

Microsoft Fabric fundamentals documentation

Microsoft Fabric is a unified platform that can meet your organization's data and analytics needs. Discover the Fabric shared and platform documentation from this page.

About Microsoft Fabric

OVERVIEW

[What is Fabric?](#)

[Fabric terminology](#)

[What's New](#)

[Migration to Microsoft Fabric](#)

GET STARTED

[Start a Fabric trial](#)

[Fabric home navigation](#)

[End-to-end tutorials](#)

[Context sensitive Help pane](#)

Get started with Fabric items

CONCEPT

[Get started with a task flow](#)

[Find items in OneLake data hub](#)

[Promote and certify items](#)

HOW-TO GUIDE

[Apply sensitivity labels](#)

Copilot

CONCEPT

[Copilot overview](#)

[Copilot in Fabric FAQ](#)

[Privacy, security, and responsible use for Copilot](#)

HOW-TO GUIDE

[Enable Copilot](#)

Workspaces

CONCEPT

[Fabric workspace](#)

[Workspace roles](#)

GET STARTED

[Create a workspace](#)

HOW-TO GUIDE

[Workspace access control](#)

Get Help

HOW-TO GUIDE

[Use the integrated Help pane](#)

[Check for known issues ↗](#)

[Contact Support](#)

What is Microsoft Fabric?

10/03/2025

Microsoft Fabric is a data analytics platform that handles your entire data workflow, from collecting and processing data to building reports and dashboards. It combines data ingestion, transformation, real-time event routing, and visualization through workloads like Data Engineering, Data Factory, Data Science, Real-Time Intelligence, Data Warehouse, and Databases.

As a Software as a Service (SaaS) platform, Fabric centralizes data storage with OneLake. It embeds AI capabilities throughout, so you don't need to integrate services manually, allowing you to transform raw data into actionable insights efficiently.

ⓘ Note

- The [Fabric Analyst in a Day \(FAIAD\)](#) workshop is free, hands-on training for analysts working with Power BI and Fabric. Get hands-on experience analyzing data and building reports using Fabric. The workshop covers key concepts like working with lakehouses, creating reports, and analyzing data in the Fabric environment.
- Join the new Fabric user panel to share feedback and help shape Fabric and Power BI. Participate in surveys and 1:1 sessions with the product team. Learn more and sign up at [Fabric user panel](#).

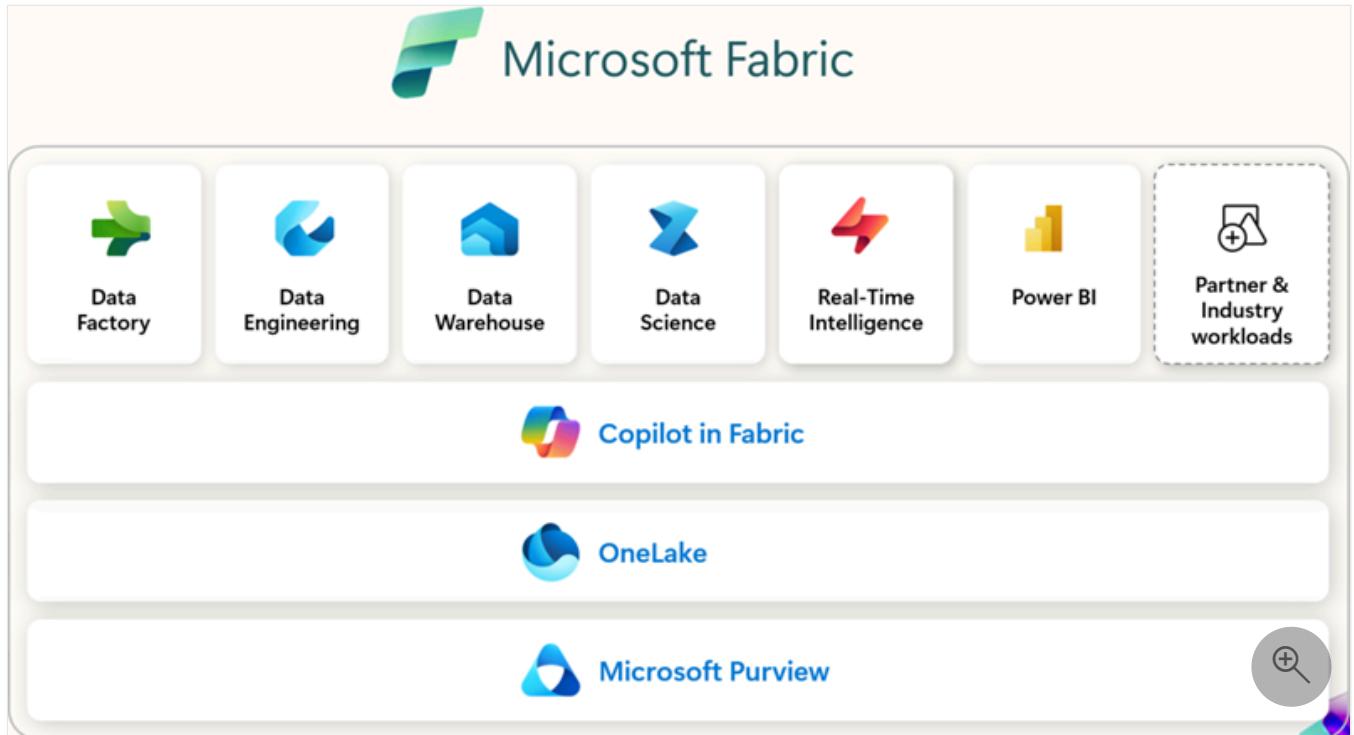
Capabilities of Fabric

Microsoft Fabric provides several integrated capabilities:

- **Role-specific workloads:** Tailored tools for data engineers, data scientists, business analysts, and database administrators, each with interfaces designed for their workflow.
- **OneLake:** All Fabric tools can access a central data storage, eliminating the need to copy data between services.
- **Copilot support:** An AI assistant that helps write code, generate insights, and automate repetitive tasks.
- **Integration with Microsoft 365:** Connect Fabric data to Excel, Teams, and other Microsoft 365 applications.
- **Azure AI Foundry:** Provides prebuilt AI models and tools for building custom machine learning solutions.
- **Unified data management:** Centralized data discovery that simplifies governance, sharing, and use.

Unification with SaaS foundation

Microsoft Fabric is built on a SaaS platform. It unifies new and existing components from Power BI, Azure Synapse Analytics, Azure Data Factory, and more into a single environment.



Fabric's integrated approach provides several advantages:

- Integrated analytics from data ingestion through reporting
- Consistent, user-friendly experiences
- Easy access and reuse of all assets
- Unified data lake storage preserving data in its original location
- AI assistance built into every workload
- Centralized administration and governance

Fabric centralizes data discovery, administration, and governance by automatically applying permissions and inheriting data sensitivity labels across all the items in the suite. Governance is powered by Purview, which is built into Fabric. This seamless integration lets creators focus on producing their best work without managing the underlying infrastructure.

Components of Microsoft Fabric

Microsoft Fabric offers the following workloads, each customized for a specific role and task:

- **Power BI** - Power BI lets you connect to data sources, create interactive charts and dashboards, and share insights across your organization. This allows business owners

access to all data in Fabric quickly and effectively, enabling better data-focused decisions. For more information, see [What is Power BI?](#)

- **Databases** - Databases in Fabric are a developer-friendly transactional database such as Azure SQL Database, which allows you to easily create your operational database in Fabric. Using the mirroring capability, you can bring data from various systems together into OneLake. You can continuously replicate your existing data estate directly into Fabric's OneLake, including data from Azure SQL Database, Azure Cosmos DB, Azure Databricks, Snowflake, and Fabric SQL database. For more information, see [SQL database in Microsoft Fabric](#) and [What is Mirroring in Fabric?](#)
- **Data Factory** - Data Factory provides a modern data integration experience to ingest, prepare, and transform data from a rich set of data sources. It incorporates the simplicity of Power Query, and you can use more than 200 native connectors to connect to data sources on-premises and in the cloud. For more information, see [What is Data Factory in Microsoft Fabric?](#)
- **Industry Solutions** - Fabric provides industry-specific data solutions that address unique industry needs and challenges, and include data management, analytics, and decision-making. For more information, see [Industry Solutions in Microsoft Fabric](#).
- **Real-Time Intelligence** - Real-Time Intelligence analyzes data as it arrives, such as IoT sensor readings, application logs, or website clickstreams. It enables the extraction of insights, visualization, and action on data in motion by handling data ingestion, transformation, storage, modeling, analytics, visualization, tracking, AI, and real-time actions. The [Real-Time hub](#) in Real-Time Intelligence provides a wide variety of no-code connectors, converging into a catalog of organizational data that is protected, governed, and integrated across Fabric. For more information, see [What is Real-Time Intelligence in Fabric?](#).
- **Data Engineering** - Fabric Data Engineering provides Apache Spark for processing large datasets, with notebooks and tools for writing and scheduling data transformation jobs. It enables you to create, manage, and optimize infrastructures for collecting, storing, processing, and analyzing vast data volumes. Fabric Spark's integration with Data Factory allows you to schedule and orchestrate notebooks and Spark jobs. For more information, see [What is Data engineering in Microsoft Fabric?](#)
- **Fabric Data Science** - Fabric Data Science enables you to build, deploy, and operationalize machine learning models from Fabric. It integrates with Azure Machine Learning to provide built-in experiment tracking and model registry. Data scientists can enrich organizational data with predictions and business analysts can integrate those predictions into their BI reports, allowing a shift from descriptive to predictive insights. For more information, see [What is Data science in Microsoft Fabric?](#)

- **Fabric Data Warehouse** - Fabric Data Warehouse provides industry leading SQL performance and scale. It separates compute from storage, enabling independent scaling of both components. Additionally, it natively stores data in the open Delta Lake format. For more information, see [What is data warehousing in Microsoft Fabric?](#)

Fabric helps organizations and individuals analyze their data and create reports, dashboards, and machine learning models. It implements a data mesh architecture. For more information, see [What is a data mesh?](#)

OneLake: The unification of lakehouses

The Microsoft Fabric platform unifies the OneLake and lakehouse architecture across an enterprise.

OneLake

A data lake is the foundation for all Fabric workloads. In Fabric, this lake is called [OneLake](#). OneLake is built into the platform and serves as a single store for all organizational data.

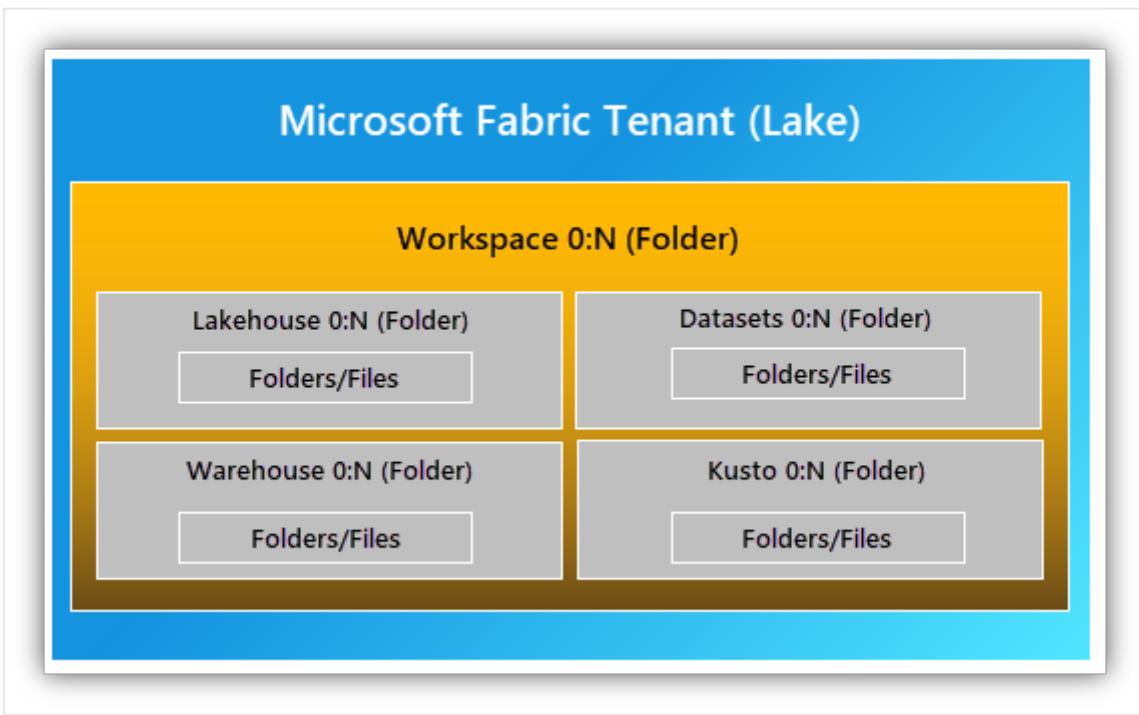
OneLake is built on ADLS (Azure Data Lake Storage) Gen2. It provides a single SaaS experience and a tenant-wide store for data that serves both professional and citizen developers. It simplifies the user experience by removing the need to understand complex infrastructure details like resource groups, RBAC, Azure Resource Manager, redundancy, or regions. You don't need an Azure account to use Fabric.

OneLake prevents data silos by offering a unified storage system that makes data discovery, sharing, and consistent policy enforcement easy. For more information, see [What is OneLake?](#)

OneLake and lakehouse data hierarchy

OneLake's hierarchical design simplifies organization-wide management. Fabric includes OneLake by default, so no upfront provisioning is needed. Each tenant gets one unified OneLake with single file-system namespace that spans users, regions, and clouds. OneLake organizes data into containers for easy handling. The tenant maps to the root of OneLake and is at the top level of the hierarchy. You can create multiple workspaces (which are like folders) within a tenant.

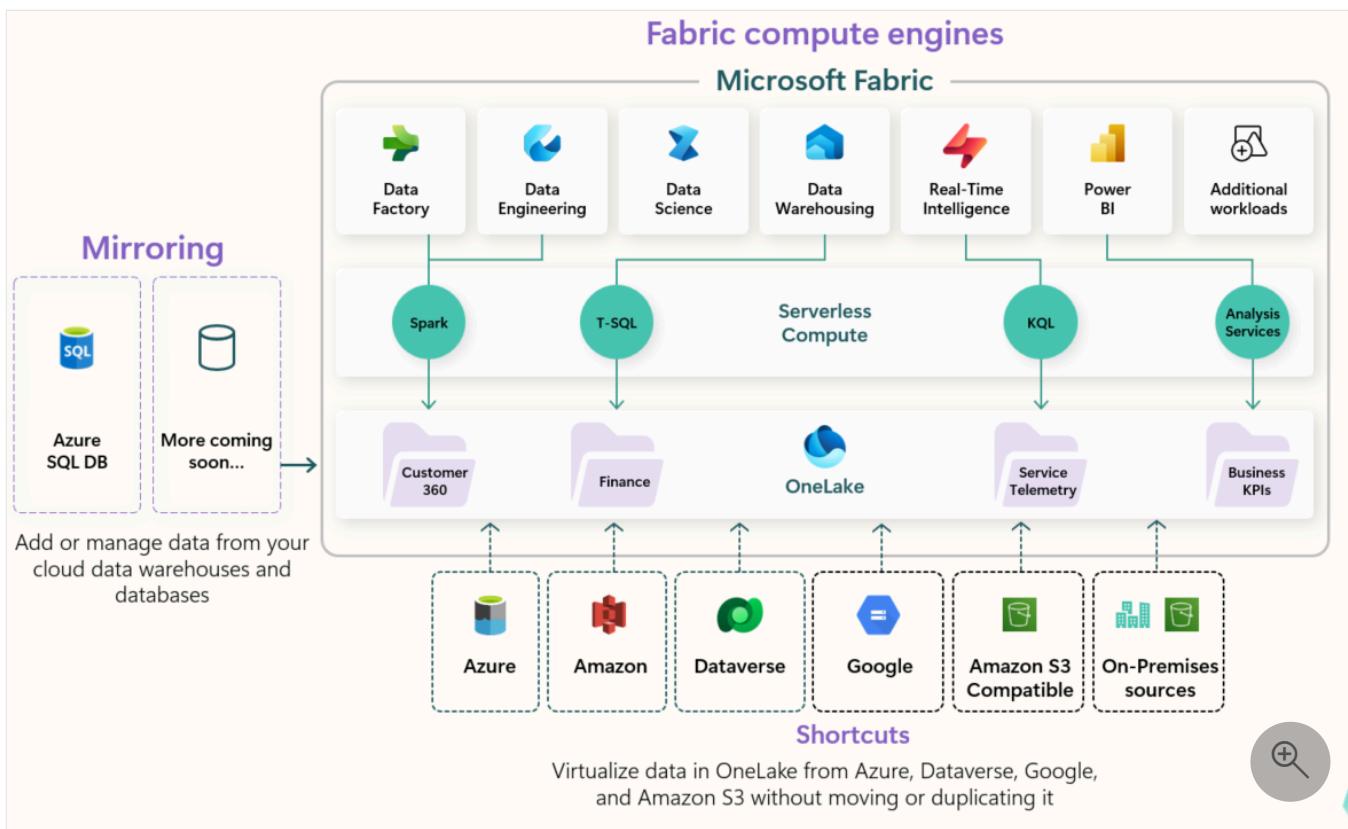
The following image shows how Fabric stores data in OneLake. You can have several workspaces per tenant and multiple lakehouses within each workspace. A lakehouse is a collection of files, folders, and tables that acts as a database over a data lake. To learn more, see [What is a lakehouse?](#).



Every developer and business unit in the tenant creates their own workspaces in OneLake. They ingest data into lakehouses and start processing, analyzing, and collaborating on that data—like using OneDrive in Microsoft Office.

Fabric compute engines

All Microsoft Fabric compute experiences come preconfigured with OneLake, like Office apps automatically use organizational OneDrive. Experiences like Data Engineering, Data Warehouse, Data Factory, Power BI, and Real-Time Intelligence use OneLake as their native store without extra setup.



OneLake lets you instantly mount your existing PaaS storage accounts using the [Shortcut](#) feature. You don't have to migrate your existing data. Shortcuts provide direct access to data in Azure Data Lake Storage. They also enable easy data sharing between users and applications without duplicating files. Additionally, you can create shortcuts to other storage systems, allowing you to analyze cross-cloud data with intelligent caching that reduces egress costs and brings data closer to compute.

Real-Time hub: the unification of data streams

The Real-Time hub is a foundational location for data in motion. It provides a unified SaaS experience and tenant-wide logical place for streaming data. It lists data from every source, allowing users to discover, ingest, manage, and react to it. It contains both [streams](#) and [KQL Database](#) tables. Streams include [Data streams](#), [Microsoft sources](#) (such as [Azure Event Hubs](#), [Azure IoT Hub](#), [Azure SQL Database \(DB\) Change Data Capture \(CDC\)](#), [Azure Cosmos DB CDC](#), [Azure Data Explorer](#), and [PostgreSQL DB CDC](#)), [Fabric events](#) ([workspace item events](#), [OneLake events](#), and [Job events](#)), and [Azure events](#), including [Azure Blob Storage events](#) and external events from Microsoft 365 or other clouds services.

The Real-Time hub makes it easy to discover, ingest, manage, and consume data-in-motion from a wide variety of sources to collaborate and develop streaming applications in one place. For more information, see [What is the Real-Time hub?](#)

Fabric solutions for ISVs

If you're an Independent Software Vendors (ISVs) looking to integrate your solutions with Microsoft Fabric, you can use one of the following paths based on your desired level of integration:

- **Interop** - Integrate your solution with the OneLake Foundation and establish basic connections and interoperability with Fabric.
- **Develop on Fabric** - Build your solution on top of the Fabric platform or seamlessly embed Fabric's functionalities into your existing applications. You can easily use Fabric capabilities with this option.
- **Build a Fabric workload** - Create customized workloads and experiences in Fabric, tailoring your offerings to maximize their effect within the Fabric ecosystem.

For more information, see the [Fabric ISV partner ecosystem](#).

Related content

- [Microsoft Fabric terminology](#)
- [Create a workspace](#)
- [Navigate to your items from Microsoft Fabric Home page](#)
- [End-to-end tutorials in Microsoft Fabric](#)

What's new in Microsoft Fabric?

10/08/2025

This page is continuously updated with a recent review of what's new in [Microsoft Fabric](#).

- To follow the latest in Fabric news and features, see the [Microsoft Fabric Updates Blog ↗](#).
- For community, marketing, case studies, and industry news, see the [Microsoft Fabric Blog ↗](#).
- Follow the latest in Power BI at [What's new in Power BI?](#)
- For older updates, review the [Microsoft Fabric What's New archive](#).

New to Microsoft Fabric?

- [Learning Paths for Fabric](#)
- [Get started with Microsoft Fabric](#)
- [End-to-end tutorials in Microsoft Fabric](#)
- [Microsoft Fabric terminology](#)

Features currently in preview

The following table lists the features of Microsoft Fabric that are currently in preview. Preview features are sorted alphabetically.

Note

Features currently in preview are available under [supplemental terms of use ↗](#). Review for legal terms that apply to Azure features that are in beta, preview, or otherwise not yet released into general availability. Microsoft Fabric provides previews to give you a chance to evaluate and [share feedback with the product group ↗](#) on preview features before they become [generally available \(GA\)](#).

 Expand table

Feature	Learn more
Access your Delta Lake tables as Apache Iceberg in OneLake (preview)	OneLake now lets you access your Delta Lake tables using Apache Iceberg compatible readers ↗ , automatically, without data movement or duplication. To get started, see Use Iceberg tables with OneLake .

Feature	Learn more
AI functions (preview)	AI functions for data engineering ↗ are now in preview. With AI functions, you can harness the power of GenAI for summarization, classification, text generation, and so much more—all with a single line of code. Learn more about recent improvements to AI functions during the current preview ↗ .
Anomaly detection (Preview)	With a no-code interface, automatic model selection, and flexible alerts, tracking changes and unexpected events is easy with Anomaly detection in Real-Time Intelligence (Preview) . For more information, see AI-Powered Real-Time Intelligence with Anomaly Detection (Preview) ↗ .
Apache Iceberg data in OneLake using Snowflake and shortcuts (preview)	You can now consume Apache Iceberg-formatted data across Microsoft Fabric with no data movement or duplication ↗ , plus Snowflake has added the ability to write Iceberg tables directly to OneLake. For more information, see Use Apache Iceberg tables with OneLake .
Approximate or fuzzy string matching (preview)	In SQL database in Fabric, you can check if two strings are similar, and calculate the difference between two strings. Use this capability to identify strings that might be different because of character corruption. What is fuzzy string matching?
ArcGIS GeoAnalytics for Microsoft Fabric Spark (preview)	Microsoft and Esri have partnered to bring spatial analytics into Microsoft Fabric ↗ . To learn more about ArcGIS integration within Microsoft Fabric Spark, see ArcGIS GeoAnalytics for Microsoft Fabric (preview) ↗ and ArcGIS in Fabric integrations ↗ .
AutoML code-first preview	In Fabric Data Science, the new AutoML feature ↗ enables automation of your machine learning workflow . AutoML, or Automated Machine Learning, is a set of techniques and tools that can automatically train and optimize machine learning models for any given data and task type.
AutoML low code user experience in Fabric (preview)	AutoML, or Automated Machine Learning, is a process that automates the time-consuming and complex tasks of developing machine learning models. The new low code AutoML experience supports various tasks, including regression, forecasting, classification, and multi-class classification. To get started, Create models with Automated ML (preview) .
Azure Blob Storage in OneLake shortcut type (preview)	You can now create shortcuts to Azure Blob Storage in OneLake ↗ , making it easier to integrate and access blob data in Microsoft Fabric. For more information, see Create an Azure Blob Storage shortcut (preview) .
Azure Key Vault references to authenticate to Fabric data connections (preview)	You can now authenticate to Fabric data connections using Azure Key Vault stored secrets (preview) ↗ . Azure Key Vault references enable secure and centralized secret management for your data connections. For more information, see Azure Key Vault references overview (preview) and get started at Configure Azure Key Vault references .
Centralized data governance in the	A new centralized data governance experience in the OneLake catalog ↗ is in preview. Data owners can view aggregated insights on the items they created,

Feature	Learn more
OneLake catalog (preview)	consider improving their governance by taking recommended actions, and access more information along with all available tools in Fabric.
Code-First Hyperparameter Tuning preview	In Fabric Data Science, FLAML is now integrated for hyperparameter tuning , currently a preview feature. Fabric's <code>flaml.tune</code> feature streamlines this process, offering a cost-effective and efficient approach to hyperparameter tuning .
Confluent Schema Registry Support in Eventstream (Preview)	Eventstream's Confluent Cloud for Apache Kafka streaming connector now supports decoding data from topics associated with a data contract in Confluent Schema Registry , enabling seamless ingestion, preview, and routing of schema-encoded streaming data in Fabric Real-Time Intelligence. For more information, see Add Confluent Cloud for Apache Kafka source to an eventstream .
Continuous ingestion from Azure Storage to Eventhouse (preview)	You can now use continuous ingestion from Azure Storage to Eventhouse (preview) to automatically and efficiently ingest data from Azure Storage into Eventhouse. For more information, see Get data from Azure Storage .
Copilot for Dataflow Gen 2 Modern Get Data	With Copilot for the Modern Get Data experience in Dataflow Gen 2 , you can ingest and transform data with natural language commands. For a walkthrough, see Blog: Copilot in Modern Get Data (MGD) for Dataflow Gen 2 .
Copilot for Data Warehouse Chat preview	You'll now see a Copilot button in the ribbon that starts a chat with Copilot for acceleration with any data warehousing task . For more information, see How to: Use the Copilot chat pane for Fabric Data Warehouse .
Copilot for SQL analytics endpoint (preview)	The Copilot for SQL analytics endpoint introduces Copilot capabilities for the SQL analytics endpoint, enabling users to generate and optimize SQL queries using natural language. For more information, see Copilot for SQL analytics endpoint .
Copilot in Fabric is available worldwide	Copilot in Fabric is now available to all customers, including Copilot for Power BI , Copilot for Data Factory , Copilot for Data Science & Data Engineering , and Copilot for Writing KQL Queries . Read more in our Overview of Copilot in Fabric .
Copy job support for change data capture (CDC) (preview)	Change Data Capture (CDC) in Copy Job is a powerful capability in Data Factory Data pipelines that enables efficient and automated replication of changed data including inserted, updated, and deleted records from a source to a destination.
Copy job support for Multiple Scheduler (preview)	Copy job Multiple Scheduler support allows a single Copy job to be triggered at different intervals. In the past, this required creating multiple Copy jobs for each schedule. For more information, see Job scheduler in Microsoft Fabric .

Feature	Learn more
Cosmos DB in Microsoft Fabric (preview)	The preview of Cosmos DB in Microsoft Fabric is now available to all users. Since its announcement at Microsoft Build 2025, several new capabilities have been added, including vector indexing and search . For more information, see Announcing Cosmos DB in Microsoft Fabric . To get started, see Quickstart: Create a Cosmos DB database in Microsoft Fabric (preview) .
Customer-managed keys for Fabric workspaces (Preview)	Customer-managed keys (CMK) for Microsoft Fabric workspaces are now available in preview in all public regions , enabling customers to meet compliance requirements and protect data with their own keys. For more information, see Customer-managed keys for Fabric workspaces .
DacFx Integration for Warehouse ALM	Simplify your warehouse application lifecycle management (ALM) with DacFx integration in Git and deployment pipelines for Fabric Warehouse (preview). For more information, see Simplify your Warehouse ALM with DacFx integration in Git and Deployment Pipelines .
Dataflow Gen2 Public APIs (preview)	Data Factory APIs enable users to automate and manage dataflows, including creation, management, scheduling, and monitoring. For more information, see Use public parameters in Dataflow Gen2 (preview) .
Data replication from Lakehouse with Delta Change Feed (preview)	The Fabric Lakehouse Table connector provides changed data from a Fabric Lakehouse via Delta Change Data Feed (CDF), to supported destinations. For more information, see Data Replication from Fabric Lakehouse with Delta Change Data Feed (Preview) .
Data source instructions in Fabric Data Agent	Data Source Instructions in the Fabric Data Agent help you get more precise, relevant answers from your structured data. For more information, see New in Fabric Data Agent: Data source instructions for smarter, more accurate AI responses .
DATEADD number allows bigint (preview)	In SQL database in Fabric, with <code>DATEADD (datepart , number , date)</code> a number can be expressed as a bigint . For more information, see DATEADD (Transact-SQL) .
Delta column mapping in the SQL analytics endpoint	SQL analytics endpoint now supports Delta tables with column mapping enabled . For more information, see Delta column mapping and Limitations of the SQL analytics endpoint . This feature is currently in preview.
Digital twin builder (preview)	Digital twin builder (preview) is a new item within the Real-Time Intelligence workload. Digital twins create data-driven, real-time representations of entities . It's a data modeling item that creates digital representations of real-world environments, to optimize physical operations using data. For more information, see What is digital twin builder (preview)? .
Encrypt data at rest using customer-managed keys (preview)	By default, Fabric encrypts all data at rest using Microsoft-managed keys. You can now encrypt data at rest in your Fabric workspaces using customer-managed keys , as a preview feature, giving you greater control over data security and compliance. For more information, see Customer-managed keys for Fabric workspaces .

Feature	Learn more
Enhanced conversation with Microsoft Fabric Copilot (preview)	We're introducing improvements to AI functionalities in Microsoft Fabric ↗ , including a new way to store chat prompts and history, improved accuracy of responses, and better context knowledge retention.
Evaluate your Fabric data agents with the Python SDK (preview)	You can now use the Python SDK to programmatically evaluate Fabric data agents ↗ . For more information, see Consume a Fabric Data Agent in Microsoft Copilot Studio (preview) .
Eventstream Derived Streams in Direct Ingestion mode (preview)	You can ingest data from a Fabric Eventstream to Eventhouse seamlessly either from an eventstream or using Eventhouse Get Data Wizard. This capability is now being extended to support eventstream derived streams in direct ingestion mode . For more information, see Fabric Eventhouse now supports Eventstream Derived Streams in Direct Ingestion mode (preview) ↗ .
Eventstream processing and routing events to Activator (preview)	Now, Fabric Eventstream supports processing and transforming events with business requirements ↗ before routing the events to the destination: Activator. When these transformed events reach Activator, you can establish rules or conditions for your alerts to monitor the events.
Fabric Data Agents + Microsoft Copilot Studio (Preview)	The preview of the integration between Fabric data agents and Microsoft Copilot Studio is now available. Watch a demo from Build 2025 about Creating Data Agents in Fabric for Multi-Agent AI Solutions ↗ . For more information, see multi-agent orchestration in Microsoft Copilot Studio ↗ .
Fabric data agent integration with Azure AI Agent Service (preview)	We're excited to launch the integration of data agents in Fabric with Azure AI Agent Service from Azure AI Foundry. To get started, see Consume a Fabric Data Agent in Microsoft Copilot Studio (preview) . The Fabric data agent SDK ↗ is also available in preview.
Fabric data agent integration with Microsoft Copilot Studio (preview)	Fabric data agent is available in preview and can be added as an agent to your custom setup in Microsoft Copilot Studio. For more information, see Fabric data agent integration with Microsoft Copilot Studio (preview) ↗ .
Fabric data factory Upsert table action in the Lakehouse Connector (preview)	The Upsert (Preview) table action in the Lakehouse Connector ↗ is in preview.
Fabric Extensibility Toolkit (Preview)	The Extensibility Toolkit builds on the foundation of the Workload Development Kit while introducing several key improvements and new capabilities. We have also created a new Fabric Community Repository ↗ . This repository contains a wide variety of item types built with the Extensibility toolkit you can add to your tenant. For more information, see Introducing the Microsoft Fabric Extensibility Toolkit ↗ .
Fabric MCP (Preview)	Fabric MCP ↗ is a developer-focused Model Context Protocol server that enables AI-assisted code generation and item authoring in Microsoft Fabric. Designed for agent-powered development and automation, it integrates with

Feature	Learn more
	tools like VS Code and GitHub Codespaces as part of the Microsoft MCP initiative.
Fabric Spark Applications Comparison (Preview)	The Spark Applications Comparison feature lets users select and compare up to four Spark application runs side by side. For more information, see Blog: Fabric Spark Applications Comparison ↗ .
Fabric Spark Diagnostic Emitter (preview)	The Fabric Apache Spark Diagnostic Emitter ↗ (preview) allows Apache Spark users to collect logs, event logs, and metrics from their Spark applications and send them to various destinations, including Azure Event Hubs , Azure storage , and Azure log analytics .
Fabric SQL database (preview)	SQL database in Microsoft Fabric (preview) is a developer-friendly transactional database, based on Azure SQL Database , that allow you to easily create your operational database in Fabric. SQL database in Fabric uses the SQL Database Engine as Azure SQL Database .
Fabric variable libraries in Dataflow Gen2 with CI/CD (preview)	Fabric variable libraries offer a centralized way to manage configuration values across Microsoft Fabric workloads. With the new integration in Dataflow Gen2, you can reference these variables directly in your dataflow, enabling dynamic behavior across environments and simplifying CI/CD workflows. For more information, see variable libraries in Dataflow Gen2 .
Folder REST API (preview)	You can now create and manage workspace folders in automation scenarios and integrate with other systems and tools. The Folder Rest API is now in preview ↗ . To get started, see Fabric REST API Folders .
Graph in Microsoft Fabric (preview)	<p>Graph in Microsoft Fabric transforms disconnected data into AI-powered insights using a labeled property graph model. Query relationships with GQL (Graph Query Language), run built-in graph algorithms, and uncover hidden connections in your data—all directly from OneLake without ETL or data duplication.</p> <p>To get started, see Graph in Microsoft Fabric (preview) quickstart.</p>
Inline code completion in Fabric notebooks (preview)	Fabric notebooks with inline code completion ↗ helps users write code faster and with fewer errors. For more information, see Copilot for Data Science and Data Engineering (preview) .
Item History in Fabric Capacity Metrics App (Preview)	The Item History page in the Fabric Capacity Metrics App (Preview) ↗ provides a 30-day view of compute capacity consumption with interactive visuals and slicers for workspace and item-level analysis. For more information, see Understand the metrics app item history page (preview) .
JobInsight Diagnostics Library (Preview)	JobInsight ↗ is a diagnostics library to analyze completed Spark applications via APIs for queries, jobs, stages, tasks, executors, and event logs. For more information, see JobInsight diagnostics library (preview) .

Feature	Learn more
JSON Lines support in OPENROWSET (Preview)	JSON Lines (JSONL) support in the OPENROWSET(BULK) function ↗ for Fabric Data Warehouse and SQL analytics endpoints is now in preview, allowing you to query external data in JSONL format. For more information, see OPENROWSET (BULK) (Transact-SQL) .
Lakehouse schemas feature (preview)	The Lakehouse schemas feature (preview) ↗ introduces data pipeline support for reading the schema info from Lakehouse tables and supports writing data into tables under specified schemas. Lakehouse schemas allow you to group your tables together for better data discovery, access control, and more.
Lakehouse support for git integration and deployment pipelines (preview)	The Lakehouse now integrates with the lifecycle management capabilities in Microsoft Fabric ↗ , providing a standardized collaboration between all development team members throughout the product's life. Lakehouse Lifecycle management facilitates an effective product versioning and release process by continuously delivering features and bug fixes into multiple environments.
Livy REST API (preview)	The Fabric Livy endpoint lets users submit and execute their Spark code on the Spark compute within a designated Fabric workspace, eliminating the need to create a Notebook or Spark Job Definition item. The Livy API offers the ability to customize the execution environment through its integration with the Environment ↗ .
Load Fabric OneLake Data in Excel	Easily load Fabric OneLake data into Excel with integrated OneLake catalog and modern Get Data experience (preview). For more information and steps to get started, see OneLake catalog and Get Data are integrated into Excel for Windows ↗ .
Materialized Lake views (preview)	Materialized Lake Views were announced at Build 2025 ↗ . Materialized Lake Views in Microsoft Fabric enable fast and efficient querying of data stored in OneLake.
MCP Support for Real-Time Intelligence (preview)	Model Context Protocol (MCP) is now supported for Real-Time Intelligence (RTI) ↗ . The open-source MCP server ↗ enables AI agents or AI applications to interact with Fabric RTI by providing tools through the MCP interface, allowing for seamless data querying and analysis capabilities.
MERGE support (Preview)	The MERGE T-SQL syntax is now in preview for Fabric Data Warehouse. This DML statement provides a sleek and uniform approach for executing transformations based on conditions between a Source table and Target table. Perform INSERTs, UPDATEs, and DELETEs all in a single command with MERGE.
Microsoft Entra service principal support for Amazon S3 Shortcuts (preview)	You can now use Microsoft Entra service principals to access Amazon S3 via OneLake Shortcuts ↗ , eliminating the need for long-term AWS access keys. This integration uses OpenID Connect (OIDC) for short-lived, standards-based tokens, simplifies cross-cloud identity management, and enables full auditability via AWS CloudTrail. To get started, see AWS S3 shortcuts using service principal authentication .

Feature	Learn more
Microsoft Fabric Admin APIs	Fabric Admin APIs ↗ are designed to streamline administrative tasks. The initial set of Fabric Admin APIs is tailored to simplify the discovery of workspaces, Fabric items, and user access details.
Microsoft Fabric SKU estimator (preview)	The Microsoft Fabric SKU estimator ↗ , now available in preview, is an enhanced version of the previously introduced Microsoft Fabric Capacity Calculator. For more information, see Introducing the Microsoft Fabric SKU estimator (preview) ↗ and Mastering SKU Estimations with the Microsoft Fabric SKU Estimator ↗ .
Mirroring in Microsoft Fabric (preview)	With database mirroring in Fabric, you can easily bring your databases into OneLake in Microsoft Fabric ↗ . This enables seamless, zero-ETL, near real-time insights on your data. Some mirroring sources are generally available, some are still in preview. For more information, see What is Mirroring in Fabric?
Modern evaluator for Dataflow Gen2 (preview)	The Modern Query Evaluation Engine (also known as the "Modern Evaluator") provides a new query execution engine running on .NET core version 8, which can significantly improve the performance of dataflow runs in some scenarios. For more information, see the Modern evaluator for Dataflow Gen2 .
ML model endpoints (Preview)	ML models in Fabric can now serve real-time predictions from secure, scalable, and easy-to-use online endpoints ↗ . In addition to batch predictions in Spark, you can use endpoints to bring ML model predictions to other Fabric solutions and custom applications. For more information, see Automated machine learning in Fabric and Model endpoints in Fabric .
MSSQL extension for VS Code Fabric integration (Preview)	MSSQL extension for VS Code Fabric integration (Preview) ↗ adds support for connecting, running queries, and managing objects in SQL databases in Fabric directly from Visual Studio Code. Download the extension at mssql extension at marketplace.visualstudio.com ↗ .
Multiple-Schema Inferencing in Eventstream (Preview)	Multiple-schema inferencing in Eventstream lets you work with multiple data sources that emit varying schemas by inferring and managing multiple schemas simultaneously. For more information, see Enhancing Data Transformation Flexibility with Multiple-Schema Inferencing in Eventstream (Preview) ↗ .
Notebook Copilot inline code completion (preview)	Now in preview, Copilot Inline Code Completion (Preview) is an AI feature that assists data scientists and engineers in writing Python code more quickly and easily. For more information, see Notebook Copilot inline code completion (Preview) ↗ .
Notebook debug within vscode.dev (preview)	You can now place breakpoints and debug your Notebook code ↗ with the Synapse VS Code - Remote ↗ extension in vscode.dev ↗ . This update first starts with the Fabric Runtime 1.3 (GA) .
OneLake as a Source for COPY INTO and OPENROWSET (Preview)	COPY INTO and OPENROWSET now support reading directly from OneLake paths in Fabric Data Warehouse (preview) ↗ , enabling SQL-based data ingestion and ad hoc querying from Lakehouse folders without external

Feature	Learn more
	storage or complex setup. For more information, see Ingest data into the Warehouse .
OneLake data access roles (preview)	OneLake data access roles for lakehouse are in preview . Role permissions and user/group assignments can be easily updated through a new folder security user interface. For an example, see Secure Mirrored Azure Databricks Data in Fabric with OneLake security .
OpenAI plugins for Eventhouse (preview)	You can now use two powerful AI plugins for Eventhouse: AI Embed Text Plugin and AI Chat Completion Prompt Plugin . Connect Eventhouse data to OpenAI-powered applications for advanced analytics and AI scenarios. For more information, see ai_embed_text (preview) and ai_chat_completion (preview) .
Partitioned compute for Dataflow Gen2 (preview)	Partitioned compute is a capability of the Dataflow Gen2 engine that allows parts of your dataflow logic to run in parallel, reducing the time to complete its evaluations. For more information, see partitioned compute in Dataflow Gen2 .
Pass Parameter Values to Fabric Items (Preview)	Activator enables you to automatically activate Fabric items like pipeline and notebook . whenever certain data conditions are met. You can not only activate and execute Fabric items but also pass values to the parameters defined in your Fabric items .
PostgreSQL Flexible Server mirroring to Fabric	Fabric Database Mirroring now supports replication of your Azure Database for PostgreSQL Flexible Server . as a preview feature. You can continuously replicate data in near real-time from your Flexible Server instance to Fabric OneLake. For more information, see Mirroring Azure Database for PostgreSQL flexible server .
Prebuilt Azure AI services in Fabric preview	The preview of prebuilt AI services in Fabric . is an integration with Azure AI services , formerly known as Azure Cognitive Services. Prebuilt Azure AI services allow for easy enhancement of data with prebuilt AI models without any prerequisites. Currently, prebuilt AI services are in preview and include support for the Microsoft Azure OpenAI Service , Azure AI Language , and Azure AI Translator .
Preview-only steps for Dataflow Gen2 (preview)	Preview only steps are transformation steps in Dataflow Gen2 that are executed only during the authoring phase for the data preview. They're excluded from run operations, ensuring they don't affect runtime behavior or production logic. For more information, see preview-only step in Dataflow Gen2 .
Public API capabilities for Dataflow Gen2 dataflows in Fabric Data Factory (preview)	This preview of the Dataflows Gen 2 public APIs enables users to create, update, and monitor their data workflows programmatically. The APIs support a wide range of operations including dataflows CRUD (Create, Read, Update, and Delete), scheduling, and monitoring, making it easier for users to manage their data integration processes.

Feature	Learn more
Public parameter values to refresh a Dataflow Gen2 (preview)	Learn more about the new public parameters capability for Dataflow Gen2 with CI/CD support, as well as the support for this new mode within the Dataflow refresh activity in Data Pipelines.
Regular expression functions (preview)	In SQL database in Fabric, regular expression (REGEX) functions return text based on values in a search pattern. For more information, see Regular expressions .
REST APIs for connections and gateways (preview)	REST APIs for connections and gateways are now in preview . These new APIs allow developers to programmatically manage and interact with connections and gateways within Fabric.
Result set caching (preview)	Result set caching works by persisting the final result sets for applicable <code>SELECT</code> T-SQL queries, bypassing complex compilation and data processing of the original query to return queries faster. For more information, see Result Set Caching for Microsoft Fabric Data Warehouse (preview) .
Scalar user-defined functions (UDFs)	Scalar user-defined functions (UDFs) are now supported as a preview feature. For more information, see CREATE FUNCTION for Fabric Data Warehouse .
Schema Registry (Preview)	Event Schema Registry (preview) provides a contract-based way to define and validate event schemas in Fabric Eventstreams for type-safe, reliable real-time pipelines. For more information, see Schema Registry overview .
Secure mirrored Azure Databricks data with OneLake security (preview)	You can secure mirrored Azure Databricks data in Fabric using OneLake security , now a feature in preview. You can now map Unity Catalog (UC) policies to Microsoft OneLake security. For more information, see Automatic identity managed in Azure Databricks .
Share the Fabric Data agent (preview)	Share capability for the Fabric Data agent (preview) allows you to share the Data agent with others using various permission models.
Shortcut transformations (preview)	Shortcut transformations let you automatically transform files into Delta tables as you bring data into or move it within OneLake, keeping data always in sync without the need for pipelines. For more information, see Shortcuts file transformations .
Solace PubSub+ Connector	Seamlessly connect Fabric Eventstream with Solace PubSub+ (preview). For more information and steps to get started, see New Solace PubSub+ Connector: seamlessly connect Fabric Eventstream with Solace PubSub+ (preview) .
SQL database support for Tenant level private links (preview)	You can use tenant level private links to provide secure access for data traffic in Microsoft Fabric, including SQL database (in preview). For more information, see Set up and use private links and Blog: Tenant Level Private Link (Preview) .

Feature	Learn more
SQL Operator under Fabric Eventstream (Preview)	The new SQL Operator enables real-time data transformation with the flexibility and control to craft custom transformations using custom SQL syntax. To get started, see Process events using SQL code editor (preview) .
Synapse Data Explorer to Eventhouse migration tooling (Preview)	The next generation of Azure Synapse Data Explorer offering is evolving to become Eventhouse . To get started, see Migrate from Azure Synapse Data Explorer to Fabric Eventhouse (preview) .
Tabbed navigation for multitasking and other UI improvements	Fabric now supports tabs to open multiple items and easily switch between them. It offers an object explorer that lets you browse and open items across all your open workspaces. To learn more, see tabbed navigation in Fabric portal and New Multitasking Features coming to Fabric (Preview) .
Upsert to delta table with Lakehouse connector (Preview)	We've added upsert support to the Lakehouse connector, allowing direct writes to Delta tables, in both Copy job and Copy activity within Pipeline. For more information, see Configure Lakehouse in a copy activity .
varchar(max) and varbinary(max) support in preview	Support for the varchar(max) and varbinary(max) data types in Fabric Data Warehouse is now in preview. For more information, see Announcing public preview of VARCHAR(MAX) and VARBINARY(MAX) types in Fabric Data Warehouse .
Warehouse snapshots (preview)	Warehouse snapshots are a point-in-time, read-only representation of your data warehouse. You can create a snapshot of your warehouse at any point in the past 30 days, connect to it and query it just like a warehouse, and "roll forward" your snapshot regularly. To get started, see Create and manage a warehouse snapshot .
Warehouse source control (preview)	Using Source control with Warehouse (preview) , you can manage development and deployment of versioned warehouse objects. You can use SQL Database Projects extension available inside of Azure Data Studio and Visual Studio Code . For more information on warehouse source control, see CI/CD with Warehouses in Microsoft Fabric .
Warehouse SQL Audit Logs	SQL Audit Logs in Fabric Data Warehouse provide a comprehensive and immutable record of all database activities, capturing critical details such as the event timestamp, the user or process that triggered the action, and the executed T-SQL statements. For more information, see Introducing SQL Audit Logs for Fabric Data Warehouse .
Workspace-level Private Link (Preview)	Fabric workspace-level Private Link (Preview) enables fine-grained network isolation by securing individual Fabric workspaces with private endpoints. For more information, see Private link for Fabric workspaces (preview) .
Workspace-level workload assignment (Preview)	Workspace admins can now add additional workloads directly to their workspaces , eliminating the need for tenant or capacity-level setup. In the Workloads Hub , admins can add workloads directly to a workspace .

Feature	Learn more
Workspace monitoring (preview)	Workspace monitoring is a Microsoft Fabric database that collects data from a range of Fabric items in your workspace, and lets users access and analyze logs and metrics. For more about this feature, see Announcing preview of workspace monitoring .
Workspace Outbound Access Protection for Spark (Preview)	Workspace Outbound Access Protection for Spark lets workspace admins restrict Spark outbound connections to only approved destinations via managed private endpoints to reduce data exfiltration risk. For more information, see Workspace outbound access protection (preview) .

Generally available features

The following table lists the features of Microsoft Fabric that have recently transitioned from preview to general availability (GA).

[Expand table](#)

Month	Feature	Learn more
September 2025	Govern tab (Generally Available)	The Governance experience within the OneLake catalog allows you to secure your data estate within Fabric. To get started, see Govern your Fabric data .
September 2025	Purview Data Loss Protection and Prevention policies (Generally Available)	DLP policies for Fabric and Power BI are generally available. For more information, see Microsoft Purview Protection Policies for Fabric and Protection policies .
September 2025	Fabric User Data Functions (Generally Available)	Fabric User Data Functions are now generally available. You can create functions that contain business logic and connect to Fabric data sources, and/or invoke them from other Fabric items such as Data pipelines, Notebooks and Power BI reports. For more information, see Fabric User data functions .
September 2025	Python Notebooks (Generally Available)	Python notebooks are now generally available, multiple kernel support, new APIs, Pylance, and more. To get started, see Use Python experience on Notebook . For more information on Pylance, see Enhance Python development with Pylance .
September 2025	Environment Public APIs (Generally Available)	Environment APIs allow admins to create, get, or update environments, import, export or remove external libraries, and upload or delete custom libraries. Some existing APIs have newly updated response contracts. For a full list of impacted APIs and migration guidance, see Manage the environment through public APIs .

Month	Feature	Learn more
September 2025	Fabric Spark Monitoring APIs (Generally Available)	Fabric Spark Monitoring APIs are a robust set of tools designed to enhance observability and streamline the monitoring and management of Spark applications within Microsoft Fabric. For more information, see Fabric Spark Monitoring APIs (Generally Available) .
September 2025	Spark Run Series Analysis (Generally Available)	The Spark Monitoring Run Series Analysis features allow you to analyze the run duration trend and performance comparison for Pipeline Spark activity recurring run instances and repetitive Spark run activities, from the same Notebook or Spark Job Definition. For more information, see Monitor Apache Spark run series .
September 2025	Data Wrangler (Generally Available)	In Data Wrangler's visual interface , you can see smart suggestions from Microsoft PROSE for operations that are relevant to your data frame. Describe your desired transformations in natural language, and Copilot will generate code and an instant preview of the results. For big data workflows, Data Wrangler can translate all your pandas operations back to PySpark .
September 2025	Dataflow Gen2 parameterization (Generally Available)	Parameterized Dataflow Gen2 using public parameters mode is now a generally available feature, and includes new parameters info from recent runs, improved error messaging, and expanded data type support. To get started, Use public parameters in Dataflow Gen2 .
September 2025	Incremental refresh destinations in Dataflow Gen2 (Generally Available)	Incremental refresh support for Lakehouse tables in Dataflow Gen2 is now generally available.
September 2025	Mirroring for Azure SQL Managed Instance (Generally Available)	Mirroring for Azure SQL Managed Instance (now generally available) offers continuous data replication into OneLake. To get started, see Mirroring Azure SQL Managed Instance .
September 2025	New generally available Dataflow Gen2 data destinations	Review Dataflow Gen2 data destinations and managed settings for data destinations now generally available, including SharePoint and Fabric Lakehouse Tables.
September 2025	Copilot in Dataflow Gen2 (Generally Available)	Copilot can now help you interpret Mashup (Power Query M) code in natural language. For more information, see Copilot explainer skill in Dataflow Gen2 . Copilot can also use natural language to create custom columns .
September 2025	Invoke remote pipeline (Generally Available)	You can now use the Invoke Pipeline activity to call pipelines from Azure Data Factory or Synapse Analytics pipelines . This feature allows you to utilize your existing ADF or Synapse

Month	Feature	Learn more
		pipelines inside of a Fabric pipeline by calling it inline through this new Invoke Pipeline activity .
September 2025	Azure Databricks jobs activity (Generally Available)	You can run and manage Azure Databricks jobs from Fabric Data Pipelines as part of end-to-end workflows in Fabric Data Pipelines. For more information, see Transform data by running an Azure Databricks activity .
September 2025	Virtual Network Data Gateway supports Fabric pipeline and Copy job (Generally Available)	You can now use Pipeline and Copy job with the Virtual Network Data Gateway . For more information, see What is a virtual network data gateway?
September 2025	Fabric VS Code extension (Generally Available)	The Microsoft Fabric for VS Code extension is now generally available and packed with features for programmatic management, git integration, multi-workspace support, and Fabric SQL database integration. For more information, see Microsoft Fabric extension for VS Code (Generally Available) .
September 2025	Variable library (Generally Available)	The Variable library allows users to define and manage variables at the workspace level, so they could soon be used across various workspace items, such as pipelines, notebooks, Shortcut for lakehouse and more. You can also Use variable libraries in pipelines .
September 2025	Discover Dataflow Gen2 Parameters API (Preview)	The new Discover Dataflow Gen2 Parameters API lets you retrieve all parameters defined within a Dataflow Gen2 with CI/CD that has the public parameters mode enabled. To get started, see Items - Discover Dataflow parameters API .
September 2025	Teams and Outlook activities in pipelines	The activities that allow you to send email or Teams messages from Fabric pipelines are now generally available. For more information, see the Outlook 356 activity and the Teams activity .
September 2025	JSON Lines support in OPENROWSET	JSON Lines (JSONL) support in the OPENROWSET(BULK) function for Fabric Data Warehouse and SQL analytics endpoints is now generally available, allowing you to query external data in JSONL format. For more information, see Browse file content using OPENROWSET function .
September 2025	Migration Assistant for Fabric Data Warehouse	The Migration Assistant , now generally available, simplifies the process of migrating from Azure Synapse Analytics to Fabric Data Warehouse. To get started, see Migrate with the Fabric Migration Assistant for Data Warehouse .
August 2025	SET SHOWPLAN_XML support	The SET SHOWPLAN_XML T-SQL syntax is now generally available for Fabric Data Warehouse and SQL analytics

Month	Feature	Learn more
		endpoint. Use this session-level statement and its visualizer counterpart in SQL Server Management Studio to get insight into query plan information.
July 2025	Mirroring for Azure SQL Database with Data Gateway GA	Mirroring for Azure SQL Database with Virtual Network Data Gateway and on-premises Data Gateway (OPDG) is now generally available.
July 2025	Autoscale Billing for Spark in Microsoft Fabric	Autoscale Billing for Apache Spark in Microsoft Fabric is now generally available. Autoscale is a serverless billing model designed to offer greater flexibility, transparency, and cost efficiency for running Spark workloads at scale. For more information, see Autoscale Billing for Spark in Microsoft Fabric and Understand the metrics app Autoscale compute for Spark page .
July 2025	SQL analytics endpoint metadata sync with REST API	The ability to refresh SQL endpoint metadata via REST API is now generally available. For more information, see Refresh SQL analytics endpoint Metadata REST API GA .
July 2025	DOP Feedback generally available	Degrees of Parallelism (DOP) feedback is now generally available in SQL database in Fabric. For more information, see Smarter Parallelism: Degree of parallelism feedback in SQL Server 2025 .
July 2025	Mirrored Azure Databricks	Mirrored Azure Databricks catalogs to Fabric are now generally available. A mirrored Unity Catalog in Fabric enables customer to read data managed by Unity Catalog from Fabric workloads. Storage accounts behind a firewall are also generally available. For more information, see Mirroring Azure Databricks Unity Catalog to Microsoft OneLake in Fabric (Generally Available) .
June 2025	Secure Data Streaming with Managed Private Endpoints in Fabric Eventstream GA	By creating a Fabric Managed Private Endpoint in Fabric Eventstream (now generally available), you can now securely connect Eventstream to your Azure services, such as Azure Event Hubs or IoT Hub, within a private network or behind a firewall. For more information, see Secure Data Streaming with Managed Private Endpoints in Fabric Eventstream (preview) .
June 2025	Notebook version history GA	Fabric notebook version history provides robust built-in version control capabilities, including automatic and manual checkpoints, tracked changes, version comparisons, and previous version restore. For more information, see Notebook version history .
June 2025	T-SQL notebooks GA	The T-SQL notebook feature is now generally available . You can use T-SQL notebooks to write and run T-SQL code, manage complex queries, and write better markdown

Month	Feature	Learn more
		documentation. The new monitoring experience includes a new Recent run panel and a dedicated T-SQL panel to list the query history. To learn more, see T-SQL support in Microsoft Fabric notebooks .
June 2025	Azure database for PostgreSQL connector 2.0	The Azure database for PostgreSQL connector version 2.0 is now generally available. This new version is enhanced to support TLS 1.3, the upsert table action, as well as the script activity in data pipeline.
June 2025	Incremental Copy GA, Lakehouse Upserts, and New Connectors	Incremental copy is now generally available, you can now choose to merge data directly into more destination stores, and more connectors with Copy job are now available. For more information, see Simplifying Data Ingestion with Copy job .
June 2025	Capacity pools	Capacity administrators can now create custom pools based on their workload requirements, providing granular control over compute resources. Custom pools for Data Engineering and Data Science can be set as Spark Pool options within Workspace Spark Settings and environment items.
June 2025	Boost performance effortlessly with Automated Table Statistics in Fabric Spark	Automated Table Statistics are now generally available, automatically optimizing query performance by maintaining up-to-date statistics in Fabric Spark. For more information, see Configure and manage Automated Table Statistics in Fabric Spark .

For older general availability (GA) announcements, review the [Microsoft Fabric What's New archive](#).

Community

This section summarizes new Microsoft Fabric community opportunities for prospective and current influencers and MVPs.

- Sign up for the Fabric Community Newsletter: visit [Fabric Community News](#) and select **Subscribe** from the **Options** menu.
- Join a local [Fabric User Group](#) or [join a local event](#).
- Vote for your favorite new product feature ideas at [Microsoft Fabric Ideas](#).
- To learn about the Microsoft MVP Award and to find MVPs, see [mvp.microsoft.com](#).
- Are you a student? Learn more about the [Microsoft Learn Student Ambassadors program](#).
- Visit the [Microsoft Fabric Career Hub](#) for everything you need on your certification journey, including a 50% discount on exams.

- Watch and subscribe to [Microsoft Fabric videos on YouTube](#).
- Ask and answer questions in the [Microsoft Fabric community](#).
- Join the [Microsoft Fabric user panel](#) to share real-world experiences and feedback with the Fabric and Power BI product teams through surveys and 1:1 meetings.
- Spread your Fabric knowledge, insights, and best practices with others. To learn more, see the [Super User Program](#).

[+] [Expand table](#)

Month	Feature	Learn more
September 2025	50% discount on exams DP-600, DP-700, DP-900, and PL-300	To celebrate FabCon Vienna, we are offering the entire Fabric community a 50% discount on exams DP-600, DP-700, DP-900, and PL-300.
September 2025	Hack the Future of Data with Microsoft Fabric	Join the global movement to innovate with AI and Microsoft Fabric , kicking off September 15, 2025, at the Microsoft Fabric Community Conference in Vienna, and running virtually through November 3, 2025. Win up to \$10,000 in prizes and get featured by Microsoft blogs and social media!
August 2025	Fabric Influencers Spotlight August 2025	The August 2025 Fabric Influencers Spotlight highlights and amplifies blog posts, videos, presentations, and other content related to Microsoft Fabric from members of Microsoft MVPs & Fabric Super Users from the Fabric community.
July 2025	Fabric Influencers Spotlight July 2025	Read about Microsoft MVPs & Fabric Super Users doing amazing work on all aspects of Microsoft Fabric.
July 2025	Power BI Turns 10	On July 24th, the Fabric Community gathered to celebrate Power BI's 10th birthday. If you missed it, there's still time to join in on the fun. Watch the Guy in a Cube birthday party , view the #PBI10 Dataviz Contest Winners , and request a 50% voucher for Fabric and Power BI certification exams until August 31, 2025.
June 2025	Chart your course as a Microsoft Fabric Data Engineer with curated skilling and certifications	Fabric Data Engineers design and manage advanced data solutions, ensuring that businesses can use their data effectively. Learn more about becoming a Fabric Data Engineer , and Elevate your Microsoft Fabric data engineering skills: Prepare for DP-700 Exam .

For older updates, review the [Microsoft Fabric What's New archive](#).

Power BI

Important

If you're accessing Power BI on a web browser version older than Chrome 94, Microsoft Edge 94, Safari 16.4, Firefox 93, or equivalent, you need upgrade your web browser to a newer version by August 31, 2024. Using an outdated browser version after this date can prevent you from accessing features in Power BI.

Updates to Power BI Desktop and the Power BI service are summarized at [What's new in Power BI?](#)

Microsoft Fabric platform features

News and feature announcements about the Microsoft Fabric platform experience.

 Expand table

Month	Feature	Learn more
September 2025	Fabric VS Code extension (Generally Available)	The Microsoft Fabric for VS Code extension is now generally available and packed with features for programmatic management, git integration, multi-workspace support, and Fabric SQL database integration. For more information, see Microsoft Fabric extension for VS Code (Generally Available) .
September 2025	Fabric CLI is now Open Source	Fabric CLI provides developers with a fast, scriptable, and intuitive way to navigate and operate Microsoft Fabric. Now open source for the community, this isn't just about sharing code — it's about unlocking the innovation of our developer community. To get started, see the Fabric CLI repo .
September 2025	Fabric MCP (Preview)	Fabric MCP is a developer-focused Model Context Protocol server that enables AI-assisted code generation and item authoring in Microsoft Fabric. Designed for agent-powered development and automation, it integrates with tools like VS Code and GitHub Codespaces as part of the Microsoft MCP initiative — and is fully open and extensible.
September 2025	Fabric Extensibility Toolkit (Preview)	The Extensibility Toolkit builds on the foundation of the Workload Development Kit while introducing several key improvements and new capabilities. We have also created a new Fabric Community Repository . This repository contains a wide variety of item types built with the Extensibility toolkit you can add to your tenant. For more information, see Introducing the Microsoft Fabric Extensibility Toolkit .

Month	Feature	Learn more
September 2025	Workspace-level workload assignment (Preview)	Workspace admins can now add additional workloads directly to their workspaces ↗ , eliminating the need for tenant or capacity-level setup. In the Workloads Hub ↗ , admins can add workloads directly to a workspace .
September 2025	Govern tab (Generally Available)	The Governance experience ↗ within the OneLake catalog allows you to secure your data estate within Fabric. To get started, see Govern your Fabric data .
September 2025	Purview Data Loss Protection and Prevention policies (Generally Available)	DLP policies for Fabric and Power BI are generally available. For more information, see Microsoft Purview Protection Policies for Fabric ↗ and Protection policies .
August 2025	Meet Your Healthcare Regulation and Compliance Requirements with Purview Data Loss Prevention (DLP) Policies	Purview DLP policies for Fabric ↗ help healthcare organizations protect PHI and meet regulatory requirements through automated sensitive data discovery, real-time policy tips, and audit trails. For more information, see Get started with Data loss prevention policies for Fabric and Power BI .
August 2025	Item History in Fabric Capacity Metrics App (Preview)	The Item History page in the Fabric Capacity Metrics App (Preview) ↗ provides a 30-day view of compute capacity consumption with interactive visuals and slicers for workspace and item-level analysis. For more information, see Understand the metrics app item history page (preview) .
August 2025	Fabric workspace-level Private Link (Preview)	Fabric workspace-level Private Link (Preview) ↗ enables fine-grained network isolation by securing individual Fabric workspaces with private endpoints. For more information, see Private link for Fabric workspaces (preview) .
August 2025	Customer-managed keys for Fabric workspaces (Preview)	Customer-managed keys (CMK) for Microsoft Fabric workspaces are now available in preview in all public regions ↗ , enabling customers to meet compliance requirements and protect data with their own keys. For more information, see Customer-managed keys for Fabric workspaces .
August 2025	Support for Transport Layer Security (TLS) 1.1 and earlier versions has ended	We have officially ended the support for TLS 1.1 and earlier versions on the Fabric platform. On July 31, 2025, all outbound connections from Fabric to customer data sources must use TLS 1.2 or later versions ↗ .
July 2025	Autoscale Billing for Spark in Microsoft Fabric	Autoscale Billing for Apache Spark in Microsoft Fabric ↗ is now generally available. Autoscale is a serverless billing model designed to offer greater flexibility, transparency, and cost efficiency for running Spark workloads at scale. For more information, see Autoscale Billing for Spark in Microsoft Fabric

Month	Feature	Learn more
		and Understand the metrics app Autoscale compute for Spark page .
July 2025	Build workloads with Language Choice and Simplicity	Language Choice in the Workload Development Kit (WDK) ↗ allows developers to build workloads using Python, Java, Node.js, or Go. For more information, see Back-end set up for Workload Development Kit .
July 2025	Terraform Provider for Microsoft Fabric tutorial	This four-part blog series helps you Get started with the Terraform Provider for Microsoft Fabric ↗, including practical guidance for automating Microsoft Fabric administration using the Fabric CLI and Terraform Provider.
July 2025	Default Semantic Models retirement	Starting September 5, 2025, Power BI <i>default</i> semantic models are no longer created automatically when a warehouse, lakehouse, or mirrored item is created. If your item doesn't have a semantic model already, you can create a Power BI semantic model . Existing default semantic models will be converted to regular semantic models. For more information, see Sunsetting Default Semantic Models ↗.
July 2025	Workspace access limits	Workspace access limits are rolling out in August 2025 ↗. Each Fabric and Power BI workspace will be limited to a maximum of 1,000 users or groups in workspace roles (Admin, Member, Contributor, Viewer).
July 2025	Fabric workspace identity: Removing default Contributor access for workspace identity	Starting on July 27, 2025, new and existing workspace identities no longer have Contributor access ↗ by default, enhancing security and access control in Fabric workspaces. For more information, see Workspace identity in Microsoft Fabric .
June 2025	Best Practices for Success with Purview Data Loss Prevention (DLP) Policies	Learn more about proven best practices to maximize your security, compliance, and productivity with Purview Data Loss Prevention (DLP) policies ↗.
June 2025	New features for Microsoft Fabric Extension in VS Code	Now in the Fabric extension for VS Code , you can create items and switch tenants to manage your workspaces and items. For more information, see Announcing new features for Microsoft Fabric Extension in VS Code ↗.
June 2025	Surge Protection for Background Operation	Surge Protection for background operations is now generally available (GA). Using surge protection, capacity admins can limit overuse by background operations in their capacities ↗.
June 2025	New item creation experience in Fabric	The enhanced item creation experience in Fabric is all about consistency, efficiency, and control. Now, no matter what type of item you're adding, the process feels familiar and smooth

Month	Feature	Learn more
		every time. For more information, see Introducing new item creation experience in Fabric .

For older updates, review the [Microsoft Fabric What's New archive](#).

Continuous Integration/Continuous Delivery (CI/CD) in Microsoft Fabric

This section includes guidance and documentation updates on development process, tools, source control, and versioning in the Microsoft Fabric workspace.

[] [Expand table](#)

Month	Feature	Learn more
September 2025	Variable library (Generally Available)	The Variable library allows users to define and manage variables at the workspace level, so they could soon be used across various workspace items, such as pipelines, notebooks, Shortcut for lakehouse, and more. You can also Use variable libraries in CI/CD for Dataflow Gen 2 and Copy Job .
August 2025	Multiple Scheduler and CI/CD Support	Multiple Scheduler support in Fabric allows users to configure up to 20 schedulers per item, each with its own schedule, and adds CI/CD support for managing scheduler deployments at scale. For more information, see Choose the best Fabric CI/CD workflow option for you .

For older updates, review the [Microsoft Fabric What's New archive](#).

Microsoft Copilot in Microsoft Fabric

With Copilot and other generative AI features in preview, Microsoft Fabric brings a new way to transform and analyze data, generate insights, and create visualizations and reports. For more information, see [Overview of Copilot in Fabric](#).

[] [Expand table](#)

Month	Feature	Learn more
July 2025	Fabric Data Agents + Microsoft Copilot Studio (Preview)	The preview of the integration between Fabric data agents and Microsoft Copilot Studio is now available. Watch a demo from Build 2025 about Creating Data Agents in Fabric for Multi-Agent AI

Month	Feature	Learn more
		Solutions . For more information, see multi-agent orchestration in Microsoft Copilot Studio .
June 2025	Notebook Copilot inline code completion (preview)	Now in preview, Copilot Inline Code Completion (Preview) is an AI feature that assists data scientists and engineers in writing Python code more quickly and easily. For more information, see Notebook Copilot code completion (Preview) .

For older updates, review the [Microsoft Fabric What's New archive](#).

Data Factory in Microsoft Fabric

This section summarizes recent new features and capabilities of [Data Factory in Microsoft Fabric](#). Follow issues and feedback through the [Data Factory Community Forum](#).

[] [Expand table](#)

Month	Feature	Learn more
September 2025	Dataflow Gen2 parameterization (Generally Available)	Parameterized Dataflow Gen2 using public parameters mode is now a generally available feature, and includes new parameters info from recent runs, improved error messaging, and expanded data type support. To get started, Use public parameters in Dataflow Gen2 .
September 2025	Incremental refresh destinations in Dataflow Gen2 (Generally Available)	Incremental refresh support for Lakehouse tables in Dataflow Gen2 is now generally available.
September 2025	New generally available Dataflow Gen2 data destinations	Review Dataflow Gen2 data destinations and managed settings for data destinations now generally available, including SharePoint and Fabric Lakehouse Tables.
September 2025	Copilot in Dataflow Gen2 (Generally Available)	Copilot can now help you interpret Mashup (Power Query M) code in natural language. For more information, see Copilot explainer skill in Dataflow Gen2 . Copilot can also use natural language to create custom columns .
September 2025	Invoke remote pipeline (Generally Available)	You can now use the Invoke Pipeline activity to call pipelines from Azure Data Factory or Synapse Analytics pipelines . This feature allows you to utilize your existing ADF or Synapse pipelines inside of a Fabric pipeline by calling it inline through this new Invoke Pipeline activity.

Month	Feature	Learn more
September 2025	Variable library integration with DataFlow Gen2, Copy job, and pipelines	The Variable library can now be used in Dataflow Gen2 (preview) , Copy job (Preview), pipelines, and more. For more information, see Use variable libraries in pipelines or Use Fabric variable libraries in Dataflow Gen 2 (preview) CI/CD .
September 2025	Virtual Network Data Gateway supports Fabric pipeline and Copy job (Generally Available)	You can now use Pipeline and Copy job with the Virtual Network (VNET) Data Gateway . For more information, see What is a virtual network data gateway?
September 2025	Data replication from Lakehouse with Delta Change Feed (preview)	The Fabric Lakehouse Table connector provides changed data from a Fabric Lakehouse via Delta Change Data Feed (CDF), to supported destinations. For more information, see Data Replication from Fabric Lakehouse with Delta Change Data Feed (Preview) .
September 2025	Evaluate pipeline expressions	The Evaluate Expression feature allows you to test and debug your pipeline expressions. Check expression outputs, review individual components, and validate your logic without running the entire pipeline. For more information, see evaluate pipeline expressions .
September 2025	Fabric variable libraries in Dataflow Gen2 with CI/CD (preview)	Fabric variable libraries offer a centralized way to manage configuration values across Microsoft Fabric workloads. With the new integration in Dataflow Gen2, you can reference these variables directly in your dataflow, enabling dynamic behavior across environments and simplifying CI/CD workflows. For more information, see variable libraries in Dataflow Gen2 .
September 2025	New connectors available in Data Factory	New connectors are now generally available , including Amazon RDS for Oracle, Cassandra, Greenplum, HDFS, Informix, Microsoft Access database, and Presto.
September 2025	Upsert to delta table with Lakehouse connector (Preview)	We've added upsert support to the Lakehouse connector, allowing direct writes to Delta tables, in both Copy job and Copy activity within Pipeline. For more information, see Configure Lakehouse in a copy activity .
September 2025	Preview-only steps for Dataflow Gen2 (preview)	Preview only steps are transformation steps in Dataflow Gen2 that are executed only during the authoring phase for the data preview. They're excluded from run operations, ensuring they don't affect runtime behavior or production logic. For more information, see preview-only step in Dataflow Gen2 .
September 2025	Partitioned compute for Dataflow Gen2 (preview)	Partitioned compute is a capability of the Dataflow Gen2 engine that allows parts of your dataflow logic to run in parallel, reducing the time to complete its evaluations. For

Month	Feature	Learn more
		more information, see partitioned compute in Dataflow Gen2 .
September 2025	Modern evaluator for Dataflow Gen2 (preview)	The Modern Query Evaluation Engine (also known as the "Modern Evaluator") provides a new query execution engine running on .NET core version 8, which can significantly improve the performance of dataflow runs in some scenarios. For more information, see the Modern evaluator for Dataflow Gen2 .
September 2025	REST API for Apache Airflow Jobs	Fabric Data Factory offers a powerful set of APIs that make it easy to automate and manage your Apache Airflow Jobs. You can connect to different data sources and services, and build, update, or monitor your workflows with just a few lines of code. For more information, see API capabilities for Fabric Data Factory's Apache Airflow Job .
August 2025	Copy job Activity in pipelines (Preview)	A Copy job Activity in pipelines (Preview) lets you orchestrate an existing or new Copy job directly inside a Data Factory pipeline, combining data movement with other activities and integrated monitoring. For more information, see Copy job activity in Data Factory pipelines .
August 2025	On-premises data gateway August 2025 release	The on-premises data gateway now supports Microsoft Entra ID authentication for PostgreSQL and Lakehouse connector enhancements (delta column mapping, deletion vectors, change data feed) plus stability fixes.
August 2025	Copy job support for Multiple Scheduler (preview)	Copy job Multiple Scheduler support allows a single Copy job to be triggered at different intervals. In the past, this required creating multiple Copy jobs for each schedule. For more information, see Job scheduler in Microsoft Fabric .
August 2025	New Copy job features: Reset Incremental Copy, Auto Table Creation, and JSON Support	Copy Job in Microsoft Fabric Data Factory now supports resetting incremental copy, automatic table creation on destination, and JSON file format , making data movement more flexible and efficient. For more information, see Copy job in Data Factory .
August 2025	Support for workspace identity authentication in new Fabric connectors and Dataflow Gen2	Workspace identity authentication is now available in new Fabric connectors and Dataflow Gen2 , enabling secure, credential-free access to data sources using managed identities. For more information, see Authenticate with workspace identity .
July 2025	Copy Data from Database View, Sample dataset and New Connectors	Recent improvements are Simplifying Data Ingestion with Copy job , including enhancements to Copy job in Data Factory , support for copying data from database views, sample datasets, and new connectors.

Month	Feature	Learn more
July 2025	New SAP connectivity features	New SAP connectivity features ↗ include new built-in SAP connectors for SAP Table and SAP BW OpenHub via an on-premises data gateway.
June 2025	On-premises data gateway June 2025 release	New features of on-premises data gateway (version 3000.274) ↗ include the Azure database for PostgreSQL connector version 2.0, enhanced data type support in the Fabric Data Warehouse connector, and a new Upsert table action in the Lakehouse Connector (preview).
June 2025	Incremental Copy GA, Lakehouse Upserts, and New Connectors	Incremental copy is now generally available, you can now choose to merge data directly into more destination stores, and more connectors with Copy job are now available. For more information, see Simplifying Data Ingestion with Copy job ↗ .

For older updates, review the [Microsoft Fabric What's New archive](#).

Data Factory in Microsoft Fabric samples and guidance

[\[+\] Expand table](#)

Month	Feature	Learn more
July 2025	Boost Performance with Fast Copy in Dataflow Gen2 dataflows for Snowflake	Fast Copy in Dataflow Gen2 dataflows ↗ provide faster and more cost-efficient data loading from Snowflake into Microsoft Fabric. For more information, see Fast copy in Dataflow Gen2 .
June 2025	Privacy by Design: PII Detection and Anonymization with PySpark	This blog explores how to build scalable, secure, and compliant data workflows using PySpark, Microsoft Presidio, and Faker ↗ .

Fabric Data Engineering

This section summarizes recent new features and capabilities of the [Data Engineering workload in Microsoft Fabric](#).

[\[+\] Expand table](#)

Month	Feature	Learn more
September 2025	Fabric User Data Functions (Generally Available)	Fabric user data functions ↗ are now generally available. You can create functions that contain business logic and connect to Fabric

Month	Feature	Learn more
	Available)	data sources, and/or invoke them from other Fabric items such as Data pipelines, Notebooks and Power BI reports. For more information, see Fabric user data functions .
September 2025	Python Notebooks (Generally Available)	Python notebooks are now generally available , multiple kernel support, new APIs, Pylance, and more. To get started, see Use Python experience on Notebook . For more information on Pylance, see Enhance Python development with Pylance .
September 2025	Environment Public APIs (Generally Available)	Environment APIs allow admins to create, get, or update environments, import, export or remove external libraries, and upload or delete custom libraries. Some existing APIs have newly updated response contracts. For a full list of impacted APIs and migration guidance, see Manage the environment through public APIs .
September 2025	Fabric Spark Monitoring APIs (Generally Available)	Fabric Spark Monitoring APIs are a robust set of tools designed to enhance observability and streamline the monitoring and management of Spark applications within Microsoft Fabric. For more information, see Fabric Spark Monitoring APIs (Generally Available) .
September 2025	Spark Run Series Analysis (Generally Available)	The Spark Monitoring Run Series Analysis features allow you to analyze the run duration trend and performance comparison for Pipeline Spark activity recurring run instances and repetitive Spark run activities, from the same Notebook or Spark Job Definition. For more information, see Monitor Apache Spark run series .
September 2025	Fabric Spark Applications Comparison (Preview)	The Spark Applications Comparison feature lets users select and compare up to four Spark application runs side by side. For more information, see Blog: Fabric Spark Applications Comparison .
September 2025	OneLake file explorer updates	The latest improvements to OneLake file explorer provide smarter sync, stability improvements, and .NET 8 codebase. For more information, see OneLake file explorer .
September 2025	Workspace Outbound Access Protection for Spark (Preview)	Workspace Outbound Access Protection for Spark lets workspace admins restrict Spark outbound connections to only approved destinations via managed private endpoints to reduce data exfiltration risk. For more information, see Workspace outbound access protection (preview) .
August 2025	JobInsight Diagnostics Library (Preview)	JobInsight is a diagnostics library to analyze completed Spark applications via APIs for queries, jobs, stages, tasks, executors, and event logs. For more information, see JobInsight diagnostics library (preview) .

Month	Feature	Learn more
August 2025	Enhanced Monitoring for Spark High Concurrency Workloads in Microsoft Fabric	Enhanced Monitoring for Spark High Concurrency Workloads in Microsoft Fabric ↗ adds Notebook-aware job, log, and snapshot views for high-concurrency Spark sessions to improve debugging and performance tuning. For more information, see Apache Spark application detail monitoring .
August 2025	Develop mode for Fabric User Data Functions (Preview)	Develop mode for Fabric User Data Functions ↗ is a dedicated environment to test, edit, and validate functions before publishing, with immediate outputs and logs. For more information, see Test your User Data Functions in the Fabric portal (preview) .
August 2025	OpenAPI specification code generation for Fabric User Data Functions	The Open API specification, formerly Swagger Specification, now provides code generation ↗ for Fabric User Data Functions enables automatic generation of OpenAPI specifications (formerly Swagger specification) for your functions, supporting client code generation, API management, and AI agent integration. For more information, use the latest version of the <code>fabric-user-data-functions</code> library, and see Configure a tool for OpenAPI spec samples in Azure AI Foundry .
August 2025	Load data from network-protected Azure Storage accounts to Microsoft OneLake with AzCopy	AzCopy now supports copying data from firewall-enabled Azure Storage accounts into OneLake using trusted workspace access ↗ , enabling secure and efficient large-scale data movement. For more information, see Copy data with OneLake and AzCopy and Use trusted workspace access .
July 2025	Autoscale Billing for Spark in Microsoft Fabric	Autoscale Billing for Apache Spark in Microsoft Fabric ↗ is now generally available. Autoscale is a serverless billing model designed to offer greater flexibility, transparency, and cost efficiency for running Spark workloads at scale. For more information, see Autoscale Billing for Spark in Microsoft Fabric and Understand the metrics app Autoscale compute for Spark page .
July 2025	Microsoft Entra service principal support for Amazon S3 Shortcuts (preview)	You can now use Microsoft Entra service principals to access Amazon S3 via OneLake Shortcuts ↗ , eliminating the need for long-term AWS access keys. This integration uses OpenID Connect (OIDC) for short-lived, standards-based tokens, simplifies cross-cloud identity management, and enables full auditability via AWS CloudTrail. To get started, see AWS S3 shortcuts using service principal authentication .
July 2025	Access your Delta Lake tables as Apache Iceberg in OneLake (preview)	OneLake now lets you access your Delta Lake tables using Apache Iceberg compatible readers ↗ , automatically, without data movement or duplication. To get started, see Use Apache Iceberg tables with OneLake .

Month	Feature	Learn more
July 2025	Python Notebook supports tsql magic commands (preview)	Python Notebooks now support the <code>tsql</code> magic command ↗ to query Fabric Data Warehouse. To see the full syntax, you can use the <code>%%tsql -?</code> command. For more information, see Run T-SQL code in Fabric Python notebooks .
June 2025	Notebook Copilot inline code completion (preview)	Now in preview, Copilot Inline Code Completion (Preview) is an AI feature that assists data scientists and engineers in writing Python code more quickly and easily. For more information, see Notebook Copilot code completion (Preview) ↗ .
June 2025	Notebook version history GA	Fabric notebook version history ↗ provides robust built-in version control capabilities, including automatic and manual checkpoints, tracked changes, version comparisons, and previous version restore. For more information, see Notebook version history .
June 2025	T-SQL notebooks GA	The T-SQL notebook feature is now generally available ↗ . You can use T-SQL notebooks to write and run T-SQL code, manage complex queries, and write better markdown documentation. The new monitoring experience includes a new Recent run panel and a dedicated T-SQL panel to list the query history. To learn more, see T-SQL support in Microsoft Fabric notebooks .
June 2025	AI functions improvements (preview)	AI functions for data engineering ↗ are now in preview. Learn more about recent improvements to AI functions during the current preview ↗ .
June 2025	New features for Microsoft Fabric Extension in VS Code	Now in the Fabric extension for VS Code , you can create items and switch tenants to manage your workspaces and items. For more information, see Announcing new features for Microsoft Fabric Extension in VS Code ↗ .
June 2025	Customer-managed keys for Fabric workspaces (preview)	Workspace customer-managed keys allow you to encrypt data in OneLake using your own keys. For more information, see Customer Managed Keys in OneLake: Strengthening Data Protection and Control ↗ .
June 2025	Aggregations in Fabric API for GraphQL	Aggregations in Fabric API for GraphQL ↗ enable more efficient and powerful data queries using GraphQL in Fabric. For more information, see Aggregations in API for GraphQL .

For older updates, review the [Microsoft Fabric What's New archive](#).

Fabric Data Engineering samples and guidance

Expand table

Month	Feature	Learn more
August 2025	Declarative Data Transformations with Materialized Lake Views	Learn how to use Declarative Data Transformations with Materialized Lake Views to enable declarative, incremental transformations across Bronze, Silver, and Gold layers for curated analytics. For more information, see Materialized Lake Views and Create a materialized lake view .
August 2025	How to access your Microsoft Fabric tables in Apache Iceberg format	See an example of how Microsoft OneLake now enables Delta Lake tables in Fabric to be accessed as Apache Iceberg tables , allowing seamless interoperability with Iceberg-compatible engines and tools. For more information, see Virtualize Delta Lake tables as Iceberg .
July 2025	Using Microsoft Fabric Git integration for User Data Functions	Microsoft Fabric provides built-in Git integration and deployment pipelines for user data functions , streamlining version control, collaboration, and release management for workspace items. For more information, see Introduction to Git integration in Fabric .
July 2025	Shortcut-based AI Powered OneLake Shortcut Transformations for unstructured text	Shortcut-based AI transformations convert raw text files into governed Delta Lake tables in minutes, enabling faster insights, automated compliance, and consistent data quality. For more information, see AI transformations for OneLake shortcuts .
July 2025	User Data Functions now support async functions and pandas DataFrame, Series types	Learn how to use async functions , pandas DataFrame , and Series types in Fabric user data functions.
July 2025	Connecting AI agents to Microsoft Fabric with GraphQL and the Model Context Protocol (MCP)	Learn how to Connect AI agents to Microsoft Fabric with GraphQL and the Model Context Protocol (MCP) . The complete MCP server implementation is available in the Microsoft Fabric samples repository .
June 2025	How to debug user data functions locally in VS Code	Learn how to perform local debugging on user data functions with Visual Studio Code .
June 2025	Integrating Azure API Management with Fabric API for GraphQL	Learn how to configure Azure API Management (APIM) with Microsoft Fabric's API for GraphQL to significantly enhance your API's capabilities by providing robust scalability and security features such as identity management, rate limiting, and caching.
June 2025	Privacy by Design: PII Detection and Anonymization with PySpark	This blog explores how to build scalable, secure, and compliant data workflows using PySpark, Microsoft Presidio, and Faker .
June 2025	Integrate Fabric with Azure Databricks using private	Learn how to securely integrate Azure Databricks with Fabric using a virtual network gateway , enabling end to end

Month	Feature	Learn more
	network	private network connectivity.

Fabric Data Science

This section summarizes recent improvements and features for [Data Science in Microsoft Fabric](#).

 [Expand table](#)

Month	Feature	Learn more
September 2025	Data Agent from mirrored databases	You can unlock LLM-powered insights through Data Agent from your mirrored databases enables Data Agent to connect to mirrored databases in Fabric for natural language querying and analysis. For more information, see Data Agent overview and Mirroring overview .
September 2025	Data Wrangler (Generally Available)	In Data Wrangler's visual interface , you can see smart suggestions from Microsoft PROSE for operations that are relevant to your data frame. Describe your desired transformations in natural language, and Copilot will generate code and an instant preview of the results. For big data workflows, Data Wrangler can translate all your pandas operations back to PySpark .
September 2025	AI Functions in Data Wrangler (Preview)	The ability to apply AI functions directly within Data Wrangler to transform your data quickly and visually is now available as a preview feature.
August 2025	Pandas DataFrames and Series as input and output types	You can now use Fabric User Data Functions with Pandas DataFrames and Series in Notebooks to add native Pandas DataFrame and Series input/output support for User Data Functions in notebooks via Apache Arrow for faster, more efficient reuse. For more information, see NotebookUtils for Fabric .
July 2025	Expanded Data Agent support for large data sources	Fabric data agents now support large-scale data sources , including Kusto, Semantic Models, Lakehouse, and Warehouse datasets with over 1,000 tables and more than 100 columns and measures. For configuration guidance, see Data agent configuration best practices .
July 2025	ML model endpoints (Preview)	ML models in Fabric can now serve real-time predictions from secure, scalable, and easy-to-use online endpoints . In addition to batch predictions in Spark, you can use endpoints to bring ML model predictions to other Fabric solutions and custom applications. For more information, see Automated machine learning in Fabric and Model endpoints in Fabric .

Month	Feature	Learn more
June 2025	AI functions improvements (preview)	AI functions for data engineering are now in preview. Learn more about recent improvements to AI functions during the current preview .
June 2025	Data source instructions in Fabric Data Agent	Data Source Instructions in the Fabric Data Agent help you get more precise, relevant answers from your structured data. For more information, see New in Fabric Data Agent: Data source instructions for smarter, more accurate AI responses .

For older updates, review the [Microsoft Fabric What's New archive](#).

Fabric Data Science samples and guidance

[] [Expand table](#)

Month	Feature	Learn more
September 2025	Fabric Data Agent in external applications with Python client SDK (Preview)	Learn how to use the Python client SDK to add a Fabric data agent to web apps and other clients by using interactive browser authentication.

Cosmos DB in Microsoft Fabric (Preview)

This section summarizes recent improvements and features for [Cosmos DB in Microsoft Fabric](#).

[] [Expand table](#)

Month	Feature	Learn more
July 2025	Cosmos DB in Microsoft Fabric (preview)	The preview of Cosmos DB in Microsoft Fabric is now available to all users. Since its announcement at Microsoft Build 2025, several new capabilities have been added, including vector indexing and search . For more information, see Announcing Cosmos DB in Microsoft Fabric . To get started, see Quickstart: Create a Cosmos DB database in Microsoft Fabric (preview) .

SQL database in Microsoft Fabric (Preview)

This section summarizes recent improvements and features for [SQL databases in Microsoft Fabric](#).

[] [Expand table](#)

Month	Feature	Learn more
October 2025	Configure backup retention (Preview)	The ability to change the retention period of backups on a SQL database from the default of 7 days is currently a preview feature. For more information, see Automatic backups in SQL database in Microsoft Fabric .
September 2025	Auditing, backup, Copilot, and more	Read about new SQL database in Fabric features including auditing, backup, Copilot, and more .
September 2025	MSSQL extension for VS Code Fabric integration (Preview)	MSSQL extension for VS Code Fabric integration (Preview) adds support for connecting, running queries, and managing objects in SQL databases in Fabric directly from Visual Studio Code. Download the extension at mssql extension at marketplace.visualstudio.com .
September 2025	Performance Dashboard enhancements	The Performance dashboard now includes memory consumption metrics in the performance monitoring capability, among other enhancements. To access, select Performance summary on your SQL database. For more information on the new features, see Memory consumption metrics: Now available for Fabric SQL Database .
July 2025	DOP Feedback generally available	Degrees of Parallelism (DOP) feedback is now generally available in SQL database in Fabric. For more information, see Smarter Parallelism: Degree of parallelism feedback in SQL Server 2025 .
July 2025	Deploy SQL database with Fabric CLI	You can now create a SQL database with the Fabric CLI .
June 2025	Updates to Database Development Tools for SQL database in Fabric	Updates to Database Development Tools for SQL database in Fabric introduce new capabilities for developing, deploying, and managing SQL databases in Fabric .

For older updates, review the [Microsoft Fabric What's New archive](#).

SQL database in Microsoft Fabric samples and guidance

[Expand table](#)

Month	Feature	Learn more
September 2025	Fast Copy to SQL database in Fabric	Fast Copy for SQL database ingestion reduces latency for large SQL source loads in Dataflow Gen2 by using parallel bulk operations.

Month	Feature	Learn more
July 2025	AI Ready Apps: Interacting with SQL Database in Fabric using GraphQL and MCP	Learn how Contoso Recruiting Agency uses Microsoft Fabric API for GraphQL and the Model Context Protocol (MCP) server ↗ to enable real-time, intelligent interactions with SQL database in Fabric.
July 2025	Connect to your SQL database in Fabric using Python Notebook	You can now use a python notebook to connect to your SQL database in Fabric with the help of the T-SQL Magic command <code>%%tsql</code> . For more information, see Run T-SQL code in Fabric Python notebooks .

Fabric Data Warehouse

This section summarizes recent improvements and features for Fabric Data Warehouse.

[\[+\] Expand table](#)

Month	Feature	Learn more
September 2025	JSON Lines support in OPENROWSET	JSON Lines (JSONL) support in the OPENROWSET(BULK) function for Fabric Data Warehouse and SQL analytics endpoints is now generally available, allowing you to query external data in JSONL format. For more information, see Browse file content using OPENROWSET function .
September 2025	Migration Assistant for Fabric Data Warehouse	The Migration Assistant , now generally available, simplifies the process of migrating from Azure Synapse Analytics to Fabric Data Warehouse. To get started, see Migrate with the Fabric Migration Assistant for Data Warehouse .
September 2025	MERGE support (Preview)	The MERGE T-SQL syntax is now in preview for Fabric Data Warehouse. This DML statement provides a sleek and uniform approach for executing transformations based on conditions between a Source and Target table. Perform INSERTs, UPDATEs, and DELETEs all in a single command with MERGE.
August 2025	SET SHOWPLAN_XML support	The SET SHOWPLAN_XML T-SQL syntax is now generally available for Fabric Data Warehouse and SQL analytics endpoint. Use this session-level statement and its visualizer counterpart in SQL Server Management Studio to get insight into query plan information.
July 2025	OneLake as a Source for COPY INTO and OPENROWSET (Preview)	COPY INTO and OPENROWSET now support reading directly from OneLake paths in Fabric Data Warehouse (preview) ↗ , enabling SQL-based data ingestion and ad hoc querying from Lakehouse folders without external storage or complex setup. For more information, see Ingest data into the Warehouse .

Month	Feature	Learn more
July 2025	Visual SQL Audit Logs configuration (Preview)	A new visual experience for configuring, enabling, and managing SQL Audit Logs in Fabric Warehouse is now available as a preview feature ↗ , allowing you to set up and customize auditing directly from the Fabric portal. For more information, see SQL audit logs in Fabric Data Warehouse (Preview) . To get started, see Configure SQL audit logs in Fabric Data Warehouse .
July 2025	JSON Lines support in OPENROWSET (Preview)	JSON Lines (JSONL) support in the OPENROWSET(BULK) function ↗ for Fabric Data Warehouse and SQL analytics endpoints is now in preview, allowing you to query external data in JSONL format. For more information, see OPENROWSET (BULK) (Transact-SQL) .
July 2025	Standardized audit operations	Audit operations are now consolidated under standardized operation names ↗ . For more information, see Operation list for audit logs and SQL audit logs in Fabric Data Warehouse (Preview) .
July 2025	Fabric Data Warehouse Migration Assistant: Better, Faster, More Reliable	Recent improvements to the Fabric Data Warehouse Migration Assistant ↗ add autofixes for the SQL surface area, removing some unsupported elements. For more information, see Migrate with Migration Assistant .
July 2025	SQL analytics endpoint metadata sync with REST API	The ability to refresh SQL endpoint metadata via REST API is now generally available. For more information, see Refresh SQL analytics endpoint Metadata REST API GA ↗ .
July 2025	Default Semantic Models retirement	Starting September 5, 2025, Power BI <i>default</i> semantic models are no longer created automatically when a warehouse, lakehouse, or mirrored item is created. If your item doesn't have a semantic model already, you can create a Power BI semantic model . Existing default semantic models will be converted to regular semantic models. For more information, see Sunsetting Default Semantic Models ↗ .
June 2025	Python Notebook supports tsql magic commands (preview)	Python Notebooks now support the <code>tsql</code> magic command ↗ to query Fabric Data Warehouse. To see the full syntax, you can use the <code>%%tsql -?</code> command. For more information, see Run T-SQL code in Fabric Python notebooks .
June 2025	T-SQL notebooks GA	The T-SQL notebook feature is now generally available ↗ . You can use T-SQL notebooks to write and run T-SQL code, manage complex queries, and write better markdown documentation. The new monitoring experience includes a new Recent run panel and a dedicated T-SQL panel to list the query history. To learn more, see T-SQL support in Microsoft Fabric notebooks .
June 2025	Refresh SQL analytics endpoint metadata	You can now refresh SQL endpoint metadata via REST API . To learn more, see Refresh SQL analytics endpoint Metadata REST

Month	Feature	Learn more
	with REST API (preview)	API (Preview) ↗ .
June 2025	Scalar user-defined functions (UDFs)	Scalar user-defined functions (UDFs) are now supported ↗ as a preview feature. For more information, see CREATE FUNCTION for Fabric Data Warehouse .
June 2025	Result set caching (preview)	Result set caching works by persisting the final result sets for applicable <code>SELECT</code> T-SQL queries, bypassing complex compilation and data processing of the original query to return queries faster. For more information, see Result Set Caching for Microsoft Fabric Data Warehouse (preview) ↗ .

For older updates, review the [Microsoft Fabric What's New archive](#).

Fabric Data Warehouse samples and guidance

[\[+\] Expand table](#)

Month	Feature	Learn more
September 2025	A Guide: Migrating to Fabric Data Warehouse	Read for resources, tools, roadmaps, and more for migration to Fabric Data Warehouse ↗ .
June 2025	Make your scalar user-defined functions (UDFs) inlineable	Scalar user-defined functions (UDFs) are now supported ↗ and inlining is an important concept to understand. For more information, see How to make your SQL scalar user-defined function (UDF) inlineable in Microsoft Fabric Warehouse ↗ .

Fabric Mirroring

This section summarizes recent improvements and features for Mirroring in Microsoft Fabric.

[\[+\] Expand table](#)

Month	Feature	Learn more
September 2025	Data Agent from mirrored databases	You can unlock LLM-powered insights through Data Agent from your mirrored databases ↗ enables Data Agent to connect to mirrored databases in Fabric for natural language querying and analysis. For more information, see Data Agent overview and Mirroring overview .

Month	Feature	Learn more
September 2025	Mirroring for Azure SQL Managed Instance (Generally Available)	Mirroring for Azure SQL Managed Instance (now generally available) offers continuous data replication into OneLake. To get started, see Mirroring Azure SQL Managed Instance .
September 2025	Mirrored databases from Oracle (preview)	You can now mirror your Oracle databases in Microsoft Fabric . When you mirror your Oracle data , you can analyze it together with data from other sources in near real-time with minimal latency and cost. For more information, see the tutorial to set up Oracle database mirroring .
September 2025	Mirrored databases from Google Big Query (preview)	You can now mirror your Google BigQuery databases in Microsoft Fabric . Once in Fabric, you can take advantage of powerful capabilities for business intelligence, AI, data engineering, data science, and data sharing. To get started, see the tutorial to set up Google BigQuery database mirroring .
August 2025	Resource governance for mirrored SQL Server 2025 (Preview)	You can now customize and configure resource governor pools and workloads for Fabric Mirroring from databases in SQL Server 2025 (Preview). For more information, see Resource governor for SQL Server mirroring in Fabric .
August 2025	Autoreseed feature for mirrored SQL Server 2025 (Preview)	You can now enable and manage the autoreseed feature for Fabric Mirroring from databases in SQL Server 2025 (Preview). For more information, see Optimize performance for SQL Server mirroring in Fabric .
August 2025	Maximum transactions limit for mirrored SQL Server 2025 (Preview)	You can now enable and manage a maximum and lower bound of transactions to be processed by Fabric Mirroring on SQL Server 2025 (Preview). For more information, see Maximum transactions for SQL Server mirroring in Fabric .
July 2025	Mirroring for Azure SQL Database with Data Gateway GA	Mirroring for Azure SQL Database with Virtual Network Data Gateway and On-Premises Data Gateway (OPDG) is now generally available.
August 2025	Decoupling semantic models for Mirroring customers	Semantic models are now decoupled from Mirrored artifacts in Microsoft Fabric , allowing you to define, version, and manage semantic models independently from mirrored data. For more information, see Sunsetting Default Semantic Models – Microsoft Fabric .
July 2025	Connect to your warehouse using Python Notebook	You can now use a python notebook to connect to your warehouse with the help of the T-SQL Magic command <code>%%tsql</code> . For more information, see Run T-SQL code in Fabric Python notebooks .
July 2025	Mirrored Azure Databricks	Mirrored Azure Databricks catalogs to Fabric are now generally available. A mirrored Unity Catalog in Fabric enables customer to read data managed by Unity Catalog from Fabric workloads.

Month	Feature	Learn more
		Storage accounts behind a firewall are also generally available. For more information, see Mirroring Azure Databricks Unity Catalog to Microsoft OneLake in Fabric (Generally Available) .
June 2025	Secure mirrored Azure Databricks data with OneLake security (preview)	You can secure mirrored Azure Databricks data in Fabric using OneLake security , now a feature in preview. You can now map Unity Catalog (UC) policies to Microsoft OneLake security. For more information, see Automatic identity managed in Azure Databricks .

For older updates, review the [Microsoft Fabric What's New archive](#).

Real-Time Intelligence in Microsoft Fabric

This section summarizes recent improvements and features for [Real-Time Intelligence in Microsoft Fabric](#).

[] [Expand table](#)

Month	Feature	Learn more
September 2025	Azure Monitor Logs Integration in Fabric via Eventstream	Azure Monitor Logs integration in Fabric via Eventstream enables streaming Azure Monitor Logs into Fabric for real-time analytics and operational insights. For more information, see Stream Azure diagnostic logs and metrics data into Microsoft Fabric .
September 2025	Azure Diagnostics source in Real-Time hub	Using Fabric Real-Time hub, you can stream diagnostic logs and metrics from Azure resources into Microsoft Fabric for real-time data processing and analysis.
September 2025	Eventhouse endpoint for a Lakehouse	Use the Eventhouse endpoint for a Lakehouse to query lakehouse data, discover real-time insights across your data estate, and streamline analysis of structured, semi-structured, and unstructured data.
September 2025	Maps in Fabric	You can now easily Create a map to bring geospatial insights. Users can ingest location data from a Lakehouse or Eventhouse, visualize it instantly, and build map-centric applications without specialized knowledge or writing code.
September 2025	Anomaly detection (Preview)	With a no-code interface, automatic model selection, and flexible alerts, tracking changes and unexpected events is easy with Anomaly detection in Real-Time Intelligence (Preview) .
September 2025	Schema Registry (Preview)	Event Schema Registry (preview) provides a contract-based way to define and validate event schemas in Fabric Eventstreams for

Month	Feature	Learn more
		type-safe, reliable real-time pipelines. For more information, see Schema Registry overview .
July 2025	Pass Parameter Values to Fabric Items (Preview)	Activator enables you to automatically activate Fabric items like pipelines and notebooks whenever certain data conditions are met. You can not only activate and execute Fabric items but also pass values to the parameters defined in your Fabric items .
July 2025	Confluent Schema Registry Support in Eventstream (Preview)	Eventstream's Confluent Cloud for Apache Kafka streaming connector now supports decoding data from topics associated with a data contract in Confluent Schema Registry , enabling seamless ingestion, preview, and routing of schema-encoded streaming data in Fabric Real-Time Intelligence. For more information, see Add Confluent Cloud for Apache Kafka source to an eventstream .
July 2025	Multiple-Schema Inferencing in Eventstream (Preview)	Multiple-schema inferencing in Eventstream lets you work with multiple data sources that emit varying schemas by inferring and managing multiple schemas simultaneously. For more information, see Enhancing Data Transformation Flexibility with Multiple-Schema Inferencing in Eventstream (Preview) .
July 2025	SQL Operator under Fabric Eventstream (Preview)	The new SQL Operator enables real-time data transformation with the flexibility and control to craft custom transformations using custom SQL syntax. To get started, see Process events using SQL code editor (preview) .
June 2025	Secure Data Streaming with Managed Private Endpoints in Fabric Eventstream GA	By creating a Fabric Managed Private Endpoint in Fabric Eventstream (now generally available), you can now securely connect Eventstream to your Azure services, such as Azure Event Hubs or IoT Hub, within a private network or behind a firewall. For more information, see Secure Data Streaming with Managed Private Endpoints in Fabric Eventstream (preview) .
June 2025	MCP Support for Real-Time Intelligence (preview)	Model Context Protocol (MCP) is now supported for Real-Time Intelligence . The open-source MCP server enables AI agents or AI applications to interact with Fabric Real-Time Intelligence by providing tools through the MCP interface, allowing for seamless data querying and analysis capabilities.
June 2025	Eventhouse no-code table creation and editing	Eventhouse no-code table creation and editing allows you to define a table's structure by specifying the columns and data types – no sample data, no complex KQL queries, and no technical expertise required. For more information, see Edit a table schema .

For older updates, review the [Microsoft Fabric What's New archive](#).

Real-Time Intelligence samples and guidance

💡 Tip

Use the [Real-Time Intelligence end-to-end sample solution](#) to automatically create a collection of sample components.

[+] [Expand table](#)

Month	Feature	Learn more
July 2025	From Signals to Insights: Building a Real-Time Streaming Data Platform with Fabric Eventstream	Learn how Contoso uses MQTT sensors, public weather feeds, and Fabric Real-Time Intelligence to monitor smart buildings .
July 2025	Ingest Logs using Logstash into Real-Time Intelligence	Logstash is an open-source data processing tool that enables the collection, transformation, and forwarding of data from a wide variety of sources. Learn how to Ingest Logs using Logstash into Real-Time Intelligence .
July 2025	ML model scoring in Fabric Eventhouse via update policy (preview)	Learn how to accomplish ML model scoring using Eventstream, Eventhouse, OneLake, Spark notebooks, KQL querysets, and update policies.

Related content

- [Modernization Best Practices and Reusable Assets Blog](#)
- [Microsoft Fabric migration overview](#)
- [Fabric Known Issues](#)
- [Microsoft Fabric Blog](#)
- [Microsoft Fabric terminology](#)
- [What's new in Power BI?](#)
- [Microsoft Fabric videos on YouTube](#)
- [Microsoft Fabric community](#)

ⓘ Note: The author created this article with assistance from AI. [Learn more](#)

Microsoft Fabric terminology

06/10/2025

Learn the definitions of terms used in Microsoft Fabric, including terms specific to Fabric Data Warehouse, Fabric Data Engineering, Fabric Data Science, Real-Time Intelligence, Data Factory, and Power BI.

General terms

- **Capacity:** Capacity is a dedicated set of resources that is available at a given time to be used. Capacity defines the ability of a resource to perform an activity or to produce output. Different items consume different capacity at a certain time. Fabric offers capacity through the Fabric SKU and Trials. For more information, see [What is capacity?](#)
- **Experience:** A collection of capabilities targeted to a specific functionality. The Fabric experiences include Fabric Data Warehouse, Fabric Data Engineering, Fabric Data Science, Real-Time Intelligence, Data Factory, and Power BI.
- **Item:** An item is a set of capabilities within an experience. Users can create, edit, and delete them. Each item type provides different capabilities. For example, the Data Engineering experience includes the lakehouse, notebook, and Spark job definition items.
- **Tenant:** A tenant is a single instance of Fabric for an organization and is aligned with a Microsoft Entra ID.
- **Workspace:** A workspace is a collection of items that brings together different functionality in a single environment designed for collaboration. It acts as a container that uses capacity for the work that is executed, and provides controls for who can access the items in it. For example, in a workspace, users create reports, notebooks, semantic models, etc. For more information, see [Workspaces](#) article.

Fabric Data Engineering

- **Lakehouse:** A lakehouse is a collection of files, folders, and tables that represent a database over a data lake used by the Apache Spark engine and SQL engine for big data processing. A lakehouse includes enhanced capabilities for ACID transactions when using the open-source Delta formatted tables. The lakehouse item is hosted within a unique workspace folder in [Microsoft OneLake](#). It contains files in various formats (structured and unstructured) organized in folders and subfolders. For more information, see [What is a lakehouse?](#)

- **Notebook:** A Fabric notebook is a multi-language interactive programming tool with rich functions. Which include authoring code and markdown, running and monitoring a Spark job, viewing and visualizing result, and collaborating with the team. It helps data engineers and data scientist to explore and process data, and build machine learning experiments with both code and low-code experience. It can be easily transformed to a pipeline activity for orchestration.
- **Spark application:** An Apache Spark application is a program written by a user using one of Spark's API languages (Scala, Python, Spark SQL, or Java) or Microsoft-added languages (.NET with C# or F#). When an application runs, it's divided into one or more Spark jobs that run in parallel to process the data faster. For more information, see [Spark application monitoring](#).
- **Apache Spark job:** A Spark job is part of a Spark application that is run in parallel with other jobs in the application. A job consists of multiple tasks. For more information, see [Spark job monitoring](#).
- **Apache Spark job definition:** A Spark job definition is a set of parameters, set by the user, indicating how a Spark application should be run. It allows you to submit batch or streaming jobs to the Spark cluster. For more information, see [What is an Apache Spark job definition?](#)
- **V-order:** A write optimization to the parquet file format that enables fast reads and provides cost efficiency and better performance. All the Fabric engines write v-ordered parquet files by default.

Data Factory

- **Connector:** Data Factory offers a rich set of connectors that allow you to connect to different types of data stores. Once connected, you can transform the data. For more information, see [connectors](#).
- **Data pipeline:** In Data Factory, a data pipeline is used for orchestrating data movement and transformation. These pipelines are different from the deployment pipelines in Fabric. For more information, see [Pipelines](#) in the Data Factory overview.
- **Dataflow Gen2:** Dataflows provide a low-code interface for ingesting data from hundreds of data sources and transforming your data. Dataflows in Fabric are referred to as Dataflow Gen2. Dataflow Gen1 exists in Power BI. Dataflow Gen2 offers extra capabilities compared to Dataflows in Azure Data Factory or Power BI. You can't upgrade from Gen1 to Gen2. For more information, see [Dataflows](#) in the Data Factory overview.

- **Trigger:** An automation capability in Data Factory that initiates pipelines based on specific conditions, such as schedules or data availability.

Fabric Data Science

- **Data Wrangler:** Data Wrangler is a notebook-based tool that provides users with an immersive experience to conduct exploratory data analysis. The feature combines a grid-like data display with dynamic summary statistics and a set of common data-cleansing operations, all available with a few selected icons. Each operation generates code that can be saved back to the notebook as a reusable script.
- **Experiment:** A machine learning experiment is the primary unit of organization and control for all related machine learning runs. For more information, see [Machine learning experiments in Microsoft Fabric](#).
- **Model:** A machine learning model is a file trained to recognize certain types of patterns. You train a model over a set of data, and you provide it with an algorithm that it uses to reason over and learn from that data set. For more information, see [Machine learning model](#).
- **Run:** A run corresponds to a single execution of model code. In [MLflow](#), tracking is based on experiments and runs.

Fabric Data Warehouse

- **SQL analytics endpoint:** Each Lakehouse has a SQL analytics endpoint that allows a user to query delta table data with TSQL over TDS. For more information, see [SQL analytics endpoint](#).
- **Fabric Data Warehouse:** The Fabric Data Warehouse functions as a traditional data warehouse and supports the full transactional T-SQL capabilities you would expect from an enterprise data warehouse. For more information, see [Fabric Data Warehouse](#).

Real-Time Intelligence

- **Activator:** Activator is a no-code, low-code tool that allows you to create alerts, triggers, and actions on your data. Activator is used to create alerts on your data streams. For more information, see [Activator](#).
- **Eventhouse:** Eventhouses provide a solution for handling and analyzing large volumes of data, particularly in scenarios requiring real-time analytics and exploration. They're

designed to handle real-time data streams efficiently, which lets organizations ingest, process, and analyze data in near real-time. A single workspace can hold multiple Eventhouses, an eventhouse can hold multiple KQL databases, and each database can hold multiple tables. For more information, see [Eventhouse overview](#).

- **Eventstream:** The Microsoft Fabric eventstreams feature provides a centralized place in the Fabric platform to capture, transform, and route real-time events to destinations with a no-code experience. An eventstream consists of various streaming data sources, ingestion destinations, and an event processor when the transformation is needed. For more information, see [Microsoft Fabric eventstreams](#).
- **KQL Database:** The KQL Database holds data in a format that you can execute KQL queries against. KQL databases are items under an Eventhouse. For more information, see [KQL database](#).
- **KQL Queryset:** The KQL Queryset is the item used to run queries, view results, and manipulate query results on data from your Data Explorer database. The queryset includes the databases and tables, the queries, and the results. The KQL Queryset allows you to save queries for future use, or export and share queries with others. For more information, see [Query data in the KQL Queryset](#)

Real-Time hub

- **Real-Time hub:** Real-Time hub is the single place for all data-in-motion across your entire organization. Every Microsoft Fabric tenant is automatically provisioned with the hub. For more information, see [Real-Time hub overview](#).

OneLake

- **Shortcut:** Shortcuts are embedded references within OneLake that point to other file store locations. They provide a way to connect to existing data without having to directly copy it. For more information, see [OneLake shortcuts](#).

Related content

- [Navigate to your items from Microsoft Fabric Home page](#)
- [End-to-end tutorials in Microsoft Fabric](#)

Microsoft Fabric migration overview

08/19/2025

Microsoft Fabric provides a unified analytics platform, and migrating your data and workloads to Fabric can help you take advantage of its integrated capabilities. This page summarizes all migration-related articles in the documentation, grouped by migration source.

Migrate from legacy, on premises, or PaaS platforms

[+] [Expand table](#)

Article	Description
Microsoft Fabric adoption roadmap	Learn the strategic and tactical considerations and action items that lead to the successful adoption of Microsoft Fabric, and help build a data culture in your organization.
Migrate to Power BI	Learn how to plan and conduct a migration from a third-party BI tool to Power BI.

Migrate from Azure Analysis Services

[+] [Expand table](#)

Article	Description
Migrate Azure Analysis Services to Power BI	Migrate Microsoft Azure Analysis Services to Power BI using the Microsoft Power BI Premium migration feature in Power BI.

Migrate from Azure Data Factory (ADF)

[+] [Expand table](#)

Article	Description
Planning your migration from Azure Data Factory to Data Factory in Fabric	Plan your migration from Azure Data Factory to Fabric Data Factory.
Migrate from Azure Data Factory to Data Factory in Fabric	Learn how to migrate Azure Data Factory (ADF) to Data Factory in Microsoft Fabric.

Article	Description
How to Use Azure Data Factory item (Mount) in Fabric	The Azure Data Factory item in Microsoft Fabric allows you to bring in your Azure Data Factory artifacts to Fabric instantly.
Migrate from Azure Workflow Orchestration Manager to Microsoft Fabric Apache Airflow job	Learn to migrate from Azure workflow orchestration manager to Apache Airflow Job in Microsoft Fabric .

Migrate from Azure SQL Database

[] [Expand table](#)

Article	Description
SqlPackage and Copy job	You can migrate from Azure SQL Database or on-premises SQL Server to SQL database in Fabric with minimal downtime using a <code>.bacpac</code> file and SqlPackage, then a Copy job .

Migrate from Azure Data Explorer

[] [Expand table](#)

Article	Description
Migrate from Azure Data Explorer to Fabric Real-Time intelligence (Eventhouse)	Step-by-step guidance for migrating your Azure Data Explorer workloads to Fabric Eventhouse.

Migrate from Azure Synapse Analytics Data Explorer

[] [Expand table](#)

Article	Description
Migrate from Azure Synapse Data Explorer to Fabric Eventhouse (preview)	Step-by-step guidance for migrating your Azure Synapse Data Explorer (Kusto) databases to Fabric Eventhouse.

Migrate from Azure Synapse Analytics dedicated SQL pools

[+] Expand table

Article	Description
Migration Assistant for Fabric Data Warehouse (preview)	Learn how to use the Migration Assistant to move data and objects from Azure Synapse Analytics SQL Data Warehouse to Fabric Data Warehouse, including supported scenarios and limitations.
Migration methods: Azure Synapse Analytics dedicated SQL pools to Fabric Data Warehouse	Learn the methods of migration of data warehousing in Azure Synapse dedicated SQL pools to Fabric.
Migration planning: Azure Synapse Analytics dedicated SQL pools to Fabric Data Warehouse	Plan for migration of data warehousing in Azure Synapse dedicated SQL pools to Fabric.

Migrate from Azure Synapse Analytics Spark

[+] Expand table

Article	Description
Migrating from Azure Synapse Spark to Fabric	Learn about migrating from Azure Synapse Spark to Fabric, including key considerations and different migration scenarios.
Migrate data and pipelines from Azure Synapse Analytics to Fabric	Learn about your different options for migrating data and pipelines from Azure Synapse Analytics to Fabric.
Migrate Hive Metastore metadata from Azure Synapse Analytics to Fabric	Learn about your different options for migrating Hive Metastore metadata from Azure Synapse Spark to Fabric.
Migrate notebooks from Azure Synapse Analytics to Fabric	Learn about your different options for migrating your Azure Synapse Spark notebooks to Fabric.
Migrate Spark configurations from Azure Synapse Analytics to Fabric	Learn about migrating Spark configurations from Azure Synapse Spark to Fabric, including prerequisites and migration options.
Migrate Spark job definition from Azure Synapse to Fabric	Learn about migrating Spark job definitions from Azure Synapse Spark to Fabric, including migration prerequisites and options.

Article	Description
Migrate Spark libraries from Azure Synapse to Fabric	Learn about migrating Spark libraries from Azure Synapse Spark to Fabric, including migration prerequisites and options.
Migrate Spark pools from Azure Synapse Analytics to Fabric	Learn about migrating Apache Spark pools from Azure Synapse Spark to Fabric, including migration prerequisites and options.

Migrate from Power BI dataflows (Gen1)

 [Expand table](#)

Article	Description
Migrate from Dataflow Gen1 to Dataflow Gen2	Learn how to migrate from Power BI dataflows, now known as <i>Dataflow Gen1</i> , to Dataflow Gen2 in Data Factory for Microsoft Fabric.

Migrate from Power BI datamarts

 [Expand table](#)

Article	Description
Upgrade a Power BI Datamart to a Warehouse	Migrate an existing Power BI datamart to Fabric Data Warehouse. Power BI datamarts have been replaced by Fabric Data Warehouse.

Migrate from Spark

 [Expand table](#)

Article	Description
Migrate existing workspace libraries and Spark properties to a Microsoft Fabric environment	Learn how to migrate your existing workspace libraries and Apache Spark properties to a default Fabric environment.

Migrate from SQL Server instances

 [Expand table](#)

Article	Description
SqlPackage and Copy job	You can migrate from Azure SQL Database or on-premises SQL Server to SQL database in Fabric with minimal downtime using a <code>.bacpac</code> file and SqlPackage, then a Copy job .

Migration resources

- [Azure Architectures for Microsoft Fabric](#)
- [Migration to Fabric - IFS customer case story ↗](#)
- [Enable Microsoft Fabric for your organization](#)
- [Microsoft Fabric security fundamentals](#)

Related content

- [What's new in Microsoft Fabric?](#)
- [Migrating from Power BI capacity to Microsoft Fabric capacity ↗](#)

 **Note:** The author created this article with assistance from AI. [Learn more](#)

Try Microsoft Fabric for free

08/25/2025

The Microsoft Fabric trial capacity gives you **free access for 60 days** to explore almost everything Fabric has to offer—across data engineering, data science, real-time analytics, business intelligence, and more. Whether you're new to Fabric or coming from the product to learn more, this trial is your gateway to understanding how Fabric brings all your data and analytics tools together in one place.

| Quick start: [Set up your Fabric trial capacity](#) | [Start using your Fabric trial capacity](#)

What's included—and what's not

Your trial is configured as either an F4 [capacity](#) (4 capacity units) or an F64 capacity (64 capacity units) and is complemented with a Power BI Individual Trial if you don't already have a Power BI Premium Per User license.

💡 Tip

If your trial currently has 4 capacity units, you might be eligible to increase the capacity to 64 capacity units. For more information, see [Increase trial capacity](#).

With your trial capacity, you can:

- Use all Fabric workloads, including **Data Factory**, **Synapse Data Engineering**, **Real-Time Analytics**, and **Power BI**.
- Create **semantic models**, **pipelines**, **notebooks**, **reports**, and more.
- Collaborate in **workspaces** and monitor usage with the **Microsoft Fabric Capacity Metrics app**.
- Store up to **1 TB of data** in OneLake.

However, some features aren't available:

- Copilot and Trusted Workspace Access aren't supported.
- Private Link is disabled.

Learn more about which [Microsoft Fabric features are supported in a trial capacity](#).

❗ Note

The [Fabric Analyst in a Day \(FAIAD\)](#) workshop is a free, hands-on training designed for analysts working with Power BI and Microsoft Fabric. You can get hands-on experience on how to analyze data and build reports, using Fabric. It covers key concepts like working with lakehouses, creating reports, and analyzing data in the Fabric environment.

When your Fabric trial ends

Your Microsoft Fabric trial capacity lasts for 60 days, unless you cancel it earlier. As the trial nears its end, you'll see notifications in the Fabric portal and in the **Capacity settings** page of the Admin portal, helping you track how much time remains.

Once the trial expires:

- Access to the trial capacity is revoked.
- Any workspaces assigned to the trial capacity will be reassigned to Pro and non Power BI Fabric items will no longer be accessible unless the workspace is reassigned to a paid F or P capacity.
- Non Power BI Fabric items (like notebooks and pipelines) remain in your tenant, but they become inactive until reassigned to a valid capacity.
- All content remains stored in OneLake for 7 days and can be reactivated by assigning the workspace to a paid Fabric F or Power BI Premium P capacity.

Read more about [ending your trial](#).

Tip

To check your trial status or trial expiration date, go to [Admin portal > Capacity settings > Trial](#).

If you're ready to continue using Fabric, visit the [Purchase Fabric page](#) to explore your options.

To learn more about limitations and get answers to frequently asked questions about the Fabric trial, see [the FAQ](#).

Set up your Fabric trial capacity

You can start a trial capacity several different ways. The first two methods make you the Capacity administrator of the trial capacity.

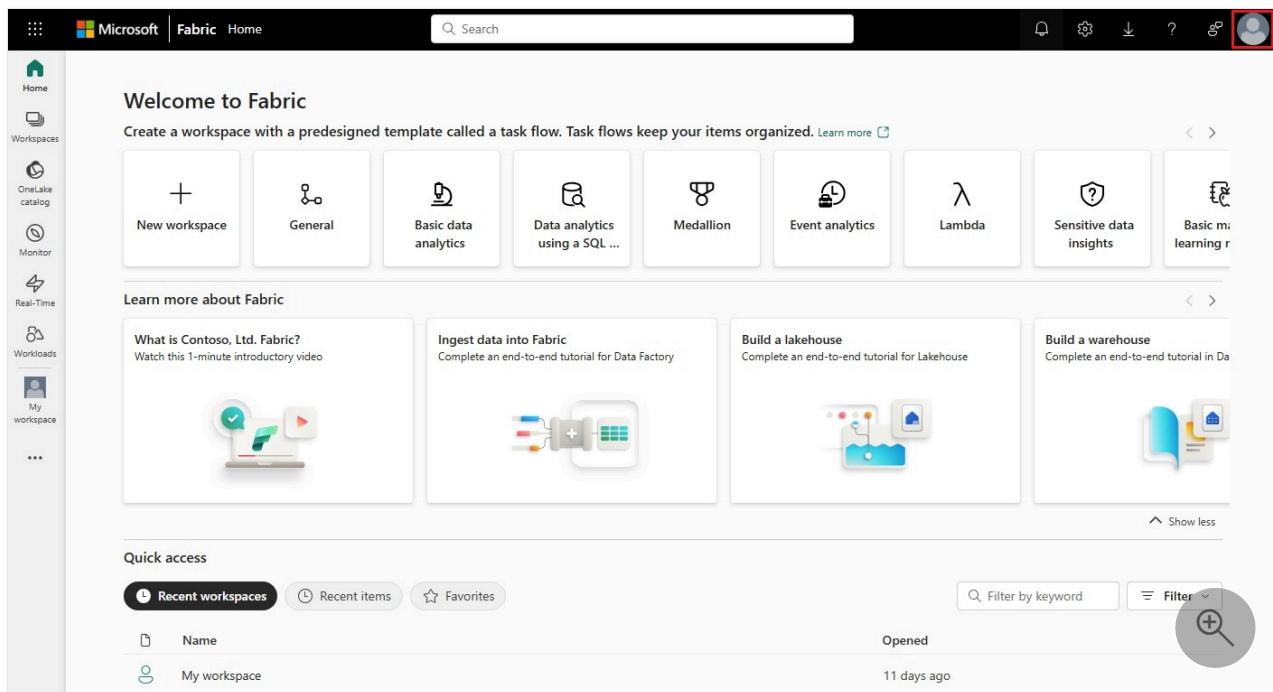
- **Method 1:** Start a new trial capacity from the Account manager.
- **Method 2:** Trigger a new trial capacity by trying to use a Fabric feature.

- **Method 3:** Join an existing trial capacity.

Method 1: Start a new trial capacity from the Account manager

You can sign up for a trial capacity. You manage who else can use your trial by giving coworkers permission to create workspaces in your trial capacity. Every user in the tenant has contributor permissions by default unless you explicitly manage who has access. Assigning workspaces to the trial capacity automatically adds coworkers (with roles in those workspaces) to the trial capacity. To start your Fabric trial capacity and become the Capacity administrator of that trial, follow these steps:

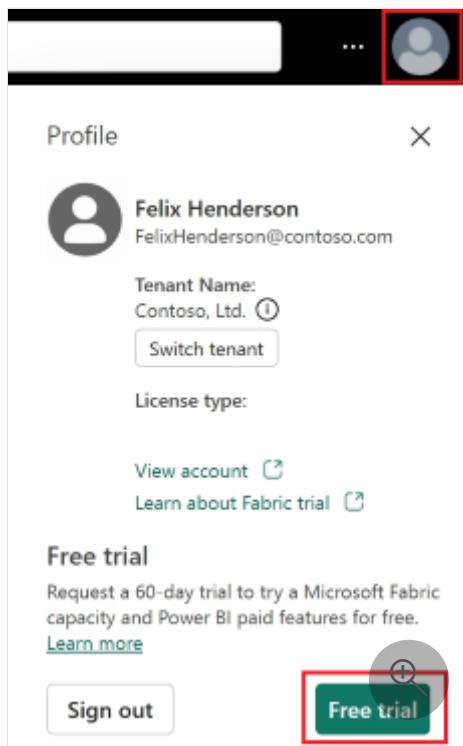
1. To open your Account manager, select the tiny photo from the upper-right corner of the [Fabric homepage](#).



2. In the Account manager, select **Start trial**. If you don't see **Start trial**, **Free trial**, or a **Trial status**, trials might be disabled for your tenant.

! Note

If the Account manager already displays **Trial status**, you might already have a **Power BI trial** or a **Fabric (Free)** trial in progress. To test this out, attempt to use a Fabric feature. For more information, see [Start using Fabric](#).



3. If prompted, agree to the terms and then select **Start trial**.
4. Within the **Activate your 60-day free Fabric trial capacity** prompt, review the **Trial capacity region**. You can either accept the default home region or update it to a new region location that best suits your needs. Once you make your selection, agree to the terms and conditions, then select **Activate**.

ⓘ Important

When planning your region deployment for Fabric capacities, it's important to make the appropriate selection from the outset. If you decide to move a workspace containing Fabric items to a different region after your trial is created, you need to delete all existing Fabric items before proceeding. For detailed instructions, see [Moving your data around](#).

To ensure the best performance and resource management, we recommend deploying your capacity in a region where your existing resources are already located. This approach minimizes network latency, reduces ingress and egress charges, and enhances overall reliability.

5. Once your trial capacity is ready, you receive a confirmation message. Select **Fabric Home Page** to begin a guided walkthrough of Fabric. You're now the Capacity administrator for that trial capacity. To learn how to share your trial capacity using workspaces, see [Share trial capacities](#).

Congratulations. You now have a Fabric trial capacity and a complementary Power BI individual trial (if you didn't already have a Power BI *paid* license). To share your capacity, see [Share trial capacities..](#)

Method 2: Trigger a Fabric trial by trying to use a Fabric feature

If your organization enabled Fabric and Power BI trials, attempting to use a Fabric feature launches a Fabric trial capacity. If your Fabric administrator enabled Microsoft Fabric for the tenant but you still don't have access to a Fabric-enabled capacity, follow these steps:

1. Try to create a Fabric item in a workspace that you own (such as [My Workspace](#)) that doesn't currently support Fabric items (that is, not a Fabric, Premium, or Trial workspace).
2. Follow the prompt to start a Fabric trial capacity.

Once you agree, your trial starts and the workspace is reassigned to a trial capacity. You're the Capacity administrator and can add additional workspaces to the trial capacity by changing their type to Trial in workspace settings.

Method 3: Join an existing trial

You can join a trial started by a coworker by adding your workspace to their existing trial capacity. This action only is possible if the trial capacity administrator gives you or the entire organization **Contributor permissions** to the trial capacity.

For more information, see [Sharing trial capacities](#).

Start using your trial

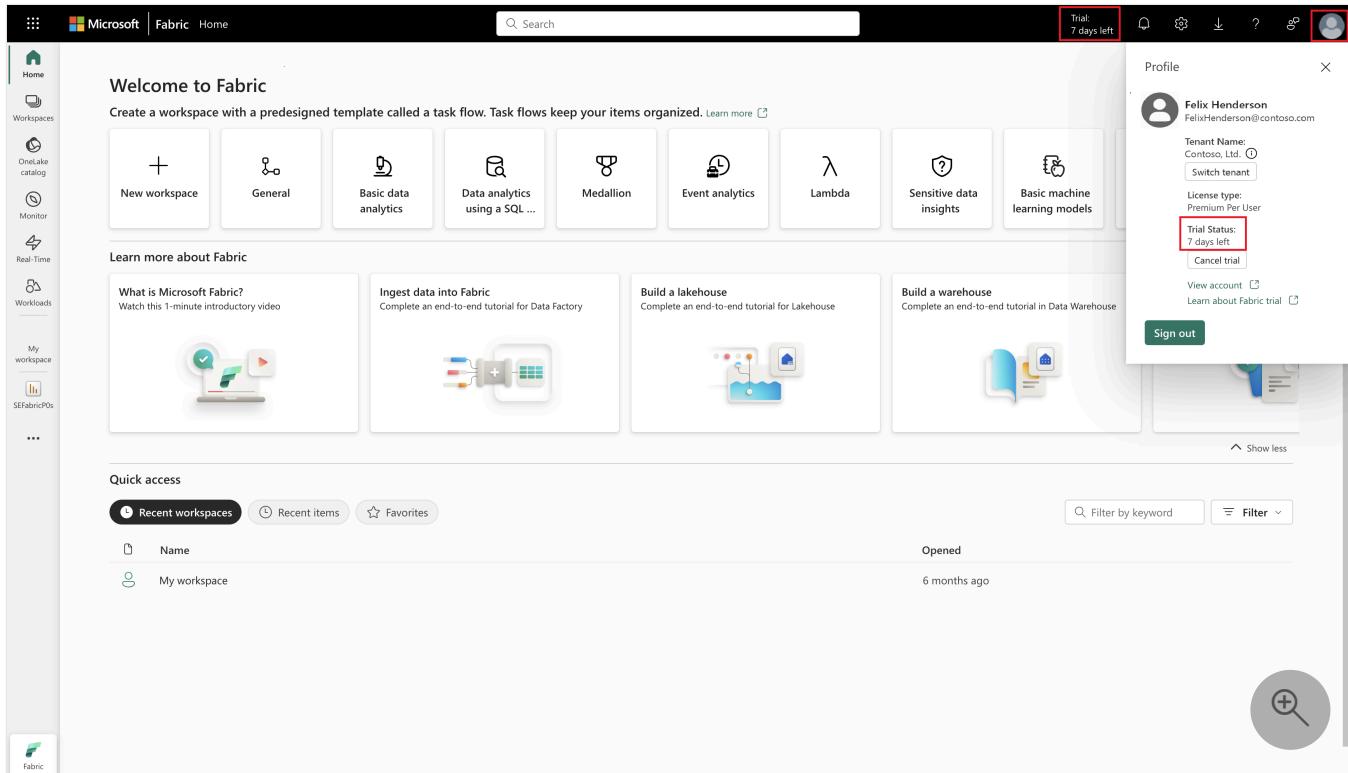
To start using your Fabric capacity trial, create a new workspace. Assign that workspace to your trial capacity [using the *Trial* license mode](#), and then all the items in that workspace are saved and executed in that trial capacity. Invite colleagues to those workspaces so they can share the trial experience with you. If you, as the Capacity administrator, enable **Contributor permissions**, then others can also assign their workspaces to your trial capacity. For more information about sharing, see [Share trial capacities](#).

- **Existing Power BI users:** If you're an existing Power BI user, jump to [Start the Fabric trial](#).
- **New Power BI users:** The Fabric trial requires a per-user license. Navigate to <https://app.fabric.microsoft.com> to sign up for a Fabric (Free) license. Once you have the free license, you can [begin participating in the Fabric capacity trial](#).

- You might already have a license and not realize it. For example, some versions of Microsoft 365 include a Power BI Pro license. Open Fabric <https://app.fabric.microsoft.com> and select your Account manager to see if you already have a license, and which license it is. Read on to see how to open your Account manager.

Get the status of your trial

To see the status of your trial, open your Account manager again and look for the **Trial status**. Your Account manager keeps track of the number of days remaining in your trial. You can also see the countdown in the Fabric menu bar or go to **Admin portal > Capacity settings > Trial**.



Share trial capacities

The person who starts the Fabric trial capacity becomes the Capacity administrator for that trial capacity. Other users on the same tenant can also start a Fabric trial capacity and become the Capacity administrator for their own trial capacity. Hundreds of users can use each trial capacity. But, Microsoft sets a limit on the number of trial capacities that can be created on a single tenant. To help others in your organization try out Fabric, share your trial capacity. There are several ways to share.

Share by enabling Contributor permissions

Enabling the **Contributor permissions** setting allows other users to assign their workspaces to your trial capacity. If you're the Capacity or Fabric administrator, adjust this setting from the Admin portal.

1. From the top right section of the Fabric menubar, select the cog icon to open **Settings**.
2. Select **Admin portal > Trial**. **Enabled for the entire organization** is set by default.

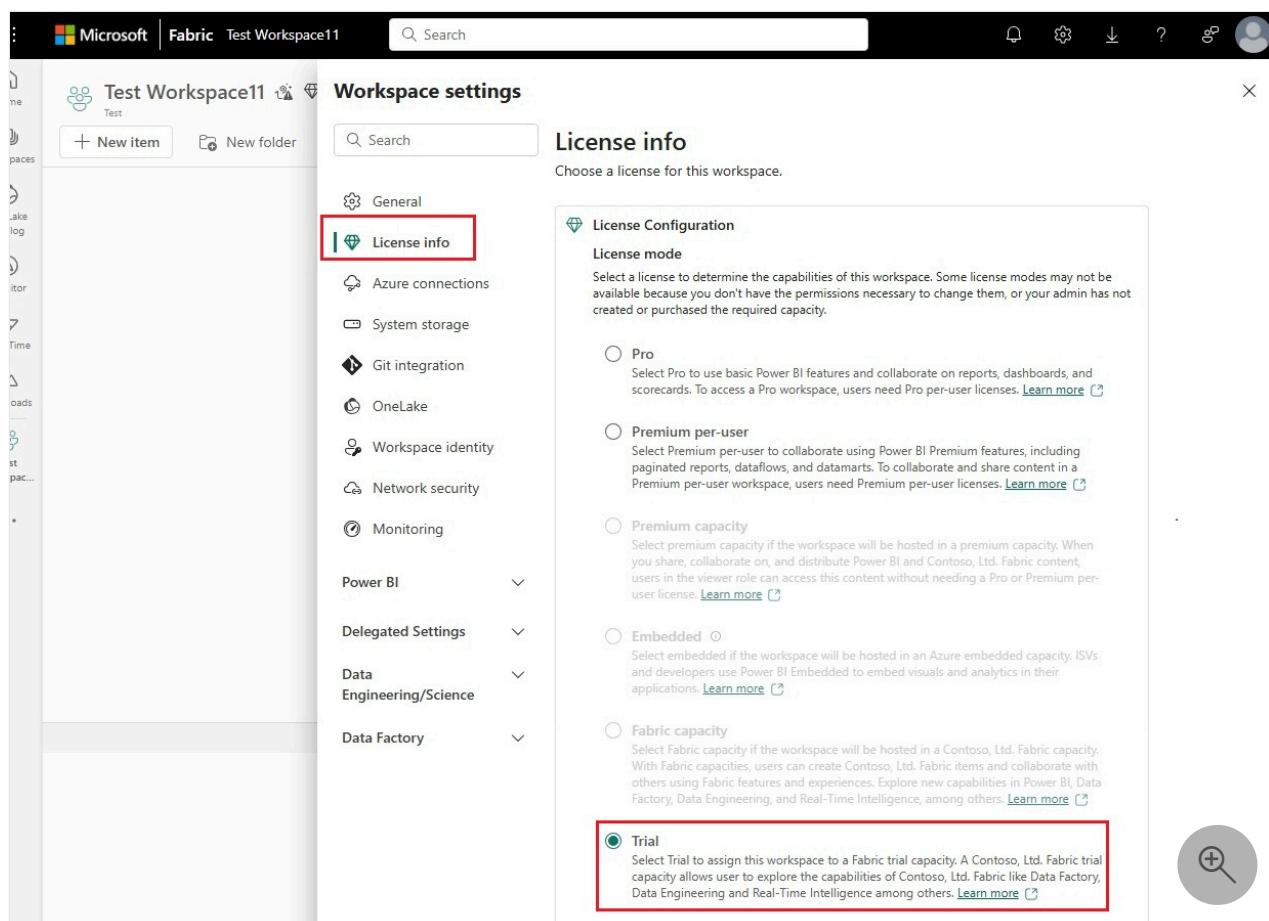
Enabling **Contributor permissions** means that any user with an Admin role in a workspace can assign that workspace to the trial capacity and access Fabric features. Apply these permissions to the entire organization or apply them to only specific users or groups.

Share by assigning workspaces

If you're the Capacity administrator, assign the trial capacity to multiple workspaces. Anyone with access to one of those workspaces can now use the Fabric capacity trial.

1. Open **Workspaces** and select the name of a workspace.
2. Select **Workspace settings**, then **License info**.
3. Select **Edit** in the **License configuration** section.

4. Select the **Trial** license mode.



5. To apply your changes, select the **Select license** button.

For more information, see [Use Workspace settings](#).

Increase trial capacity

If you're the Capacity administrator or Tenant administrator, you might be eligible to increase the trial capacity by following these steps:

1. From the upper right corner of Fabric, select the gear icon, then select **Admin portal**.
2. Select **Capacity settings**, and then choose the **Trial** tab.
3. Your current trial size is displayed here. Select the **Change size** button to increase from 4 capacity units to 64 capacity units.
4. Select **Apply**. If you're eligible to change the size, you see a success message and receive a notification.

You can also downgrade from 64 capacity units to 4 capacity units using these same steps.

Note

Changing the trial capacity doesn't change the length of the trial. The number of remaining days doesn't reset or become extended.

End a Fabric trial capacity

End a Fabric capacity trail by [canceling, letting it expire, or purchasing the full Fabric experience](#).

For more information, see [Canceling, expiring, and closing](#).

Cancel the Fabric trial

Capacity admins and Fabric admins can cancel a trial capacity. The user who starts a trial automatically becomes the Capacity administrator for that trial capacity. The Fabric administrator has full access to all Fabric management tasks. All Fabric items (non-Power BI items) in those workspaces become unusable and may be deleted after 7 days. Only the Capacity or Fabric administrator can cancel the Fabric trial capacity.

One reason to cancel a trial capacity is when the Capacity administrator of a trial capacity leaves the company. Because Microsoft limits the number of trial capacities available per

tenant, you might want to remove the unmanaged trial capacity to make room for other users to sign up for a new trial capacity.

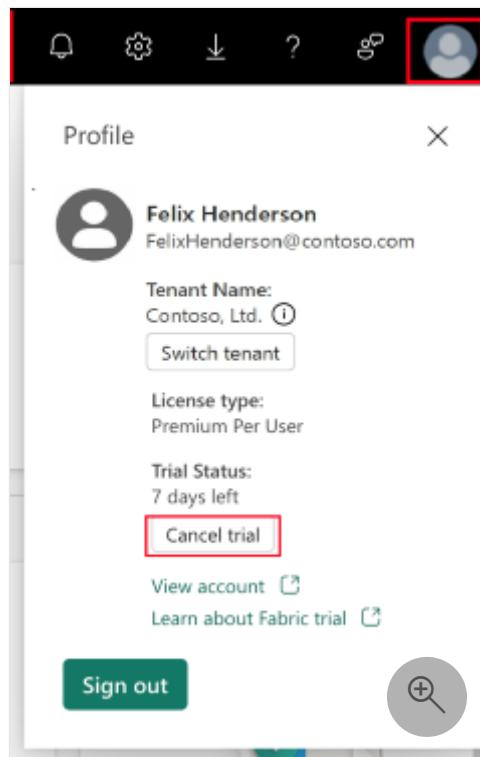
If you don't move the workspaces and their contents to a new capacity that supports Fabric:

- The license mode of any workspaces assigned to that trial capacity changes to Pro.
- All non Power BI Fabric items in the workspaces become unusable and may be deleted after seven days. Your Power BI items are unaffected and still available when the workspace license mode returns to Pro.
- You can't create workspaces that support Fabric capabilities.
- You can't share Fabric items, such as machine learning models, warehouses, and notebooks, and collaborate on them with other Fabric users.
- You can't create any other analytics solutions using these Fabric items.

(!) Note

Only capacity and Fabric admins can cancel a Fabric trial capacity.

- **Cancel a trial using your Account manager:** As a trial capacity admin, you can cancel your free Fabric trial capacity from your Account manager. Canceling the trial this way ends the trial capacity for yourself and anyone else you invited to the trial.
 - Open your Account manager and select **Cancel trial**.



- **Cancel the Fabric trial capacity using the Admin portal:** As a Capacity or Fabric administrator, you can use the Admin portal to cancel a Fabric trial capacity:

1. Select **Settings > Admin portal > Capacity settings**.
2. Then choose the **Trials** tab.
3. Select the cog icon for the trial capacity that you want to delete.

CAPACITY NAME	CAPACITY ADMINS	ACTIONS	CAPACITY UNITS	REGION	STATUS
Trial-2024080...	Alex		64	North Central US	Active

Let the trial expire

A standard Fabric trial capacity lasts 60 days. If you don't reassign workspaces to a paid Fabric capacity before the end of the trial period, non-Power BI Fabric items are removed according to the [retention policy upon removal](#). You have seven days after the expiration date to save your non-Power BI Fabric items by assigning the workspaces to an F or P capacity that supports Fabric.

To retain your Fabric items, before your trial ends, [purchase Fabric](#).

Purchase the full Fabric experience

If you want to retain your data and continue to use Microsoft Fabric, you can [purchase a capacity](#) and migrate your workspaces to that capacity. You can also migrate your workspaces to a capacity that you already own that supports Fabric items.

Frequently asked questions

Here are some things to consider and answers to frequently asked questions about the Fabric trial.

What if I don't already have an assigned Power BI PPU?

If you don't already have an assigned Power BI [Premium Per User \(PPU\)](#) license, you receive a Power BI [Individual Trial](#) when initiating a Fabric trial capacity. This individual trial enables you to perform the actions and use the features that a PPU license enables. Your Account manager still displays the nontrial licenses assigned to you. But in order to make full use of Fabric, your Fabric trial capacity comes with a complementary Power BI Individual trial.

Why can't I start a trial?

If you don't see the **Start trial** button in your Account manager:

- Your Fabric administrator might have disabled access, and you can't start a Fabric trial capacity. To request access, [contact your Fabric administrator](#).
- You're an existing Power BI individual trial user, and you don't see **Start trial** in your Account manager. You can start a Fabric trial by attempting to [create a Fabric item](#). When you attempt to create a Fabric item, you receive a prompt to start a Fabric trial. If you don't see this prompt, it's possible your Fabric administrator deactivated this action.

If you do see the **Start trial** button in your Account manager but can't start a trial:

- You might not be able to start a trial capacity if your tenant exhausted its limit of trial capacities. If that's the case, you have the following options:
 - Request another trial capacity user to share their trial capacity workspace with you. [Give users access to workspaces](#).
 - [Purchase a Fabric capacity from Azure](#) by performing a search for *Microsoft Fabric*.

How do I look up the trial Capacity administrator?

To request access to a trial capacity or to check whether your organization has the Fabric tenant setting enabled, you can contact your Capacity administrator. Ask your Fabric administrator to use the Admin portal to look up your Capacity administrator. You can find your Fabric administrator as the service administrator in the Workspace Settings of your workspace.

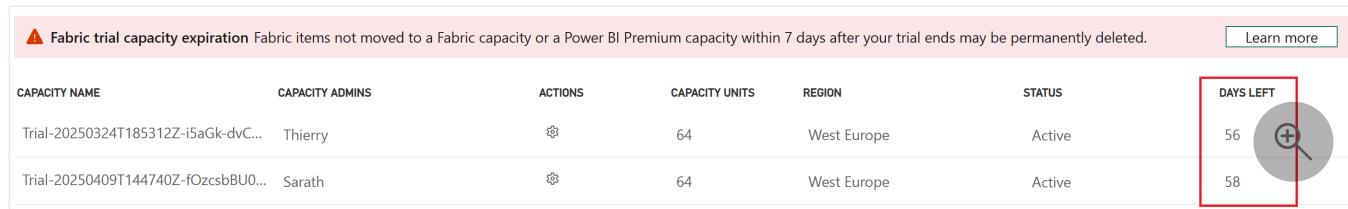
If you're the Capacity or Fabric administrator, from the upper right corner of Fabric, select the gear icon. Select **Admin portal**. For a Fabric trial, select **Capacity settings** and then choose the **Trial** tab.

The screenshot shows the Microsoft Fabric Admin portal interface. On the left, there's a sidebar with various navigation items: Tenant settings (New), Usage metrics, Users, Premium Per User, Audit logs, Domains (New), Capacity settings (highlighted with a red box and arrow), and Refresh summary. The main area has tabs at the top: Power BI Premium, Power BI Embedded, Trial (selected), and Fabric Capacity. Below the tabs, there's a link to "Learn more about Trial capacities". A table lists capacities: Capacity Name, Capacity Admins, Actions, and Capacity Units. One row is shown: Trial-20240412, Zalan Bola, a gear icon, 64, and a magnifying glass icon. A large red arrow points from the "Capacity settings" link in the sidebar to the "Trial" tab in the header.

CAPACITY NAME	CAPACITY ADMINS	ACTIONS	CAPACITY UNITS
Trial-20240412	Zalan Bola		64

How do I look up the number of days remaining in my trial?

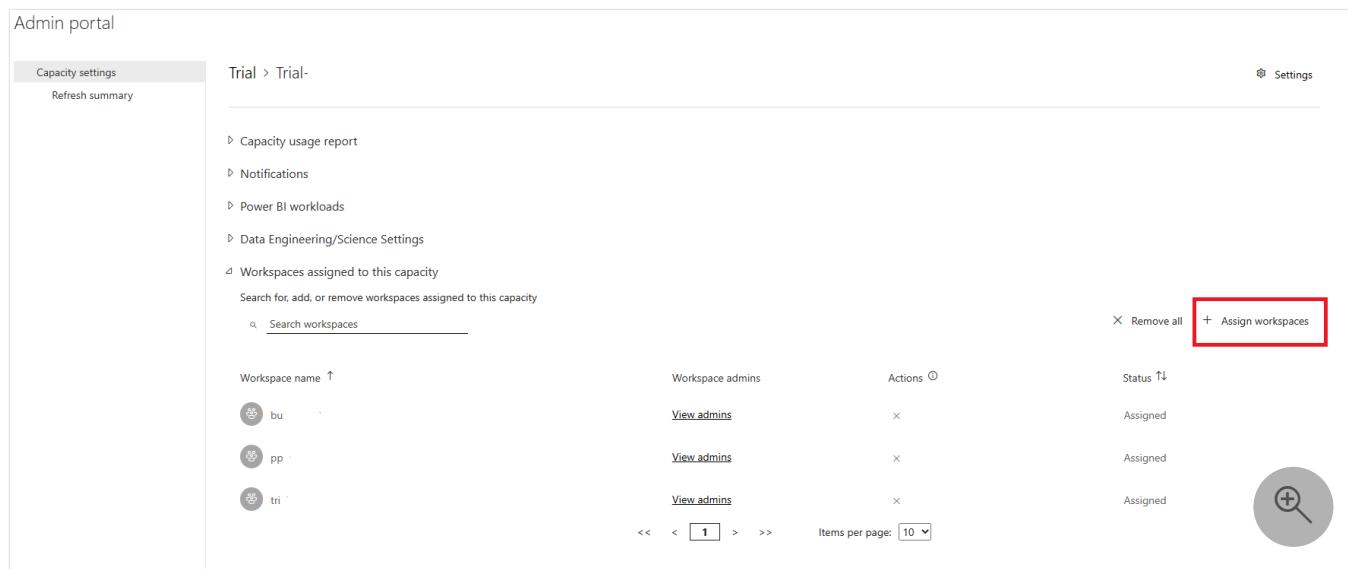
From the upper right corner of Fabric, select the gear icon. Select **Admin portal**. For a Fabric trial, select **Capacity settings** and then choose the **Trial** tab. The **Days left** column tracks the remaining days for each trial.



Fabric trial capacity expiration							Learn more
CAPACITY NAME	CAPACITY ADMINS	ACTIONS	CAPACITY UNITS	REGION	STATUS	DAYS LEFT	
Trial-20250324T185312Z-i5aGk-dvC...	Thierry	⋮	64	West Europe	Active	56	
Trial-20250409T144740Z-fOzcsbBU0...	Sarath	⋮	64	West Europe	Active	58	

Why can't I assign a workspace to the trial capacity in my workspace settings?

This can occur when the Fabric administrator turns off trials after you start a trial. To add your workspace to the trial capacity, open the Admin portal by selecting it from the gear icon in the top menu bar. Then, select **Trial > Capacity settings** and choose the name of the capacity. If you don't see your workspace assigned, add it here.



Admin portal

Capacity settings Trial > Trial- Refresh summary ⚙ Settings

Capacity usage report Notifications Power BI workloads Data Engineering/Science Settings Workspaces assigned to this capacity Search for, add, or remove workspaces assigned to this capacity Search workspaces × Remove all + Assign workspaces

Workspace name ↑	Workspace admins	Actions ⚙	Status ↑↓
bu	View admins	×	Assigned
pp	View admins	×	Assigned
tri	View admins	×	Assigned

<< < 1 > >> Items per page: 10 

What is the region for my Fabric trial capacity?

If you start the trial using the Account manager and didn't change the default region selection, your trial capacity is usually located in the home region for your tenant. See [Find your Fabric home region](#) for information about how to find your home region, where your data is stored.

ⓘ Note

In most cases, the default trial Capacity region matches your home region. However, in some cases, Fabric trials are created by default in a similar but different region (for

example, East US instead of Central US).

What effect does region have on my Fabric trial capacity?

Not all regions are available for the Fabric trial capacity. Start by [looking up your home region](#) and then check to [see if your region is supported for the Fabric trial](#). If your home region doesn't have Fabric enabled, don't use the Account manager to start a trial. To start a trial in a region that isn't your home region, follow the steps in [Other ways to start a Fabric trial](#). If you already started a trial from Account manager, cancel that trial and follow the steps in [Other ways to start a Fabric trial](#) instead.

Can I move my tenant to another region?

You can't move your organization's tenant between regions by yourself. If you need to change your organization's default data location from the current region to another region, you must contact support to manage the migration for you. For more information, see [Move between regions](#).

How can I see the Fabric trial capacity availability by Azure region?

To learn more about regional availability for Fabric trials, see [Fabric trial capacities are available in all regions](#).

How is the Fabric trial capacity different from a Power BI individual trial?

A Power BI individual trial provides use rights equivalent to a Power BI Premium Per User license. A Fabric trial capacity is for storing Fabric items and running Fabric workloads. All rules guiding [Power BI licenses](#) and what you can do in the Power BI workload remain the same with a Fabric trial capacity, which is why having a complementary Power BI individual trial is useful. The key difference is that a Fabric capacity is required to use non-Power BI workloads and items.

Does the Fabric trial capacity support autoscale?

The Fabric trial capacity doesn't support autoscale. If you need more compute capacity, you can purchase a Fabric capacity in Azure.

How can trial Capacity administrators migrate existing workspaces into a trial capacity?

Trial Capacity administrators can migrate existing workspaces into a trial capacity using workspace settings and choosing **Trial** as the license mode. To learn how to migrate workspaces, see [create workspaces](#).

The screenshot shows the Microsoft Fabric workspace settings interface. On the left, there's a sidebar with navigation links like Home, Pages, Log, Monitor, Time, and Data. The main area has a title bar with 'Microsoft Fabric Test Workspace11' and a search bar. Below that is the 'Workspace settings' header. Under 'General', the 'License info' tab is selected and highlighted with a red box. The 'License Configuration' section contains a 'License mode' dropdown with several options: Pro, Premium per-user, Premium capacity, Embedded, Fabric capacity, and Trial. The 'Trial' option is selected and highlighted with a red box. A large circular button with a magnifying glass icon is visible on the right.

Related content

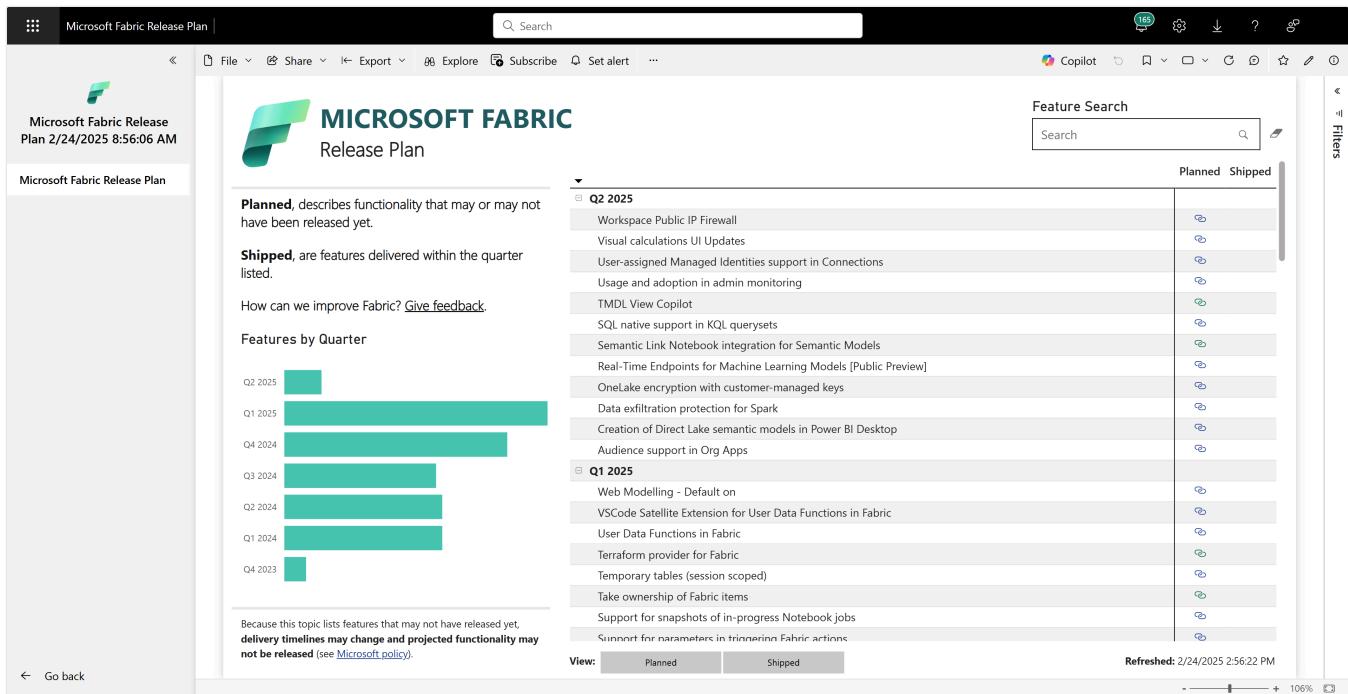
- Learn about [licenses](#)
- Review Fabric [terminology](#)

ⓘ Note: The author created this article with assistance from AI. [Learn more](#)

Connect to the Microsoft Fabric Release Plan report

Article • 05/22/2025

This article tells you how to install the template app for the Microsoft Fabric Release Plan report, and how to connect to the data source.



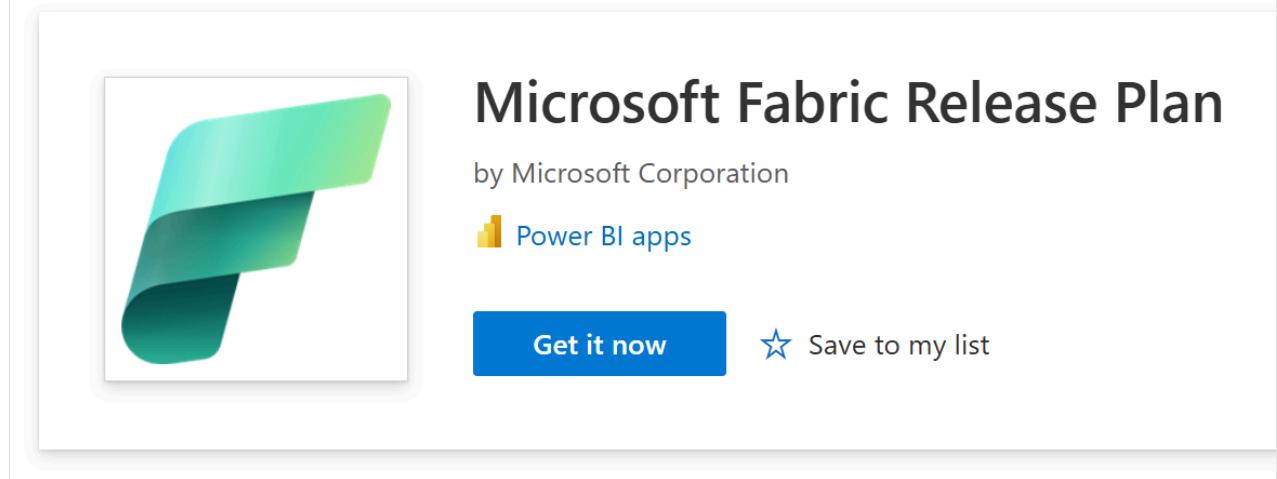
The screenshot shows the Microsoft Fabric Release Plan report interface. At the top, there's a navigation bar with icons for File, Share, Export, Explore, Subscribe, Set alert, and Copilot. A search bar is also present. The main title is "MICROSOFT FABRIC Release Plan". On the left, there's a sidebar with the title "Microsoft Fabric Release Plan" and a timestamp "Plan 2/24/2025 8:56:06 AM". It includes sections for "Planned" (describing functionality not yet released), "Shipped" (features delivered in the quarter), and a feedback link. Below that is a chart titled "Features by Quarter" showing the number of features for each quarter from Q2 2025 down to Q4 2023. A note at the bottom of this section states: "Because this topic lists features that may not have released yet, delivery timelines may change and projected functionality may not be released (see Microsoft policy)". The main content area displays a list of features categorized by quarter. The "Planned" column contains items like "Workspace Public IP Firewall", "Visual calculations UI Updates", etc. The "Shipped" column contains items like "User-assigned Managed Identities support in Connections", "Usage and adoption in admin monitoring", etc. There are filters and a feature search bar on the right side. The bottom of the screen shows a "View:" button set to "Planned" and a refresh timestamp of "Refreshed: 2/24/2025 2:56:22 PM".

After you install the template app and connected to the data sources, you can customize the report as per your needs. You can then distribute it as an app to colleagues in your organization.

Install the app

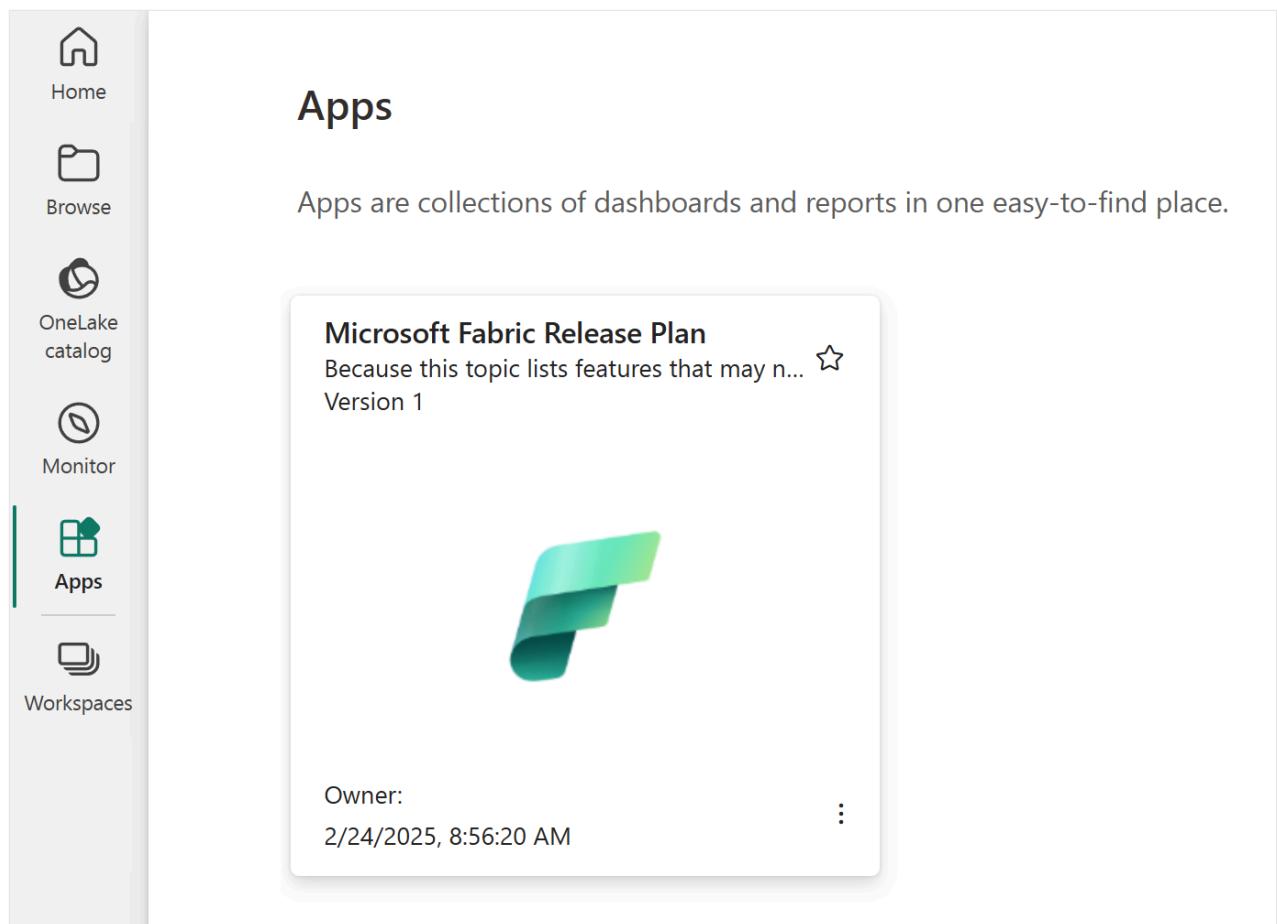
To get the Microsoft Fabric Release Plan app, you need to install it from AppSource. The app is available for free.

1. Visit [Microsoft Fabric Release Plan](#) in AppSource.
2. Select [Get it now](#).



The screenshot shows the Microsoft Fabric Release Plan app page. It features a large teal and green abstract logo icon. To the right of the icon, the app's name "Microsoft Fabric Release Plan" is displayed in a large, bold, dark font. Below the name, it says "by Microsoft Corporation" and "Power BI apps". At the bottom, there are two buttons: a blue "Get it now" button and a white "Save to my list" button with a star icon.

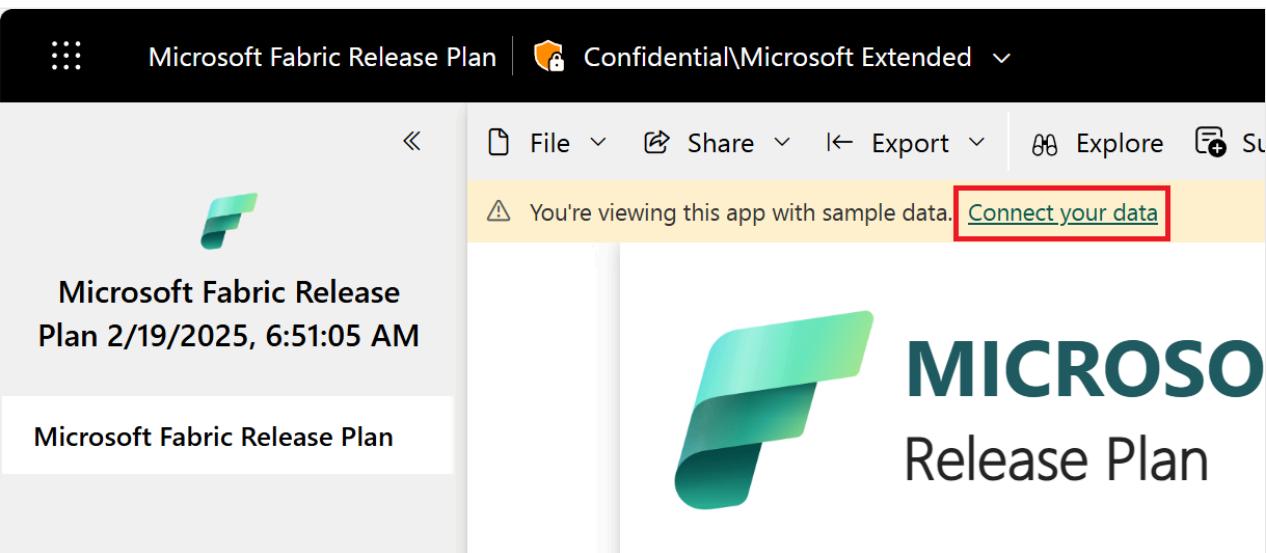
3. When prompted, select **Install**. Once the app is installed, it shows on your **Apps** page.



The screenshot shows the Microsoft Fabric Release Plan app listed on the user's Apps page. The sidebar on the left has icons for Home, Browse, OneLake catalog, Monitor, Apps (which is selected and highlighted with a teal vertical bar), and Workspaces. The main area displays the app card for "Microsoft Fabric Release Plan", which includes the app's name, a brief description ("Because this topic lists features that may n..."), a star icon, and "Version 1". The app's logo is shown, along with its owner information ("Owner: 2/24/2025, 8:56:20 AM") and a three-dot menu icon.

Connect to data sources

1. Select the icon on your Apps page to open the app. The app opens, showing sample data.
2. Select the **Connect your data** link on the banner at the top of the page.



3. The parameters dialog appears. There are no required parameters, so you can select **Next**.

Get started setting up your app! Start by filling in the parameters. Then, you'll authenticate to all the data sources this app connects to.

Parameters
Make sure all required (*) parameters are filled in before connecting to your data.

This app doesn't have any parameters.

[Go to the app documentation](#)

Next **Cancel**

4. The authentication method dialog appears. Recommended values are prepopulated as an Anonymous authentication method. select **Sign in and connect**.



Connect to Microsoft Fabric Release Plan

You are connecting to

Url

[https://learn.microsoft.com/en-us/fabric/release-|](https://learn.microsoft.com/en-us/fabric/release-)



Authentication method

Anonymous



Privacy level setting for this data source [Learn more](#)

Public



[Go to the app documentation ↗](#)

Back

Sign in and connect

Cancel

5. The report connects to the data sources and is populated with up-to-date data. You see sample data while the refresh is in progress.

Microsoft Fabric Release Plan 2/19/2025, 6:51:05 AM

Microsoft Fabric Release Plan

You're viewing this app with sample data. Refresh is in progress.

MICROSOFT Release Plan

When the data refresh is complete, you're in the workspace associated with the app.

Set up a report refresh schedule

To keep the report data up to date, you can [set up a refresh schedule](#).

Customize and share

For details, see [Customize and share the app](#).

Resources

- Help improve Microsoft Fabric by [submitting an idea](#).
- Questions? [Try asking the Microsoft Fabric Community](#).

Related content

- [What are Microsoft Fabric template apps?](#)
- [Install and distribute template apps in your organization](#)

Microsoft Fabric preview information

Article • 01/26/2025

This article describes the meaning of *preview* in Microsoft Fabric, and explains how preview experiences and features can be used.

Preview experiences and features are released with limited capabilities, but are made available on a *preview* basis so customers can get early access and provide feedback.

Preview experiences and features:

- Are subject to separate [supplemental preview terms](#).
- Aren't meant for production use.
- Are not subject to SLAs and support is provided as best effort in certain cases. However, Microsoft Support is eager to get your feedback on the preview functionality, and might provide best effort support in certain cases.
- May have limited or restricted functionality.
- May be available only in selected geographic areas.

Who can enable a preview experiences and features

To enable a preview experience or feature, you need to have a *Fabric administrator admin role*.

Note

When a preview feature is delegated, it can be enabled by a [capacity admin](#) for that capacity.

How do I enable a preview experience or feature

To enable a preview experience or feature, follow these steps:

1. Navigate to the [admin portal](#).

2. Select tenant settings tab.
 3. Select the preview experience or experience you want to enable.
 4. Enable experience using the tenant setting.
-

Feedback

Was this page helpful?



[Provide product feedback ↗](#) | [Ask the community ↗](#)

Use Fabric Home to find, personalize, and manage content

10/02/2025

Home is your personalized Fabric start page. Use it to find items and workspaces, multitask with tabs, personalize settings, and get contextual help to work faster.

Home at a glance

Home is your personalized start page. It shows supported item types (apps, reports, warehouses, lakehouses, notebooks, task flows, and more) you can access. Some preview or restricted item types might not appear.

The screenshot shows the Microsoft Fabric Home interface. A vertical navigation pane on the left contains icons for Home, Workspaces, OneLake, Monitor, Real-Time, Workloads, and Retail sales. A red circle labeled '1' is over the Home icon. A red circle labeled '2' is over the Fabric icon in the navigation bar. A red circle labeled '3' is over the 'New workspace' button. A red circle labeled '4' is over the 'Switch tenant' button in the top right. A red circle labeled '5' is over the 'Ingest data into Fabric' tutorial card. A red circle labeled '6' is over the 'Recent workspaces' tab in the quick access section. The main area features a 'Welcome to Fabric' banner, workspace cards, and a 'Learn more about Fabric' section with three cards: 'What is Microsoft Fabric?', 'Ingest data into Fabric', and 'Build a lakehouse'. The top right corner shows a user profile for Pradtanna Kurasatta, tenant information, trial status, and a 'Sign out' button.

Key areas:

1. Navigation pane (nav pane): Switch views (Home, Browse, Workloads, OneLake, and more) and open workspaces
2. Fabric and Power BI switcher
3. Create: Start a new item or task flow

4. Top bar: Search, Help (?), Feedback, Notifications, Settings, and Account manager
5. Learning and getting started resources
6. Your content: Recent workspaces, recent items, and favorites

 **Important**

Home lists only supported content you can access. If a license or subscription change removes access, Fabric prompts you to upgrade or start a trial.

Work with workspaces

A workspace is a collaborative container for related items.

Open a workspace:

1. Select **Workspaces** in the nav pane, then select a workspace.
2. Enter part of the workspace name in global search and select the workspace.
3. Use the workspace selector at the bottom of the nav pane.
4. Open an item in a workspace to activate that workspace.

Workspace behavior:

- If no workspace is open, **My workspace** opens by default.
- When you create a new item, it's added to the active workspace unless you choose a different one. Most creation dialogs default to the active workspace.
- If task flow templates are enabled in your tenant, they appear in the first row on Home to help you start structured solutions. See [Task flows in Microsoft Fabric](#).

For governance details, see [Workspaces](#).

Create items and explore workloads

Workloads are Fabric capability areas, like Data Factory, Data Engineering, and Real-Time Intelligence.

To explore:

1. Select **Workloads** in the nav pane to open the Workload hub.
2. Review available workloads and their landing pages (overview, supported item types, samples, learning links).
3. Open a workload to create items for that capability.

Note

Your organization or Microsoft can add more workloads over time. Tabs in the Workload hub refresh as new workloads are provisioned.

More about workloads: [Workloads in Fabric](#).

Multitask with tabbed navigation to access resources (preview)

The tabbed navigation allows you to work with multiple items and workspaces at the same time. It enhances navigation and reduces the need to switch context.

Tabs for open items

When you create or open an item, it appears in a tab horizontally across the top of the Fabric portal and shows the item name, icon for the item type (for example, notebook, pipeline, semantic model, and so on). You can hover over the tab to view the workspace it's created in. You can drag a tab to the required position. Tabs make it easier to identify and switch between open items without losing focus.

Note

The tabbed navigation is only available in the Fabric view, not in Power BI view. For instance, when you switch to the Power BI view from the left nav switcher, the tabbed experience isn't available.

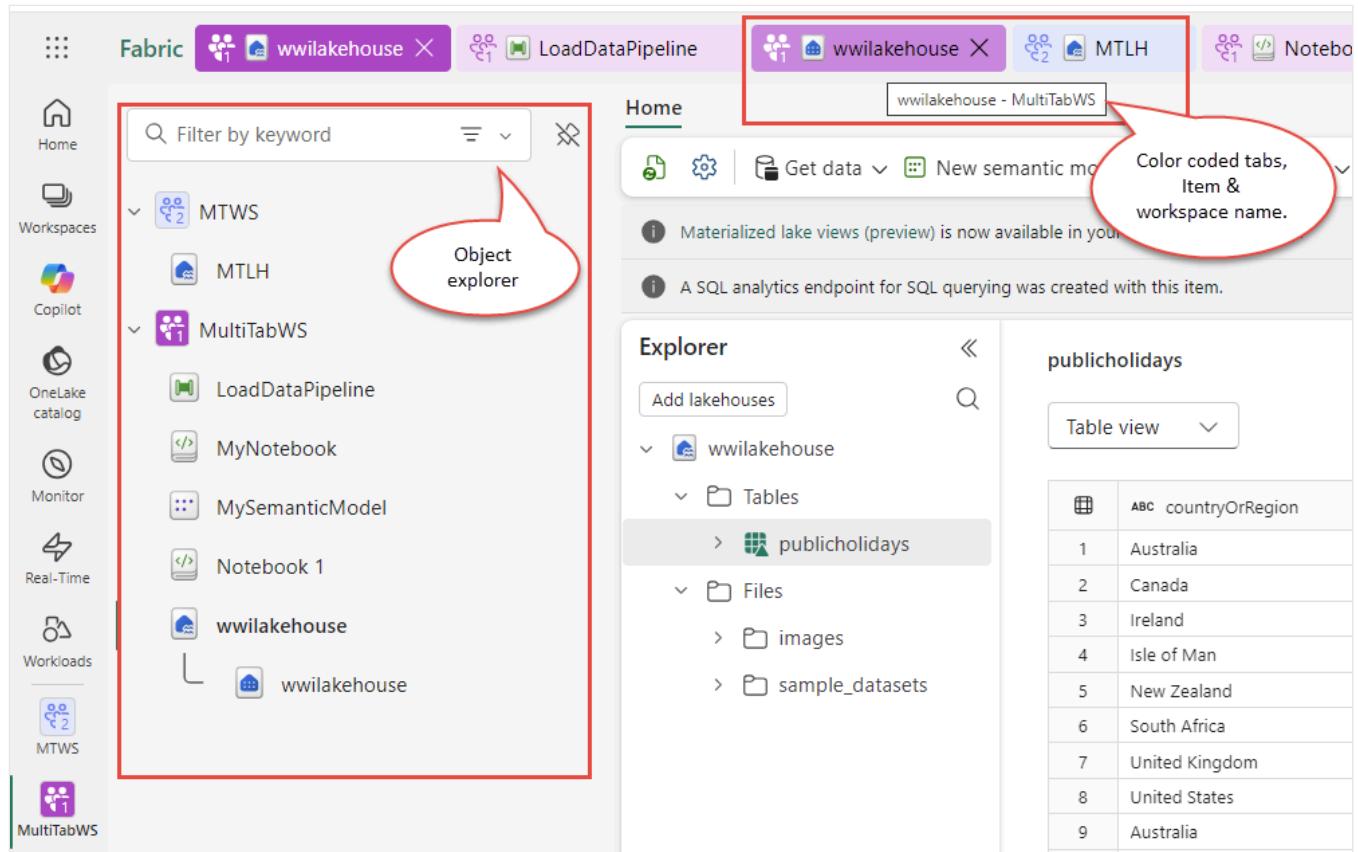
Multiple open workspaces

You can open and work across multiple workspaces side by side. Items are color-coded and numbered to indicate which workspace they belong to. This feature helps reduce confusion and improves context when working in multiple environments.

Object explorer

The object explorer provides a structured view of items across all your currently open workspaces. Use it to quickly locate and open resources without having to switch between pages. You can pin the object explorer for easy access. Use the filter option to view items of a

specific type or search for an item by a keyword. The items are organized by the hierarchy they belong to.



Keyboard shortcuts for Object Explorer and Horizontal Tabs

Use keyboard shortcuts in horizontal tabs and object explorer to switch between items, expand or collapse folders, and jump to a specific tabs. This functionality is similar to an IDE environment.

Prerequisites:

- Switch to the Fabric view using the lower-left experience switcher.
- Enable the multitasking (horizontal tabs and object explorer) feature.

Keyboard shortcuts in Object Explorer

Object explorer helps you browse workspaces, folders, and items. You can use the following shortcuts to quickly navigate:

Expand table

Action	Shortcut
Expand workspace or subfolder	→ Right arrow

Action	Shortcut
Collapse workspace or subfolder	← Left arrow
Navigate to the previous object	↑ Up arrow (If the object is a collapsed workspace/subfolder, Left arrow functions the same as Up arrow)
Navigate to the next object	↓ Down arrow (If the object is an expanded workspace/subfolder, Right arrow functions the same as Down arrow)

Use keyboard shortcuts in horizontal tabs

Horizontal tabbing lets you switch between multiple open items. Use these shortcuts to move efficiently across tabs:

[\[\] Expand table](#)

Action	Shortcut
Navigate to the Nth tab	* Windows: Alt + Number (1–9) * MacOS: Control + Number (1–9)

More open items

The previous limit of 10 open items has been increased. You can keep more resources active at once. This is especially useful for complex workflows that require multiple pipelines, notebooks, or reports.

! Note

These multitasking features are rolling out in phases starting mid September 2025. Availability might vary across tenants as the rollout progresses.

Find content fast: Search, filter, sort

Use the following table to compare Fabric's search and filtering tools. Use global search for broad, cross-workspace discovery (names, creators, tags), the local keyword filter to narrow the current view, sorting to quickly order columns, and the Filters panel for precise refinements by type, time, or owner.

Feature	How to use	Notes / examples
Global search	Use the search box in the top bar to find items by name, title, creator, tag, or workspace. Results show only content you can access.	Examples: part of a report name; a colleague's name to see items they shared; a tag (if tagging is enabled)—see Tags overview . Tag results appear only if your organization enables tagging.
Local keyword filtering	Use the Filter by keyword field on canvases (for example, Browse) to narrow the current list without leaving the page.	Applies only to the current view.
Sorting	Select a column header (for example, Name or Refreshed) to sort; select again to toggle direction.	Not all columns are sortable—hover to confirm.
Filters panel	Select Filter (upper-right of a content list) to refine results by type, time, and owner.	Examples: Type (report, notebook), Time (recently accessed or modified), Owner (creator).

Considerations

 Note

Global search uses Azure AI Search. It isn't available in sovereign clouds or regions where Azure AI Search isn't supported. Tag and community content visibility depend on feature enablement. See [Azure AI Search regions](#).

Use the help pane effectively

Select the ? icon to open the contextual Help pane:

- Feature-aware view: Shows topics and community discussions relevant to the current screen.
- Forum topics: Community posts tied to on-screen features (shown when the tenant enables forum integration).
- Other resources: Support and feedback links.
- Search box: Enter keywords to search documentation and forums; use the dropdown to refine.

Keep it docked as you work or close it to reclaim space. Use the back arrow to return to the default view.

Personalize via settings

Select the gear icon in the top bar to open settings. Links shown depend on your role (for example, admin vs contributor) and enabled preview features.

 Expand table

Section	What you can do
Preferences	Set display language, personalize UI behavior, manage notifications, configure item settings (per item type), enable developer mode (where applicable).
Resources and extensions	Manage personal and group storage, Power BI item settings, connections and gateways, embed codes, Azure Analysis Services migrations.
Governance and insights	Access the Admin portal (if permitted) and Microsoft Purview hub (preview) for governance and compliance insights.

Learn more: [Admin portal](#) • [Microsoft Purview hub \(preview\)](#)

Manage your account, notifications, and feedback

- Account manager (profile photo): View license info, trial status, organizational context
- Notifications: Alerts, system messages, subscriptions
- Feedback: Send product feedback to Microsoft
- Settings: Open the settings pane
- Help (?): Open contextual help and search

For licensing guidance, see [Licenses](#). For trial info, see [Start a Fabric trial](#).

Get support

If self-help doesn't solve your problem:

- Open the **Help** pane and scroll to **Support links**.
- Ask the community in the forums.
- If entitled, open a support ticket. See [Support options](#).

Tips to stay efficient

- Pin only the nav pane buttons you use often. Use right-click or the ellipsis (...) menu > **Unpin / Pin** (UI may vary).
- Use tabs and **Object explorer** (preview) to reduce context switching.

- Use global search for infrequently used items; refine with filters.
- Keep **Help** open while you learn a new workload.
- Review settings regularly as your workflow evolves.

Related content

- [Workspaces](#)
- [Task flows in Microsoft Fabric](#)
- [Get in-product help](#)
- [Workloads in Fabric](#)
- [Start a Fabric trial](#)
- [Licenses](#)

 **Note:** The author created this article with assistance from AI. [Learn more](#)

OneLake catalog overview

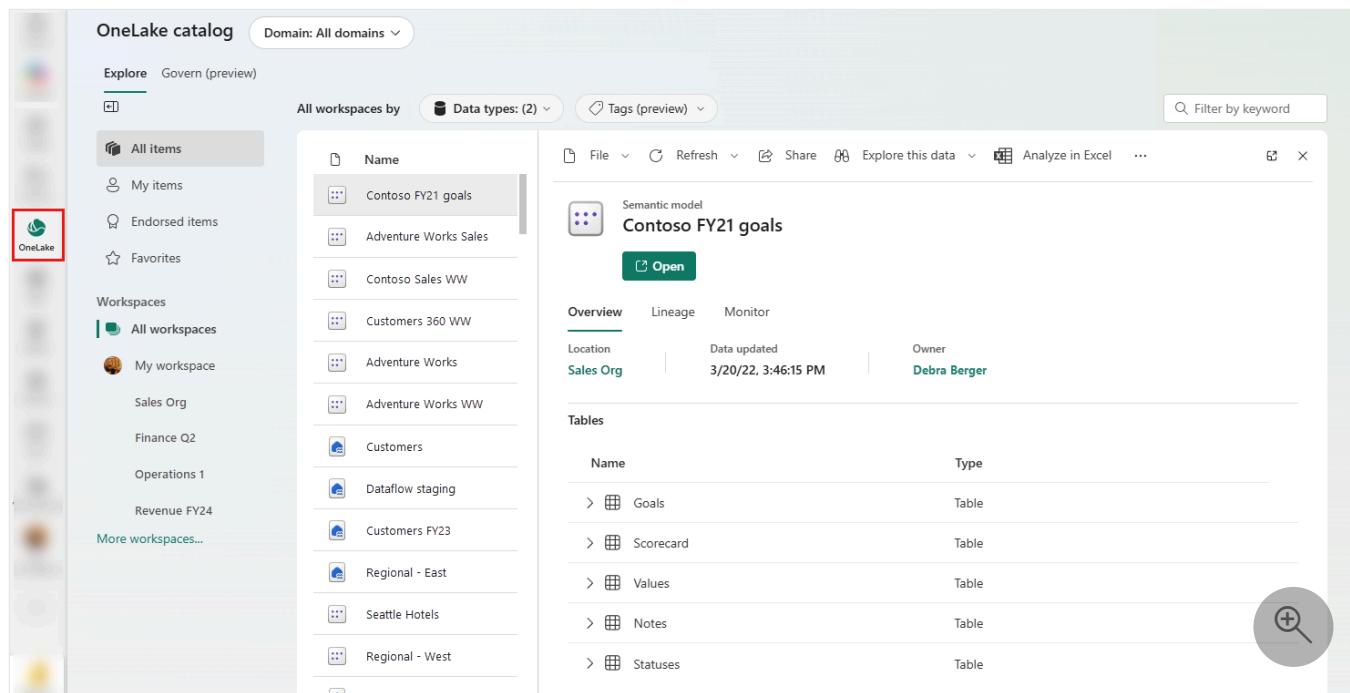
09/08/2025

OneLake catalog is a centralized place that helps you find, explore, and use the Fabric items you need, and govern the data you own. It features two tabs:

- **Explore tab:** The explore tab has an items list with an in-context item details view that makes it possible to browse through and explore items without losing your list context. It also provides selectors and filters to narrow down and focus the list, making it easier to find what you need. By default, the OneLake catalog opens on the Explore tab. Along with the OneLake catalog, you can open and work across multiple workspaces side by side using the [object explorer](#).
- **Govern tab:** The govern tab provides insights that help you understand the governance posture of all the data you own in Fabric, and presents recommended actions you can take to improve the governance status of your data.

Open the OneLake catalog

To open the OneLake catalog, select the OneLake icon in the Fabric navigation pane. Select the tab you're interested if it's not displayed by default.



Related content

- [Discover and explore Fabric items in the OneLake catalog](#)
- [View item details](#)

- Govern your data in Fabric
- Endorsement
- Fabric domains
- Lineage in Fabric
- Monitor hub

End-to-end tutorials in Microsoft Fabric

Article • 05/19/2025

In this article, you find a comprehensive list of end-to-end tutorials available in Microsoft Fabric. These tutorials guide you through a scenario that covers the entire process, from data acquisition to data consumption. They're designed to help you develop a foundational understanding of the Fabric UI, the various experiences supported by Fabric and their integration points, and the professional and citizen developer experiences that are available.

Multi-experience tutorials

The following table lists tutorials that span multiple Fabric experiences.

 Expand table

Tutorial name	Scenario
Lakehouse	In this tutorial, you ingest, transform, and load the data of a fictional retail company, Wide World Importers, into the lakehouse and analyze sales data across various dimensions.
Data Science	In this tutorial, you explore, clean, and transform a taxicab trip semantic model, and build a machine learning model to predict trip duration at scale on a large semantic model.
Real-Time Intelligence	In this tutorial, you use the streaming and query capabilities of Real-Time Intelligence to analyze London bike share data. You learn how to stream and transform the data, run KQL queries, build a Real-Time Dashboard and a Power BI report to gain insights and respond to this real-time data.
Digital twin builder (preview) in Real-Time Intelligence	In this tutorial, you set up a digital twin builder (preview) item and use it to contextualize sample data streamed from Real-Time Intelligence. Then you project your data to Eventhouse using a Fabric notebook, and extract further insights by running KQL queries and visualizing the digital twin builder data in a Real-Time Dashboard.
Data warehouse	In this tutorial, you build an end-to-end data warehouse for the fictional Wide World Importers company. You ingest data into data warehouse, transform it using T-SQL and pipelines, run queries, and build reports.
Fabric SQL database	The tutorial provides a comprehensive guide to utilizing the SQL database in Fabric . This tutorial is tailored to help you navigate through the process of database creation, setting up database objects, exploring autonomous features, and combining and visualizing data. Additionally, you learn how to create a GraphQL endpoint, which serves as a modern approach to connecting and querying your data efficiently.

Tutorial name	Scenario
Fabric Activator	The tutorial is designed for customers who are new to Fabric Activator. Using a sample eventstream, you learn your way around Activator. Once you're familiar with the terminology and interface, you create your own object, rule, and activator.

Experience-specific tutorials

The following tutorials walk you through scenarios within specific Fabric experiences.

 Expand table

Tutorial name	Scenario
Power BI	In this tutorial, you build a dataflow and pipeline to bring data into a lakehouse, create a dimensional model, and generate a compelling report.
Data Factory	In this tutorial, you ingest data with data pipelines and transform data with dataflows, then use the automation and notification to create a complete data integration scenario.
Data Science end-to-end AI samples	In this set of tutorials, learn about the different Data Science experience capabilities and examples of how ML models can address your common business problems.
Data Science - Price prediction with R	In this tutorial, you build a machine learning model to analyze and visualize the avocado prices in the US and predict future prices.
Application lifecycle management	In this tutorial, you learn how to use deployment pipelines together with git integration to collaborate with others in the development, testing, and publication of your data and reports.
Digital twin builder (preview)	In this tutorial, you model and contextualize data from multiple sources into a digital twin builder (preview) ontology. You explore the ontology with queries, then create a Power BI dashboard to visualize the data.

Related content

- [Create a workspace](#)
- Discover data items in the [OneLake data hub](#)

Workspaces in Microsoft Fabric and Power BI

06/06/2025

Workspaces are places to collaborate with colleagues to create collections of items such as lakehouses, warehouses, and reports, and to create task flows. This article describes workspaces, how to manage access to them, and what settings are available.

If you're just interested in creating a workspace, see [Create a workspace](#).

The screenshot shows the Microsoft Fabric workspace interface. At the top, there's a navigation bar with links for 'Create deployment pipeline', 'Create app', 'Manage access', and 'Workspace settings'. Below the navigation bar is a search bar with filters and a 'Get started with a task flow' section. The main area displays a list of workspace items:

Name	Type	Task	Owner	Refreshed	Next refresh	Endorsement	Sensitivity	Included in app
Visualizations	Folder	—	—	—	—	—	—	—
DataflowsStagingLakehouse	Lakehouse	Debra Berger	—	—	—	—	Confidential ⓘ	—
DataflowsStagingLakehouse	Semantic model (...)	Contoso Sample ...	4/11/24, 10:14 AM	N/A	—	—	Confidential ⓘ	—
DataflowsStagingWarehouse	SQL analytics end...	Contoso Sample ...	—	N/A	—	—	Confidential ⓘ	—
DataflowsStagingWarehouse	Warehouse	Debra Berger	—	N/A	—	—	Confidential ⓘ	—
DataflowsStagingWarehouse	Semantic model (...)	Contoso Sample ...	4/11/24, 10:14 AM	N/A	—	—	Confidential ⓘ	—
MyNewNotebook	Notebook	Debra Berger	—	—	—	—	Confidential ⓘ	—
MyPipeline	Data pipeline	Debra Berger	—	—	—	—	Confidential ⓘ	—

Work with workspaces

Here are some useful tips about working with workspaces.

- **Set up a task flow for the workspace** to organize your data project and to help others understand and work on your project. Read more about [task flows](#).
- **Pin workspaces** to the top of the workspace flyout list to quickly access your favorite workspaces. Read more about [pin workspaces](#).
- **Use granular workspace roles** for flexible permissions management in the workspaces: Admin, Member, Contributor, and Viewer. Read more about [workspace roles](#).

- **Create folders in the workspace:** Organize and manage artifacts in the workspace. Read more about [creating folders in workspaces](#).
- **Navigate to current workspace** from anywhere by selecting the icon on left nav pane. Read more about [current workspace](#) in this article.
- **Workspace settings:** As workspace admin, you can update and manage your workspace configurations in [workspace settings](#).
- **Manage a workspace in Git:** Git integration in Microsoft Fabric enables Pro developers to integrate their development processes, tools, and best practices straight into the Fabric platform. Learn how to [manage a workspace with Git](#).
- **Contact list:** Specify who receives notification about workspace activity. Read more about [workspace contact lists](#) in this article.

Current workspace

After you select and open a workspace, this workspace becomes your current workspace. You can quickly navigate to it from anywhere by selecting the workspace icon from left nav pane.

The screenshot shows the Microsoft Power BI Home page. On the left is a vertical sidebar with icons for various features: Home, Copilot, Create, Browse, OneLake, Apps, Metrics, Monitor, Learn, Real-Time, Workloads, Workspaces, and a Sample-workspace1 icon which is highlighted with a red box. The main area has a city skyline background. At the top right is a search bar. In the center, there's a green button labeled '+ New report' and a dropdown menu icon. Below these are two cards under the heading 'Recommended': 'You frequently open this' (Content Engagement Report) and 'You favorited this' (Customer Profitability Sample). At the bottom of the main area is a toolbar with buttons for All, Recent, Shared, Favorites, and My apps. A table below the toolbar lists workspaces: Sample-workspace1 (Type: Workspace).

Name	Type
Sample-workspace1	Workspace

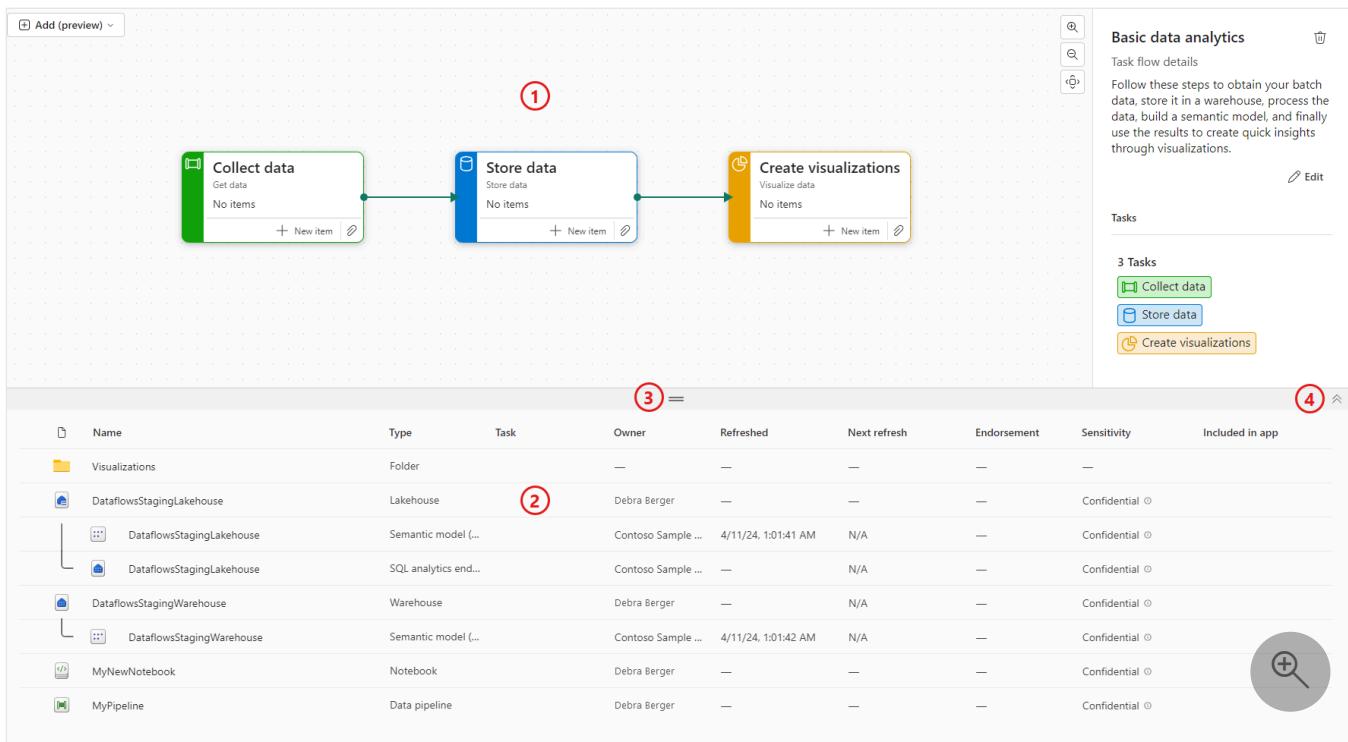
Workspace layout

A workspace consists of a header, a toolbar, and a view area. There are two views that can appear in the view area: list view and lineage view. You select the view you want to see with controls on the toolbar. The following image shows these main workspace components, with list view selected.

1. **Header:** The header contains the name and brief description of the workspace, and also links to other functionality.
2. **Toolbar:** The toolbar contains controls for adding items to the workspace and uploading files. It also contains a search box, filter, and the list view and lineage view selectors.
3. **List view and lineage view selectors:** The list view and lineage view selectors enable you to choose which view you want to see in the view area.
4. **View area:** The view area displays either list view or lineage view.

List view

List view is divided into the task flow and the items list.



- 1. Task flow:** The task flow is where you can create or view a graphical representation of your data project. The task flow shows the logical flow of the project - it doesn't show the flow of data. Read more about [task flows](#).
- 2. Items list:** The items list is where you see the items and folders in the workspace. If you have tasks in the task flow, you can filter the items list by selecting the tasks.
- 3. Resize bar:** You can resize the task flow and items list by dragging the resize bar up or down.
- 4. Show/Hide task flow:** If you don't want to see the task flow, you can hide it using the hide/show arrows at the side of the separator bar.

Lineage view

Lineage view shows the flow of data between the items in the workspace. Read more about [lineage view](#).

Workspace settings

Workspace admins can use workspace settings to manage and update the workspace. The settings include general settings of the workspace, like the basic information of the workspace, contact list, SharePoint, license, Azure connections, storage, and other experiences' specific settings.

To open the workspace settings, you can select the workspace in the nav pane, then select **More options (...) > Workspace settings** next to the workspace name.

The screenshot shows the Microsoft Power BI interface. On the left, there's a vertical sidebar with icons for Home, Create, Browse, OneLake, and Apps. The main area is titled "Workspaces" and shows a search bar with "sample-". Below it, a list starts with "All" and "Sample-workspace1". A context menu is open over the workspace name, with options "Workspace settings" and "Workspace access". The "Workspace settings" option is highlighted with a red box.

You can also open it from the workspace page.

The screenshot shows the Microsoft Power BI workspace page for "Sample-workspace1". At the top, there are navigation links for Home, Create, and Browse. Below the title, there are buttons for "+ New", "Upload", "Create app", and "Manage access". To the right of "Manage access", there is a link "Workspace settings" which is highlighted with a red box. The main area displays a table with columns for Name, Type, and Owner, along with a search icon.

Workspace contact list

The Contact list feature allows you to specify which users receive notification about issues occurring in the workspace. By default, the one who created the workspace is in the contact list. You can add others to that list while [creating workspace](#) or in workspace settings after creation. Users or groups in the contact list are also listed in the user interface (UI) of the workspace settings, so workspace users know whom to contact.

The screenshot shows the 'Workspace settings' page for a Microsoft Fabric workspace. On the left, there's a sidebar with tabs like 'About', 'Premium', 'Azure connections', 'System storage', 'Git integration', 'OneLake', and 'Other'. The 'About' tab is highlighted with a red box. Below it, there's a dropdown menu for 'Power BI'. The main area has several sections: 'Workspace image' with upload and reset buttons; 'Name' set to 'New Retail Analysis'; 'Description' with a placeholder 'Describe this workspace (Optional)'; 'Domain' with a dropdown menu set to 'Assign to a domain (optional)'; 'Contact list' which contains a single entry 'Sample User' with an 'X' button to remove it; and 'Workspace OneDrive' with an optional field '(Optional)'. A red box highlights the 'Contact list' section.

Microsoft 365 and SharePoint

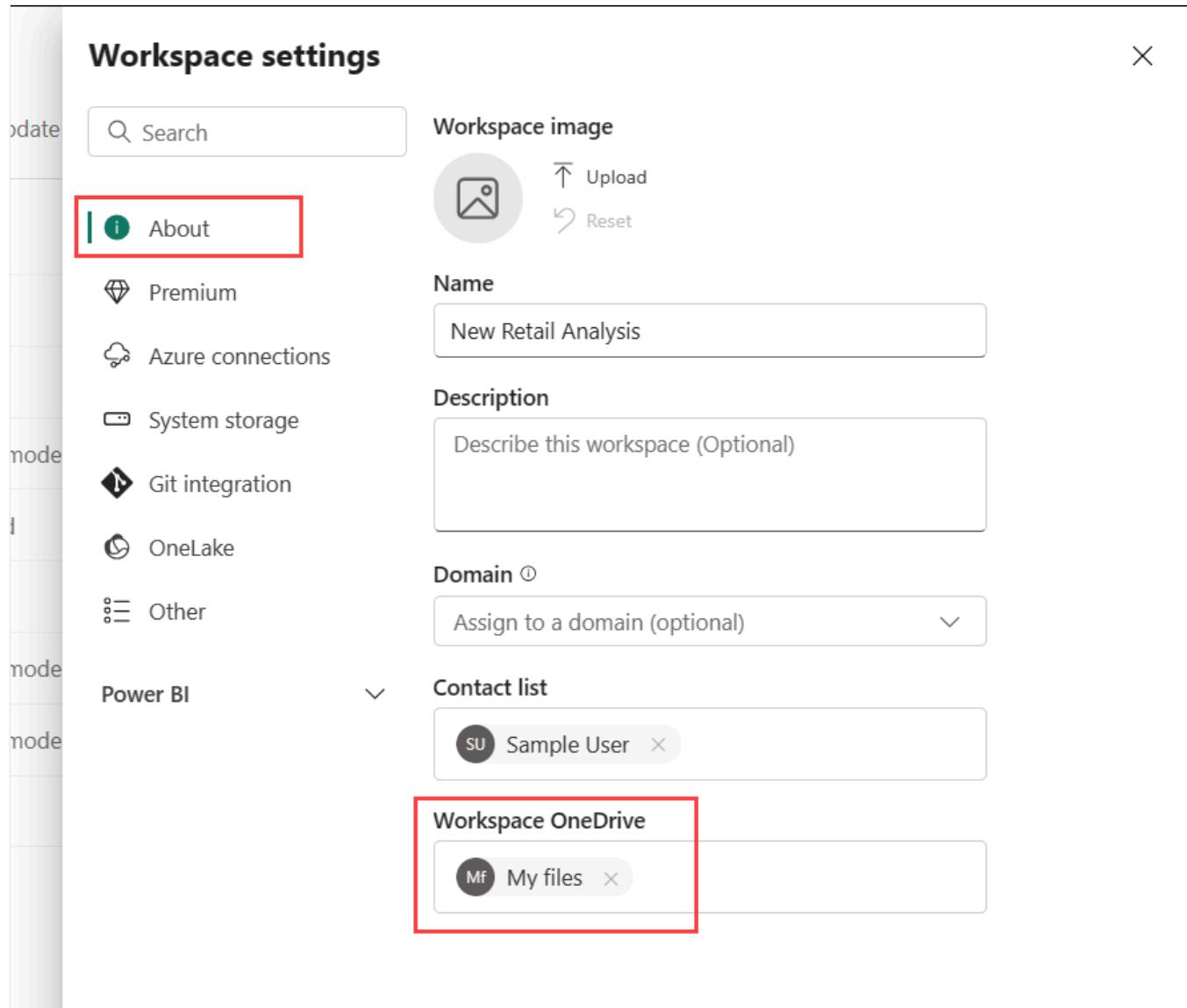
The Workspace SharePoint feature allows you to configure a Microsoft 365 Group whose SharePoint document library is available to workspace users. You create the Group outside of Microsoft Fabric first, with one available method being from SharePoint. Read about creating a [SharePoint shared library](#).

(!) Note

Creating Microsoft 365 Groups may be restricted in your environment, or the ability to create them from your SharePoint site may be disabled. If this is the case, speak with your IT department.

Microsoft Fabric doesn't synchronize permissions between users or groups with workspace access, and users or groups with Microsoft 365 Group membership. A best practice is to [give access to the workspace](#) to the same Microsoft 365 Group whose file storage you configured. Then manage workspace access by managing membership of the Microsoft 365 Group.

You can configure SharePoint in workspace settings by typing in the name of the Microsoft 365 group that you created earlier. Type just the name, not the URL. Microsoft Fabric automatically picks up the SharePoint for the group.



The screenshot shows the 'Workspace settings' page for a workspace named 'New Retail Analysis'. The 'About' tab is selected. The 'Workspace OneDrive' section shows 'My files' assigned, which is highlighted with a red box. Other sections include 'Name' (New Retail Analysis), 'Description' (Describe this workspace (Optional)), 'Domain' (Assign to a domain (optional)), 'Contact list' (Sample User), and 'Power BI' (dropdown menu).

License mode

By default, workspaces are created in your organization's shared capacity. When your organization has other capacities, workspaces including My Workspaces can be assigned to any capacity in your organization. You can configure it while creating a workspace or in **Workspace settings -> Premium**. Read more about [licenses](#).

Workspace settings

Update

- About
- Premium
- Azure connections
- System storage
- Git integration
- OneLake
- Other

Power BI

Choose a license

License mode ①

Pro
Select Pro to use basic Power BI features and collaborate on reports, dashboards, and scorecards. To access a Pro workspace, users need Pro per-user licenses. [Learn more ↗](#)

Premium per-user
Select Premium per-user to collaborate using Power BI Premium features, including paginated reports, dataflows, and datamarts. To collaborate and share content in a Premium per-user workspace, users need Premium per-user licenses. [Learn more ↗](#)

Premium capacity
Select premium capacity if the workspace will be hosted in a premium capacity. When you share, collaborate on, and distribute Power BI and Microsoft Fabric content, users in the viewer role can access this content without needing a Pro or Premium per-user license.
[Learn more ↗](#)

Embedded ①
Select embedded if the workspace will be hosted in an Azure embedded capacity. ISVs and developers use Power BI Embedded to embed visuals and analytics in their applications.
[Learn more ↗](#)

Fabric capacity
Select Fabric capacity if the workspace will be hosted in a Microsoft Fabric capacity. With Fabric capacities, users can create Microsoft Fabric items and collaborate with others using Fabric features and experiences. Explore new capabilities in Power BI, Data Factory, Data Engineering, and Real-Time Analytics, among others. [Learn more ↗](#)

Trial
Select the free trial per-user license to try all the new features and experiences in Microsoft Fabric for 60 days. A Microsoft Fabric trial license allows users to create Microsoft Fabric items and collaborate with others in a Microsoft Fabric trial capacity. Explore new capabilities in Power BI, Data Factory, Data Engineering, and Real-Time Analytics, among others.
[Learn more ↗](#)

Azure connections configuration

Workspace admins can configure dataflow storage to use Azure Data Lake Gen 2 storage and Azure Log Analytics (LA) connection to collect usage and performance logs for the workspace in workspace settings.

The screenshot shows the 'Workspace settings' page in the Power BI service. On the left, there's a sidebar with various options like 'Update', 'Search', 'About', 'Premium', 'Azure connections' (which is highlighted with a red box), 'System storage', 'Git integration', 'OneLake', 'Other', and 'Power BI'. The main content area has two sections: 'Azure Data Lake Gen2 Storage' and 'Azure Log Analytics'. Under 'Azure Data Lake Gen2 Storage', there's a note about connecting to an Azure Data Lake Gen2 storage account, a checkbox for 'Use the default Azure connection', and a button to 'Connect an Azure Data Lake Gen2 storage account'. Under 'Azure Log Analytics', there's a note about connecting to an Azure Log Analytics workspace, a link to 'Learn more about Azure Log Analytics', and a button to 'Configure Azure Log Analytics'. A search bar and a plus sign icon are at the bottom right.

With the integration of Azure Data Lake Gen 2 storage, you can bring your own storage to dataflows, and establish a connection at the workspace level. Read [Configure dataflow storage to use Azure Data Lake Gen 2](#) for more detail.

After the connection with Azure Log Analytics (LA), activity log data is sent continuously and is available in Log Analytics in approximately 5 minutes. Read [Using Azure Log Analytics](#) for more detail.

System storage

System storage is the place to manage your semantic model storage in your individual or workspace account so you can keep publishing reports and semantic models. Your own semantic models, Excel reports, and those items that someone has shared with you, are included in your system storage.

In the system storage, you can view how much storage you have used and free up the storage by deleting the items in it.

Keep in mind that you or someone else may have reports and dashboards based on a semantic model. If you delete the semantic model, those reports and dashboards don't work anymore.

Workspace settings

Update Search 0 MB used of 10 GB (0.00%) 10 GB available

0 MB Owned by me

- About
- Premium
- Azure connections
- System storage**
- Git integration
- OneLake
- Other

Name	Size	Type	Related objects
Retail Analysis Sample small mul...	10 MB	Dataset	Retail Analysis small multi...
Retail Analysis Sample	10 MB	Dataset	Retail Analysis Sample, N...
Usage Metrics Report	1 MB	Dataset	Usage Metrics Report
Power BI Content Engagement S...	1 MB	Dataset	Power BI Content Engage...

Power BI  

Remove the workspace

As an admin for a workspace, you can delete it. When you delete the workspace, everything contained within the workspace is deleted for all group members, and the associated app is also removed from AppSource.

In the Workspace settings pane, select **Other > Remove this workspace**.

Workspace settings

Update Search Delete this workspace and all data and items in it?

This workspace will be permanently deleted after a retention period of 90 days, as defined by your Fabric administrator. Contact your Fabric administrator if you need to restore the workspace and recover the items in it during this retention period.

- About
- Premium
- Azure connections
- System storage
- Git integration
- OneLake
- Other**

Remove this workspace 

Power BI  



If the workspace you're deleting has a workspace identity, that workspace identity will be irretrievably lost. In some scenarios this could cause Fabric items relying on the workspace identity for trusted workspace access or authentication to break. For more information, see [Delete a workspace identity](#).

Administering and auditing workspaces

Administration for workspaces is in the Microsoft Fabric admin portal. Microsoft Fabric admins decide who in an organization can create workspaces and distribute apps. Read about [managing users' ability to create workspaces](#) in the "Workspace settings" article.

Admins can also see the state of all the workspaces in their organization. They can manage, recover, and even delete workspaces. Read about [managing the workspaces themselves](#) in the "Admin portal" article.

Auditing

Microsoft Fabric audits the following activities for workspaces.

[] [Expand table](#)

Friendly name	Operation name
Created Microsoft Fabric folder	CreateFolder
Deleted Microsoft Fabric folder	DeleteFolder
Updated Microsoft Fabric folder	UpdateFolder
Updated Microsoft Fabric folder access	UpdateFolderAccess

Read more about [Microsoft Fabric auditing](#).

Sign-in problems

See the following table if you have trouble signing in.

[] [Expand table](#)

Message	Meaning	How to fix
browser_storage_unsupported	Your browser is blocking access to storage, which	- Check your browser's privacy settings. - Make sure cookies and local storage (like

Message	Meaning	How to fix
	is required for signing in.	<p><code>sessionStorage</code> or <code>localStorage</code>) are allowed.</p> <ul style="list-style-type: none"> - Try disabling any extensions that might block storage access.
<code>cluster_resolution_failure_401</code>	Your network or proxy is blocking authentication headers needed to connect to the service.	<ul style="list-style-type: none"> - Ask your IT admin to add <code>app.powerbi.com</code> to the allowlist of your proxy or firewall. This helps your network keep the necessary login information in place when trying to connect to the service.

Considerations and limitations

Limitations to be aware of:

- Workspaces can contain a maximum of 1,000 Fabric and Power BI items.
- Certain special characters aren't supported in workspace names when using an XMLA endpoint. As a workaround, use URL encoding of special characters, for example, for a forward slash /, use %2F.
- A user or a [service principal](#) can be a member of up to 1,000 workspaces.

Related content

- [Create workspaces](#)
- [Give users access to workspaces](#)

Create a workspace

09/08/2025

This article explains how to create *workspaces* in Microsoft Fabric. In workspaces, you create collections of items such as lakehouses, warehouses, and reports. For more background, see the [Workspaces](#) article.

To create a workspace:

1. In the nav pane, select **Workspaces**.
2. At the bottom of the Workspace pane that opens, select **New workspace**.
3. The **Create a workspace** pane opens.

- Give the workspace a unique name (mandatory).
- Provide a description of the workspace (optional).
- Assign the workspace to a domain (optional).

If you are a domain contributor for the workspace, you can associate the workspace to a domain, or you can change an existing association. For information about domains, see [Domains in Fabric](#).

4. When done, either continue to the advanced settings, or select **Apply**.

You can open and work across multiple workspaces side by side. Items are color-coded and numbered to indicate which workspace they belong to. To learn more see, [Object explorer and tabbed navigation in Fabric portal](#).

Advanced settings

Expand **Advanced** and you see advanced setting options:

Contact list

Contact list is a place where you can put the names of people as contacts for information about the workspace. Accordingly, people in this contact list receive system email notifications for workspace level changes.

By default, the first workspace admin who created the workspace is the contact. You can add other users or groups according to your needs. Enter the name in the input box directly, it helps you to automatically search and match users or groups in your org.



sampleuser (Owner) 



test 

Enter users and groups

License mode

Different [license](#) mode provides different sets of feature for your workspace. After the creation, you can still change the workspace license type in workspace settings, but some migration effort is needed.

Note

Currently, if you want to downgrade the workspace license type from Premium capacity to Pro (Shared capacity), you must first remove any non-Power BI Fabric items that the workspace contains. Only after you remove such items will you be allowed to downgrade the capacity. For more information, see [Moving data around](#).

Default storage format

Power BI semantic models can store data in a highly compressed in-memory cache for optimized query performance, enabling fast user interactivity. With Premium capacities, large semantic models beyond the default limit can be enabled with the Large semantic model storage format setting. When enabled, semantic model size is limited by the Premium capacity size or the maximum size set by the administrator. Learn more about [large semantic model storage format](#).

Template apps

[Power BI template apps](#) are developed for sharing outside your organization. If you check this option, a special type of workspace (template app workspace) is created. It's not possible to revert it back to a normal workspace after creation.

Dataflow storage (preview)

Data used with Power BI is stored in internal storage provided by Power BI by default. With the integration of dataflows and Azure Data Lake Storage Gen 2 (ADLS Gen2), you can store your dataflows in your organization's Azure Data Lake Storage Gen2 account. Learn more about [dataflows in Azure Data Lake Storage Gen2 accounts](#).

Give users access to your workspace

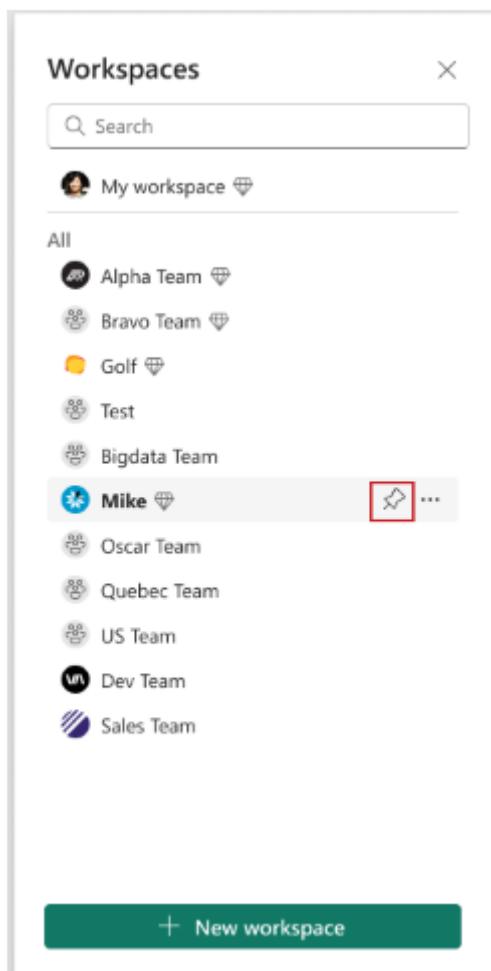
Now that you've created the workspace, you'll want to add other users to *roles* in the workspace, so you can collaborate with them. See these articles for more information:

- [Give users access to a workspace](#)
- [Roles in workspaces](#)

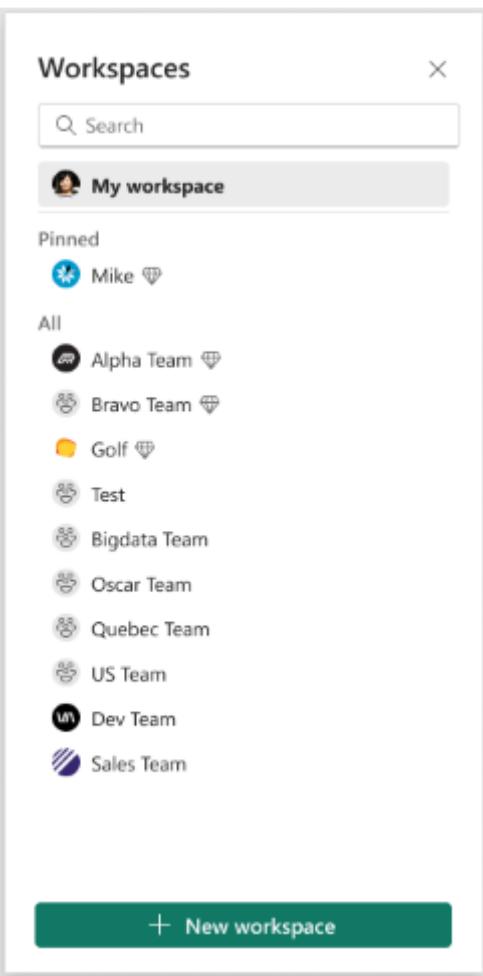
Pin workspaces

Quickly access your favorite workspaces by pinning them to the top of the workspace flyout list.

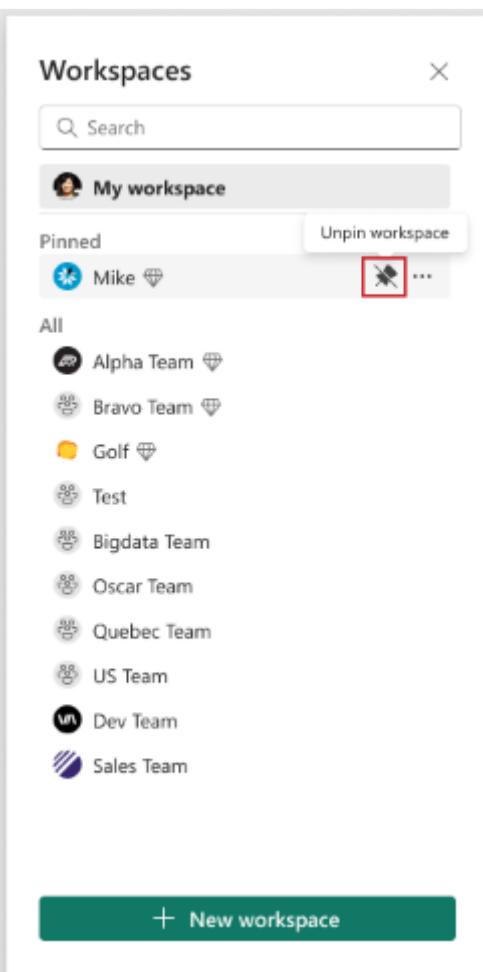
1. Open the workspace flyout from the nav pane and hover over the workspace you want to pin. Select the **Pin to top** icon.



2. The workspace is added in the **Pinned** list.



3. To unpin a workspace, select the unpin button. The workspace is unpinned.



Related content

- Read about [workspaces](#)

Roles in workspaces in Microsoft Fabric

09/26/2025

Workspace roles let you manage who can do what in a Microsoft Fabric workspace. Microsoft Fabric workspaces sit on top of OneLake and divide the data lake into separate containers that can be secured independently. Workspace roles in Microsoft Fabric extend the Power BI workspace roles by associating new Microsoft Fabric capabilities such as data integration and data exploration with existing workspace roles. For more information on Power BI roles, see [Roles in workspaces in Power BI](#).

You can either assign roles to individuals or to security groups, Microsoft 365 groups, and distribution lists. To grant access to a workspace, assign those user groups or individuals to one of the workspace roles: Admin, Member, Contributor, or Viewer. Here's how to [give users access to workspaces](#).

To create a new workspace, see [Create a workspace](#).

Everyone in a user group gets the role that you assign. If someone is in several user groups, they get the highest level of permission that's provided by the roles that they're assigned. If you nest user groups and assign a role to a group, all the contained users have permissions.

Users in workspace roles have the following Microsoft Fabric capabilities, in addition to the existing Power BI capabilities associated with these roles.

Microsoft Fabric workspace roles

[] [Expand table](#)

Capability	Admin	Member	Contributor	Viewer
Update and delete the workspace.	<input checked="" type="checkbox"/>			
Add or remove people, including other admins.	<input checked="" type="checkbox"/>			
Add members or others with lower permissions.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Allow others to reshare items. ¹	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Create or modify database items.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Create or modify database mirroring items.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Create or modify warehouse items.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Capability	Admin	Member	Contributor	Viewer
View and read content of pipelines, notebooks, Spark job definitions, ML models and experiments, and eventstreams.	✓	✓	✓	✓
View and read content of KQL databases, KQL query-sets, digital twin builder items, and real-time dashboards.	✓	✓	✓	✓
Connect to SQL analytics endpoint of Lakehouse or the Warehouse	✓	✓	✓	✓
Read Lakehouse and Data warehouse data and shortcuts ² with T-SQL through TDS endpoint (ReadData).	✓	✓	✓	✓
Read Lakehouse and Data warehouse data and shortcuts ² through OneLake APIs and Spark (ReadAll).	✓	✓	✓	
Read Lakehouse data through Lakehouse explorer (ReadAll).	✓	✓	✓	
Subscribe to OneLake events.	✓	✓	✓	
Write or delete pipelines, notebooks, Spark job definitions, ML models, and experiments, and eventstreams.	✓	✓	✓	
Write or delete Eventhouses ³ , KQL Querysets, Real-Time Dashboards, digital twin builder data, and schema and data of KQL Databases, Lakehouses, data warehouses, and shortcuts.	✓	✓	✓	
Execute or cancel execution of notebooks, Spark job definitions, ML models, and experiments.	✓	✓	✓	
Execute or cancel execution of pipelines.	✓	✓	✓	
View execution output of pipelines, notebooks, ML models and experiments.	✓	✓	✓	✓
Schedule data refreshes via the on-premises gateway. ⁴	✓	✓	✓	
Modify gateway connection settings. ⁴	✓	✓	✓	

¹ Contributors and Viewers can also share items in a workspace, if they have Reshare permissions.

² Other permissions are needed to read data from shortcut destination. Learn more about [shortcut security model](#).

³ Other permissions are needed to perform certain operations on data in an Eventhouse. Learn more about the [hybrid role-based access control model](#).

⁴ Keep in mind that you also need permissions on the gateway. Those permissions are managed elsewhere, independent of workspace roles and permissions.

Related content

- [Roles in workspaces in Power BI](#)
- [Create workspaces](#)
- [Give users access to workspaces](#)
- [Fabric and OneLake security](#)
- [OneLake shortcuts](#)
- [Data warehouse security](#)
- [Data engineering security](#)
- [Data science roles and permissions](#)
- [Role-based access control in Eventhouse](#)

Reassign a workspace to a different capacity

09/19/2025

When you create a workspace, it's assigned to a [capacity](#). The capacity that new workspaces are assigned to by default is determined by the capacity type and/or by the configuration of Fabric or capacity administrators. After a workspace is created, you can reassign it to another available capacity if you have the [workspace admin role](#) and the capacity admin or capacity contributor role. You reassign workspaces to other capacities by changing the workspace license mode.

License modes and capacity types

The workspace license modes refer to different capacity types. There are two types of license modes: per user license modes and capacity license modes.

Per user license mode: With a per user license mode, a workspace is hosted on system reserved capacity. The options are *Pro* and *Premium Per User (PPU)*.

Capacity license mode: With a capacity license mode, a workspace is hosted on a capacity which either has been purchased or is a trial, and is reserved for the organization. These capacities are divided into stock keeping units (SKUs). Each SKU provides a different number of capacity units (CUs), which are used to calculate the capacity's compute power.

The capacity license mode options are related to several [capacity types](#):

- **Premium capacity:** Premium capacity refers to a capacity that was bought as part of a Power BI Premium subscription. These capacities use P SKUs.

Note

Premium capacities are transitioning to Fabric. For more information, see [Power BI Premium transition to Microsoft Fabric](#).

- **Embedded:** Embedded refers to capacity that was bought as part of a Power BI Embedded subscription. These capacities use A or EM SKUs.
- **Trial:** Refers to a Microsoft Fabric trial capacity. These capacities use Trial SKUs.
- **Fabric capacity:** Fabric capacity refers to Microsoft Fabric capacity. These capacities use F SKUs.

Reassign a workspace to a different capacity

You can reassign a workspace to a different capacity via workspace license modes in the workspace settings.

1. Open the workspace settings and choose **License info**. Information about the current license is displayed.
2. Select **Edit**. The list of available licenses modes appears.
3. Select the desired license mode and specify the capacity the workspace will be hosted on.

ⓘ Note

You can choose specific capacities only when you select one of the capacity license modes. Fabric automatically reserves shared capacity for per-user licenses.

ⓘ Important

The types of items contained in the workspace can affect the ability to change license modes and/or move the workspace to a capacity in a different region. See [Moving data around](#) for detail.

Related content

- [Fabric licenses](#)
- [Moving data around](#)
- [Manage your Fabric capacity settings](#)

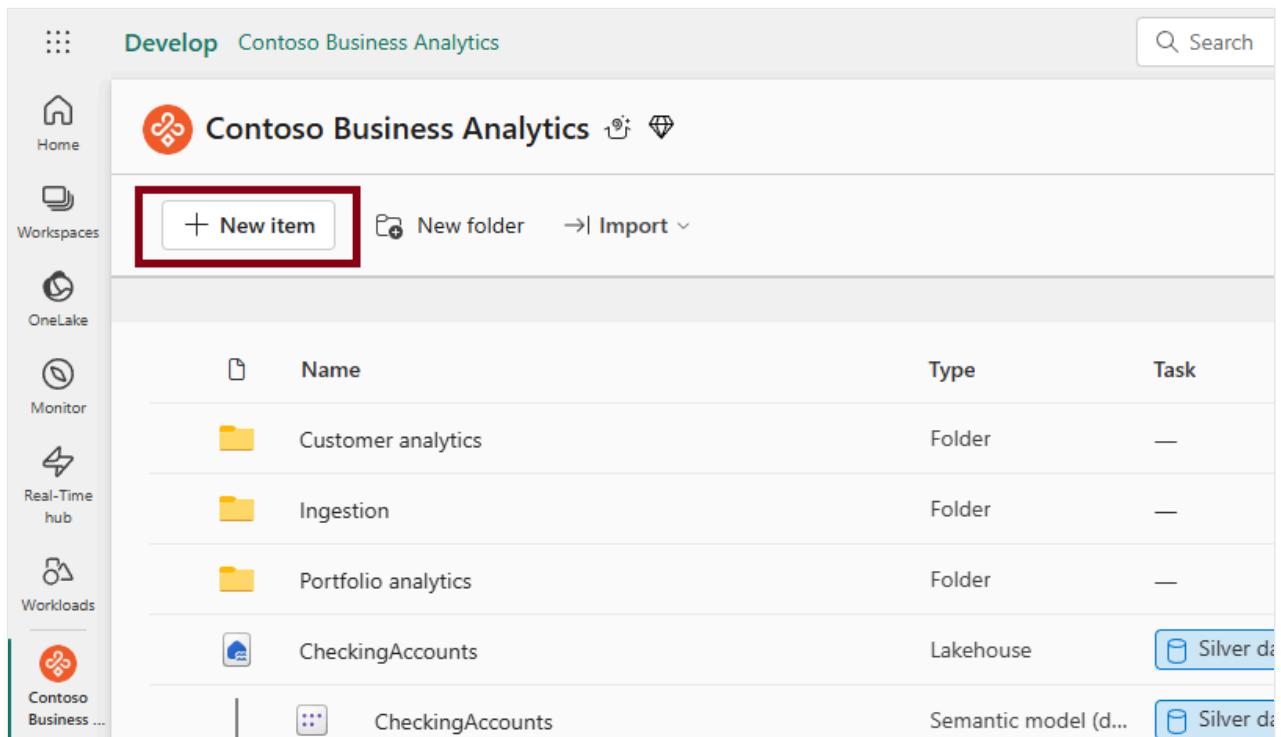
Create items in workspaces

09/16/2025

This article explains how to create items in workspaces in Microsoft Fabric. For more information about items and workspaces, see the [Microsoft Fabric terminology](#) and [Workspaces](#) article.

Create an item in a workspace

1. In a workspace, select **New item**



The screenshot shows the Microsoft Fabric workspace interface for 'Contoso Business Analytics'. On the left, there's a sidebar with icons for Home, Workspaces (which is selected), OneLake, Monitor, Real-Time hub, Workloads, and Contoso Business ... (also selected). The main area has a title bar 'Develop Contoso Business Analytics' and a search bar. Below the title is a toolbar with a 'New item' button (highlighted with a red box), 'New folder', and 'Import'. The main content area displays a table of items:

	Name	Type	Task
Folder	Customer analytics	Folder	—
Folder	Ingestion	Folder	—
Folder	Portfolio analytics	Folder	—
Lakehouse	CheckingAccounts	Lakehouse	Silver da
	CheckingAccounts	Semantic model (d...)	Silver da

2. You can see all items are categorized by tasks. Each task represents daily job-to-be-done when you build a data solution: get data, store data, prepare data, analyze and train data, track data, visualize data, and develop data. Inside each category, item types are sorted alphabetically. You can scroll down and up to browse all item types which are available for you to create.

New item

Select an item type

Favorites All items Filter by item type

Get data

Ingest batch and real-time data into a single location within your Fabric workspace.

Copy job (preview) Makes it easy to copy data in Fabric. Includes full copy, incremental copy, and event-based copy modes.

Data pipeline Ingest data at scale and schedule data workflows.

Dataflow Gen1 Prep, clean, and transform data.

Dataflow Gen2 Prep, clean, and transform data.

Dataflow Gen2 (CI/CD, preview) Prep, clean, and transform data with enhanced capabilities.

Eventstream Capture, transform, and route real-time event stream to various destinations in desired format with no-code experience.

3. Select the card of item type you need to create, you can start the creation process of an item.

Search by item type

1. To find out the item type you need, enter the keyword of an item type, you can search in this panel.

New item

Select an item type

Favorites All items

Get data

Ingest batch and real-time data into a single location within your Fabric workspace.

Notebook Explore data and build machine learning solutions with Apache Spark applications.

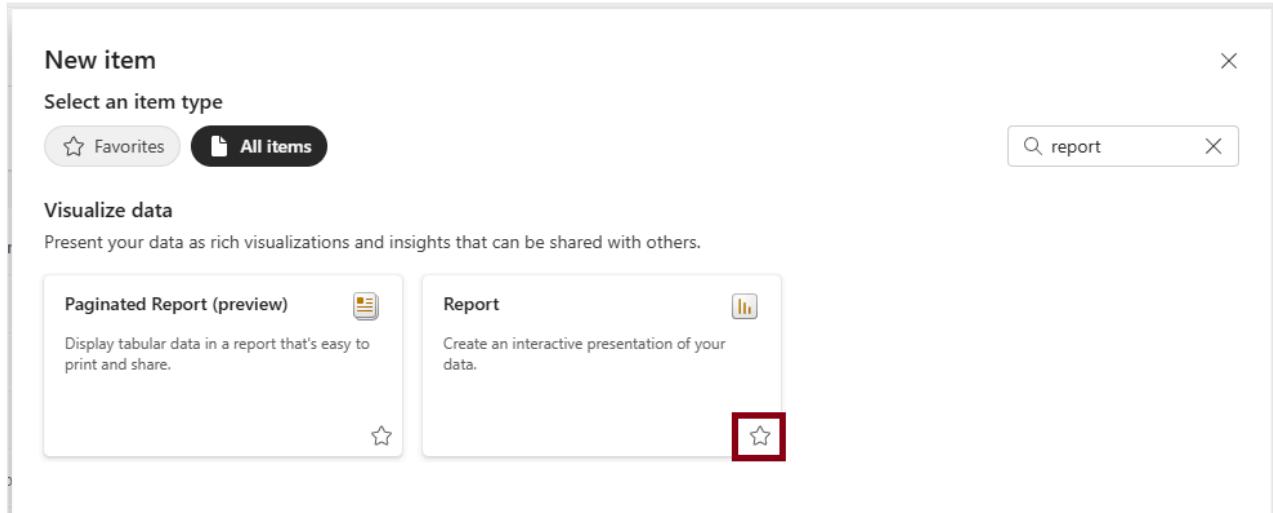
Prepare data

Clean, transform, extract, and load your data for analysis and modeling tasks.

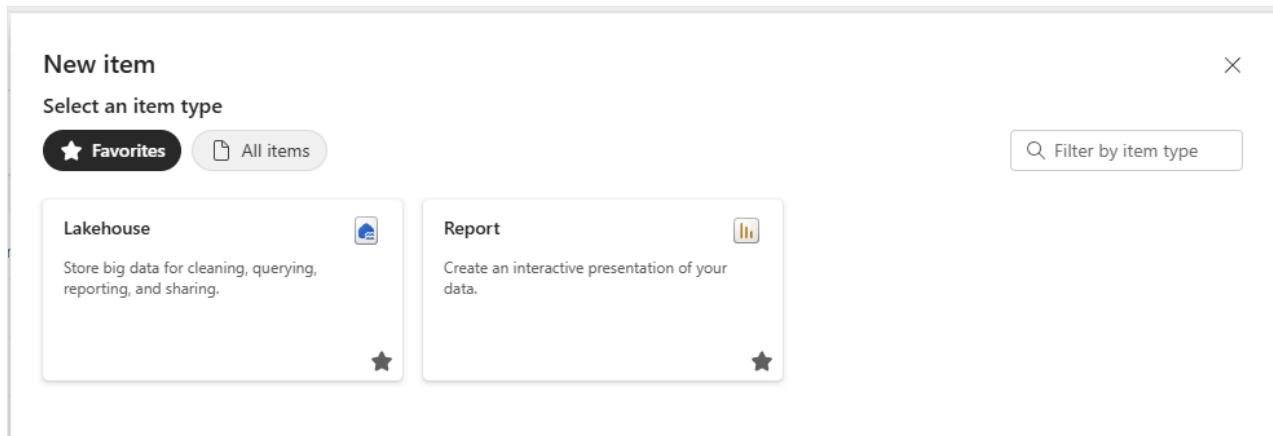
Notebook Explore data and build machine learning solutions with Apache Spark applications.

Add items to Favorites

1. Select the star button on a card of an item type, you can add this item type to your 'Favorites'

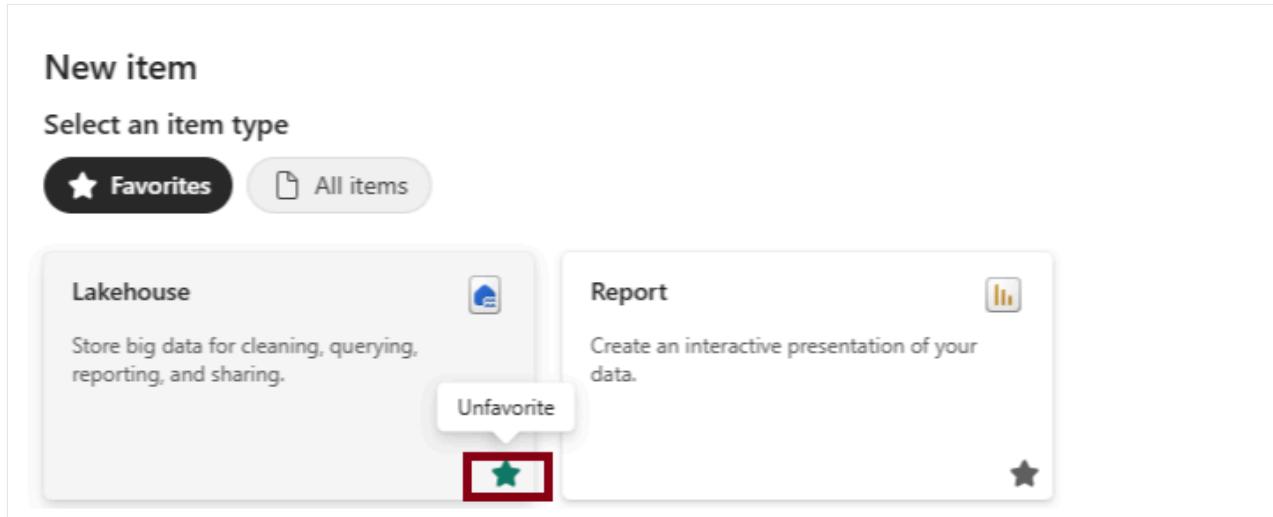


2. Select 'Favorite' and you can see all item types you added to 'Favorites'



3. Next time, when you select 'New item' button, 'Favorites' is shown by default so that you can quickly access the items you need to create most frequently

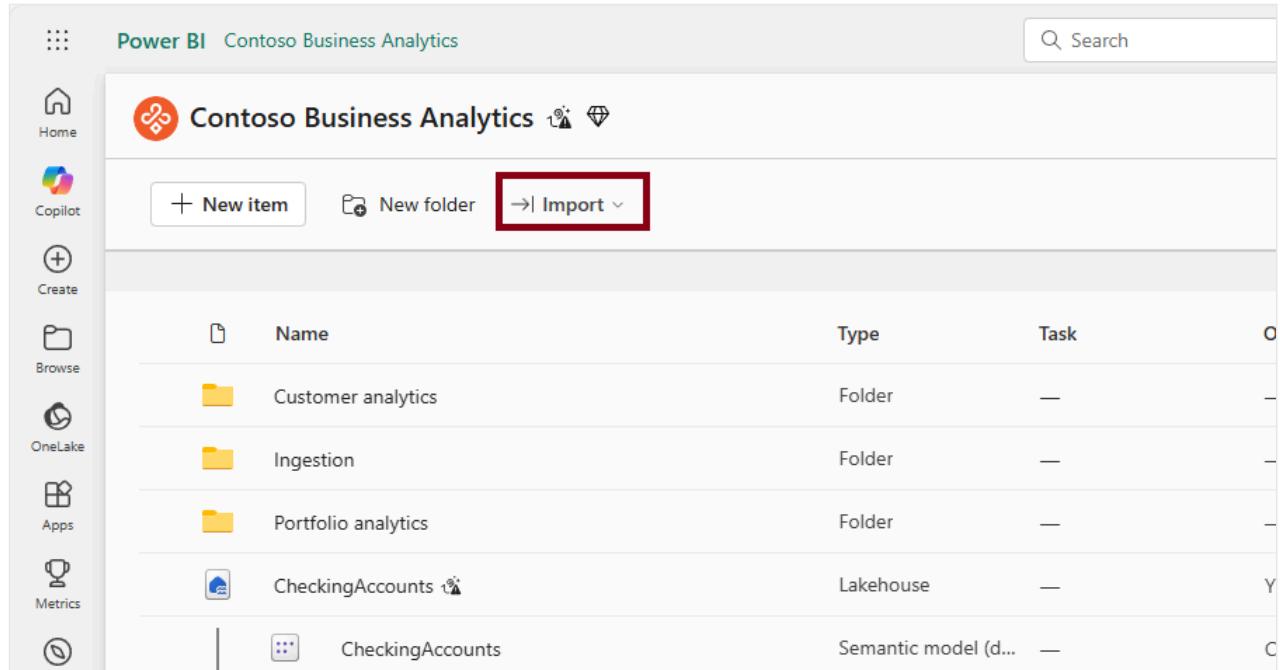
4. By clicking on the star button again, you can unfavorite the item types.



Import items

You can also import files from outside Fabric to create Fabric items in a workspace.

1. Select 'Import' in a workspace, you can see all item types you can create by importing the files from somewhere else.



The screenshot shows the Power BI interface for the 'Contoso Business Analytics' workspace. On the left, there's a sidebar with icons for Home, Copilot, Create, Browse, OneLake, Apps, Metrics, and a circular icon. The main area has a search bar at the top right. Below it, there's a title bar with the workspace name and some status icons. In the center, there are three buttons: '+ New item', 'New folder', and 'Import'. The 'Import' button is highlighted with a red box. Below these buttons is a table with columns for Name, Type, Task, and other details. The table contains the following data:

	Name	Type	Task	Other
	Customer analytics	Folder	—	—
	Ingestion	Folder	—	—
	Portfolio analytics	Folder	—	—
	CheckingAccounts	Lakehouse	—	Y
	CheckingAccounts	Semantic model (d...)	—	C

2. Select the item type you want to import, and select the location where your files locate.

The screenshot shows the Power BI workspace interface. On the left, there's a sidebar with icons for Home, Copilot, Create, Browse, OneLake, and Apps. The main area has a title 'Contoso Business Analytics' and a navigation bar with '+ New item', 'New folder', and 'Import'. A dropdown menu under 'Import' is open, showing 'Notebook' (selected) and 'Report or Paginated Report'. A tooltip for 'Notebook' says 'Import notebook source code files from your local drive.' Below the dropdown, there's a list of folders: 'Customer analytics', 'Ingestion', and 'Portfolio analytics'. The 'Import' dropdown is highlighted with a red box.

This screenshot is similar to the one above, but the 'Report or Paginated Report' option in the 'Import' dropdown is highlighted with a red box. A tooltip for 'Report or Paginated Report' says 'Import .pbix or .rdl files from OneDrive, Sharepoint, or your local drive.' The rest of the interface is identical to the first screenshot.

3. Select the file you want to import and confirm.

4. Check if new items are created in workspace and the import process is completed successfully.

The screenshot shows the Power BI workspace after an import. The sidebar and navigation bar are the same as before. The main area displays a list of items in a table format. The table includes columns for Name, Type, Task, Owner, Refreshed, Next refresh, Endorsement, Sensitivity, and Included in app. Items listed include 'Customer analytics' (Folder), 'Ingestion' (Folder), 'Portfolio analytics' (Folder), 'CheckingAccounts' (Lakehouse), 'CustomerSegmentationData' (Lakehouse), and 'Datalgestion-Notebook' (Notebook). A red box highlights the 'Datalgestion-Notebook' row. A success message in the top right corner says 'Imported successfully. All files are listed in the page. Go to workspace'.

Rename items

1. In the workspace list, go to the item and click on 'More options'.
2. Select 'Settings' and go to the 'About' tab.
3. Change the name of the item. When renaming items, you can reuse the name of a previously deleted item of the same type within 30 seconds of deletion. You cannot reuse the name of an existing item of the same type in the workspace.

Related content

- [Create workspaces](#)

Create folders in workspaces

Article • 01/26/2025

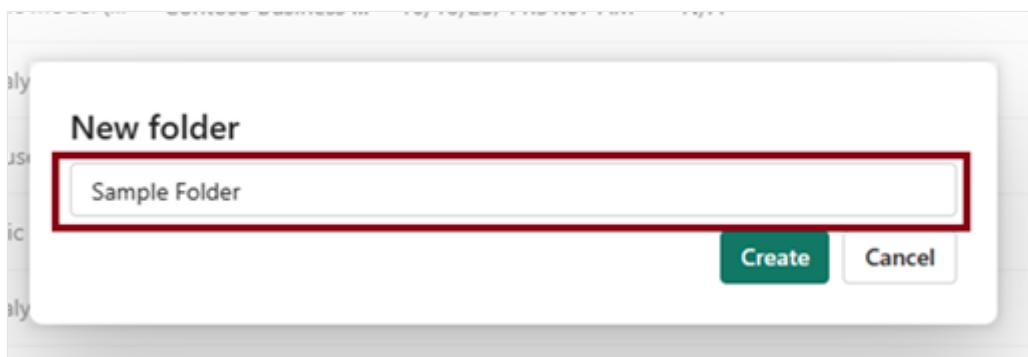
This article explains what folders in workspaces are and how to use them in workspaces in Microsoft Fabric. Folders are organizational units inside a workspace that enable users to efficiently organize and manage artifacts in the workspace. For more information about workspaces, see the [Workspaces](#) article.

Create a folder in a workspace

1. In a workspace, select **New folder**.

Name	Type
Customer analytics	Folder
Ingestion	Folder
Portfolio analytics	Folder
CheckingAccounts	Lakehouse
CheckingAccounts	Semantic model (d...)

2. Enter a name for the folder in the **New folder** dialog box. See [Folder name requirements](#) for naming restrictions.



3. The folder is created successfully.

The screenshot shows the Fabric Contoso Business Analytics interface. On the left is a sidebar with icons for Home, Workspaces, OneLake, Monitor, Real-Time, Workloads, and Contoso Business ... (selected). The main area has a title bar with the fabric logo and 'Contoso Business Analytics'. Below it are buttons for '+ New item', 'New folder', and 'Import'. A table lists items: Customer analytics (Folder), Ingestion (Folder), Portfolio analytics (Folder), Sample Folder (Folder, highlighted with a red box), CheckingAccounts (Lakehouse), and CheckingAccounts (Semantic model, partially visible). The table columns are Name, Type, Task, and Order.

	Name	Type	Task	Order
	Customer analytics	Folder	—	—
	Ingestion	Folder	—	—
	Portfolio analytics	Folder	—	—
	Sample Folder	Folder	—	—
	CheckingAccounts	Lakehouse	—	Yi
	CheckingAccounts	Semantic model (d...)	—	C

4. You can create nested subfolders in a folder in the same way. A maximum of 10 levels of nested subfolders can be created.

⚠ Note

You can nest up to 10 folders in the root folder.

Folder name requirements

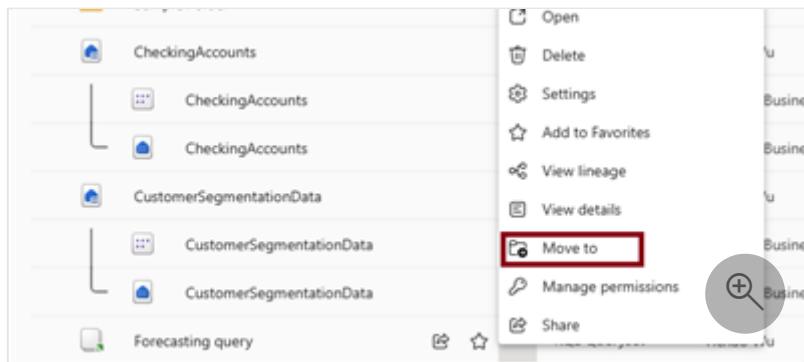
Folder names must follow certain naming conventions:

- The name can't include C0 and C1 control codes.
- The name can't contain leading or trailing spaces.
- The name can't contain these characters: ~"#.&*:;<>?{/|}.
- The name can't contain system-reserved names, including: \$recycle.bin, recycled, recycler.
- The name length can't exceed 255 characters.
- You can't have more than one folder with the same name in a folder or at the root level of the workspace.

Move items into a folder

Move a single item

1. Select the context menu (...) of the item you want to move, then select **Move to**.



2. Select the destination folder where you want to move this item.

Move 1 item

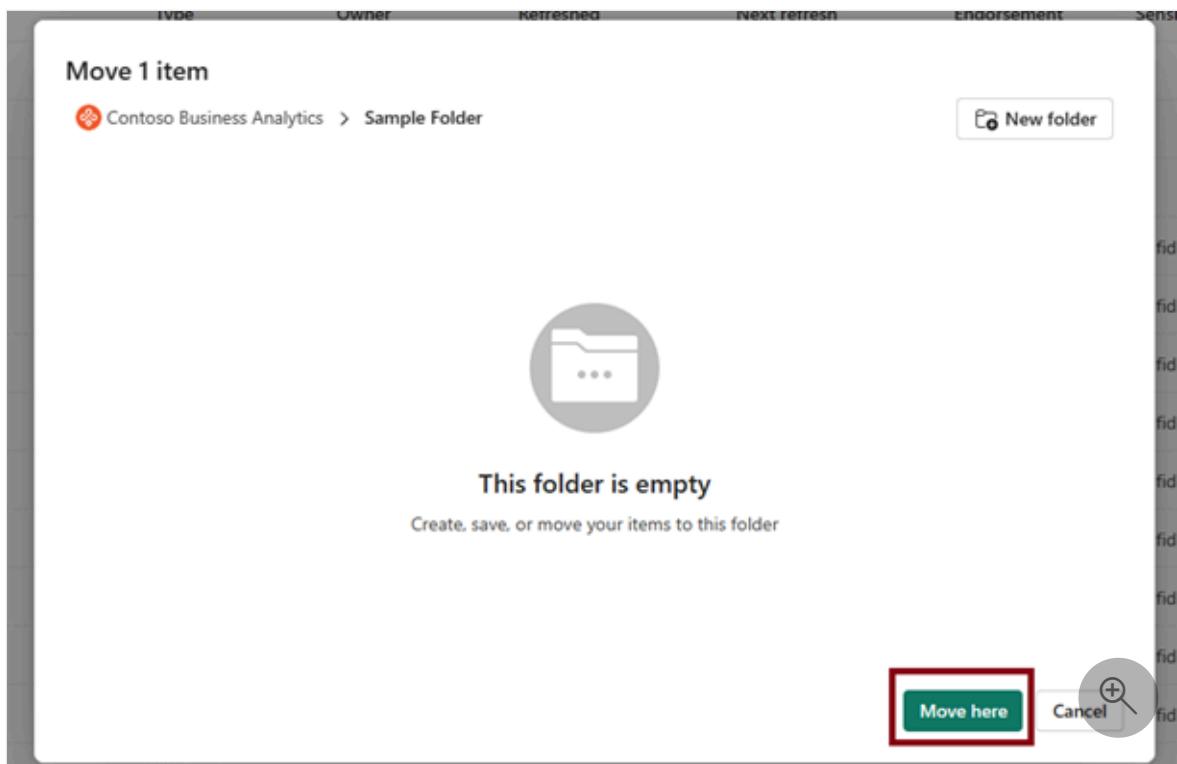
Contoso Business Analytics

New folder

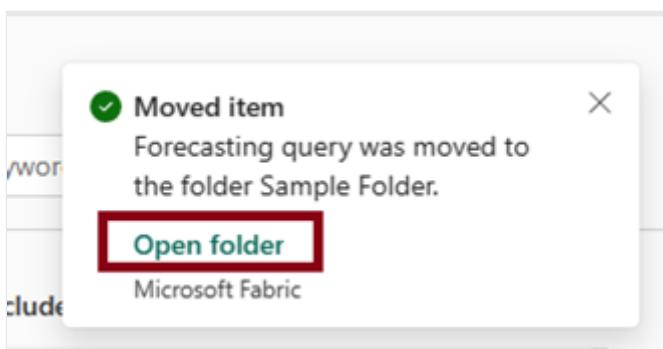
Name	Type	Owner
Customer analytics	Folder	-
Portfolio analytics	Folder	-
Sample Folder	Folder	-
CheckingAccounts	Lakehouse	Yichao Wu
CheckingAccounts	Semantic model (default)	Contoso Business Analytics
CheckingAccounts	SQL analytics endpoint	Contoso Business Analytics
CustomerSegmentationData	Lakehouse	Yichao Wu
CustomerSegmentationData	Semantic model (default)	Contoso Business Analytics

Move here Cancel

3. Select **Move here**.



4. By selecting **Open folder** in the notification or navigating to the folder directly, you can go to the destination folder to check if the item moved successfully.



Move multiple items

1. Select multiple items, then select **Move** from the command bar.

Synapse Data Engineering Contoso Business Analytics

Search

Home Create Browse Data hub Monitoring hub Workspaces Contoso Business...

Contoso Business Analytics

6 Selected Move

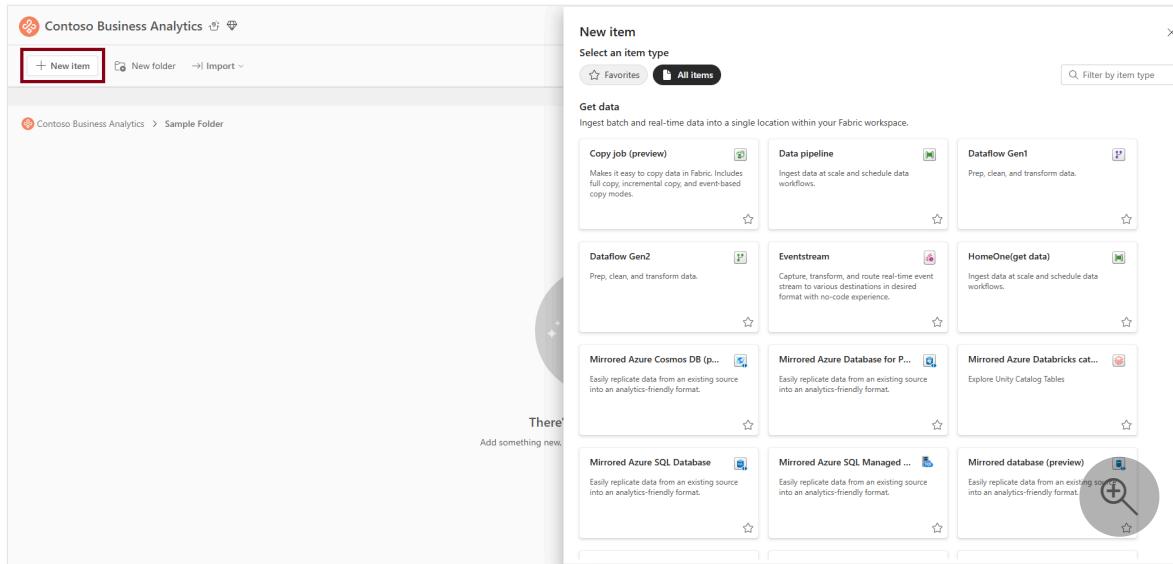
	Name	Type	Owner
<input type="checkbox"/>	Customer analytics	Folder	-
<input type="checkbox"/>	Portfolio analytics	Folder	-
<input checked="" type="checkbox"/>	Sample Folder	Folder	-
<input checked="" type="checkbox"/>	CheckingAccounts	Lakehouse	Yichao Wu
<input checked="" type="checkbox"/>	CheckingAccounts	Semantic model (...	Contoso Business .
<input checked="" type="checkbox"/>	CheckingAccounts	SQL analytics end...	Contoso Business .
<input checked="" type="checkbox"/>	CustomerSegmentationData	Lakehouse	Yichao Wu
<input checked="" type="checkbox"/>	CustomerSegmentationData	Semantic model (...	Contoso Business .
<input checked="" type="checkbox"/>	CustomerSegmentationData	SQL analytics end...	Contoso Business .
<input checked="" type="checkbox"/>	pipeline1	Data pipeline	Yichao Wu
<input checked="" type="checkbox"/>	pipeline2	Data pipeline	Yichao Wu

2. Select a destination where you want to move these items. You can also create a new folder if you need it.

Type	Owner	Refreshed	Next refresh	Endorsement	Set
Move 6 items					
Contoso Business Analytics					
<input type="button" value="New folder"/>					
Name	Type	Owner			
Customer analytics	Folder	-			
Portfolio analytics	Folder	-			
Sample Folder	Folder	-			
CheckingAccounts	Lakehouse	Yichao Wu			
CheckingAccounts	Semantic model (default)	Contoso Business Analytics			
CheckingAccounts	SQL analytics endpoint	Contoso Business Analytics			
CustomerSegmentationData	Lakehouse	Yichao Wu			
CustomerSegmentationData	Semantic model (default)	Contoso Business Analytics			
<input type="button" value="Move here"/> <input type="button" value="Cancel"/>					

Create an item in a folder

1. Go to a folder, select **New**, then select the item you want to create. The item is created in this folder.



➊ Note

Currently, you can't create certain items in a folder:

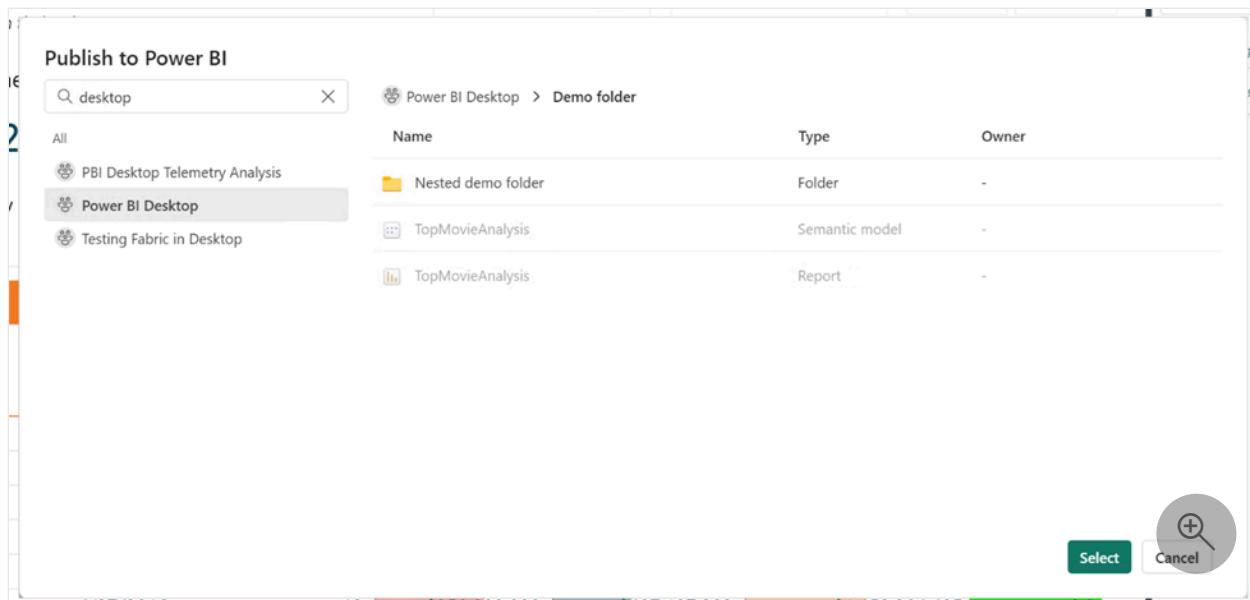
- Dataflows gen2
- Streaming semantic models
- Streaming dataflows

If you create items from the home page or the **Create** hub, items are created at the root level of the workspace.

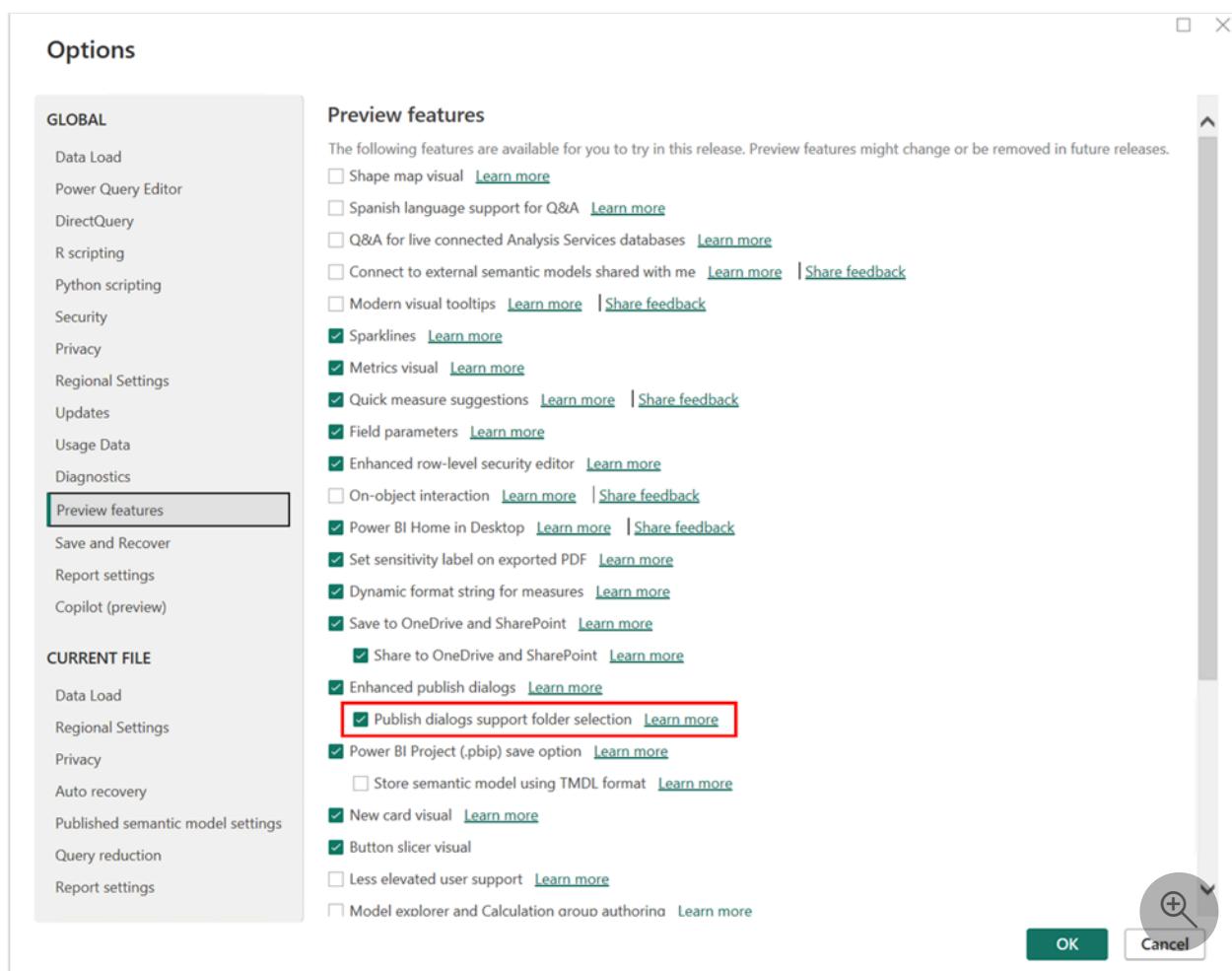
Publish to folder (preview)

You can now publish your Power BI reports to specific folders in your workspace.

When you publish a report, you can choose the specific workspace and folder for your report, as illustrated in the following image.

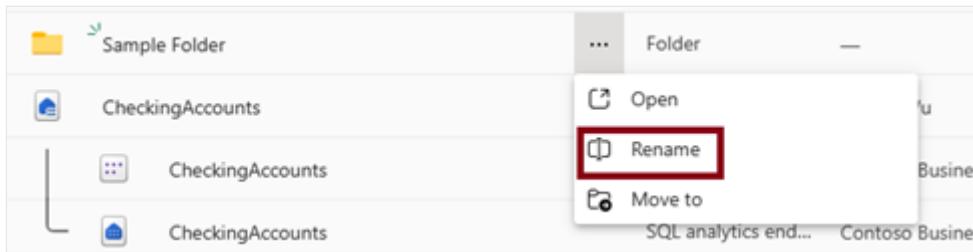


To publish reports to specific folders in the service, make sure that in Power BI Desktop, the **Publish dialogs support folder selection** setting is enabled in the **Preview features** tab in the options menu.

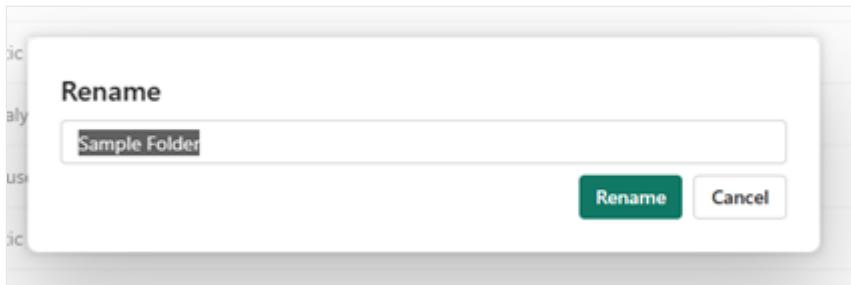


Rename a folder

1. Select the context (...) menu, then select **Rename**.



2. Give the folder a new name and select the **Rename** button.



Note

When renaming a folder, follow the same naming convention as when you're creating a folder. See [Folder name requirements](#) for naming restrictions.

Delete a folder

1. Make sure the folder is empty.
2. Select the context menu (...) and select **Delete**.

The screenshot shows the Fabric interface with the title "Fabric Contoso Business Analytics". On the left, there's a sidebar with icons for Home, Workspaces, OneLake, Monitor, Real-Time, Workloads, and a selected "Contoso Business ..." workspace. The main area displays a list of items under "Contoso Business Analytics". The items include "Customer analytics" (Folder), "Ingestion" (Folder), "Portfolio analytics" (Folder), "Sample Folder" (Folder), "CheckingAccounts" (File), "CheckingAccounts" (File), "CheckingAccounts" (File), and "CustomerSegmentationData" (File). A context menu is open over the "Sample Folder", listing "Open", "Rename", "Move to", and "Delete". The "Delete" option is highlighted with a red border.

⚠ Note

Currently you can only delete empty folders.

Permission model

Workspace admins, members, and contributors can create, modify, and delete folders in the workspace. Viewers can only view folder hierarchy and navigate in the workspace.

Currently, folders inherit the permissions of the workspace where they're located.

[Expand table](#)

Capability	Admin	Member	Contributor	Viewer
Create folder	✓	✓	✓	✗
Delete folder	✓	✓	✓	✗
Rename folder	✓	✓	✓	✗
Move folder and items	✓	✓	✓	✗
View folder in workspace list	✓	✓	✓	✓

Considerations and limitations

- Currently dataflows gen2, streaming semantic models, and streaming dataflows can't be created in folders.
- If you trigger item creation from the home page, create hub, and industry solution, items are created at the root level of workspaces.
- Git doesn't currently support workspace folders.
- If folders is enabled in the Power BI service but not enabled in Power BI Desktop, republishing a report that is in a nested folder will replace the report in the nested folder.
- If Power BI Desktop folders is enabled in Power BI Desktop, but not enabled in the service and you publish to a nested folder, the report will be published to the general workspace.
- When publishing reports to folders, report names must be unique throughout an entire workspace, regardless of their location. Therefore, when publishing a report to a workspace that has another report with the same name in a different folder, the report will publish to the location of the already existing report. If you want to move the report to a new folder location in the workspace, you need to make this change in the Power BI service.
- Folders are not supported in [Template App workspaces](#).

Related content

- [Folders in deployment pipelines](#)
- [Create workspaces](#)
- [Give users access to workspaces](#)

Feedback

Was this page helpful?

 Yes

 No

[Provide product feedback ↗](#) | [Ask the community ↗](#)

Give users access to workspaces

08/12/2025

After you [create a workspace](#) in Microsoft Fabric, or if you have an Admin or Member role in a workspace, you can give others access to it by adding them to the different roles. Workspace creators are automatically admins. For an explanation of the different roles, see [Roles in workspaces](#).

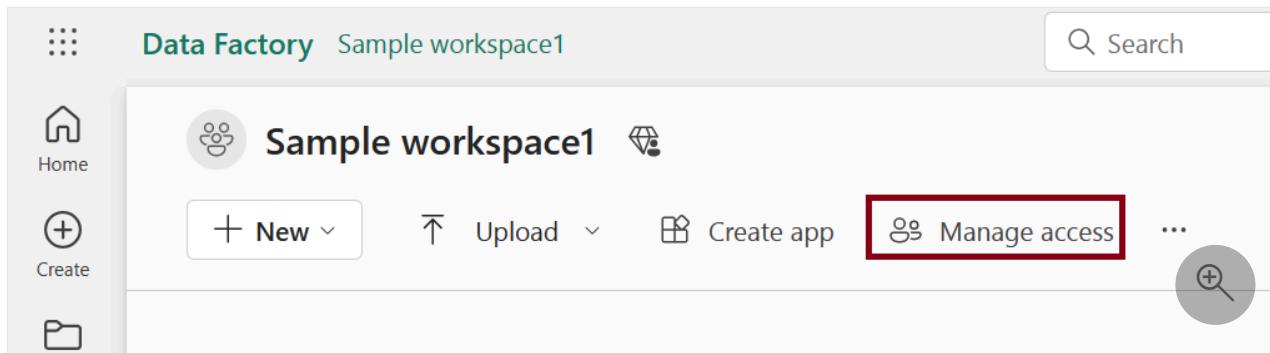
! Note

To enforce row-level security (RLS) on Power BI items for Microsoft Fabric Pro users who browse content in a workspace, assign them the Viewer role.

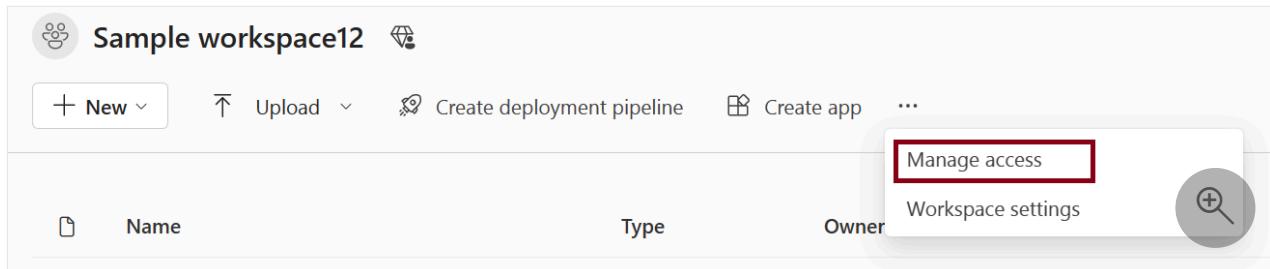
After you add or remove workspace access for a user or a group, the permission change only takes effect the next time the user logs into Microsoft Fabric.

Give access to your workspace

1. Because you have the Admin or Member role in the workspace, on the command bar of the workspace page, you see **Manage access**. Sometimes this entry is in the **More options (...)** menu.



Manage access in the **More options** menu:



2. Select **Add people or groups**.

Manage access

X

Sample workspace1

+ Add people or groups

Search within workspace



Sample User ⓘ

Admin ▾

3. Enter name or email, select a **role**, and select **Add**. You can add security groups, mail-enabled security groups, distribution lists, Microsoft 365 groups, or individuals to these workspaces as admins, members, contributors, or viewers. If you have the member role, you can only add others to the member, contributor, or viewer roles.

[←](#) Add people

X

Sample workspace1

i Admins, members, and contributors have edit and view access. Viewers only have view access. [Learn more](#) 

Enter name or email

 Viewer ▾

Add

 Admin

 Member

 Contributor

 Viewer

4. You can view and modify access later if needed. Use the **Search** box to search for people or groups who already have access to this workspace. To modify access, select the dropdown arrow and select a role.

Manage access

X

Sample workspace1

+ Add people or groups

Search within workspace

SU

Sample User ⓘ

Admin ▾

SU

Sample user2 ⓘ

Contributor ▾

Admin

Member

Viewer

Remove

Workspace access limits

Each workspace will be limited to a maximum of 1,000 users or groups in workspace roles (Admin, Member, Contributor, Viewer). This change does not affect the number of users within a group itself. For example, if there is a workspace with one group, that group can have over 1,000 users. The limitation also covers external guests. Workspace admins or members attempting to add users or groups after this limit is reached, will get an error in the workspace access flow.

Related content

- Read about [the workspace experience](#)
- [Create a workspace](#)
- [Roles in workspaces](#)

Get started with Git integration

09/10/2025

This article walks you through the following basic tasks in Microsoft Fabric's Git integration tool:

- [Connect to a Git repo](#)
- [Commit changes](#)
- [Update from Git](#)
- [Disconnect from Git](#)

We recommend reading the [overview of Git integration](#) before you begin.

Prerequisites

To integrate Git with your Microsoft Fabric workspace, you need to set up the following prerequisites for both Fabric and Git.

Fabric prerequisites

To access the Git integration feature, you need a [Fabric capacity](#). A Fabric capacity is required to use all supported Fabric items. If you don't have one yet, [sign up for a free trial](#). Customers that already have a [Power BI Premium capacity](#), can use that capacity, but keep in mind that [certain Power BI SKUs only support Power BI items](#).

In addition, the following [tenant switches](#) must be enabled from the Admin portal:

- [Users can create Fabric items](#)
- [Users can synchronize workspace items with their Git repositories](#)
- [Create workspaces](#) (only if you want to branch out to a new workspace.)
- [Users can synchronize workspace items with GitHub repositories](#): For GitHub users only

These switches can be enabled by the tenant admin, capacity admin, or workspace admin, depending on your [organization's settings](#).

Git prerequisites

Git integration is currently supported for Azure DevOps and GitHub. To use Git integration with your Fabric workspace, you need the following in either Azure DevOps or GitHub:

Azure DevOps

- An Active **Azure DevOps account** registered to the same user and tenant that is using the Fabric workspace (cross-tenant support is currently in preview). [Create a free account ↗](#).
- Access to an existing repository.

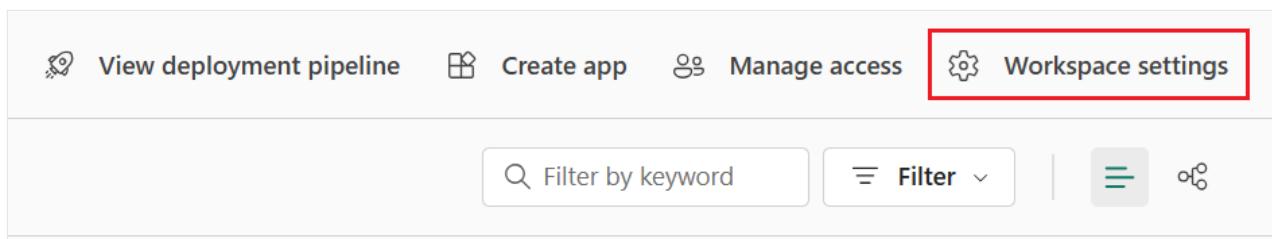
Connect a workspace to a Git repo

Connect to a Git repo

Only a workspace admin can connect a workspace to a repository, but once connected, anyone with [permission](#) can work in the workspace. If you're not an admin, ask your admin for help with connecting. To connect a workspace to an Azure or GitHub Repo, follow these steps:

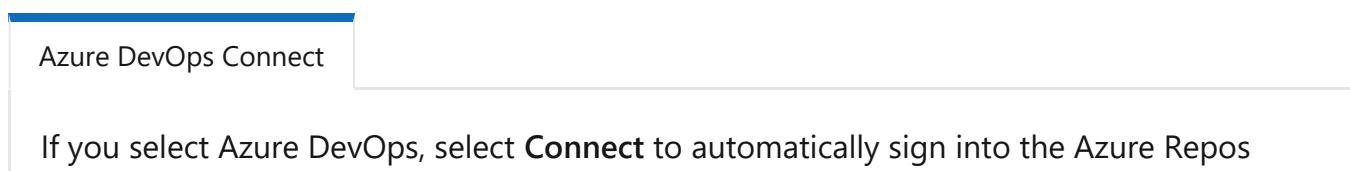
1. Sign into Fabric and navigate to the workspace you want to connect with.

2. Go to **Workspace settings**



3. Select **Git integration**.

4. Select your Git provider. Currently, Azure DevOps and GitHub are supported.



If you select Azure DevOps, select **Connect** to automatically sign into the Azure Repos account registered to the Microsoft Entra user signed into Fabric.

If you have already signed in to Azure from Fabric using a different account, select your account from the list and select **Connect**.

If it's your first time signing in from Fabric, or you want to add a new account, select **Add account**.

If it's the first time connecting, you need to Authorize your user. Provide the following information:

- *Display name* - must be unique for each user
- *Azure DevOps URL* - URL of the Azure DevOps repository. URL must be in the format
`https://dev.azure.com/{organization}/{project}/_git/{repository}` or
`https://{{organization}}.visualstudio.com/{project}/_git/{repo}`.
- *Authentication* - You can authenticate either with *OAuth2* or a *Service Principal*. For more information see [Azure DevOps - Git Integration with service principal \(preview\)](#)

Add Azure DevOps account

Display name *

Azure DevOps URL * ⓘ

Authentication method * ⓘ

OAuth 2.0

Service principal

After you sign in, select **Connect** to allow Fabric to access your account

Connect to a workspace

If the workspace is already connected to Azure DevOps/GitHub, follow the instructions for [Connecting to a shared workspace](#).

Azure DevOps branch connect

1. From the dropdown menu, specify the following details about the branch you want to connect to:

- [Organization](#)
- [Project](#)
- [Git repository](#).

- Branch (Select an existing branch using the drop-down menu, or select **+ New Branch** to create a new branch. You can only connect to one branch at a time.)
- Folder (Type in the name of an existing folder or enter a name to create a new folder. If you leave the folder name blank, content is created in the root folder. You can only connect to one folder at a time.)

Workspace settings

Search

Git integration

Connect to Git to manage your code and back up your work. [Learn more](#)

General

License info

Azure connections

System storage

Git integration

OneLake

Workspace identity

Network security

Encryption (preview)

Monitoring

Power BI

Delegated Settings

Data

Engineering/Science

Data Factory

Preview items Some item types are only available in preview when using Git. [Learn more](#)

Connect Git provider and account

Provider

Azure DevOps

Entra Account

Log out

Manage all accounts

Connect Git repository and branch

Organization *

Organization

Project *

Project

Git repository * ⓘ

Git repository

Branch * ⓘ

Branch

Git folder ⓘ

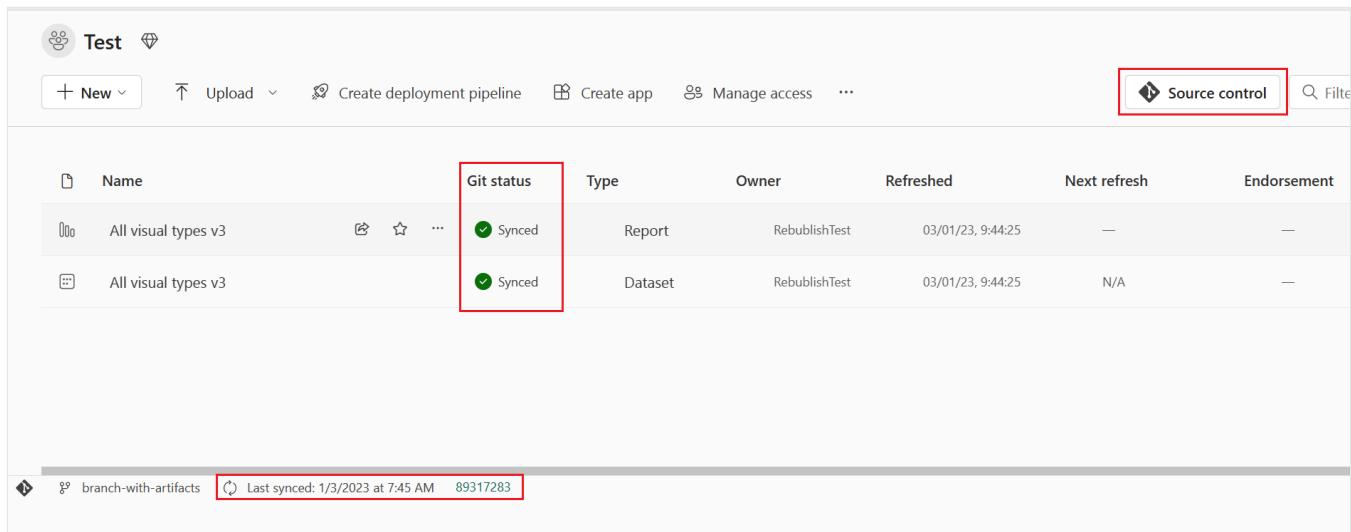
Enter name of folder

Connect and sync **Cancel**

Select **Connect and sync**.

During the initial sync, if either the workspace or Git branch is empty, content is copied from the nonempty location to the empty one. If both the workspace and Git branch have content, you're asked which direction the sync should go. For more information on this initial sync, see [Connect and sync](#).

After you connect, the Workspace displays information about source control that allows the user to view the connected branch, the status of each item in the branch and the time of the last sync.



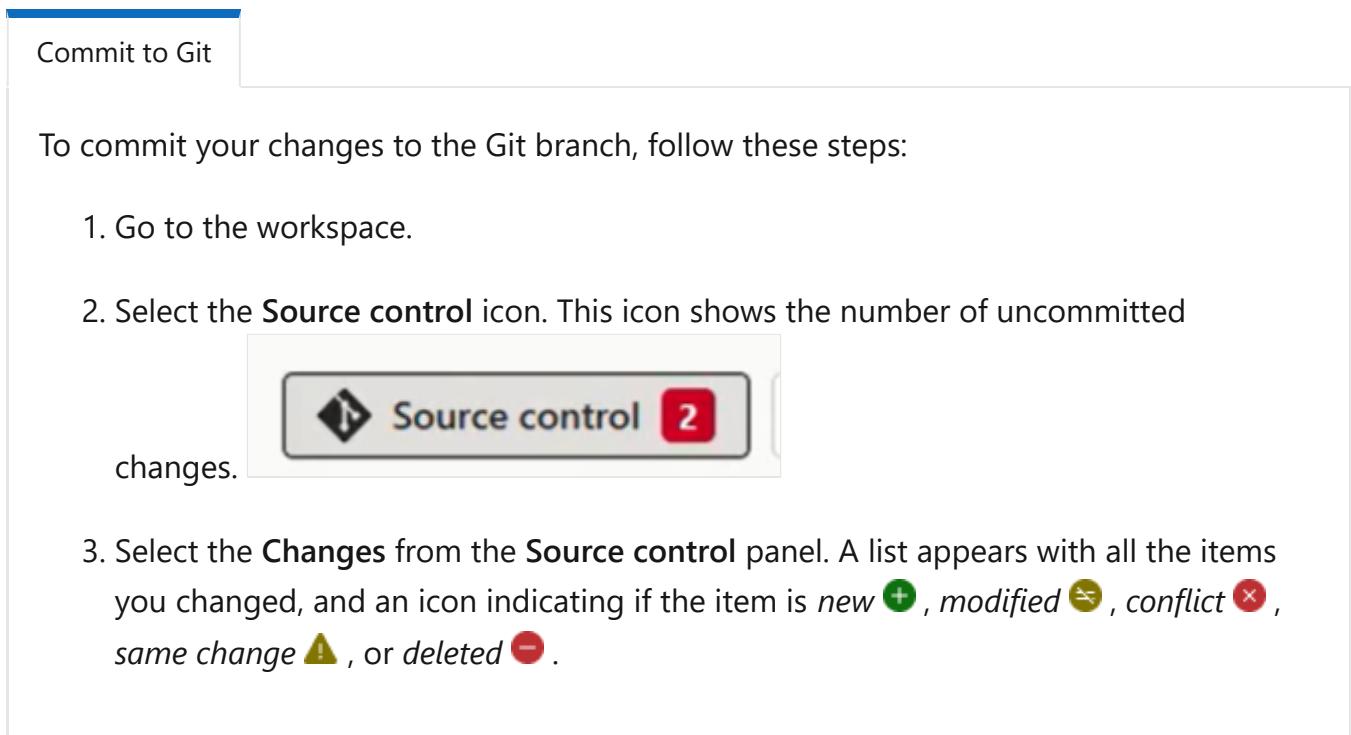
The screenshot shows the Power BI workspace interface. At the top, there's a navigation bar with options like '+ New', 'Upload', 'Create deployment pipeline', 'Create app', 'Manage access', and 'Source control'. The 'Source control' button is highlighted with a red box. Below the navigation bar is a table listing items from a Git branch. The columns are 'Name', 'Git status', 'Type', 'Owner', 'Refreshed', 'Next refresh', and 'Endorsement'. Two items are listed: 'All visual types v3' (Report, Synced) and 'All visual types v3' (Dataset, Synced). A red box highlights the 'Git status' column for both rows. At the bottom of the table, it says 'branch-with-artifacts' and 'Last synced: 1/3/2023 at 7:45 AM 89317283'.

To keep your workspace synced with the Git branch, [commit any changes](#) you make in the workspace to the Git branch, and [update your workspace](#) whenever anyone creates new commits to the Git branch.

Commit changes to git

Once you successfully connect to a Git folder, edit your workspace as usual. Any changes you save are saved in the workspace only. When you're ready, you can commit your changes to the Git branch, or you can undo the changes and revert to the previous status.

Read more about [commits](#).



The screenshot shows the Power BI workspace interface with a 'Commit to Git' button at the top left. Below it, a 'Source control' icon is shown with a red box around it, indicating two uncommitted changes. The text below the icon provides instructions for committing changes to the Git branch.

To commit your changes to the Git branch, follow these steps:

1. Go to the workspace.
2. Select the **Source control** icon. This icon shows the number of uncommitted changes.
3. Select the **Changes** from the **Source control** panel. A list appears with all the items you changed, and an icon indicating if the item is *new* (+), *modified* (邈), *conflict* (✖), *same change* (!), or *deleted* (-).

4. Select the items you want to commit. To select all items, check the top box.
5. Add a comment in the box. If you don't add a comment, a default message is added automatically.
6. Select Commit.

Changes 4 • Updates

Commit message

Add details before committing or we'll add for you by default.

<input checked="" type="checkbox"/>	Item	Status
<input checked="" type="checkbox"/>	Analysis	Synced
<input checked="" type="checkbox"/>	Analytics v2	Synced
<input checked="" type="checkbox"/>	Analysis	Synced
<input checked="" type="checkbox"/>	Analytics v2	Synced

Commit Undo

After the changes are committed, the items that were committed are removed from the list, and the workspace points to the new commit that it synced to.

Source control

X

demo123

Changes Updates



You don't have any changes

Any uncommitted changes from Git will be listed here.

After the commit is completed successfully, the status of the selected items changes from **Uncommitted** to **Synced**.

Update workspace from Git

Whenever anyone commits a new change to the connected Git branch, a notification appears in the relevant workspace. Use the **Source control** panel to pull the latest changes, merges, or reverts into the workspace and update live items. Changes to folders are also updated. Read more about [updating](#).

To update a workspace, follow these steps:

1. Go to the workspace.
2. Select the **Source control** icon.
3. Select **Updates** from the Source control panel. A list appears with all the items that were changed in the branch since the last update.
4. Select **Update all**.

Source control

X

∅ Changes  Updates (1)

Items

Status

 Cola Analysis



 Update all

After it updates successfully, the list of items is removed, and the workspace points to the new workspace that it's synced to.

Source control

X

branch-with-artifacts

Changes 2 • Updates



You don't have any updates

Any unsynced updates from Git will be listed here.

After the update is completed successfully, the status of the items changes to **Synced**.

Disconnect a workspace from Git

Only a workspace admin can disconnect a workspace from a Git Repo. If you're not an admin, ask your admin for help with disconnecting. If you're an admin and want to disconnect your repo, follow these steps:

1. Go to **Workspace settings**
2. Select **Git integration**
3. Select **Disconnect workspace**
4. Select **Disconnect** again to confirm.

Permissions

The actions you can take on a workspace depend on the permissions you have in both the workspace and the Git repo. For a more detailed discussion of permissions, see [Permissions](#).

Considerations and limitations

General Git integration limitations

- The [authentication method](#) in Fabric must be at least as strong as the authentication method for Git. For example, if Git requires multifactor authentication, Fabric needs to require multifactor authentication as well.
- Power BI Datasets connected to Analysis Services aren't supported at this time.
- If you use a workspace identity in one artifact and commit it to Git, it can be updated (back to a fabric workspace) only in a workspace connected to the same identity. Be careful, as this also affects features like branch out.
- Submodules aren't supported.
- Sovereign clouds aren't supported.

Azure DevOps limitations

- Azure DevOps isn't supported if [Enable IP Conditional Access policy validation](#) is enabled.
- If the workspace and Git repo are in two different geographical regions, the tenant admin must enable [cross-geo exports](#).
- If your organization configured [conditional access](#), make sure the **Power BI Service** has the same [conditions set](#) for authentication to function as expected.
- The commit size is limited to 125 MB.
- When using the Azure DevOps connector the commit size is limited to 25 MB. For the default single sign-on (SSO) Microsoft Entra ID account, the limit is 125 MB.

GitHub Enterprise limitations

Some GitHub Enterprise versions and settings aren't supported. For example:

- GitHub Enterprise Cloud with data residency ([ghe.com](#))
- GitHub Enterprise Server with a custom domain is not supported, even if the instance is publicly accessible
- Github Enterprise Server hosted on a private network
- IP allowlist

Workspace limitations

- Only the workspace admin can manage the connections to the [Git Repo](#) such as connecting, disconnecting, or adding a branch.
Once connected, anyone with [permission](#) can work in the workspace.
- Workspaces with template apps installed can't be connected to Git.
- [MyWorkspace](#) can't connect to a Git provider.

Branch and folder limitations

- Maximum length of branch name is 244 characters.
- Maximum length of full path for file names is 250 characters. Longer names fail.
- Maximum file size is 25 MB.
- Folder structure is maintained up to 10 levels deep.
- Downloading a report/dataset as [.pbix](#) from the service after deploying them with Git integration is not recommended, as the results are unreliable. We recommend using PowerBI Desktop to download reports/datasets as [.pbix](#).
- If the item's display name has any of these characteristics, The Git folder is renamed to the logical ID (Guid) and type:
 - Has more than 256 characters
 - Ends with a `.` or a space
 - Contains any forbidden characters as described in [directory name limitations](#)
- When you connect a workspace that has folders to Git, you need to commit changes to the Git repo if that [folder structure](#) is different.

Directory name limitations

- The name of the directory that connects to the Git repository has the following naming restrictions:
 - The directory name can't begin or end with a space or tab.
 - The directory name can't contain any of the following characters: `" / : < > \ * ? |`
- The item folder (the folder that contains the item files) can't contain any of the following characters: `" : < > \ * ? |`. If you rename the folder to something that includes one of these characters, Git can't connect or sync with the workspace and an error occurs.

Branching out limitations

- Branch out requires permissions listed in [permissions table](#).
- There must be an available capacity for this action.
- All [workspace](#) and [branch naming limitations](#) apply when branching out to a new workspace.

- Only [Git supported items](#) are available in the new workspace.
- The related branches list only shows branches and workspaces you have permission to view.
- [Git integration](#) must be enabled.
- When branching out, a new branch is created and the settings from the original branch aren't copied. Adjust any settings or definitions to ensure that the new meets your organization's policies.
- When branching out to an existing workspace:
 - The target workspace must support a Git connection.
 - The user must be an admin of the target workspace.
 - The target workspace must have capacity.
 - The workspace can't have template apps.
- Note that when you branch out to a workspace, any items that aren't saved to Git can get lost. We recommend that you [commit](#) any items you want to keep before branching out.

Sync and commit limitations

- You can only sync in one direction at a time. You can't commit and update at the same time.
- Sensitivity labels aren't supported and exporting items with sensitivity labels might be disabled. To commit items that have sensitivity labels without the sensitivity label, [ask your administrator](#) for help.
- Works with [limited items](#). Unsupported items in the folder are ignored.
- Duplicating names isn't allowed. Even if Power BI allows name duplication, the update, commit, or undo action fails.
- B2B isn't supported.
- [Conflict resolution](#) is partially done in Git.
- During the *Commit to Git* process, the Fabric service deletes files *inside the item folder* that aren't part of the item definition. Unrelated files not in an item folder aren't deleted.
- After you commit changes, you might notice some unexpected changes to the item that you didn't make. These changes are semantically insignificant and can happen for several reasons. For example:
 - Manually changing the item definition file. These changes are valid, but might be different than if done through the editors. For example, if you rename a semantic model column in Git and import this change to the workspace, the next time you commit changes to the semantic model, the *bim* file will register as changed and the modified column pushed to the back of the `columns` array. This is because the AS engine that generates the *bim* files pushes renamed columns to the end of the array. This change doesn't affect the way the item operates.

- Committing a file that uses *CRLF* line breaks. The service uses *LF* (line feed) line breaks. If you had item files in the Git repo with *CRLF* line breaks, when you commit from the service these files are changed to *LF*. For example, if you open a report in desktop, save the project file (*.pbip*) and upload it to Git using *CRLF*.
- Refreshing a semantic model using the [Enhanced refresh API](#) causes a Git diff after each refresh.

Related content

- [Understand the Git integration process](#)
- [Manage Git branches](#)
- [Git integration best practices](#)

Take ownership of Fabric items

Article • 04/07/2025

When a user leaves the organization, or if they don't sign in for more than 90 days, it's possible that any Fabric items they own will stop working correctly. In such cases, anyone with read and write permissions on such an item (such as workspace admins, members, and contributors) can take ownership of the item, using the procedure described in this article.

When a user takes over ownership of an item using this procedure, they also become the owner of any child items the item might have. You can't take over ownership of child items directly - only through the parent item.

(!) Note

Items such as semantic models, reports, datamarts, dataflows gen1 and dataflows gen2 have existing functionality for changing item ownership that remains the same. This article describes the procedure for taking ownership of other Fabric items.

Prerequisites

To take over ownership of a Fabric item, you must have read and write permissions on the item.

Take ownership of a Fabric item

To take ownership of a Fabric item:

1. Navigate to the item's settings. Remember, the item can't be a child item.
2. In the **About** tab, select **Take over**.
3. A message bar indicates whether the take over was successful.

If the take over fails for any reason, select **Take over** again.

 Expand table

Operation status	Error message	Next step
Success	Successfully took over the item.	None.
Partial Failure	Can't take over child items. Try again.	Retry take over of parent item.
Complete Failure	Can't take over <item_name>. Try again.	Retry take over of parent item.

Note

Data Pipeline items require the additional step of ensuring that the **Last Modified By** user is also updated after taking item ownership. You can do this by making a small edit to the item and saving it. For example, you could make a small change to the activity name.

Important

The take over feature doesn't cover ownership change of related items. For instance, if a data pipeline has notebook activity, changing ownership of the data pipeline doesn't change the ownership of the notebook. Ownership of related items needs to be changed separately.

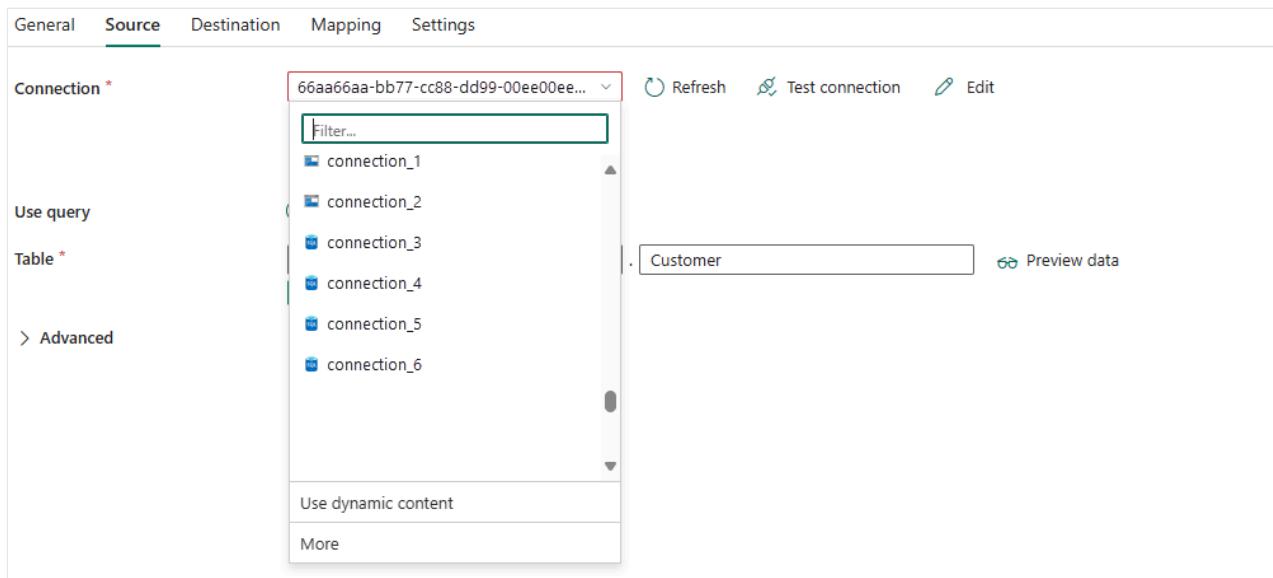
Repair connections after Fabric item ownership change

Some connections that use the previous item owner's credentials might stop working if the new item owner doesn't have access to the connection. In such cases, you might see a warning message.

In this scenario, the new item owner can fix connections by going into the item and replacing the connection with a new or existing connection. The following sections describe the steps for doing this procedure for several common item types. For other item types that have connections, refer to the item's connection management documentation.

Pipelines

1. Open the pipeline.
2. Select the activity created.
3. Replace the connection in the source and/or destination with the appropriate connection.



KQL Queryset

1. Open the KQL queryset.
2. In the **Explorer** pane, add another connection or select an existing one.

Real-Time Dashboard

1. Open the real-time dashboard in edit mode.
2. Choose **New data source** on the tool bar.
3. Select **Add+** to add new data sources.
4. In the new or existing tile, select the appropriate data source.

User data functions

1. Open the item and go to **Manage Connections**.
2. Select **Add data connection** to add a new connection and use that in the data function.

Dataflow Gen2 (CI/CD)

This is a separate item from Dataflows Gen1 and Gen2. Refer to the creation experience [here](#).

1. Open the item and go to **Manage Connections**.
2. Navigate to the relevant connection and select **Edit Connection** to make updates.

Considerations and limitations

- The following Fabric items don't support ownership change.
 - Mirrored Cosmos DB
 - Mirrored SQL DB
 - Mirrored SQL Managed Instance
 - Mirrored Snowflake
 - Mirrored database

If a mirrored database stops working because the item owner has left the organization or their credentials are disabled, create a new mirrored database.

- The option to take over an item isn't available if the item is a system-generated item not visible or accessible to users in a workspace. For instance, a parent item might have system-generated child items - this can happen when items such as Eventstream items and Data Activator items are created through the Real-Time hub. In such cases, the take over option is not available for the parent item.
- Currently, there's no API support for changing ownership of Fabric items. This doesn't impact existing functionality for changing ownership of items such as semantic models, reports, dataflows gen1 and gen2, and datamarts, which continues to be available. For information about taking ownership of warehouses, see [Change ownership of Fabric Warehouse](#).
- This Fabric-item takeover feature doesn't cover ownership takeover as a service principal.

Workspace identity

08/01/2025

A Fabric workspace identity is an automatically managed service principal that can be associated with a Fabric workspace. Fabric workspaces with a workspace identity can securely read or write to firewall-enabled Azure Data Lake Storage Gen2 accounts through [trusted workspace access](#) for OneLake shortcuts. Fabric items can use the identity when connecting to resources that support Microsoft Entra authentication. Fabric uses workspace identities to obtain Microsoft Entra tokens without the customer having to manage any credentials.

Workspace identities can be created in the workspace settings of any workspace except My workspaces.

When you create a workspace identity, Fabric creates a service principal in Microsoft Entra ID to represent the identity. An accompanying app registration is also created. Fabric automatically manages the credentials associated with workspace identities, thereby preventing credential leaks and downtime due to improper credential handling.

 **Note**

Fabric workspace identity is **generally available**. You can create a workspace identity in any workspace except **My workspace**.

While Fabric workspace identities share some similarities with Azure managed identities, their lifecycle, administration, and governance are different. A workspace identity has an independent lifecycle that is managed entirely in Fabric. A Fabric workspace can optionally be associated with an identity. When the workspace is deleted, the identity gets deleted. The name of the workspace identity is always the same as the name of the workspace it's associated with.

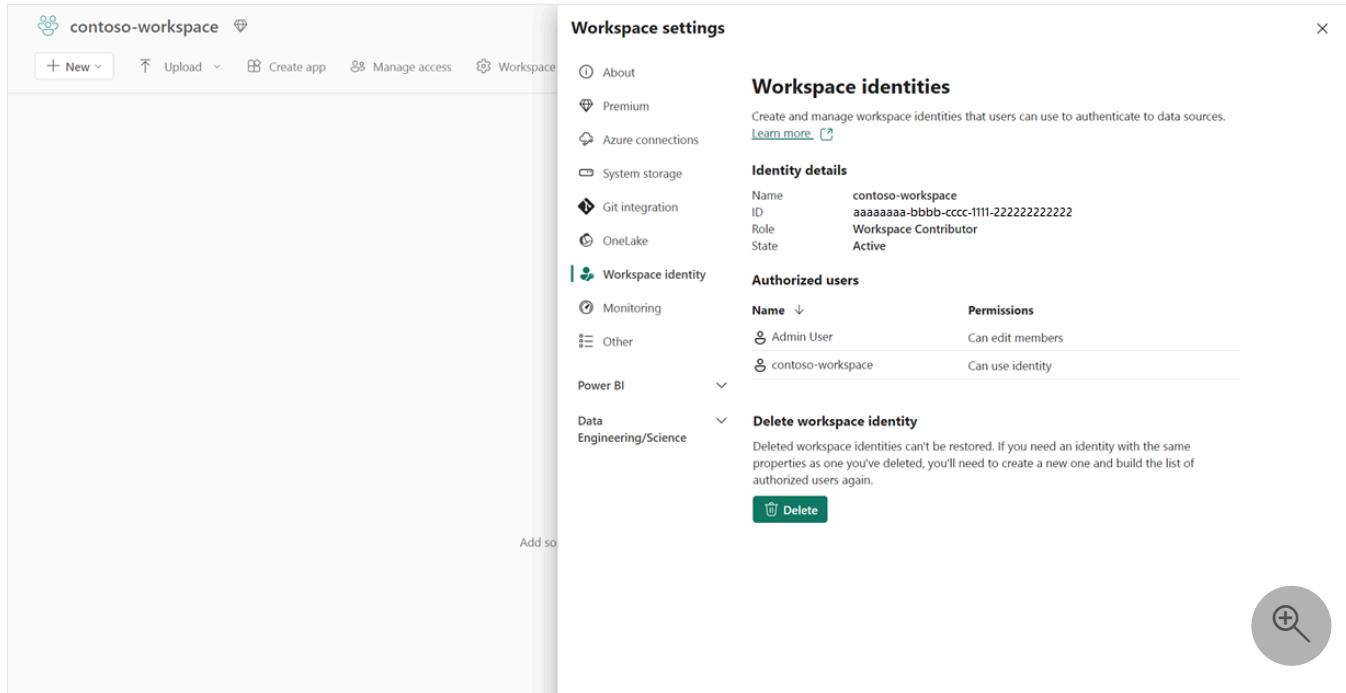
Create and manage a workspace identity

You must be a workspace admin to be able to create and manage a workspace identity. The workspace you're creating the identity for can't be a **My Workspace**.

1. Sign in to the [Microsoft Fabric portal](#).
2. Select **Workspaces**, and then select the workspace you want to create a workspace identity for.
3. In the workspace, select the **Workspace settings** (gear) icon.
4. Select the **Workspace identity** tab.

5. Select the + Workspace identity button.

When the workspace identity has been created, the tab displays the workspace identity details and the list of authorized users.



The screenshot shows the 'Workspace settings' page for a workspace named 'contoso-workspace'. On the left, there's a sidebar with various workspace management options like 'About', 'Premium', 'Azure connections', 'System storage', 'Git integration', 'OneLake', 'Monitoring', 'Other', 'Power BI', and 'Data Engineering/Science'. The 'Power BI' section is expanded, showing 'Add so...'. On the right, under the 'Workspace identities' tab, there's a section titled 'Identity details' with fields for Name (contoso-workspace), ID (aaaaaaa-bbbb-cccc-1111-222222222222), Role (Workspace Contributor), and State (Active). Below that is a table titled 'Authorized users' with two entries: 'Admin User' (Can edit members) and 'contoso-workspace' (Can use identity). At the bottom, there's a 'Delete workspace identity' section with a 'Delete' button and a note about deleted identities. A search icon is also present.

The sections of the workspace identity configuration are described in the following sections.

Identity details

[] [Expand table](#)

Detail	Description
Name	Workspace identity name. The workspace identity name is the same as the workspace name.
ID	The workspace identity GUID. This is a unique identifier for the identity.
Role	The workspace role assigned to the identity.
State	The state of the workspace. Possible values: <i>Active</i> , <i>Inactive</i> , <i>Deleting</i> , <i>Unusable</i> , <i>Failed</i> , <i>DeleteFailed</i>

Authorized users

For information, see [Access control](#).

Delete a workspace identity

When an identity is deleted, Fabric items relying on the workspace identity for trusted workspace access or authentication will break. **Deleted workspace identities cannot be restored.**

 **Note**

When a workspace is deleted, its workspace identity is deleted as well. If the workspace is restored after deletion, the workspace identity is not restored. If you want the restored workspace to have a workspace identity, you must create a new one.

How to use workspace identity

Workspace identity currently can be used in two ways:

- For authentication: See [Authenticate with workspace identity](#)
- For trusted workspace access: Shortcuts in a workspace that has a workspace identity can be used for trusted service access. For more information, see [trusted workspace access](#).

Security, administration, and governance of the workspace identity

The following sections describe who can use the workspace identity, and how you can monitor it in Microsoft Purview and Azure.

Access control

Workspace identity can be [created and deleted by workspace admins](#). By default, the workspace identity is not granted any workspace role.

 **Warning**

Workspace identity is an automatically managed service principal created by Fabric users. Access to this identity should be carefully managed and monitored, as any individual given access to the identity is allowed to assume it.

Workspace identity is supported for authentication to target resources in connections. Only users with an admin, member, or contributor role in the workspace can configure the workspace identity for authentication in connections.

[Application Administrators](#) or users with higher roles can view, modify, and delete the service principal and app registration associated with the workspace identity in Azure.

Warning

Modifying or deleting the service principal or app registration in Azure is not recommended, as it will cause Fabric items relying on workspace identity to stop working. Such changes may be reverted. Additionally, adhere to the principle of least privilege when managing Application Administrator roles. Ensure that only appropriate users are assigned this role. For more details, refer to [Application Administrators](#)

Administer the workspace identity in Fabric

Fabric administrators can administer the workspace identities created in their tenant on the [Fabric identities tab](#) in the admin portal.

1. Navigate to the [Fabric identities](#) tab in the Admin portal.
2. Select a workspace identity, and then select **Details**.
3. In the Details tab, you can view additional information related to the workspace identity.
4. You can also delete a workspace identity.

Note

Workspace identities cannot be restored after deletion. Be sure to review the consequences of deleting a workspace identity described in [Delete a workspace identity](#).

Administer the workspace identity in Purview

You can view the audit events generated upon the creation and deletion of workspace identity in Purview Audit Log. To access the log

1. Navigate to the [Microsoft Purview hub](#).
2. Select the **Audit** tile.
3. In the audit search form that appears, use the **Activities - friendly names** field to search for *fabric identity* to find the activities related to workspace identities. Currently, the following activities related to workspace identities are:
 - Created Fabric Identity for Workspace
 - Retrieved Fabric Identity for Workspace

- Deleted Fabric Identity for Workspace
- Retrieved Fabric Identity Token for Workspace

Administer the workspace identity in Azure

The application associated with the workspace identity can be viewed under both **Enterprise applications** and **App registrations** in the Azure portal.

Enterprise applications

The application associated with the workspace identity can be seen in **Enterprise Applications** in the Azure portal. Fabric Identity Management app is its configuration owner.

Warning

Modifications to the application made here will cause the workspace identity to stop working, and such changes may be reverted. Additionally, adhere to the principle of least privilege when managing Application Administrator roles. Ensure that only appropriate users are assigned this role. For more details, refer to [Application Administrators](#)

To view the audit logs and sign-in logs for this identity:

1. Sign in to the Azure portal.
2. Navigate to **Microsoft Entra ID > Enterprise Applications**.
3. Select either **Audit logs** or **Sign in logs**, as desired.

App registrations

The application associated with the workspace identity can be seen under **App registrations** in the Azure portal. No modifications should be made there, as this will cause the workspace identity to stop working.

Advanced scenarios

The following sections describe scenarios involving workspace identities that might occur.

Deleting the identity

The workspace identity can be deleted in the workspace settings. When an identity is deleted, Fabric items relying on the workspace identity for trusted workspace access or authentication

will break. Deleted workspace identities can't be restored.

When a workspace is deleted, its workspace identity is deleted as well. If the workspace is restored after deletion, the workspace identity is **not** restored. If you want the restored workspace to have a workspace identity, you must create a new one.

Renaming the workspace

When a workspace gets renamed, the workspace identity is also renamed to match the workspace name. However its Microsoft Entra application and service principal remain the same. Note that there can be multiple application and app registration objects with same name in a tenant.

Considerations and limitations

- A workspace identity can be created in any workspace except a My Workspace.
- If a workspace with a workspace identity is migrated to a non-Fabric capacity or to a non-F SKU Fabric capacity, the identity won't be disabled or deleted, but Fabric items relying on trusted workspace access will stop working.
- A maximum of 1,000 workspace identities can be created in a tenant. Once this limit is reached, workspace identities must be deleted to enable newer ones to be created.
- Azure Data Lake Storage Gen2 shortcuts in a workspace that has a workspace identity will be capable of trusted service access.

Troubleshooting issues with creating a workspace identity

- If you can't create a workspace identity because the creation button is disabled, make sure you have the workspace administrator role.
- If you run into issues the first time you create a workspace identity in your tenant, try the following steps:
 1. If the workspace identity state is *failed*, wait for an hour and then delete the identity.
 2. After the identity has been deleted, wait 5 minutes and then create the identity again.

Related content

- [Authenticate with workspace identity](#)

- Trusted workspace access
- Fabric identities

What is workspace monitoring (preview)?

09/07/2025

Workspace monitoring is a Microsoft Fabric database that collects and organizes logs and metrics from a range of Fabric items in your workspace. Workspace monitoring lets workspace users access and analyze logs and metrics related to Fabric items in the workspace. You can query the database to gain insights into the usage and performance of your workspace.

Monitoring

Workspace monitoring creates an [Eventhouse](#) database in your workspace that collects and organizes logs and metrics from the Fabric items in the workspace. Workspace contributors can query the database to learn more about the performance of their Fabric items.

- **Security** - Workspace monitoring is a secure read-only database that is accessible only to workspace users with at least a contributor role.
- **Data collection** - The monitoring Eventhouse collects diagnostic logs and metrics from Fabric items in the workspace. The data is aggregated and stored in the monitoring database, where it can be queried using KQL or SQL. The database supports both historical log analysis and real-time data streaming.
- **Access** - Access the monitoring database from the workspace. You can build and save query sets and dashboards to simplify data exploration.

Operation logs

After you install [workspace monitoring](#), you can query the following logs:

- Data engineering (GraphQL)
 - [GraphQL operations](#)
- Eventhouse monitoring in Real-Time Intelligence
 - [Command logs](#)
 - [Data operation logs](#)
 - [Ingestion results logs](#)
 - [Metrics](#)
 - [Query logs](#)
- Mirrored database
 - [Mirrored database logs](#)

- Power BI
 - Semantic models

Sample queries

Workload monitoring sample queries are available from [workspace-monitoring](#) in the Fabric samples GitHub repository.

Templates

You can create and explore workspace monitoring using Power BI reports and Real-time dashboards by following the [Visualize workspace monitoring](#) guide or via the templates available from [workspace-monitoring-dashboards](#).

Considerations and limitations

- You can only enable either workspace monitoring or [log analytics](#) in a workspace. You can't enable both at the same time. To enable workspace monitoring in a workspace that already has log analytics enabled, delete the log analytics configuration and wait for a few hours before enabling workspace monitoring.
- The workspace monitoring Eventhouse is a read-only item.
 - To delete the database, use the workspace settings. Before recreating a deleted database, wait about 15 minutes.
 - To share the database, grant users a workspace *member* or *admin* [role](#).
- The retention period for monitoring data is 30 days.
- You can't configure ingestion to filter for specific log type or category such as *error* or *workload type*.
- User data operation logs aren't available even though the table is available in the monitoring database.
- Workspace monitoring is billed based on the capacity consumed by the monitoring items. For more details, see [Eventhouse and KQL Database consumption](#) and [Microsoft Fabric event streams capacity consumption](#).
- [Throttling](#)
 - Monitoring Eventstream and Eventhouse operations aren't impacted by the state of the capacity. When the capacity is throttled, the queries on the monitoring Eventhouse and

the Eventstream ingestion operations continue to function normally. There's also no impact to real-time dashboards built on top of the monitoring database.

- Power BI reports or Activator alerts, built on top of the monitoring database respect the capacity state and get throttled.

Related content

- [Enable monitoring in your workspace](#)
- [Eventhouse monitoring](#)

Enable monitoring in your workspace

Article • 01/26/2025

This article explains how to enable [monitoring](#) in a Microsoft Fabric workspace.

Prerequisites

- A Power BI Premium or a Fabric capacity.
- The [Workspace admins can turn on monitoring for their workspaces](#) tenant setting is enabled. To enable the setting, you need to be a Fabric administrator. If you're not a Fabric administrator, ask the Fabric administrator in your organization to enable the setting.
- You have the **admin** role in the workspace.

Enable monitoring

Follow these steps to enable monitoring in your workspace:

1. Go to the workspace you want to enable monitoring for, and select **Workspace settings** (⚙).
2. In *Workspace settings*, select **Monitoring**.
3. Select **+Eventhouse** and wait for the database to be created.

Related content

- [What is workspace monitoring?](#)

Feedback

Was this page helpful?

 Yes

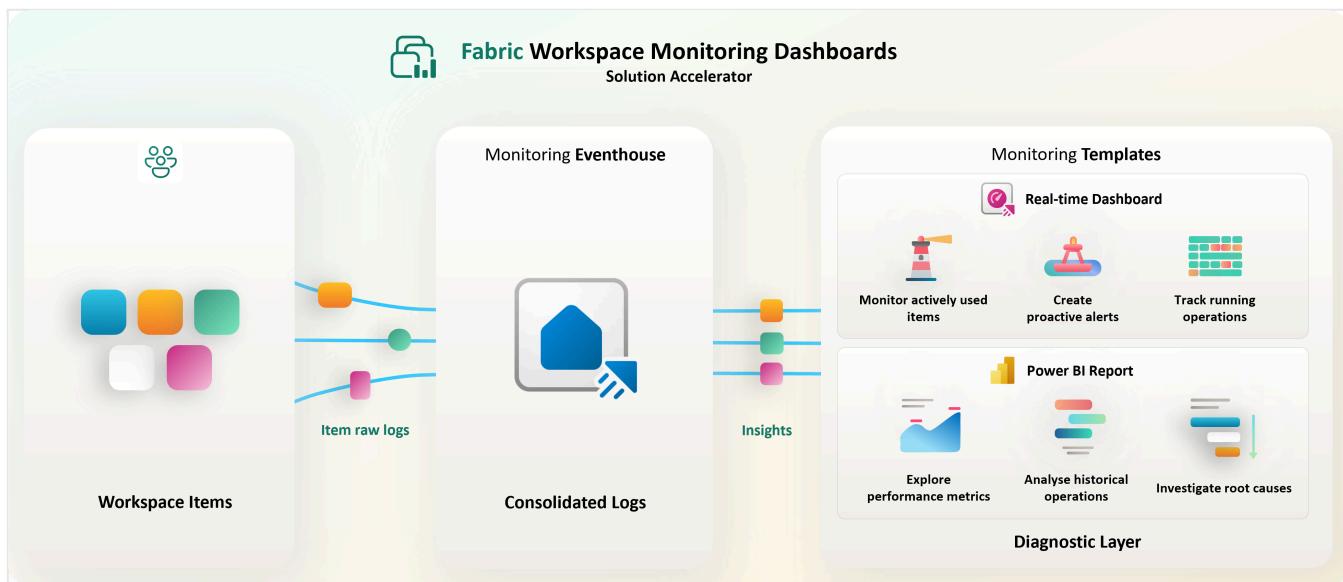
 No

[Provide product feedback ↗](#) | [Ask the community ↗](#)

Visualize your workspace monitoring in a Real-Time dashboard or Power BI report using Sample Templates

09/16/2025

Fabric workspace monitoring provides rich telemetry across your workspace assets, including Eventhouses, Power BI Semantic Models, Data Engineering (GraphQL), and Mirrored Databases. The workspace monitoring data is stored in an Eventhouse, which is part of Fabric Real-Time Intelligence. This telemetry includes diagnostic logs, ingestion results, query activity, and system metrics, all of which are collected and organized in a secure, read-only Eventhouse database. To help you turn this data into actionable insights, this article guides you through connecting your monitoring data to a Real-Time Dashboard or a Power BI report using a sample end-to-end monitoring solution.



To get started, follow the [end-to-end sample guide](#) to set up the sample environment. Once complete, follow the steps in this article to learn how to connect your own monitoring data and visualize it in real time.

Prerequisites

- A Power BI Premium capacity or a [workspace](#) with Microsoft Fabric-enabled [capacity](#).
- [Workspace monitoring](#) must be enabled in your workspace.
- A monitoring sample workspace with the [End-to-End Real-Time Intelligence sample solution](#) setup.

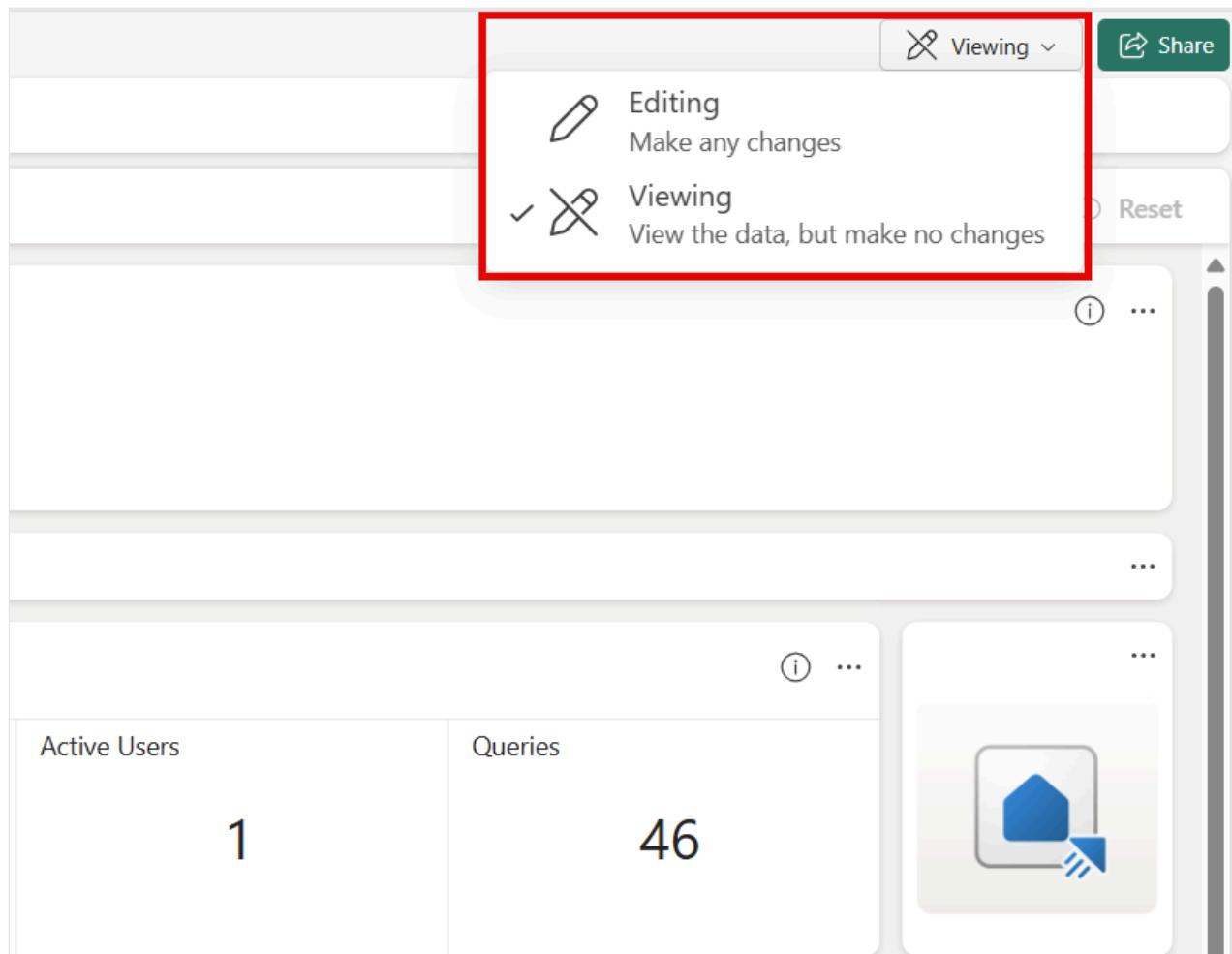
Connect the sample Real-Time Dashboard

To connect the sample Real-Time dashboard to monitoring data from another workspace:

1. Open the folder containing the autogenerated items from the sample end-to-end solution and navigate to the **Real-Time dashboard**.

	Name	Type ↑
📁	Monitoring_sample	Folder
📁	Monitoring_sample_1	Folder
⚡	Monitoring_Activator	Activator
🏡	Monitoring_Eventhouse	Eventhouse
↳	Monitoring_Database	KQL Database
ETwitter	Monitoring_Eventstream	Eventstream
📄	Monitoring_Queryset	KQL Queryset
👁️	Monitoring_RTDashboard	Real-Time Dashboard
📊	Monitoring_Report	Report
⋮	Monitoring_Report	Semantic model

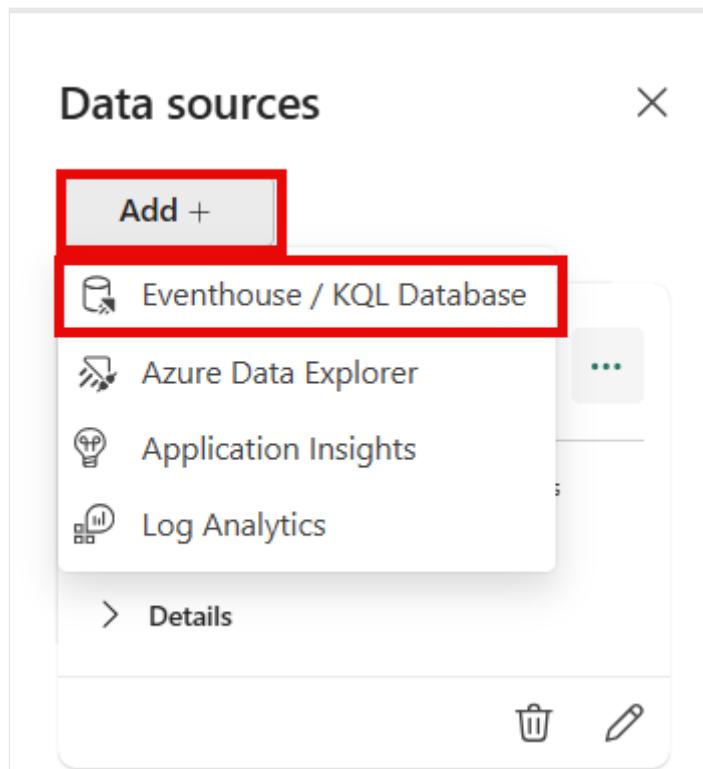
2. Open the sample dashboard and switch to **Editing mode**.



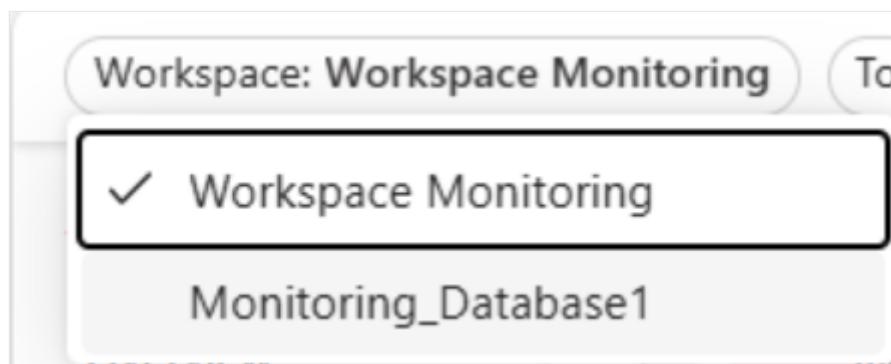
3. Go to **Manage > Data Sources**.

The screenshot shows the 'Manage' page with a red box around the 'Manage' tab. Below it, the 'Data sources' tab is also highlighted with a red box. Other tabs include 'Parameters', 'Replace with file', 'Download file', and 'Auto refresh'. At the bottom, there are filters for 'Workspace: Workspace Monitoring', 'Time range: Last 30 days', and 'TimeUnit: Seconds'. On the left, a sidebar shows 'Pages' and 'Current Workspace'.

4. Select **Add** in the Data Sources side pane.



5. Select the KQL Database from the Monitoring Eventhouse in the workspace you want to connect to.
6. After you add the data source, change the display name to reflect the workspace the Monitoring database belongs to.
7. Finally, select **Save** to apply the changes.
8. Use the **Workspace** parameter to switch between Eventhouses and monitor multiple workspaces from a single dashboard.



Connect the sample Power BI Report

To connect the sample Power BI report to monitoring data from another workspace:

1. Open the folder containing the autogenerated items from the sample end-to-end solution and navigate to the **Semantic model** report.

Name	Status	Type
Monitoring_Activator	Activated	Activator
Monitoring_Eventhouse	Activated	Eventhouse
Monitoring_Database	Activated	KQL Database
Monitoring_Eventstream	Activated	Eventstream
Monitoring_Queryset	Activated	KQL Queryset
Monitoring_Report	Activated	Report
Monitoring_Report	Activated	Semantic model
Monitoring_RTDashboard	Activated	Real-Time Dashboard

2. Select the ellipsis (...) next to the report name and navigate to the **Settings** option.

Name	Status	Type
Monitoring_Activator	Activated	Activator
Monitoring_Eventhouse	Activated	Eventhouse
Monitoring_Database	Activated	KQL Database
Monitoring_Eventstream	Activated	Eventstream
Monitoring_Queryset	Activated	KQL Queryset
Monitoring_Report	Activated	Report
Monitoring_Report	Activated	Semantic model
Monitoring_RTDashboard	Activated	Real-Time Dashboard

...

Delete

- Quick insights
- Security
- Rename
- Open data model
- Settings
- Refresh history
- Download this file
- Manage permissions
- View workspace lineage
- View item lineage
- Move to

3. Under the **Parameters** section:

- a. Replace the **Query URI** with your Monitoring Eventhouse URI from the workspace you want to connect to.

Parameters

With the new Query Parameters feature, users can now easily define one or multiple parameters to be used in their queries, Data Model and report layers in Power BI Desktop.

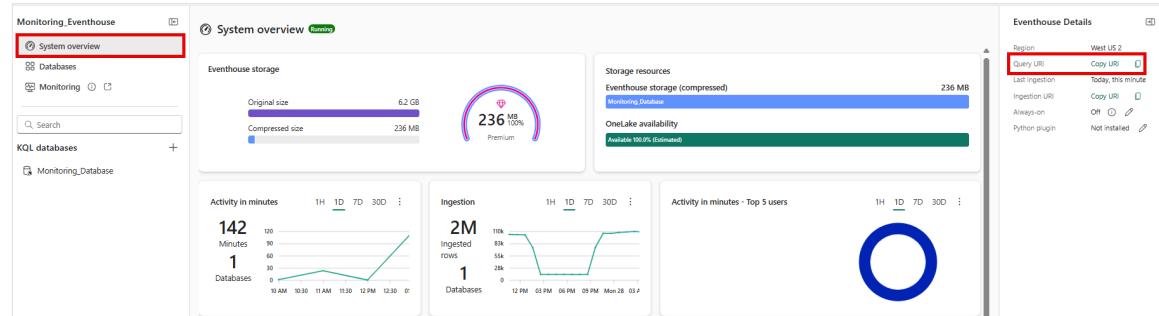
SM_OperationId [NOT REQUIRED] Specific Operation ID will be used as a dynamic M-Paramater on drillthrough report page.

Query URI [REQUIRED] - The Query URI of the Monitoring Eventhouse

Database ID [REQUIRED] - Name or ID of the Monitoring Database

Apply **Discard**

- Find the Monitoring Eventhouse URI by navigating to the Eventhouse's **System Overview** page, and locating the **Query URI** in the **Eventhouse Details** side pane.



- b. Replace the **Database ID** with your Monitoring Eventhouse's database ID.

Parameters

With the new Query Parameters feature, users can now easily define one or multiple parameters to be used in their queries, Data Model and report layers in Power BI Desktop.

SM_OperationId [NOT REQUIRED] Specific Operation ID will be used as a dynamic M-Paramater on drillthrough report page.

Query URI [REQUIRED] - The Query URI of the Monitoring Eventhouse

`https://trd-yk48btkwcmuga84s.z6.kusto.fabric.microsoft.com`

Database ID [REQUIRED] - Name or ID of the Monitoring Database

`e439ee80-1881-4afa-8393-6cccd6adb7c37`

Apply

Discard

- Find the database ID by navigating to the Monitoring KQL Database page in the Monitoring Eventhouse and locating the database ID in the page URL, after the `/databases/` segment.

- c. Select **Apply** to save the changes. You might be prompted to sign in and validate your credentials.

4. Navigate back to the autogenerated items list and refresh the Semantic model.

Name	Status	Type
Monitoring_Activator	Activator	
Monitoring_Eventhouse	Eventhouse	
Monitoring_Database	KQL Database	
Monitoring_Eventstream	Eventstream	
Monitoring_Queryset	KQL Queryset	
Monitoring_Report	Report	
Monitoring_Report	  ...	Semantic model
Monitoring_RTDashboard		Real-Time Dashboard

Related Content

- [Sample Gallery](#)

- End-to-End Sample
- Workspace Monitoring Overview

Endorse Fabric and Power BI items

Article • 01/26/2025

Fabric provides three ways to endorse valuable, high-quality items to increase their visibility: **promotion** and **certification** and designating them as **master data**.

- **Promotion:** Promotion is a way to highlight items you think are valuable and worthwhile for others to use. It encourages the collaborative use and spread of content within an organization.

Any item owner, as well as anyone with write permissions on the item, can promote the item when they think it's good enough for sharing.

- **Certification:** Certification means that the item meets the organization's quality standards and can be regarded as reliable, authoritative, and ready for use across the organization.

Only [authorized reviewers \(defined by the Fabric administrator\)](#) can certify items. Item owners who wish to see their item certified and aren't authorized to certify it themselves need to follow their organization's guidelines about getting items certified.

- **Master data:** Being labeled as master data means that the data item is regarded by the organization as being core, single-source-of-truth data, such as customer lists or product codes.

Only [authorized reviewers \(defined by the Fabric administrator\)](#) can label data items as master data. Item owners who wish to see their item endorsed as master data and aren't authorized to apply the **Master data** badge themselves need to follow their organization's guidelines about getting items labeled as master data.

Currently it's possible to promote or certify all Fabric and Power BI items except Power BI dashboards.

Master data badges can only be applied to items that contain data, such as lakehouses and semantic models.

This article describes:

- How to [promote items](#).
- How to [certify items](#) if you're an authorized reviewer, or [request certification](#) if you're not.

- How to apply the **Master data badge** to a data item if you are authorized to do so, or [request master data designation](#) if you're not.

See the [endorsement overview](#) to learn more about endorsement.

Promote items

To promote an item, you must have write permissions on the item you want to promote.

1. Go to the settings of the item you want to promote.
2. Expand the endorsement section and select **Promoted**.

If you're promoting a Power BI semantic model and see a **Make discoverable** checkbox, it means you can make it possible for users who don't have access to the semantic model to find it. See [semantic model discovery](#) for more detail.

3. Select **Apply**.

Certify items

Item certification is a significant responsibility, and you should only certify an item if you feel qualified to do so and have reviewed the item.

To certify an item:

- You must be [authorized by the Fabric administrator](#).

 **Note**

If you aren't authorized to certify an item yourself, you can [request item certification](#).

- You must have write permissions on the item you want to apply the **Certified** badge to.
1. Carefully review the item and determine whether it meets your organization's certification standards.
 2. If you decide to certify the item, go to the workspace where it resides, and open the settings of the item you want to certify.
 3. Expand the endorsement section and select **Certified**.

If you're certifying a Power BI semantic model and see a **Make discoverable** checkbox, it means you can make it possible for users who don't have access to the semantic model to find it. See [semantic model discovery](#) for more detail.

4. Select **Apply**.

Label data items as master data

Labeling data items as master data is a significant responsibility, and you should perform this task only if you feel you are qualified to do so.

To label a data item as master data:

- You must be [authorized by the Fabric administrator](#).

 **Note**

If you aren't authorized to designate a data item as master data yourself, you can [request the master data designation](#).

- You must have write permissions on the item you want to apply the **Master data** badge to.
1. Carefully review the data item and determine whether it is truly core, single-source-of-truth data that your organization wants users to find and use for the kind of data it contains.
 2. If you decide to label the item as master data, go to the workspace where it located, and open the settings of the item's settings..
 3. Expand the endorsement section and select **Master data**.
 4. Select **Apply**.

Request certification or master data designation

If you would like to certify your item or get it labeled as master data but aren't authorized to do so, follow the steps below.

1. Go to the workspace where the item you want endorsed as certified or master data is located, and then open the settings of that item.

2. Expand the endorsement section. The **Certified** or **Master data** button will be greyed if you're not authorized to endorse items as certified or as master data.
3. Select relevant link, **How do I get content certified** or **How do I get content endorsed as Master data** to find out how to get your item endorsed the way you want it to be:

The screenshot shows the 'Endorsement' section of a Fabric interface. On the left, there's a sidebar with 'About', 'Sensitivity label', and a selected 'Endorsement' tab. Under 'Endorsement', there are four options: 'None' (selected), 'Promoted', 'Certified' (disabled), and 'Master Data' (disabled). Each option has a descriptive text below it. Two links are highlighted with red boxes: 'How do I get content certified?' and 'How do I get content endorsed as master data?'. The 'Certified' and 'Master Data' buttons are greyed out.

! Note

If you clicked one of the links but got redirected back to this note, it means that your Fabric admin has not made any information available. In this case, contact the Fabric admin directly.

Related content

- [Read more about endorsement](#)
- [Enable item certification \(Fabric admins\)](#)
- [Enable master data endorsement \(Fabric admins\)](#)
- [Read more about semantic model discoverability](#)

Feedback

Was this page helpful?

Yes

No

[Provide product feedback ↗](#) | [Ask the community ↗](#)

Share items in Microsoft Fabric

Article • 04/06/2025

Workspaces are the central places where you collaborate with your colleagues in Microsoft Fabric. Besides assigning workspace roles, you can also use item sharing to grant and manage item-level permissions in scenarios where:

- You want to collaborate with colleagues who don't have a role in the workspace.
- You want to grant additional item level-permissions for colleagues who already have a role in the workspace.

This document describes how to share an item and manage its permissions.

Share an item via link

1. In the list of items, or in an open item, select the **Share** button .
2. The **Create and send link** dialog opens. Select **People in your organization can view**.

Create and send link



test-KQL-Queryset



People in your organization can
view >

Enter a name or email address

Add a message (optional)

Send



Copy link



by Email



by Teams



by PowerPoint

3. The **Select permissions** dialog opens. Choose the audience for the link you're going to share.

Select permissions

X

test-KQL-Queryset

People who can view this KQL Queryset

-  People in your organization
-  People with existing access
-  Specific people

Additional permissions

Authorized users can view this KQL Queryset by default. Select additional permissions.

- Share
- Edit

 Share first the database, then the queryset

Apply

Back

You have the following options:

- **People in your organization** This type of link allows people in your organization to access this item. It doesn't work for external users or guest users. Use this link type when:
 - You want to share with someone in your organization.
 - You're comfortable with the link being shared with other people in your organization.
 - You want to ensure that the link doesn't work for external or guest users.
- **People with existing access** This type of link generates a URL to the item, but it doesn't grant any access to the item. Use this link type if you just want to send a link to somebody who already has access.
- **Specific people** This type of link allows specific people or groups to access the report. If you select this option, enter the names or email addresses of the people you wish to share with. This link type also lets you share to guest

users in your organization's Microsoft Entra ID. You can't share to external users who aren't guests in your organization.

! Note

If your admin has disabled shareable links to **People in your organization**, you can only copy and share links using the **People with existing access** and **Specific people** options.

4. Choose the permissions you want to grant via the link.

The image shows two identical-looking "Select permissions" dialog boxes side-by-side. Both dialogs have a header "Select permissions" and a sub-header "test-KQL-Queryset". They both show a section for "People who can view this KQL Queryset" with three options: "People in your organization" (selected), "People with existing access" (disabled), and "Specific people" (disabled). Below this is a "Additional permissions" section with two checkboxes: "Share" (selected) and "Edit" (disabled). A note at the bottom says "Share first the database, then the queryset". At the bottom are "Apply" and "Back" buttons. In the second dialog, the "Share" checkbox is highlighted with a red border, while in the first, the "Edit" checkbox is highlighted.

Links that give access to **People in your organization** or **Specific people** always include at least read access. However, you can also specify if you want the link to include additional permissions as well.

! Note

The **Additional permissions** settings vary for different items. Learn more about the [item permission model](#).

Links for **People with existing access** don't have additional permission settings because these links don't give access to the item.

Select **Apply**.

5. In the **Create and send link** dialog, you have the option to copy the sharing link, generate an email with the link, or share it via Teams.

Create and send link



test-KQL-Queryset



People in your organization can
view >

Enter a name or email address

Add a message (optional)

Send



Copy link



by Email



by Teams



by PowerPoint

- **Copy link:** This option automatically generates a shareable link. Select **Copy** in the **Copy link** dialog that appears to copy the link to your clipboard.

Copy link

test-KQL-Queryset



Link ready!

Link

<https://daily.powerbi.com/links/...>

Copy



People in your organization can view,
edit, and share

- **by Email:** This option opens the default email client app on your computer and creates an email draft with the link in it.
 - **by Teams:** This option opens Teams and creates a new Teams draft message with the link in it.
6. You can also choose to send the link directly to **Specific people** or groups (distribution groups or security groups). Enter their name or email address, optionally type a message, and select **Send**. An email with the link is sent to your specified recipients.

Create and send link



test-KQL-Queryset



People in your organization can
view and share



Malik Barden



Corey Gray

Add a message (optional)

Send



Copy link



By Email



To Teams



To PowerPoint

When your recipients receive the email, they can access the report through the shareable link.

Manage item links

1. To manage links that give access to the item, in the upper right of the sharing dialog, select the **Manage permissions** icon:

Create and send link



X

test-KQL-Queryset



People in your organization can
view



2. The **Manage permissions** pane opens, where you can copy or modify existing links or grant users direct access. To modify a given link, select **Edit**.

Manage permissions

X

Sample item

Links that give access

<https://msit.powerbi.com/group...>



People in your organization can view and share.

<https://msit.powerbi.com/group...>



Specific people can view and share.



People with direct access



Malik Barden

owner



Corey Gray



Shawn Hughes

[Advanced](#)

3. In the **Edit link** pane, you can modify the permissions included in the link, people who can use this link, or delete the link. Select **Apply** after your modification.

This image shows the **Edit link** pane when the selected audience is **People in your organization can view and share**.

Edit link

Sample item

Link details

<https://msit.powerbi.com/groups/me...>



 People in your organization can view and share.

Sample item permissions

Select the permissions you want to grant to this Sample item

Share

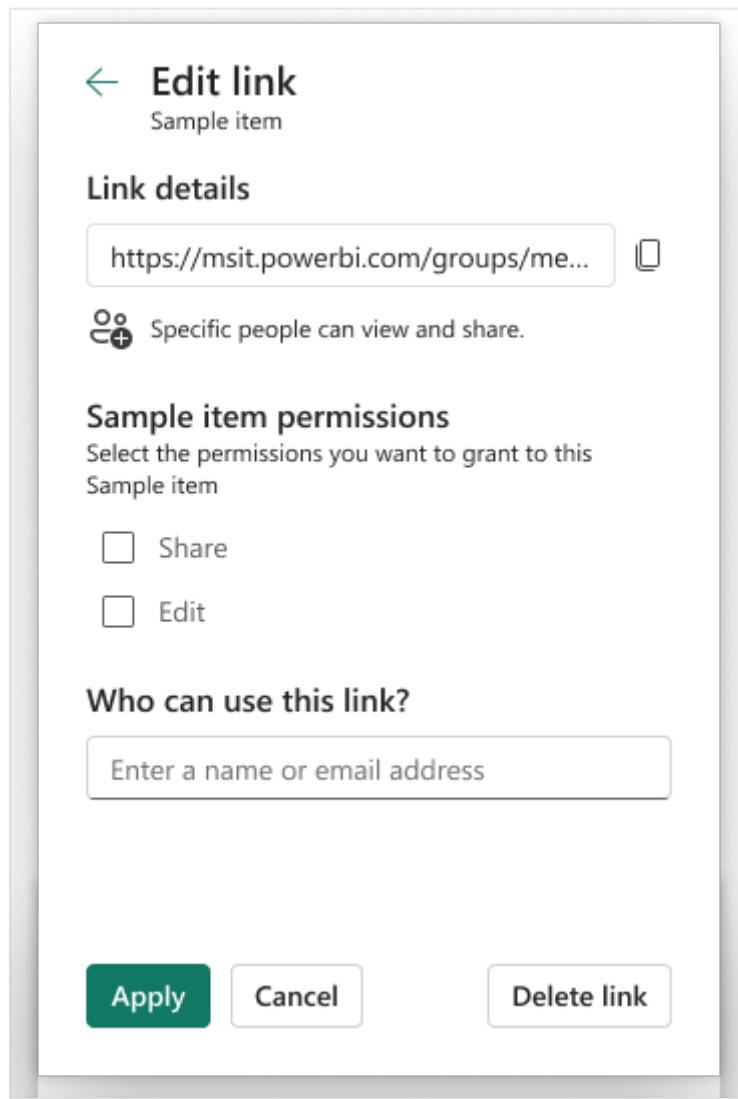
Edit

Apply

Cancel

Delete link

This image shows the **Edit link** pane when the selected audience is **Specific people can view and share**. Note that the pane enables you to modify who can use the link.



4. For more access management capabilities, select the **Advanced** option in the footer of the Manage permissions pane. On the management page that opens, you can:

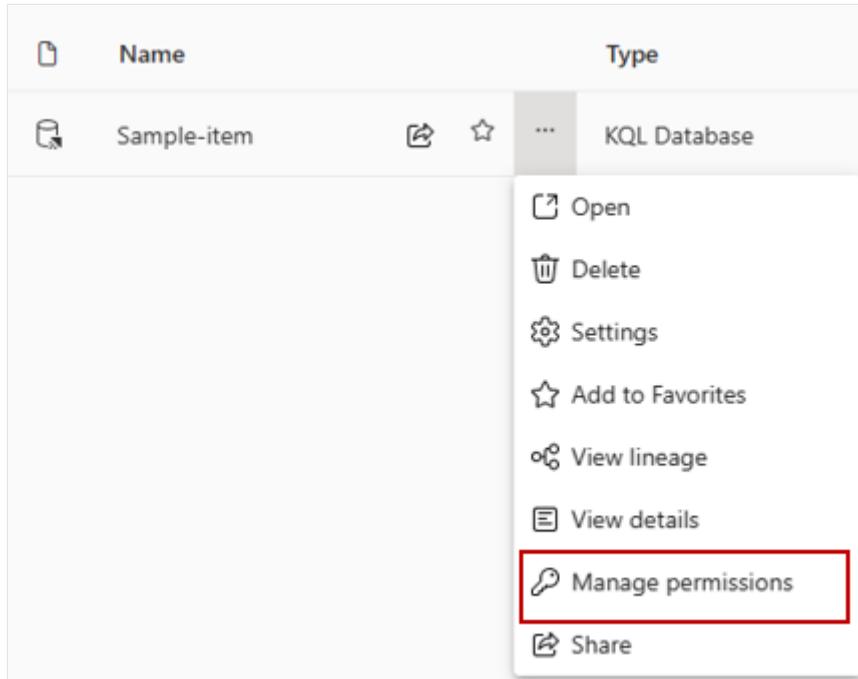
- View, manage, and create links.
- View and manage who has direct access and grant people direct access.
- Apply filters or search for specific links or people.

Fabric				
<input type="text"/> Search				
<input type="checkbox"/> Sample item				
+ Add link				
Links	Direct access			
Link name	Who has access	Permissions	Created by	
https://contoso.com/groups/prepre/inten...	<input type="checkbox"/> ...	Read, reshare, build	Malik Barden	
https://contoso.com/groups/prepre/inten...	<input type="checkbox"/> ...	Read, reshare, build	Malik Barden	
http://contoso.com/groups/prepre/inten...	<input type="checkbox"/> ...	Read, reshare, build	Malik Barden	

Grant and manage access directly

In some cases, you need to grant permission directly instead of sharing link, such as granting permission to service account, for example.

1. Select **Manage permission** from the context menu.



2. Select **Direct access**.

The screenshot shows the 'Fabric' interface. At the top, there's a search bar and a 'Fabric' title. Below that, a list of items starts with 'Sample-item' and a '+ Add link' button. Underneath, there are two tabs: 'Links' (selected) and 'Direct access' (highlighted with a red box). The main area displays a table with columns: 'Link name', 'Who has access', 'Permissions', and 'Created by'. Three rows of data are shown:

Link name	Who has access	Permissions	Created by
https://contoso.com/groups/prepre/inten...	[User icons]	Read, reshare, build	Malik Barden
https://contoso.com/groups/prepre/inten...	[User icons]	Read, reshare, build	Malik Barden
http://contoso.com/groups/prepre/inten...	[User icons]	Read, reshare, build	Malik Barden

3. Select **Add user**.

People and groups with access	Email Address	Role	Permissions
Malik Barden	malikbarde@contoso.com	Workspace Admin	Read, reshare, build
Cory Gray	corygr@contoso.com	-	Read, reshare

4. Enter the names of people or accounts that you need to grant access to directly.

Select the permissions that you want to grant. You can also optionally notify recipients by email.

5. Select **Grant**.

Grant people access

Sample item

You are granting read permissions to this kql database to the following recipients.

Additional permissions

Share

Edit

Notification Options

Notify recipients by email

Grant **Back**

6. You can see all the people, groups, and accounts with access in the list on the permission management page. You can also see their workspace roles, permissions, and so on. By selecting the context menu, you can modify or remove the permissions.

ⓘ Note

You can't modify or remove permissions that are inherited from a workspace role in the permission management page. Learn more about [workspace roles](#) and the [item permission model](#).

Item permission model

Depending on the item being shared, you may find a different set of permissions that you can grant to recipients when you share. Read permission is always granted during sharing, so the recipient can discover the shared item in the OneSource data hub and open it.

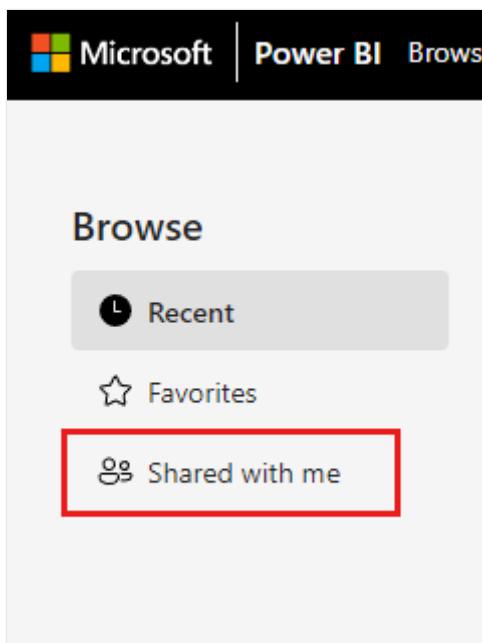
[\[+\] Expand table](#)

Permission granted while sharing	Effect
Read	Recipient can discover the item in the data hub and open it. Connect to the Warehouse or SQL analytics endpoint of the Lakehouse.
Edit	Recipient can edit the item or its content.
Share	Recipient can share the item and grant permissions up to the permissions that they have. For example, if the original recipient has <i>Share</i> , <i>Edit</i> , and <i>Read</i> permissions, they can at most grant <i>Share</i> , <i>Edit</i> , and <i>Read</i> permissions to the next recipient.
Read All with SQL analytics endpoint	Read data from the SQL analytics endpoint of the Lakehouse or Warehouse data through TDS endpoints.
Read all with Apache Spark	Read Lakehouse or Data warehouse data through OneLake APIs and Spark. Read Lakehouse data through Lakehouse explorer.

Permission	Effect
granted while sharing	
Subscribe to OneLake events	Subscribe to OneLake events for lakehouses, data warehouses, mirrored databases, SQL databases, and KQL databases.
Build	Build new content on the semantic model.
Execute	Execute or cancel execution of the item.

Considerations and limitations

- When a user's permission on an item is revoked through the manage permissions experience, it can take up to two hours for the change to take effect if the user is signed-in. If the user is not signed in, their permissions will be evaluated the next time they sign in, and any changes will only take effect at that time.
- The **Shared with me** option in the **Browse** pane currently only displays Power BI items that have been shared with you. It doesn't show you non-Power BI Fabric items that have been shared with you.



- The sharing dialog for lakehouses, data warehouses, mirrored databases, and SQL databases shows an option to subscribe to OneLake events. Permission to subscribe to OneLake events is granted along with the *Read All Apache Spark* permission. This is a temporary limitation.

Related content

- Workspace roles
-

Feedback

Was this page helpful?

 Yes

 No

[Provide product feedback ↗](#) | [Ask the community ↗](#)

Apply sensitivity labels to Fabric items

Article • 01/26/2025

Sensitivity labels from Microsoft Purview Information Protection on items can guard your sensitive content against unauthorized data access and leakage. They're a key component in helping your organization meet its governance and compliance requirements. Labeling your data correctly with sensitivity labels ensures that only authorized people can access your data. This article shows you how to apply sensitivity labels to your Microsoft Fabric items.

ⓘ Note

For information about applying sensitivity labels in Power BI Desktop, see [Apply sensitivity labels in Power BI Desktop](#).

Prerequisites

Requirements needed to apply sensitivity labels to Fabric items:

- Power BI Pro or Premium Per User (PPU) license
- Edit permissions on the item you wish to label.

ⓘ Note

If you can't apply a sensitivity label, or if the sensitivity label is greyed out in the sensitivity label menu, you may not have permissions to use the label. Contact your organization's tech support.

Apply a label

There are two common ways of applying a sensitivity label to an item: from the flyout menu in the item header, and in the item settings.

- From the flyout menu - select the sensitivity indication in the header to display the flyout menu:

The screenshot shows the settings for a 'Lakehouse_For_Dataflows' item. A red box highlights the 'Sensitivity' dropdown menu, which is set to 'Confidential'. A tooltip explains that sensitivity is automatically applied to downstream items created from this lakehouse. Below the dropdown, there are sections for 'Owner' (Debra Berger), 'Description' (Primary component), and a 'Show more' link. To the right, a table lists components with their types and relationships:

	Type	Relationship
Lakehouse_For_Dataflows	SQL endpoint	Downstream
Lakehouse_For_Dataflows	Dataset (default)	Downstream

- In items settings - open the item's settings, find the sensitivity section, and then choose the desired label:

The screenshot shows the settings for a 'My KQL Database' item. A red box highlights the 'Sensitivity label' input field, which is currently set to 'Confidential'. Below it, the 'Apply to downstream items' section is visible, containing a description and a toggle switch labeled 'On'.

Related content

- [Sensitivity label overview](#)

Feedback

Was this page helpful?

 Yes

 No

[Provide product feedback ↗](#) | [Ask the community ↗](#)

Job scheduler in Microsoft Fabric

09/16/2025

Automate and streamline your data analytics workflows in Microsoft Fabric with the job scheduler. This article explains how to use the job scheduler to set up recurring jobs, manage multiple schedules, and integrate scheduling with your CI/CD processes. Learn how to keep your items up to date and ensure reliable task automation in your Fabric workspace.

What is the job scheduler?

The job scheduler is a built-in tool that lets you schedule jobs to run automatically at specified times. Use it to trigger data refreshes, pipeline runs, or other supported tasks for items in your Fabric workspace.

Access the job scheduler

To access the job scheduler:

1. Open your Fabric workspace and locate the item you want to schedule (for example, Notebook).
2. Select the item's contextual menu.
3. Select **Schedule** from the menu to open the job scheduler interface.

You can also access the scheduler from within an item's settings by selecting the **Schedule** label.

Set up your schedule

After you open the scheduler for an item:

1. Toggle the scheduler **On** to enable scheduling.
2. Use the configuration panel to set when and how often the job runs.
3. Save your schedule to activate it.

Choose how often you want the job to run, and specify the start and end times. The scheduler supports various recurrence types, including minute-based, hourly, daily, weekly, monthly, and specific dates or weekdays of a month.

 Expand table

Recurrence type	Details and options
Minute-based	Every 1 to 720 minutes
Hourly	Every 1 to 72 hours
Daily	Up to 10 times per day
Weekly	On selected weekdays, up to 10 times per week
Monthly	Every 1 to 12 months
Specific dates/weekdays of a month	Select specific dates or weekdays in a month

If your configuration doesn't match a valid time, the scheduler skips that run and waits for the next valid time.

To ensure your schedule is valid:

- Set a valid start and end time for your schedule.
- Make sure the end time is after the start time.
- The scheduler automatically handles special cases like daylight saving time and invalid dates (for example, February 30).

ⓘ Important

Schedules become expired if a user doesn't log in to Fabric for 90 consecutive days. For more information, see [Refresh tokens in the Microsoft identity platform](#).

Manage multiple schedules

Create and manage multiple schedules for a single item. Use different schedules to run jobs at different times or with different settings.

1. On the **Schedule** screen, view, add, and edit multiple schedule configurations for each item.
2. Select the schedule you want to manage, or create a new one for different job types or timing needs.

Schedule

Only 20 total schedules can be created and maintained for this item.

This includes any schedules created using the API that aren't displayed here.

Refresh status

Last successful refresh

No refresh history

Scheduled run

Every 15 minutes

On

Last successful refresh Next refresh

Not available 

less than a minute

 Show more

Time zone:

Schedule ID:

 Edit

Every day

On

Time of day Last successful refresh Next refresh

07:00 AM

Not available 

17 hour(s) 14 minute(s)

 Show more

Time zone:

Schedule ID:

 Edit

 Add schedule

Automate schedules with CI/CD

The job scheduler supports CI/CD integration, so you can deploy and manage schedules as part of your development workflow.

 Expand table

Workflow	Description
Deployment pipelines	Schedules are included when you deploy an item
Git integration	Schedules are stored in a <code>.schedules</code> file in your item definition
Public API	Manage schedules by using code

When you deploy an item, its schedules are automatically included, so you don't need to recreate them manually. For step-by-step instructions, see [CI/CD workflow options in Fabric](#).

Important

All items that had a scheduler configured prior to CI/CD being enabled appear as "uncommitted" when running `git status`. Carefully review and confirm the changes that need to be committed to avoid unintended actions. Items without prior scheduler configuration aren't affected. We apologize for any inconvenience this may cause.

Summary

The job scheduler in Microsoft Fabric lets you automate recurring jobs, manage multiple schedules for each item, and integrate scheduling into your CI/CD workflows. Use it to streamline your data analytics process, and make sure your jobs run reliably and efficiently.

Related content

- [CI/CD workflow options in Fabric](#)

Delta Lake table format interoperability

Article • 04/27/2025

In Microsoft Fabric, the Delta Lake table format is the standard for analytics. [Delta Lake](#) is an open-source storage layer that brings ACID (Atomicity, Consistency, Isolation, Durability) transactions to big data and analytics workloads.

All Fabric experiences natively generate and consume Delta Lake tables, providing a unified product experience. Delta Lake tables produced by one compute engine, such as Fabric Data Warehouse or Synapse Spark, can be consumed by any other engine, such as Power BI. When you ingest data into Fabric, Fabric stores it as Delta tables by default. You can easily integrate external data containing Delta Lake tables by using OneLake shortcuts.

Delta Lake features and Fabric experiences

To achieve interoperability, all the Fabric experiences align on the Delta Lake features and Fabric capabilities. Some experiences can only write to Delta Lake tables, while others can read from it.

- Writers:** Data warehouses, eventstreams, and exported Power BI semantic models into OneLake
- Readers:** SQL analytics endpoint and Power BI direct lake semantic models
- Writers and readers:** Fabric Spark runtime, dataflows, data pipelines, and Kusto Query Language (KQL) databases

The following matrix shows key Delta Lake features and its availability on each Fabric experience.

[\[+\] Expand table](#)

Fabric capability	Column mappings	Deletion vectors	V-order writing	Table optimization and maintenance	Partitions	Liquid Clustering	TIMESTAMP_NTZ	Delta reader/writer version and default table features
Data warehouse Delta Lake export	Name: Yes ID: No	Yes	Yes	Yes	Read: N/A (not applicable) Write: No	No	No	Reader: 3 Writer: 7 Deletion Vectors, Column Mappings (name)
SQL analytics endpoint	Name: Yes ID: No	Yes	N/A (not applicable)	N/A (not applicable)	Read: Yes Write: N/A (not applicable)	Yes	No	N/A (not applicable)
Lakehouse explorer and preview	Name: Yes ID: No	Yes	N/A (not applicable)	Yes	Read: Yes Write: N/A (not applicable)	Yes	Yes	N/A (not applicable)
Fabric Spark Runtime 1.3	Name: Yes ID: Yes	Yes	Yes	Yes	Read: Yes Write: Yes	Yes	Yes	Reader: 1 Writer: 2
Fabric Spark Runtime 1.2	Name: Yes ID: Yes	Yes	Yes	Yes	Read: Yes Write: Yes	Yes, read only	Yes	Reader: 1 Writer: 2
Fabric Spark	Name: Yes	No	Yes	Yes	Read: Yes	Yes, read	No	Reader: 1

Fabric capability	Column mappings	Deletion vectors	V-order writing	Table optimization and maintenance	Partitions	Liquid Clustering	TIMESTAMP_NTZ	Delta reader/writer version and default table features
Runtime 1.1	ID: Yes			Write: Yes		only	Writer: 2	
Dataflows Gen2	Name: Yes ID: No	Yes	Yes	No	Read: Yes Write: Yes	Yes, read only	No	Reader: 1 Writer: 2
Data pipelines	Name: No ID: No	No	Yes	No	Read: Yes Write: Yes, overwrite only	Yes, read only	No	Reader: 1 Writer: 2
Power BI direct lake semantic models	Name: Yes ID: No	Yes	N/A (not applicable)	N/A (not applicable)	Read: Yes Write: N/A (not applicable)	Yes	No	N/A (not applicable)
Export Power BI semantic models into OneLake	Name: Yes ID: No	N/A (not applicable)	Yes	No	Read: N/A (not applicable) Write: No	No	No	Reader: 2 Writer: 5 Column Mappings (name)
KQL databases	Name: Yes ID: No	Yes	No	No*	Read: Yes Write: Yes	No	No	Reader: 1 Writer: 1
Eventstreams	Name: No ID: No	No	No	No	Read: N/A (not applicable) Write: Yes	No	No	Reader: 1 Writer: 2

* KQL databases provide certain table maintenance capabilities such as [retention](#). Data is removed at the end of the retention period from OneLake. For more information, see [One Logical copy](#).

(!) Note

- Fabric doesn't write column mappings by default, except where noted. The default Fabric experience generates tables that are compatible across the service. Delta Lake tables produced by third-party services may have incompatible table features.
- Some Fabric experiences don't offer table optimization and maintenance capabilities, such as bin-compaction, V-order, deletion vector merge (PURGE), and clean up of old unreferenced files (VACUUM). To keep Delta Lake tables optimal for analytics, follow the techniques in [Use table maintenance feature to manage delta tables in Fabric](#) for tables ingested using those experiences.

Current limitations

Currently, Fabric doesn't support these Delta Lake features:

- V2 Checkpoints aren't uniformly available in all experiences. Only Spark notebooks and Spark jobs can read and write to tables with V2 Checkpoints. Lakehouse and SQL Analytics don't correctly list tables containing V2 Checkpoint files in the `__delta_log` folder.

- Delta Lake 3.x Uniform. This feature is supported only in the Data Engineering Spark-compute (Notebooks, Spark Jobs).
- Identity columns writing (proprietary Databricks feature)
- Delta Live Tables (proprietary Databricks feature)
- Delta Lake 4.x features: Type widening, collations, variant type, coordinated commits.

Special characters on table names

Microsoft Fabric supports special characters as part of the table names. This feature allows the usage of unicode characters to compose table names in Microsoft Fabric experiences.

The following special characters are either reserved or not compatible with at least one of Microsoft Fabric technologies and must not be used as part of a table name: " (double quotes), ' (single quote), #, %, +, ;, ?, ` (backtick).

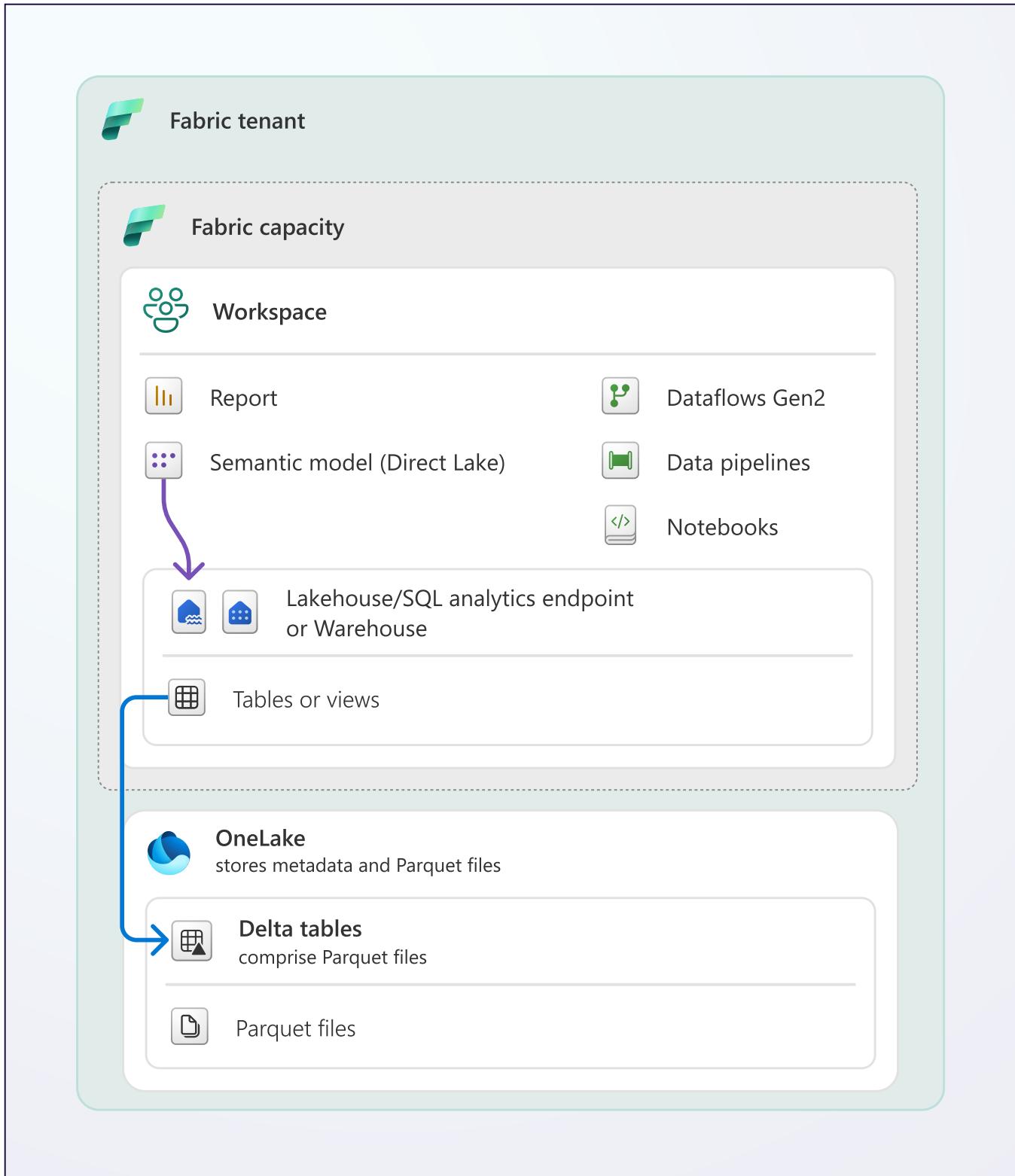
Related content

- [What is Delta Lake?](#)
- Learn more about [Delta Lake tables](#) in Fabric Lakehouse and Synapse Spark.
- [Learn about Direct Lake in Power BI and Microsoft Fabric.](#)
- Learn more about [querying tables from the Warehouse through its published Delta Lake Logs.](#)

Direct Lake overview

10/13/2025

Direct Lake is a Power BI semantic model table storage mode option available in Microsoft Fabric. It's optimized for large volumes of data to be quickly loaded into memory from [delta tables](#) available in the [OneLake](#)—the single store for all analytics data. Once loaded into memory, the semantic model enables high performance interactive analysis.



Direct Lake is ideal for semantic models connecting to large Fabric lakehouses, warehouses, and other Fabric data sources with delta tables. Direct Lake is especially useful when replicating the entire data volume into an import table is challenging or impossible. Direct Lake and import queries are processed by the VertiPaq query engine, whereas DirectQuery federates queries to the underlying data source. Direct Lake and import queries normally outperform DirectQuery queries when loading and interacting with visuals in reports.

However, a Direct Lake differs from an Import mode in an important way: a refresh operation for a Direct Lake semantic model is conceptually different to a refresh operation for an Import semantic model. Import mode replicates the data and creates an entire cached copy of the data for the semantic model, whereas a Direct Lake refresh copies only metadata (known as [framing](#), described later in this article), which can take a few seconds to complete. The Direct Lake refresh is a low-cost operation that analyzes the metadata of the latest version of the Delta tables and is updated to reference the latest files in OneLake. In contrast, for an Import refresh produces a copy of the data, which can take considerable time and consume significant data source and capacity resources (memory and CPU). Direct Lake moves data preparation to OneLake and in doing so uses the full breadth of Fabric technologies for data prep, including Spark jobs, T-SQL DML statements, dataflows, pipelines, and more.

Direct Lake storage mode offers the following key benefits:

- Similar to Import mode, Direct Lake queries are processed by the VertiPaq engine, and thus delivers query performance comparable to Import mode without the management overhead of data refresh cycles to load the entire data volume.
- Uses existing Fabric investments by seamlessly integrating with large lakehouses, warehouses, and other Fabric sources with Delta tables. For example, Direct Lake is an ideal choice for the *gold* analytics layer in the medallion lakehouse architecture.
- Maximizes Return on Investment (ROI) because analyzed data volumes can exceed the capacity's max memory limits, since only the data that's needed to answer a query is loaded into memory.
- Minimizes data latencies by quickly and automatically synchronizing a semantic model with its sources, making new data available to business users without refresh schedules.

When should you use Direct Lake storage mode?

The primary use case for Direct Lake storage mode is typically for IT-driven analytics projects that use lake-centric architectures. In such scenarios, you have, or expect to accumulate, large volumes of data in OneLake. The fast loading of that data into memory, frequent and fast refresh operations, efficient use of capacity resources, and fast query performance are all important for this use case.

Note

Import and DirectQuery tables in semantic models are still relevant in Fabric, and they're the right choice of semantic model for some scenarios. For example, Import storage mode often works well for a self-service analyst who needs the freedom and agility to act quickly, and without dependency on IT to add new data elements.

A semantic model with import tables and Direct Lake tables offers flexibility with scale needed for many BI scenarios too.

Also, [OneLake integration](#) automatically writes data for tables in Import storage mode to [Delta tables](#) in OneLake without involving any migration effort, which lets you realize many of the benefits of Fabric that are made available to Import semantic model users, such as integration with lakehouses through shortcuts, SQL queries, notebooks, and more. We recommend this option as a quick way to reap the benefits of Fabric without necessarily or immediately redesigning your existing data warehouse and/or analytics system.

Direct Lake depends on data preparation being done in the data lake. Data preparation can be done by using various tools, such as Spark jobs for Fabric lakehouses, T-SQL DML statements for Fabric warehouses, dataflows, pipelines, and others, which helps ensure data preparation logic is performed upstream in the architecture to maximize reusability. However, if the semantic model author doesn't have the ability to modify the source item, for example if a self-service analyst doesn't have write permissions on a lakehouse that is managed by IT, then augmenting the model with Import storage mode tables might be a good choice, since Import mode supports data preparation by using Power Query, which is defined as part of semantic model.

Be sure to consider your current [Fabric capacity license](#) and the [Fabric capacity guardrails](#) when you consider Direct Lake storage mode. Also, factor in the [considerations and limitations](#), which are described later in this article.

Tip

We recommend that you produce a [prototype](#)—or proof of concept (POC)—to determine whether a Direct Lake semantic model is the right solution, and to mitigate risk.

Key concepts and terminology

This article assumes familiarity with the following concepts:

- Users load and interact with visuals in Power BI reports generating DAX queries to the semantic model.
- **Storage mode:** The semantic model processes the DAX queries differently depending on the table storage mode used. For example:
 - Import and Direct Lake storage modes use the VertiPaq engine to process DAX queries and return results to the Power BI report and user.
 - DirectQuery translates DAX queries to the query syntax of the data source, such as a SQL query, and runs them on the underlying source database. These source databases aren't typically optimized for heavy query load coming from reports and aggregated queries needed by the visuals, and may result in slower performance when compared to Import and Direct Lake modes.

Storage mode is a property of a table in the semantic model. When a semantic model includes tables with different storage modes, it's referred to as a composite model. For more information about storage modes, see [Semantic model modes in the Power BI service](#).

Direct Lake table storage mode have two options:

- **Direct Lake on OneLake** can use data from one or more Fabric data source with delta tables. Direct Lake on OneLake doesn't fall back to DirectQuery mode via the SQL analytics endpoint of the data source. Semantic models with Direct Lake on OneLake tables can also have import tables added from other data sources.

 **Note**

Direct Lake on OneLake is currently in public preview. Enable the tenant setting **User can create Direct Lake on OneLake semantic models (preview)** in the admin portal to create semantic models with this table storage mode. Already created semantic models aren't impacted by this tenant setting.

- **Direct Lake on SQL** can use the data from a single Fabric data source with delta tables. The SQL analytics endpoint is used for delta table and SQL view discovery and permission checks. Direct Lake on SQL endpoints fall back to DirectQuery table storage mode when it can't load the data directly from a delta table, such as when the data source is a SQL view or when the Warehouse uses SQL-based granular access control. The semantic model property, **Direct Lake behavior**, controls the fall back behavior.

Comparison of storage modes

The following table compares Direct Lake storage mode to Import and DirectQuery storage modes.

[Expand table](#)

Capability	Direct Lake on OneLake	Direct Lake on SQL endpoints	Import	DirectQuery
Tenant setting	Enable the tenant setting User can create Direct Lake on OneLake semantic models (preview) in the admin portal.	Enabled for all tenants.	Enabled for all tenants.	Enabled for all tenants.
Licensing	Fabric capacity subscription (SKUs) only	Fabric capacity subscription (SKUs) only	Any Fabric or Power BI license (including Microsoft Fabric Free licenses)	Any Fabric or Power BI license (including Microsoft Fabric Free licenses)
Data source	Tables of any Fabric data source backed by Delta tables	Only lakehouse or warehouse tables (or views)	Any connector	Any connector that supports DirectQuery mode
Connect to SQL analytics endpoint views	No	Yes – but will automatically fall back to DirectQuery mode	Yes	Yes
Composite models	Yes - can combine with import storage mode tables in Power BI web modeling and DirectQuery tables with XMLA tools.	No ¹	Yes – can combine with DirectQuery, Dual, and Direct Lake storage mode tables	Yes – can combine with Import, Dual, and Direct Lake storage mode tables
Single sign-on (SSO)	Yes	Yes	Not applicable	Yes
Calculated tables	Yes – but calculations can't refer to columns of tables in Direct Lake mode.	No – except calculation groups , what-if parameters , and field parameters , which implicitly create calculated tables	Yes	No – calculated tables use Import storage mode even when they refer to other tables in DirectQuery mode
Calculated columns	No	No	Yes	Yes
Hybrid tables	No	No	Yes	Yes

Capability	Direct Lake on OneLake	Direct Lake on SQL endpoints	Import	DirectQuery
Model table partitions	No – however partitioning can be done at the Delta table level	No – however partitioning can be done at the Delta table level	Yes – either automatically created by incremental refresh, or manually created by using the XMLA endpoint	No
User-defined aggregations	No	No	Yes – Import aggregation tables on DirectQuery tables are supported	Yes
SQL analytics endpoint object-level security or column-level security	No	Yes – but might produce errors when permission is denied	Yes – but must duplicate permissions with semantic model object-level security	Yes – but queries might produce errors when permission is denied
SQL analytics endpoint row-level security (RLS)	No	Yes – but queries will fall back to DirectQuery mode	Yes – but must duplicate permissions with semantic model RLS	Yes
Semantic model row-level security (RLS)	Yes – but it's strongly recommended to use a fixed identity cloud connection	Yes – but it's strongly recommended to use a fixed identity cloud connection	Yes	Yes
Semantic model object-level security (OLS)	Yes	Yes	Yes	Yes
Large data volumes without refresh requirement	Yes	Yes	No	Yes
Reduce data latency	Yes – when automatic updates is enabled, or	Yes – when automatic updates is enabled, or	No	Yes

Capability	Direct Lake on OneLake	Direct Lake on SQL endpoints	Import	DirectQuery
	programmatic reframing	programmatic reframing		
Power BI Embedded	Yes ²	Yes ²	Yes	Yes

¹ When using Direct Lake on SQL endpoints, you can't combine Direct Lake storage mode tables with DirectQuery or Dual storage mode tables *in the same semantic model*. However, you can use Power BI Desktop to create a composite model on a Direct Lake semantic model and then extend it with new tables (by using Import, DirectQuery, or Dual storage mode) or calculations. For more information, see [Build a composite model on a semantic model](#).

² Requires a V2 embed token. If you're using a service principal, you must use a [fixed identity](#) cloud connection.

How Direct Lake works

Typically, queries sent to a Direct Lake semantic model are handled from an in-memory cache of the columns sourced from Delta tables. The underlying storage for a Delta table is one or more Parquet files in OneLake. Parquet files organize data by columns rather than rows. Semantic models load entire columns from Delta tables into memory as they're required by queries.

Direct Lake on OneLake isn't coupled with the SQL endpoint, offering tighter integration with OneLake features such as OneLake security and more efficient DAX query plans because, for example, checking for SQL based security isn't required. DirectQuery fallback isn't supported by Direct Lake on OneLake.

With Direct Lake on SQL endpoints, a DAX query might use *DirectQuery fallback*, which involves seamlessly switching to [DirectQuery mode](#). DirectQuery fallback retrieves data directly from the [SQL analytics endpoint of the lakehouse](#) or the warehouse. For example, fallback occurs when SQL based security is detected in the SQL endpoint. In this case, a DirectQuery operation sends a query to the SQL analytics endpoint. Fallback operations might result in slower query performance.

The following sections describe Direct Lake concepts and features, including column loading, framing, automatic updates, and DirectQuery fallback.

Column loading (transcoding)

Direct Lake semantic models only load data from OneLake as and when columns are queried for the first time. The process of loading data on-demand from OneLake is known as *transcoding*.

When the semantic model receives a DAX (or Multidimensional Expressions—MDX) query, it first determines what columns are needed to produce a query result. Any column directly used by the query is needed, and also columns required by relationships and measures. Typically, the number of columns needed to produce a query result is significantly smaller than the number of columns defined in the semantic model.

Once it understands which columns are needed, the semantic model determines which columns are already in memory. If any columns needed for the query aren't in memory, the semantic model loads all data for those columns from OneLake. Loading column data is typically a fast operation, however it can depend on factors such as the cardinality of data stored in the columns.

Columns loaded into memory are then *resident* in memory. Future queries that involve only resident columns don't need to load any more columns into memory.

A column remains resident until there's reason for it to be removed (evicted) from memory. Reasons that columns might get removed include:

- The model or table was refreshed after a Delta table update at the source (see [Framing](#) in the next section).
- No query used the column for some time.
- Other memory management reasons, including memory pressure in the capacity due to other, concurrent operations.

Your choice of Fabric SKU determines the maximum available memory for each Direct Lake semantic model on the capacity. For more information about resource guardrails and maximum memory limits, see [Fabric capacity requirements](#) later in this article.

Framing

Framing provides model owners with point-in-time control over what data is loaded into the semantic model. Framing is a Direct Lake operation triggered by a refresh of a semantic model, and in most cases takes only a few seconds to complete. That's because it's a low-cost operation where the semantic model analyzes the metadata of the latest version of the Delta Lake tables and is updated to reference the latest Parquet files in OneLake.

When framing occurs, resident table column segments and dictionaries might be evicted from memory if the underlying data has changed and the point in time of the refresh becomes the new baseline for all future transcoding events. From this point, Direct Lake queries only

consider data in the Delta tables as of the time of the most recent framing operation. For that reason, Direct Lake tables are queried to return data based on the state of the Delta table *at the point of the most recent successful framing operation*. That time isn't necessarily the latest state of the Delta tables.

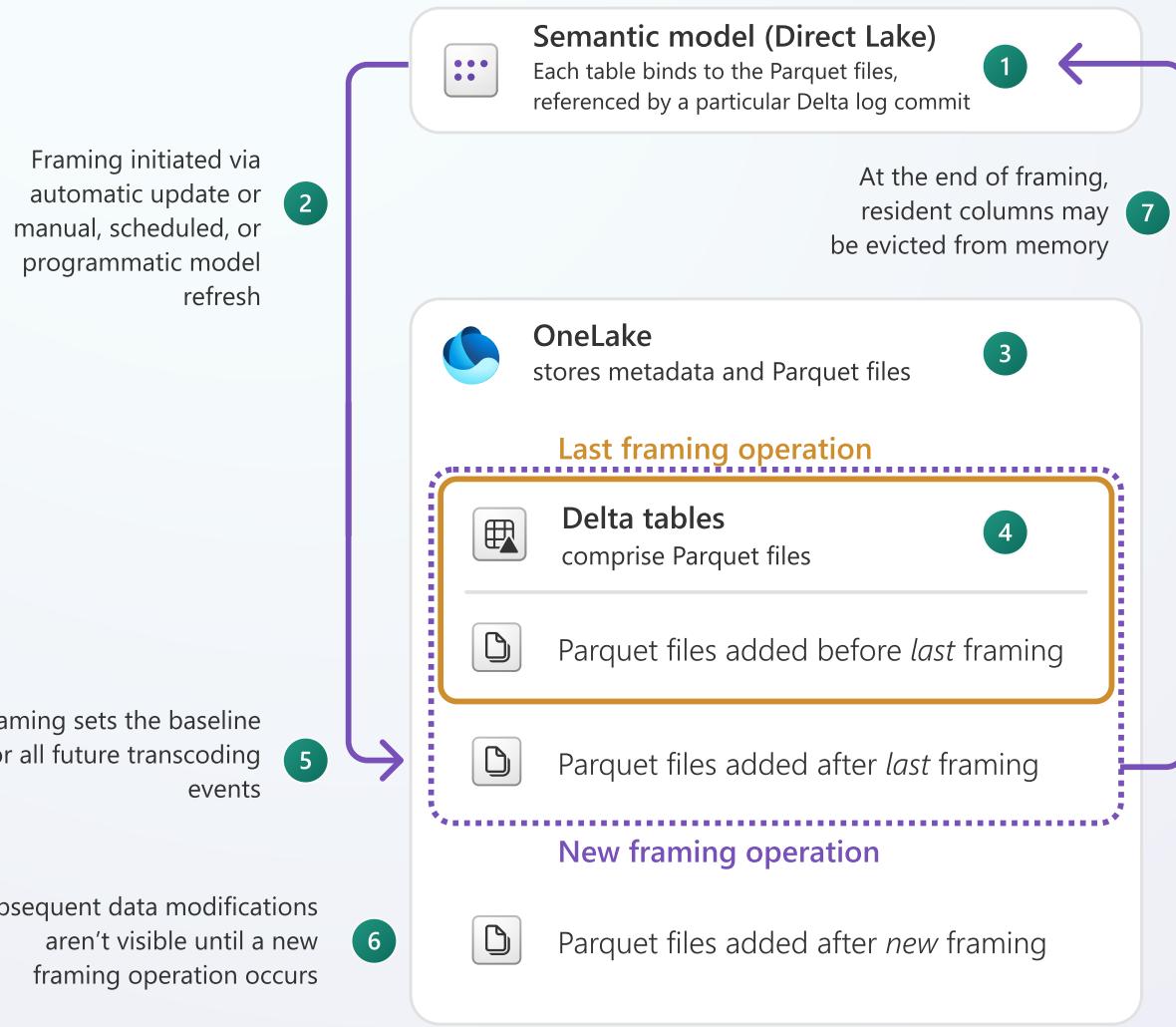
The semantic model analyzes the Delta log of each Delta table during framing to drop only the affected column segments and to reload newly added data during transcoding. An important optimization is that dictionaries will usually not be dropped when incremental framing takes effect, and new values are added to the existing dictionaries. This incremental framing approach helps to reduce the reload burden and benefits query performance. In the ideal case, when a Delta table received no updates, no reload is necessary for columns already resident in memory and queries show far less performance impact after framing because incremental framing essentially enables the semantic model to update substantial portions of the existing in-memory data in place.

 **Note**

Framing may fail if a Delta table exceeds the Fabric capacity guardrails, such as when a Delta table has more than 10,000 parquet files. For more information about resource guardrails, see [Fabric capacity requirements](#) later in this article.

The following diagram shows how Direct Lake framing operations work.

Framing in a Direct Lake semantic model



The diagram depicts the following processes and features.

 [Expand table](#)

Item	Description
1	A semantic model exists in a Fabric workspace.
2	Framing operations take place periodically, and they set the baseline for all future transcoding events. Framing operations can happen automatically, manually, on schedule, or programmatically.
3	OneLake stores metadata and Parquet files, which are represented as Delta tables.

Item	Description
4	The last framing operation includes Parquet files related to the Delta tables, and specifically the Parquet files that were added before the <i>last</i> framing operation.
5	A later framing operation includes Parquet files added after the <i>last</i> framing operation.
6	Resident columns in the Direct Lake semantic model might be evicted from memory, and the point in time of the refresh becomes the new baseline for all future transcoding events.
7	Subsequent data modifications, represented by new Parquet files, aren't visible until the next framing operation occurs.

It's not always desirable to have data representing the latest state of any Delta table when a transcoding operation takes place. Consider that framing can help you provide consistent query results in environments where data in Delta tables is transient. Data can be transient for several reasons, such as when long-running extract, transform, and load (ETL) processes occur.

Refresh for a Direct Lake semantic model can be done manually, automatically, or programmatically. For more information, see [Refresh Direct Lake semantic models](#).

Automatic updates

There's a semantic model-level setting to automatically update Direct Lake tables. It's enabled by default. It ensures that data changes in OneLake are automatically reflected in the Direct Lake semantic model. You should disable automatic updates when you want to control data changes by framing, which was explained in the previous section. For more information, see [Manage Direct Lake semantic models](#).

Tip

You can set up [automatic page refresh](#) in your Power BI reports. It's a feature that automatically refreshes a specific report page providing that the report connects to a Direct Lake semantic model (or other types of semantic model).

DirectQuery fallback

When using Direct Lake on SQL endpoints, a query sent to a Direct Lake semantic model can fall back to [DirectQuery mode](#) in which case the table no longer operates in Direct Lake mode. It retrieves data directly from the SQL analytics endpoint of the lakehouse or warehouse. Such queries always return the latest data because they're not constrained to the point in time of the last framing operation.

When DirectQuery fallback occurs, a query no longer uses Direct Lake mode. A query *can't* leverage Direct Lake mode when the semantic model queries a view in the SQL analytics endpoint, or a table in the SQL analytics endpoint that [enforces row-level security \(RLS\)](#). Also, a query *can't* leverage Direct Lake mode when a Delta table [exceeds the guardrails of the capacity](#).

Important

If possible, you should always design your solution—or size your capacity—to avoid DirectQuery fallback. That's because it might result in slower query performance.

You can control fallback of your Direct Lake semantic models by setting its *DirectLakeBehavior* property. This setting only applies to Direct Lake on SQL endpoints. Direct Lake on OneLake doesn't support DirectQuery fallback. For more information, see [Set the Direct Lake behavior property](#).

Data security and access permissions

By default, Direct Lake uses single sign-on (SSO), which means that the identity that queries the semantic model (often a report user) must be authorized to access the data. Alternatively, you can bind a Direct Lake model to a sharable cloud connection (SCC) to provide a fixed identity and disable SSO. In this case, only the fixed identity requires read access to the data in the source.

Fabric item permissions

Direct Lake enforces a layered security model. Effective authorization for any query depends on both Fabric item permissions (workspace and semantic model access) and source-level permissions, and on how the model is configured for authentication—either SSO or a fixed-identity SCC.

Operational guidance:

- Authentication mode determines whether queries execute using individual user identities (SSO) or a single service identity (fixed-identity SCC).
 - Use SSO for interactive scenarios where per-user authorization is required.
 - Use fixed-identity SCC for embedded or read-only consumer scenarios where source-level access is scoped to a single service account.
- Apply least-privilege principles at both the source and workspace levels.
- Test and validate behavior for both authentication modes—especially for SQL-based RLS and any cases that might trigger DirectQuery fallback—before production deployment.

For more information, see [Integrate Direct Lake security](#).

Semantic model permissions

In addition to Fabric item permissions, you must also grant permissions to users so that they can use or manage the Direct Lake semantic model. In short, report consumers need *Read* permission, and report creators need additional *Build* permission. Semantic model permissions can be [assigned directly](#) or [acquired implicitly using workspace roles](#). To manage the semantic model settings (for refresh and other configurations), you must be the [semantic model owner](#).

Permission requirements

For scenarios and permission requirements, see [Direct Lake users](#).

 **Important**

You should always thoroughly test permissions before releasing your semantic model and reports into production.

For more information, see [Semantic model permissions](#).

Fabric capacity requirements

Direct Lake semantic models require a [Fabric capacity license](#). Also, there are capacity guardrails and limitations that apply to your Fabric capacity subscription (SKU), as presented in the following table.

 **Important**

The first column in the following table also includes Power BI Premium capacity subscriptions (P SKUs). Microsoft is consolidating purchase options and retiring the Power BI Premium per capacity SKUs. New and existing customers should consider purchasing Fabric capacity subscriptions (F SKUs) instead.

For more information, see [Important update coming to Power BI Premium licensing](#) and [Power BI Premium](#).

 Expand table

Fabric SKU	Parquet files per table	Row groups per table	Rows per table (millions)	Max model size on disk/OneLake (GB)	Max memory (GB) ¹
F2	1,000	1,000	300	10	3
F4	1,000	1,000	300	10	3
F8	1,000	1,000	300	10	3
F16	1,000	1,000	300	20	5
F32	1,000	1,000	300	40	10
F64/FT1/P1	5,000	5,000	1,500	Unlimited	25
F128/P2	5,000	5,000	3,000	Unlimited	50
F256/P3	5,000	5,000	6,000	Unlimited	100
F512/P4	10,000	10,000	12,000	Unlimited	200
F1024/P5	10,000	10,000	24,000	Unlimited	400
F2048	10,000	10,000	24,000	Unlimited	400

¹ For Direct Lake semantic models, *Max Memory* represents the upper memory resource limit for how much data can be paged in. For this reason, it's not a guardrail because exceeding it doesn't result in a fallback to DirectQuery mode; however, it can have a performance impact if the amount of data is large enough to cause excessive paging in and out of the model data from the OneLake data.

If exceeded, the *Max model size on disk/OneLake* causes all queries to the semantic model to fall back to DirectQuery mode. All other guardrails presented in the table are evaluated per query. It's therefore important that you [optimize your Delta tables](#) and [Direct Lake semantic model](#) to avoid having to unnecessarily scale up to a higher Fabric SKU.

Additionally, *Capacity unit* and *Max memory per query limits* apply to Direct Lake semantic models. For more information, see [Capacities and SKUs](#).

Considerations and limitations

Direct Lake semantic models present some considerations and limitations.

 Note

The capabilities and features of Direct Lake semantic models are evolving rapidly. Be sure to check back periodically to review the latest list of considerations and limitations.

Direct Lake on OneLake table storage mode is in public preview. Enable the tenant setting [User can create Direct Lake on OneLake semantic models \(preview\)](#) in the admin portal to create semantic models with Direct Lake on OneLake tables.

 Expand table

Consideration / limitation	Direct Lake on OneLake	Direct Lake on SQL (analytics endpoint)
When the SQL analytics endpoint enforces row-level security, DAX queries are processed differently depending on the type of Direct Lake mode employed.	Queries will succeed.	Yes, unless fallback is disabled in which case queries will fail.
When Direct Lake on OneLake is employed, queries will succeed, and SQL based RLS is not applied. Direct Lake on OneLake requires the user has access to the files in OneLake, which doesn't observe SQL based RLS.		
If a table in the semantic model is based on a (non-materialized) SQL view, DAX queries are processed differently depending on the type of Direct Lake mode employed.	Not applicable	Yes, unless fallback is disabled in which case queries will fail.
Direct Lake on SQL endpoints will fall back to DirectQuery in this case.		
It isn't supported to create a Direct Lake on OneLake table based on a non-materialized SQL view. You can instead use a lakehouse materialized view because Delta tables are created. Alternatively, use a different storage mode such as Import or DirectLake for tables based on non-materialized SQL views.		
Composite modeling, which means Direct Lake semantic model tables can be mixed with tables in other storage modes, such as Import, DirectQuery, or Dual (except for special cases, including calculation groups , what-if parameters , and field parameters).	Supported	Not supported
Calculated columns and calculated tables that reference columns or tables in Direct Lake storage mode. Calculation groups , what-if parameters , and field parameters , which implicitly create calculated tables, and calculated tables that don't reference Direct Lake columns or tables are supported in all scenarios.	Not supported	Not supported

Consideration / limitation	Direct Lake on OneLake	Direct Lake on SQL (analytics endpoint)
Direct Lake storage mode tables don't support complex Delta table column types. Binary and GUID semantic types are also unsupported. You must convert these data types into strings or other supported data types.	Not supported	Not supported
Table relationships require the data types of related columns to match.	Yes	Yes
One-side columns of relationships must contain unique values. Queries fail if duplicate values are detected in a one-side column.	Yes	Yes
<p>Auto date/time intelligence in Power BI Desktop to create relationships using only the date part of a datetime column.</p> <p>Note: Marking your own date table as a date table and creating relationships using date columns is supported.</p>	Supported	Not supported
The length of string column values is limited to 32,764 Unicode characters.	Yes	Yes
Non-numeric floating point values, such as <i>Nan</i> (not a number), aren't supported.	Yes	Yes
<p>Publish to web from Power BI using a service principal is only supported when using a fixed identity for the Direct Lake semantic model.</p>	Yes	Yes
In the web modeling experience , validation is limited for Direct Lake semantic models. User selections are assumed to be correct, and no queries are issued to validate cardinality or cross filter selections for relationships, or for the selected date column in a marked date table.	Yes	Yes
In the Fabric portal, the <i>Direct Lake</i> tab in the refresh history lists Direct Lake-related refresh failures. Successful refresh (framing) operations aren't typically listed unless the refresh status changes, such as from no previous run or refresh failure to refresh success or refresh success with warning.	Yes	Yes
Your Fabric SKU determines the maximum available memory per Direct Lake semantic model for the capacity. When the limit is exceeded, queries to the semantic model might be slower due to excessive paging in and out of the model data.	Yes	Yes
Creating a Direct Lake semantic model in a workspace that is in a different region of the data source workspace isn't supported. For example, if the Lakehouse is in West Central US,	Yes	Yes

Consideration / limitation	Direct Lake on OneLake	Direct Lake on SQL (analytics endpoint)
then you can only create semantic models from this Lakehouse in the same region. A workaround is to create a Lakehouse in the other region's workspace and shortcut to the tables before creating the semantic model. To find what region you are in, see find your Fabric home region .		
Embedding reports requires a V2 embed token .	Yes	Not supported
Service principal profiles for authentication.	Not supported	Not supported
Power BI Direct Lake semantic models can be created and queried by Service Principals and Viewer role membership with Service Principals is supported, but the default Direct Lake semantic models on lakehouse/warehouse don't support this scenario.	Yes	Yes
Shortcuts in a lakehouse can be used as data sources for semantic model tables.	Not supported during public preview	Supported
Create Direct Lake models in personal workspaces (My Workspace).	Not supported	Not supported
Deployment pipeline rules to rebind data source.	Not supported directly - can create a parameter expression to use in the connection string.	Supported
Adding a table from the same data source twice.	Not supported in Power BI Desktop or web modeling. It is possible in XMLA-based external tools.	Not supported in Power BI Desktop or web modeling. It is possible in XMLA-based external tools.

- Analyze in Excel pivot tables (and other MDX clients) have the same limitations as DirectQuery with Direct Lake tables in the semantic model. Session-scoped MDX statements, such as named sets, calculated members, default members, etc. are not supported. Query-scoped MDX statements, such as the 'WITH' clause, are supported. Direct Lake table user-defined hierarchies are not supported. Import table user-defined hierarchies are supported even with Direct Lake tables in the semantic model.

- Power BI Desktop can live edit a semantic model with Direct Lake tables and import tables. [Calculation groups](#), [what-if parameters](#), and [field parameters](#), which implicitly create calculated tables, and calculated tables that don't reference Direct Lake columns or tables can also be included.
- Power BI web modeling can open any semantic model, including Direct Lake tables with other storage mode tables.
- DAX query view when live editing or live connected, and writing DAX queries in the web, are supported for Direct Lake on SQL, Direct Lake on OneLake, and true composite (Direct Lake on OneLake + import from any data source) semantic models.
- TMDL view is supported when live editing in Power BI Desktop.
- Creating reports with a live connection is supported for all semantic models, when the report author has at least build access.

Related content

- [Develop Direct Lake semantic models](#)
- [Manage Direct Lake semantic models](#)
- [Understand Direct Lake query performance](#)
- [Create a lakehouse for Direct Lake](#)
- [Analyze query processing for Direct Lake semantic models](#)

Understand Direct Lake query performance

06/27/2025

Apart from semantic model design and query complexity, Direct Lake performance specifically depends on well-tuned Delta tables for efficient and fast column loading (transcoding) and optimal query execution. Make sure you apply V-Order optimization. Also, keep the number of Parquet files small, use large row groups, and strive to minimize the effect of data updates on the Delta log. These are common best practices that can help to ensure fast query execution in cold, semiwarm, warm, and hot Direct Lake mode states.

This article explains how Direct Lake performance depends on Delta table health and efficient data updates. Understanding these dependencies is crucial. You learn that the data layout in your Parquet files is as important for query performance as are a good semantic model design and well-tuned data analysis expression (DAX) measures.

What you need to know

This article assumes that you're already familiar with the following concepts:

- **Delta tables in OneLake:** Detailed information about Delta tables in OneLake is available in the [Microsoft Fabric fundamentals documentation](#).
- **Parquet files, row groups, and Delta log:** The Parquet file format, including how data is organized into row groups and column chunks, and how metadata is handled, is explained in the [Parquet file format documentation](#). See also the [Delta transaction log protocol documentation](#).
- **Delta table optimization and V-Order:** See the Fabric Lakehouse documentation about Delta table maintenance, such as [Delta Lake table optimization and V-Order](#).
- **Framing and transcoding:** Refreshing a Direct Lake semantic model (framing) and on-demand column data loading (transcoding) are important concepts, covered at an introductory level in the [Direct Lake overview article](#).
- **Formula and Storage Engine:** When a DAX query is executed, the Formula Engine generates the query plan and retrieves the necessary data and initial aggregations from the Storage Engine. The optimizations discussed in this article focus on the Storage Engine. To learn more about the Formula Engine and the Storage Engine, explore the [Analysis Services developer documentation](#).
- **VertiPaq and VertiScan:** In import mode and in Direct Lake mode, the Storage Engine uses its VertiPaq engine to maintain a columnar in-memory store. VertiScan enables the Formula Engine to interact with VertiPaq. For more information, see the [Analysis Services developer documentation](#).

- **Dictionary encoding:** Both Parquet files and VertiPaq use dictionary encoding, which is a data compression technique applied to individual columns of various data types, such as int, long, date, and char. It works by storing each unique column value in memory as an integer using Run Length Encoding (RLE)/Bit-Packing Hybrid encoding. VertiPaq always uses dictionary encoding, but Parquet might switch to plain encoding or delta encoding under some circumstances, as explained in [Encodings in the Parquet File-Format documentation](#), which would require Direct Lake to re-encode the data with corresponding effect on transcoding performance.
- **Column chunks and column segments:** Refer to the way Parquet and VertiPaq store column data for efficient data retrieval. Each column in a table is divided into smaller chunks that can be processed and compressed independently. VertiPaq calls these chunks segments. You can use the [DISCOVER_STORAGE_TABLE_COLUMN_SEGMENTS schema rowset](#) to retrieve information about the column segments in a Direct Lake semantic model.
- **Python and Jupyter Notebooks:** Jupyter Notebooks provide an interactive environment to write and run Python code. Basic knowledge of Python is helpful if you want to follow the code snippets later in this chapter. For more information, see the [Python language reference](#). For information on how to use notebooks in Microsoft Fabric, see [How to use notebooks - Microsoft Fabric](#).

What affects Direct Lake query performance

This section summarizes the main factors affecting Direct Lake performance. Subsequent sections offer more detailed explanations:

- **V-Order compression:** The effectiveness of compression can affect query performance, as better compression leads to faster data loading and more efficient query processing. Data loading is fast because streaming compressed data boosts transcoding efficiency. Query performance is also optimal because V-Order compression enables VertiScan to compute results directly on top of compressed data, skipping the decompression step.
- **Data types:** Using appropriate data types for columns can improve compression and performance. For example, use integer data types instead of strings where possible and avoid storing integers as strings.
- **Segment size and count:** VertiPaq stores column data in segments. A large number of smaller segments can negatively affect query performance. For large tables, Direct Lake prefers large segment sizes, such as between 1 million to 16 million rows.
- **Column cardinality:** High cardinality columns (columns with many unique values) can slow down performance. Reducing cardinality where possible can help.
- **Indexes and aggregations:** Columns with lower cardinality benefit from dictionary encoding, which can speed up queries by reducing the amount of data that needs to be scanned.

- **DirectQuery fallback:** Fallback operations might result in slower query performance as the data must now be fetched from the SQL analytics endpoint of the Fabric data source. Moreover, fallback relies on hybrid query plans to support both DirectQuery and VertiScan with some tradeoffs on performance even when Direct Lake doesn't need to fallback. If possible, disable DirectQuery fallback to avoid hybrid query plans.
- **Degree of memory residency:** Direct Lake semantic models can be in cold, semiwarm, warm, or hot state with increasingly better performance from cold to hot. Transitioning quickly from cold to warm is a key to good Direct Lake performance.
 - *Cold:* VertiPaq store is empty. All data required to answer a DAX query must be loaded from Delta tables.
 - *Semiwarm:* Direct Lake only drops those column segments during framing that belong to removed row groups. This means that only updated or newly added data must be loaded. A Direct Lake semantic model can also go into semiwarm state under memory pressure when it must unload segments and join indexes due to memory pressure.
 - *Warm:* The column data required to answer a DAX query is already fully loaded into memory.
 - *Hot:* The column data is already fully loaded into memory, VertiScan caches are populated, and the DAX queries hit the caches.
- **Memory pressure:** Direct Lake must load all column data required to answer a DAX query into memory, which can exhaust available memory resources. With insufficient memory, Direct Lake must unload previously loaded column data, which Direct Lake then might have to reload again for subsequent DAX queries. Adequately sizing Direct Lake semantic models can help to avoid frequent reloading.

Memory residency and query performance

Direct Lake performs best in the warm or hot state, while cold states result in slower performance. Direct Lake avoids falling back to cold as much as possible by using incremental framing.

Bootstrapping

After the initial semantic model load, no column data is resident in memory yet. Direct Lake is cold. When a client submits a DAX query to a Direct Lake semantic model in the cold state, Direct Lake must perform the following main tasks so that the DAX query can be processed and answered:

- VertiPaq dictionary transcoding. Direct Lake must merge the local Parquet dictionaries for each column chunk to create a global VertiPaq dictionary for the column. This **merge** operation affects query response time.

- Loading Parquet column chunks into column segments. In most cases, this is a direct remapping of Parquet data IDs to VertiPaq IDs when both sides can use RLE/Bit-Packing Hybrid encoding. If the Parquet dictionaries use plain encoding, VertiPaq must convert the values to RLE/Bit-Packing Hybrid encoding, which takes longer.
 - Direct Lake performance is optimal on V-Ordered Parquet files because V-Ordering increases the quality of RLE compression. Direct Lake can load tightly packed V-Ordered data faster than less compressed data.
- Generating join indexes. If the DAX query accesses columns from multiple tables, Direct Lake must build join indexes according to the table relationships so that VertiScan can join the tables correctly. To build the join indexes, Direct Lake must load the dictionaries of the key columns participating in the relationship and the column segments of the primary key column (the column on the One side of the table relationship).
- Applying Delta deletion vectors. If a source Delta table uses deletion vectors, Direct Lake must load these deletion vectors to ensure deleted data is excluded from query processing.

 **Note**

The cold state can also be induced by sending a `processClear` followed by a `processFull` XMLA command to the model. The `ProcessClear` command removes all data and the association with the framed Delta table version. The `ProcessFull` XMLA command performs framing to bind the model to the latest available Delta commit version.

Incremental framing

During framing, Direct Lake analyzes the Delta log of each Delta table and drops loaded column segments and join indexes only when the underlying data has changed. Dictionaries are retained to avoid unnecessary transcoding and new values are simply added to the existing dictionaries. This incremental framing approach reduces the reload burden and benefits cold query performance.

You can analyze incremental framing effectiveness by using the `INFO.STORAGECOLUMNSEGMENTS()` DAX function, which wraps the `DISCOVER_STORAGE_TABLE_COLUMN_SEGMENTS` schema rowset. Follow these steps to ensure meaningful results:

1. Query your Direct Lake semantic model to ensure it is in warm or hot state.

2. Update the Delta table you want to investigate and refresh the Direct Lake semantic model to perform framing.
3. Run a DAX query to retrieve column segment information by using the `INFO.STORAGECOLUMNSEGMENTS()` function, as in the following screenshot. The screenshot uses a small sample table for illustration purposes. Each column only has a single segment. The segments aren't resident in memory. This indicates a true cold state. If the model was warm before framing, this means that the Delta table was updated using a destructive data loading pattern, making it impossible to use incremental framing. Delta table update patterns are covered later in this article.

The screenshot shows the Power BI DAX Query View interface. The query editor contains the following DAX code:

```

1 // Welcome to DAX query view! Learn more about DAX queries at https://aka.ms/dax-queries.
2 // Right-click on tables, columns, or measures in the data pane to access quick queries, or ask Copilot for help writing DAX.
3
4 EVALUATE
5   SUMMARIZE(
6     FILTER(
7       INFO.STORAGECOLUMNSEGMENTS(),
8       LEFT([TABLE_ID], 16) = "publicholidays (" +
9     ),
10    [TABLE_ID], [COLUMN_ID], [SEGMENT_NUMBER], [ISRESIDENT]
11 )

```

The results pane displays a table with the following data:

	[TABLE_ID]	[COLUMN_ID]	[SEGMENT_NUMBER]	[ISRESIDENT]
1	publicholidays (14)	RowNumber 26629798 ...	0	True
2	publicholidays (14)	countryOrRegion (18)	0	False
3	publicholidays (14)	holidayName (19)	0	False
4	publicholidays (14)	normalizeHolidayName ...	0	False
5	publicholidays (14)	isPaidTimeOff (21)	0	False
6	publicholidays (14)	countryRegionCode (22)	0	False
7	publicholidays (14)	date (23)	0	False

At the bottom of the interface, it shows "Success (1917.1 ms)" and "Query 1 of 1".

! Note

When a Delta table receives no updates, no reload is necessary for columns already resident in memory. When using nondestructive update patterns, queries show far less performance effect after framing because incremental framing essentially enables Direct Lake to update substantial portions of the existing in-memory data in place.

Full memory residency

With dictionaries, column segments, and join indexes loaded, Direct Lake reaches the warm state with query performance on par with import mode. In both modes, the number and size of column segments play a crucial role in optimizing query performance.

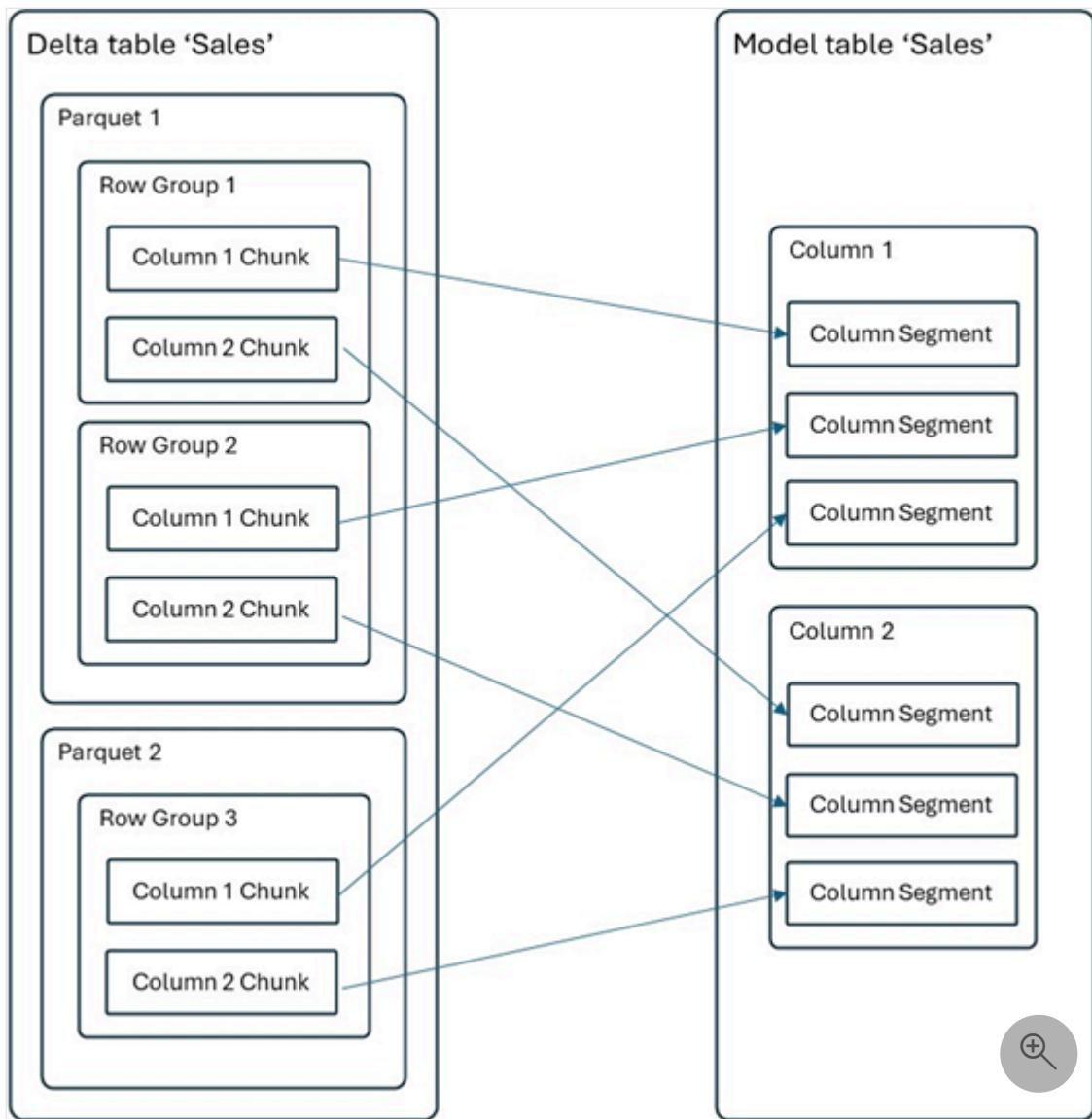
Delta table differences

Parquet files organize data by columns rather than rows. Direct Lake also organizes data by columns. The alignment facilitates seamless integration, yet there are important differences, specifically concerning row groups and dictionaries.

Row groups versus column segments

A row group in a Parquet file consists of column chunks, and each chunk contains data for a specific column. A column segment in a semantic model, on the other hand, also contains a chunk of column data.

There's a direct relationship between the total row group count of a Delta table and the segment count for each column of the corresponding semantic model table. For example, if a Delta table across all its current Parquet files has three row groups in total, then the corresponding semantic model table has three segments per column, as illustrated in the following diagram. In other words, if a Delta table has a large number of tiny row groups, a corresponding semantic model table would also have a large number of tiny column segments. This would negatively affect query performance.

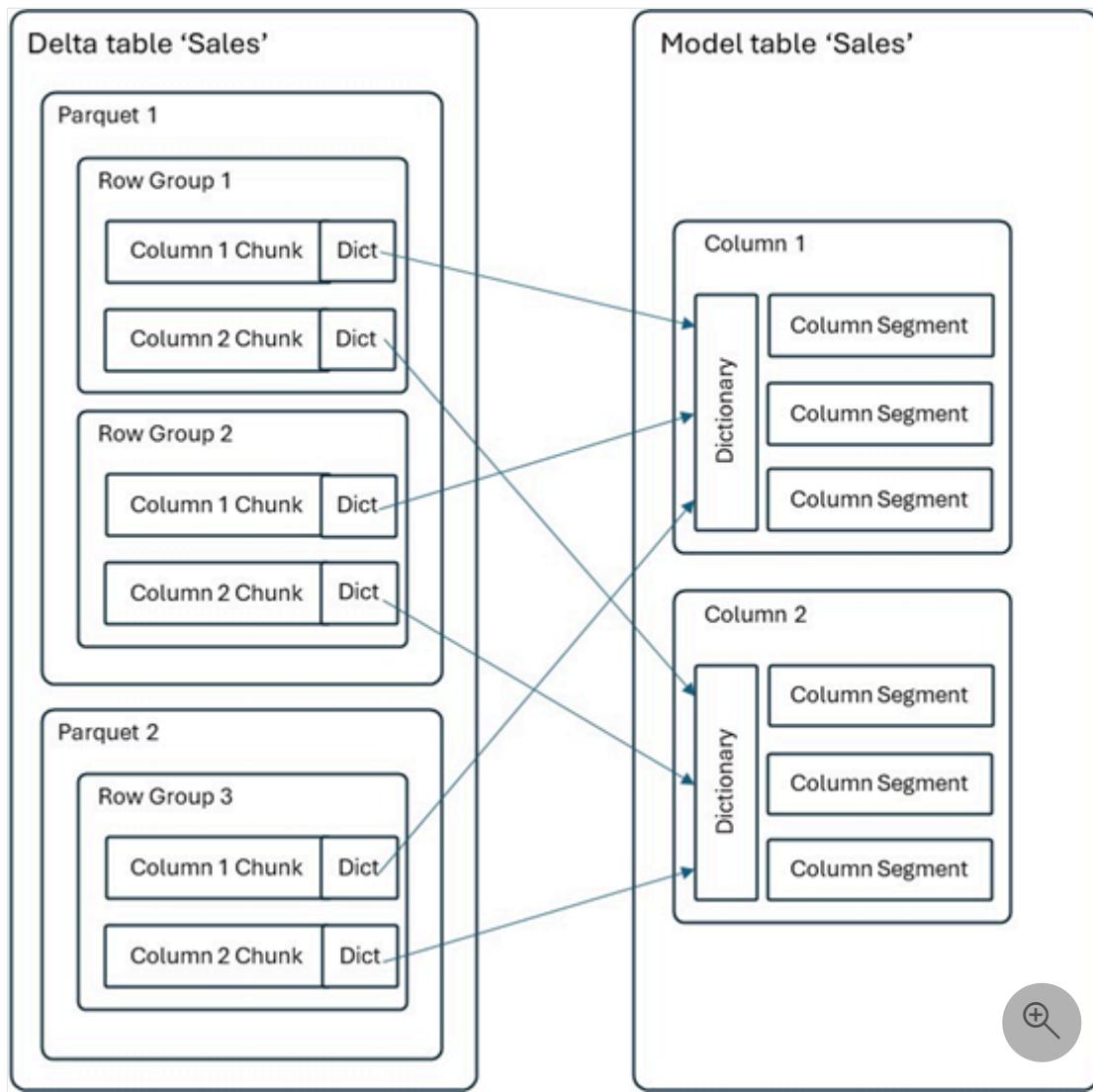


⚠ Note

Because Direct Lake prefers large column segments, the row groups of the source Delta tables should ideally be large.

Local dictionaries versus global dictionary

The total row group count of a Delta table also has direct effect on dictionary transcoding performance because Parquet files use local dictionaries while Direct Lake semantic models use a global dictionary for each column, as depicted in the following diagram. The higher the number of row groups, the higher the number of local dictionaries that Direct Lake must merge to create a global dictionary, and the longer it takes for transcoding to complete.



Delta table update patterns

The method used to ingest data into a Delta table can greatly influence incremental framing efficiency. For instance, using the **Overwrite** option when loading data into an existing table erases the Delta log with each load. This means Direct Lake can't use incremental framing and must reload all the data, dictionaries, and join indexes. Such destructive update patterns negatively affect query performance.

The screenshot shows the 'Copy data into Lakehouse' wizard with the following steps completed:

- Choose data source
- Connect to data source
- Connect to data destination
Select and map to folder path or table.

The 'Review + save' step is the final one.

In the 'Connect to data destination' section, the configuration is as follows:

- Connection: LabsDevLH
- Root folder: Tables (selected)
- Load settings: Load to existing table (selected)
- Table: sample_table (highlighted by a red box)
- Table action: Overwrite (selected)

Buttons at the bottom include Import schemas, New mapping, Reset, and Delete.

This section covers Delta table update patterns that enable Direct Lake to use incremental framing, preserving VertiPaq column store elements like dictionaries, column segments, and join indexes, to maximize transcoding efficiency and boost cold query performance.

Batch processing without partitioning

This update pattern collects and processes data in large batches at scheduled intervals, such as on a weekly or monthly basis. As new data arrives, old data is often removed in a rolling or sliding window fashion to keep the table size under control. However, removing old data can be a challenge if the data is spread across most of the Parquet files. For example, removing one day out of 30 days might affect 95% of the Parquet files instead of 5%. In this case, Direct Lake would have to reload 95% of the data even for a relatively small **delete** operation. The same issue also applies to updates of existing rows because updates are combined deletes and appends. You can analyze the effect of **delete** and **update** operations by using Delta Analyzer, as explained later in this article.

Batch processing with partitioning

Delta table partitioning can help to reduce the effect of **delete** operations as the table is divided into smaller Parquet files stored in folders based on the distinct values in the partition column. Commonly used partition columns include date, region, or other dimensional categories. In the previous example of removing one day out of 30 days, a Delta table partitioned by date would constrain the deletes to only the Parquet files of the partition for that day. However, it's important to note that extensive partitioning could result in a substantially increased number of Parquet files and row groups, thereby causing an excessive increase in column segments within the Direct Lake semantic model, negatively affecting query performance. Choosing a low-cardinality partition column is crucial for query performance. As a best practice, the column should have fewer than 100-200 distinct values.

Incremental loading

With incremental loading, the update process only inserts new data into a Delta table without affecting existing Parquet files and row groups. There are no deletes. Direct Lake can load the new data incrementally without having to discard and reload existing VertiPaq column store elements. This method works well with Direct Lake incremental framing. Delta table partitioning isn't necessary.

Stream processing

Processing data near real-time, as it arrives, can cause a proliferation of small Parquet files and row groups, which can negatively affect Direct Lake performance. As with the incremental loading pattern, it isn't necessary to partition the Delta table. However, frequent table maintenance is essential to ensure that the number of Parquet files and row groups remains within the guardrail limits specified in the [Direct Lake overview article](#). In other words, don't forget to run Spark Optimize regularly, such as daily or even more often. Spark Optimize is covered again in the next section.

 Note

Actual real-time analysis is best implemented using Eventstreams, KQL databases, and Eventhouse. Refer to the [Real-Time Intelligence documentation in Microsoft Fabric](#) for guidance.

Delta table maintenance

Key maintenance tasks include vacuuming and optimizing Delta tables. To automate maintenance operations, you can use the Lakehouse APIs as explained in the [Manage the Lakehouse with Microsoft Fabric REST API](#) documentation.

Vacuuming

Vacuuming removes Parquet files no longer included in the current Delta commit version and older than a set retention threshold. Removing these Parquet files doesn't affect Direct Lake performance because Direct Lake only loads the Parquet files that are in the current commit version. If you run VACUUM daily with the default values, the Delta commit versions of the last seven days are retained for time travel.

 Important

Because a framed Direct Lake semantic model references a particular Delta commit version, you must ensure that the Delta table keeps this version until you refresh (frame) the model again to move it to the current version. Otherwise, users encounter query errors when the Direct Lake semantic model tries to access Parquet files that no longer exist.

Spark Optimize

Delta table optimization merges multiple small Parquet files into fewer large files. Because this can affect cold Direct Lake performance, it's good practice to optimize infrequently, such as over weekends or at the end of the month. Optimize more often if small Parquet files accumulate quickly (high-frequency small updates) to ensure the Delta table stays within guardrail limits.

Partitioning can help to minimize optimization effect on incremental framing because partitioning effectively collocates the data. For example, partitioning a large Delta table based on a low-cardinality date_key column would constrain weekly maintenance to a maximum of seven partitions. The Delta table would retain most of the existing Parquet files. Direct Lake would only have to reload seven days of data.

Analyzing Delta table updates

Use Delta Analyzer or similar tools to study how Delta table updates affect Parquet files and row groups. Delta Analyzer lets you track the evolution of Parquet files, row groups, column chunks, and columns in response to **append**, **update**, and **delete** operations. Delta Analyzer is available as a [standalone Jupyter Notebook](#). It's also available in the [semantic-link-labs library](#). The following sections use semantic-link-labs. This library is easy to install in a notebook using the `%pip install semantic-link-labs` command.

Row group size

The ideal row-group size for Direct Lake semantic models is between 1 million and 16 million rows, yet Fabric might use larger row group sizes for large tables if the data is compressible. Generally, we don't recommend that you change the default row group size. It's best to let Fabric manage the Delta table layout. But it's also a good idea to double check.

The following Python code can serve as a starting point to analyze the row group sizes and other details of a Delta table in a Fabric notebook-connected lakehouse. The following table shows the output for a sample table with 1 billion rows.

```

import sempy_labs as labs
from IPython.display import HTML
from IPython.display import clear_output

table_name = "<Provide your table name>"

# Load the Delta table and run Delta Analyzer
df = spark.read.format("delta").load(f"Tables/{table_name}")
da_results = labs.delta_analyzer(table_name)

# Display the table summary in an HTML table.
clear_output()

df1 = da_results['Summary'].iloc[0]

html_table = "<table border='1'><tr><th>Column Name</th><th>{table_name}</th></tr>"
for column in da_results['Summary'].columns:
    html_table += f"<tr><td>{column}</td><td>{df1[column]}</td></tr>"
html_table += "</table>

display(HTML(html_table))

```

Output:

[] Expand table

Parameter	Value
Table name	sales_1
Row count	10000000000
Row groups	24
Parquet files	8
Max rows per row group	51210000
Min rows per row group	22580000
Avg rows per row group	41666666.666666664
VOrder enabled	True
Total size	7700808430
Timestamp	2025-03-24 03:01:02.794979

The Delta Analyzer summary shows an average row group size of approximately 40 million rows. This is larger than the recommended maximum row group size of 16 million rows.

Fortunately, the larger row group size doesn't cause significant issues for Direct Lake. Larger row groups facilitate continuous segment jobs with minimal overhead in the Storage Engine. Conversely, small row groups, those significantly under 1 million rows, can cause performance issues.

More important in the previous example is that Fabric distributed the row groups across eight Parquet files. This aligns with the number of cores on the Fabric capacity to support efficient parallel **read** operations. Also important is that the individual row group sizes don't deviate too far from the average. Large variations can cause nonuniform VertiScan load, resulting in less optimal query performance.

Rolling window updates

For illustration purposes, the following Python code sample simulates a rolling window update. The code removes the rows with the oldest DateID from a sample Delta table. It then updates the DateID of these rows and inserts them back again into the sample table as the most recent rows.

```
from pyspark.sql.functions import lit

table_name = "<Provide your table name>"
table_df = spark.read.format("delta").load(f"Tables/{table_name}")

# Get the rows of the oldest DateID.
rows_df = table_df[table_df["DateID"] == 20200101]
rows_df = spark.createDataFrame(rows_df.rdd, schema=rows_df.schema)

# Delete these rows from the table
table_df.createOrReplaceTempView(f"{table_name}_view")
spark.sql(f"DELETE From {table_name}_view WHERE DateID = '20200101'")

# Update the DateID and append the rows as new data
rows_df = rows_df.withColumn("DateID", lit(20250101))
rows_df.write.format("delta").mode("append").save(f"Tables/{table_name}")
```

The `get_delta_table_history` function in the [semantic-link-labs library](#) can help to analyze the effect of this rolling window update. See the following Python code sample. See also the table with the output after the code snippet.

```
import sempy_labs as labs
from IPython.display import HTML
from IPython.display import clear_output
```

```

table_name = "<Provide your table name>"
da_results = labs.get_delta_table_history(table_name)

# Create a single HTML table for specified columns
html_table = "<table border='1'>"
# Add data rows for specified columns
for index, row in da_results.iterrows():
    for column in ['Version', 'Operation', 'Operation Parameters', 'Operation Metrics']:
        if column == 'Version':
            html_table += f"<tr><td><b>Version</b></td><td><b>{row[column]}</b></td></tr>"
        else:
            html_table += f"<tr><td>{column}</td><td>{row[column]}</td></tr>"
html_table += "</table>

# Display the HTML table
display(HTML(html_table))

```

Output:

 Expand table

Version	Description	Value
2	Operation	WRITE
	Operation parameters	{'mode': 'Append', 'partitionBy': '[]'}
	Operation metrics	{'numFiles': '1', 'numOutputRows': '548665', 'numOutputBytes': '4103076'}
1	Operation	DELETE
	Operation parameters	{'predicate': '["(DateID#3910 = 20200101)"]'}
	Operation metrics	{'numRemovedFiles': '8', 'numRemovedBytes': '7700855198', 'numCopiedRows': '999451335', 'numDeletionVectorsAdded': '0', 'numDeletionVectorsRemoved': '0', 'numAddedChangeFiles': '0', 'executionTimeMs': '123446', 'numDeletionVectorsUpdated': '0', 'numDeletedRows': '548665', 'scanTimeMs': '4820', 'numAddedFiles': '18', 'numAddedBytes': '7696900084', 'rewriteTimeMs': '198625'}
0	Operation	WRITE
	Operation parameters	{'mode': 'Overwrite', 'partitionBy': '[]'}

Version	Description	Value
Operation metrics	{'numFiles': '8', 'numOutputRows': '1000000000', 'numOutputBytes': '7700892169'}	

The Delta Analyzer history above shows that this Delta table now has the following three versions:

- **Version 0:** This is the original version with eight Parquet files and 24 row groups as discussed in the previous section.
- **Version 1:** This version reflects the **delete** operation. Although only a single day's worth of data (DateID = '20200101') was removed from the sample table with five years of sales transactions, all eight Parquet files were affected. In the Operation Metrics, `numRemovedFiles` is eight [Parquet files] and `numAddedFiles` is 18 [Parquet files]. This means that the **delete** operation replaced the original eight Parquet files with 18 new Parquet files.
- **Version 3:** The Operation Metrics reveal that one more Parquet file with 548,665 rows was added to the Delta table.

After the rolling window update, the most current Delta commit version includes 19 Parquet files and 21 row groups, with sizes ranging from 500 thousand to 50 million rows. The rolling window update of 548,665 rows affected the entire Delta table of 1 billion rows. It replaced all Parquet files and row groups. Incremental framing can't be expected to improve cold performance in this case, and the increased variation in row group sizes is unlikely to benefit warm performance.

Delta table updates

The following Python code updates a Delta table in essentially the same way as described in the previous section. On the surface, the `update` function only changes the `DateID` value of the existing rows that match a given `DateID`. However, Parquet files are immutable and can't be modified. Below the surface, the `update` operation removes existing Parquet files and adds new Parquet files. The outcome and effect are the same as for the rolling window update.

```
from pyspark.sql.functions import col, when
from delta.tables import DeltaTable

# Load the Delta table
table_name = "<Provide your table name>"
delta_table = DeltaTable.forPath(spark, f"Tables/{table_name}")

# Define the condition and the column to update
```

```

condition = col("DateID") == 20200101
column_name = "DateID"
new_value = 20250101

# Update the DateID column based on the condition
delta_table.update(
    condition,
    {column_name: when(condition, new_value).otherwise(col(column_name))})
)

```

Partitioned rolling window updates

Partitioning can help to reduce the effect of table updates. It might be tempting to use the date keys, but a quick cardinality check can reveal that this isn't the best choice. For example, the sample table discussed so far contains sales transactions for the last five years, equivalent to about 1800 distinct date values. This cardinality is too high. The partition column should have fewer than 200 distinct values.

```

column_name = 'DateID'
table_name = "<Provide your table name>"
table_df = spark.read.format("delta").load(f"Tables/{table_name}")

distinct_count = table_df.select(column_name).distinct().count()
print(f"The '{column_name}' column has {distinct_count} distinct values.")

if distinct_count <= 200:
    print(f"The '{column_name}' column is a good partitioning candidate.")

table_df.write.format("delta").partitionBy(column_name).save(f"Tables/{table_name}_by_date_id")
    print(f"Table '{table_name}_by_date_id' partitioned and saved successfully.")
else:
    print(f"The cardinality of the '{column_name}' column is possibly too high.")

```

Output:

```

The 'DateID' column has 1825 distinct values.
The cardinality of the 'DateID' column is possibly too high.

```

If there's no suitable partition column, it can be created artificially by reducing the cardinality of an existing column. The following Python code adds a Month column by removing the last two digits of the DateID. This produces 60 distinct values. The sample code then saves the Delta table partitioned by the Month column.

```

from pyspark.sql.functions import col, expr

column_name = 'DateID'
table_name = "sales_1"
table_df = spark.read.format("delta").load(f"Tables/{table_name}")

partition_column = 'Month'
partitioned_table = f"{table_name}_by_month"
table_df = table_df.withColumn(partition_column, expr(f"int({column_name} / 100)"))

distinct_count = table_df.select(partition_column).distinct().count()
print(f"The '{partition_column}' column has {distinct_count} distinct values.")

if distinct_count <= 200:
    print(f"The '{partition_column}' column is a good partitioning candidate.")

table_df.write.format("delta").partitionBy(partition_column).save(f"Tables/{partitioned_table}")
    print(f"Table '{partitioned_table}' partitioned and saved successfully.")
else:
    print(f"The cardinality of the '{partition_column}' column is possibly too high.")

```

Output:

```

The 'Month' column has 60 distinct values.
The 'Month' column is a good partitioning candidate.
Table 'sales_1_by_month' partitioned and saved successfully.

```

The Delta Analyzer summary now shows that the Delta table layout is well aligned with Direct Lake. The average row group size is about 16 million rows, and the mean absolute deviation of the row group sizes and therefore segment sizes is fewer than 1 million rows.

[] [Expand table](#)

Parameter	Value
Table name	sales_1_by_month
Row count	10000000000
Row groups	60
Parquet files	60

Parameter	Value
Max rows per row group	16997436
Min rows per row group	15339311
Avg rows per row group	16666666.66666666
VOrder enabled	True
Total size	7447946016
Timestamp	2025-03-24 03:01:02.794979

After a rolling window update against a partitioned sample table, the Delta Analyzer history shows that only one Parquet file was affected. See the following output table. Version 2 has exactly 16,445,655 rows copied over from the old Parquet file into a replacement Parquet file, and Version 3 adds a new Parquet file with 548,665 rows. In total, Direct Lake only needs to reload about 17 million rows, a sizeable improvement over a 1-billion-rows reload without partitioning.

[Expand table](#)

Version	Description	Value
2	Operation	WRITE
	Operation parameters	{'mode': 'Append', 'partitionBy': '["Month"]'}
	Operation metrics	{'numFiles': '1', 'numOutputRows': '548665', 'numOutputBytes': '4103076'}
1	Operation	DELETE
	Operation parameters	{'predicate': '["(DateID#3910 = 20200101)"]'}
	Operation metrics	{'numRemovedFiles': '1', 'numRemovedBytes': '126464179', 'numCopiedRows': '16445655', 'numDeletionVectorsAdded': '0', 'numDeletionVectorsRemoved': '0', 'numAddedChangeFiles': '0', 'executionTimeMs': '19065', 'numDeletionVectorsUpdated': '0', 'numDeletedRows': '548665', 'scanTimeMs': '1926', 'numAddedFiles': '1', 'numAddedBytes': '121275513', 'rewriteTimeMs': '17138'}
0	Operation	WRITE
	Operation parameters	{'mode': 'Overwrite', 'partitionBy': '["Month"]'}

Version	Description	Value
	Operation metrics	{'numFiles': '60', 'numOutputRows': '1000000000', 'numOutputBytes': '7447681467'}

Append-only pattern followed by Spark Optimize

Append-only patterns don't affect existing Parquet files. They work well with Direct Lake incremental framing. However, don't forget to optimize your Delta tables to consolidate Parquet files and row groups, as discussed earlier in this article. Small and frequent appends can accumulate files quickly and can distort the uniformity of the row group sizes.

The following output shows the Delta Analyzer history for a nonpartitioned table compared to a partitioned table. The history includes seven appends and one subsequent `optimize` operation.

 Expand table

Version	Description	Value in <i>default</i> layout	Value in <i>partitioned</i> layout
8	Operation	OPTIMIZE	OPTIMIZE
	Operation parameters	{'predicate': '[]', 'auto': 'false', 'clusterBy': '[]', 'vorder': 'true', 'zOrderBy': '[]'}	{'predicate': "[("Month >= 202501)]", 'auto': 'false', 'clusterBy': '[]', 'vorder': 'true', 'zOrderBy': '[]'}
	Operation metrics	{'numRemovedFiles': '8', 'numRemovedBytes': '991234561', 'p25FileSize': '990694179', 'numDeletionVectorsRemoved': '0', 'minFileSize': '990694179', 'numAddedFiles': '1', 'maxFileSize': '990694179', 'p75FileSize': '990694179', 'p50FileSize': '990694179', 'numAddedBytes': '990694179'}	{'numRemovedFiles': '7', 'numRemovedBytes': '28658548', 'p25FileSize': '28308495', 'numDeletionVectorsRemoved': '0', 'minFileSize': '28308495', 'numAddedFiles': '1', 'maxFileSize': '28308495', 'p75FileSize': '28308495', 'p50FileSize': '28308495', 'numAddedBytes': '28308495'}
7	Operation	WRITE	WRITE
	Operation parameters	{'mode': 'Append', 'partitionBy': '[]'}	{'mode': 'Append', 'partitionBy': '["Month"]'}
	Operation metrics	{'numFiles': '1', 'numOutputRows': '547453', 'numOutputBytes': '4091802'}	{'numFiles': '1', 'numOutputRows': '547453', 'numOutputBytes': '4091802'}
6	Operation	WRITE	WRITE

Version	Description	Value in <i>default</i> layout	Value in <i>partitioned</i> layout
	Operation parameters	{'mode': 'Append', 'partitionBy': '[]'}	{'mode': 'Append', 'partitionBy': '["Month"]'}
	Operation metrics	{'numFiles': '1', 'numOutputRows': '548176', 'numOutputBytes': '4095497'}	{'numFiles': '1', 'numOutputRows': '548176', 'numOutputBytes': '4095497'}
5	Operation	WRITE	WRITE
	Operation parameters	{'mode': 'Append', 'partitionBy': '[]'}	{'mode': 'Append', 'partitionBy': '["Month"]'}
	Operation metrics	{'numFiles': '1', 'numOutputRows': '547952', 'numOutputBytes': '4090107'}	{'numFiles': '1', 'numOutputRows': '547952', 'numOutputBytes': '4093015'}
4	Operation	WRITE	WRITE
	Operation parameters	{'mode': 'Append', 'partitionBy': '[]'}	{'mode': 'Append', 'partitionBy': '["Month"]'}
	Operation metrics	{'numFiles': '1', 'numOutputRows': '548631', 'numOutputBytes': '4093134'}	{'numFiles': '1', 'numOutputRows': '548631', 'numOutputBytes': '4094376'}
3	Operation	WRITE	WRITE
	Operation parameters	{'mode': 'Append', 'partitionBy': '[]'}	{'mode': 'Append', 'partitionBy': '["Month"]'}
	Operation metrics	{'numFiles': '1', 'numOutputRows': '548671', 'numOutputBytes': '4101221'}	{'numFiles': '1', 'numOutputRows': '548671', 'numOutputBytes': '4101221'}
2	Operation	WRITE	WRITE
	Operation parameters	{'mode': 'Append', 'partitionBy': '[]'}	{'mode': 'Append', 'partitionBy': '["Month"]'}
	Operation metrics	{'numFiles': '1', 'numOutputRows': '546530', 'numOutputBytes': '4081589'}	{'numFiles': '1', 'numOutputRows': '546530', 'numOutputBytes': '4081589'}
1	Operation	WRITE	WRITE
	Operation parameters	{'mode': 'Append', 'partitionBy': '[]'}	{'mode': 'Append', 'partitionBy': '["Month"]'}
	Operation metrics	{'numFiles': '1', 'numOutputRows': '548665', 'numOutputBytes': '4101048'}	{'numFiles': '1', 'numOutputRows': '548665', 'numOutputBytes': '4101048'}

Version	Description	Value in <i>default</i> layout	Value in <i>partitioned</i> layout
			'4101048'}
0	Operation	WRITE	WRITE
	Operation parameters	{'mode': 'Overwrite', 'partitionBy': '[]'}	{'mode': 'Overwrite', 'partitionBy': '["Month"]'}
	Operation metrics	{'numFiles': '8', 'numOutputRows': '1000000000', 'numOutputBytes': '7700855198'}	{'numFiles': '60', 'numOutputRows': '1000000000', 'numOutputBytes': '7447681467'}

Looking at the Operation Metrics of Version 8, it's worth pointing out that the **optimize** operation for the nonpartitioned table merged eight Parquet files affecting roughly 1 GB of data while the **optimize** operation of the partitioned table merged seven Parquet files affecting only about 25 MB of data. It follows that Direct Lake would perform better with the partitioned table.

Considerations and limitations

Considerations and limitations for optimizing Direct Lake performance are as follows:

- Avoid destructive update patterns on large Delta tables to preserve incremental framing in Direct Lake.
- Small Delta tables don't need to be optimized for incremental framing.
- Aim for a row group size of between 1 million to 16 million rows to create column segments in Direct Lake with 1 million to 16 million rows. Direct Lake prefers large column segments.
- Avoid high cardinality partition columns because Direct Lake transcoding is less efficient with many small Parquet files and row groups than with fewer large Parquet files and row groups.
- Due to unforeseen demand for compute and memory resources, a semantic model might be reloaded onto another Fabric cluster node in cold state.
- Direct Lake doesn't use delta\Parquet statistics for row group\file skipping to optimize data loading.

Direct Lake in Power BI Desktop (preview)

08/01/2025

Power BI Desktop can create and edit Power BI semantic models with Direct Lake tables. Semantic models with Direct Lake tables are created in, and edited from, the Fabric workspace, not on your local machine, so when using Power BI Desktop, you **live edit** the semantic model where it is. There's no publish action as changes made in Power BI Desktop happen to the semantic model in the Fabric workspace. This experience is the same as when you're editing the semantic model in the web, or in the Fabric workspace, by choosing the **Open data model** action.

Version history is available and automatically creates a version each time you start a live editing session, so you can undo an accidental change. **Git integration** is also available for semantic models, giving you full control over changes. And **deployment pipelines** can also be used to only live edit a semantic model in a development workspace before pushing to a production workspace.

In a semantic model with import tables, the data is downloaded and locally available on your computer. In a semantic model with Direct Lake tables, the data remains in the OneLake. When visuals use data, the semantic model provides the data from where it is stored. Learn more about [Direct Lake query performance](#).

Metadata for the semantic model that is the information about the tables columns, measures, relationships, and all other semantic modeling features, can be downloaded, with the data, as a **PBIX file** for semantic models not using Direct Lake tables. Metadata for the semantic model when you include Direct Lake tables can also be downloaded, without the data, using the **Power BI Project (PBIP)** format. Learn more about [Direct Lake with PBIP](#).

Power BI reports can be created from all semantic models from Power BI Desktop with a live connection by choosing a **Power BI semantic model** from the **OneLake catalog** and selecting **Connect**. Reports can also be created in the Fabric workspace from many places, including the right-click context menu and choosing **create a report**. Learn more about [building reports](#).

This article discusses more details about live editing in Power BI Desktop, and how to create and add Direct Lake tables to a semantic model in Power BI Desktop.

Enable preview feature

Live editing semantic models in Direct Lake mode with Power BI Desktop is enabled by default. You can disable this feature by turning off the **Live edit of Power BI semantic models in Direct Lake mode** preview selection, found in **Options and Settings > Options > Preview features**.

Creating semantic models with Direct Lake tables is in public preview, and you need to enable it. You can enable this feature by turning on **Create semantic models in Direct Lake storage mode from one or more Fabric artifacts** option, found in Power BI Desktop's Options and Settings > Options > Preview features.

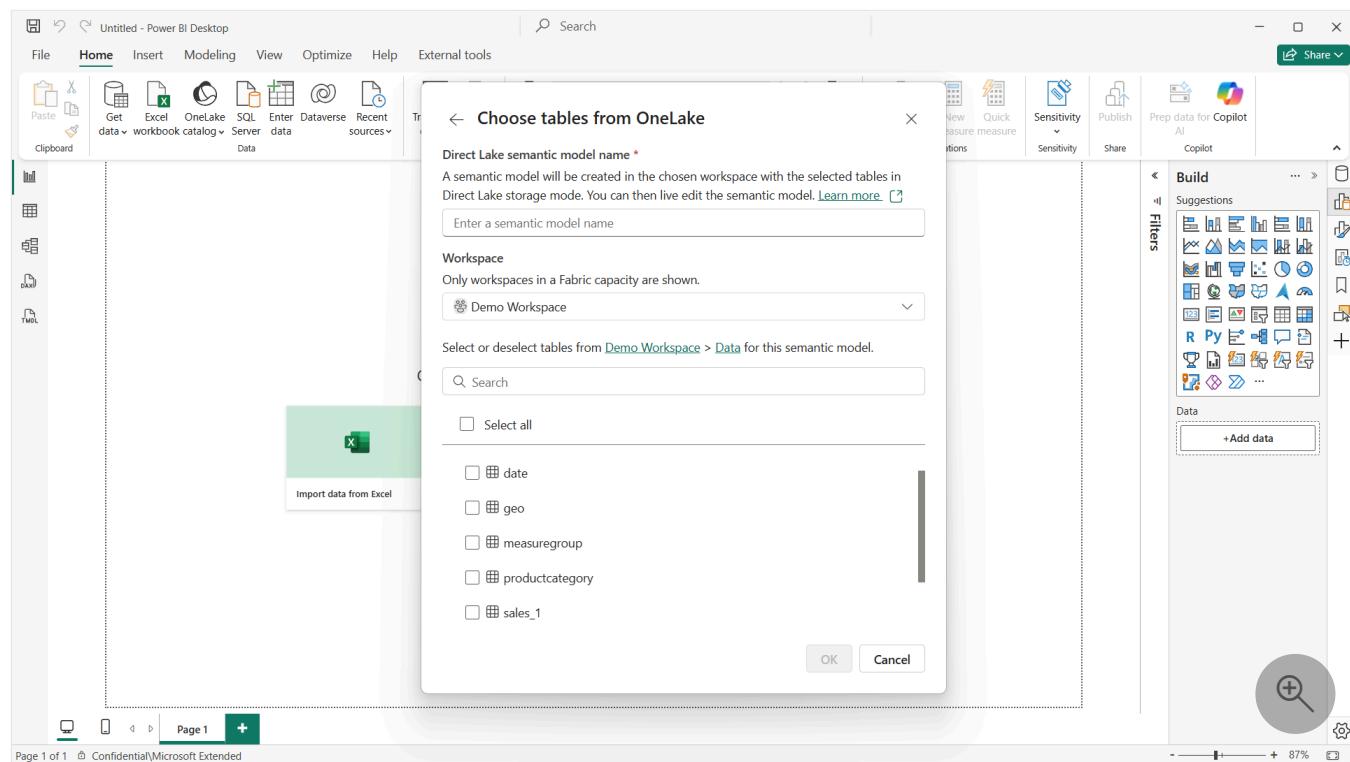
Create a semantic model with Direct Lake tables

To create a semantic model with Direct Lake tables, take the following steps.

1. Open Power BI Desktop and select **OneLake catalog**.
2. Select a Fabric item, such as a **Lakehouse** or **Warehouse**, and press **Connect**.
3. Give your semantic model a name, pick a Fabric workspace for it, and select the tables to include. Then press **OK**.

The semantic model is created in the Fabric workspace and now you're live editing the semantic model in Power BI Desktop.

Semantic models with Direct Lake tables created in Power BI Desktop use **Direct Lake on OneLake** storage mode. The differences between Direct Lake on OneLake and Direct Lake on SQL are explained in the [Overview](#).

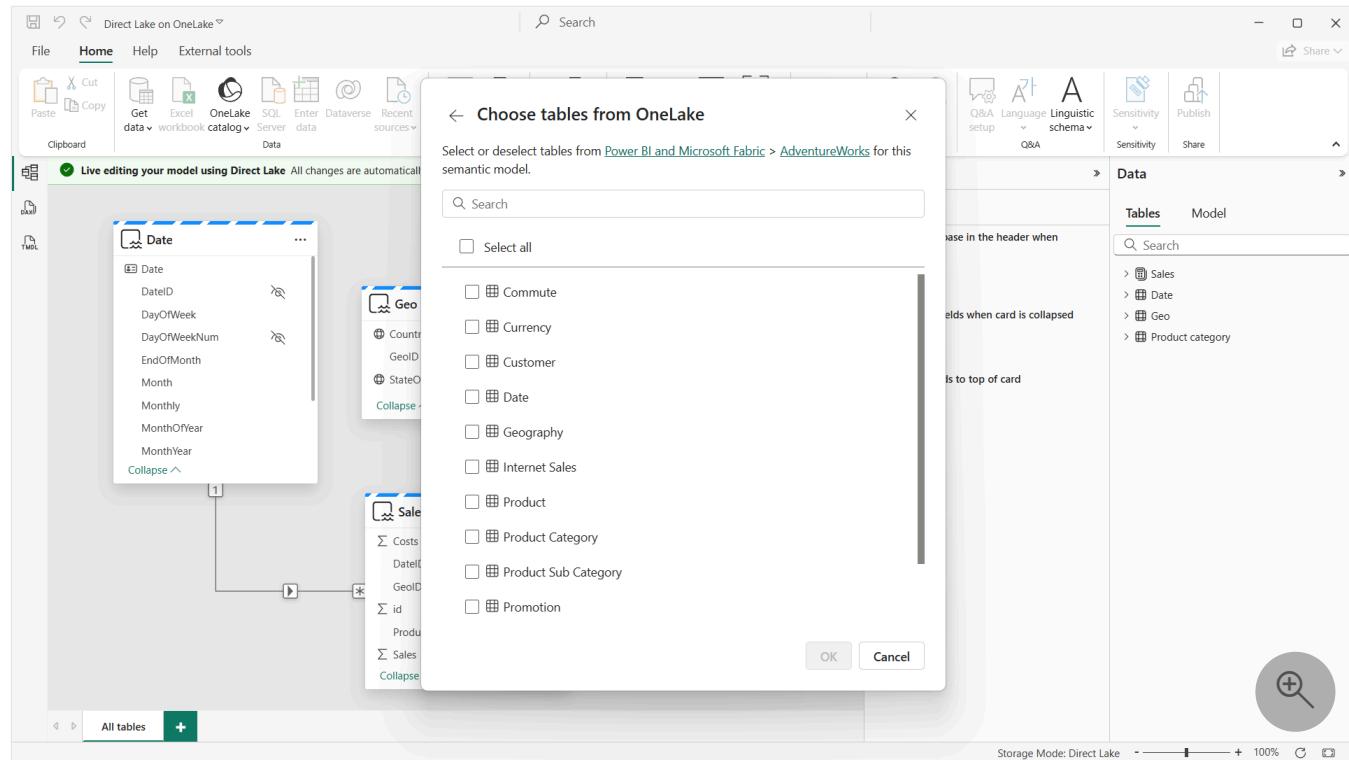


Add Direct Lake tables from other Fabric items

To add Direct Lake tables from other Fabric items, take the following steps.

1. While live editing a Direct Lake on OneLake semantic model in Power BI Desktop, open the **OneLake catalog** and select another Fabric item, such as a **Lakehouse** or **Warehouse**.
2. In the dialog, select the tables you want to include then press **OK**.

The tables are added to your semantic model and you can continue live editing.

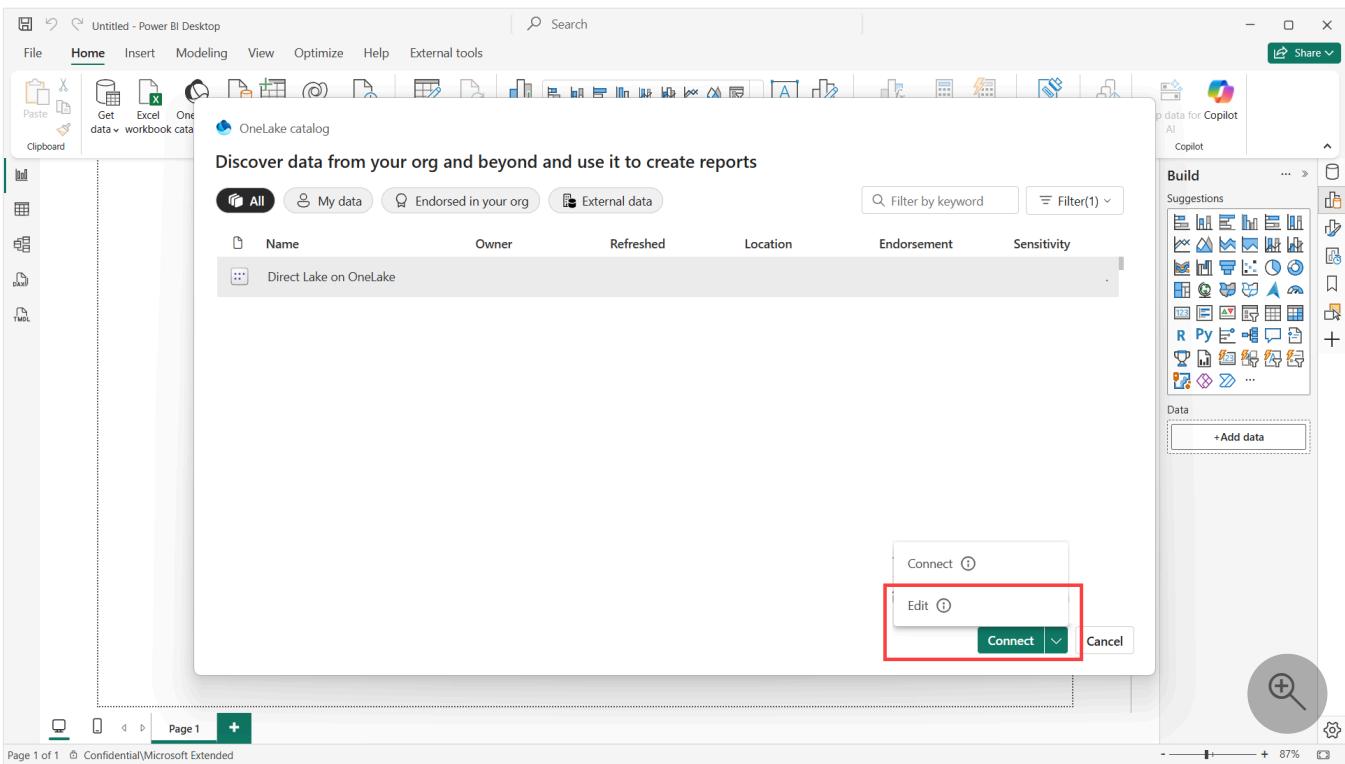


Live edit a semantic model with Direct Lake tables

To edit a semantic model with Direct Lake tables later, take the following steps.

1. In a new instance of Power BI Desktop, open the **OneLake catalog** and select the **Power BI semantic model**.
2. Select the **Connect** dropdown list and choose **Edit**.

Now you're live editing the semantic model.



! Note

Semantic models with Direct Lake storage modes are supported. Selecting a semantic model with tables in other storage modes results in an error.

Alternatively, if you have [exported the semantic model to a Power BI Project \(PBIP\)](#), take the following steps.

1. Double-click the PBIP file on in the Power BI Project (PBIP) folder.
2. Or, in Power BI Desktop choose **File** then **Open** and navigate to the **PBIP file in the Power BI Project (PBIP)** folder.

Live editing in Power BI Desktop differences

Live editing in Power BI Desktop is different than editing a local model with import and DirectQuery tables, and different than editing a report with a live connection.

Report view

The report view is removed when live editing, unless you're [live editing with Power BI Project \(PBIP\)](#).

To create a report, follow these steps in Power BI Desktop.

1. Select **File** then **Blank report** to create a new report.

2. Open the OneLake catalog and choose the Power BI semantic model you're live editing (it should show at the top of the list).
3. Select Connect.
4. Now you can create the report. Save the file and publish to the Fabric workspace when ready.

Learn more about [building reports](#).

Table view

The table view is also removed when live editing, unless you have a [calculation group](#) or [calculated table](#) in the semantic model. These derived tables use import storage mode. Calculated tables without direct references to Direct Lake table columns are allowed. A common example is using [INFO.VIEW DAX functions](#) to self-document the semantic model.

(!) Note

Import tables from any data source can be added to the semantic model with Direct Lake on OneLake tables using XMLA. Live editing semantic models with import and Direct Lake tables in Power BI Desktop isn't yet supported.

Saving

As you make changes to your semantic model, your changes are automatically saved and the **Save** button is disabled when in Live edit mode. Changes made in Power BI Desktop automatically happen to the semantic model in the Fabric workspace.

[Version history](#) creates a version at the beginning of each live editing session if you need to revert a change. There's no undo action available as you make changes. [Git integration](#) or using [deployment pipelines](#) to first live edit in a development workspace then pushing to a production environment are also available to live edit without affecting downstream users.

There's no local file created but if you would like a local copy of the metadata, you can [export to a Power BI Project \(PBIP\)](#) and continue live editing with a **Save** button for the local metadata. You can utilize local Git techniques to undo changes. To export to Power BI Project (PBIP), go to **File** then **Export**, and choose **Power BI Project (PBIP)**.

If two or more users are live editing the same semantic model and a conflict occurs, Power BI Desktop alerts one of the users, and syncs the model to the latest version. Any changes you were trying to make will need to be performed again after the model sync. This behavior is the same behavior as [editing data models in the Power BI service](#), also called web modeling.

Refresh

Selecting the Refresh button when live editing a semantic model with Direct Lake tables performs a schema refresh and reframe the Direct Lake tables.

The schema refresh checks the tables definitions in the model and compares it to the same named table in the data source for any changes to columns. Changes detected from the data source, in this case a Fabric artifact, are made to the semantic model. For example, a column was added to a table. Changing the table or column name in the semantic model in Power BI Desktop persist after a refresh.

Changing a table or column name at the data source removes the table or column on the next schema refresh. You can use [TMDL view](#) to see the SourceLineageTag property and update it to the new name to avoid the semantic model removing it on schema refresh.

Another way to perform a schema refresh is to return to [Edit tables](#) and select **OK**. Go to **Transform data** dropdown list then **Data source settings** and select [Edit tables](#).

Scheduled refresh in the Fabric workspace only reframe the Direct Lake tables without a schema refresh. Learn more about [refresh in Power BI](#).

Power BI Project (PBIP)

When working on a Power BI Project (PBIP) with a semantic model with Direct Lake tables, Power BI Desktop needs to connect to a semantic model in a Fabric workspace, also termed as a remote semantic model. Remote modeling is live editing, as all changes you make are immediately applied to the semantic model in the workspace. In addition, you can save your semantic model and report definitions, or metadata, to your local PBIP files. The PBIP files can later be deployed to a Fabric workspace using a deployment mechanism such as Fabric Git Integration. Learn more about [remote modeling with Power BI Project \(PBIP\)](#)

Name in header links

Selecting the name of the semantic model in the top left corner of Power BI Desktop expands to show the location of the semantic model in the Fabric workspace. Selecting the workspace name or semantic model name navigates you to them in the web. Version history is also available.

TMDL view

TMDL (Tabular Model Definition Language) view can be used with Direct Lake semantic models. The TMDL scripts aren't saved unless you're live editing with a [Power BI Project \(PBIP\)](#). Learn

more about [TMDL view](#).

DAX query view

DAX (Data Analysis Expressions) query view can be used with Direct Lake semantic models. The DAX queries aren't saved unless you're live editing with a [Power BI Project \(PBIP\)](#). Learn more about [DAX query view](#).

Migrate Direct Lake on SQL semantic models to Direct Lake on OneLake

If you already have an existing **Direct Lake on SQL** semantic model and want to migrate to **Direct Lake on OneLake**, you can by using [TMDL view](#). Direct Lake on OneLake offers the advantage of having tables from multiple sources and no fallback to DirectQuery.

These migration steps aren't recommended if you're using SQL analytics endpoint views in the Direct Lake on SQL semantic model.

To change to Direct Lake on OneLake, follow these steps.

1. Live edit the semantic model you want to migrate in Power BI Desktop.
2. In the header, open the dropdown list on the name and choose **Version history** to make a version to return to, if you want to have that option.
3. Go to **TMDL view**.
4. Drag the **Semantic model** node into the editor to script the entire model.
5. Find the **Expression** toward the bottom of the script.
6. Change `Sql.Database("SQL endpoint connection string", "ID of the SQL analytics endpoint")` to `AzureStorage.DataLake("https://onelake.dfs.fabric.microsoft.com/ID of the workspace/ID of the lakehouse or warehouse")`.
7. If the source is a **Lakehouse without schemas**, remove all `schemaName` property references. Select **Find** in the ribbon to find one. Select it and use `CTRL+SHIFT+L` to select them all, then `CTRL+SHIFT+K` to remove all the lines at once.
8. Then select **Apply**.
9. On success, go to **Model view** to **Refresh** the model. You can adjust credentials in the **Settings** page of the model in the web.

Now the semantic model is using Direct Lake on OneLake. If there are issues, you can restore to the version you created to return to Direct Lake on SQL storage mode.

Requirements and permissions

- XMLA Endpoint must be enabled on the tenant. Learn more in the [XMLA endpoint article](#).
- XMLA Endpoint with *Read Write* access must be enabled at the capacity. Learn more in the [tools article](#).
- User must have *Write* permission on the semantic model. Learn more in the [permissions article](#).
- User must have *Viewer* permission on the lakehouse. Learn more in the [lakehouse article](#).
- This feature is unavailable for users with a free license.

Considerations and limitations

Live edit of semantic models in Direct Lake mode in Power BI Desktop is currently in preview.

- You can't transform data using Power Query editor. In the source Fabric item there can be transformation options, such as using Power Query in Dataflows.
- You can't have multiple data sources when using Direct Lake on SQL. Add data to the Fabric data source used by semantic model. Multiple data sources are supported for Direct Lake on OneLake storage mode.
- You can't publish the Power BI Project (PBIP) from Power BI Desktop. You can use Fabric Deployment mechanisms such as Fabric Git Integration or Fabric Item APIs to publish your local PBIP files to a Fabric workspace.
- You can't validate RLS roles from Power BI Desktop. You can validate the role in the service.
- You can't sign out during live editing without unexpected errors.
- You can open external tools, but the external tool must manage authentication to the remote semantic model.
- You can change the data category to *barcode*, but reports linked to the semantic model can't filter by barcodes.
- You can't live edit externally shared semantic models.
- Review the current [known issues and limitations of Direct Lake](#).

Related content

- [Direct Lake overview](#)
- [Power BI Project files](#)

Direct Lake in Power BI Project (preview)

Article • 05/12/2025

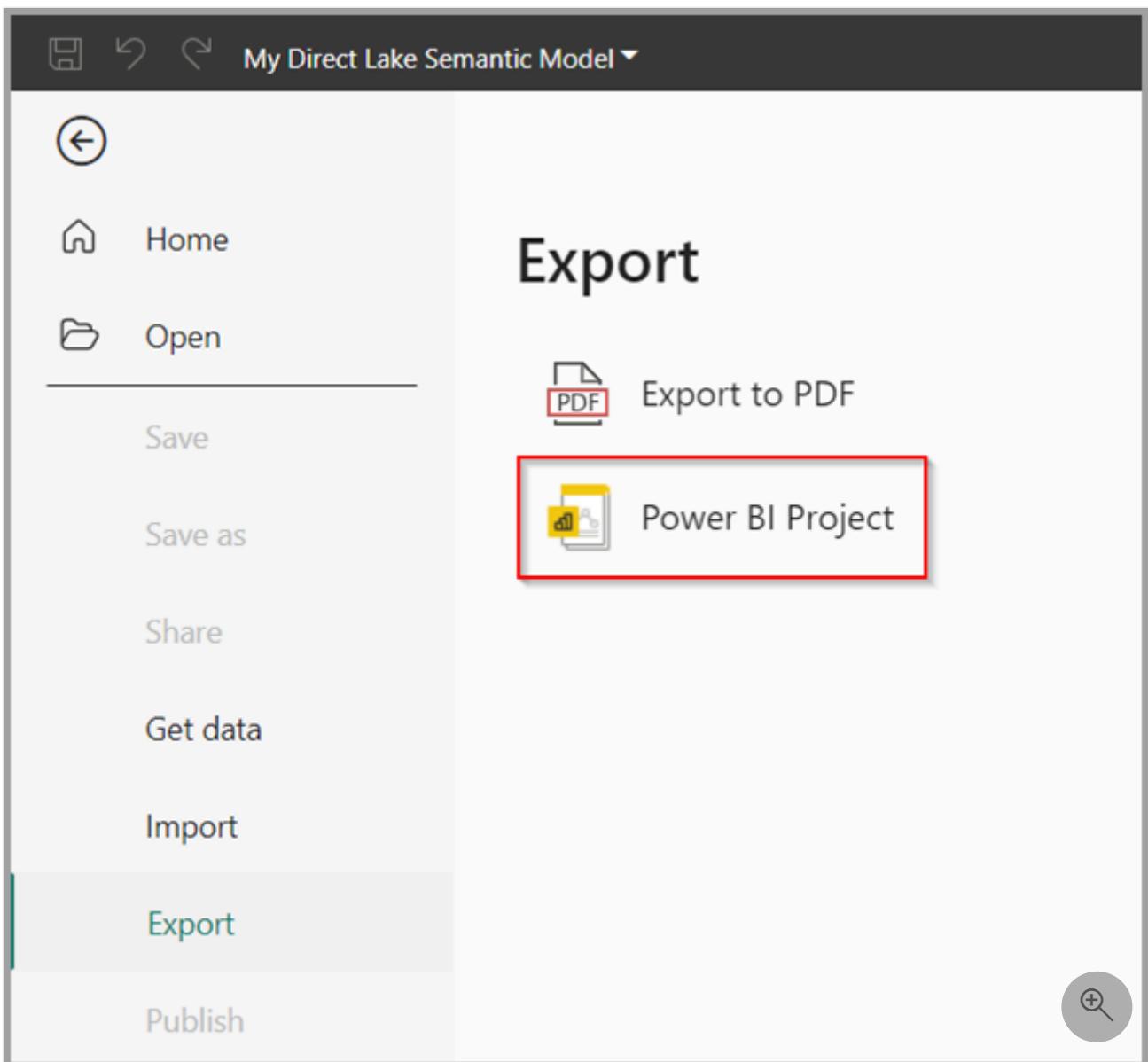
When working on a Power BI Project (PBIP) with a semantic model with Direct Lake tables, Power BI Desktop needs to connect to a semantic model in a Fabric workspace, also termed as a remote semantic model. Remote modeling is live editing, as all changes you make are immediately applied to the semantic model in the workspace. However, unlike live edit, you can save your semantic model and report definitions, or metadata, to your local PBIP files that can later be deployed to a Fabric workspace using a deployment mechanism such as Fabric Git Integration. Learn more about remote modeling with [Power BI Project \(PBIP\)](#).

To support professional enterprise development workflows of semantic models in Direct Lake mode, you can export the definition of your semantic model after opening it for editing, which provides a local copy of the semantic model and report metadata that you can use with Fabric deployment mechanisms such as Fabric Git Integration. The Power BI Desktop **report view** becomes enabled letting you view and edit the local report. **Publish** directly from Power BI Desktop isn't available but you can publish using Git integration. The **Save** button is also enabled to save the local model metadata and report in the Power BI Project folder.

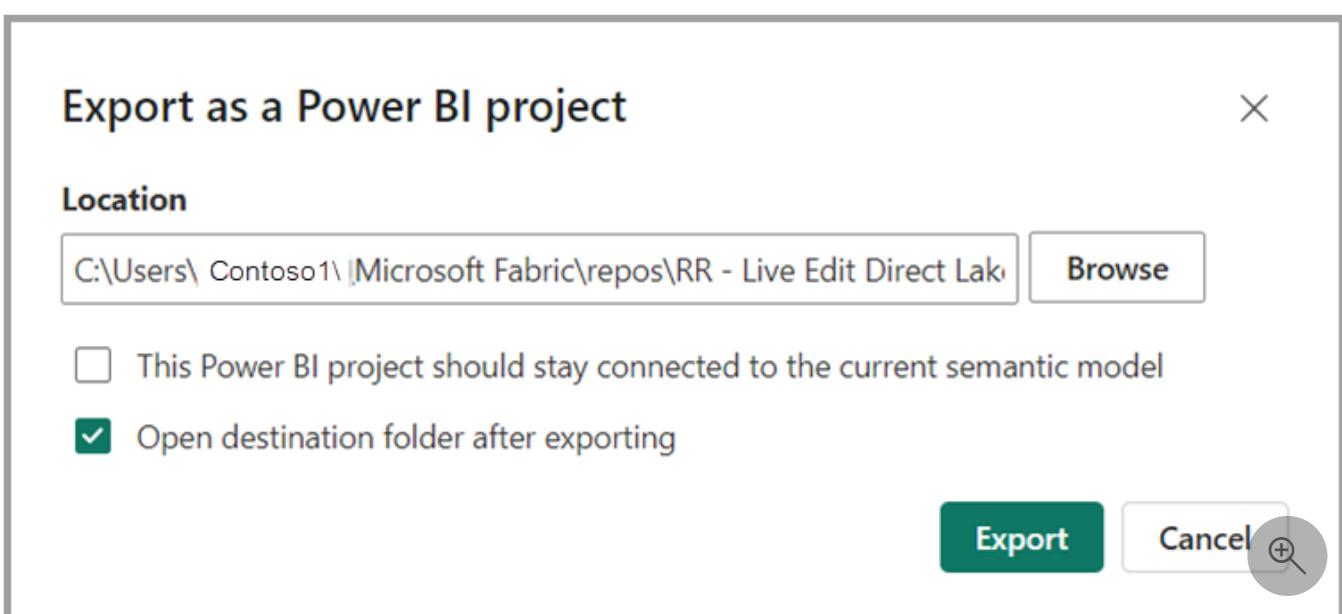
Export to a Power BI Project

To support professional enterprise development workflows of semantic models in Direct Lake mode, you can export the definition of your semantic model after opening it for editing, which provides a local copy of the semantic model and report metadata that you can use with Fabric deployment mechanisms such as [Fabric Git Integration](#). The Power BI Desktop report view becomes enabled letting you view and edit the local report, publish directly from Power BI Desktop isn't available but you can publish using Git integration. The **Save** button is also enabled to save the local model metadata and report in the Power BI Project folder.

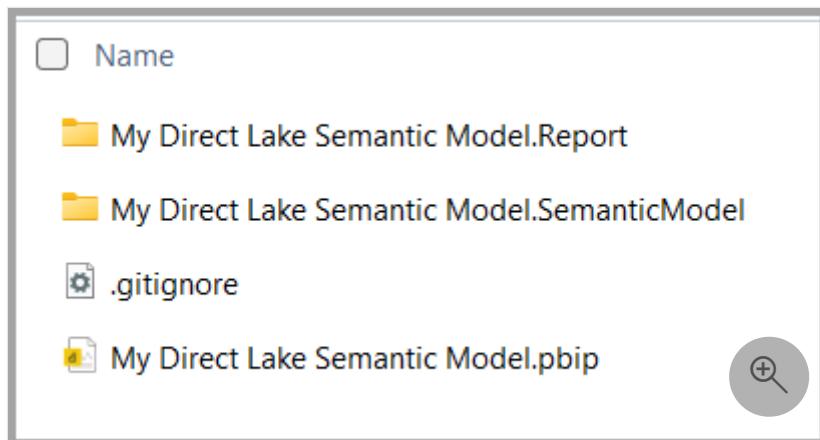
Navigate to **File > Export > Power BI Project** and export it as a [Power BI Project file \(PBIP\)](#).



By default, the PBIP file is exported to the `%USERPROFILE%\Microsoft Fabric\repos\[Workspace Name]` folder. However, you can choose a different location during the export process.



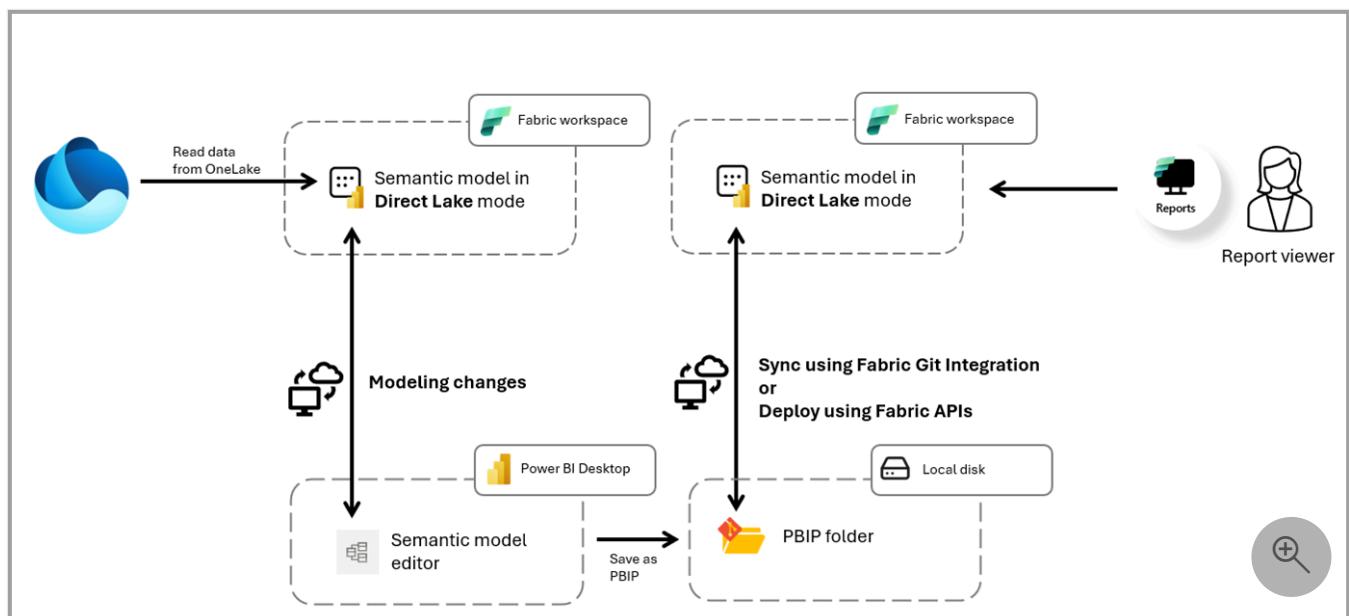
Selecting **Export** opens the folder containing the PBIP files of the exported semantic model along with an empty report.



After exporting, you should open a new instance of Power BI Desktop and open the exported PBIP file to continue editing with a Power BI Project. When you open the PBIP file, Power BI Desktop prompts you to either create a new semantic model in a Fabric workspace, or select an existing semantic model for **remote modeling**.

Remote modeling with a Power BI Project

When working on a Power BI Project (PBIP) with a semantic model that can't run on the local Power BI Analysis Services engine, such as Direct Lake mode, Power BI Desktop requires to be connected to a semantic model in a Fabric workspace, a remote semantic model. Like *live edit*, all changes you make are immediately applied to the semantic model in the workspace. However, unlike live edit, you can save your semantic model and report definitions to local PBIP files that can later be deployed to a Fabric workspace using a deployment mechanism such as [Fabric Git Integration](#).

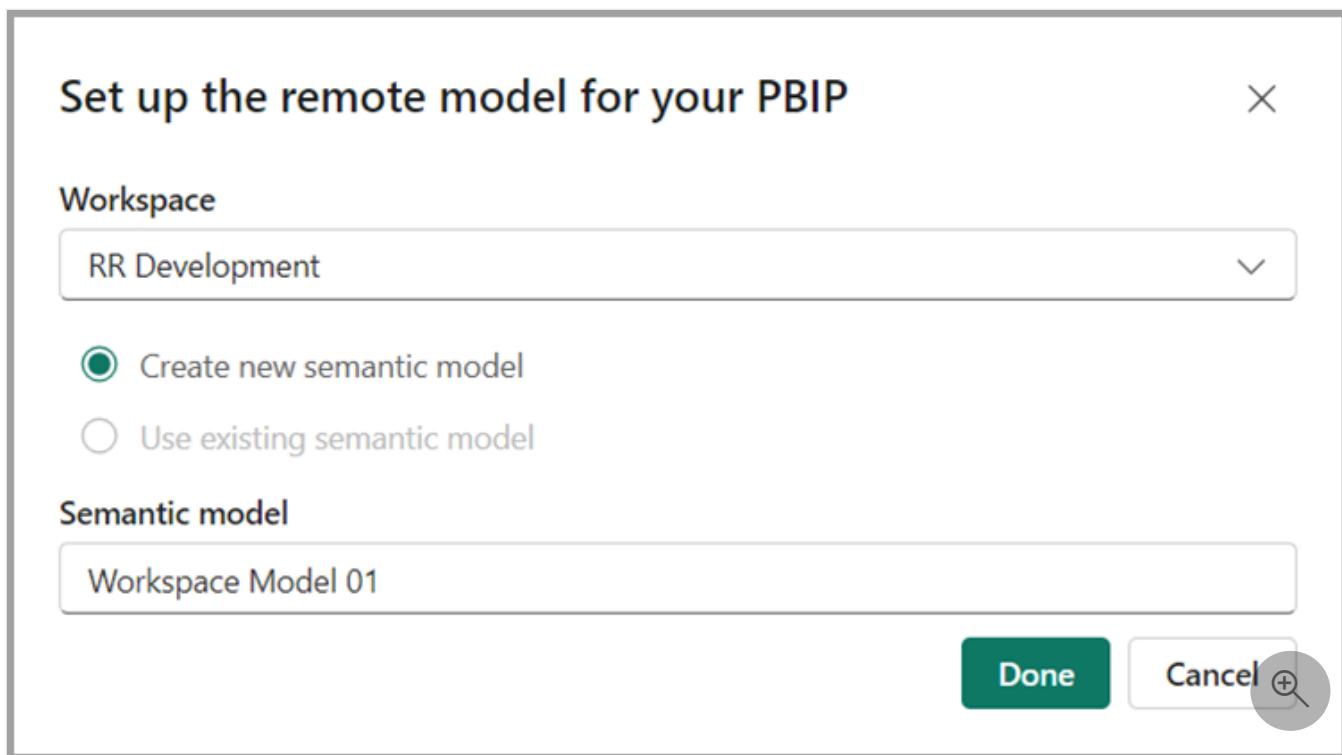


(!) Note

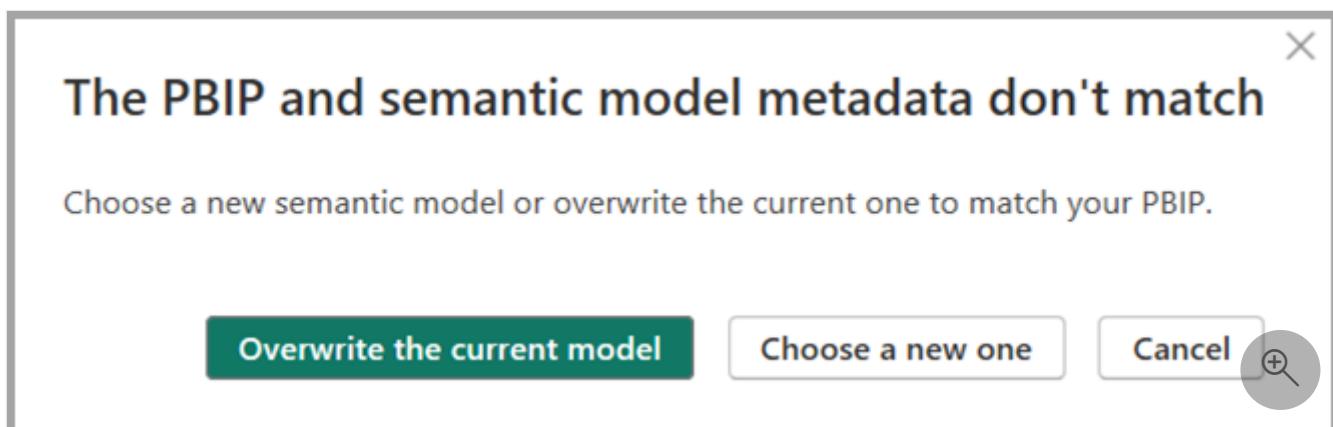
Semantic models in Direct Lake mode, when exported to a Git repository using [Fabric Git Integration](#), can be edited using Power BI Desktop. To do so, make sure at least one report is connected to the semantic model, then open the report's exported `definition.pbir` file to edit both the report and the semantic model.

Open your Power BI Project

When opening a Power BI Project (PBIP) that require a remote semantic model, Power BI Desktop prompts you to either create a new semantic model or select an existing semantic model in a Fabric workspace.



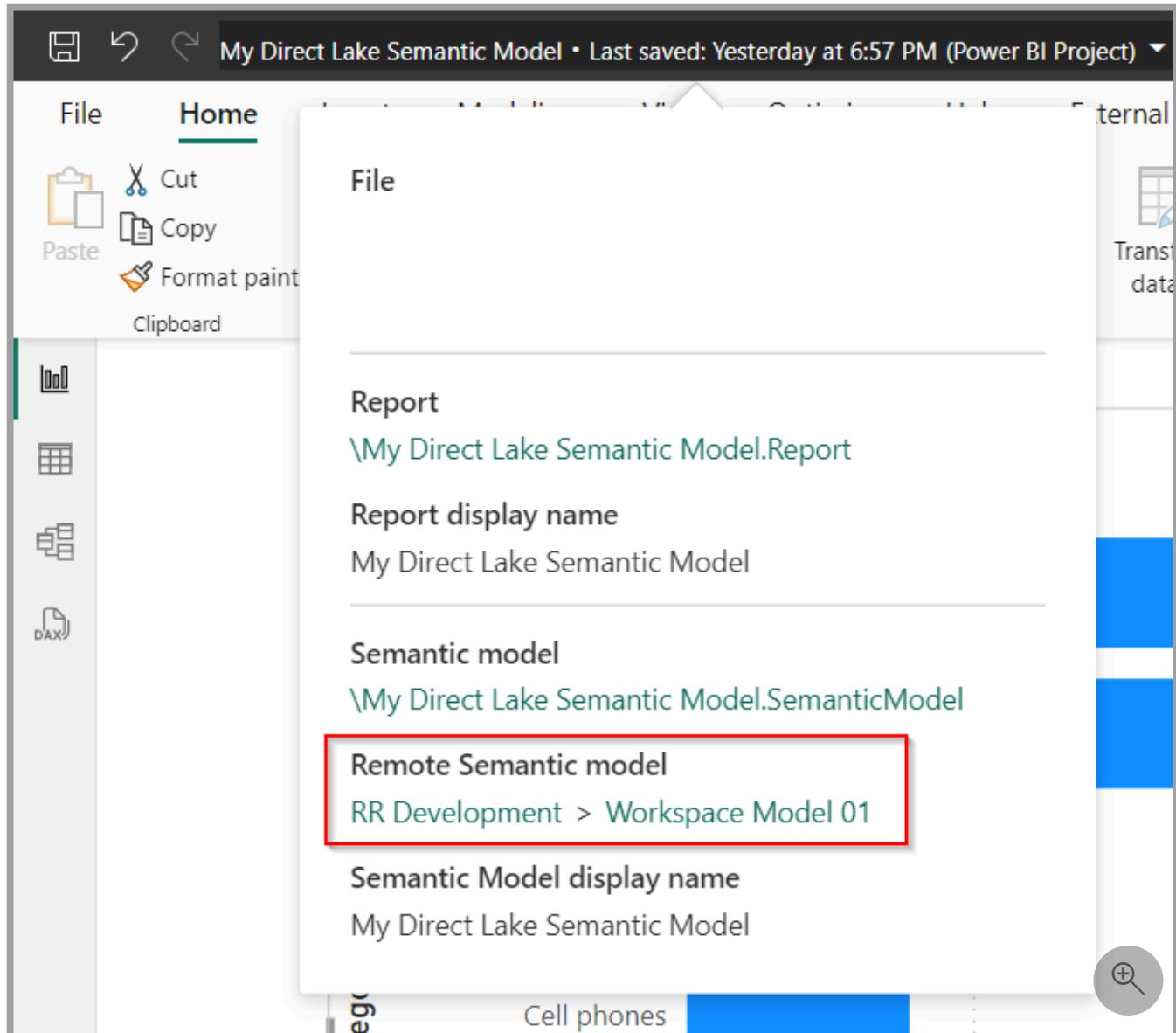
If you select an existent semantic model and the definition differs, Power BI Desktop warns you before overwriting, as shown in the following image.



(!) Note

You can select the same semantic model you exported the PBIP from. However, the best practice when working with a PBIP that requires a remote semantic model is for each developer to work on their own private remote semantic model to avoid conflicts with changes from other developers.

Selecting the title bar displays both the PBIP file location and the remote semantic model living in a Fabric workspace, shown in the following image.



A local setting will be saved in the Power BI Project files with the configured semantic model, next time you open the PBIP, you won't see the prompt, and Fabric semantic model will be overwritten with the metadata from the semantic model in the Power BI Project files.

Change remote semantic model

During the **preview**, if you wish to switch the remote semantic model in the PBIP you must navigate to the `*.SemanticModel\pbi\localSettings.json` file. There, you can either modify the `remoteModelingObjectId` property to the ID of the semantic model you want to connect to, or remove the property altogether. Upon reopening the PBIP, Power BI Desktop connects to the new semantic model or prompts you to create or select an existing semantic model.



```
1 {  
2     "version": "1.1",  
3     "userConsent": {},  
4     "securityBindingsSignature": "AQAAANCMnd8BFdERjHoAwE/C1+sBAAAATUA1tOek  
5     "remoteModelingObjectId": "aaaaaaaa-0000-1111-bbbbbbbbbbbb"  
6 }
```

A screenshot of a code editor showing a JSON configuration file. The file contains several properties: 'version' set to '1.1', 'userConsent' as an empty object {}, 'securityBindingsSignature' as a long base64 string, and 'remoteModelingObjectId' set to a GUID value 'aaaaaaaa-0000-1111-bbbbbbbbbbbb'. The 'remoteModelingObjectId' line is highlighted with a red rectangular box. In the top right corner of the code editor window, there is a small circular icon with a magnifying glass symbol.

 **Note**

The configuration described in this section is intended solely for local development and should not be used for deployment across different environments.

Related

- [Power BI Project \(PBIP\)](#)

Direct Lake in web modeling

09/25/2025

Open data model, or web modeling, works with semantic models with Direct Lake tables. Direct Lake tables can be **Direct Lake on SQL** or **Direct Lake on OneLake**, which have different considerations when creating and editing in the web.

 Expand table

Scenario	Direct Lake on OneLake	Direct Lake on SQL
Creating in the web	<ul style="list-style-type: none">Select Create in the left navigation, then OneLake catalog.Select New semantic model from Lakehouse.Select OneLake catalog from web modeling.Select New item from a workspace and choosing Semantic model, then OneLake catalog	Select New semantic model from SQL analytics endpoints or Warehouses.
Editing in the web	Select Open data model from the semantic model details page or context menu.	Select Open data model from the semantic model details page or context menu.

Edit in Desktop is available when web modeling to continue [live editing any Direct Lake semantic model in Power BI Desktop](#).

Create a semantic model with Direct Lake tables

To create a semantic model with **Direct Lake on OneLake tables**, take the following steps.

1. Select **Create** from the left navigation bar, then select **OneLake catalog** and choose a Fabric item. Alternatively, open the Lakehouse and select **New semantic model**.
2. Give your semantic model a name, pick a Fabric workspace for it, and select the tables to include. Then press **OK**.

The semantic model is created and now you're live editing the modeling in the browser.

To create a semantic model with **Direct Lake on SQL tables**, take the following steps.

1. Open the SQL analytics endpoint or warehouse, go to **Reporting** and then select **New semantic model**.

2. Give your semantic model a name, pick a Fabric workspace for it, and select the tables to include. Then press **OK**.

The semantic model is created and now you're live editing the modeling in the browser.

! Note

Check your pop-up blocker if web modeling doesn't appear after clicking OK.

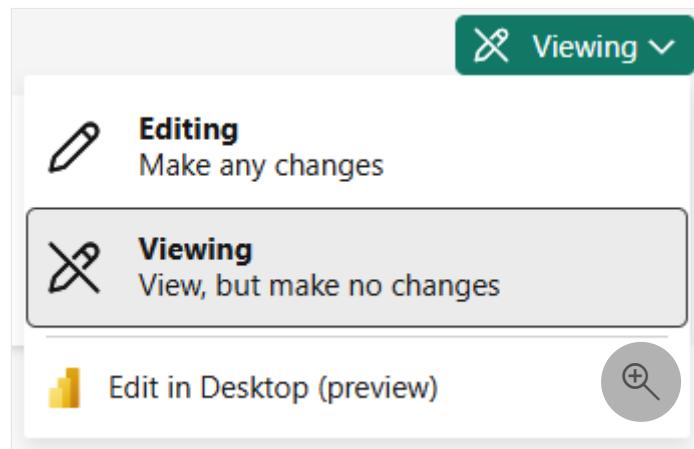
The differences between Direct Lake on OneLake and Direct Lake on SQL are explained in the [Overview](#).

Edit a semantic model in Direct Lake mode

To edit a semantic model with Direct Lake tables later, take the following steps.

1. Navigate to the semantic model in the Fabric Portal. [Home](#), [OneLake catalog](#), and [search](#) at the top of the page are available to help you find it.
2. Select the semantic model to open the details page, or use the context-menu, then select [Open data model](#).

Now you're live editing the semantic model in the web. The model opens by default in **viewing mode** to avoid accidental edits. Change to **editing mode** in the top right-hand corner of the window. [Edit in Desktop](#) is also available to change to [live edit in Power BI Desktop](#).



Composite semantic models with Direct Lake and import storage mode tables

A composite semantic model has tables in different storage modes. Direct Lake on OneLake table storage mode already could mix tables from other Fabric data sources, such as lakehouses, warehouses, SQL databases in Fabric, and mirrored databases. And with this

update, now that flexibility is extended much further with the ability to add in import tables from any data source, from 100s of connectors in Power Query online.

Import tables can be added an existing semantic model with Direct Lake on OneLake tables. Edit the semantic model in Power BI web modeling and choose **Get data** or **Transform data** from the ribbon.

Note

If you haven't set up a credential for this data source before you may be prompted to do that in the Power Query online experience. After that, if the load data fails on saving the transformations, go to the schedule refresh page of the semantic model and set the credentials there as well before returning to web modeling and refreshing.

Direct Lake on OneLake tables can be added to an existing semantic model with import storage mode tables too. Edit the semantic model in Power BI web modeling and choose **OneLake catalog** from the ribbon.

Related content

- [Edit data models in the Power BI service](#)
- [Composite semantic models in Power BI](#)

Edit tables for Direct Lake semantic models

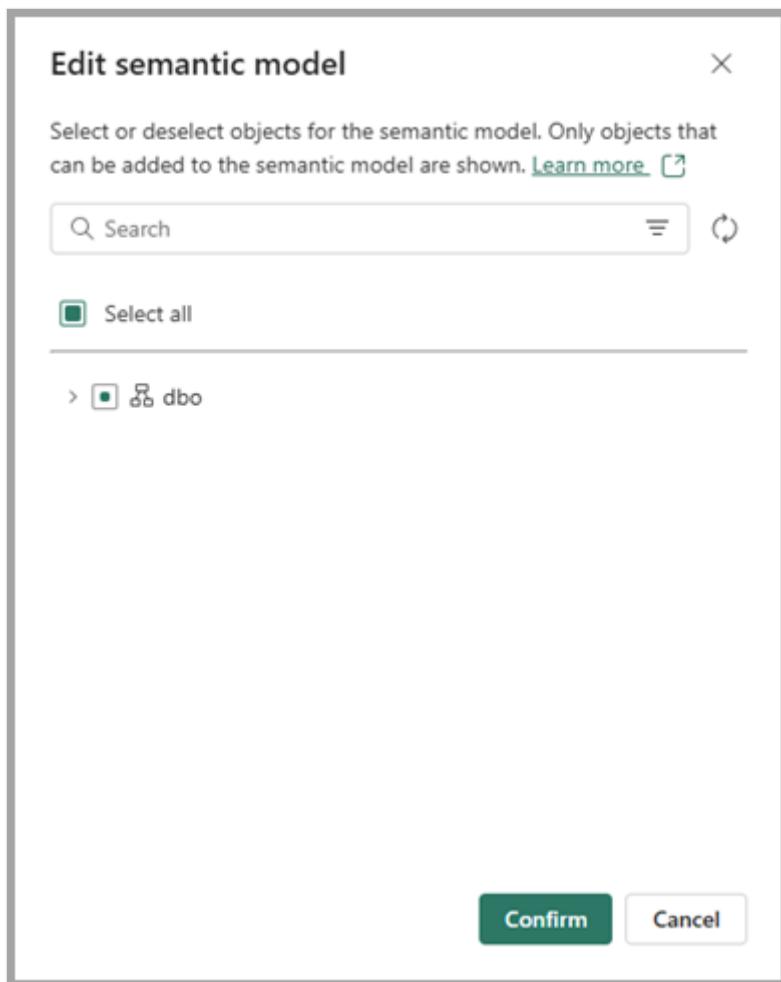
09/22/2025

Semantic models in Direct Lake mode's tables come from Microsoft Fabric and OneLake data. Instead of the **transform data** experience of Power BI import and DirectQuery, Direct Lake mode uses the **Edit tables** experience, allowing you to decide which Direct Lake tables you want the semantic model to use.

Use and features of Edit tables

The purpose of **Edit tables** is to add or remove tables in the semantic model in Direct Lake mode. Such tables reside in a single Fabric item that writes data to the OneLake, such as a Lakehouse or Warehouse.

The following image shows the Edit tables initial dialog:



The Edit tables dialog has the following sections:

- **Title** displays whether you're editing or creating.
- **Information** text and **learn more** link to the Direct Lake documentation.

- **Workspace** and **Fabric item** links to view the source of the tables in the web. Not available in all scenarios.
- **Search** to find the specific table or view from the data source.
- **Filter** to limit the schema or object type (table or view) that is displayed.
- **Reload** to sync the SQL analytics endpoint of a Lakehouse or a warehouse (requires write permission on the Lakehouse or warehouse). Not available in all scenarios.
- **Tree view** organizes the available tables or views:
 - Schema name
 - Object type (table or view)
 - Table or view name
- **Check boxes** allow you to select or unselect tables or views to use in the semantic model.
- **Confirm or Cancel** button let you decide whether to make the change to the semantic model.

In the semantic model, tables and columns can be renamed to support reporting expectations. Edit tables still show the data source table names, and schema sync doesn't impact the semantic model renames.

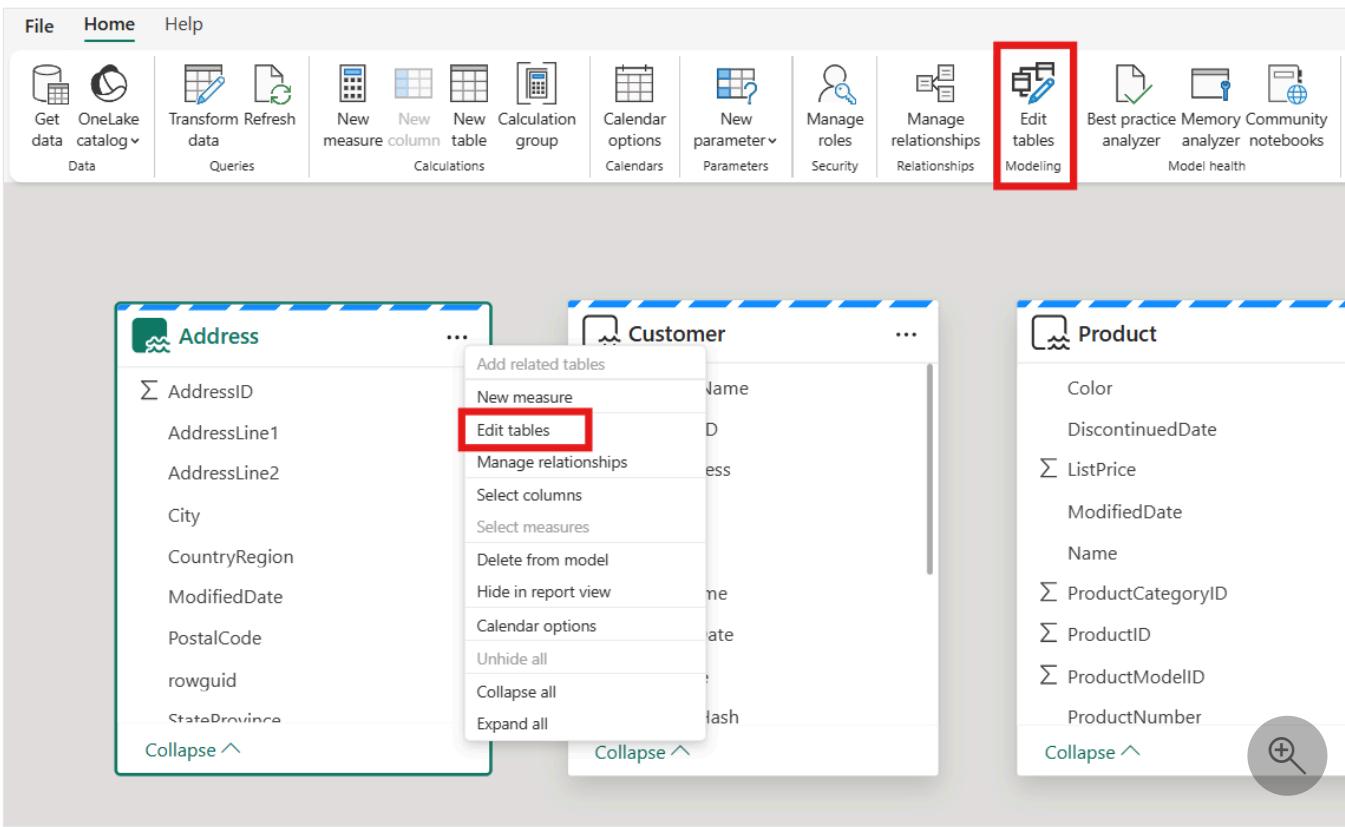
In the Lakehouse, tables and views can also be renamed. If the upstream data source renames a table or column after it has been added to the semantic model, the semantic model will still reference the previous name. Consequently, the table will be removed from the model during the schema sync. The table with the new name shows in the **Edit tables** dialog as unchecked, and must be explicitly checked and added again to the semantic model. Measures can be moved to the new table, but relationships and column property updates need to be reapplied to the table.

Entry points

The following sections describe the multiple ways to get to **Edit tables**.

Editing a semantic model with Direct Lake tables in web modeling

When you're editing a semantic model in the browser, there's a ribbon button to launch **Edit tables**. Alternatively, select the context menu of a table and choose **Edit tables**, as shown in the following image.

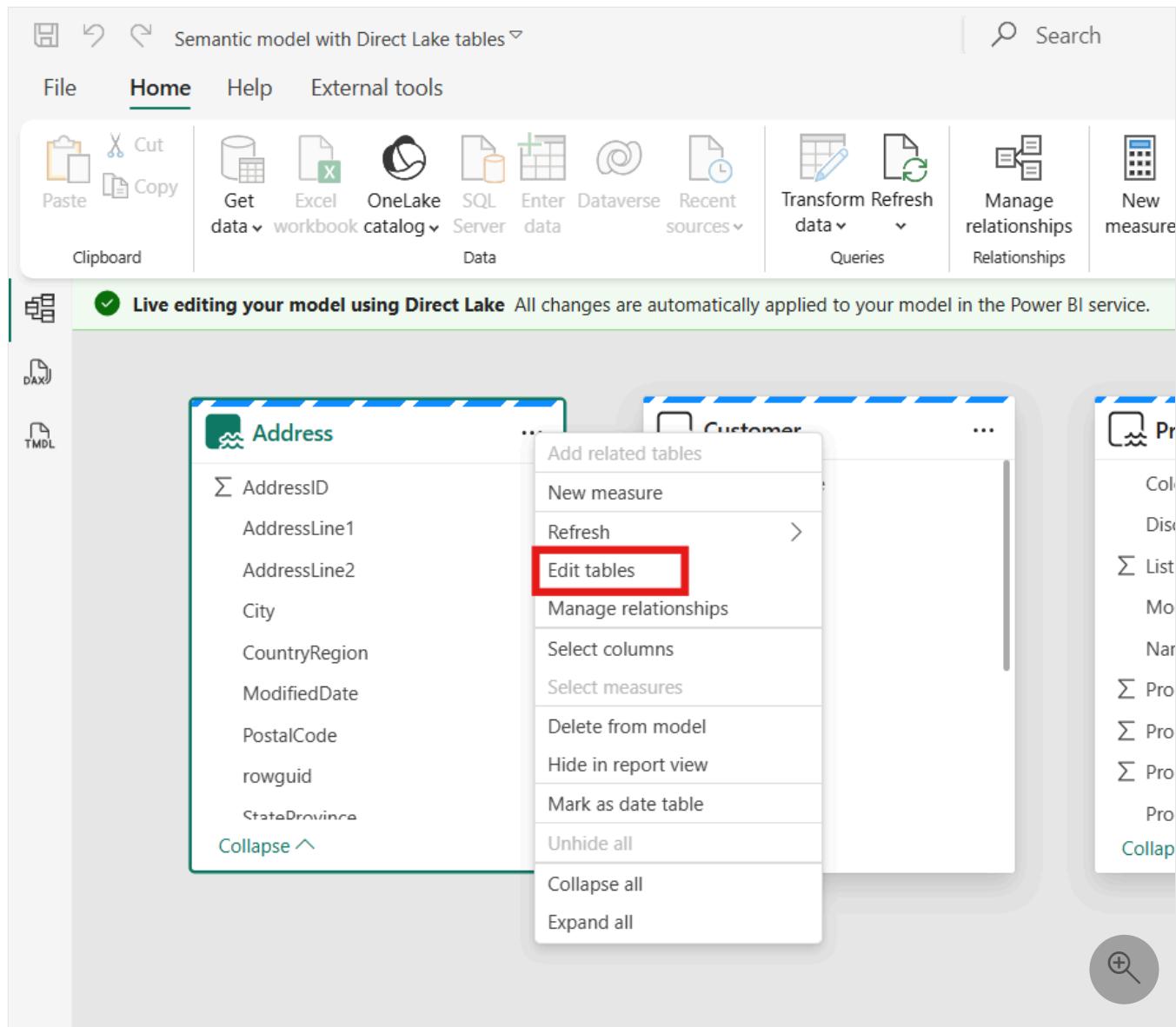


! Note

If the **Edit tables** button is disabled, try selecting a single table.

Live editing as semantic model with Direct Lake tables in Power BI Desktop

Select the context menu of a table and choose **Edit tables**, as shown in the following image.



Edit tables dialog

Selecting **Edit tables** launches the dialog, as shown in the following image.

Edit Tables

X

Select or deselect tables for the semantic model.

Search ≡

Select all

▼  SalesLT

-  Address
-  Customer
-  Product
-  ProductCategory
-  ProductDescription
-  ProductModel
-  SalesOrderDetail
-  SalesOrderHeader

>  dbo

OK Cancel 

You can perform many actions that impact the tables in the semantic model:

- Selecting the **Confirm** button with no changes initiates a schema sync. Any table changes in the data source, such as an added or removed column, are applied to the semantic model.
- Selecting the **Cancel** button returns to editing the model without applying any updates.
- **Selecting** tables or views previously unselected adds the selected items to the semantic model.
- **Unselecting** tables or views previously selected removes them from the semantic model.

Tables with measures can be unselected but remain in model view showing measures only without any data columns. The measures can be either deleted or moved to a different table. When all measures are moved or deleted, go back to Edit tables and click Confirm to no longer show the empty table in the model.

Creating a new semantic model

A dialog shows how to pick Direct Lake tables when creating a new semantic model from **OneLake catalog** in web create page and in Power BI Desktop.

When creating a semantic model, you must specify two properties:

- **Direct Lake semantic model:** The name of the semantic model in the workspace, which can be changed later. If the semantic model with the same name already exists in the workspace, a number is automatically appended to the end of the model name.
- **Workspace:** The workspace where the semantic model is saved. By default the workspace you're currently working in is selected, but you can change it to another Fabric workspace.

The following image shows the dialog when creating a new semantic model.

← Choose tables from OneLake

X

Direct Lake semantic model name *

A semantic model will be created in the chosen workspace with the selected tables in Direct Lake storage mode. You can then live edit the semantic model. [Learn more](#) ↗

Semantic model with Direct Lake tables

Workspace

Only workspaces in a Fabric capacity are shown.



Fabric and Power BI



Select or deselect tables for the semantic model.

Q Search



Select all

▼ SalesLT

Address

Customer

Confirm

Cancel



Create and edit relationships between tables

In other storage modes, there are data previews and relationship validation to populate the cardinality and cross-filter direction based on column profiling queries automatically. Direct Lake tables don't run queries to show data previews. Many to one (*:1) cardinality is determined based on table row count DAX queries. The table with more rows is considered as the many side. Single cross-filter direction is always pre-populated. These properties may need to be changed manually to reflect the relationship correctly.

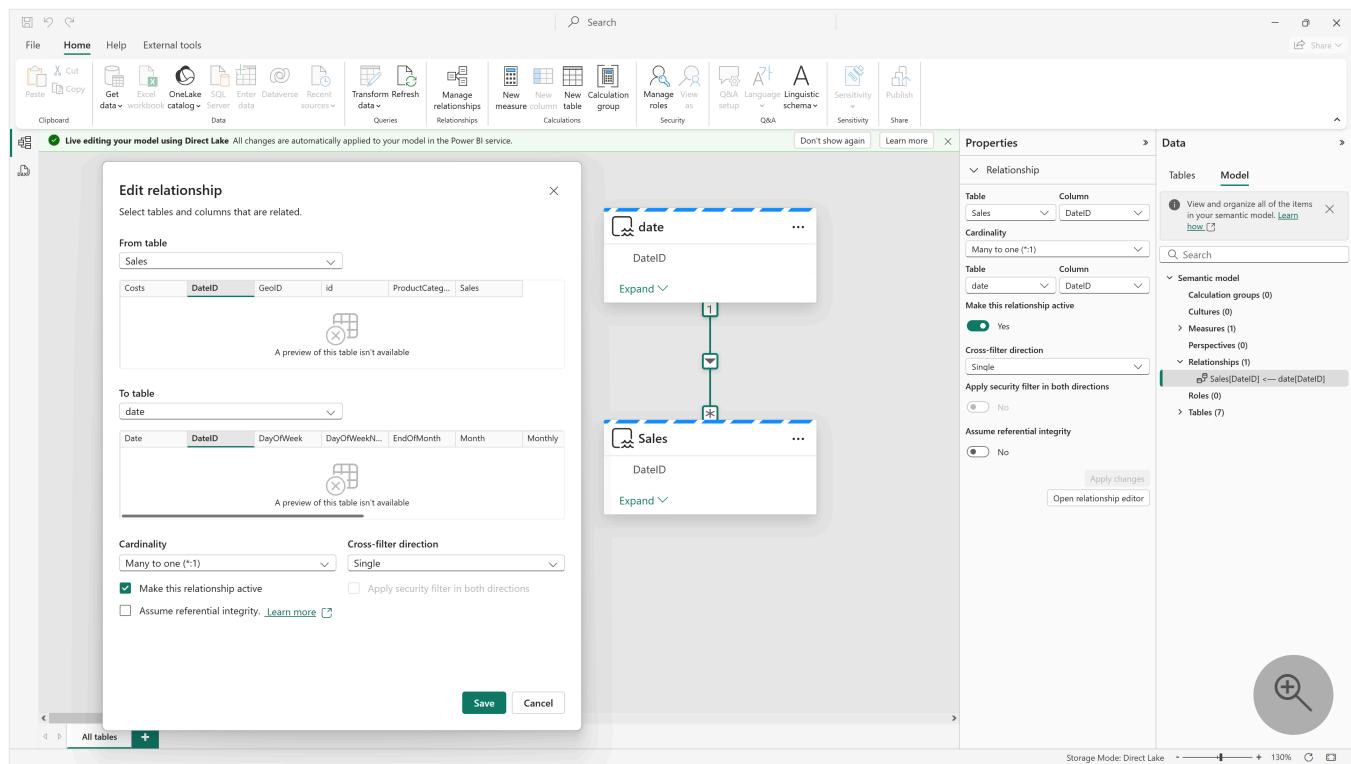
To further validate your relationship properties, run a DAX query in **DAX query view** or create a visual in **Report view** using these two tables together.

Refer to the [create relationships in Power BI](#) article for more information about table relationships.

Create new relationships

Now you have tables in your semantic model you can create relationships between them. Row counts are used to help determine the cardinality. There are many ways to create the relationship.

- In the **Model** view, dragging a column from one table to a column in another table opens the **Relationship editor** or **Properties** pane with the columns pre-selected.
- Selecting **Manage relationships** from the ribbon gives you the option to create a **New relationship** without any pre-selections in the editor.
- Using the context menu on the **Data** pane **Model Explorer's Relationships** node to pick **New relationship** gives you the option to create a relationship without any pre-selections in the **Properties** pane.



Edit existing relationships

To edit an existing relationship, select any created relationship line in the diagram view to show the relationship in the **Properties** pane, and double-clicking opens the **relationship editor**.

Limitations

- Tables in Direct Lake storage mode don't show data previews in the relationship dialog.
- Tables in Direct Lake storage mode don't have relationship validation for cardinality and cross-filter direction.

Related content

- [Direct Lake overview](#)
- [Create a lakehouse for Direct Lake](#)
- [Analyze query processing for Direct Lake semantic models](#)

Create a lakehouse for Direct Lake

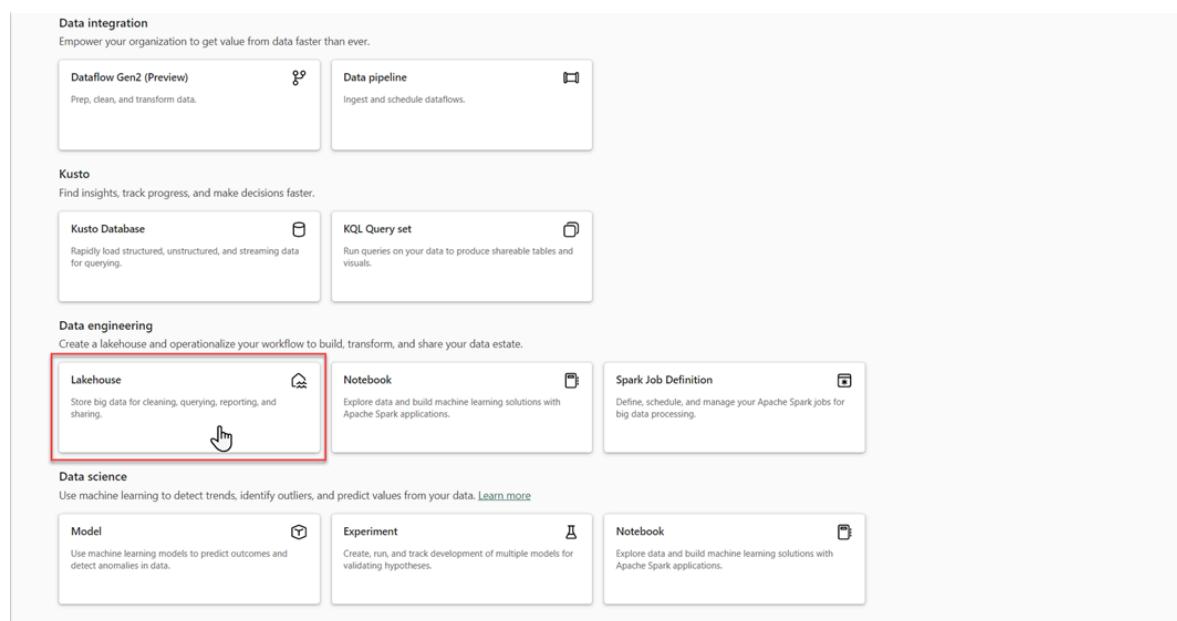
Article • 01/26/2025

This article describes how to create a lakehouse, create a Delta table in the lakehouse, and then create a basic semantic model for the lakehouse in a Microsoft Fabric workspace.

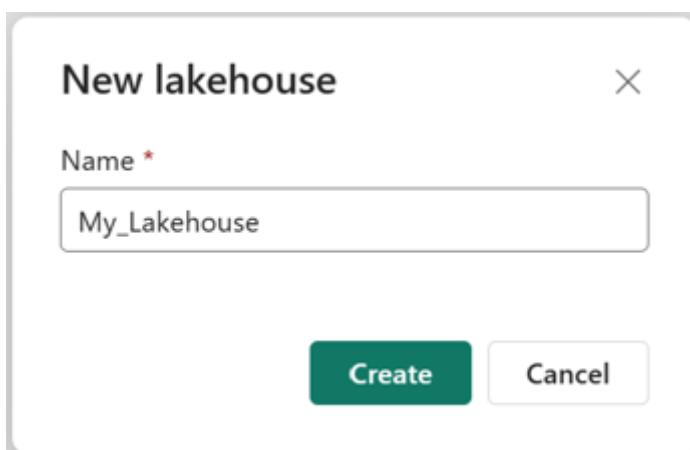
Before getting started creating a lakehouse for Direct Lake, be sure to read [Direct Lake overview](#).

Create a lakehouse

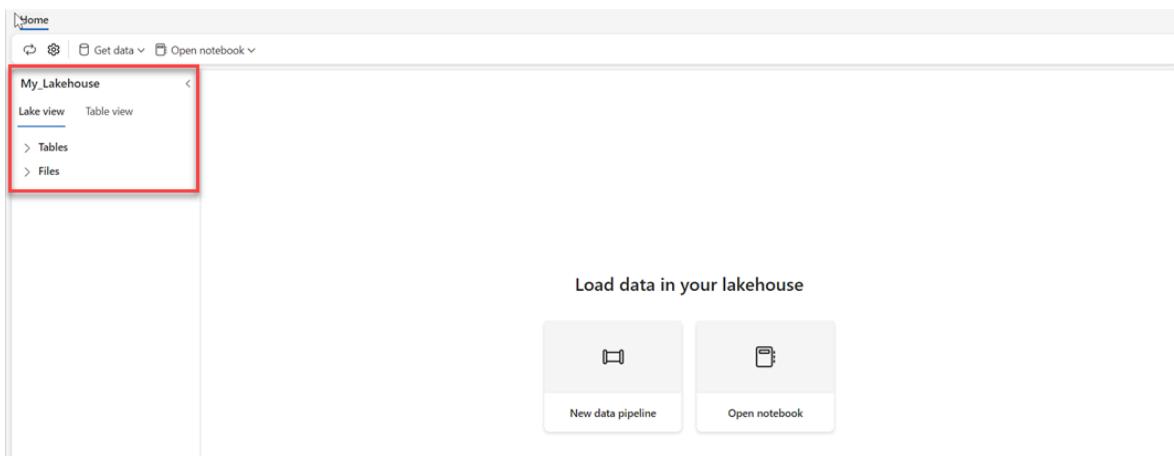
1. In your Microsoft Fabric workspace, select **New > More options**, and then in **Data Engineering**, select the **Lakehouse** tile.



2. In the **New lakehouse** dialog box, enter a name, and then select **Create**. The name can only contain alphanumeric characters and underscores.



3. Verify the new lakehouse is created and opens successfully.

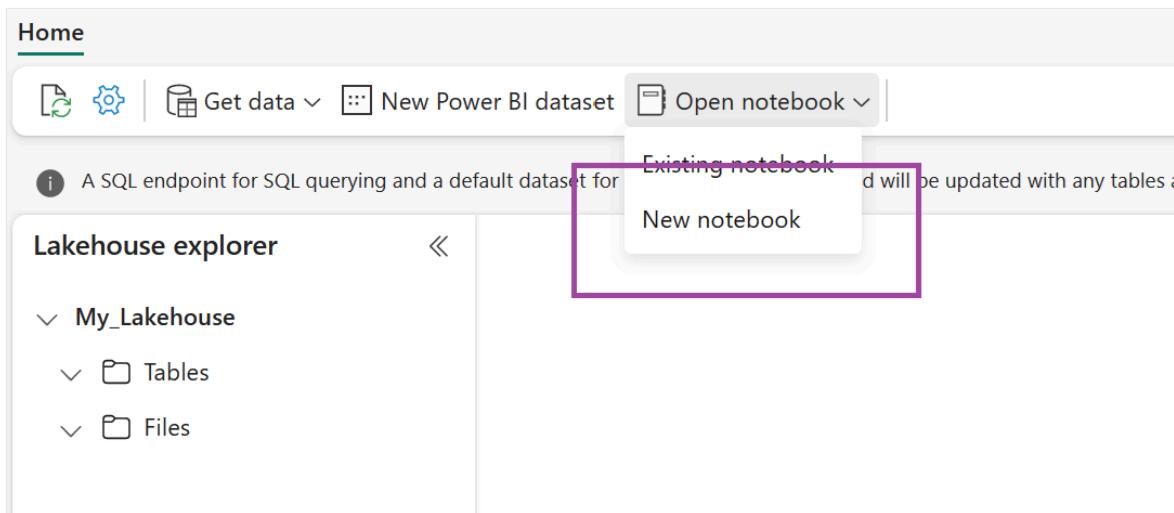


Create a Delta table in the lakehouse

After creating a new lakehouse, you must then create at least one Delta table so Direct Lake can access some data. Direct Lake can read parquet-formatted files, but for the best performance, it's best to compress the data by using the VORDER compression method. VORDER compresses the data using the Power BI engine's native compression algorithm. This way the engine can load the data into memory as quickly as possible.

There are multiple options to load data into a lakehouse, including data pipelines and scripts. The following steps use PySpark to add a Delta table to a lakehouse based on an [Azure Open Dataset](#):

1. In the newly created lakehouse, select **Open notebook**, and then select **New notebook**.



2. Copy and paste the following code snippet into the first code cell to let SPARK access the open model, and then press **Shift + Enter** to run the code.

Python

```

# Azure storage access info
blob_account_name = "azureopendatastorage"
blob_container_name = "holidaydatacontainer"
blob_relative_path = "Processed"
blob_sas_token = r""

# Allow SPARK to read from Blob remotely
wasbs_path = 'wasbs://%s@%s.blob.core.windows.net/%s' %
(blob_container_name, blob_account_name, blob_relative_path)
spark.conf.set(
    'fs.azure.sas.%s.%s.blob.core.windows.net' % (blob_container_name,
    blob_account_name),
    blob_sas_token)
print('Remote blob path: ' + wasbs_path)

```

3. Verify the code successfully outputs a remote blob path.

The screenshot shows the Azure Synapse Studio interface. On the left, there's a 'Lakehouse explorer' sidebar with a 'My_Lakehouse' section containing 'Tables' and 'Files'. The main area is a code editor with a PySpark (Python) language dropdown. The code cell contains the provided Python script. The output cell [1] shows the execution log: '16 sec - Apache Spark session started in 14 sec 67 ms. Command executed in 1 sec 915 ms by Kay Unkroth on 11:35:28 AM, 4/19/23'. Below the log, the output '... Remote blob path: wasbs://holidaydatacontainer@azureopendatastorage.blob.core.windows.net/Processed' is highlighted with a purple box.

```

1 # Azure storage access info
2 blob_account_name = "azureopendatastorage"
3 blob_container_name = "holidaydatacontainer"
4 blob_relative_path = "Processed"
5 blob_sas_token = r""

6
7 # Allow SPARK to read from Blob remotely
8 wasbs_path = 'wasbs://%s@%s.blob.core.windows.net/%s' % (blob_container_name, blob_account_name, blob_relative_path)
9 spark.conf.set(
10     'fs.azure.sas.%s.%s.blob.core.windows.net' % (blob_container_name,
11     blob_account_name),
12     blob_sas_token)
13
14
[1] ✓ 16 sec - Apache Spark session started in 14 sec 67 ms. Command executed in 1 sec 915 ms by Kay Unkroth on 11:35:28 AM, 4/19/23
... Remote blob path: wasbs://holidaydatacontainer@azureopendatastorage.blob.core.windows.net/Processed
+ Code + Markdown

```

4. Copy and paste the following code into the next cell, and then press Shift + Enter.

The screenshot shows the Azure Synapse Studio interface with a Python notebook cell. The cell has a 'Python' language dropdown. The code in the cell reads:

```

# Read Parquet file into a DataFrame.
df = spark.read.parquet(wasbs_path)
print(df.printSchema())

```

5. Verify the code successfully outputs the DataFrame schema.

```

1 # Azure storage access info
2 blob_account_name = "azuredatapocstorage"
3 blob_container_name = "holidaydatacontainer"
4 blob_relative_path = "Processed"
5 blob_sas_token = r""
6
7 # Allow SPARK to read from Blob remotely
8 wasbs_path = "wasbs://{}@{}.blob.core.windows.net/{}".format(blob_container_name, blob_account_name, blob_relative_path)
9 spark.conf.set(
10     'fs.azure.sas.{}.blob.core.windows.net'.format(blob_container_name, blob_account_name),
11     blob_sas_token)
12 print("Remote blob path: " + wasbs_path)
13
14
[1] 16 sec - Apache Spark session started in 14 sec 67 ms. Command executed in 1 sec 915 ms by Kay Unkroth on 11:35:28 AM, 4/19/23
Remote blob path: wasbs://holidaydatacontainer@azuredatapocstorage.blob.core.windows.net/Processed

```



```

1 # Read Parquet file into a DataFrame.
2 df = spark.read.parquet(wasbs_path)
3 print(df.printSchema())
4
5
[2] 2 sec - Command executed in 1 sec 733 ms by Kay Unkroth on 11:38:58 AM, 4/19/23
> !!! Spark jobs (1 of 1 succeeded)
... root
|-- countryOrRegion: string (nullable = true)
|-- holidayName: string (nullable = true)
|-- normalizeHolidayName: string (nullable = true)
|-- isPaidTimeOff: boolean (nullable = true)
|-- countryRegionCode: string (nullable = true)
|-- date: timestamp (nullable = true)
None

```

6. Copy and paste the following lines into the next cell, and then press **Shift + Enter**. The first instruction enables the VORDER compression method, and the next instruction saves the DataFrame as a Delta table in the lakehouse.

```

# Save as delta table
spark.conf.set("spark.sql.parquet.vorder.enabled", "true")
df.write.format("delta").saveAsTable("holidays")

```

7. Verify all SPARK jobs complete successfully. Expand the SPARK jobs list to view more details.

ID	Description	Status	Stages	Tasks	Duration	Rows	Data read	Data written
Job 2	\$anon\$fun\$RecordDeltaOperation\$5 at SynapseLoggingShim.scala:86	Succeeded	1/1	1/1 succeeded	13 sec	139114	323.91 KB	230.86 KB
Job 3	\$anon\$fun\$RecordDeltaOperation\$5 at SynapseLoggingShim.scala:86	Succeeded	1/1	1/1 succeeded	1 sec	8	1.92 KB	1.63 KB
Job 4	\$anon\$fun\$RecordDeltaOperation\$5 at SynapseLoggingShim.scala:86	Succeeded	1/0	50/50 succeeded	6 sec	54	1.63 KB	4.3 KB
Job 5	\$anon\$fun\$RecordDeltaOperation\$5 at SynapseLoggingShim.scala:86	Succeeded	1/-1	1/1 succeeded	< 1 ms	50	4.3 KB	0 B

8. To verify a table has been created successfully, in the upper left area, next to **Tables**, select the ellipsis (...), then select **Refresh**, and then expand the **Tables** node.

9. Using either the same method as above or other supported methods, add more Delta tables for the data you want to analyze.

Create a basic Direct Lake model for your lakehouse

1. In your lakehouse, select **New semantic model**, and then in the dialog, select tables to be included.

2. Select **Confirm** to generate the Direct Lake model. The model is automatically saved in the workspace based on the name of your lakehouse, and then opens the model.

The screenshot shows the 'Details for My_Lakehouse (1)' card in the workspace. It includes sections for 'Add description', 'Location' (SeeThroughTest), 'Refreshed' (4/19/23, 12:00:13 PM), 'Visualize this data' (Create an interactive report, or a table, to discover and share business insights), and 'Share this data' (Give people access to the dataset and set their permissions to work with it). Below this is a table listing datasets, with 'My_Lakehouse' selected. On the right, there's a 'Tables' pane with a list of tables: customer, holidays, inventory, product, and sales. A tooltip for the 'Tables' pane says: 'To select more than one table, and view summarized data, create a paginated report.'

3. Select **Open data model** to open the Web modeling experience where you can add table relationships and DAX measures.

The screenshot shows the Power BI Web Modeling Experience interface. The top navigation bar includes Home, Help, New measure, New column, New table, Manage roles, Security, and Reporting. The main area displays a data model diagram with entities like 'product', 'business', 'segment', 'customer', and 'sales'. Relationships are shown as lines connecting the entities. The 'Properties' pane on the right shows settings for cards, such as 'Show related fields when card is collapsed' (Yes) and 'Pin related fields to top of card' (No). The 'Fields' pane lists fields from various tables: business, pricing_level, product, sales, and segment. At the bottom, there's a toolbar with 'All tables' and a '+' button.

When you're finished adding relationships and DAX measures, you can then create reports, build a composite model, and query the model through XMLA endpoints in much the same way as any other model.

Related content

- [Specify a fixed identity for a Direct Lake model](#)
- [Direct Lake overview](#)
- [Analyze query processing for Direct Lake semantic models](#)

Feedback

Was this page helpful?

 Yes

 No

[Provide product feedback ↗](#) | [Ask the community ↗](#)

Develop Direct Lake semantic models

07/25/2025

This article describes design topics relevant to developing Direct Lake semantic models.

Create the model

You can create a Direct Lake semantic model in [Power BI Desktop](#) or from many Fabric items in the browser. For example, from an open Lakehouse you can choose **New semantic model** to create a new semantic model in Direct Lake storage mode.

You can use either [Power BI Desktop](#) or [web modeling](#) in the browser to edit the semantic model to add relationships, rename fields, add measures, and other semantic modeling tasks.

Alternatively, as with any Power BI semantic model, you can continue the development of your model by using an XMLA-compliant tool, like SQL Server Management Studio (SSMS) (version 19.1 or later) or open-source, community tools. For more information, see [Model write support with the XMLA endpoint](#) later in this article. Fabric notebooks can also programmatically create and edit semantic models with semantic link and semantic link labs.

💡 Tip

You can learn how to create a lakehouse, a Delta table, and a basic Direct Lake semantic model by completing [this tutorial](#).

Model tables

Model tables are based on either a table or a view of the SQL analytics endpoint. However, avoid using views whenever possible. Queries to a model table based on a view [fall back to DirectQuery mode](#), which may result in slower query performance.

⚠️ Warning

Views can only be used in Direct Lake on SQL, and not available to be used in Direct Lake on OneLake.

Tables should include columns for filtering, grouping, sorting, and summarizing, in addition to columns that support model relationships. Unnecessary columns don't affect semantic model

query performance because they don't load into memory, but they result in a larger storage size in OneLake and need more compute resources to load and maintain.

Warning

Using columns that apply [dynamic data masking \(DDM\)](#) in Direct Lake semantic models is not supported.

Import tables can be added to semantic models with Direct Lake on OneLake tables. Calculated tables can be added as long as they do not reference a Direct Lake table. Calculation groups can be added.

To learn how to select which tables to include in your Direct Lake semantic model, see [Edit tables for Direct Lake semantic models](#).

For more information about columns to include in your semantic model tables, see [Understand Direct Lake query performance](#).

Enforce data-access rules

When you have requirements to deliver subsets of model data to different users, you can enforce data-access rules. You enforce rules by setting up object-level security (OLS) and/or row-level security (RLS) in the [SQL analytics endpoint](#) or in the semantic model.

Note

The topic of *enforcing data-access rules* is different, yet related, to *setting permissions* for content consumers, creators, and users who manage the semantic model (and related Fabric items). For more information about setting permissions, see [Manage Direct Lake semantic models](#).

Object-level security (OLS)

OLS involves restricting access to discover and query objects or columns. For example, you might use OLS to limit the users who can access the `Salary` column from the `Employee` table.

For a SQL analytics endpoint, you can set up OLS to [control access to the endpoint objects](#), such as tables or views, and column-level security (CLS) to [control access to endpoint table columns](#).

For a semantic model, you can set up OLS to [control access to model tables or columns](#). You need to use open-source, community tools like Tabular Editor to set up OLS.

Row-level security (RLS)

RLS involves restricting access to subsets of data in tables. For example, you might use RLS to ensure that salespeople can only access sales data for customers in their sales region.

For a SQL analytics endpoint, you can set up RLS to [control access to rows in an endpoint table](#).

 **Important**

When a query uses any table that has RLS in the SQL analytics endpoint, it falls back to DirectQuery mode. Query performance might be slower.

For a semantic model, you can set up RLS to [control access to rows in model tables](#). RLS can be set up in the [web modeling experience](#) or by using a third-party tool.

How queries are evaluated

The [reason to develop Direct Lake semantic models](#) is to achieve high performance queries over large volumes of data in OneLake. Therefore, you should strive to design a solution that maximizes the chances of in-memory querying.

The following steps approximate how queries are evaluated (and whether they fail). The benefits of Direct Lake storage mode are only possible when the fifth step is achieved.

1. If the query contains any table or column that's restricted by semantic model OLS, an error result is returned (report visuals fail to render).
2. If the query contains any column that's restricted by SQL analytics endpoint CLS (or the table is denied), an error result is returned (report visuals fail to render).
 - a. If the cloud connection uses SSO (default), CLS is determined by the access level of the report consumer.
 - b. If the cloud connection uses a fixed identity, CLS is determined by the access level of the fixed identity.
3. If the query contains any table in the SQL analytics endpoint that enforces RLS or a view is used, the query falls back to DirectQuery mode.
 - a. If the cloud connection uses SSO (default), RLS is determined by the access level of the report consumer.
 - b. If the cloud connection uses a fixed identity, RLS is determined by the access level of the fixed identity.

4. If the query [exceeds the guardrails of the capacity](#), it falls back to DirectQuery mode.
5. Otherwise, the query is satisfied from the in-memory cache. Column data is [loaded into memory](#) as and when it's required.

Source item permissions

The account used to access data is one of the following.

- If the cloud connection uses SSO (default), it is the report consumer.
- If the cloud connection uses a fixed identity, it is the fixed identity.

The account must at least have *Read* and *ReadData* permissions on the source item (lakehouse or warehouse). Item permissions can be inherited from workspace roles or assigned explicitly for the item as described in [this article](#).

Assuming this requirement is met, Fabric grants the necessary access to the semantic model to read the Delta tables and associated Parquet files (to load column data into memory) and data-access rules can be applied.

Data-access rule options

You can set up data-access rules in:

- The semantic model only.
- The SQL analytics endpoint only.
- In both the semantic model and the SQL analytics endpoint.

Rules in the semantic model

If you must enforce data-access rules, you should do so in the semantic model whenever viable. That's because RLS enforced by the semantic model is achieved by filtering the in-memory cache of data to achieve high performance queries.

It's also a suitable approach when report consumers aren't granted permission to query the lakehouse or warehouse.

In either case, it's strongly recommended that the cloud connection uses a fixed identity instead of SSO. SSO would imply that end users can access the SQL analytics endpoint directly and might therefore bypass security rules in the semantic model.



Important

Semantic model item permissions can be [set explicitly](#) via [Power BI apps](#), or [acquired implicitly](#) via workspace roles.

Notably, semantic model data-access rules are not enforced for users who have *Write* permission on the semantic model. Conversely, data-access rules do apply to users who are assigned to the *Viewer* workspace role. However, users assigned to the *Admin*, *Member*, or *Contributor* workspace role implicitly have *Write* permission on the semantic model and so data-access rules are not enforced. For more information, see [Roles in workspaces](#).

Rules in the SQL analytics endpoint

It's appropriate to enforce data-access rules in the SQL analytics endpoint when the semantic model [cloud connection](#) uses [single sign-on \(SSO\)](#). That's because the identity of the user is delegated to query the SQL analytics endpoint, ensuring that queries return only the data the user is allowed to access. It's also appropriate to enforce data-access rules at this level when users query the SQL analytics endpoint directly for other workloads (for example, to create a Power BI paginated report, or export data).

Notably, however, a semantic model query falls back to DirectQuery mode when it includes any table that enforces RLS in the SQL analytics endpoint. So, the semantic model might never cache data into memory to achieve high performance queries.

Rules at both layers

Data-access rules can be enforced at both layers. However, this approach involves extra complexity and management overhead. In this case, it's recommended that the cloud connection uses a fixed identity instead of SSO.

Comparison of data-access rule options

The following table compares data data-access setup options.

 [Expand table](#)

Apply data-access rules to	Comment
Semantic model only	Use this option when users aren't granted item permissions to query the lakehouse or warehouse. Set up the cloud connection to use a fixed identity. High query performance can be achieved from the in-memory cache.

Apply data-access rules to	Comment
SQL analytics endpoint only	Use this option when users need to access data from either the warehouse or the semantic model, and with consistent data-access rules. Ensure SSO is enabled for the cloud connection. Query performance might be slow.
Lakehouse or warehouse <i>and</i> semantic model	This option involves extra management overhead. Set up the cloud connection to use a fixed identity.

Recommended practices for enforcing data-access rules

Here are recommended practices related to enforcing data-access rules:

- If different users must be restricted to subsets of data, whenever viable, enforce RLS only at the semantic model layer. That way, users benefit from high performance in-memory queries. In this case, it's strongly recommended that the cloud connection uses a fixed identity instead of SSO.
- If possible, avoid enforcing OLS and CLS at either layer because it results in errors in report visuals. Errors can lead to confusion or concern for users. For summarizable columns, consider creating measures that return BLANK in certain conditions instead of CLS (if possible).

Model write support with the XMLA endpoint

Direct Lake semantic models support write operations with the XMLA endpoint by using tools such as SSMS (19.1 or later), and open-source, community tools.

💡 Tip

For more information about using third-party tools to develop, manage, or optimize semantic models, see the [advanced data model management](#) usage scenario.

Before you can perform write operations, the XMLA read-write option must be enabled for the capacity. For more information, see [Enable XMLA read-write](#).

Model write operations with the XMLA endpoint support:

- Customizing, merging, scripting, debugging, and testing Direct Lake model metadata.
- Source and version control, continuous integration and continuous deployment (CI/CD) with Azure DevOps and GitHub. For more information, see [Content lifecycle management](#).

- Automation tasks like semantic model refresh, and applying changes to Direct Lake semantic models by using PowerShell and the REST APIs.

When changing a semantic model using XMLA, you must update the *ChangedProperties* and *PBI_RemovedChildren* collection for the changed object to include any modified or removed properties. If you don't perform that update, Power BI modeling tools might overwrite any changes the next time the schema is synchronized with the Lakehouse.

Learn more about semantic model object lineage tags in the [lineage tags for Power BI semantic models](#) article.

 **Important**

Direct Lake tables created by using XMLA applications will initially be in an unprocessed state until the application sends a refresh command. Queries that involve unprocessed tables will always fall back to DirectQuery mode. So, when you create a new semantic model, be sure to refresh the model to process its tables.

For more information, see [Semantic model connectivity with the XMLA endpoint](#).

Direct Lake model metadata

When you connect to a Direct Lake semantic model with the XMLA endpoint, the metadata looks like that of any other model. However, Direct Lake models show the following differences:

- The `compatibilityLevel` property of the database object is 1604 (or higher).
- The mode property of Direct Lake partitions is set to `directLake`.
- Direct Lake partitions use shared expressions to define data sources. The expression points to the SQL analytics endpoint of the lakehouse or warehouse. Direct Lake uses the SQL analytics endpoint to discover schema and security information, but it loads the data directly from OneLake (unless it falls back to DirectQuery mode for any reason).

Post-publication tasks

After you publish a Direct Lake semantic model, you should complete some setup tasks. For more information, see [Manage Direct Lake semantic models](#).

Related content

- Direct Lake overview
- Manage Direct Lake semantic models
- Understand Direct Lake query performance
- Create a lakehouse for Direct Lake
- Edit tables for Direct Lake semantic models
- OneLake integration for semantic models

Integrate Direct Lake security

09/29/2025

Direct Lake security ensures that only authorized users can query Delta tables in OneLake. You can manage data access permissions through workspace roles. Workspace contributors, members, and admins can read data in OneLake. You can also grant access to the data in OneLake through item-level and compute permissions. The third option is to leverage OneLake security to enforce granular role-based security across all Fabric compute engines. This article explains how to align permission models, choose single sign-on (SSO) or fixed identities, and leverage object-level security (OLS) and row-level security (RLS). Learn more in [OneLake security overview](#).

Key concepts and terminology

This article assumes you're familiar with these concepts:

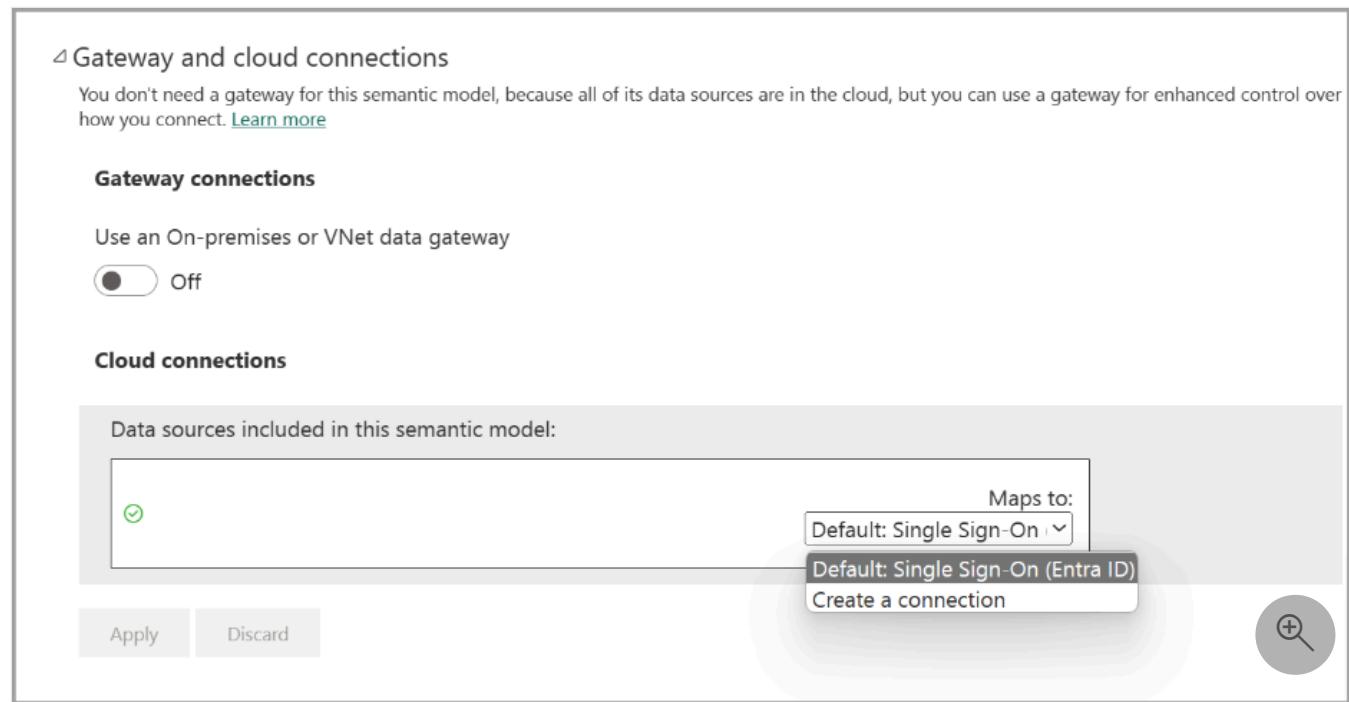
- Direct Lake uses shared M expressions in the semantic model metadata to reference data sources through Power Query data access functions: *AzureStorage.DataLake* for Direct Lake on OneLake and *Sql.Database* for Direct Lake on SQL endpoints. However, Direct Lake doesn't use these functions to read the source Delta tables. It reads the Delta tables directly through OneLake APIs.
- To ensure only authorized users query the data, Direct Lake checks the data access permissions of the effective identity. The effective identity depends on the data connection configuration. By default, Direct Lake uses SSO (Microsoft Entra ID) and uses the identity of the current user querying the semantic model. You can also bind a Direct Lake model to an explicit cloud connection to provide a fixed identity.
- If you grant data access permissions through workspace roles, only members of the Contributors role (or higher) can read data in OneLake. Workspace Viewers, however, don't have *read* permission in OneLake. Viewers and users who aren't members of a workspace role can get *read* access through a combination of item permissions, compute permissions, or OneLake security roles.
- OneLake security lets members of the Workspace Admin and Workspace Member roles define granular role-based security for users in the Viewer role. Specify the tables a Viewer or user with explicit *read* permission can access and exclude specific rows or columns. To learn more about OneLake security roles, see [Table security in OneLake](#), [Column-level security in OneLake](#), and [RLS in OneLake](#).

Connection configuration

Configure data connections for a Direct Lake model the same way as other semantic model types. See [Connect to cloud data sources in the Power BI service](#) for details.

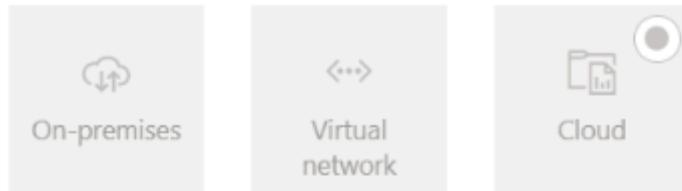
Because Direct Lake connects only to Fabric data sources, the default SSO (Microsoft Entra ID) configuration usually works, so you don't need to bind semantic models to explicit data connections. This approach reduces configuration complexity and lowers management overhead.

With SSO (Microsoft Entra ID), Direct Lake checks that the current user querying the semantic model has *read* access to the data. Only users with *read* access can query the data. The following screenshot shows a Direct Lake model using the default SSO configuration.



When you use an explicit data connection with a fixed identity instead of SSO, Direct Lake doesn't require every user to have *read* permission on the underlying data. If Microsoft Entra SSO remains disabled in the data connection, the fixed identity's permissions determine what data Direct Lake can access.

New connection



Connection name *

Connection for Direct Lake on OneLake

Connection type *

Azure Data Lake Storage Gen2



Server * (i)

Full path * (i)

Authentication

Authentication method *

OAuth 2.0



[Edit credentials](#)

Single sign-on



Use Entra ID SSO for DirectQuery and Direct Lake.



Create

Close



! Note

You can configure a data connection to use both SSO and a fixed identity. Direct Lake checks the current user's permissions at query time and uses the fixed identity for framing and transcoding at refresh time. To use a fixed identity for both queries and refreshes, make sure SSO is disabled in the data connection configuration.

Authentication requirements

Direct Lake models use Microsoft Entra ID authentication. In the data connection configuration, choose **OAuth 2.0, Service Principal, or Workspace Identity** as the authentication method. Other methods, like key or SAS authentication, might appear in the configuration UI but aren't supported for Direct Lake models.

Permission requirements

The permission requirements differ between Direct Lake on SQL endpoints and Direct Lake on OneLake. This is because Direct Lake on SQL endpoints relies on the SQL Analytics Endpoint of the target data source, whereas Direct Lake on OneLake uses the OneLake APIs for permission checks.

Direct Lake on SQL endpoints

Direct Lake on SQL endpoints performs permission checks via the SQL analytics endpoint to determine whether the effective identity attempting to access the data has the necessary data access permissions. Notably, the effective identity doesn't need permission to read Delta tables directly in OneLake. It's enough to have *read* access to the Fabric artifact, such as a lakehouse, and SELECT permission on a table through its SQL analytics endpoint. That's because Fabric grants the necessary permissions to the semantic model to read the Delta tables and associated Parquet files (to **load column data** into memory). The semantic model has permission to periodically read the SQL analytics endpoint to check what data the querying user (or fixed identity) can access.

Direct Lake on OneLake

Direct Lake on OneLake doesn't use a SQL analytics endpoint for permission checks. It uses OneLake Security. When OneLake Security is enabled, Direct Lake on OneLake uses the current user (or fixed identity) to resolve OneLake Security roles and enforce OLS and RLS on the target Fabric artifact. If OneLake Security isn't enabled, Direct Lake on OneLake requires the effective identity to have Read and ReadAll permissions on the target Fabric artifact to access its Delta

tables in OneLake. For more information about Read and ReadAll permissions, see the [Item permissions section in the OneLake security overview article](#).

(!) Note

Contributors (or higher) have Read and ReadAll permissions in OneLake. Viewers and users who aren't members of a workspace role must be granted Read and ReadAll permissions or added to a OneLake security group. For more information about managing OneLake security groups, see [OneLake data access control model](#).

Direct Lake users

The following scenarios list minimum permission requirements.

[+] [Expand table](#)

Scenario	Direct Lake on SQL endpoints	Direct Lake on OneLake	Comments
Users can view reports	<ul style="list-style-type: none">- Grant <i>Read</i> permission for the reports and <i>Read</i> permission for the semantic model.- If Direct Lake uses SSO, grant users at least <i>Read</i> permission for the target Fabric artifact and SELECT permissions for the tables.	<ul style="list-style-type: none">- Grant <i>Read</i> permission for the reports and <i>Read</i> permission for the semantic model.- If Direct Lake uses SSO, grant users at least <i>Read</i> permission for the target Fabric artifact and add them to a OneLake security role or grant them <i>ReadAll</i> permission.	Reports don't need to belong to the same workspace as the semantic model. For more information, see Strategy for read-only consumers .
Users can create reports	<ul style="list-style-type: none">- Grant <i>Build</i> permission for the semantic model.- If Direct Lake uses SSO, grant users at least <i>Read</i> permission for the target Fabric artifact and SELECT permissions for the tables.	<ul style="list-style-type: none">- Grant <i>Build</i> permission for the semantic model.- If Direct Lake uses SSO, grant users at least <i>Read</i> permission for the target Fabric artifact and add them to a OneLake security role or grant them <i>ReadAll</i> permission.	Users can only build reports on the tables and columns they have access to. This may be a subset the full set of tables and columns in the model. For more information, see Strategy for content creators .

Scenario	Direct Lake on SQL endpoints	Direct Lake on OneLake	Comments
Users can query the semantic model but are denied querying the lakehouse or SQL analytics endpoint	<ul style="list-style-type: none"> - Bind the Direct Lake model to a cloud connection with a fixed identity and leave SSO disabled. - Grant the fixed identity at least <i>Read</i> permission for the target Fabric artifact and SELECT permissions for the tables. - Don't grant users any permission for the target Fabric artifact. 	<ul style="list-style-type: none"> - Bind the Direct Lake model to a cloud connection with a fixed identity and leave SSO disabled. - Grant the fixed identity at least <i>Read</i> permission for the target Fabric artifact and add it to a OneLake security role or grant it <i>ReadAll</i> permission. - Don't grant users any permission for the target Fabric artifact. 	Only suitable when the cloud connection uses a fixed identity.
Users can query the semantic model and the SQL analytics endpoint but are denied querying the lakehouse	- Grant <i>Read</i> and <i>ReadData</i> permissions for the target Fabric artifact.	Not applicable.	Important: Queries sent to the SQL analytics endpoint will bypass data access permissions enforced by the semantic model.
Manage the semantic model, including refresh settings	- Requires semantic model ownership.	- Requires semantic model ownership.	For more information, see Semantic model ownership .

 **Important**

Always test permissions before releasing your semantic model and reports to production.

For more information, see [Semantic model permissions](#).

Direct Lake owners

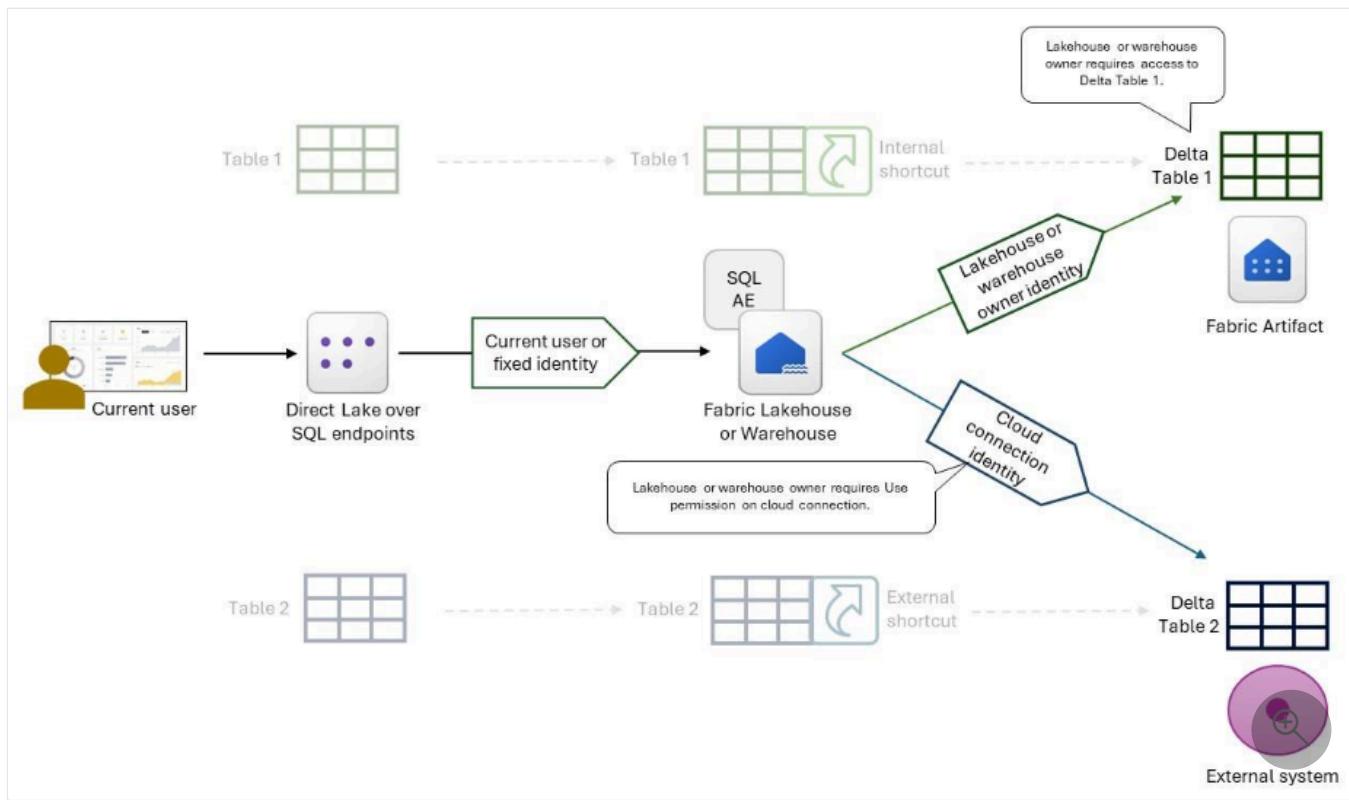
In addition to the effective identity (current user or fixed identity), Direct Lake also requires the semantic model owner to have *read* access to the source tables so that Direct Lake can frame the semantic model as part of data refresh. No matter who refreshes a Direct Lake model, Direct Lake checks the owner's permission to ensure the model is allowed to access the data. The owner's data access permission requirements are the same as for users querying the model.

If the semantic model owner doesn't have the required data access permissions, Direct Lake raises the following error during framing: `We cannot refresh this semantic model because one or multiple source tables either do not exist or access was denied. Please contact a data source admin to verify that the tables exist and ensure that the owner of this semantic model does have read access to these tables. Some restricted tables including fully restricted and partially restricted (indicating column constraints): '\<list of tables\>'.`

Shortcuts to source tables

Shortcuts are OneLake objects that you add to a Fabric lakehouse or other Fabric artifact to point to internal or external storage locations. In a Direct Lake model, Delta tables added through shortcuts appear as native in the connected Fabric artifact because shortcuts are transparent when you access data through the OneLake API.

When you access shortcuts through Direct Lake over SQL endpoints, Direct Lake first validates that the effective identity (current user or fixed identity) can access the table in the semantic model's data source. For internal shortcuts, after that check passes, Direct Lake uses the data source owner's identity to read the Delta table through the shortcut at the table's Fabric artifact. The data source owner must have access permission in the target OneLake location. For external shortcuts, the data source owner also needs Use permission on the cloud connection to the external system that hosts the Delta table. For more information, see [OneLake shortcuts](#).



Direct Lake over OneLake has different permission requirements because the SQL Analytics Endpoint isn't involved. When a user accesses data through an internal shortcut to another OneLake location, the effective identity (current user or fixed identity) must have permission in the target location. The effective identity must be a Contributor (or higher), have Read and ReadAll permissions, or be in a OneLake security role that grants *read* access.

Object-level security (OLS) and row-level security (RLS)

Both OneLake Security and Direct Lake models support OLS and RLS. OLS enables artifact owners and admins to secure specific tables or columns. RLS can be used to restrict data access at the row level based on filters. You can define OLS and RLS in OneLake Security, in a Direct Lake model, or in both locations.

i Important

Direct Lake doesn't support SQL Analytics Endpoint OLS/RLS. To return correct data, Direct Lake over SQL endpoints falls back to DirectQuery mode if a Fabric artifact uses OLS or RLS. If DirectQuery fallback is disabled, queries over SQL endpoints fail when OLS/RLS is defined at the SQL Analytics Endpoint. Direct Lake over OneLake avoids this limitation.

Direct Lake on OneLake OLS/RLS with OneLake Security OLS/RLS

Direct Lake on OneLake evaluates access to OLS/RLS secured objects by resolving the effective identity's OneLake Security roles and applying the defined OLS/RLS rules. The OneLake Security roles are handled the same as Direct Lake roles. If the effective identity belongs to multiple roles in OneLake Security and Direct Lake, Direct Lake first unions the OneLake Security roles, then intersects the result with the Direct Lake roles.

This table lists common troubleshooting situations caused by conflicting OneLake Security and Direct Lake rules.

 Expand table

Scenario	Comments
No rows returned due to RLS filtering	If the effective identity lacks row-level access permissions, queries can return empty results. This behavior is expected when RLS filters exclude all rows for the current user.
Can't find table	These errors usually occur when object permissions are missing after applying OneLake Security roles.
Column can't be found	
Failed to resolve name	
Not a valid table, variable, or function name	

OLS/RLS scope differences

Enforcing OLS and RLS in OneLake Security applies the rules across all compute engines and ensures unified access control for users. This means that, regardless of the compute engine—lakehouse, warehouse, semantic model, or other artifact—OneLake Security rules control the user's data access. In contrast, OLS/RLS defined within a Direct Lake semantic model only apply within the scope of that model. Other compute engines don't apply these Direct Lake security rules, which can produce different results when users access the data through other paths.

Important

When you use both OneLake Security OLS/RLS and Direct Lake OLS/RLS, users who have OneLake access can still retrieve and work with the data—even if Direct Lake model rules further restrict data—because model-level rules don't extend beyond the model. Use OneLake Security for comprehensive access control across all compute engines.

OneLake OLS and semantic model metadata

Semantic model metadata includes definitions of tables, columns, relationships, and other schema elements. Users with *build* or higher permissions can view the model metadata via XML for Analysis (XMLA) and REST APIs. For more information, see [Semantic model permissions](#).

To protect sensitive table and column names in OneLake with OneLake OLS, remember that OneLake Security applies only to members of the workspace Viewer role. OneLake OLS doesn't prevent members of the Contributor (or higher) workspace role from discovering secured tables or columns because they already have Write permission to all workspace artifacts. Members of the Viewer role with *build* or higher permissions on a Direct Lake model can discover sensitive schema information through the semantic model metadata. These higher privileged viewers still don't have data access, but they can see that the secured tables and columns exist.

A Direct Lake model might exist in the same workspace as the source artifact or in a separate workspace. Grant a viewer in the same workspace *build* (or higher) access to a Direct Lake model through item permissions. In a separate workspace, a user might be a Contributor (or higher) or have *build* (or higher) item permissions to access the model metadata.

OneLake OLS and Git integration

Git integration enables developers to integrate their application lifecycle management (ALM) processes into the Fabric platform. The Git repository preserves the workspace structure, including all supported artifacts. Developers have full visibility to the metadata of all their items in the Git repository. Direct Lake model metadata lets them see that secured tables or columns exist even if they don't have access to the target data source in another workspace. For more information, see [What is Microsoft Fabric Git integration?](#)

Considerations and limitations

Consider these Direct Lake security limitations.

Note

The capabilities and features of Direct Lake semantic models and OneLake security evolve rapidly. Check back periodically for updates.

- Assign workspace viewers OneLake security roles that grant *read* access to the source Fabric artifacts. If a source artifact has shortcuts to another Fabric artifact, the user also needs *read* access to each shortcut's target Fabric artifact.

- Use a fixed identity to isolate users from a source Fabric artifact. Bind the Direct Lake model to a cloud connection. Keep SSO disabled on the cloud connection to use the fixed identity for refreshes and queries.
- Direct Lake semantic models that rely on Fabric OneLake security on the source artifact don't support backup operations.
- Bidirectional relationships aren't supported in a Direct Lake model if the source Fabric artifact relies on OneLake security RLS.
- During public preview, OneLake security supports only static RLS on a single table.
- During public preview, OneLake security doesn't support dynamic definitions or complex role configurations, such as combining multiple OLS and RLS roles across related tables.
- Consolidate OneLake security RLS and OLS permissions into one role per user instead of assigning multiple roles.
- If the OneLake security configuration changes, such as due to shortcut changes in the target artifact, refresh Direct Lake on OneLake models that access that artifact. If autosync is enabled, the service usually refreshes them automatically. Otherwise, refresh the models manually.
- If a Lakehouse has OneLake security:
 - The SQL analytics endpoint is, by default, fixed identity to the owner of the Lakehouse, so the SQL analytics endpoint OneLake security is the same as the owner (no limitations). Direct Lake on SQL stays using Direct Lake, unless extra SQL granular access roles are added.
 - The SQL analytics endpoint can be changed to SSO. When this happens, OneLake security roles are added as SQL granular access control rules and the user is blocked from editing them directly on the SQL analytics endpoint. At this point, Direct Lake on SQL falls back to DirectQuery 100% of the time.

ⓘ **Note:** The author created this article with assistance from AI. [Learn more](#)

Analyze query processing for Direct Lake semantic models

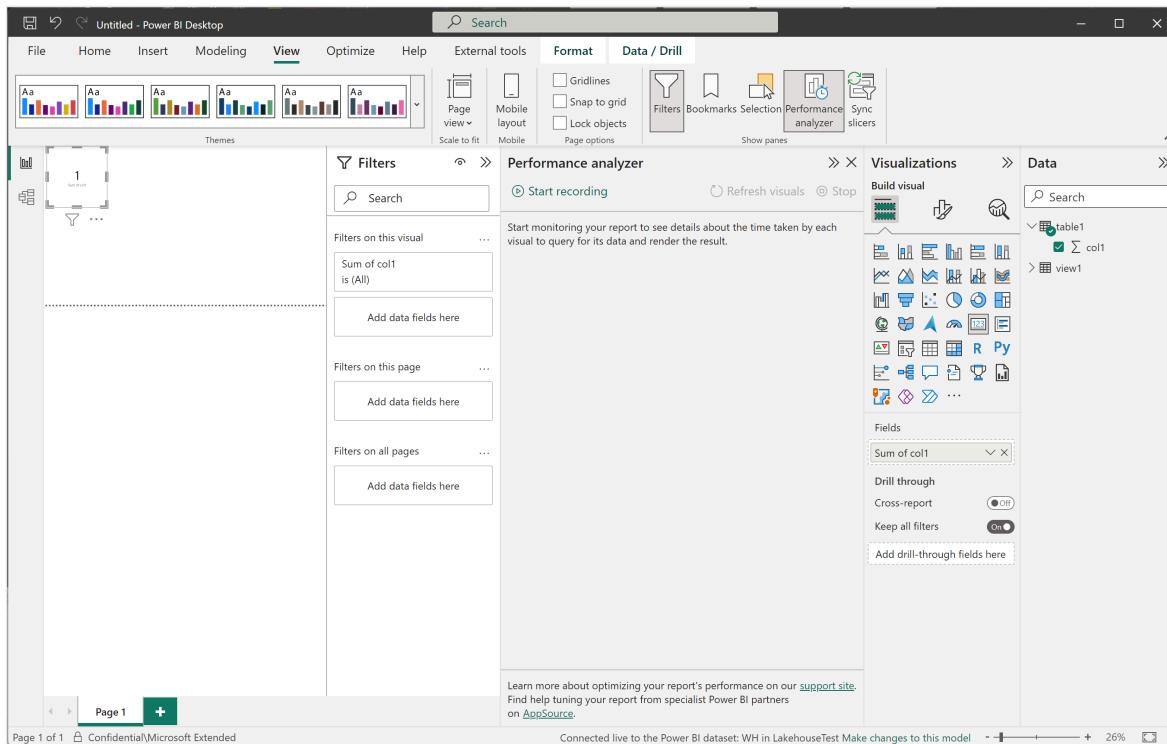
Article • 01/26/2025

Power BI semantic models in *Direct Lake* mode read Delta tables directly from OneLake — unless they have to fall back to *DirectQuery* mode. Typical fallback reasons include memory pressures that can prevent loading of columns required to process a DAX query, and certain features at the data source might not support Direct Lake mode, like SQL views in a Warehouse and Lakehouse. In general, Direct Lake mode provides the best DAX query performance unless a fallback to DirectQuery mode is necessary. Because fallback to DirectQuery mode can impact DAX query performance, it's important to analyze query processing for a Direct Lake semantic model to identify if and how often fallbacks occur.

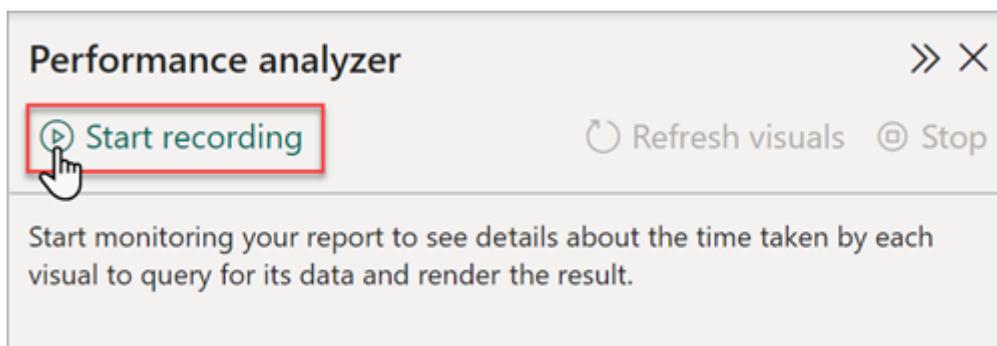
Analyze by using Performance analyzer

Performance analyzer can provide a quick and easy look into how a visual queries a data source, and how much time it takes to render a result.

1. Start Power BI Desktop. On the startup screen, select **New > Report**.
2. Select **Get Data** from the ribbon, then select **Power BI semantic models**.
3. In the **OneLake data hub** page, select the Direct Lake semantic model you want to connect to, and then select **Connect**.
4. Place a card visual on the report canvas, select a data column to create a basic report, and then on the **View** menu, select **Performance analyzer**.

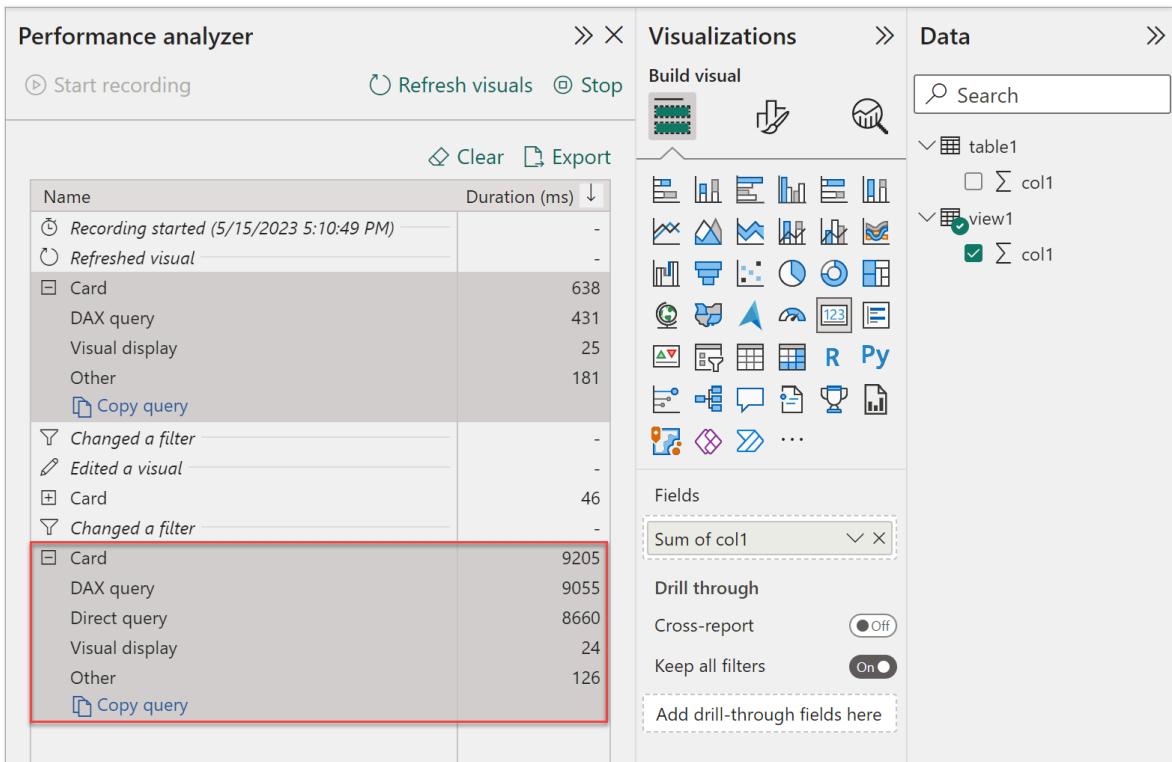


5. In the Performance analyzer pane, select Start recording.



6. In the Performance analyzer pane, select Refresh visuals, and then expand the Card visual. The card visual doesn't cause any DirectQuery processing, which indicates the semantic model was able to process the visual's DAX queries in Direct Lake mode.

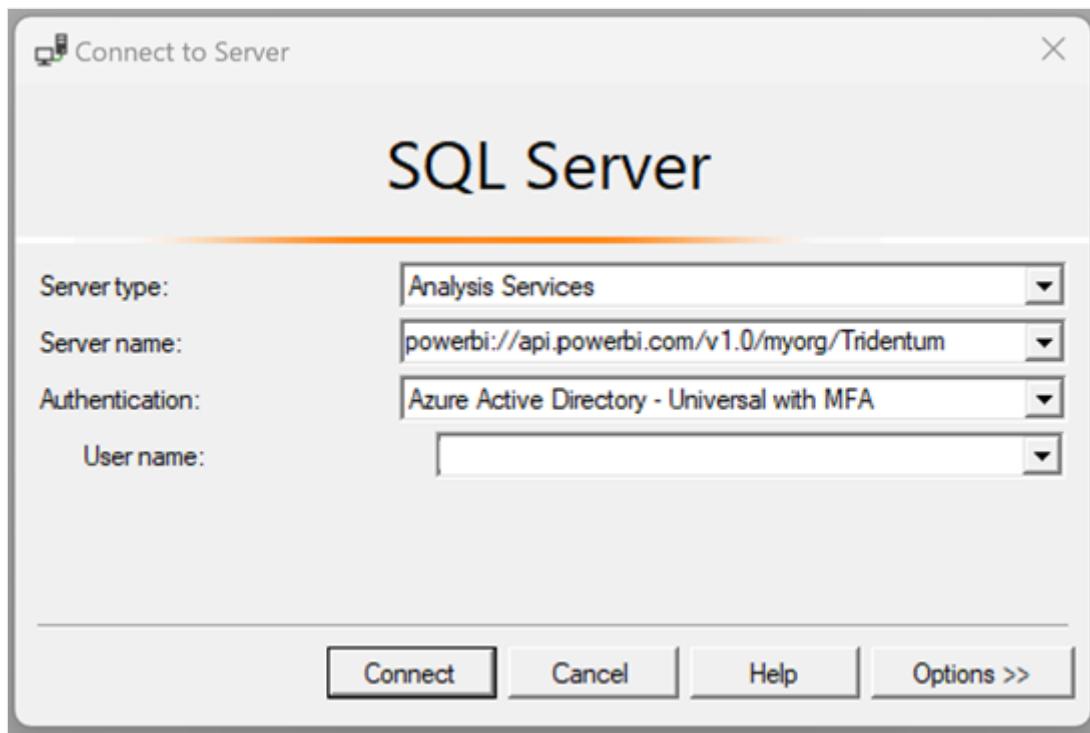
If the semantic model falls back to DirectQuery mode to process the visual's DAX query, you see a **Direct query** performance metric, as shown in the following image:



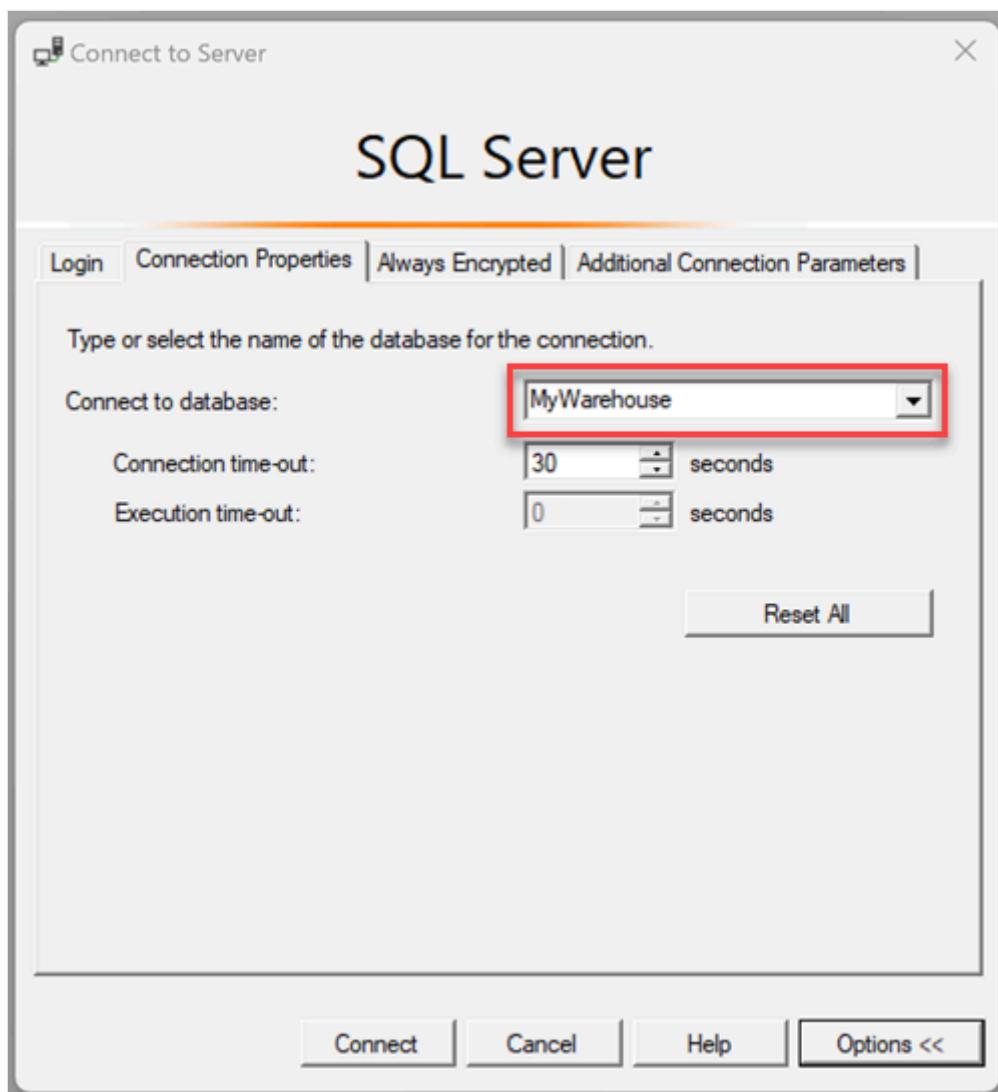
Analyze by using SQL Server Profiler

SQL Server Profiler can provide more details about query performance by tracing query events. It's installed with [SQL Server Management Studio \(SSMS\)](#). Before starting, make sure you have the latest version of SSMS installed.

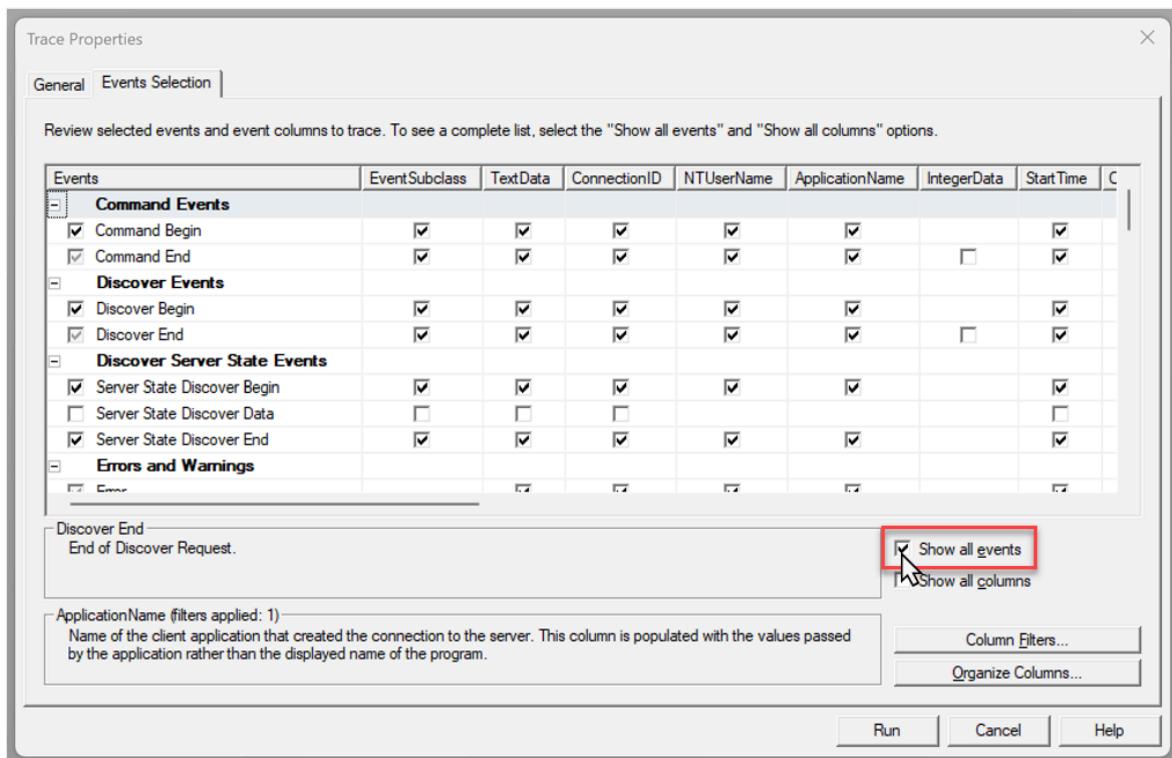
1. Start SQL Server Profiler from the Windows menu.
2. In SQL Server Profiler, select **File > New Trace**.
3. In **Connect to Server > Server type**, select **Analysis Services**, then in **Server name**, enter the URL to your workspace, then select an authentication method, and then enter a username to sign in to the workspace.



4. Select Options. In **Connect to database**, enter the name of your semantic model and then select **Connect**. Sign in to Microsoft Entra ID.



5. In **Trace Properties > Events Selection**, select the **Show all events** checkbox.

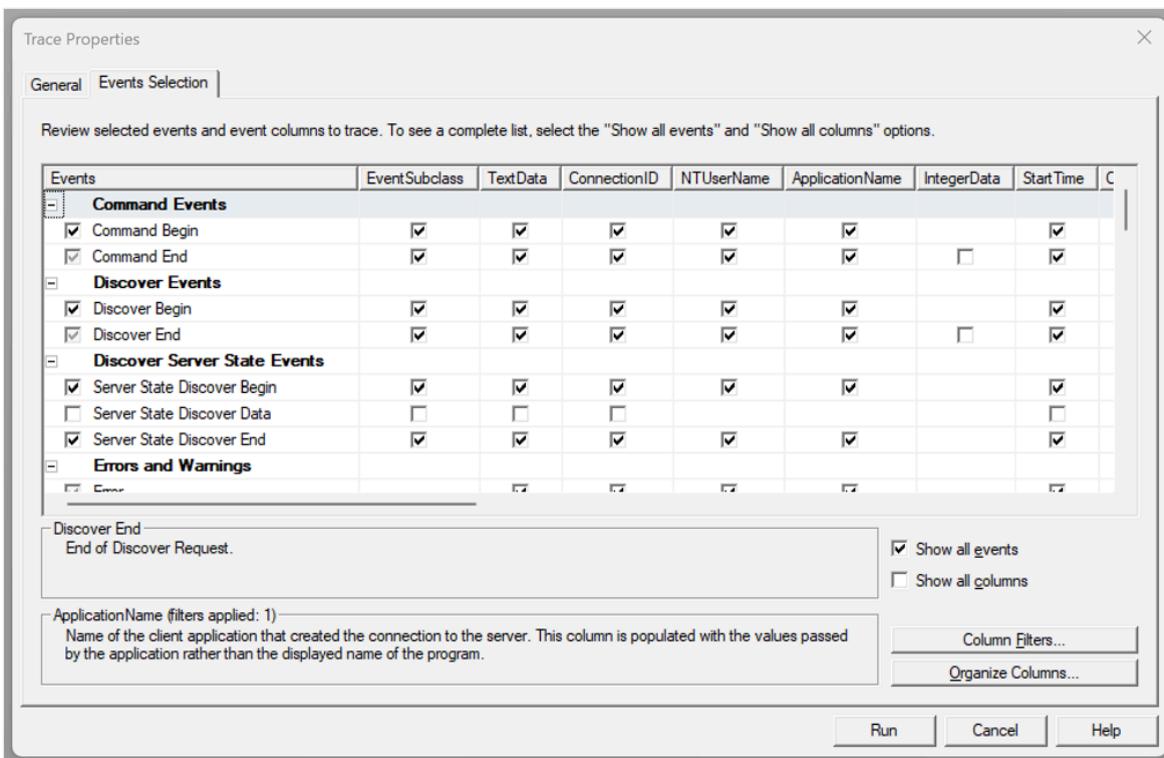


6. Scroll to **Query Processing**, and then select checkboxes for the following events:

[Expand table](#)

Event	Description
DirectQuery_Begin DirectQuery_End	If DirectQuery Begin/End events appear in the trace, the semantic model might have fallen back to DirectQuery mode. However, note that the presence of EngineEdition queries and possibly queries to check Object-Level Security (OLS) do not represent a fallback because the engine always uses DirectQuery mode for these non-query processing related checks.
VertiPaq_SE_Query_Begin VertiPaq_SE_Query_Cache_Match VertiPaq_SE_Query_Cache_Miss VertiPaq_SE_Query_End	VertiPaq storage engine (SE) events in Direct Lake mode are the same as for import mode.

It should look like this:



7. Select Run. In Power BI Desktop, create a new report or interact with an existing report to generate query events. Review the SQL Server Profiler trace report for query processing events.

The following image shows an example of query processing events for a DAX query. In this trace, the VertiPaq storage engine (SE) events indicate that the query was processed in Direct Lake mode.

EventClass	EventSubclass	TextData	ConnectionID	NTUserName	Application
Discover Begin	26 - DISCO...	<ccon><RestrictionList xmlns="urn:sc...	8341	Power B...	PowerBI
Discover End	26 - DISCO...	<ccon><RestrictionList xmlns="urn:sc...	8341	Power B...	PowerBI
Discover Begin	54 - DISCO...	<ccon><RestrictionList xmlns="urn:sc...	8341	Power B...	PowerBI
DirectQuery Begin		SELECT 'EngineEdition', SERVERPROPE...	8341	Power B...	PowerBI
DirectQuery End		SELECT 'EngineEdition', SERVERPROPE...	8341	Power B...	PowerBI
Discover End	54 - DISCO...	<ccon><RestrictionList xmlns="urn:sc...	8341	Power B...	PowerBI
Query Begin	3 - DAXQuery	DEFINE VAR __DSOCore = DISTINCT...	8341	Power B...	PowerBI
VertiPaq SE Query Begin	0 - VertiP...	SET DC_KIND="AUTO"; SELECT [<ccon>...	8341	Power B...	
VertiPaq SE Query Begin	10 - Inter...	SET DC_KIND="DENSE"; SELECT [<ccon...	8341	Power B...	
VertiPaq SE Query End	10 - Inter...	SET DC_KIND="DENSE"; SELECT [<ccon...	8341	Power B...	
VertiPaq SE Query End	0 - VertiP...	SET DC_KIND="AUTO"; SELECT [<ccon>...	8341	Power B...	
Query End	3 - DAXQuery	DEFINE VAR __DSOCore = DISTINCT...	8341	Power B...	PowerBI

```

DEFINE
    VAR __DSOCore =
        DISTINCT('Geography'[city])
    VAR __DSOBodyLimited =
        TOPN(3502, __DSOCore, 'Geography'[city], 1)
EVALUATE
    __DSOBodyLimited
ORDER BY
  
```

Trace is running. | Ln 98, Col 1 | Rows: 103

Related content

- Create a lakehouse for Direct Lake
- Direct Lake overview

Feedback

Was this page helpful?

 Yes

 No

[Provide product feedback ↗](#) | [Ask the community ↗](#)

Build Power BI Reports with Direct Lake Tables

10/01/2025

Semantic models with Direct Lake tables can be used like any other Power BI semantic model. You can create Power BI reports, Power BI explorations, and run Data Analysis eXpression (DAX) queries.

When a Power BI report shows data in visuals, it requests it from the semantic model. With Direct Lake mode, the semantic model accesses the OneLake delta table to consume data and return it to the Power BI report. For efficiency, the semantic model can keep some recently accessed data in the cache.

With Direct Lake on SQL, when the semantic model can't use Direct Lake it can fall back to DirectQuery and access the data via the SQL analytics endpoint. This behavior is controlled by the **Direct Lake behavior** property.

Creating a report

Creating a report from a Power BI semantic model is easy. The report live connects to the semantic model. In a live connection, the report can be created and edited without editing the semantic model itself. You need at least Build permission on the semantic model to live connect.

Power BI Desktop

Power BI Desktop can live connect to any semantic model in the Power BI service to create a report.

ⓘ Note

Live connect is different from live editing a semantic model in Power BI Desktop. Live connect is also different than having a local semantic model with import or DirectQuery tables and report together.

1. Open Power BI Desktop
2. Select **OneLake catalog** or **Get data from other sources** ribbon button
3. Filter by **Semantic model**
4. Select the semantic model with the Direct Lake tables and then **Connect**

You're now live connected to the semantic model and can start creating the report. Learn more about Power BI reports at the [Power BI reporting documentation](#). Save the file locally and publish to any workspace when ready to see it online and share with others.

In Power BI Desktop, report measures can be created in a live connected report to add a calculation without adding measures to the semantic model itself.

Power BI service or Fabric portal

The Power BI service or Fabric portal has many paths to create a report with a live connection to a semantic model. Here are a few of the paths to create a report.

- Use the context menu (...) of a semantic model in a workspace, then choose **Create report**
- From **Home** choose **New report**, then **Pick a published semantic model** and select the semantic model with Direct lake tables
- From **OneLake catalog** using the drop-down **All items** by filter to **Data and Semantic model**, select the semantic model with Direct lake tables then select **Explore** and **Create a blank report** from the top bar
- In web modeling, after choosing **Open data model**, go to **File**, then **Create new report**

The screenshot shows the Power BI service or Fabric portal interface. On the left, there's a sidebar with various workspace and catalog icons. The main area displays the semantic model details for 'contoso-sm'. It includes sections for 'Discover business insights' (with a 'Explore this data' button) and 'Share this data' (with a 'Share semantic model' button). Below this, a section titled 'See what already exists' lists items sharing the same data source: 'NYCTaxi_648' (SQL analytics endpoint and Lakehouse types). To the right, a 'Tables' pane lists tables like 'green_tripdata_2017' through 'green_tripdata_2022'. A large search icon is at the bottom right.

Any of these actions create a Power BI report in the web browser.

Other reporting options

There are many other ways to use Power BI semantic models. Here are a few of the other options.

- [Explore](#) are created from the context menu or details page of a semantic model in the Power BI service
- [Paginated reports](#) are created from the context menu or details page of a semantic model in the Power BI service
- [DAX queries](#) can be run from the context menu or details page of a semantic model in the Power BI service or in Power BI Desktop using [DAX query view](#)
- [Excel with Power BI add-on pane](#) can be used to create refreshable pivot tables or flat tables of data from a semantic model

Setting permissions for report consumption

The semantic model in Direct Lake mode is consuming data from the OneLake on demand when visuals load in a report. To make sure that data is accessible, necessary permissions on the Fabric item that owns the OneLake data need to be set.

The semantic model can use single sign-on (SSO) or a fixed identity to access OneLake data of a Fabric item. With SSO, the report consumers need access to the data in the Fabric item. With a fixed identity, report consumers need *viewer* role or higher on the semantic model and report, or access granted to the report via an [app](#).

Viewer role or higher can be granted via [workspace roles](#) or individually to any Fabric item, semantic model, or report.

Also, with fixed identity, row-level security defined in the semantic model can limit the data the report consumer sees while maintaining Direct Lake mode.

Consumption scenarios

Here are some common scenarios to demonstrate how to use these different permission options.

Permissions to view report only

Use a fixed identity to the Fabric item on the semantic model, and publish the report.

- **App option:** Publish an app from the workspace with the report. Only give report consumers permission in the app.

- **Item option:** Grant report consumers *viewer* role on both the report and semantic model individually.
- **Workspace option:** Publish the report and semantic model to their own workspace, separate from the source Fabric item, and grant report consumers *viewer* role on the workspace. [Workspace roles](#) apply to all items in the workspace, including new items added later.

Permissions to view report and create their own reports only

Use a fixed identity to the Fabric item on the semantic model, and publish the report.

- **App option:** Publish an app from the workspace with the report. Give report consumers permission in the app, with the advanced option to include *build* permission to create their own reports.
- **Item option:** Grant report consumers *viewer* role on both the report and semantic model individually. Include *build* access on the semantic model.
- **Workspace option:** Publish the report and semantic model to their own workspace, separate from the source Fabric item, and grant report consumers *viewer* role on the workspace. [Workspace roles](#) apply to all items in the workspace, including new items added later. Include *build* access on the semantic model.

Permissions to view report, create their own reports, use the SQL analytics endpoint, and access the delta tables directly

Use SSO to the Fabric item on the semantic model, and publish the report.

- **App option:** Publish an app from the workspace with the report. Give report consumers permission in the app, with the advanced option to include *build* permission to create their own reports. In addition, make sure the users have *ReadAll* permission on the Fabric item.
- **Item option:** Grant report consumers *viewer* role on both the report and semantic model individually. Include *build* access on the semantic model. In addition, make sure the users have *ReadAll* permission on the Fabric item.
- **Workspace option:** Publish the report and semantic model to the workspace with the source Fabric item, and grant report consumers *viewer* role on the workspace. [Workspace roles](#) apply to all items in the workspace, including new items added later. Include *build* access on the semantic model and *ReadAll* access on the Fabric item.

Permissions to view and edit the report, semantic model, and Fabric items in the workspace

Use SSO to the Fabric item on the semantic model, and publish the report. Grant the users any [workspace roles](#) higher than *viewer*.

Related content

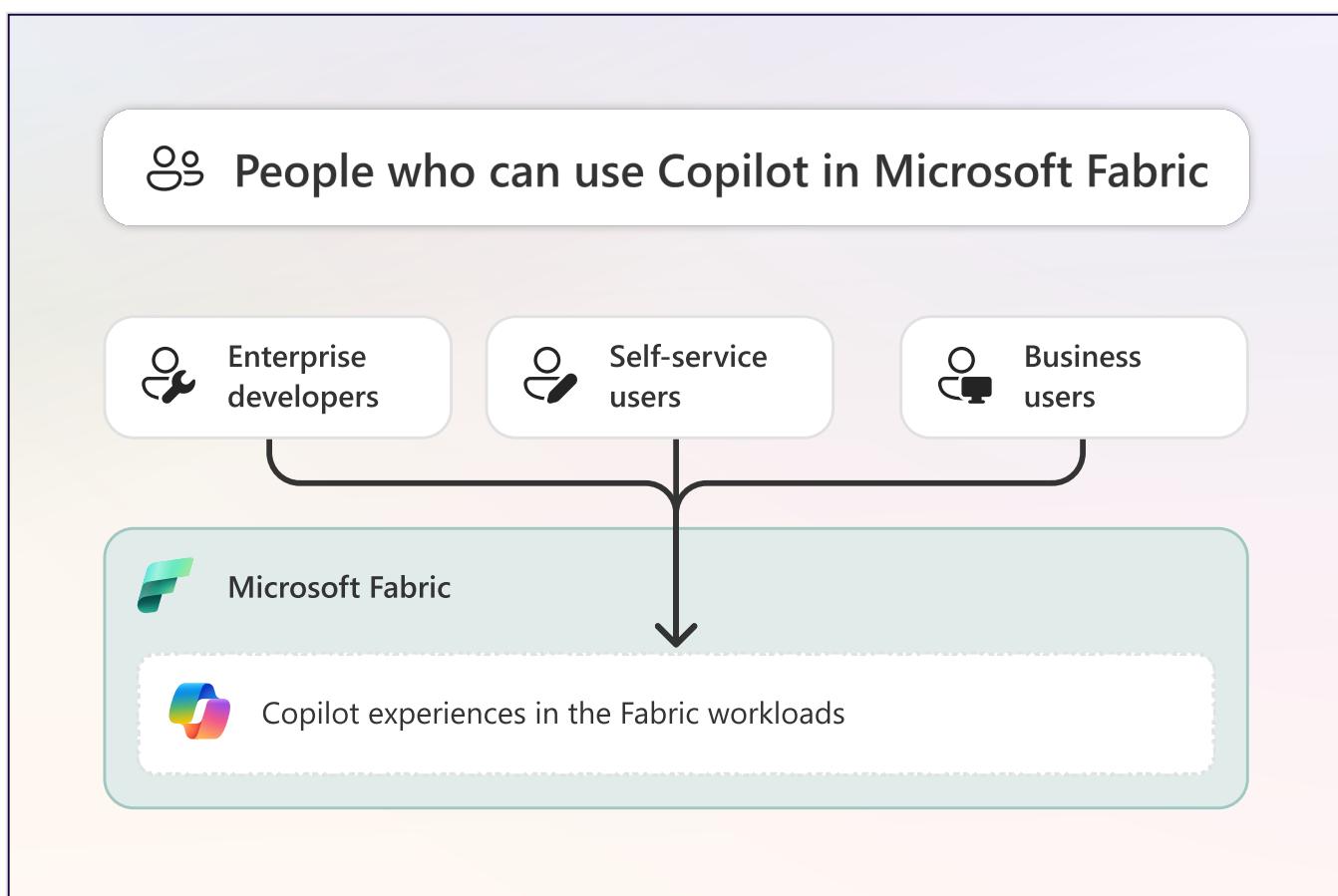
- [Power BI reporting](#)

What is Copilot in Fabric?

07/16/2025

Copilot and other generative AI features in preview bring new ways to transform and analyze data, generate insights, and create visualizations and reports in Microsoft Fabric and Power BI. This article introduces you to Copilot in Fabric and tells you how it works in the different workloads. It also discusses data security and privacy, responsible use, and regional availability.

Copilot in Microsoft Fabric is a generative AI assistive technology that aims to enhance the data analytics experience in the Fabric platform for users. Copilot uses large-language models (LLMs) that attempt to facilitate user interaction with their data and items in Fabric. People who use Copilot can include people who create, manage, and consume Fabric items, including enterprise developers, self-service users, and business users.



This article helps you to understand how Copilot in Fabric works, including its architecture and cost. The information in this article is intended to guide you and your organization to use and manage Copilot effectively. This article is primarily targeted at:

- **BI and analytics directors or managers:** Decision makers who are responsible for overseeing the BI program and strategy, and who decide whether to enable and use Copilot in Fabric or other AI tools.

- **Fabric administrators:** The people in the organization who oversee Microsoft Fabric and its various workloads. Fabric administrators oversee who can use Copilot in Fabric for each of these workloads and monitor how Copilot usage affects available Fabric capacity.
- **Data architects:** The people responsible for designing, building, and managing the platforms and architecture that support data and analytics in the organization. Data architects consider the usage of Copilot in architecture design.
- **Center of Excellence (COE), IT, and BI teams:** The teams that are responsible for facilitating successful adoption and use of data platforms like Fabric in the organization. These teams and individuals might use AI tools like Copilot themselves, but also support and mentor self-service users in the organization to benefit from them, as well.

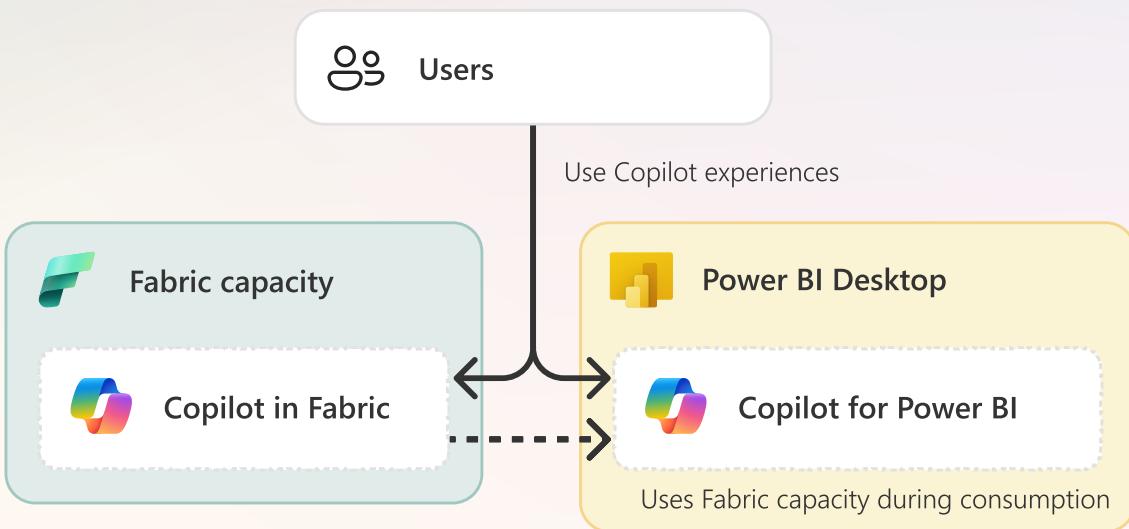
 **Important**

Copilot in Fabric aims to *augment* the abilities and intelligence of human users. Copilot can't, and doesn't, aim to *replace* the people who today create and manage reports or other Fabric items. To get the most out of Copilot in Fabric, you should consider how you'll enable these individuals and teams to make their work more efficient or improve their outcomes.

There are different Copilots in each of the Fabric workloads, like Data Factory, Data Science, and Power BI. In Power BI Desktop, Copilot experiences are available to users with access to a workspace that uses Fabric capacity or those assigned to a Fabric Copilot capacity.



Copilot in Microsoft Fabric



Enabling and effectively using Copilot in your organization requires deliberate thought and planning. Generative AI is an evolving technology with specific nuances and considerations to keep in mind, so it's important to apply generative AI tools like Copilot to the appropriate problems and scenarios. Furthermore, Copilot in Power BI consumes your available Fabric capacity, meaning that you should manage its usage to avoid overconsumption that can lead to throttling and disruption of your other Fabric operations.

Enable Copilot

Before your business can start using Copilot capabilities in Microsoft Fabric, you need to [enable Copilot](#).

ⓘ Note

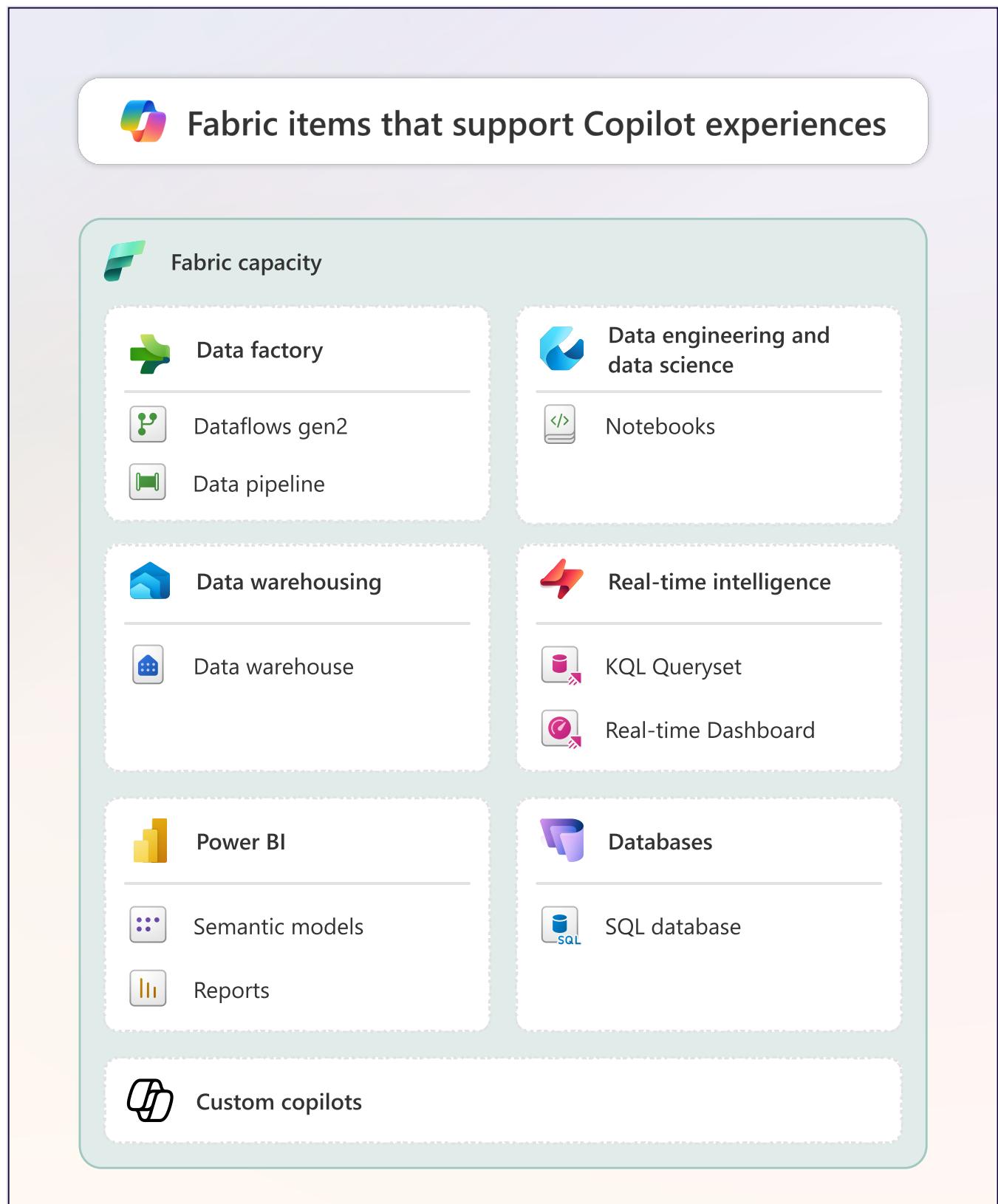
Copilot isn't yet supported for sovereign clouds due to GPU availability.

Copilot experiences

You can enable and use Copilot across the various Fabric workloads, and within those workloads you can use different Copilot experiences. While each of these Copilot experiences

uses a similar common architecture, they work in distinct ways.

The following diagram depicts an overview of the different items that support Copilot experiences for each Fabric workload.



Copilot in Fabric in the Data Science and Data Engineering workloads

Copilot for Data Engineering and Data Science is an AI-enhanced toolset tailored to support data professionals in their workflow. It provides intelligent code completion, automates routine tasks, and supplies industry-standard code templates to facilitate building robust data pipelines and crafting complex analytical models. Utilizing advanced machine learning algorithms, Copilot offers contextual code suggestions that adapt to the specific task at hand, helping you code more effectively and with greater ease. From data preparation to insight generation, Microsoft Fabric Copilot acts as an interactive aide, lightening the load on engineers and scientists and expediting the journey from raw data to meaningful conclusions.

Copilot in Fabric in the Data Factory workload

Copilot for Data Factory is an AI-enhanced toolset that supports both citizen and professional data wranglers in streamlining their workflow. It provides intelligent code generation to transform data with ease and generates code explanations to help you better understand complex tasks. For more information, see [Copilot for Data Factory](#)

Copilot in Fabric in the Data Warehouse workload

Microsoft Copilot for Fabric Data Warehouse is an AI assistant designed to streamline your data warehousing tasks. Key features of Copilot for Warehouse include Natural Language to SQL, code completion, quick actions, and intelligent insights. For more information, see [Copilot for Data Warehouse](#).

Copilot in the SQL database workload

Copilot for SQL database in Microsoft Fabric is an AI assistant designed to streamline your OLTP database tasks. Key features of Copilot for SQL database include Natural Language to SQL, code completion, quick actions, and document-based Q&A. For more information, see [Copilot for SQL database](#).

Copilot in Fabric in the Power BI workload

Power BI has introduced generative AI that allows you to create reports automatically by selecting the article for a report or by prompting Copilot for Power BI on a particular article. You can use Copilot for Power BI to generate a summary for the report page that you created, and generate synonyms for better Q&A capabilities.

For more information on the features and how to use Copilot for Power BI, see [Overview of Copilot for Power BI](#).

Copilot in Fabric in the Real-Time Intelligence workload

Copilot for Real-Time Intelligence is an advanced AI tool designed to help you explore your data and extract valuable insights. You can input questions about your data, which are then automatically translated into Kusto Query Language (KQL) queries. Copilot streamlines the process of analyzing data for both experienced KQL users and citizen data scientists.

For more information, see [Copilot for Writing KQL Queries](#).

Where to find the AI and Copilot experiences in Fabric

The following table provides an overview of the various AI and Copilot experiences available in Fabric, and which workloads and items these experiences apply to. The links in the *Experience* column take you to the documentation describing how to set up and use these features.

 [Expand table](#)

Fabric workload	Supported items	Experience
Copilot for Data Science and Data Engineering	Notebook (typically with lakehouses and other data items)	<ul style="list-style-type: none">- Copilot chat panel vs chat magics in a notebook.- Generate code or markdown for a notebook (preview).- Add comments, fix errors, or debug notebook code (preview).- Analyze and visualize data.- Explain notebook contents (preview).
AI Experiences in Fabric Data Science	Data agent AI functions AI services	<ul style="list-style-type: none">- Create a Fabric Data agent.- Transform and enrich data seamlessly with AI functions.- AI services in Fabric.
Copilot for Data Factory	Dataflows gen2 Data pipeline	<ul style="list-style-type: none">- Generate a new query. - Generate and run a data pipeline.- Summarize a data pipeline.- Troubleshoot pipeline errors.
Copilot for Data Warehouse	SQL Queries in Data Warehouse	<ul style="list-style-type: none">- Generate SQL queries (preview).- Suggest SQL code completions (preview).- Fix code in SQL queries (preview).- Explain code in SQL queries (preview).

Fabric workload	Supported items	Experience
Copilot for SQL database	SQL queries in SQL database	<ul style="list-style-type: none"> - Generate SQL queries (preview). - Suggest SQL code completions (preview). - Fix code in SQL queries (preview). - Explain code in SQL queries (preview).
Copilot for Power BI	Semantic models in Power BI Desktop or Power BI service	<ul style="list-style-type: none"> - Suggest linguistic model synonyms. - Suggest measure descriptions. - Write and explain DAX queries. - Ask questions about your data (preview).
	Reports (Power BI Desktop, service, or mobile app)	<ul style="list-style-type: none"> - Power BI home (announced). - Suggest a report page (preview). - Suggest a visual (preview). - Summarize data in a narrative visual. - Explain a report page or visual.
Copilot for Real-Time Intelligence	KQL queryset	<ul style="list-style-type: none"> - Generate KQL queries (preview). - Modify or explore a previously generated KQL query (preview).
	Real-time dashboards	<ul style="list-style-type: none"> - Generate a real-time dashboard.

 **Note**

Copilot's capabilities are evolving over time. More items and Copilot experiences will likely become available in the future.

The Copilot experiences which are in *preview* are subject to separate [supplemental preview terms](#), and aren't meant for production use. For more information, see [Microsoft Fabric preview information](#). We recommend that you only use these preview experiences to test and evaluate Copilot's capabilities.

Create your own AI solution accelerators

Build your own copilots

Using the client advisor AI accelerator tool, you can build custom copilot with your enterprise data. The client advisor AI accelerator uses Azure OpenAI Service, Azure AI Search, and

Microsoft Fabric to create custom Copilot solutions. This all-in-one custom copilot empowers client advisors to use generative AI across structured and unstructured data optimizing daily tasks and fostering better interactions with clients. To learn more, see the [GitHub repo ↗](#).

Conversational knowledge mining solution accelerator

The conversational knowledge mining solution accelerator is built on top of Microsoft Fabric, Azure OpenAI Service, and Azure AI Speech. It enables customers with large amounts of conversational data to use generative AI to find key phrases alongside the operational metrics. This way, you can discover valuable insights with business impact. To learn more, see the [GitHub repo. ↗](#)

How do I use Copilot responsibly?

To learn how to use Copilot responsibly, see the guidance at [Privacy, security, and responsible use for Copilot \(preview\)](#).

Available regions

Available regions for Azure OpenAI Service

To access the prebuilt [Azure OpenAI Service ↗](#), including the [Copilot in Fabric](#), you must have an F2 or higher SKU or a P SKU in the following [Fabric regions](#). The Azure OpenAI Service isn't available on trial SKUs.

The Azure OpenAI Service used to power Fabric Copilot is currently deployed only in US datacenters (East US, East US2, South Central US, and West US) and one EU datacenter (France Central). This differs from the standard Azure OpenAI Service available in the Azure portal, which is accessible in many more regions. For details on standard Azure OpenAI region availability, see [Azure OpenAI Service region availability](#). If your data is outside the US or EU, the feature is disabled by default unless your tenant admin enables **Data sent to Azure OpenAI can be processed outside your capacity's geographic region, compliance boundary, or national cloud instance** tenant setting. To learn how to get to the tenant settings, see [About tenant settings](#).

Data processing across geographic areas

The prebuilt [Azure OpenAI Service ↗](#) and [Copilot in Fabric](#) might process your prompts and results (input and output when using Copilot) outside your capacity's geographic region, depending on where the Azure OpenAI service is hosted. The table below shows the mapping

of where data is processed across geographic areas for Copilot in Fabric and Azure OpenAI features.

! Note

The data processed for Copilot interactions can include user prompts, meta prompts, structure of data (schema) and conversation history. No data, such as content in tables is sent to Azure OpenAI for processing unless directed by the user.

 Expand table

Geographic area where your Fabric Capacity is located	Geographic area where Azure OpenAI Service is hosted	Data processing outside your capacity's geographic region?	Actions required to use Fabric Copilot
US	US	No	Turn on Copilot.
EU Data Boundary	EU Data Boundary	No	Turn on Copilot.
UK	EU Data Boundary	Yes	Turn on Copilot. Enable cross-geo data processing.
Australia Brazil Canada India Asia Japan Korea South Africa Southeast Asia United Arab Emirates	US	Yes	Turn on Copilot. Enable cross-geo data processing.

Data storage of conversation history cross geographic regions

! Note

This is only applicable for customers who want to use [Copilot in Notebooks](#) and Fabric [data agents](#) (formerly known as Data agent) powered by Azure OpenAI, and whose capacity's geographic region is outside of the EU data boundary and the US.

In order to use fully conversational agentic AI experiences, the agent needs to store conversation history across user sessions. This ensures that the AI agent keeps context about

what a user asked in previous sessions and is a desired behavior in many agentic experiences. Experiences such as Copilot in Notebooks and Fabric data agents are AI experiences that store conversation history across the user's sessions. **This history is stored inside the Azure security boundary, in the same region and in the same Azure Open AI resources that process all your Fabric AI requests.** The difference in this case is that the conversation history is stored for as long as the user allows. For experiences that don't store conversation history across sessions, no data is stored. Prompts are only processed by Azure OpenAI resources that Fabric uses.

Your users can delete their conversation history at any time, simply by clearing the chat. This option exists both for Copilot in Notebooks and data agents. If the conversation history isn't manually removed, it is stored for 28 days.

[Learn more about the tenant setting for conversation history](#)

Related content

- [What is Microsoft Fabric?](#)
- [Copilot for Microsoft Fabric and Power BI: FAQ](#)
- [AI services in Fabric \(preview\)](#)
- [Copilot tenant settings](#)

How Copilot in Microsoft Fabric works

Article • 04/17/2025

Copilot in Microsoft Fabric is a generative AI assistive technology that aims to enhance the data analytics experience in the Fabric platform. This article helps you understand how Copilot in Fabric works and provides some high-level guidance and considerations about how you might best use it.

! Note

Copilot's capabilities are evolving over time. If you plan to use Copilot, ensure that you keep up to date with the monthly updates to Fabric and any changes or announcements to the Copilot experiences.

This article helps you to understand how Copilot in Fabric works, including its architecture and cost. The information in this article is intended to guide you and your organization to use and manage Copilot effectively. This article is primarily targeted at:

- **BI and analytics directors or managers:** Decision makers who are responsible for overseeing the BI program and strategy, and who decide whether to enable and use Copilot in Fabric or other AI tools.
- **Fabric administrators:** The people in the organization who oversee Microsoft Fabric and its various workloads. Fabric administrators oversee who can use Copilot in Fabric for each of these workloads and monitor how Copilot usage affects available Fabric capacity.
- **Data architects:** The people responsible for designing, building, and managing the platforms and architecture that support data and analytics in the organization. Data architects consider the usage of Copilot in architecture design.
- **Center of Excellence (COE), IT, and BI teams:** The teams that are responsible for facilitating successful adoption and use of data platforms like Fabric in the organization. These teams and individuals might use AI tools like Copilot themselves, but also support and mentor self-service users in the organization to benefit from them, as well.

Overview of how Copilot in Fabric works

Copilot in Fabric works similar to the other Microsoft Copilots, such as [Microsoft 365 Copilot](#), [Microsoft Security Copilot](#), and [Copilots and generative AI in Power Platform](#). However, there are several aspects that are specific to how Copilot in Fabric works.

Process overview diagram

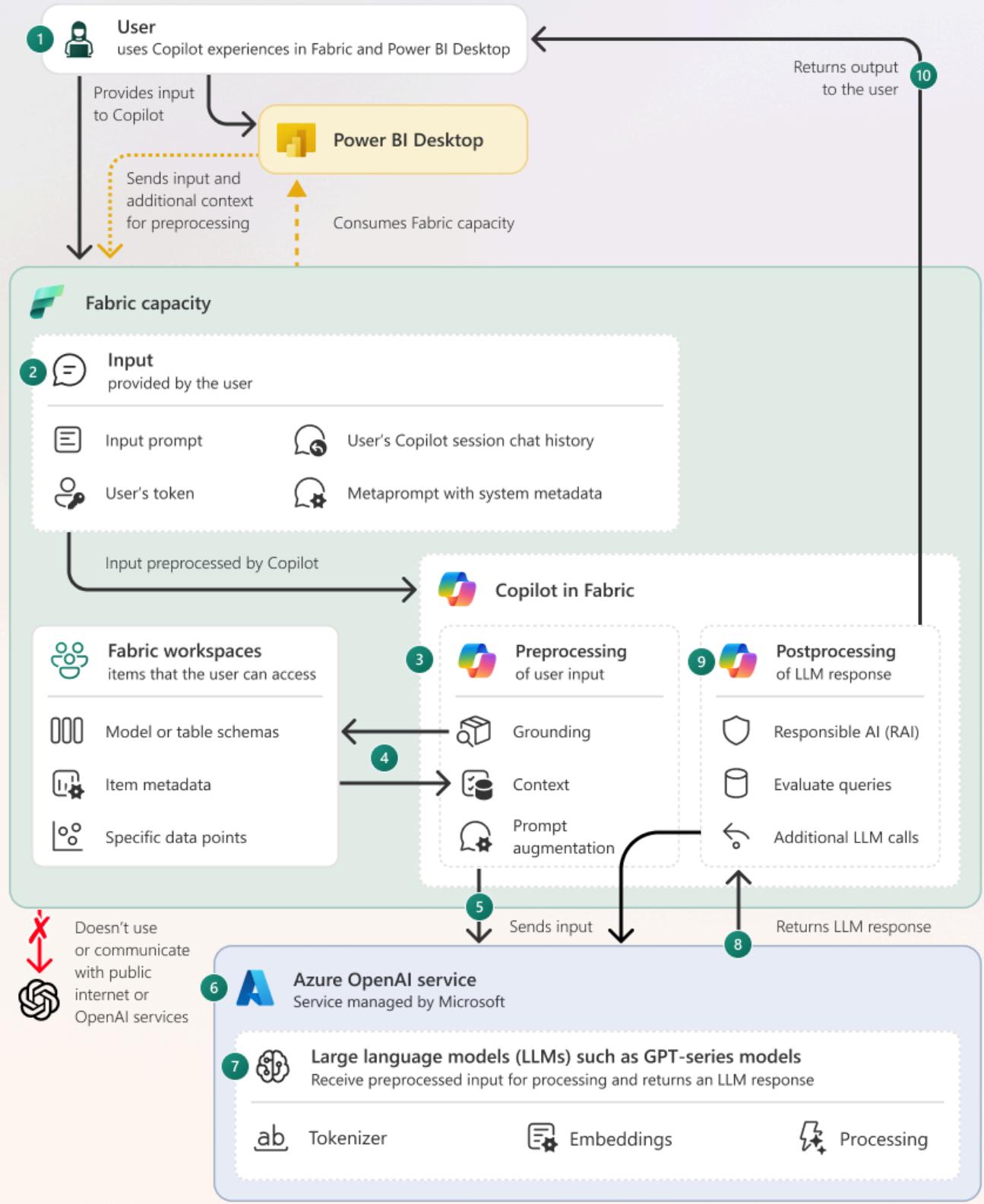
The following diagram depicts an overview of how Copilot in Fabric works.

 **Note**

The following diagram depicts the general architecture of Copilot in Fabric. However, depending on the specific workload and experience, there might be additions or differences.



Copilot in Fabric process overview



The diagram consists of the following parts and processes:

Expand table

Item	Description
1	The user provides an input to Copilot in Fabric, Power BI Desktop, or the Power BI mobile app. The input can be a written prompt or another interaction that generates a prompt. All interactions with Copilot are user-specific.
2	The input contains information that includes the prompt, the user's token, and context like the user's Copilot session chat history and a meta-prompt with system metadata, including where the user is and what they're doing in Fabric or Power BI Desktop.
3	Copilot handles preprocessing and postprocessing of user inputs and large language model (LLM) responses, respectively. Certain specific steps done during preprocessing and postprocessing depend on which Copilot experience an individual is using. Copilot must be enabled by a Fabric administrator in the tenant settings to use it.
4	During preprocessing, Copilot performs grounding to retrieve additional contextual information to improve the specificity and usefulness of the eventual LLM response. Grounding data might include metadata (such as the schema from a lakehouse or semantic model) or data points from items in a workspace, or the chat history from the current Copilot session. Copilot only retrieves grounding data that a user has access to.
5	Preprocessing results in the final inputs: a final prompt and grounding data. Which data is sent depends on the specific Copilot experience and what the user is asking for.
6	Copilot sends the input to the Azure OpenAI Service. This service is managed by Microsoft and isn't configurable by the user. Azure OpenAI doesn't train models with your data. If Azure OpenAI isn't available in your geographical area and you've enabled the tenant setting <i>Data sent to Azure OpenAI can be processed outside your capacity's geographic region, compliance boundary, or national cloud instance</i> , then Copilot might send your data outside of these geographical areas.
7	Azure OpenAI hosts LLMs like the GPT series of models. Azure OpenAI doesn't use the public services or APIs of OpenAI, and OpenAI doesn't have access to your data. These LLMs tokenize the input and use embeddings from their training data to process the inputs into a response. LLMs are limited in the scope and scale of their training data. Azure OpenAI contains configuration that determines how the LLM processes the input and which response it returns. It's not possible for customers to view or change this configuration. The call to the OpenAI Service is done via Azure, and not over the public internet.
8	The LLM response is sent from Azure OpenAI to Copilot in Fabric. This response comprises text, which might be natural language, code, or metadata. The response might include inaccurate or low-quality information. It's also non-deterministic, meaning that a different response might be returned for the same input.
9	Copilot postprocesses the LLM response. Postprocessing includes filtering for responsible AI, but also involves handling the LLM response and producing the final Copilot output. The specific steps taken during postprocessing depend on the Copilot experience an individual use.
10	Copilot returns the final output to the user. The user checks the output before use, as the output contains no indication of reliability, accuracy, or trustworthiness.

The next sections describe the five steps in the Copilot process depicted in the previous diagram. These steps explain in detail how Copilot goes from user input to user output.

Step 1: A user provides input to Copilot

To use Copilot, a user must first submit an [input](#). This input can be a written prompt that the user submits themselves, or it can be a prompt generated by Copilot when the user selects an interactive element in the UI. Depending on the specific Fabric workload, item, and Copilot experience that someone uses, they have different ways to provide an input to Copilot.

The following sections describe several examples of how a user can provide inputs to Copilot.

Input via the Copilot chat panel

With many Copilot experiences in Fabric, you can extend a Copilot chat panel to interact with Copilot using natural language like you would with a chatbot or messaging service. In the Copilot chat panel, you can write a natural language prompt describing the action that you want Copilot to take. Alternatively, the Copilot chat panel might contain buttons with suggested prompts that you can select. Interacting with these buttons causes Copilot to generate a corresponding prompt.

The following image shows an example of using the Copilot chat panel to ask a data question about a Power BI report.



Copilot

Preview



Here are some things you can try:

Create a new report page

Suggest content for a new report page

Answer this data question ...

What profit margin did the Australia sales region achieve in 2023?

The profit margin that the Australia sales region achieved in 2023 was 62.37% [1](#).

Source: Current page

Describe the report you want to create or ask a question



Content created by AI may not be accurate or appropriate, so review it carefully.
[Read terms](#)

 **Note**

If you use the Microsoft Edge browser, you might also have access to Copilot there.

[Copilot in Edge](#) can also open a Copilot chat panel (or sidebar) in your browser. The Copilot in Edge can't interact with or use any of the Copilot experiences in Fabric. While both Copilots have a similar user experience, Copilot in Edge is completely separate from Copilot in Fabric.

Input via context-dependent pop-up windows

In certain experiences, you can select the Copilot icon to trigger a pop-up window to interact with Copilot. Examples include when you use Copilot in the DAX query view or in the TMDL scripting view of Power BI Desktop. This pop-up window contains an area for you to enter a natural language prompt (similar to the Copilot chat panel) as well as context-specific buttons that can generate a prompt for you. This window might also contain output information, such as explanations about DAX queries or concepts when using Copilot in the DAX query view.

The following image shows an example of someone using the Copilot experience in the DAX query view to explain a query that they generated by using Copilot in Power BI.

The screenshot shows a DAX query in the Power BI DAX query editor. The code is as follows:

```
1
2
3  -
4+ // DAX query generated by Fabric Copilot with "YTD profit by month in 2023"
5+ DEFINE
6+     // Filter for the year 2023
7+     VAR _Filter = FILTER(
8+         ALL('Date'[Year]),
9+         'Date'[Year] == 2023
10+
11+ // YTD profit by month for the year 2023
12+ EVALUATE
13+     SUMMARIZECOLUMNS(
14+         'Date'[Month],
15+         _Filter,
16+         "Profit YTD", [Profit YTD]
17+     )
```

Below the code, there is an AI-generated explanation:

Explain this DAX query

Explained by AI

The DAX query you've provided is calculating the Year-To-Date (YTD) profit for each month in the year 2023.

Show more ▾

Content created by AI may contain mistakes, so review it carefully. [Read terms](#)

Types of user inputs

Copilot inputs can be from a written prompt or a button in the UI:

- **Written prompt:** A user can write a prompt in the Copilot chat panel, or in other Copilot experiences, like the DAX query view in Power BI Desktop. Written prompts require that the user adequately explains the instruction or question for Copilot. For instance, a user can ask a question about a semantic model or report when using Copilot in Power BI.
- **Button:** A user can select a button in the Copilot chat panel or other Copilot experiences to provide an input. Copilot then produces the prompt based on the user selection. These buttons can be the initial input to Copilot, such as the suggestions in the Copilot chat panel. However, these buttons might also appear during a session when Copilot makes suggestions or requests clarifications. The prompt Copilot generates depends on the

context, such as the chat history of the current session. An example of a button input is when you ask Copilot to suggest synonyms for model fields, or descriptions for model measures.

Additionally, you can provide inputs in different services or applications:

- **Fabric:** You can use Copilot in Fabric from your web browser. This is the only way to use Copilot for any items that you exclusively create, manage, and consume in Fabric.
- **Power BI Desktop:** You can use Copilot in Power BI Desktop with semantic models and reports. These include both the development and consumption Copilot experiences for the Power BI workload in Fabric.
- **Power BI mobile app:** You can use Copilot in the Power BI mobile app if the report is in a supported workspace (or an app connected to that workspace) with Copilot enabled.

Note

To use Copilot with Power BI Desktop, you must configure Power BI Desktop to use Copilot consumption from a supported workspace backed by Fabric capacity. Then you can use Copilot with semantic models published to any workspace, including Pro and PPU workspaces.

While you can't alter the prompts that Copilot generates when you select a button with written prompts, you can ask questions and provide instructions using natural language. One of the most important ways to improve the results you get with Copilot is to write clear and descriptive prompts that accurately convey what you want to do.

Improve written prompts for Copilot

The clarity and quality of the prompt a user submits to Copilot can affect the usefulness of the output the user receives. What constitutes a good written prompt depends on the specific Copilot experience that you're using; however, there are some techniques that you can apply to all experiences to improve your prompts in general.

Here are several ways to improve prompts that you submit to Copilot:

- **Use English language prompts:** Today, Copilot features work best in the English language. That's because the corpus of training data for these LLMs is mostly English. Other languages might not perform as well. You can try to write prompts in other languages, but for the best results, we recommend that you write and submit English language prompts.

- **Be specific:** Avoid ambiguity or vagueness in questions and instructions. Include sufficient details to describe the task you want Copilot to perform, and what is the output that you expect.
- **Provide context:** Where necessary, provide relevant context for your prompt, including what you intend to do or what question you want to answer with an output. For instance, the key components for a good prompt could include:
 - *Goal:* What output you want Copilot to achieve.
 - *Context:* What you intend to do with that particular output and why.
 - *Expectations:* What you expect the output will look like.
 - *Source:* What data or fields Copilot should use.
- **Use verbs:** Refer explicitly to specific actions that you want Copilot to take, such as "*create* a report page" or "*filter* to customer key accounts".
- **Use correct and relevant terminology:** Refer explicitly to the appropriate terms in your prompt, like function, field, or table names, visual types, or technical terminology. Avoid misspellings, acronyms, or abbreviations, as well as superfluous grammar, or atypical characters like Unicode characters or emojis.
- **Iterate and troubleshoot:** When you don't get the expected result, try to adjust your prompt and re-submit it to see if this improves the output. Some Copilot experiences also provide a *Retry* button to re-submit the same prompt and check for a different result.

Important

Consider training users to write good prompts before you enable Copilot for them. Ensure that users understand the difference between a clear prompt that can produce useful results, and a vague prompt that doesn't.

Also, Copilot and many other LLM tools are *non-deterministic*. This means that two users submitting the same prompt that uses the same grounding data can obtain different results. This non-determinism is inherent to the underlying technology of generative AI, and is an important consideration when you expect or need deterministic results, such as an answer to a data question, like "*What are the sales in August 2021?*"

Other input information that Copilot uses in preprocessing

Aside from input that a user provides, Copilot also retrieves additional information that it uses in preprocessing during the next step. This information includes:

- **The user's token.** Copilot doesn't operate under a system account or authority. All information sent to and used by Copilot is specific to the user; Copilot can't allow a user to view or access items or data that they don't already have permission to view.
- **The Copilot session chat history for the current session.** For chat experiences or the Copilot chat panel, Copilot always provides the Chat history for use in preprocessing as part of the grounding data context. Copilot doesn't remember or use chat history from previous sessions.
- **Meta-prompt with system metadata.** A meta-prompt provides additional context about where the user is and what they're doing in Fabric or Power BI Desktop. This meta-prompt information is used during preprocessing to determine which skill or tool Copilot should use to answer the user's question.

Once a user submits their input, Copilot proceeds to the next step.

Step 2: Copilot preprocesses the input

Before submitting a prompt to the Azure OpenAI Service, Copilot *preprocesses* it. Preprocessing constitutes all actions that are handled by Copilot between when it receives the input and when this input is processed in the Azure OpenAI Service. Preprocessing is necessary to ensure that Copilot's output is specific and appropriate to your instructions or questions.

You can't affect what preprocessing is done by Copilot. However, it's important to understand preprocessing so that you know what data Copilot uses and how it gets it. This is pertinent to understanding the cost of Copilot in Fabric, and when you troubleshoot why it produces an incorrect or unexpected result.

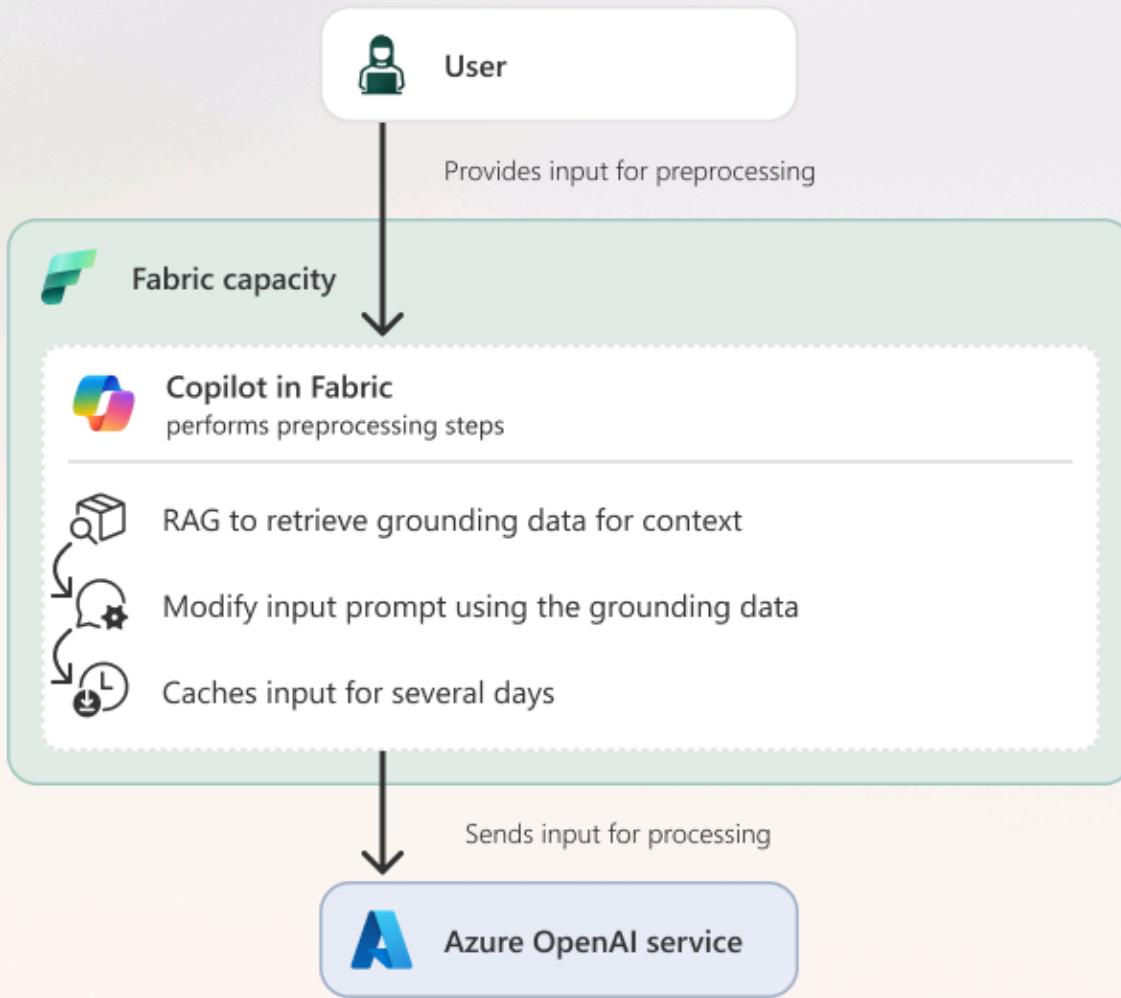
💡 Tip

In certain experiences, you can also make changes to items so that their grounding data is better structured for Copilot to use. An example is performing linguistic modeling in a semantic model, or adding synonyms and descriptions to semantic model measures and columns.

The following diagram depicts what happens during preprocessing by Copilot in Fabric.



Preprocessing of input by Copilot



After receiving user input, Copilot performs preprocessing, which involves the following steps:

- **Grounding:** Copilot performs retrieval augmented generation (RAG) to collect *grounding data*. Grounding data comprises relevant information from the current context in which you're using Copilot in Fabric. Grounding data might include context such as:
 - The chat history from the current session with Copilot.
 - Metadata about the Fabric item that you're using with Copilot (like the schema of your semantic model or lakehouse, or metadata from a report visual).
 - Specific data points, such as those displayed in a report visual. *Report metadata* in the visual configuration also contains data points.
 - Meta-prompts, which are supplemental instructions provided for each experience to help ensure a more specific and consistent output.

- **Prompt augmentation:** Depending on the scenario, Copilot rewrites (or *augments*) the prompt based on the input and grounding data. The augmented prompt should be better and more context-aware than your original input prompt.
- **Caching:** In certain scenarios, Copilot caches your prompt and the grounding data for 48 hours. Caching the prompt ensures that repeated prompts return the same results while cached, that they return these results faster, and that you aren't consuming Fabric capacity just for repeating a prompt in the same context. Caching occurs in two different places:
 - The browser cache of the user.
 - The first back-end cache in the home region of the tenant, where it's stored for auditing purposes. No data is cached in the Azure OpenAI Service or the location of the GPUs. For more information about caching in Fabric, refer to the [Microsoft Fabric security whitepaper](#).
- **Sending input to Azure OpenAI:** Copilot sends the augmented prompt and the relevant grounding data to the Azure OpenAI Service.

When Copilot performs grounding, it only collects information from data or items that a user can access normally. Copilot respects workspace roles, item permissions, and data security. Copilot also can't access data from other users; interactions with Copilot are specific to each individual user.

The data that Copilot collects during the grounding process and what Azure OpenAI processes depends on the specific Copilot experience that you use. For more information, see [What data does Copilot use and how is it processed?](#).

After the preprocessing is finished and Copilot has sent the input to Azure OpenAI, the Azure OpenAI Service can process that input to produce a response and output that's sent back to Copilot.

Step 3: Azure OpenAI processes the prompt and generates an output

All Copilot experiences are powered by the Azure OpenAI Service.

Understand the Azure OpenAI Service

Copilot uses Azure OpenAI—not OpenAI's publicly available services—to process all data and return a response. As mentioned earlier, this response is produced by an *LLM*. LLMs are a specific approach to "narrow" AI that focus on using deep learning to find and reproduce

patterns in unstructured data; specifically, text. Text in this context includes natural language, metadata, code, and any other semantically meaningful arrangement of characters.

Copilot currently uses a combination of GPT models, including the Generative Pre-trained Transformer (GPT) series of models from OpenAI.

(!) Note

You can't choose or change the models Copilot uses, including using other foundation models or your own models. Copilot in Fabric uses various models. It's also not possible for you to alter or configure the Azure OpenAI Service to behave differently with Copilot in Fabric; this service is managed by Microsoft.

The models used by Copilot in Fabric presently don't use any fine-tuning. The models instead rely on grounding data and meta-prompts to create more specific and useful outputs.

The models used by Copilot in Fabric presently don't use any fine-tuning. The models instead rely on grounding data and meta-prompts to create more specific and useful outputs.

Microsoft hosts the OpenAI models in Microsoft's Azure environment and the service doesn't interact with any public services by OpenAI (for example, ChatGPT or the public OpenAI APIs). Your data isn't used to train models and isn't available to other customers. For more information, see [Azure OpenAI Service](#).

Understand tokenization

It's essential that you understand tokenization since [the cost of Copilot in Fabric \(which is how much Fabric capacity Copilot consumes\)](#) is determined by the number of tokens produced by your Copilot inputs and outputs.

To process the text input from Copilot, Azure OpenAI must first convert that input into a numerical representation. A key step in this process is *tokenization*, which is the partitioning of input text into different, smaller parts, called *tokens*. A token is a set of co-occurring characters, and it's the smallest unit of information that an LLM uses to produce its output. Each token has a corresponding numerical ID, which becomes the vocabulary of the LLM to encode and use text as numbers. There are different ways to tokenize text, and different LLMs tokenize input text in different ways. Azure OpenAI uses [Byte-Pair Encoding \(BPE\)](#), which is a method of subword tokenization.

To better understand what a token is and how a prompt becomes tokens, consider the following example. This example shows an input prompt and its tokens, estimated using the

OpenAI Platform tokenizer [\(for GPT4\)](#). Beneath the highlighted tokens in the prompt text is an array (or list) of the numerical token IDs.

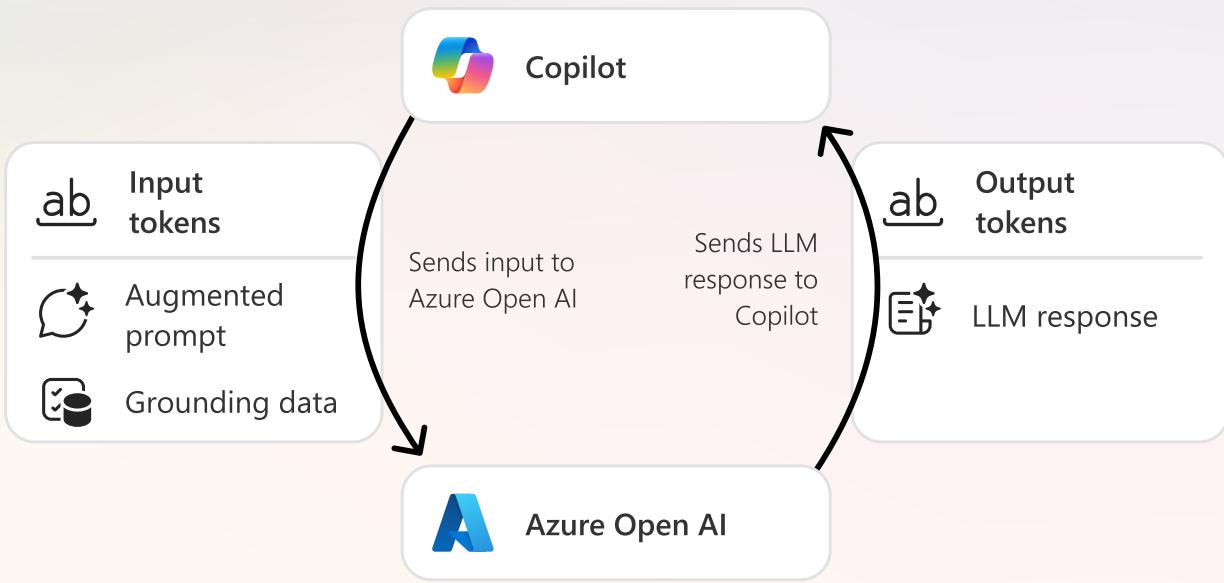
The screenshot shows the Azure OpenAI Platform tokenizer interface. At the top, a header reads "ab Input prompt tokens". Below this, two sections are displayed: "Tokens" (7) and "Characters" (27). A text input field contains the prompt "Summarize this report page.". Below the input field are two buttons: "Text" (grayed out) and "Token IDs" (highlighted in green). The "Text" button is used to view the input text, while the "Token IDs" button is used to view the numerical representation of the tokens. The "Token IDs" section displays the list [64614, 277, 750, 290, 3019, 3011].

In the example, each differently colored highlight indicates a single token. As mentioned previously, Azure OpenAI uses *subword* tokenization, so a token isn't a word, but it also isn't a character, or a fixed number of characters. For instance "*report*" is a single token, but "*.*" is, too.

To reiterate, you should understand what a token is because [the cost of Copilot \(or its Fabric capacity consumption rate\) is determined by tokens](#). Therefore, understanding what a token is and how input and output tokens are created helps you understand and anticipate how Copilot usage results in consumption of Fabric CUs. For more information about the [cost of Copilot in Fabric](#), see the appropriate section later in this article.

Copilot in Fabric uses both input and output tokens, as depicted in the following diagram.

ab Input and output tokens in Copilot



Copilot creates two different kinds of tokens:

- *Input tokens* result from tokenizing both the final prompt and any grounding data.
- *Output tokens* result from tokenizing the LLM response.

Some Copilot experiences result in multiple LLM calls. For instance, when asking a data question about models and reports, the first LLM response might be a query evaluated against a semantic model. Copilot then sends the result of that evaluated query to Azure OpenAI again and requests a summary, which Azure OpenAI returns with another response. These additional LLM calls might be handled and the LLM responses combined during the postprocessing step.

ⓘ Note

With Copilot in Fabric, except for changes to a written input prompt, you can only optimize input and output tokens by adjusting the configuration of the relevant items, like hiding columns in a semantic model or reducing the number of visuals or pages in a report. You can't intercept or modify the grounding data before it's sent to Azure OpenAI by Copilot.

Understand processing

It's important that you understand how an LLM in Azure OpenAI processes your data and produces an output, so that you can better understand why you get certain outputs from Copilot and why you should critically appraise them before further use or decision-making.

Note

This article provides a simple, high-level overview of how the LLMs that Copilot uses (like GPTs) work. For technical details and a deeper understanding of how GPT models process input to produce a response, or about their architecture, read the research papers

[Attention Is All You Need](#) (2017) by Ashish Vaswani and others, and [Language Models are Few-Shot Learners](#) (2020) by Tom Brown and others.

The purpose of Copilot (and LLMs in general) is to provide a context-appropriate, useful output, based on the input that a user provides and other relevant grounding data. An LLM does this by interpreting the meaning of tokens in a similar context, as seen in their training data. To get a meaningful semantic understanding of tokens, LLMs have been trained on massive datasets thought to [comprise both copyrighted and public domain information](#). However, this training data is limited in terms of content freshness, quality, and scope, which creates limitations for LLMs and the tools that use them, such as Copilot. For more information about these limitations, see [Understand the limitations of Copilot and LLMs](#) later in this article.

The semantic meaning of a token is captured in a mathematical construct referred to as an [embedding](#), which turns tokens into dense vectors of real numbers. In simpler terms, embeddings provide LLMs with the semantic meaning of a given token, based on the other tokens around it. This meaning depends on the LLM training data. Think of tokens like unique building blocks, while embeddings help an LLM know what block to use when.

Using tokens and embeddings, the LLM in Azure OpenAI processes your input and generates a response. This processing is a computationally intensive task that requires significant resources, which is where the cost comes from. An LLM produces its response one token at a time, where it selects each token using a computed probability based on the input context. Each generated token is also added to that existing context before producing the next token. The final response of the LLM must therefore always be text, which Copilot might later postprocess to make a more useful output for the user.

It's important to understand several key aspects about this generated response:

- It's non-deterministic; the same input can produce a different response.
- It can be interpreted as low-quality or incorrect by the user in their context.
- It's based on the LLM training data, which is finite and limited in its scope.

Understand the limitations of Copilot and LLMs

It's important to understand and acknowledge the limitations of Copilot and the underlying technology that it uses. Understanding these limitations helps you to get value from Copilot while also mitigating risks inherent to using it. To use Copilot in Fabric effectively, you should understand the use-cases and scenarios that best fit this technology.

It's important to keep the following considerations in mind when you use Copilot in Fabric:

- **Copilot in Fabric is non-deterministic.** Except for when a prompt and its output are cached, the same input can produce different outputs. When you accept a range of possible outputs—like a report page, a code pattern, or a summary—this is less of a problem, because you can tolerate and might even expect variety in the response. However, for scenarios when you expect only one correct answer, you might want to consider an alternative approach to Copilot.
- **Copilot in Fabric can produce low quality or inaccurate outputs:** Like all LLM tools, it's possible for Copilot to produce outputs that might not be correct, expected, or suitable for your scenario. This means that you should avoid using Copilot in Fabric with sensitive data or in high-risk areas. For example, you shouldn't use Copilot outputs to answer data questions about business-critical processes, or to create data solutions that might affect the personal or collective well-being of individuals. Users should check and validate Copilot outputs before they use them.
- **Copilot has no understanding of "accuracy" or "truthfulness":** The outputs that Copilot provides don't provide an indication of trustworthiness, reliability, or similar sentiments. The underlying technology involves pattern recognition and is unable to evaluate the quality or usefulness of its outputs. Users should critically evaluate outputs before they use these outputs in other work or decision-making.
- **Copilot can't reason, understand your intent, or know context beyond its input:** While the grounding process of Copilot ensures that outputs are more specific, grounding alone can't give Copilot all the information that it needs to answer your questions. For instance, if you use Copilot to generate code, Copilot still doesn't know what you'll do with that code. This means that the code might work in one context, but not another, and users must either modify the output or their prompt to address this.
- **Copilot outputs are limited by the training data of the LLMs it uses:** In certain Copilot experiences, such as those where you generate code, you might want Copilot to generate code with a newly released function or pattern. However, Copilot won't be able to do this effectively if there are no examples of that in the training data of the GPT models it uses, which has a cutoff in the past. This also happens when you try to apply Copilot to contexts that are sparse in its training data, like when using Copilot with the TMDL editor

in Power BI Desktop. In these scenarios, you should be particularly vigilant and critical of low-quality or inaccurate outputs.

Warning

To mitigate the risks of these limitations and considerations, and the fact that Copilot, LLMs, and generative AI are nascent technology, you *should not* use Copilot in Fabric for autonomous, high-risk, or business-critical processes and decision-making.

For more information, see [Security guidance for LLMs](#).

Once the Azure OpenAI Service processes the input and produces a response, it returns this response as an output to Copilot.

Step 4: Copilot performs postprocessing on the output

Upon receiving the response from Azure OpenAI, Copilot performs additional postprocessing to ensure that the response is appropriate. The purpose of postprocessing is to filter out inappropriate content.

To perform postprocessing, Copilot might perform the following tasks:

- **Responsible AI checks:** Ensuring Copilot complies with the responsible AI standards at Microsoft. For more information, see [What should I know to use Copilot responsibly?](#)
- **Filtering with Azure content moderation:** Filtering responses to ensure that Copilot only returns responses appropriate to the scenario and experience. Here are some examples of how Copilot performs filtering with Azure content moderation:
 - *Unintended or improper use:* Content moderation ensures that you can't use Copilot in unintended or improper ways, such as asking questions about other topics outside the scope of the workload, item, or experience you're using.
 - *Inappropriate or offensive outputs:* Copilot prevents outputs that could contain unacceptable language, terms, or phrases.
 - *Attempts of prompt injection:* Copilot prevents prompt injection, where users attempt to hide disruptive instructions in grounding data, like in object names, descriptions, or code comments in a semantic model.
- **Scenario-specific constraints:** Depending on which Copilot experience you use, there might be additional checks and handling of the LLM response before you receive the output. Here are some examples of how Copilot enforces scenario-specific constraints:
 - *Code parsers:* Generated code might be put through a parser to filter out low-quality responses and errors to ensure that the code runs. This happens when you generate

DAX queries by using Copilot in the DAX query view of Power BI Desktop.

- *Validation of visuals and reports:* Copilot checks that visuals and reports can render before returning them in an output. Copilot doesn't validate whether the results are accurate or useful, or whether the resulting query will time out (and produce an error).
- **Handling and using the response:** Taking the response and adding additional information or using it in other processes to provide the output to the user. Here are some examples of how Copilot might handle and use a response during postprocessing:
 - *Power BI report page creation:* Copilot combines the LLM response (report visual metadata) with other report metadata, which results in creating a new report page. Copilot might also apply a *Copilot theme* if you haven't created any visuals in the report yet. The theme isn't part of the LLM response, and it includes a background image, as well as colors and visual styles. If you've created visuals, then Copilot doesn't apply the Copilot theme and uses the theme you already have applied. When changing a report page, Copilot will also delete the existing page and replace it with a new one with the adjustments applied.
 - *Power BI data questions:* Copilot evaluates a query against a semantic model.
 - *Data factory dataflow gen2 transformation step suggestion:* Copilot modifies the item metadata to insert the new step, adjusting the query.
- **Additional LLM calls:** In certain scenarios, Copilot might perform additional LLM calls to enrich the output. For instance, Copilot might submit the result of an evaluated query to the LLM as a new input and request an explanation. This natural language explanation is then packaged together with the query result in the output that a user sees in the Copilot chat panel.

If content is filtered out in the output, then Copilot will either re-submit a new, modified prompt, or return a standard response.

- **Resubmit a new prompt:** When a response doesn't meet scenario-specific constraints, Copilot will produce another modified prompt to try again. In some circumstances, Copilot might suggest several new prompts for the user to select before submitting the prompt to generate a new output.
- **Standard response:** The standard response in this case would indicate a generic error. Depending on the scenario, Copilot might provide additional information to guide the user to produce another input.

Note

It isn't possible to view the original, filtered responses from Azure OpenAI, or to alter the standard responses from or behavior of Copilot. This is managed by Microsoft.

After postprocessing is complete, Copilot will then return an output to the user.

Step 5: Copilot returns the output to the user

The output for a user can take the form of natural language, code, or metadata. This metadata will typically be rendered in the UI of Fabric or Power BI Desktop, such as when Copilot returns a Power BI visual or suggests a report page. For some Copilot in Power BI experiences, the user can provide both inputs and outputs to Copilot via the Power BI mobile app.

In general, outputs can either allow user intervention or be fully autonomous and not allow the user to alter the result.

- **User intervention:** These outputs allow a user to modify the result before it's evaluated or displayed. Some examples of outputs that allow user intervention include:
 - Generation of code like DAX or SQL queries, which a user can choose to keep or run.
 - Generation of measure descriptions in a semantic model, which a user can choose to keep, modify, or delete.
- **Autonomous:** These outputs can't be altered by the user. The code might be evaluated directly against a Fabric item, or the text isn't editable in the pane. Some examples of autonomous outputs include:
 - Answers to data questions about a semantic model or report in the Copilot chat panel, which automatically evaluate queries against the model and show the result.
 - Summaries or explanations of code, items, or data, which automatically choose what to summarize and explain, and show the result.
 - Creation of a report page, which automatically creates the page and visuals in the report.

Sometimes, as part of the output, Copilot might also suggest an additional, follow-up prompt, such as requesting clarification, or another suggestion. This is typically useful when the user wants to improve the result or continue working on a specific output, like explaining a concept to understand generated code.

Outputs from Copilot might contain low-quality or inaccurate content

Copilot has no way to evaluate or indicate the usefulness or accuracy of its outputs. As such, it's important that users evaluate this themselves whenever they use Copilot.

To mitigate risks or challenges from LLM hallucinations in Copilot, consider the following advice:

- Train users to use Copilot and other similar tools that leverage LLMs. Consider training them on the following topics:

- What Copilot can and can't do.
- When to use Copilot and when not to use it.
- How to write better prompts.
- How to troubleshoot unexpected results.
- How to validate outputs by using trusted online sources, techniques, or resources.
- Test items with Copilot before you allow these items to be used with it. Certain items require certain preparatory tasks to ensure that they work well with Copilot.
- Avoid using Copilot in [autonomous, high-risk, or business-critical decision-making processes](#).

 **Important**

Additionally, review the [supplemental preview terms for Fabric](#), which include terms of use for Microsoft Generative AI Service Previews. While you can try and experiment with these preview features, we recommend that you don't use Copilot features in preview in production solutions.

Privacy, security, and responsible AI

Microsoft is committed to ensuring that our AI systems are guided by our [AI principles](#) and [Responsible AI Standard](#). See [Privacy, security, and responsible use of Copilot in Fabric](#) for a detailed overview. See also [Data, privacy, and security for Azure OpenAI Service](#) for detailed information specific for Azure OpenAI.

For an overview specifically for each Fabric workload, see the following articles:

- [Responsible use in Data Factory](#)
- [Responsible use in Data Science and Data Engineering](#)
- [Responsible use in Data Warehousing](#)
- [Responsible use in Power BI](#)
- [Responsible use in Real-Time Intelligence](#)

Cost of Copilot in Fabric

Unlike other Microsoft Copilots, Copilot in Fabric doesn't require additional per-user or per-capacity licenses. Rather, Copilot in Fabric consumes from your available Fabric capacity units (CUs). The consumption rate of Copilot is determined by the number of tokens in your inputs and outputs when you use it across the various experiences in Fabric.

If you have a Fabric capacity, you're using either a [pay-as-you-go or reserved instance](#). In both cases, Copilot consumption works the same. In a pay-as-you-go scenario, you're billed per second that your capacity is active until you pause your capacity. Billing rates have no relationship to the usage of your Fabric CUs; you pay the same amount if your capacity is fully utilized or completely unused. As such, Copilot doesn't have a direct cost or impact on your Azure billing. Rather, Copilot consumes from the available CUs which other Fabric workloads and items also use, and if you use too much, users will experience reduced performance and [throttling](#). It's also possible to enter a state of CU debt called *carryforward*. For more information about throttling and carryforward, see [Throttle triggers and throttle stages](#).

The following sections explain more about how you should understand and manage Copilot consumption in Fabric.

 **Note**

For more information, see [Copilot in Fabric consumption](#).

Copilot consumption in Fabric is determined by tokens

Copilot consumes your available Fabric CUs, also commonly referred to as *capacity*, *compute*, or *resources*. The consumption is determined by the input and output tokens when you use it. To review, you can understand input and output tokens as a result of tokenizing the following:

- *Input tokens*: Tokenization of your written prompt and grounding data.
- *Output tokens*: Tokenization of the Azure OpenAI response, based on the input. Output tokens are [three times more expensive than input tokens](#).

You can limit the number of input tokens by using shorter prompts, but you can't control what grounding data Copilot uses for preprocessing, or the number of output tokens that the LLM in Azure OpenAI returns. For instance, you can expect that the [report creation experience](#) for Copilot in Power BI will have a high consumption rate, since it might use grounding data (like your model schema) and might produce a verbose output (report metadata).

Inputs, outputs, and grounding data are converted to tokens

To reiterate from an earlier section in this article, it's important to understand the [tokenization process](#) so that you know what kinds of inputs and outputs produce the highest consumption.

Optimizing prompt tokens isn't likely to have a significant effect on your Copilot costs. For instance, the number of tokens in a written user prompt is typically much smaller than the tokens of grounding data and outputs. Copilot handles the grounding data and outputs

autonomously; you can't optimize or influence these tokens. For instance, when using Copilot in Power BI, Copilot might use the schema from of your semantic model or metadata from your report as grounding data during preprocessing. This metadata likely comprises many more tokens than your initial prompt.

Copilot performs various system optimizations to reduce input and output tokens. These optimizations depend on the Copilot experience that you're using. Examples of system optimizations include:

- **Schema reduction:** Copilot doesn't send the entire schema of a semantic model or lakehouse table. Instead, it uses embeddings to determine which columns to send.
- **Prompt augmentation:** When rewriting the prompt during preprocessing, Copilot tries to produce a final prompt that will return a more specific result.

Additionally, there are various user optimizations that you can implement to limit what grounding data Copilot can see and use. These user optimizations depend on the item and experience that you're using. Some examples of user optimizations include:

- **Hiding fields or marking tables as *private* in a semantic model:** Any hidden or private objects won't be considered by Copilot.
- **Hiding report pages or visuals:** Similarly, any hidden report pages or visuals hidden behind a report bookmark are also not considered by Copilot.

Tip

User optimizations are mainly effective for improving the usefulness of Copilot outputs, rather than optimizing Copilot cost. For more information, see articles specific to the various workloads and Copilot experiences.

You have no visibility on the tokenization process, and you can only minimally impact the input and output tokens. As such, the most effective way for you to manage Copilot consumption and avoid [throttling](#) is by managing Copilot usage.

Copilot is a background operation that's smoothed

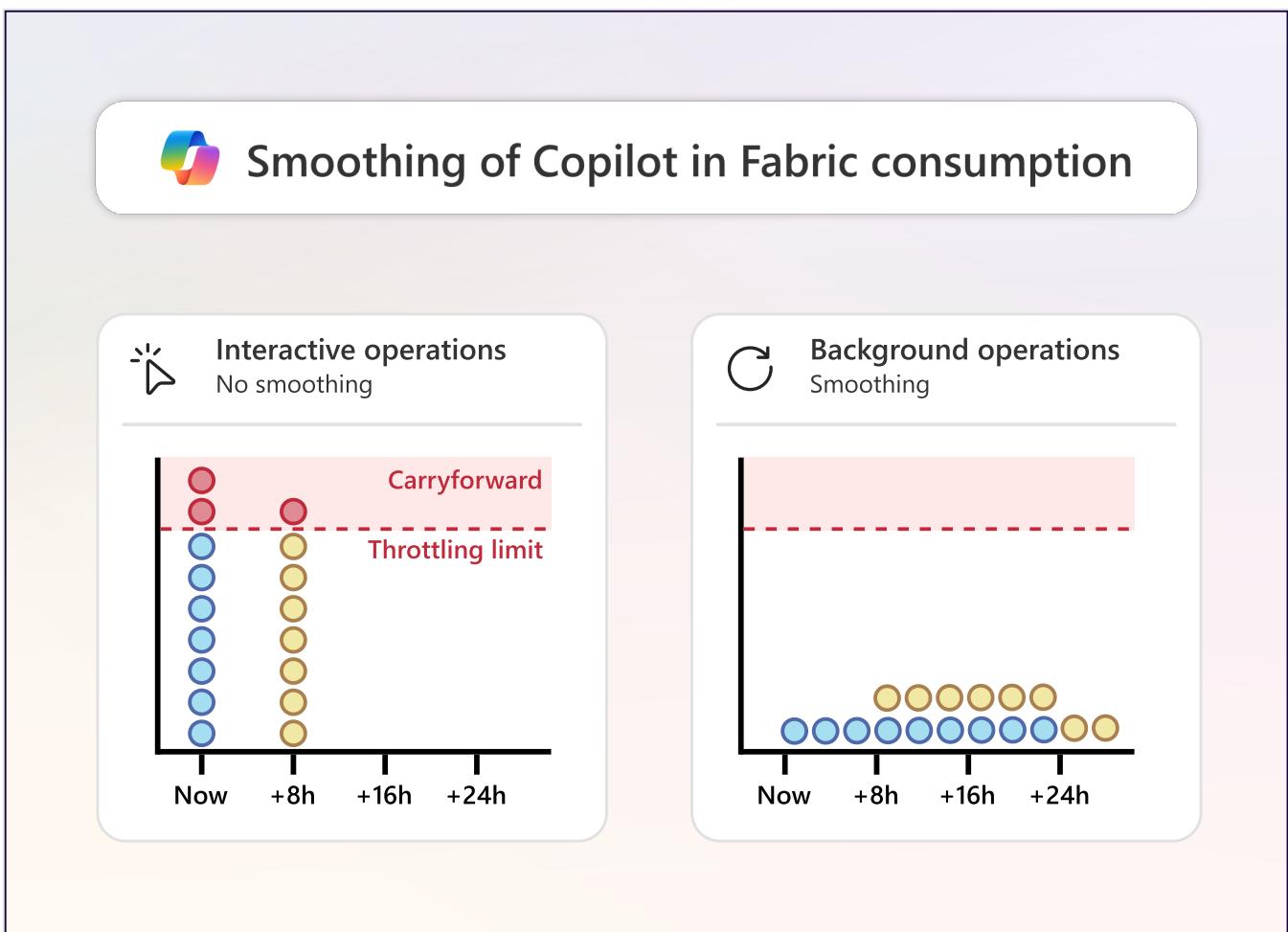
Concurrent usage of Copilot in Fabric—when many individuals are using it at the same time—is handled by a process called *smoothing*. In Fabric, any operation classified as a [*background operation*](#) has its CU consumption divided over a 24-hour window, starting from the time of the operation to exactly 24 hours later. This is in contrast to [*interactive operations*](#), like semantic model queries from individuals using a Power BI report, which aren't smoothed.

⚠ Note

To simplify your understanding, background and interactive operations classify different things that happen in Fabric for billing purposes. They don't necessarily relate to whether an item or feature is *interactive for a user* or *happening in the background*, as their names might suggest.

For example, if you use 48 CUs with a background operation now, it results in 2 CUs of consumption now, and also 2 CUs each hour from now until 24 hours from now. If you use 48 CUs with an interactive operation, it results in an observed 48 CUs used *now*, and has no effect on future consumption. However, smoothing also means that you can potentially accumulate CU consumption *in that window* if your usage of Copilot or other Fabric workloads is sufficiently high.

To better understand smoothing and its effects on your Fabric CU consumption, consider the following diagram:



The diagram depicts an example of a scenario with high concurrent usage of an interactive operation (which isn't smoothed). An interactive operation crosses the throttling limit (the available Fabric capacity) and enters carryforward. This is the scenario without smoothing. In contrast, background operations like Copilot have the consumption spread over 24 hours.

Subsequent operations within that 24-hour window will "stack" and contribute to total cumulative consumption in that period. In the smoothed scenario of this example, the background operations like Copilot would contribute to future CU consumption, but don't trigger throttling or cross any limits.

Monitor Copilot consumption in Fabric

Fabric administrators can monitor how much Copilot consumption is occurring in your Fabric capacity by using the [Microsoft Fabric Capacity Metrics app](#). In the app, a Fabric administrator can view a breakdown by activity and user, helping them to identify the individuals and areas where they might need to focus during periods of high consumption.

💡 Tip

Rather than considering abstract calculations like tokens to CUs, we recommend that you focus on the *percentage of your Fabric capacity* that you've utilized. This metric is the simplest to understand and act upon, because once you reach 100% utilization, you can experience [throttling](#).

You can find this information on the [timepoint page of the app](#).

❗ Note

When you pause a capacity, the smoothed usage is compacted into the timepoint in which the capacity becomes paused. This compaction of the smoothed consumption results in a peak of observed consumption, which doesn't reflect your actual usage. This peak will often produce notifications and warnings that you've exhausted your available Fabric capacity, but these are false positives.

Alleviate high utilization and throttling

Copilot consumes Fabric CUs, and even with smoothing, you might encounter situations of high utilization, which leads to high consumption, and throttling of your other Fabric workloads. The following sections discuss some strategies you can use to alleviate the impact on your Fabric capacity in this scenario.

User training and allowlisting

An important way to ensure effective adoption of any tool is to equip users with sufficient mentoring and training, and to gradually roll out access as people complete such training.

Effective training is a preventative measure to avoid high utilization and throttling preemptively, by educating users about how to use Copilot effectively and on what not to do.

You can best control who can use Copilot in Fabric by creating an *allowlist* of users with access to the feature from the Fabric tenant settings. This means that you enable Copilot in Fabric only for users who belong to specific security groups. If necessary, you might create separate security groups for each of the Fabric workloads where you can enable Copilot to obtain finer grain control over who can use which Copilot experiences. For more information about creating security groups, see [Create, edit, or delete a security group](#).

Once you add specific security groups to the Copilot tenant settings, you can put together onboarding training for users. A Copilot training course should cover basic topics, such as the following.

Tip

Consider creating an overview training for basic concepts about LLMs and generative AI, but then create workload-specific training for users. Not every individual needs to learn about every Fabric workload if it isn't necessarily relevant to them.

- **LLMs:** Explain the basics of what an LLM is and how it works. You shouldn't go into technical details, but you should explain concepts like prompts, grounding, and tokens. You can also explain how LLMs can get meaning from input and produce context-appropriate responses because of their training data. Teaching this to users helps them understand how the technology works and what it can and can't do.
- **What Copilot and other generative AI tools are used for:** You should explain that Copilot isn't an autonomous agent and isn't intended to replace humans in their tasks, but meant to augment individuals to potentially perform their current tasks better and faster. You should also emphasize cases where Copilot isn't suitable, using specific examples, and explain what other tools and information individuals might use to address their problems in those scenarios.
- **How to critically appraise Copilot outputs:** It's important that you guide users about how they can validate Copilot outputs. This validation depends on the Copilot experience they're using, but in general, you should emphasize the following points:
 - Check each output before you use it.
 - Evaluate and ask yourself if the output is correct or not.
 - Add comments to generated code to understand how it works. Alternatively, ask Copilot for explanations for that code, if necessary, and cross-reference that explanation with trusted sources.

- If the output produces an unexpected result, troubleshoot with different prompts or by performing manual validation.
- **Risks and limitations of LLMs and generative AI:** You should explain key risks and limitations of Copilot, LLMs, and generative AI, such as those mentioned in this article:
 - They're non-deterministic.
 - They provide no indication or guarantees of accuracy, reliability, or truthfulness.
 - They can hallucinate and produce inaccurate or low-quality outputs.
 - They can't generate information that spans outside the scope of their training data.
- **Where to find Copilot in Fabric:** Provide A a high-level overview of the different workloads, items, and Copilot experiences that someone might use.

Scale your capacity

When you experience throttling in Fabric due to Copilot consumption or other operations, you can [temporarily scale \(or resize\) your capacity](#) to a higher SKU. This is a reactive measure that temporarily elevates your cost to alleviate short-term issues due to throttling or carryforward. This is particularly helpful when you experience throttling primarily due to background operations, since the consumption (and thus the impact) might be spread over a 24-hour window.

Split-capacity strategies

In scenarios where you expect a high usage of Copilot in Fabric (such as in large organizations), you might consider isolating Copilot consumption from your other Fabric workloads. In this split-capacity scenario, you prevent Copilot consumption from negatively impacting other Fabric workloads by enabling Copilot only on a separate F64 or higher SKU, which you only use for dedicated Copilot experiences. This split-capacity strategy produces higher cost, but it might make it easier to manage and govern Copilot usage.

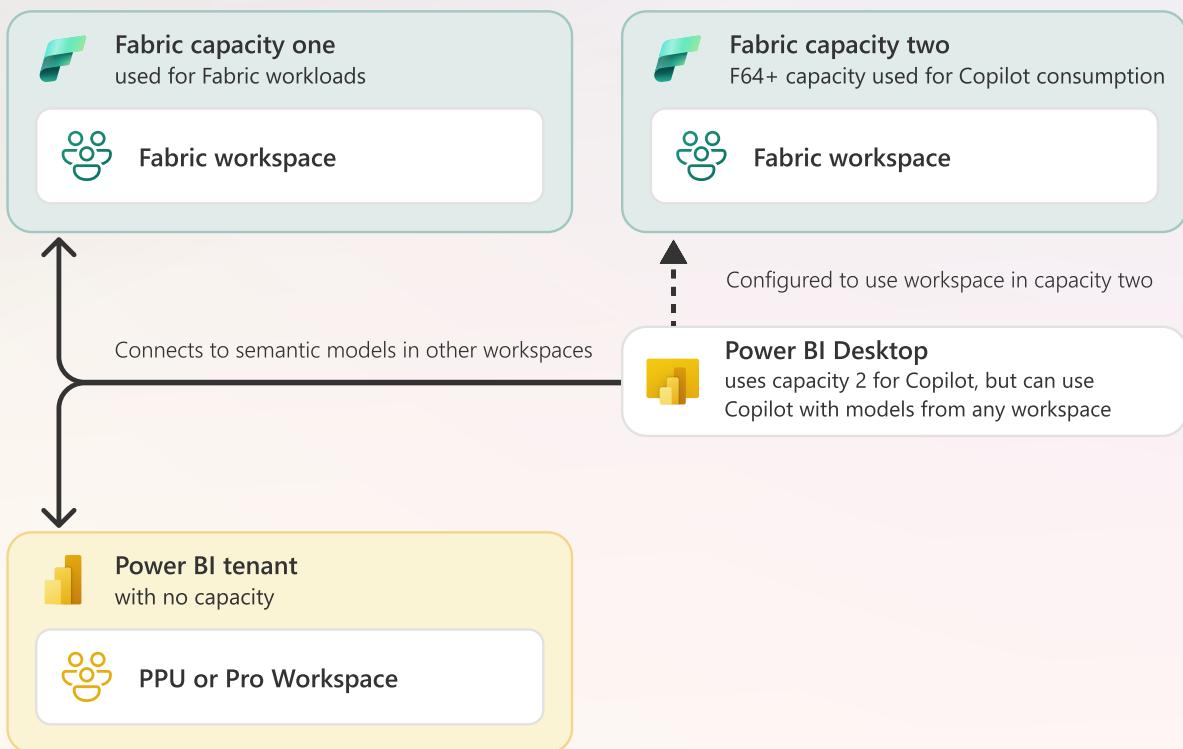
Tip

You can use some Copilot experiences with items in other capacities that don't support or enable Copilot. For example, in Power BI Desktop, you can link to a workspace with an F64 SKU Fabric capacity, but then connect to a semantic model in an F2 or PPU workspace. Then, you can use Copilot experiences in Power BI Desktop, and the Copilot consumption will only affect the F64 SKU.

The following diagram depicts an example of a split-capacity strategy to isolate Copilot consumption with experiences like those in Copilot in Power BI Desktop.



Split capacity strategy to manage Copilot consumption



You can also use a split-capacity solution by [assigning Copilot consumption to a separate capacity](#). Assigning Copilot consumption to a separate capacity ensures that high utilization of Copilot doesn't impact your other Fabric workloads and the business-critical processes that depend on them. Of course, using any split-capacity strategy requires that you already have two or more F64 or higher SKUs. As such, this strategy might not be manageable for smaller organizations or organizations with a limited budget to spend on their data platforms.

Irrespective of how you choose to manage Copilot, what's most important is that you monitor Copilot consumption in your Fabric capacity.

Related content

- [Overview of Copilot in Fabric](#)
- [Copilot for Microsoft Fabric and Power BI: FAQ](#)
- [Copilot tenant settings](#)

Copilot in Fabric glossary and terms

Article • 04/17/2025

This article provides an overview of selected key terms and their definitions in the context of Copilot in Fabric. Refer to these terms when you read articles on Copilot in Fabric, or when you use Copilot and need a reminder about what a term or name means.

 Expand table

Term	Definition (in context of Copilot in Fabric)
<i>Azure AI Search (formerly Azure Cognitive Search)</i>	<p>A search and retrieval system with a comprehensive set of advanced search technologies, built for high-performance applications at any scale. Azure AI Search is the primary recommended retrieval system when building RAG-based applications on Azure, with native LLM integrations between Azure OpenAI Service and Azure Machine Learning.</p>
	'
	You use Azure AI Search to create your own copilots.
<i>Azure OpenAI Service (Azure OpenAI)</i>	<p>Provides REST API access to OpenAI's language models. Azure OpenAI Service is a Microsoft-managed service which doesn't use the public OpenAI services or resources. Copilot sends the preprocessed input to Azure OpenAI so that the input can be processed. After processing, Azure OpenAI returns an LLM response to Copilot for postprocessing.</p>
	You can't view, access, or modify Azure OpenAI Services used for Copilot in Fabric.
<i>Capacity units (CUs)</i>	<p>How you measure capacity usage by using the Microsoft Fabric Capacity Metrics app. The number of CUs you have depends on your Fabric capacity SKU; higher SKUs have a higher number of available CUs. When you use 100% of your available CUs, you can enter a state of throttling, which might result in degraded performance and errors.</p>
	Copilot in Fabric consumes from your available Fabric CUs.
<i>Capacity usage</i>	The compute impact of all your capacity operations.
	Copilot in Fabric is a background operation that results in capacity usage.
<i>Consumption (of Fabric CUs)</i>	The use of Fabric CUs. Synonymous with capacity usage.
	Using Copilot in Fabric results in consumption of your Fabric CUs.
<i>Copilot</i>	A generative AI assistant that aims to enhance the data analytics experience in the Fabric platform. There are different Copilots in each workload, and different Copilot experiences depending on what item and UI you're working with.
<i>Embedding (in the context of LLMs)</i>	The process of turning tokens into dense vectors of real numbers. Embeddings provide LLMs with the semantic meaning of a given token based on other tokens

Term	Definition (in context of Copilot in Fabric)
	around it in a sentence or paragraph.
<i>Experience</i>	<p>A functional module for Copilot, such as the DAX query experience, which generates DAX code, and the report page generation experience, which generates visuals for a Power BI report page.</p> <p>When you use Copilot in Fabric, you use different Copilot experiences. Each workload and item can have multiple experiences.</p>
<i>Foundation model</i>	<p>The base models made available by vendors such OpenAI (for the GPT models) or Anthropic (for Claude models). Each model has its own training data and works differently, such as using different ways to tokenize and process input to produce a response.</p> <p>Copilot in Fabric uses the GPT foundation models from OpenAI, hosted by Microsoft in the Azure OpenAI Service. You can't change or fine-tune these models yourself.</p>
<i>Generative AI</i>	<p>A form of artificial intelligence in which models are trained to generate new original content based on natural language input.</p> <p>Copilot in Fabric is a tool that leverages generative AI technology, which attempts to enhance the data analytics experience in the Fabric platform.</p>
<i>Grounding</i>	<p>A preprocessing technique where additional contextual information is retrieved and used to enhance the specificity and usefulness of the LLM response. Grounding data is always specific to a user and respects the permissions to items and any enforced data security.</p> <p>Copilot in Fabric performs grounding during preprocessing of the input prompt, which might involve retrieving information from the current active Copilot session, item metadata, or specific data points.</p>
<i>Input</i>	<p>The prompt or interaction given to Copilot which starts the Copilot process.</p> <p>Copilot in Fabric uses different inputs; mainly, a written, natural language input from the user, or a generated natural language input from the user interacting with a button or similar UI element.</p>
<i>Large language model (LLM)</i>	<p>Deep learning models trained using large text corpora to generate text. LLMs are based on the idea of auto-regressive models, where they have been trained to predict the next word (or the most probable ones) given the previous ones. LLMs can be used to process large amounts of text and learn the structure and syntax of human language.</p> <p>Copilot in Fabric leverages the GPT series of LLMs from OpenAI, which are hosted in the Azure OpenAI Service.</p>
<i>Meta-prompt</i>	<p>A prompt that isn't provided by the user. Meta-prompts are provided by Copilot and configured by Microsoft. Each Copilot experience uses their own meta-prompts</p>

Term	Definition (in context of Copilot in Fabric)
	<p>to improve the specificity and usefulness of Copilot outputs. For instance, the DAX Query Copilot experience uses a meta-prompt that contains multiple examples of DAX queries and expressions.</p>
<i>Natural language</i>	<p>A naturally occurring or conversational language.</p> <p>Copilot in Fabric can receive user input from a natural language prompt.</p>
<i>Operation (of Fabric)</i>	<p>Activities that occur in Fabric and result in capacity usage.</p> <p>On-demand requests and operations that can be triggered by user interactions with the UI, such as data model queries generated by report visuals, are classified as <i>interactive</i> operations. Longer running operations such as semantic model or dataflow refreshes are classified as <i>background</i> operations.</p> <p>Copilot in Fabric is a background operation.</p>
<i>Orchestrator</i>	<p>A task during Copilot preprocessing that determines what skill or tool Copilot should use. The orchestrator determines this by using system information from a meta-prompt provided during the input.</p>
<i>Output</i>	<p>What Copilot returns to a user after postprocessing. Outputs can consist of low quality and inaccurate content, so users should critically evaluate each output before further use or decision-making.</p> <p>Copilot in Fabric can return different outputs depending on the experience that an individual is using.</p>
<i>Preprocessing</i>	<p>Activities by Copilot where the user input is taken and enhanced, or additional information is retrieved, in order to try to produce a more specific and useful output.</p>
<i>Postprocessing</i>	<p>Activities by Copilot where the LLM response is taken, filtered, and handled to produce the final output. Postprocessing activities vary greatly depending on the specific Copilot experience that an individual is using.</p>
<i>Prompt</i>	<p>An input for Copilot written in natural language by a user or generated by Copilot in response to user interaction.</p>
<i>Q&A (Power BI feature)</i>	<p>A feature in Power BI that lets you ask questions of your data using natural language and get a response. Q&A uses natural language processing, but not generative AI.</p> <p>Copilot in Fabric can be used to enhance the Q&A experience; for instance, it can generate synonyms for linguistic modeling.</p>
<i>Response (of an LLM)</i>	<p>The result of a processed input. An LLM response is always text, but that text can be either natural language, code, or metadata.</p>
<i>Responsible AI</i>	<p>A set of guiding principles and practices that, in theory, should mitigate risks and</p>

Term	Definition (in context of Copilot in Fabric)
(RAI)	improve ethical use of AI if they're followed.
<i>Retrieval augmented generation (RAG)</i>	An architecture that augments the capabilities of an LLM by adding an information retrieval system that provides grounding data. Copilot in Fabric uses RAG during preprocessing.
<i>Skill</i>	A specific task within a Copilot experience. For instance, filtering a report page is a skill of the Copilot report page summary experience.
<i>Stock-keeping unit (SKU)</i>	The size of your Fabric capacity. A SKU is indicated by the letter <i>F</i> followed by a number, such as F2, F8, or F64. Larger numbers correspond to larger SKUs.
	Copilot in Fabric is only available for SKUs of F64 or higher.
<i>Smoothing</i>	A process in Fabric where capacity usage of a background operation is spread over a 24-hour window, starting from when the operation begins to exactly 24 hours later. Smoothing operations reduce the impact peak concurrent usage on your Fabric capacity.
	All Copilot in Fabric capacity usage is smoothed, because it's a background operation.
<i>Token</i>	The smallest unit of information that an LLM uses. A token comprises one or more characters of frequently co-occurring text. Each token has a corresponding unique integer for a given LLM, known as a <i>Token ID</i> . Tokens are necessary to convert natural language into a numerical representation, which is what an LLM uses to process input and return a response.
<i>Tokenization</i>	The process of converting natural language inputs to tokens. Tokenization is done by an LLM, and different LLMs tokenize inputs in different ways.
<i>Workload</i>	The different functional areas of Fabric, like Data Engineering, Data Science, or Power BI. Different workloads in Fabric use different Copilots. There are different Copilot experiences in each workload.

Related content

- [What is Microsoft Fabric?](#)
- [Copilot in Fabric: FAQ](#)

Enable Copilot in Fabric

Article • 05/12/2025

Copilot and other generative AI features in preview bring new ways to transform and analyze data, generate insights, and create visualizations in Microsoft Fabric and Power BI. To use Copilot, you have to first enable Copilot in Fabric.

Copilot in Microsoft Fabric is enabled by default. Administrators can disable Copilot from the admin portal if your organization isn't ready to adopt it. Administrators can refer to the [Copilot tenant settings](#) article for details.

The following screenshot shows the tenant setting where Copilot can be enabled or disabled:

The screenshot shows the Microsoft Fabric Admin portal. On the left, there's a sidebar with various settings like Tenant settings (highlighted with a red box), Usage metrics, Users, Premium Per User, Audit logs, Domains (with a 'New' badge), Workloads, Tags (preview) (with a 'New' badge), Capacity settings, Refresh summary, Embed Codes, Organizational visuals, Azure connections, Workspaces, Custom branding, Protection metrics, Fabric identities, Featured content, Help + support. The main area is titled 'Copilot and Azure OpenAI Service'. It contains a note: 'Users can use Copilot and other features powered by Azure OpenAI Enabled for the entire organization'. Below it, it says '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.' with a 'Learn More' link. A note below states: 'For customers in the EU Data Boundary, this setting adheres to Microsoft Fabric's EU Data Boundary commitments.' with a 'Learn More' link. A note below says: 'By enabling this setting, you agree to the [Preview Terms](#)'. A large button labeled 'Enabled' is shown with a red box around it. Below the button, two notes provide information about the availability and processing of data outside the geographic region. At the bottom, there's a section for 'Apply to:' with three options: 'The entire organization' (selected), 'Specific security groups', and 'Except specific security groups'.

Copilot in Microsoft Fabric is rolling out gradually, ensuring all customers with paid Fabric capacities (F2 or higher) gain access. It automatically appears as a new setting in the Fabric admin portal when available for your tenant. Once billing starts for the Copilot in Fabric experiences, Copilot usage will count against your existing Fabric capacity.

Warning

Enabling Copilot in Fabric for your entire tenant without adequate planning and preparation can lead to higher Fabric capacity utilization and other potential risks.

Consider enabling Copilot in Fabric for specific security groups and workspaces only after you take the appropriate steps to prepare.

Also, it isn't possible to enable only specific Copilot experiences, like using Copilot in the DAX query view of Power BI semantic models. You can only control whether Copilot is enabled or not at the level of each workload.

Prerequisites

Enabling Copilot in Fabric involves several prerequisites and steps, as described in the following table:

 Expand table

Step	Where you take this step	Description
1	Azure portal	You must have a supported SKU to use Copilot in Fabric. Pro and PPU workspaces don't support Copilot consumption.
2	Azure portal	Your Fabric capacity must be in a supported region to enable Copilot in Fabric.
3	Microsoft 365 admin center	You should create and manage one or more security groups for users who are allowed to use Copilot in Fabric. Using security groups is a good way to ensure that you limit rollout to some—and not all—users, for instance, after they have completed prerequisite training.
4	Fabric tenant settings	<p>You must enable the relevant Copilot tenant settings, including the settings <i>Users can use Copilot and other features powered by Azure OpenAI</i> and <i>Data sent to Azure OpenAI can be processed outside your capacity's geographic region, compliance boundary, or national cloud instance</i>.</p> <p>You can choose to enable Copilot for only select security groups. Copilot in Fabric is enabled by default for the entire tenant.</p>
5	Capacity settings	If tenant settings are delegated to capacity administrators, then you must enable Copilot in the delegated tenant settings of your capacity settings for the Fabric capacity you'll use with Copilot.
		You can choose to enable Copilot for only select security groups in the delegated tenant settings.

Step	Where you take this step	Description
6	Workspace settings and workspace roles	You must assign a workspace and provision workspace access to the individuals who will use Copilot. Fabric items using Copilot must be in this workspace, but they might consume or refer to items in other workspaces or capacities.
7	Power BI Desktop settings	To use Copilot in Power BI Desktop, you must select a supported workspace (described in step 6).

 **Note**

You don't need to enable Fabric to use Copilot in Power BI. You can enable Copilot for the Power BI workload without enabling the other Fabric workloads; for instance, if you have a P SKU.

See the article [Overview of Copilot in Fabric](#) for details on its functionality across workloads, data security, privacy compliance, and responsible AI use.

Related content

- [What is Microsoft Fabric?](#)
- [Copilot in Fabric: FAQ](#)
- [AI services in Fabric \(preview\)](#)
- [Copilot tenant settings](#)
- [Copilot in Power BI](#)

Copilot in Power BI integration

Article • 04/18/2025

Copilot in Microsoft Fabric is a generative AI assistant that aims to enhance the data analytics experience in the Fabric platform. There are different Copilots in each of the Fabric workloads, including Power BI. Various Power BI personas including enterprise developers, self-service users, and business users can all use the various Copilot in Power BI experiences. This article provides an in-depth overview of how Copilot in Power BI enhances the data analytics experience by assisting users in creating and consuming semantic models and reports.

ⓘ Note

For additional information, see the [Copilot in Power BI documentation](#).

�� People who can use Copilot in Power BI



Enterprise
developers



Self-service
users



Business
users



Microsoft Fabric



Copilot in Power BI



Semantic models

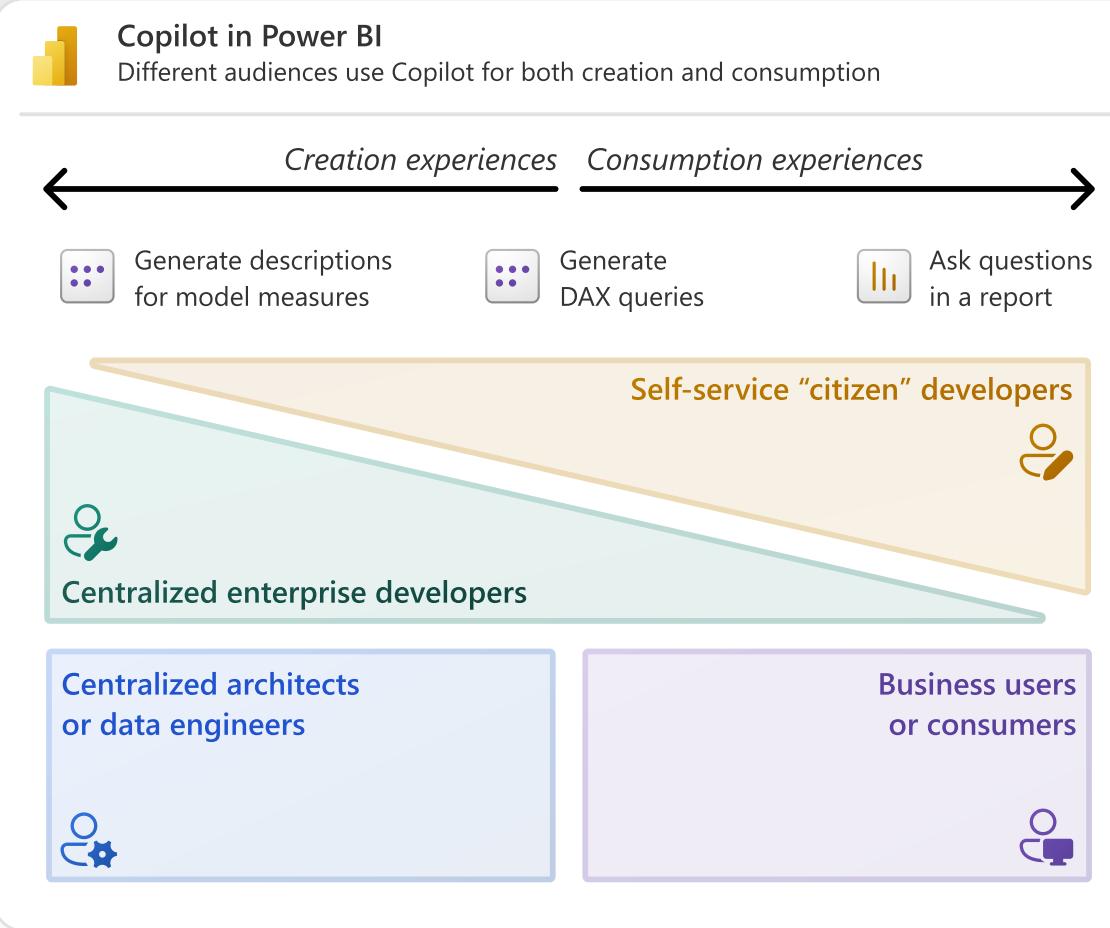


Reports

Copilot in Power BI aims to help both Power BI developers and analysts *create* models and reports, while also giving business users new ways to *consume* those models and reports. The following diagram depicts how different personas in Power BI can use the various Copilot experiences to create or consume their data.



Copilot in Power BI for creation and consumption



In summary, Copilot in Power BI has experiences that support the creation of Power BI items, like generating descriptions for model measures. Centralized enterprise developers, architects, data engineers, or self-service developers might all use these experiences to support their development tasks. Copilot experiences can also support consumption of Power BI items, such as asking questions in the Copilot chat pane of a report. Self-service users, business users, and even enterprise developers can all leverage these experiences to help them answer questions about their data in specific scenarios. Finally, some Copilot experiences support both creation and consumption, like generating DAX in a semantic model to either query and explore the model, or to create model measures that contain calculations and business logic.

! Note

Like Copilot in the other Fabric workloads, Copilot in Power BI can't *replace* the people who create semantic models or reports in your organization. Rather, Copilot aims to

augment those individuals so that they're more efficient in their tasks and so that they can improve the models and reports that they create.

Likewise, generated reports or answered data questions by Copilot can't replace the models and reports created by Power BI developers or analysts. These people typically have a deeper and broader understanding of the business problem and its surrounding context.

Copilot in Power BI provides new opportunities and approaches to work with your data. However, getting the most value from these new opportunities and approaches a healthy data culture and good adoption of Power BI. This includes preparing effective user training and enablement, as well as monitoring and governing Copilot usage. Enabling and using Copilot in Power BI requires careful deliberation; you can't just turn on Copilot and expect to see productivity enhancement across your organization.

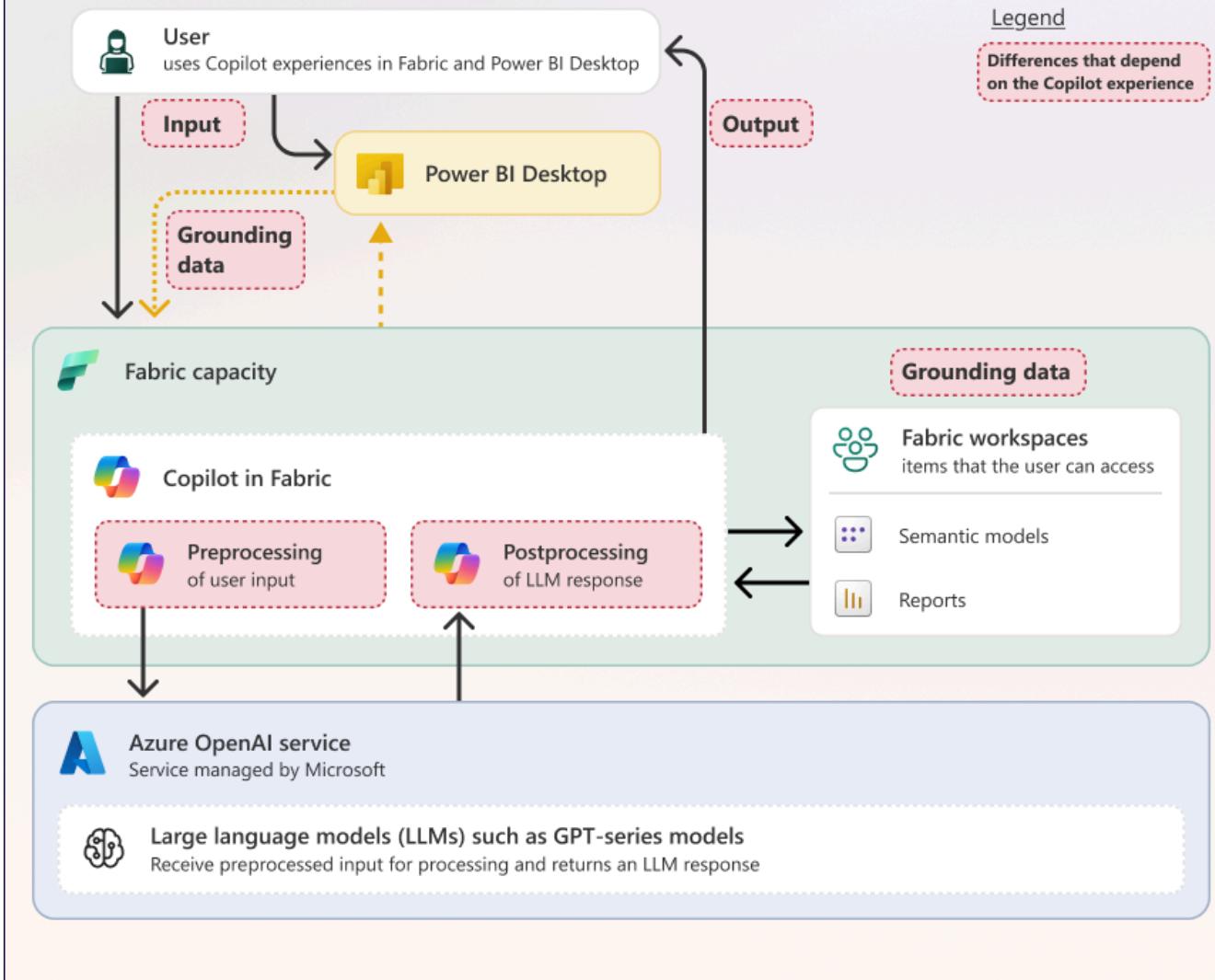
Overview of how Copilot in Power BI works

Copilot in Power BI works similarly to the general process of [Copilot in Fabric](#). However, Copilot in Power BI differs in several areas, depending on the specific Copilot experience that an individual uses.

The following diagram depicts the different areas that differ between the Copilot experiences with Copilot in Power BI compared to Copilot in other workloads.



Where Copilot in Power BI experiences differ



In summary, there are several areas that differ in the Copilot architecture depending on which Copilot experience that you use.

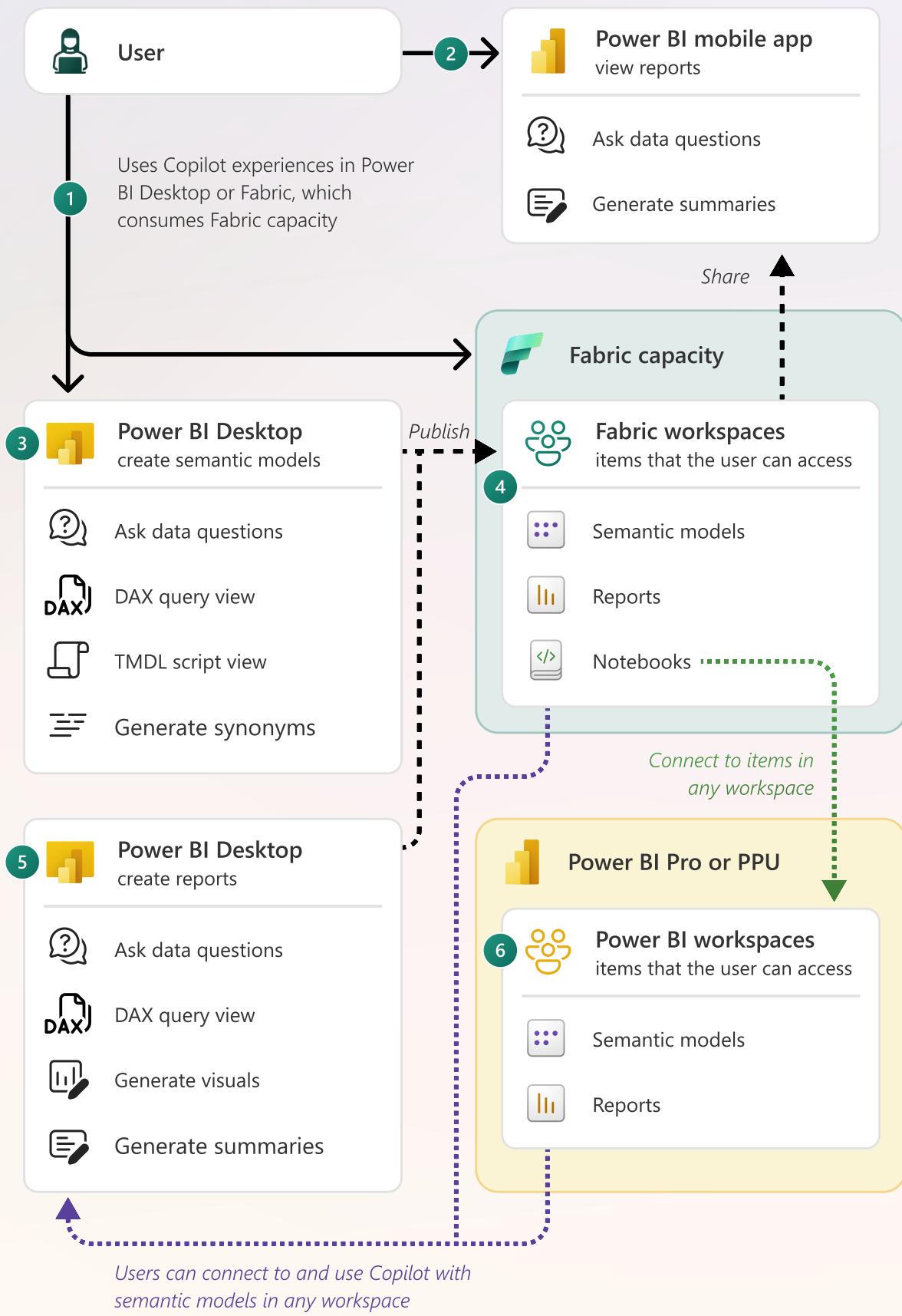
- **Input:** Different experiences require a user to provide input in different ways.
 - The *ask data questions* experiences for models or reports require the user to write a prompt in the Copilot chat pane.
 - The *generate measure descriptions* experience requires a user to push a button in the Properties pane in the Model view of Power BI Desktop.
- **Preprocessing and grounding data:** Depending on the experience, Copilot retrieves different grounding data. Examples of preprocessing differences between the Copilot experiences in Power BI include:
 - The *ask data questions of a semantic model* experience might use the semantic model schema or linguistic model to generate an appropriate query. A semantic model developer can control what part of the schema Copilot can see and use by hiding

- fields. They can also increase the usefulness of their Copilot outputs by optimizing their model to work better with Copilot, such as adding descriptions.
- The *report page summarization* experience might use report metadata or even specific data points from your report visuals to make the summary. A report developer can control what part of the report Copilot can see and use by hiding pages and visuals.
 - **Postprocessing:** Depending on the experience, Copilot handles the large language model (LLM) response in different ways. Examples of postprocessing differences between the Copilot experiences in Power BI include:
 - The *DAX query view* experience runs DAX from the LLM response through a DAX parser to ensure the generated DAX query will run. If not—for instance, if the LLM produces hallucinations—then Copilot requests a new LLM response.
 - The *report page creation* experience takes the LLM response and combines it with an existing Copilot theme, the report metadata, and other information to create the new page in the Power BI report.
 - **Output:** Depending on the experience, Copilot will return different types of outputs to a user after postprocessing. Examples of output differences between the Copilot experiences in Power BI include:
 - The *DAX query view* experience produces DAX queries if the user asks to generate or suggest DAX code, but it produces a natural language explanation of a DAX concept if the user asks how generated code works.
 - The *report page creation* experience produces a new report page if the user asks to generate a report page or to change an existing, previously generated report page.

Copilot in Power BI overview diagram

The following diagram gives an overview of how someone can use the different Copilot experiences with Copilot in Power BI.

Copilot in Power BI



The diagram consists of the following parts and processes:

[Expand table](#)

Item	Description
1	<p>The user provides an input to Copilot, which could be a written prompt or another interaction that generates a prompt. All interactions with Copilot are user specific. The user can interact with Copilot in Power BI either using the Power BI mobile app, Power BI Desktop, or in a Fabric workspace.</p>
2	<p>In the Power BI mobile app, users can view reports in Power BI apps or Fabric Org Apps, or reports that they have access to from a workspace. In the Copilot chat pane in the mobile app, users can ask questions about reports and their data.</p>
3	<p>In Power BI Desktop, users can use Copilot while they develop semantic models. They can ask data questions, generate DAX queries in the DAX query view, or generate synonyms for Q&A linguistic modeling or measure descriptions for the semantic model.</p> <p>To use Copilot in Power BI Desktop, users have to connect to a supported workspace on Fabric capacity.</p>
4	<p>In a workspace that uses a license mode of a supported Fabric capacity, users can use Copilot with semantic models and reports that they Publish from Power BI Desktop, upload via Git integration, or create in Fabric. Users might also use notebooks to help develop and manage semantic models by using semantic link and could use Copilot in those notebooks (even though notebooks are not an item of the Power BI workload).</p>
5	<p>In Power BI Desktop, users can connect to a semantic model from any workspace and create reports. They might use Copilot to ask data questions, generate DAX, visuals, or summaries to support the report creation process.</p> <p>To use Copilot in Power BI Desktop, users have to connect to a supported workspace on Fabric capacity.</p>
6	<p>Workspaces that have a license mode of Power BI Pro, Premium Per User (PPU), or an unsupported F SKU don't support Copilot.</p> <p>Users can consume items from these workspaces in Power BI Desktop and use Copilot, so long as they set up Power BI Desktop to consume Fabric capacity from a supported workspace.</p> <p>Users can also create reports in these workspaces, and use Copilot in these reports, so long as that report connects to a semantic model in supported workspace</p>

(!) Note

While this diagram focuses on Power BI, Power BI developers and analysts don't necessarily use the Power BI workload in Fabric exclusively. These individuals also likely

use the other Fabric workloads to create items and leverage the other various Copilot experiences.

How to enable Copilot in Power BI

To use Copilot in Power BI, you have to first enable it. The steps to enable Copilot in Power BI are similar to the steps you take to [enable Copilot in Fabric](#). You can enable or disable Copilot specifically for Power BI, like with the other workloads.

There are also several other noteworthy scenarios to consider:

- **P SKUs:** You can also use Copilot in Power BI if you have a P SKU.
- **Cross-workspace consumption:** Some Copilot experiences will still work when you consume items located in workspaces that use a license mode that doesn't support Copilot, like Pro, PPU, or an unsupported SKU. For example, you can use Copilot in Power BI Desktop while consuming a semantic model published to workspaces that don't support Copilot. Similarly, you can also connect to these semantic models from certain Fabric items, like notebooks using the Semantic Link feature.
- **Cross-capacity consumption:** Fabric administrators can [delegate Copilot consumption to a Fabric Copilot capacity \(FCC\)](#). This can be a useful way to prevent Copilot usage from impacting your main Fabric capacity that other Fabric workloads and items need to support business-critical processes or decision making.

Responsible use of Copilot in Power BI

The following considerations are important to keep in mind when you use Copilot in Power BI:

- **Governance:** Ensure that you set up security groups and allow access to Copilot in Power BI only once users have completed training or demonstrated their understanding of the technology, its limitations, and its use cases. If you're enabling Copilot for the first time, use this approach to incrementally roll out Copilot in Power BI in phases when you're ready.
- **Preparation of semantic models:** Significant effort must go into preparing your semantic model to work well with Copilot. These preparations include ensuring proper naming conventions, field descriptions, following good modeling practices, setting up linguistic modeling, and other steps. Neglecting these preparations can lead to Copilot producing more unhelpful and inaccurate results.

- **Preparation of business users:** If business users should use Copilot in Power BI, you should explain to them when to use Copilot and when to simply look at and use their reports. Encouraging business users to use Copilot instead of interacting with reports can lead to increased capacity usage and inefficiency, as they might spend more time writing prompts and reading outputs than reading and interpreting visuals. Instead, they can use Copilot to help them find and interpret information in busy reports, particularly when they can't find what they need.
- **Evaluation of outputs:** Copilot outputs can contain inaccurate and low-quality content. Outputs are also nondeterministic; meaning that it's possible that a user receives a different output from a Copilot experience, despite using the same prompt and grounding data. It's important to set expectations with users so that they know what kinds of outputs to expect from Copilot, and how they can evaluate or validate these outputs, for themselves.

For more information, see [Privacy, security, and responsible AI use of Copilot in Fabric and Copilot in Power BI](#).

Warning

Content filtering and responsible AI features automatically reject LLM calls that contain certain words and phrases that are potentially harmful or problematic. However, your model might contain valid uses of these words and phrases for certain analyses or scenarios. If your model schema or metadata contains any of these phrases, then you can't use Copilot in Power BI, as all of your prompts will result in errors.

Separately, consider enabling Copilot in Fabric for specific security groups and workspaces only after you take the appropriate steps to prepare to use it responsibly. Enabling Copilot before you make these preparations can lead to unnecessary governance risks and challenges with adoption.

Copilot experiences in Power BI

There are different Copilot experiences in Power BI which you can use with either semantic models or reports. The following articles in this series describe these experiences in detail and how you can best use them.

- [Use Copilot with semantic models](#)
- [Use Copilot with Power BI reports](#)

Note

See [Where to find the Copilot experiences in Fabric](#) for a full overview of each experience by item and workload.

Related content

- [Overview of Copilot for Power BI](#)
- [Enable Copilot in Fabric](#)

Use Copilot with semantic models

Article • 04/18/2025

This article helps you to use the Copilot experiences in Power BI for semantic models.

Copilot in Microsoft Fabric is a generative AI assistant that aims to enhance the data analytics experience in the Fabric platform, including the Power BI workload. You can use Copilot in Power BI to support both the development and the consumption of semantic models by both self-service and enterprise users. When used effectively, Copilot can support both analysts and business users to improve productivity and get more value from their semantic models.

However, to use Copilot with semantic models in Power BI, you must first prepare your data, your semantic model, and your users. If you fail to do so, then Copilot produces mainly low-quality and inaccurate outputs that might be incorrect or even misleading. The following sections guide you through how you can use Copilot in Power BI to either develop or consume a semantic model with the available Copilot experiences.

Note

For additional information, see the [Copilot in Power BI documentation](#).

Copilot and its capabilities are evolving over time. The Copilot experiences in the following sections will change, and new experiences might become available with semantic models. As such, you should keep up to date with the monthly Power BI releases and any relevant Copilot announcements.

Important

You can't enable or disable Copilot in specific workloads, or for specific Copilot experiences. If Copilot in Fabric is enabled in your capacity for a user or security group, then all workloads and Copilot experiences are accessible for those users.

Develop a semantic model with help from Copilot

When you develop a semantic model in Power BI, you can use Copilot to help improve the efficiency and convenience of certain tasks. Typically, this involves leveraging Copilot to streamline redundant or repetitious changes for you (such as generating measure descriptions) or helping you to tackle or understand challenging model design or DAX (such as using Copilot in the DAX query view to explain DAX concepts or to generate DAX queries).

The following sections explain how a Power BI developer or analyst who creates semantic models can leverage the various Copilot experiences in Power BI.

Note

The following sections focus on the experiences that support semantic model development in Power BI Desktop, and not online by using [Edit data models in the Power BI service](#). The guidance and considerations in the following sections might still apply when you edit data models in the Power BI service, but be aware that differences exist between these two experiences.

In general, we recommend that you develop Power BI semantic models by using Power BI Desktop or third-party tools, then publish these models to the Power BI service when you're ready to use them. However, you can also edit data models in the Power BI service if that is your preference, or if you can't use desktop tools to develop your model.

Ask data questions

While you develop a semantic model, you often need to explore and query the data. Normally, you would do this by using a combination of the Power Query editor, the report canvas, and DAX queries. However, you can also ask data questions about your model and its contents by using the Copilot chat pane. Generally, asking data questions is more of a consumption experience, where business users can ask questions about the data when they can't find the answer in a report. However, developers might use this to explore data or validate how Copilot performs on their model.

The following image shows an example of a user asking a data question to Copilot about a semantic model. The image shows the following prompt: *What was the profit % for the Australia sales region in 2023?*



Copilot

Preview



Here are some things you can try:

Create a new report page

Suggest content for a new report page

Answer this data question ...

What was the profit % for the Australia sales region in 2023?

The profit for the Australia sales region in 2023 is displayed in the card visual.

Show reasoning ▾



49.04K

Profit

Add to page

63

Describe the report you want to create or ask a question



Content created by AI may not be accurate or appropriate, so review it carefully.
[Read terms](#)

Use cases

You can use Copilot to ask data questions for the following use cases:

- **Explore data in your model:** A developer might use the *Ask data questions* experience to explore the data in their model by using Copilot. However, it's likely more efficient to explore the data by adding visuals to the report canvas, or by using DAX queries. That's

because report visuals automatically update whenever you make changes in the model, but answers to data questions in the Copilot chat pane are static, and disappear whenever you close the Copilot chat pane. Additionally, visuals generated by Copilot can contain visual-specific filters that you can't create yourself in Power BI Desktop. These filters can be misleading or troublesome to investigate.

- **Validate Copilot use for consuming the semantic model:** Developers should use the *Ask data questions* experience to understand and test how Copilot consumption experiences perform on their semantic model. This is the main use case for using *Ask data questions* when you develop a semantic model. This use case lets a developer make changes to their semantic model that might better support Copilot to produce more useful outputs.

Important

When you design your semantic model, ensure that you discuss with users and document how they'll consume it, including which items, tools, and experiences they'll use. If users won't use Copilot in Power BI, then a developer doesn't need to use the *Ask data questions* experience to test their model. However, if users plan to use Copilot to consume semantic models now or in the future, then it's essential for developers to account for this during both model design and development.

Benefits

A developer can use *Ask data questions* to understand how the experience will be for business users who consume the semantic model by using Copilot in Power BI. This testing is essential if business users want to use Copilot to consume a semantic model.

Specifics of the experience

The *Ask data questions* experience differs from the standard Copilot in Fabric process in the following areas. This overview applies to use of the *Ask data questions* experience when both *developing* and *consuming* semantic models:

- **Input:** Users provide a written prompt asking a question or requesting specific information from the semantic model.
- **Preprocessing and grounding data:** Copilot retrieves grounding data from the model schema. It performs schema reduction to try to restrict the context to what is most important. As context, Copilot takes the following information to try to improve the usefulness and specificity of the Copilot output:

- Any report metadata on the current report page. If there's relevant report metadata, then Copilot in Power BI answers data questions from the report instead of the model.
- The conversation with Copilot in the current session. This includes any previous questions and outputs, which includes data points from data questions that Copilot previously answered.
- The semantic model schema, which includes tables, rows, columns, measures, and other objects (like relationships, calculation groups, and so forth).
- The full model linguistic schema.
- Certain semantic model properties, including descriptions, data types, format strings, and data category.

The following information is excluded:

- Any report page that's hidden.
- Any field (measure or column) in the model that's hidden.
- Any table in the model that's marked as *private*.

- **Output:** The output that Copilot provides contains several parts:

- **Visual:** Copilot answers the data question by rendering a Power BI visual, such as a card, a line chart, or a table. Copilot chooses the visual and its formatting, which the user can't control or request in their prompt. The visual might time out if the underlying model, DAX, or data isn't optimized or is too complex.
- **Summary:** Copilot summarizes the query result. This summary is generated by sending a semantic query result back to Azure OpenAI (which includes data points) and requesting a natural language explanation.
- **Errors or clarification request:** If Copilot is unable to produce a response, it might return a generic error message. This error message could include a request for clarification, including suggested variants of the user's original data question.

Caution

When using Copilot in Power BI with semantic models in Power BI Desktop, Copilot might use report metadata as grounding data. In certain circumstances, report metadata can contain data points, such as column values, which might include sensitive information. This is true both for the legacy report metadata format and the new [Power BI enhanced report \(PBIR\) format](#).

Tips to improve Copilot outputs

Copilot can produce inaccurate or low-quality outputs, including incorrect answers to data questions. Often, incorrect answers arise from either user mistakes or model issues. To reduce

the probability of wrong or unexpected Copilot outputs, you can address user prompts and data model design.

Important

Inaccurate responses to data questions can lead to incorrect decisions and actions by business users, which produces bad results. To avoid this negative impact, it's important that you mitigate the probability of inaccurate responses by Copilot as much as possible.

A user can only really produce incorrect results by writing a poor prompt. Examples of poor prompts include:

- **Vague or incomplete prompts:** If you inaccurately or incompletely describe the desired output or you use ambiguous language in your prompt, then Copilot is less likely to produce a useful result. When writing prompts, you should try to be as specific and descriptive as possible in stating your desired result.
- **Incorrect prompts:** If you make spelling mistakes when you refer to a measure, column, or table name, then Copilot might not refer to the correct field. When writing prompts, you should ensure that the fields you mention in your prompt refer correctly to the fields in the semantic model schema. This includes avoiding abbreviations, acronyms, or excessive punctuation. Note that you can also use synonyms to refer to fields, but there's no way to validate which synonyms are available for a given field (like how you can see descriptions when hovering on a measure or column in the Data pane).
- **Excessive or inappropriate grounding data:** If you submit a prompt via the Copilot chat pane, then Copilot takes the chat history from that session as grounding data during preprocessing. Depending on what that chat history entails, you might get different or unexpected results. When writing prompts, you should take into consideration that any previous prompts and outputs will be used as grounding data. To avoid this, you can select the Copilot button to close and reopen the Copilot chat pane, clearing the chat history before you submit a new prompt.

The following image shows an example of an incorrect output from Copilot due to a poor user prompt:

 Copilot Preview X

Here are some things you can try:

- Create a new report page
- Suggest content for a new report page
- Answer this data question ...

What was the profit % for the Australia sales region in 2023?

The profit for the Australia sales region in 2023 is displayed in the card visual.

Show reasoning ▾

49.04K

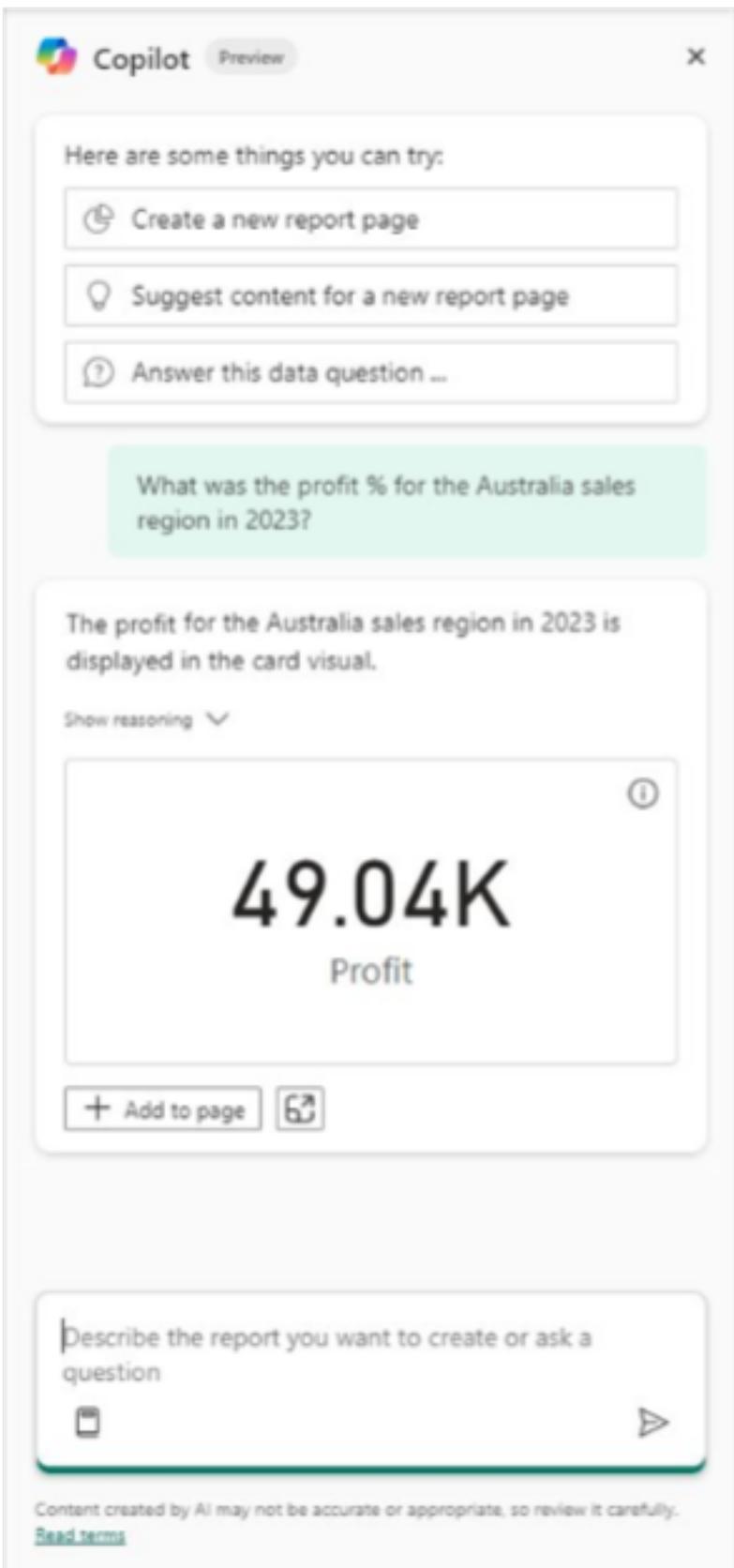
Profit

ⓘ

+ Add to page 63

Describe the report you want to create or ask a question

Content created by AI may not be accurate or appropriate, so review it carefully.
[Read terms](#)



The image shows the following prompt: *What was the profit % for the Australia sales region in 2023?* In the output, Copilot returns the profit value rather than the profit as a percentage. In this case, the user could obtain a better result from Copilot by specifying more clearly that they want the profit in percentage (rather than using the percentage symbol).

Aside from user prompts, the *Ask data questions* experience can also produce incorrect or unexpected results due to the quality or organization of the underlying semantic model.

Examples of when your semantic model produces poor results include:

- **Poor model design or implementation:** If your semantic model doesn't follow common best practices (such as a [star schema design](#)), then you're likely to get poor results with any consumption tool or experience. You should always strive for quality semantic models to get the most out of Power BI and Fabric. See also [Data modeling guidance for Power BI](#) for more tips and guidance to improve your Power BI semantic models.
- **Poor naming conventions:** If your fields have inconsistent or excessive naming conventions (such as acronyms, abbreviations, and punctuation), then users are more likely to make mistakes in their prompts and Copilot will get confused when referring to these fields. Copilot works best when tables, columns, and measures have names in human-readable English.
- **Poor model organization:** If you don't organize your model, then you're likely to experience more issues with Copilot. Model organization is a large topic that encompasses many tasks, including field descriptions, hiding columns and measures, and avoiding fields with the same names across different tables.
- **Linguistic modeling:** If your semantic model doesn't have linguistic modeling set up, including synonyms for fields or verbs for relationships, then Copilot might be more likely to return unexpected results. Power BI relies on the same linguistic modeling as the Q&A feature. Setting up a linguistic model for your semantic model costs additional time and effort on top of your semantic model development tasks. However, you can offset this slightly by [using Copilot to generate synonyms](#), explained later in this article.
- **Model complexity:** The more complex your model is, including having more fields, dependencies, and business logic, the more likely you are to experience difficulties when using Copilot. For instance, complex patterns like currency conversion or disconnected tables (like [field parameters](#)) might cause unexpected or incorrect results when users reference these fields or tables in their prompts. With more complex models, you might need to consider specific model design decisions to obtain the best results with Copilot. In general, you should test your model with Copilot to determine whether you get consistently correct and reliable results. If not, you might want to consider advising users not to use Copilot to consume your semantic model.

 **Note**

For more information, see [Prepare a semantic model for Copilot consumption](#) later in this article. See also the separate article [update your data model to work well with Copilot for Power BI](#) for additional considerations.

The following image shows an example of an incorrect output from Copilot due to problems with the semantic model:

The screenshot shows the Copilot interface with the following components:

- Top Bar:** Features the Copilot logo, a "Preview" button, and a close ("X") button.
- Suggested Actions:** A list of three items:
 - Create a new report page
 - Suggest content for a new report page
 - Answer this data question ...
- Question Box:** A green box containing the user's question: "Question: How many units were sold in Australia in 2023?"
- Response Area:** A large box containing the text "Showing units, where country is Australia and year is in 2023." Below this, a "Show reasoning" dropdown is set to "▼". The main response is "462 Units".
- Buttons:** At the bottom of the response area are "Add to page" and a share icon.
- Feedback Area:** A box at the bottom left for "Describe the report you want to create or ask a question" with a "Send" button.
- Disclaimer:** A note at the bottom stating "Content created by AI may not be accurate or appropriate, so review it carefully." followed by a "Read terms" link.

The image depicts the following prompt: *How many units were sold in Australia in 2023?* In the response, Copilot returns the number of units where the *Country* column in the *Customer* table is filtered to "Australia", instead of filtering the *Country* column in the *Sales region* table. In this case, the user could have improved the prompt to specify sales region country. However, the semantic model developer could also hide or rename the *Country* column in the *Customer*

table if it isn't intended to be used by Copilot. Alternatively, they could disable the field from the [field synonyms](#) of the linguistic model by using the Q&A setup.

We discuss the importance of the linguistic schema and Q&A setup in the section [Linguistic schema](#).

Tip

You can identify which fields and filters Copilot uses to generate a visual or answer a data question by clicking the *Add to page* button. This adds the visual to the report canvas, where you can select the visual and view any filters Copilot applies or the fields Copilot uses.

Irrespective of prompt or model quality, you can still obtain inaccurate or low-quality outputs from Copilot when you use the *Ask data questions* experience. That's because the underlying model—with its current configuration—is nondeterministic and isn't guaranteed to produce a correct answer, or the same answer with the same prompt, model, and data.

The following image shows an example of Copilot producing inaccurate or inappropriate results:

 Copilot [Preview](#) X

? Answer this data question ...

Question: Which country produced the highest profit in 2024?

It looks like you're asking about profit by country in 2024, but the dataset only includes data up to October 2023. Can you confirm if you want to see the highest profit by country for the available data?

Question: Which country produced the highest profit in 2023?

Showing top country by profit, where birthday is in 2023.

Show reasoning ▾

Country i

+ Add to page ↗

Describe the report you want to create or ask a question

📋

▶

Content created by AI may not be accurate or appropriate, so review it carefully.
[Read terms](#)

In this example, the image shows the prompts: *Question: Which country produced the highest profit in 2024?* and *Question: Which country produced the highest profit in 2023?* The outputs show Copilot first asking for clarification after it says that there's no data for 2024 in the model. However, there *is* data in the model in 2024 when filtering to that year using the date table. Copilot then returns a result filtering the *Birthday* column from the *Customer* table, rather than the marked date table in the model. While the user could produce a more specific prompt or

the developer could hide the *Birthday* field, in this case, Copilot should produce the expected result.

To mitigate this, it's important to train users to critically appraise any outputs that they obtain from Copilot in Fabric and Power BI, and what to do to troubleshoot unexpected results or to try a new prompt by closing and reopening the Copilot chat pane or window.

DAX query view

While developing a semantic model, you can use Copilot to generate DAX queries in the DAX query view. In these queries, you can also define DAX measures, which you can then add to your semantic model. You can also use Copilot to explain DAX concepts either in generated queries or queries that you authored yourself.

The following image shows an example of a user asking Copilot to generate a DAX query.

The screenshot shows the DAX query view interface. At the top, there is a green 'Run' button and a grey 'Update model with changes (0)' button. Below this is a code editor area with numbered lines 2 through 17. Lines 3 to 17 contain a DAX query:`2
3 -
4+ // DAX query generated by Fabric Copilot with "YTD profit by month in 2023"
5+ DEFINE
6+ // Filter for the year 2023
7+ VAR _Filter = FILTER(
8+ ALL('Date'[Year]),
9+ 'Date'[Year] == 2023
10+
11+ // YTD profit by month for the year 2023
12+ EVALUATE
13+ SUMMARIZECOLUMNS(
14+ 'Date'[Month],
15+ _Filter,
16+ "Profit YTD", [Profit YTD]
17+)`At the bottom of the code editor, there is a search bar containing 'YTD profit by month in 2023' with a magnifying glass icon and a close button. Below the search bar are three buttons: 'Explain this query', 'Explain a DAX topic', and 'Retry'. At the very bottom, there are two large buttons: 'Keep query' (green) and 'Discard query' (white). A small note at the bottom states: 'Content created by AI may contain mistakes, so review it carefully. [Read terms](#)'.

The image depicts the following prompt: *YTD profit by month in 2023*. The user could then ask Copilot to explain the query, as depicted in the following image.

The screenshot shows the Fabric Copilot interface. At the top, there are two buttons: "Run" and "Update model with changes (0)". Below these is a code editor window containing a DAX query:

```
1
2
3  -
4+ // DAX query generated by Fabric Copilot with "YTD profit by month in 2023"
5+ DEFINE
6+     // Filter for the year 2023
7+     VAR _Filter = FILTER(
8+         ALL('Date'[Year]),
9+         'Date'[Year] == 2023
10+
11+ // YTD profit by month for the year 2023
12+ EVALUATE
13+     SUMMARIZECOLUMNS(
14+         'Date'[Month],
15+         _Filter,
16+         "Profit YTD", [Profit YTD]
17+     )
```

Below the code editor is a modal window titled "Explain this DAX query". It contains several buttons: "Explain this query" (highlighted), "Explain a DAX topic", "Retry", "Keep query" (highlighted), and "Discard query". The main text area of the modal says: "The DAX query you've provided is calculating the Year-To-Date (YTD) profit for each month in the year 2023." There is also a "Show more" link and a note at the bottom: "Content created by AI may contain mistakes, so review it carefully. [Read terms](#)".

The image depicts the following prompt: *Explain this DAX query*. The explanation is shown at the bottom of the Copilot window.

Use cases

You can use Copilot in the DAX query view for the following use cases:

- **Generate DAX queries:** You can use Copilot to suggest DAX queries, which you can use to:
 - Explore or analyze your model or data.
 - Test and validate your model or data.
 - Try new approaches or patterns to calculations in DAX.
- **Refactor existing DAX queries:** You can use Copilot to more conveniently or efficiently modify queries that you copied or wrote yourself, such as:

- Adding comments to explain and document a DAX query or measure.
- Making the query easier to read and understand, such as a query copied from a Power BI report visual that you're investigating.
- Making large or repetitious replacements in the code.
- Asking Copilot to remove or replace variables.
- **Generate DAX measures:** You can use Copilot to suggest DAX measures which are defined upstream of a generated query. These measures can be limited to the DAX query you generate or added to your semantic model.
- **Explain DAX concepts:** You can use Copilot to explain and better understand different concepts in DAX, such as:
 - DAX query or a defined measure in the query.
 - DAX functions, such as [CALCULATE](#) or [KEEPFILTERS](#).

Benefits

The main benefit of using Copilot in the DAX query view is that you get support when you write DAX queries. This means that less experienced developers and analysts can use Copilot to learn DAX concepts or generate DAX to use in their model. It can also save intermediate and experienced developers time when they need to develop DAX, but they can't remember a particular function or pattern, or when they want to refactor or simplify an existing query.

There are other generative AI tools that you can use for DAX code, but Copilot in Power BI has the following specific benefits:

- Copilot in Power BI is developed in collaboration with the authors of the DAX language.
- Copilot doesn't use any model fine-tuning, but it contains metaprompts with specific DAX examples by Microsoft.
- You don't have to copy or paste code or model information, since Copilot is integrated in Power BI Desktop.
- During postprocessing, Copilot uses a DAX parser to ensure that the query is valid, which reduces the probability of receiving hallucinations in your queries.

Warning

Inexperienced Power BI developers or analysts should ensure that they validate and understand any DAX that they generate *before* they use it. This is particularly important when you use Copilot in the DAX query view to suggest measures that you add to your model. That's because Copilot doesn't know where you'll use that measure, and while the suggested code might work in the initial DAX query, in a different filter context of your report, it could produce unexpected or incorrect results.

To validate and understand DAX, these inexperienced developers can use Copilot to add comments to the code, explain concepts, and also research the patterns or functions by using verified online sources, such as [Microsoft documentation](#).

Specifics of the experience

The Copilot experiences in the DAX query view have steps during preprocessing and postprocessing that differ from the other Copilot experiences in Fabric.

Copilot in the DAX query view has the following specifics to keep in mind:

- **Input:** Users provide a written prompt in an input box specific to a single DAX query window. They can request a query, request changes to an existing query that Copilot already generated or explain a DAX concept. In the input box, users can also select buttons to generate queries. The Retry button will re-generate the query while neglecting the current context, so that you can try to get a different approach.
- **Preprocessing and grounding data:** Copilot retrieves grounding data from the model schema and anything in the query window. Copilot takes the following information as context to try to improve the usefulness and specificity of the Copilot output:
 - Any text that's in the current DAX query window, including DAX code you've written, comments, or previous DAX queries that you generated.
 - The conversation history with Copilot from the currently active session. This includes any previous questions and outputs, but not data points.
 - The semantic model schema, which includes tables, rows, columns, measures, and other objects (like relationships, calculation groups, and so forth). This includes all objects irrespective of whether they're hidden or not (except when you have a live connection to a shared semantic model).
 - Synonyms from the model linguistic schema.
 - Certain semantic model properties, including DAX expressions, descriptions (truncated after the first 200 characters), data types, format strings (and format string expressions), and data category.
 - Some statistical aggregations like minimum and maximum values of columns from your model that might be used in a query. These are data points sent to Copilot as context.
 - Copilot might also send the query result back to Azure OpenAI to be able to explain the generated query or its results.

The following information is excluded:

- The conversation history with Copilot in the current session when you select the Retry button.

- Any table in the model that's marked as *private*.
- Comments in DAX expressions.
- **Output:** The output that Copilot provides contains either DAX code and DAX comments in the DAX query window, or explanations of the DAX in the Copilot input box. A user typically must then choose to run and keep the query themselves.

Tips to improve Copilot outputs

To improve the quality of DAX queries generated by Copilot, you should use the same tips as when you use the [Ask data questions experience in Copilot](#). Specifically, you should ensure that your prompts are clear, accurate, and descriptive, and that your semantic model is well-designed, organized, and doesn't contain too much complexity or exceptions.

 **Note**

For more information, see [Prepare a semantic model for Copilot consumption](#) later in this article. See also the separate article [update your data model to work well with Copilot for Power BI](#) for additional considerations.

Some tips specific to the DAX query experience are as follows:

- **Differences between local and live connection models:** Copilot works differently depending on whether you're querying a local model open in Power BI Desktop or a shared semantic model in the Power BI service. For instance, when you have a live connection to a shared semantic model and use the DAX query view experience:
 - Copilot can't see the DAX expressions of measures, or any hidden or private objects.
 - Copilot must run the DAX query before returning it to ensure the query is valid.
- **Use the Retry button:** The Retry button empties the Copilot cache, ensuring that you get a new result with the same prompt and grounding data. This is useful when you're iteratively working toward a solution that meets your specific requirements.
- **Ask Copilot to add comments to your code:** Comments are a useful way to organize and document your DAX queries, and to help you understand the code that Copilot generates. You can also ask Copilot to explain the DAX concept.
- **Check quality, peer-reviewed sources:** If you still don't understand the generated code with comments and explanations from Copilot, you should research the functions and patterns online from reputable sources either in the [Microsoft documentation](#) or from the [Power BI community](#).

- **Beware of variable usage by Copilot:** Copilot can struggle to use variables appropriately in DAX queries and defined measures. For instance, Copilot might try to filter or group a variable that's already been declared, which isn't possible and produces an unexpected result.
- **Use concise descriptions to distinguish between similarly named fields:** Descriptions help when similar fields exist in the same model, such as *Name* in the *Customer* table and *Name* in the *Store* table.
- **Beware calculation group usage by Copilot:** Copilot can struggle to use calculation groups in your suggested queries. To improve Copilot's use of calculation groups, you should include calculation item names listed in the calculation group description.
- **Beware newer functions and DAX syntax:** Copilot and other generative AI tools are limited in their training data volume and scope. As such, they're more likely to make mistakes with newer DAX functions or syntax. For these scenarios, you might want to try authoring the query yourself first, then revising it by using Copilot.
- **When generating measures, always ask for a query:** The Copilot experience in the DAX query view is designed to generate DAX queries. You'll get the best results when you instruct Copilot to perform this task, rather than asking it to generate a measure or another DAX expression.

Linguistic schema

You can use Copilot to suggest synonyms for fields and linguistic relationships for your model. You create synonyms or relationships when creating the linguistic schema for your semantic model. This *linguistic modeling* is important to ensure that both Q&A and Copilot can return useful results when users pose questions to a semantic model. They're used to interpret user prompts and identify the right fields, such as the synonym *Turnover* being used to identify a measure named *Sales amount*.

To add synonyms and relationships to your semantic model, you have to enable the Power BI Desktop setting [Turn on Q&A to ask natural language questions about your data](#) in the Data Load settings of the current file. Then, you can open the Q&A setup window via *Q&A Setup* in the *Modeling* ribbon of Power BI Desktop.

The following image depicts the Q&A setup window in Power BI Desktop, where you can add synonyms and relationships for use by both Q&A and Copilot in Power BI.

The screenshot shows the 'Getting started' section of the Q&A setup interface. It includes a sidebar with options like 'Q&A setup', 'Getting started', 'Synonyms', 'Relationships', 'Teach Q&A', 'Review questions', and 'Suggested questions'. The main area has five cards: 'Synonyms' (with a 'Synopsis' button), 'Review questions' (with a 'Review questions' button), 'Help Q&A understand people better' (with a play button icon), 'Teach Q&A' (with a 'Teach Q&A' button), and 'Suggest questions' (with a 'Suggest questions' button). A note at the bottom says 'This feature is in preview. Learn more'.

From here, you can add synonyms or relationships manually, or add suggested synonyms from your organization, a thesaurus, or by using Copilot suggestions. Copilot can suggest both synonyms and new relationship types to add to your semantic model. Copilot can also interpret unrecognized terms. For synonyms, you can adjust this from the *Suggestion settings* menu, as shown in the following image.

The screenshot shows the 'Synonyms' page with 'Suggestion settings'. It lists sources: 'Copilot (preview)', 'Org synonyms', and 'Thesaurus'. There are toggles for 'Share approved synonyms with your entire org' and 'Let Copilot interpret unrecognized terms'. A 'Manage suggestion sources' dropdown shows 'Copilot (preview)' selected. The 'Suggestions' section shows terms like 'episode', 'subdivision', 'interval', 'division', and 'unit' with their counts. A 'Copilot' section lists 'article category', 'article importance', 'article prestige', and 'article prominence'. A note at the bottom says 'This feature is in preview. Learn more'.

For more information about using the Q&A setup menu, see [Intro to Q&A tooling to train Power BI Q&A](#).

Instead of using the Q&A setup window, you can also add synonyms and relationships by using linguistic schema YAML files. For more information, see the blog post [Editing Q&A](#)

[linguistic schemas](#).

We recommend that you use Copilot to generate synonyms as the first step when performing linguistic modeling for your semantic model. Then, you can curate the suggested synonyms, removing the ones that don't make sense, and adding additional synonyms where necessary. Ensure that you [share useful synonyms with your organization](#) to reuse them.

Also, if you want to exclude a table, column, or measure from use by Q&A or Copilot, you can disable *Include in Q&A* in the *Synonyms* window of Q&A setup. This is recommended when you have technical or redundant fields that you don't want to reference using the various Copilot experiences.

Note

If you don't plan to use Copilot or Q&A for your semantic model, then you don't need to set up a linguistic schema. Linguistic modeling only benefits these specific features.

Benefits

Using Copilot to suggest synonyms can save developers time and help come up with new synonyms that they wouldn't otherwise consider. This can make linguistic modeling more efficient and effective, if you need to use it.

Tips to improve Copilot outputs

This Copilot experience uses the following grounding data for context:

- The semantic model schema, which includes unhidden tables, rows, columns, measures, and other objects (like relationships, calculation groups, and so forth).
- The full model linguistic schema.
- Certain semantic model properties, including descriptions, data types, format strings, and data category.

Given this grounding data, you can ensure that suggested synonyms are useful by:

- Using consistent and accurate naming conventions.
- Avoiding the use of punctuation, acronyms, and abbreviations, where possible.
- Naming tables, columns, and measures in English.

Measure descriptions

You can use Copilot to generate descriptions for model measures. Measure descriptions are important for both model consumers and other developers to understand the purpose of a measure and how they should use it. Also, measure descriptions can improve the usefulness of Copilot outputs for other Copilot experiences, such as when you [use Copilot to generate DAX queries in the DAX query view of a Power BI semantic model](#).

We recommend that you use Copilot to generate measure descriptions for your model measures. Then, you can review the results and revise them to ensure they're accurate, concise, and helpful.

Benefits

Creating measure descriptions is normally an arduous task that's often neglected. Generating measure descriptions reduces the time that you have to spend organizing and documenting your semantic model. Unlike a linguistic schema, all semantic models can benefit from adding descriptions to tables, columns, and measures. This helps to improve model documentation and usefulness for others in your organization.

Tip

If you need measure descriptions in another language, you can generate them in English first. Then, you can translate your published model automatically using other tools, such as [semantic link labs in notebooks](#).

Tips to improve Copilot outputs

This Copilot experience uses the following grounding data for context:

- DAX expressions for measures and calculated objects.
- Field properties, including descriptions, data types, format strings, and data category.
- Field synonyms.

Given this grounding data, you can ensure that suggested synonyms are useful by:

- Using consistent naming conventions.
- Limiting the use of punctuation, acronyms, and abbreviations.
- Naming measures in English.

Consume a semantic model by using Copilot

You can use Copilot to pose data questions to your semantic models during consumption. This experience is available whenever you use a report, including in [Power BI Desktop](#), a [published report](#) in a workspace, app, or OrgApp item, or in the [Power BI mobile app](#).

Consumers might ask data questions of a semantic model in the following scenarios:

- They can't find the information or analysis that they need in their reports.
- They want to see data presented in a different way, and [personalize visuals](#) isn't enabled.
- They want to ask a data question using natural language, rather than using tools or code.

 **Note**

See [Ask data questions](#) earlier in this article about developing a semantic model with help from Copilot. The images and guidance there also apply when using the ask data questions experience to consume a semantic model.

For more information about how you can use Copilot in reports, which consume a semantic model, see the article [Use Copilot with Power BI reports](#).

Prepare a semantic model for Copilot consumption

You should only use Copilot to consume semantic models once you've taken the necessary steps to [update your data model to work well with Copilot for Power BI](#).

 **Tip**

Consider using [tags to label semantic models](#) as ready for Copilot consumption. This can be a convenient way to allow data consumers to identify models that they can use with Copilot and expect better results. Alternatively, you can also consider the readiness of a semantic model for use with Copilot as a criteria for its [endorsement](#) to promoted or even [certified](#) status.

If your models aren't ready for use with Copilot in Power BI, but users still want the flexibility to interrogate the data themselves, consider using [personalize visuals](#).

Alternatively, you can show users how to use [explorations of the data](#) or to [connect to the semantic model](#) from Power BI Desktop or Excel to create their own reports.

Power BI Desktop

In Power BI Desktop, you can ask data questions of your semantic model by using the Copilot chat pane. This works both with local models open in Power BI Desktop, and when you're

connected to a shared semantic model by using a live connection. For more information, see [Ask data questions](#) earlier in this article.

You can also use the DAX query view to consume a semantic model by generating DAX queries. Advanced users of Power BI might do this if they prefer to explore data using code.

However, for most data consumers, it's generally more convenient and more efficient to consume and explore a semantic model by adding visuals to the report canvas, or using other items like [explorations](#) or Analyze-in-Excel pivot tables. These items typically have a simpler user interface and user experience better suited to exploring and understanding data than natural language chat-like experiences, such as Copilot.

Tip

You can use Copilot experiences in Power BI when connected to semantic models that are published to Pro or PPU workspaces. The only requirement is that you configure Power BI Desktop to consume Copilot from a F64 workspace; this occurs independently of which semantic model that you connect to and consume.

Published report

In a published report, you can also ask data questions of the connected semantic model by using the Copilot chat pane. This experience in Fabric is identical to the [Ask data questions](#) experience in Power BI Desktop for both model development and consumption.

Note

Slight differences might exist between Copilot experiences in Fabric and in Power BI Desktop. Eventually, over time, these experiences will have parity and work the same way.

Power BI mobile app

In the Power BI mobile app, you can also ask data questions for any report by using the Copilot chat pane in the app. The questions will be directed to the connected semantic model for that report. This works similarly to the [Ask data questions](#) experience explained earlier in this article.

Related content

- [Update your data model to work well with Copilot for Power BI](#)
- [Overview of Copilot for Power BI](#)

- Copilot in Power BI integration

Use Copilot with Power BI reports and semantic models

Article • 05/26/2025

Copilot within Power BI reports and semantic models can be used for various tasks for both business users and report creators, from asking questions about the data in a report they have open to kick-starting the creation of new reports and enhancing their models.

Capabilities for business users

Generate a summary of your report

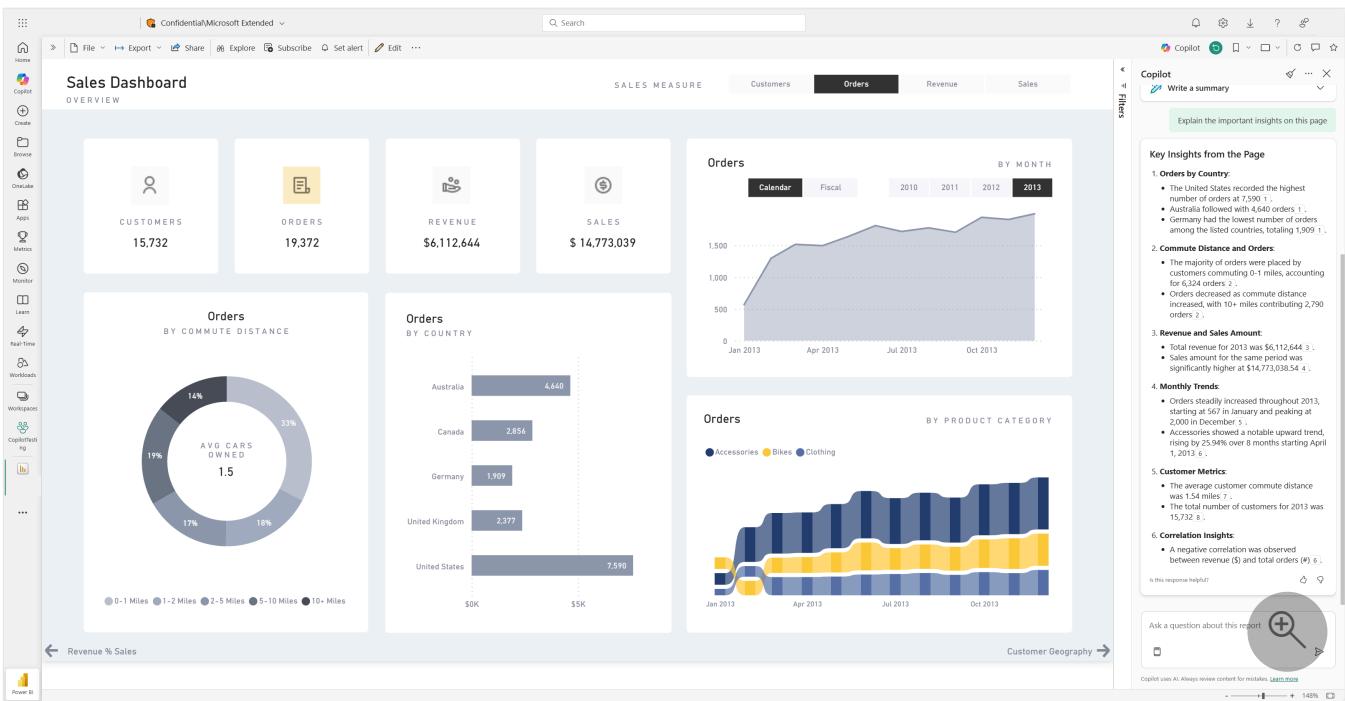
You can summarize report pages by using Copilot in smart narrative visuals on the page, in the Copilot pane, or in report subscriptions. You have the flexibility to refine or guide the summary by customizing prompts, such as "summarize this page using bullet points" or "provide a summary of sales on this page."

You can also ask specific questions about the visualized data on a report page and receive a tailored response. This response includes references to specific visuals, aiding you in understanding the specific data sources contributing to each part of the answer or summary within the report.

Consumers might use report page summaries in the following scenarios:

- Reports are complex or difficult to understand and consumers want an explanation.
- Consumers have challenges with visual or data literacy and want help.
- Consumers want a natural language summary to help them think through insights.

Learn more about [Copilot creating a summary response to prompts about your report](#).



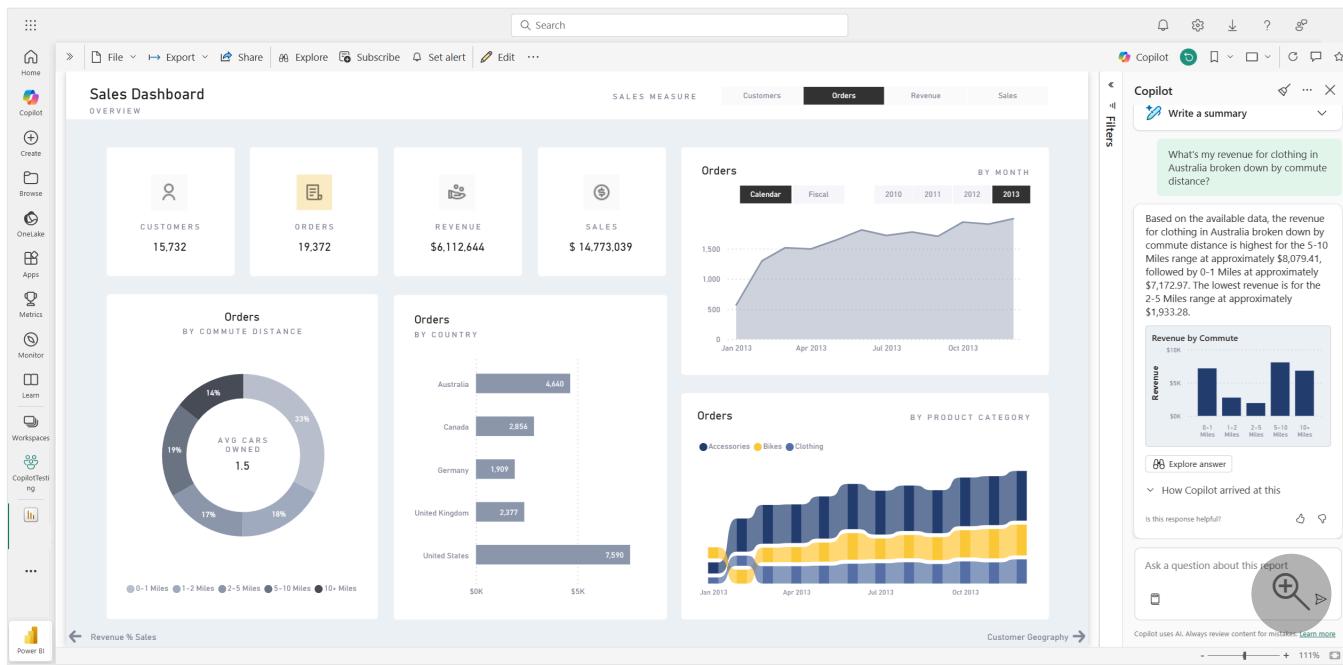
Ask questions about your data

Consumers can ask questions about reports and get answers in the Copilot pane. Copilot can find specific data points for the user and return them as an output, referencing the source visual that it was retrieved from.

Copilot can also use measures and columns in your semantic model to help you explore your data in new ways. As you ask questions about your reports and models, Copilot checks if the answer can be found in the report visuals. If existing visuals don't answer the question, Copilot then builds a visual for you using the model.

Here are examples of the type of requests that Copilot can help you with:

- Can I see this measure filtered to a different region or span of time?
- What are the top categories by a certain metric?
- Show me how this measure has changed over time.



Consumers might ask data questions of a semantic model in the following scenarios:

- They can't find the information or analysis that they need in the report.
- They want to see data presented in a different way, and personalize visuals isn't enabled.
- They want to ask a data question using natural language, rather than using tools or code.

See [Ask Copilot for data in your semantic model](#) for details.

Create report subscriptions with Copilot summaries

You can include a Copilot-generated summary for your Power BI report page or full report attachment in your email subscription to get insights. All the recipients of the email subscription receive the Copilot summary in the email. This feature is currently supported only for Standard Subscriptions.

See [Create report subscriptions with Copilot summaries](#) for details.

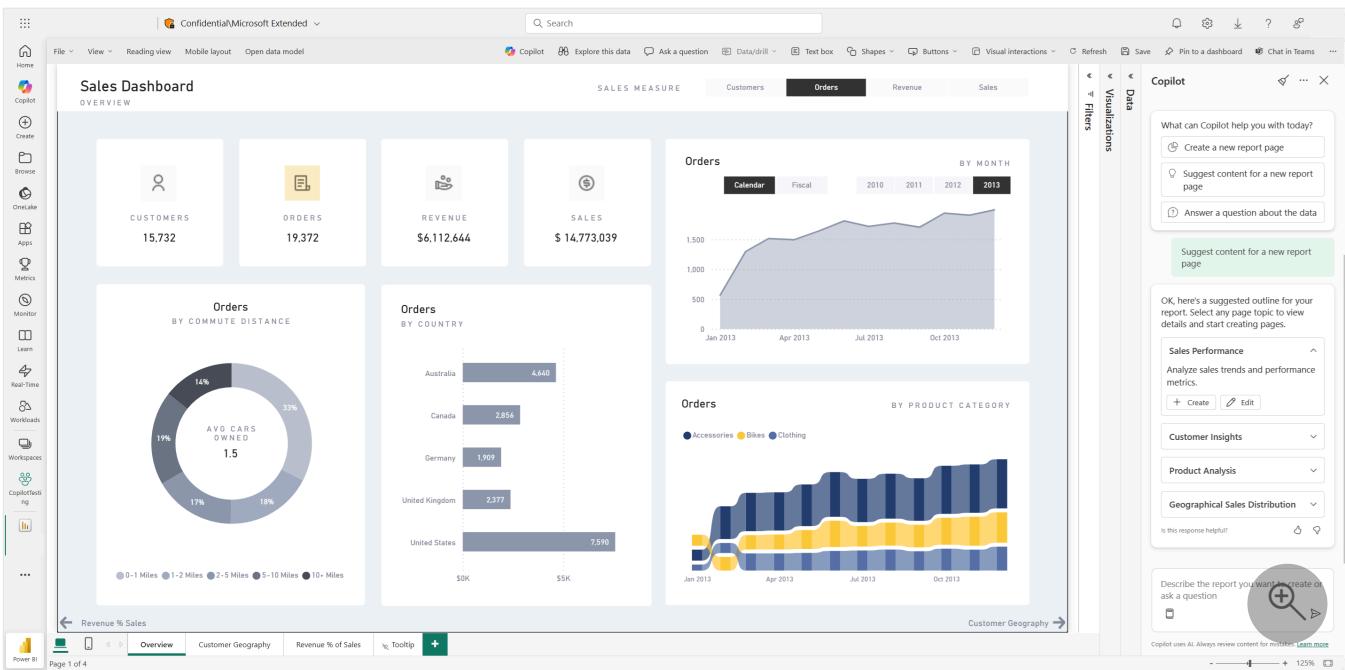
The screenshot shows a Microsoft Power BI dashboard titled "SALES Sales Overview". It includes several cards: "Revenue won \$11.43M", "Qualified Pipeline \$19.90M", and "Revenue goal \$23M". Below these are sections for "Revenue Open by Sales Stage" (1-Qualify, 2-Develop, 3-Propose, 4-Close) and "Forecast by Territory" (US-SOUTH, US-WEST, US-MIDWEST, US-NORTHEAST). A central modal window titled "Preview a sample summary by Copilot" displays a sample summary generated by Copilot, including sections like "Win/Loss Ratio Overview" and "Days to Close Insights". To the right, there's a "WHAT IF" feature and a "Subscriptions" pane where a new subscription for "Sales Overview" is being created, with "John Doe" listed as the recipient.

Capabilities for report authors

Suggest content for a report

Copilot can help you get started on a new report by suggesting topics based on your data. When you select this option directly in the chat, Copilot evaluates the data and provides a report outline with suggested pages that you can explore and choose to create for you.

- A [report outline of suggested pages for your report](#): for example, what each page in the report is about, and how many pages it creates.
- The [visuals for the individual pages](#).



Create a report page

Copilot for Power BI can help you create a report page by identifying the tables, fields, measures, and charts for your data. If you give Copilot a high-level prompt that's specific to your data, it can generate a report page that you can then customize and modify, using the existing editing tools. Copilot can help you get started on your report page quickly and save you a lot of time and effort in the process.

Here are some examples of high-level prompts to get you started:

- Create a page to evaluate the performance of different shifts based on good count, reject count, and alarm count over time.
- Create a page to analyze the efficiency of the production line and overall equipment effectiveness.
- Create a page to compare the cost and material of each product and their impact on production.

See details of how to use this in the [Power BI service](#) or [Power BI Desktop](#). If you need help with writing prompts that get you the report page you want, see [Write Copilot prompts that produce results in Power BI](#) for guidance.

Summarize the underlying semantic model

Summarize a Power BI semantic model by asking Copilot to "summarize the model" in the Copilot pane. This summary can help you gain a better understanding of data in your semantic model, identify important insights, and improve your data exploration experience. Ultimately, better understanding the semantic model can help you build more meaningful reports.

Create a summary visual on the report itself

You can use Copilot for Power BI to quickly create a narrative about a report page with just a few clicks. This narrative can summarize the entire report, specific pages, or even specific visuals that you select. See [Create a narrative with Copilot for Power BI](#) for details.

The screenshot shows the Power BI desktop interface with a report titled "Analysis of Customer Types". The report includes four cards: "Money Spent YTD" (\$61.59M), "Return Rate" (11.7%), "Average of Length of stay" (2.76), and "Count of Customer Type" (2). A Copilot dialog box is overlaid on the report, asking to "Create a narrative with Copilot". It provides a text area for describing the summary and a section for "Answer likely questions from leadership". Below the dialog are two charts: "Spent by Date and Customer Type" (showing a peak in spending around October 2021) and "Average of Length of stay by Gender and Customer Type" (comparing female and male average lengths of stay by customer type).

Write DAX queries

Copilot can write a data analysis expression (DAX) query. For example, you can type in a prompt to describe what DAX query you would like it to generate, and select **Send** or press **Enter**. To run what is returned, select **Keep it** to add it to the query tab. Then select **Run** or press **F5** to see the results of the DAX query. Read more in the article [Write DAX queries](#).

The screenshot shows the Power BI DAX Query editor. A user has typed "Order by year and add in appropriate formats" into the query editor. Copilot has generated a DAX query that includes SUMMARIZECOLUMN and ORDER BY clauses. The generated code is:

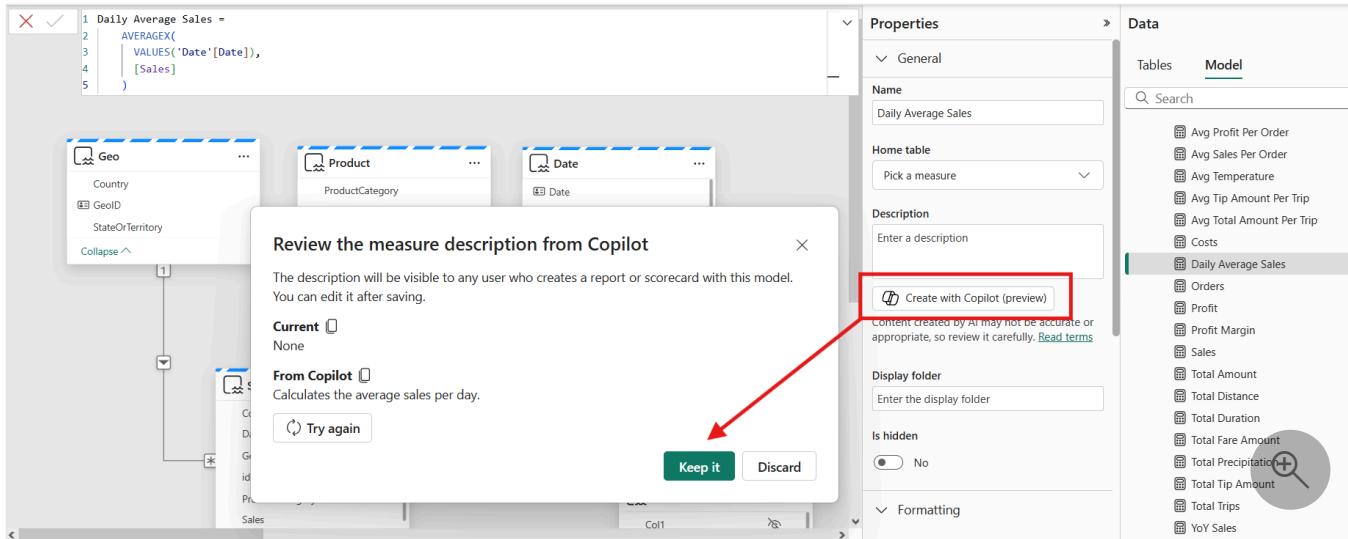
```
1+ // DAX query generated by Fabric Copilot with "Order by year and add in appropriate formats"
2+ EVALUATE
3+ SUMMARIZECOLUMN(
4+     'Date'[Year],
5+     "Sales", [Sales],
6+     "Orders", [Orders],
7+     "Profit", [Profit]
8+ )
9+ ORDER BY
10+     'Date'[Year] ASC
```

The results table shows sales data for 2020, 2021, and 2022.

	Date[Year]	[Sales]	[Orders]	[Profit]
1	2020	\$125,730,542.00	251,233	\$113,066,321.00
2	2021	\$125,403,495.00	250,305	\$112,771,816.00
3	2022	\$124,524,614.00	249,228	\$111,948,807.00

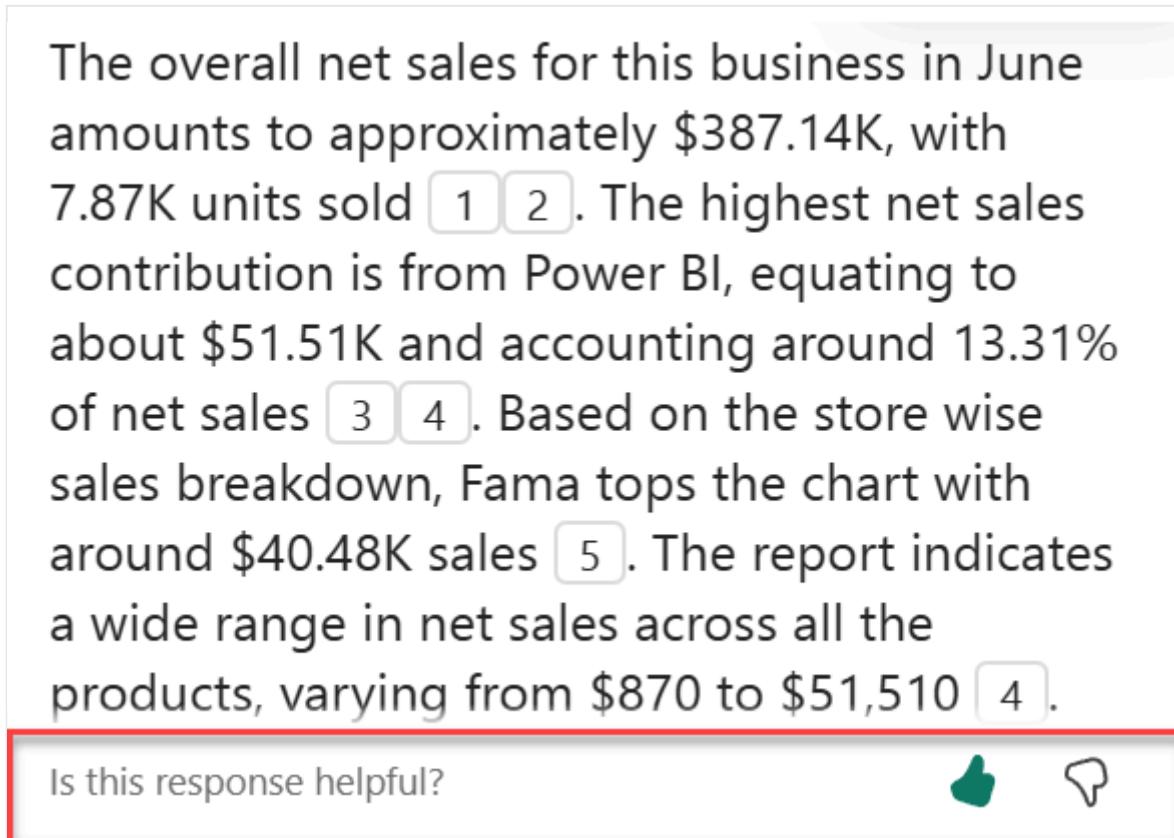
Add descriptions for semantic model measures

Copilot can add descriptions to your semantic model measures. People who build reports from your semantic model can see the name and description of your measures, which makes the description property essential documentation. [Use Copilot to create measure descriptions.](#)



Send feedback

We always welcome your feedback about our products to help us improve Copilot. Give us your feedback directly in the Copilot pane by selecting the feedback button.



Copilot requirements

Read about [requirements to use Copilot with reports and semantic models](#).

Copilot for Microsoft Fabric and Power BI: FAQ

This article answers frequently asked questions about Copilot for Microsoft Fabric and Power BI.

Note

- Your administrator needs to enable the tenant switch before you start using Copilot. See the article [Copilot tenant settings](#) for details.
- Your F or P capacity needs to be in one of the regions listed in this article, [Fabric region availability](#).
- If your tenant or capacity is outside the US or France, Copilot is disabled by default unless your Fabric tenant admin enables the [Data sent to Azure OpenAI can be processed outside your capacity's geographic region, compliance boundary, or national cloud instance](#) tenant setting in the Fabric Admin portal.
- Copilot in Microsoft Fabric isn't supported on trial SKUs. Only paid SKUs (F2 or higher, or P1 or higher) are supported. If you're using an Azure subscription with monthly credits (such as through a Visual Studio/MSDN benefit), you may not have access to the required SKUs unless billing is enabled and the appropriate capacity is provisioned.
- For more information, see the article [Overview of Copilot in Fabric](#).

Power BI

Can Copilot be enabled for specific workspaces within a tenant?

Copilot is enabled at the tenant level and access can be restricted by security groups. If the workspace is tied to an F2 or P1 capacity, Copilot experience will be enabled.

When you're using Copilot, who has access to what data?

The data that Copilot can access depends on your role-level security and user-based permission on Fabric.

If you don't have permission to access specific data, then prompting Copilot for it won't retrieve the information.

Can Copilot prompts be saved for future reference?

Copilot prompts can't be saved for future reference. The only experience where it's possible to view your prompts is by using the chat-magic function in notebooks.

Does enabling Copilot and agreeing to the setting of "Data sent to Azure OpenAI can be processed outside your capacity's geographic region, compliance boundary, or national cloud instance" mean all my data is sent or processed outside my country/region?

Not exactly. While the prompt itself is sent to Azure OpenAI, it doesn't mean your data is sent or processed outside your country/region.

The prompt isn't used to train any models.

I loaded my semantic model, but it doesn't meet all the criteria listed in the data evaluation. What should I do?

The criteria listed in [Update your data model to work well with Copilot for Power BI](#) is important because it helps you get a better quality report. As long as you meet seven of the eight points, including Consistency, the quality of the reports generated should be good.

If your data doesn't meet that criteria, we recommend spending the time to bring it into compliance.

I was given a Copilot URL, but I can't see the Copilot button. Why is that?

First, check with your admin to see if they have enabled Copilot.

Next, when you select a Copilot-enabled URL, you have to initially load the semantic model. When you've completed loading the semantic model, then you see the Copilot button.

I selected the Copilot button, and it's stuck on Analyzing your semantic model.

Depending upon the size of the semantic model, Copilot might take a while to analyze it. If you've waited longer than 15 minutes and you haven't received any errors, chances are that there's an internal server error.

Try restarting Copilot by closing the pane and selecting the Copilot button again.

I loaded the semantic model and Copilot generated a summary, but I don't think that it's accurate.

This inaccuracy could be because your semantic model has missing values. Because AI is generating the summary, it can try to fill the holes and fabricate data. If you can remove the rows with missing values, this situation could be avoided.

I generated the report visuals, but the quality of the visuals concern me. I wouldn't choose them myself.

We're continuously looking to improve the quality of the Copilot-generated visuals. For now, we recommend that you make the change by using the Power BI visualization tool.

The accuracy of the narrative visual concerns me.

We're continuously working to improve the accuracy of the narrative visual results. We recommend using the custom prompts as an extra tool to try to tweak the summary to meet your needs.

I want to disable Copilot immediately as I'm concerned with the data storage you mentioned.

Contact your help desk to get support from your IT admin.

Why did Copilot respond with general knowledge data?

When a question is related to data in the semantic model, Copilot will use the semantic model to answer the question, otherwise it may answer from the [LLM's general knowledge](#).

I want to suggest new features. How can I do that?

You can submit and vote on ideas for Microsoft Fabric on the [Ideas page of the Fabric Community](#). Read more about giving feedback in the [Learn about Microsoft Fabric feedback](#) article.

Real-Time Intelligence

Does Copilot respond to multiple questions in a conversation?

No, Copilot doesn't answer follow-up questions. You need to ask one question at a time.

How can I improve the quality of the Copilot answer?

Provide any tips or relevant information in your question. For example, if you're asking about a specific column, provide the column name and the type of data it contains. If you want to use specific operators or functions, this will also help. The more information you provide, the better the Copilot answer will be.

What access level do I need on a KQL queryset to use Copilot?

You need read access to the KQL queryset to use Copilot. In order to insert and execute the Copilot-generated query in the KQL queryset, you need to have write access to that KQL queryset.

What database does the Copilot-generated query run against?

The Copilot-generated query runs against the database that the KQL queryset is connected to. If you want to change the database, you can do so in the KQL queryset.

Related content

- [What is Microsoft Fabric?](#)
- [Privacy, security, and responsible use of Copilot in Fabric](#)

Release status of AI and Copilot experiences in Fabric

09/26/2025

The following table provides an overview of the state of various AI and Copilot experiences available in Fabric.

 Expand table

Fabric workload	Supported items	Copilot experience	Release status
Data Science and Data Engineering	Notebook (typically with lakehouses and other data items)	<ul style="list-style-type: none">- Copilot chat panel vs chat magics in a notebook.- Generate code or markdown for a notebook (preview).- Add comments, fix errors, or debug notebook code (preview).- Analyze and visualize data.- Explain notebook contents (preview).	Preview
Data Science	Data Agent	<ul style="list-style-type: none">- Fabric data agent creation (preview)- Learn how to create a Fabric data agent.	Preview
Data Science	AI Functions	<ul style="list-style-type: none">- Transform and enrich data seamlessly with AI functions.	Preview
Data Factory	Dataflows gen2	<ul style="list-style-type: none">- Generate a new query.	GA
	Pipeline	<ul style="list-style-type: none">- Generate and run a pipeline.- Summarize a pipeline.- Troubleshoot pipeline errors.	GA
Data Warehouse	SQL Queries in Data Warehouse	<ul style="list-style-type: none">- Generate SQL queries (preview).- Suggest SQL code completions (preview).- Fix code in SQL queries (preview).- Explain code in SQL queries (preview).	Preview
SQL database	SQL queries in SQL database	<ul style="list-style-type: none">- Generate SQL queries (preview).- Suggest SQL code completions (preview).- Fix code in SQL queries (preview).	Preview

Fabric workload	Supported items	Copilot experience	Release status
		- Explain code in SQL queries (preview).	
Power BI	Semantic models in Power BI Desktop or Power BI service	- Suggest linguistic model synonyms. GA - Suggest measure descriptions. - Write and explain DAX queries. - Ask questions about your data.	
	Reports (Power BI Desktop, service, or mobile app)	- Power BI home (announced). - Suggest a report page. - Suggest a visual. - Summarize data in a narrative visual. - Explain a report page or visual.	GA
Real-Time Intelligence	KQL queryset	- Copilot for Writing KQL Queries (preview). - Modify or explore a previously generated KQL query (preview).	Preview
	Real-time dashboards	- Generate a real-time dashboard.	Preview

Privacy, security, and responsible AI use of Copilot in Fabric

06/25/2025

Before your business starts using Copilot in Fabric, you might have questions about how it works, how it keeps your business data secure and adheres to privacy requirements, and how to use generative AI responsibly.

This article provides answers to common questions related to business data security and privacy to help your organization get started with Copilot in Fabric. The article [Privacy, security, and responsible use for Copilot in Power BI \(preview\)](#) provides an overview of Copilot in Power BI. Read on for details about Copilot for Fabric.

Note

- Your administrator needs to enable the tenant switch before you start using Copilot. See the article [Copilot tenant settings](#) for details.
- Your F2 or P1 capacity needs to be in one of the regions listed in this article, [Fabric region availability](#).
- If your tenant or capacity is outside the US or France, Copilot is disabled by default unless your Fabric tenant admin enables the [Data sent to Azure OpenAI can be processed outside your tenant's geographic region, compliance boundary, or national cloud instance](#) tenant setting in the Fabric Admin portal.
- Copilot in Microsoft Fabric isn't supported on trial SKUs. Only paid SKUs (F2 or higher, or P1 or higher) are supported.
- See the article [Overview of Copilot in Fabric and Power BI](#) for more information.

Business data is secure

- Copilot features use [Azure OpenAI Service](#), which is fully controlled by Microsoft. Your data isn't used to train models and isn't available to other customers.
- You retain control over where your data is processed. Data processed by Copilot in Fabric stays within your tenant's geographic region, unless you explicitly allow data to be processed outside your region—for example, to let your users use Copilot when Azure OpenAI isn't available in your region or availability is limited due to high demand. Learn more about [admin settings for Copilot](#).

- Copilot doesn't store your data for abuse monitoring. To enhance privacy and trust, we've updated our approach to abuse monitoring: previously, we retained data from Copilot in Fabric, containing prompt inputs and outputs, for up to 30 days to check for abuse or misuse. Following customer feedback, we've eliminated this 30-day retention. Now, we no longer store prompt related data, demonstrating our unwavering commitment to your privacy and security.

Check Copilot outputs

- Copilot responses can include inaccurate or low-quality content, so make sure to review outputs before you use them in your work.
- People who can meaningfully evaluate the content's accuracy and appropriateness should review the outputs.
- Today, Copilot features work best in the English language. Other languages might not perform as well.

 **Important**

Review the [supplemental preview terms for Fabric](#), which includes terms of use for Microsoft Generative AI Service Previews.

How Copilot works

In this article, *Copilot* refers to a range of generative AI features and capabilities in Fabric that are powered by Azure OpenAI Service.

In general, these features are designed to generate natural language, code, or other content based on:

- (a) [inputs you provide](#), and,
- (b) [grounding data](#) that the feature has access to.

For example, Power BI, Data Factory, and data science offer Copilot chats where you can ask questions and get responses that are contextualized on your data. Copilot for Power BI can also create reports and other visualizations. Copilot for Data Factory can transform your data and explain what steps it has applied. Data science offers Copilot features outside of the chat pane, such as custom IPython magic commands in notebooks. Copilot chats might be added to other experiences in Fabric, along with other features that are powered by Azure OpenAI under the hood.

This information is sent to Azure OpenAI Service, where it's processed and an output is generated. Therefore, data processed by Azure OpenAI can include:

- The user's [prompt or input](#).
- [Grounding data](#).
- The [AI response or output](#).

Grounding data might include a combination of dataset schema, specific data points, and other information relevant to the user's current task. Review each experience section for details on what data is accessible to Copilot features in that scenario.

Interactions with Copilot are specific to each user. This means that Copilot can only access data that the current user has permission to access, and its outputs are only visible to that user unless that user shares the output with others, such as sharing a generated Power BI report or generated code. Copilot doesn't use data from other users in the same tenant or other tenants.

Copilot uses Azure OpenAI—not the publicly available OpenAI services—to process all data, including user inputs, grounding data, and Copilot outputs. Copilot currently uses a combination of GPT models, including GPT 3.5. Microsoft hosts the OpenAI models in the Microsoft Azure environment, and the Service doesn't interact with any services by OpenAI, such as ChatGPT or the OpenAI API. Your data isn't used to train models and isn't available to other customers. Learn more about [Azure OpenAI](#).

Review the Copilot process

These features follow the same general process:

1. **Copilot receives a prompt from a user.** This prompt could be in the form of a question that a user types into a chat pane, or in the form of an action such as selecting a button that says "Create a report."
2. **Copilot preprocesses the prompt through an approach called grounding.** Depending on the scenario, this might include retrieving relevant data such as dataset schema or chat history from the user's current session with Copilot. Grounding improves the specificity of the prompt, so the user gets responses that are relevant and actionable to their specific task. Data retrieval is scoped to data that is accessible to the authenticated user based on their permissions. See the section [What data does Copilot use and how is it processed?](#) in this article for more information.
3. **Copilot takes the response from Azure OpenAI and postprocesses it.** Depending on the scenario, this postprocessing might include responsible AI checks, filtering with Azure content moderation, or additional business-specific constraints.
4. **Copilot returns a response to the user in the form of natural language, code, or other content.** For example, a response might be in the form of a chat message or generated

code, or it might be a contextually appropriate form such as a Power BI report or a Synapse notebook cell.

5. **The user reviews the response before using it.** Copilot responses can include inaccurate or low-quality content, so it's important for subject matter experts to check outputs before using or sharing them.

Just as each experience in Fabric is built for certain scenarios and personas—from data engineers to data analysts—each Copilot feature in Fabric has also been built with unique scenarios and users in mind. For capabilities, intended uses, and limitations of each feature, review the section for the experience you're working in.

Definitions

Prompt or input

The text or action submitted to Copilot by a user. This could be in the form of a question that a user types into a chat pane, or in the form of an action such as selecting a button that says "Create a report."

Grounding

A preprocessing technique where Copilot retrieves additional data that's contextual to the user's prompt, and then sends that data along with the user's prompt to Azure OpenAI in order to generate a more relevant and actionable response.

Response or output

The content that Copilot returns to a user. For example, a response might be in the form of a chat message or generated code, or it might be contextually appropriate content such as a Power BI report or a Synapse notebook cell.

What data does Copilot use and how is it processed?

To generate a response, Copilot uses:

- The user's prompt or input and, when appropriate,
- Additional data that is retrieved through the grounding process.

This information is sent to Azure OpenAI Service, where it's processed and an output is generated. Therefore, data processed by Azure OpenAI can include:

- The user's prompt or input.
- Grounding data.
- The AI response or output.

Grounding data might include a combination of dataset schema, specific data points, and other information relevant to the user's current task. Review each experience section for details on what data is accessible to Copilot features in that scenario.

Interactions with Copilot are specific to each user. This means that Copilot can only access data that the current user has permission to access, and its outputs are only visible to that user unless that user shares the output with others, such as sharing a generated Power BI report or generated code. Copilot doesn't use data from other users in the same tenant or other tenants.

Copilot uses Azure OpenAI—not OpenAI's publicly available services—to process all data, including user inputs, grounding data, and Copilot outputs. Copilot currently uses a combination of GPT models, including GPT 3.5. Microsoft hosts the OpenAI models in Microsoft's Azure environment and the Service doesn't interact with any services by OpenAI (for example, ChatGPT or the OpenAI API). Your data isn't used to train models and isn't available to other customers. Learn more about [Azure OpenAI](#).

Abuse monitoring of prompts

Copilot and AI experiences in Fabric are currently **not** onboarded to any automated abuse monitoring of your prompts. This means that we currently do not process any customer prompts for monitoring of abusive content. This also means that no retention of prompts is in place for this purpose.

Data residency and compliance

You retain control over where your data is processed. Data processed by Copilot in Fabric stays within your tenant's geographic region, unless you explicitly allow data to be processed outside your region—for example, to let your users use Copilot when Azure OpenAI isn't available in your region or availability is limited due to high demand. (See [where Azure OpenAI is currently available](#).)

To allow data to be processed elsewhere, your admin can turn on the setting **Data sent to Azure OpenAI can be processed outside your tenant's geographic region, compliance boundary, or national cloud instance**. Learn more about [admin settings for Copilot](#).

What should I know to use Copilot responsibly?

Microsoft is committed to ensuring that our AI systems are guided by our [AI principles](#) and [Responsible AI Standard](#). These principles include empowering our customers to use these systems effectively and in line with their intended uses. Our approach to responsible AI is continually evolving to proactively address emerging issues.

Copilot features in Fabric are built to meet the Responsible AI Standard, which means that they're reviewed by multidisciplinary teams for potential harms, and then refined to include mitigations for those harms.

Before you use Copilot, keep in mind the limitations of Copilot:

- Copilot responses can include inaccurate or low-quality content, so make sure to review outputs before using them in your work.
- People who are able to meaningfully evaluate the content's accuracy and appropriateness should review the outputs.
- Currently, Copilot features work best in the English language. Other languages might not perform as well.

Copilot for Fabric workloads

Privacy, security, and responsible use for:

- [Copilot for Data Factory \(preview\)](#)
- [Copilot for Data Science \(preview\)](#)
- [Copilot in Fabric in Data Warehouse \(preview\)](#)
- [Copilot in Fabric in SQL database \(preview\)](#)
- [Copilot for Power BI](#)
- [Copilot for Real-Time Intelligence \(preview\)](#)

Related content

- [What is Microsoft Fabric?](#)
- [Copilot in Fabric and Power BI: FAQ](#)

Privacy, security, and responsible AI use of Copilot in Fabric in the SQL database workload (Preview)

Article • 04/10/2025

Applies to:  [SQL database](#) in Microsoft Fabric

In this article, learn how [Copilot in Fabric in SQL database](#) works, how it keeps your business data secure and adheres to privacy requirements, and how to use generative AI responsibly. For more information on Copilot in Fabric, see [Privacy, security, and responsible use of Copilot in Fabric](#).

With Copilot in Fabric SQL databases and other generative AI features, Microsoft Fabric brings a new way to transform and analyze data, generate insights, and create visualizations and reports in your database and other workloads.

For limitations, see [Limitations of Copilot in Fabric in SQL database](#).

Data use of Copilot in Fabric in SQL database

In database, Copilot can only access the database schema that is accessible in the user's database.

By default, Copilot has access to the following data types:

- Previous messages sent to and replies from Copilot for that user in that session.
- Contents of SQL query that the user has executed.
- Error messages of a SQL query that the user has executed (if applicable).
- Schemas of the database.

Tips for working with Copilot in Fabric SQL databases

- Copilot is best equipped to handle SQL database articles, so limit your questions to this area.
- Be explicit about the data you want Copilot to examine. If you describe the data asset, with descriptive table and column names, Copilot is more likely to retrieve relevant data and generate useful outputs.

Evaluation of Copilot in Fabric SQL databases

The product team tested Copilot to see how well the system performs within the context of databases, and whether AI responses are insightful and useful.

The team also invested in additional harm mitigation, including technological approaches to focusing Copilot's output on articles related to SQL databases.

Related content

- [Privacy, security, and responsible use for Copilot in Microsoft Fabric](#)
- [Copilot in Fabric in SQL database in Fabric](#)

Privacy, security, and responsible use of Copilot for Data Factory

Article • 02/27/2025

In this article, learn how [Copilot for Data Factory overview](#) works, how it keeps your business data secure and adheres to privacy requirements, and how to use generative AI responsibly. For an overview of these topics for Copilot in Fabric, see [Privacy, security, and responsible use for Copilot](#).

With Copilot for Data Factory in Microsoft Fabric and other generative AI features, Microsoft Fabric brings a new way to transform and analyze data, generate insights, and create visualizations and reports in Data Science and the other workloads.

For considerations and limitations, see [Limitations of Copilot for Data Factory](#).

Data use of Copilot for Data Factory

- Copilot can only access data that is accessible to the user's current Gen2 dataflow session, and that is configured and imported into the data preview grid. Learn more about getting data in Power Query.

Evaluation of Copilot for Data Factory

- The product team has tested Copilot to see how well the system performs within the context of Gen2 dataflows, and whether AI responses are insightful and useful.
- The team also invested in other harms mitigations, including technological approaches to focusing Copilot's output on topics related to data integration.

Tips for working with Copilot for Data Factory

- Copilot is best equipped to handle data integration topics, so it's best to limit your questions to this area.
- If you include descriptions such as query names, column names, and values in the input, Copilot is more likely to generate useful outputs.
- Try breaking complex inputs into more granular tasks. This helps Copilot better understand your requirements and generate a more accurate output.

Related content

- Copilot for Data Factory overview
 - Copilot in Fabric: FAQ
-

Feedback

Was this page helpful?

 Yes

 No

[Provide product feedback ↗](#) | [Ask the community ↗](#)

Privacy, security, and responsible use of Copilot in notebooks and Fabric data agents

Article • 05/30/2025

In this article, learn how [Microsoft Copilot in Notebooks](#) and [Fabric data agents](#) (formerly known as AI Skill) works, how it keeps your business data secure and compliant with privacy requirements, and how to responsibly use generative AI. For an overview of these topics for Copilot in Fabric, see [Privacy, security, and responsible use for Copilot \(preview\)](#).

Data use

Data use in Copilot for notebooks in Fabric

- In notebooks, Copilot can only access data that is accessible to the user's current notebook, either in an attached lakehouse or directly loaded or imported into that notebook by the user. In notebooks, Copilot can't access any data that's not accessible to the notebook.
- By default, Copilot has access to the following data types:
 - Conversation history: Previous messages sent to and replies from Copilot for that user. (see below for more details about storing conversation history)
 - Contents of cells that the user executed.
 - Outputs of cells that the user executed.
 - Schemas of data sources in the notebook.
 - Sample data from data sources in the notebook.
 - Schemas from external data sources in an attached lakehouse.

Data use in Fabric data agents

- Fabric data agents rely on the user's conversation history to better respond to the user questions. (see below for more details about storing conversation history)
- Schema information of the data sources added. This includes table and Column names. (The creator of a data agent selects which tables that should be included.)

How we handle conversation history

For [Copilot in Notebooks](#) and Fabric [data agents](#), we store conversation history across user sessions.

Why do we store conversations history and where is it stored?

In order to use fully conversational agentic AI experiences, the agent needs to store conversation history across user sessions to maintain context. This ensures that the AI agent keeps context about what a user asked in previous sessions and is typically a desired behavior in many agentic AI experiences. Experiences such as Copilot in Notebooks and Fabric data agents are AI experiences that store conversation history across user's sessions.

This history is stored inside the Azure security boundary, in the same region and in the same Azure OpenAI resources that process all your Fabric AI requests. The difference in this case is that the conversation history is stored for as long as the user allows. For experiences that don't store conversation history across sessions, no data is stored. Prompts are only processed by Azure OpenAI resources that Fabric uses.

Your users can delete their conversation history at any time, simply by clearing the chat. This option exists both for Copilot in Notebooks and data agents. If the conversation history isn't manually removed, it is stored for 28 days.

Copilot in Notebooks: Responsible AI FAQ

With Copilot in notebooks for Data Science and Data engineering in Microsoft Fabric, we offer an AI assistant to help transform, explore, and build solutions in the context of the notebook.

For considerations and limitations, see [Limitations](#).

How did we evaluate Copilot in notebooks for data science and data engineering?

- The product team tested Copilot to see how well the system performs within the context of notebooks, and whether AI responses are insightful and useful.
- The team also invested in other harm mitigations, including technological approaches to focusing Copilot's output on data science-related topics.

How do you best work with Copilot in notebooks for data science and data engineering?

- Copilot is best equipped to handle data science topics, so limit your questions to this area.

- Explicitly describe the data you want Copilot to examine. If you describe the data asset - for example, by naming files, tables, or columns - Copilot can more likely retrieve relevant data and generate useful outputs.
- For more granular responses, load the data into the notebook as DataFrames, or pin the data in your lakehouse. This gives Copilot more context with which to perform analysis. If an asset is too large to load, pinning it's a helpful alternative.

Fabric data agent: Responsible AI FAQ

What is Fabric data agent?

Fabric data agent is a new Microsoft Fabric feature that allows you to build your own conversational Q&A systems with generative AI. A Fabric data agent makes data insights more accessible and actionable for everyone in your organization. With a Fabric data agent, your team can have conversations, with plain English-language questions, about the data stored in Fabric OneLake, and then receive relevant answers. Even people without technical expertise in AI, or without a deep understanding of the data structure, can receive precise and context-rich answers.

What can data agent do?

Fabric data agent enables natural language interactions with structured data, allowing users to ask questions and receive rich, context-aware answers. It can enable users to connect and get insights from data sources like Lakehouse, Warehouse, Power BI dataset, KQL databases without needing to write complex queries. Data agent is designed to help users access and process data easily, enhancing decision-making through conversational interfaces while maintaining control over data security and privacy.

What are the intended uses for data agent?

- The Fabric data agent is intended to simplify the data querying process. It allows users to interact with structured data through natural language. It supports user insights, decision-making, and generation of answers to complex questions without the need for specialized query language knowledge. Data agent is especially useful for business analysts, decision-makers, and other nontechnical users who need quick, actionable insights from data stored in sources like KQL database, Lakehouse, Power BI dataset, and Warehouse resources.
- The Fabric data agent isn't intended for use cases where deterministic and 100% accurate results are required, because of current LLM limitations.

- The Fabric data agent isn't intended for use cases that require deep analytics or causal analytics. For example, "why did the sales numbers drop last month?" is out of current scope.

How was The Fabric data agent evaluated? What metrics are used to measure performance?

The product team tested the data agent on various public and private benchmarks, to determine the query quality against different data sources. The team also invested in other harm mitigations, including technological approaches to ensure that the data agent's output is constrained to the context of the selected data sources.

What are the limitations of The Fabric data agent? How can users minimize the impact of The Fabric data agent limitations when using the system?

- Ensure that you use descriptive column names. Instead of "C1" or "ActCu" column names (as examples), use "ActiveCustomer" or "IsCustomerActive." This is the most effective way to get more reliable queries out of the AI.
- To improve the accuracy of the Fabric data agent, you can provide more context with data agent instructions and example queries. These inputs help the Azure OpenAI Assistant API - which powers the Fabric data agent - make better decisions about how to interpret user questions and which data source is most appropriate to use.
- You can use Data agent instructions to guide the underlying agent's behavior, helping it identify the best data source to answer specific types of questions.
- You can also provide sample question-query pairs to demonstrate how the Fabric data agent should respond to common queries. These examples serve as patterns for interpreting similar user inputs and generating accurate results. Sample question-query pairs aren't currently supported for Power BI semantic model data sources.
- Refer to [this resource](#) for a full list of current limitations of the data agent.

What operational factors and settings allow for effective and responsible use of the Fabric data agent?

- The Fabric data agent can only access the data that you provide. It uses the schema (table name and column name), as well as the Fabric data agent instructions and example queries that you provide, in the User Interface (UI) or through the SDK.

- The Fabric data agent can only access the data that the user can access. If you use the data agent, your credentials are used to access the underlying database. If you don't have access to the underlying data, the data agent can't access that underlying data. This is true when you consume the data agent across different channels - for example, Azure AI Foundry or Microsoft Copilot Studio - where other users can use the data agent.

Related content

- [Privacy, security, and responsible use of Copilot for Data Factory \(preview\)](#)
- [Overview of Copilot for Data Science and Data Engineering \(preview\)](#)
- [Copilot for Data Factory overview](#)
- [Copilot in Fabric: FAQ](#)

Privacy, security, and responsible AI use of Copilot in Fabric in the Data Warehouse workload (Preview)

Article • 04/16/2025

Applies to:  Warehouse in Microsoft Fabric

In this article, you learn how [Copilot in Fabric in the Data Warehouse workload](#) works, keeps your business data secure and adheres to privacy requirements, and how to use generative AI responsibly. For more information on Copilot in Fabric, see [Privacy, security, and responsible use for Copilot in Microsoft Fabric \(preview\)](#).

With Copilot in Fabric in Data Warehouse and other generative AI features, Microsoft Fabric brings a new way to transform and analyze data, generate insights, and create visualizations and reports in your warehouse and other workloads.

For considerations and limitations, see [Limitations](#).

Data use of Copilot in Fabric in Data Warehouse

In warehouse, Copilot can only access the database schema that is accessible in the user's warehouse.

By default, Copilot has access to the following data types:

- Previous messages sent to and replies from Copilot for that user in that session.
- Contents of SQL query that the user has executed.
- Error messages of a SQL query that the user has executed (if applicable).
- Schemas of the warehouse.
- Schemas from attached warehouses or SQL analytics endpoints when cross-DB querying.

Tips for working with Copilot in Fabric in Data Warehouse

- Copilot is best equipped to handle data warehousing topics, so limit your questions to this area.
- Be explicit about the data you want Copilot to examine. If you describe the data asset, with descriptive table and column names, Copilot is more likely to retrieve relevant data and generate useful outputs.

Evaluation of Copilot in Fabric in Data Warehouse

The product team tested Copilot to see how well the system performs within the context of warehouses, and whether AI responses are insightful and useful.

The team also invested in additional harm mitigation, including technological approaches to focusing Copilot's output on topics related to data warehousing.

Related content

- [Privacy, security, and responsible AI use for Copilot in Microsoft Fabric](#)
- [What is Copilot in Fabric in Data Warehouse](#)

Privacy, security, and responsible use for Copilot in Power BI

08/21/2025

In this article, learn how [Microsoft Copilot for Power BI](#) works, how it keeps your business data secure and adheres to privacy requirements, and how to use generative AI responsibly. With Copilot and other generative AI features in preview, Power BI brings a new way to transform and analyze data, generate insights, and create visualizations and reports in Power BI and the other workloads.

For more information privacy and data security in Copilot, see [Privacy, security, and responsible use for Copilot in Microsoft Fabric \(preview\)](#).

For considerations and limitations with Copilot for Power BI, see [Considerations and Limitations](#).

Data use in Copilot for Power BI

- Copilot uses the data in a semantic model that you provide, combined with the prompts you enter, to create visuals. Learn more about [semantic models](#).
- To answer data questions from the semantic model, Copilot requires that Q&A be enabled in the semantic model's dataset settings. For more information, see [Update your data model to work well with Copilot for Power BI](#).
- To create measure descriptions in a semantic model, Copilot uses the DAX formula and table name of the selected measure. DAX comments and text in double-quotes of the DAX formula are not used. For more information, see [Use Copilot to create measure descriptions](#).
- To create DAX queries, explain DAX queries, or explain DAX topics, Copilot uses the semantic model metadata, such as table and column names and properties, with any DAX query selected in the DAX query editor combined with the request you enter, to respond. For more information, see [Use Copilot to create DAX queries](#).
- When you add a copilot summary to an email subscription, the copilot summary generated is the same as that generated when you add a narrative visual to a report. For more information, see [Copilot summaries in email subscriptions](#).

Tips for working with Copilot for Power BI

Review [FAQ for Copilot for Power BI](#) for tips and suggestions to help you work with Copilot in this experience.

Evaluation of Copilot for Data Warehouse

The product team invested in harm mitigation, including technological approaches to focusing Copilot's output on topics related to reporting and data warehousing.

Related content

- [Microsoft Copilot for Power BI](#)
- [Enable Fabric Copilot for Power BI](#)
- [Copilot in Fabric and Power BI: FAQ](#)

Privacy, security, and responsible use of Copilot for Real-Time Intelligence

Article • 01/26/2025

In this article, learn how [Copilot for Real-Time Intelligence](#) works, how it keeps your business data secure and adheres to privacy requirements, and how to use generative AI responsibly. For an overview of these topics for Copilot in Fabric, see [Privacy, security, and responsible use for Copilot](#).

This feature leverages the power of OpenAI to seamlessly translate natural language queries into Kusto Query Language (KQL), a specialized language for querying large datasets. In essence, it acts as a bridge between users' everyday language and the technical intricacies of KQL removing adoption barriers for users unfamiliar with the language. By harnessing OpenAI's advanced language understanding, this feature empowers users to submit business questions in a familiar, natural language format, which are then converted into KQL queries.

Copilot accelerates productivity by simplifying the query creation process but also provides a user-friendly and efficient approach to data analysis.

Copilot for Real-Time Intelligence intended use

Kusto Copilot accelerates data scientists' and analysts' data exploration process, by translating natural language business questions into KQL queries, based on the underlying dataset column names / schema.

What can Copilot for Real-Time Intelligence do?

Kusto Copilot is powered by generative AI models developed by OpenAI and Microsoft. Specifically, it uses OpenAI's Embedding and Completion APIs to build the natural language prompt and to generate KQL queries.

Data use of Copilot for Real-Time Intelligence

Copilot for Real-Time Intelligence has access to data that is accessible to the Copilot user, for example the database schema, user-defined functions, and data sampling of

the connected database. The Copilot refers to whichever database is currently connected to the KQL queryset. The Copilot doesn't store any data.

Evaluation of Copilot for Real-Time Intelligence

- Following a thorough research period in which several configurations and methods have been tested, the OpenAI integration method had been proven to generate highest accuracy KQL queries. Copilot doesn't automatically run the generated KQL query, and users are advised to run the queries at their own discretion.
- Kusto Copilot doesn't automatically run any generated KQL query, and users are advised to run the queries at their own discretion.

Limitations of Copilot for Real-Time Intelligence

- Complex and long user input might be misunderstood by Copilot, resulting in potentially inaccurate or misleading suggested KQL queries.
- User input which directs to database entities which are not KQL tables or materialized views (for example, a KQL function), may result in potentially inaccurate or misleading suggested KQL queries.
- More than 10,000 concurrent users within an org will most likely fail or result in major performance hit.
- The KQL query should be validated by user before executing for preventing insecure KQL query execution.

Tips for working with Copilot for Real-Time Intelligence

- We recommend you provide detailed and relevant natural language queries. Furthermore, you should provide concise and simple requests to the copilot to avoid inaccurate or misleading suggested KQL queries. You should also restrict questions to databases which are KQL tables or materialized views.
- For example, if you're asking about a specific column, provide the column name and the type of data it contains. If you want to use specific operators or functions, this will also help. The more information you provide, the better the Copilot answer will be.

Related content

- [What is Microsoft Fabric?](#)
 - [Copilot in Fabric: FAQ](#)
-

Feedback

Was this page helpful?

 Yes

 No

[Provide product feedback ↗](#) | [Ask the community ↗](#)

Use Microsoft Purview to manage data security & compliance for Copilot in Fabric

08/18/2025

Microsoft 365 licensing guidance for security & compliance

Use the following sections to identify the [Microsoft Purview capabilities that are supported for AI interactions](#) with Copilot in Fabric, and some get started recommendations for you to manage these AI interactions for security and compliance.

The first Copilot in Fabric that's supported by Microsoft Purview is [Copilot for Power BI](#). All prompts are supported and currently, all responses that are text-based.

As a prerequisite for Microsoft Purview to manage these AI interactions, the **Allow Microsoft Purview to secure AI interactions** option in the Microsoft Fabric admin portal must be **Enabled**, which is the default setting. For more information about this option, see [Tenant settings index](#).

Managing these AI interactions with Microsoft Purview requires you to enable [pay-as-you-go billing](#) in your organization.

Capabilities supported

Use the following table to see at a glance the Microsoft Purview capabilities that are supported with Copilot in Fabric.

[] [Expand table](#)

Capability or solution in Microsoft Purview	Supported for AI interactions
DSPM for AI	✓
Auditing	✓
Data classification	✓
Sensitivity labels	✗
Encryption without sensitivity labels	✗
Data loss prevention	✗
Insider Risk Management	✓

Capability or solution in Microsoft Purview	Supported for AI interactions
Communication compliance	✓
eDiscovery	✓
Data Lifecycle Management	✓
Compliance Manager	✓

Data Security Posture Management for AI

Use Microsoft Purview Data Security Posture Management (DSPM) for AI as your front door to discover, secure, and apply compliance controls for AI usage across your enterprise. This solution uses existing controls from Microsoft Purview information protection and compliance management with easy-to-use graphical tools and reports to quickly gain insights into AI use within your organization. With personalized recommendations, one-click policies help you protect your data and comply with regulatory requirements.

For more information, see [Learn about Data Security Posture Management \(DSPM\) for AI](#).

AI app-specific information:

- Recommendation [Get guided assistance to AI regulations](#), which uses [control-mapping regulatory templates from Compliance Manager](#).
- [One-click policies available](#):
 - [DSPM for AI - Capture interactions for Copilot experiences](#) from the recommendation [Secure interactions in Microsoft Copilot experiences](#).
 - [DSPM for AI - Detect risky AI usage](#) from the recommendation [Detect risky interactions in AI apps](#).
 - [DSPM for AI - Unethical behavior in AI apps](#) from the recommendation [Detect unethical behavior in AI apps](#).
 - [DSPM for AI - Detect sensitive info shared with AI via network](#) from the recommendation [Extend insights into sensitive data in AI app interactions](#).

Auditing and AI interactions

[Microsoft Purview Audit solutions](#) provide comprehensive tools for searching and managing audit records of activities performed across various Microsoft services by users and admins, and help organizations to effectively respond to security events, forensic investigations, internal investigations, and compliance obligations.

Like other activities, prompts and responses are [captured in the unified audit log](#). Events include how and when users interact with the AI app, and can include in which Microsoft 365 service the activity took place, and references to the files stored in Microsoft 365 that were accessed during the interaction. If these files have a sensitivity label applied, that's also captured.

These events flow into [activity explorer in Data Security Posture Management for AI](#), where the data from prompts and responses can be displayed. You can also use the **Audit** solution from the [Microsoft Purview portal](#) to search and find these auditing events.

For more information, see [Audit logs for Copilot and AI activities](#).

Data classification and AI interactions

Microsoft Purview data classification provides a comprehensive framework for identifying and tagging sensitive data across various Microsoft services, including Office 365, Dynamics 365, and Azure. Classifying data is often the first step to ensure compliance with data protection regulations and safeguard against unauthorized access, alteration, or destruction. You can use built-in system classifications or create your own.

Sensitive information types and trainable classifiers can be used to find sensitive data in user prompts and responses when they use AI apps. The resulting information then surfaces in the [data classification dashboard](#) and [activity explorer in Data Security Posture Management for AI](#).

Insider Risk Management and AI interactions

[Microsoft Purview Insider Risk Management](#) helps you detect, investigate, and mitigate internal risks such as IP theft, data leakage, and security violations. It leverages machine learning models and various signals from Microsoft 365 and third-party indicators to identify potential malicious or inadvertent insider activities. The solution includes privacy controls like pseudonymization and role-based access, ensuring user-level privacy while enabling risk analysts to take appropriate actions.

Use the [Risky AI usage policy template](#) to detect risky usage that includes prompt injection attacks and accessing protected materials. Insights from these signals are integrated into Microsoft Defender XDR to provide a comprehensive view of AI-related risks.

AI app-specific information:

- For prompts and responses, requires a [collection policy](#) such as [DSPM for AI - Capture interactions for Copilot experiences](#) from the DSPM for AI recommendation [Secure interactions in Microsoft Copilot experiences](#).

Communication compliance and AI interactions

Microsoft Purview Communication Compliance provides tools to help you detect and manage regulatory compliance and business conduct violations across various communication channels, which include user prompts and responses for AI apps. It's designed with privacy by default, pseudonymizing usernames and incorporating role-based access controls. The solution helps identify and remediate inappropriate communications, such as sharing sensitive information, harassment, threats, and adult content.

To learn more about using communication compliance policies for AI apps, see [Configure a communication compliance policy to detect for generative AI interactions](#).

AI app-specific information:

- For prompts and responses, requires a [collection policy](#) such as **DSPM for AI - Capture interactions for Copilot experiences** from the DSPM for AI recommendation **Secure interactions in Microsoft Copilot experiences**.

eDiscovery and AI interactions

Microsoft Purview eDiscovery lets you identify and deliver electronic information that can be used as evidence in legal cases. The eDiscovery tools in Microsoft Purview support searching for content in Exchange Online, OneDrive for Business, SharePoint Online, Microsoft Teams, Microsoft 365 Groups, and Viva Engage teams. You can then prevent the information from deletion and export the information.

Because user prompts and responses for AI apps are stored in a user's mailbox, you can create a case and use [search](#) when a user's mailbox is selected as the source for a search query. For example, select and retrieve this data from the source mailbox by selecting from the query builder **Add condition > Type > Contains any of > Edit > Copilot activity**. This query condition includes all Copilot and other AI application activity.

After the search is refined, you can export the results or add to a [review set](#). You can review and export information directly from the review set.

To learn more about identifying and deleting user AI interaction data, see [Search for and delete Copilot data in eDiscovery](#).

AI app-specific information:

- For prompts and responses, requires a [collection policy](#) such as **DSPM for AI - Capture interactions for Copilot experiences** from the DSPM for AI recommendation **Secure interactions in Microsoft Copilot experiences**.

interactions in Microsoft Copilot experiences.

Data Lifecycle Management and AI interactions

[Microsoft Purview Data Lifecycle Management](#) provides tools and capabilities to manage the lifecycle of organizational data by retaining necessary content and deleting unnecessary content. These tools ensure compliance with business, legal, and regulatory requirements.

Use [retention policies](#) to automatically retain or delete user prompts and responses for AI apps. For detailed information about this retention works, see [Learn about retention for Copilot & AI apps](#).

As with all retention policies and holds, if more than one policy for the same location applies to a user, the [principles of retention](#) resolve any conflicts. For example, the data is retained for the longest duration of all the applied retention policies or eDiscovery holds.

AI app-specific information:

- For retention policies, select the option for **Microsoft Copilot Experiences**.
- For prompts and responses, requires a [collection policy](#) such as **DSPM for AI - Capture interactions for Copilot experiences** from the DSPM for AI recommendation **Secure interactions in Microsoft Copilot experiences**.

Compliance Manager and AI interactions

[Microsoft Purview Compliance Manager](#) is a solution that helps you automatically assess and manage compliance across your multicloud environment. Compliance Manager can help you throughout your compliance journey, from taking inventory of your data protection risks to managing the complexities of implementing controls, staying current with regulations and certifications, and reporting to auditors.

To help you keep compliant with AI regulations, Compliance Manager provides regulatory templates to help you assess, implement, and strengthen your compliance requirements for all generative AI apps. For example, monitoring AI interactions and preventing data loss in AI applications. For more information, see [Assessments for AI regulations](#).

Getting started recommended steps

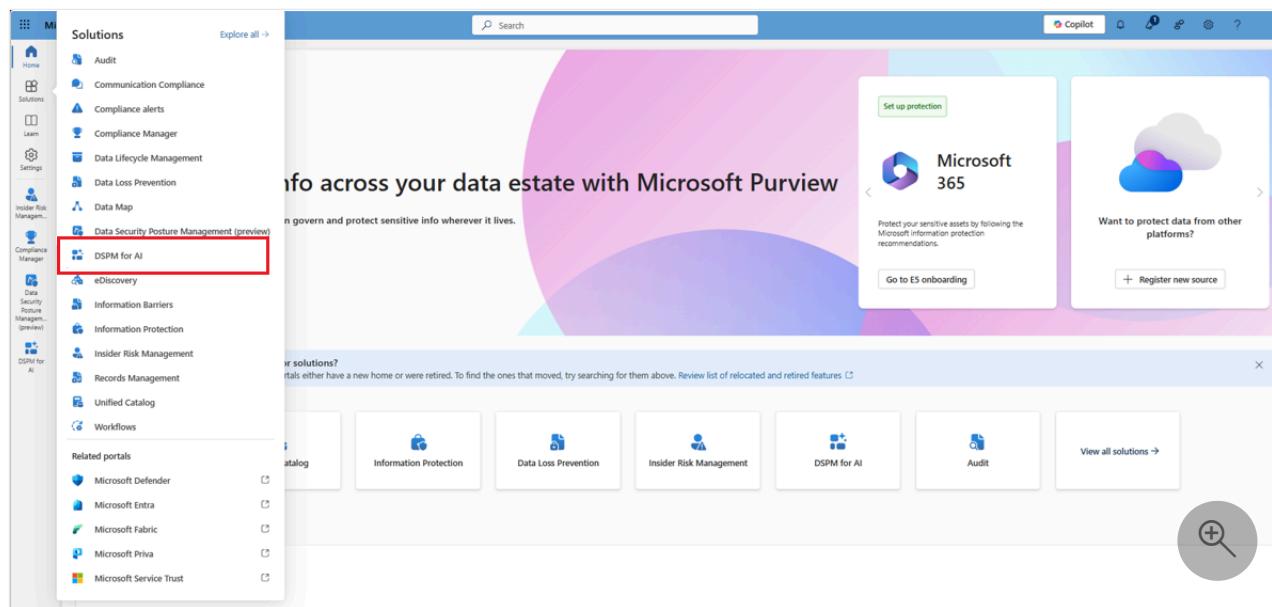
Use the following steps to get started with managing data security & compliance for AI interactions from Copilot in Fabric.

(!) Note

Managing data security & compliance for Copilot in Fabric requires the [enterprise version of Microsoft Purview data governance](#), to support the required APIs.

Because Data Security Posture Management for AI is your front door for securing and managing AI interactions, most of the following instructions use that solution:

- [Sign in to the Microsoft Purview portal](#) ↗ > **Solutions** > **DSPM for AI** with an account that has [appropriate permissions](#). For example, an account that's a member of the **Microsoft Entra Compliance Administrator** group role.



Discover potential security risks in Copilot in Fabric interactions

1. From **DSPM for AI** > **Overview**, in the **Get Started** section, look to see if auditing is on for your tenant. If not, select **Activate Microsoft Purview Audit**.
2. In the **Recommendations** section, select **View all recommendations** to take you to the **Recommendations** page. If they have a status of **Not Started**, take action on the following recommendations that create [one-click policies](#):
 - **Secure interactions in Microsoft Copilot experiences:** This recommendation creates a policy to capture prompts and responses for data security posture and regulatory compliance from Copilot in Fabric, and Security Copilot.
 - **Detect risky interactions in AI apps:** This recommendation creates a policy to help calculate user risk by detecting risky prompts and responses in Microsoft 365

Copilot, agents, and other generative AI apps.

3. Wait at least a day for data, and then navigate to the **Reports** page to view the results of your policy. Select **Copilot experiences & agents** and view information such as:

- Total interactions over time (Microsoft Copilot and agents)
- Sensitive interactions per AI app
- Top unethical AI interactions
- Insider Risk severity
- Insider risk severity per AI app
- Potential risky AI usage

4. Select **View details** for each of the report graphs to view detailed activities in the activity explorer.

From the filters, select the **AI app category** of **Copilot experiences & agents**, and then use the other filters if you need to further refine the displayed data. Then drill down to each activity to view details that include displaying the prompts and response when you're a member of the Microsoft Purview Content Explorer Content Viewer role group. For more information about this requirement, see [Permissions for Data Security Posture Management for AI](#).

Apply compliance controls to Copilot in Fabric

1. From **DSPM for AI** > **Recommendations** page, under **Not Started**, locate, and select and take actions on the following recommendation:

- **Detect unethical behavior in AI:** This recommendation creates a policy to detect sensitive information in prompts and responses in Copilot in Fabric and agents, and other generative AI apps.

2. If you need to ensure that Copilot in Fabric interactions are retained for compliance reasons:

In the Microsoft Purview portal, navigate to **Data Lifecycle Management** > **Policies** > **Retention Policies** and create a retention policy to retain Microsoft Security Copilot interactions by selecting the location **Microsoft Copilot Experiences** and specify the required retention period. For more information, see [Create and configure retention policies](#).

3. If you need to preserve, collect, analyze, review, or export Microsoft Fabric interactions:

In the Microsoft Purview portal, navigate to **eDiscovery** > **Cases** > **Create case**. In the case, [create a search](#) and use the *ItemClass* property and the

`IPM.SkypeTeams.Message.Copilot.Fabric.*` value to search for these interactions in your organization.

Routinely review the reports in DSPM for AI to determine if you need to make changes, and use activity explorer and [events](#) for deeper analysis of how users are interacting with Copilot in Fabric.

Related resources

- Blog post (July 2025): [Using Copilot in Fabric with Confidence: Data Security, Compliance & Governance with DSPM for AI ↗](#)

What is Copilot in Fabric in the Data Factory workload?

09/02/2025

This article provides an overview of Copilot in the Data Factory workload, including its features and benefits. Microsoft Copilot in the Data Factory workload is an AI-enhanced toolset that empowers customers to use natural language to articulate their requirements for creating data integration solutions using [Dataflow Gen2](#). The Copilot in the Data Factory workload operates like a subject-matter expert (SME) collaborating with you to design your data flows, supporting both citizen and professional data wranglers in streamlining their workflows.

Before your business can start using Copilot capabilities in Fabric, your administrator must enable Copilot in Microsoft Fabric (see [Copilot Fabric Overview](#)).

(!) Note

- Your administrator needs to enable the tenant switch before you start using Copilot. See the article [Copilot tenant settings](#) for details.
- Your F2 or P1 capacity needs to be in one of the regions listed in this article, [Fabric region availability](#).
- If your tenant or capacity is outside the US or France, Copilot is disabled by default unless your Fabric tenant admin enables the [Data sent to Azure OpenAI can be processed outside your tenant's geographic region, compliance boundary, or national cloud instance](#) tenant setting in the Fabric Admin portal.
- Copilot in Microsoft Fabric isn't supported on trial SKUs. Only paid SKUs (F2 or higher, or P1 or higher) are supported.
- See the article [Overview of Copilot in Fabric and Power BI](#) for more information.

How Copilot works in the Data Factory workload

Copilot in the Data Factory workload enhances productivity, unlocks profound insights, and facilitates the creation of custom AI experiences tailored to your data. As a component of the Copilot in the Fabric experience, it provides intelligent [Mashup](#) code generation to transform data using natural language input. It generates code explanations to help you better understand the complex queries and tasks that were previously generated.

Features of Copilot in the Data Factory workload

Copilot in the Data Factory workload offers different capabilities depending on the component you're working with:

With Dataflow Gen2, you can:

- Generate new transformation steps for an existing query
- Provide a summary of the query and the applied steps
- Generate a new query that might include sample data or a reference to an existing query

With pipelines, you can:

- **Pipeline Generation:** Using natural language, you can describe your desired pipeline, and Copilot understands the intent and generates the necessary pipeline activities
- **Error message assistant:** Troubleshoot pipeline issues with clear error explanation capability and actionable troubleshooting guidance
- **Summarize Pipeline:** Explain your complex pipeline with a summary of content and relations of activities within the Pipeline

Best practices for using Copilot in the Data Factory workload

To get the most out of Copilot in the Data Factory workload:

- Be specific and clear in your natural language requests
- Start with simple transformations and build complexity gradually
- Use the "Explain my current query" feature to understand the generated code
- Use the undo functionality to revert changes when needed
- Review the generated steps in the Applied steps list for accuracy
- Use starter prompts to get familiar with Copilot's capabilities

Example prompts

Here are some example prompts you can use with Copilot in the Data Factory workload:

Dataflow Gen2 prompts

Copilot prompt

- Only keep European customers
- Count the total number of employees by City
- Only keep orders whose quantities are above the median value
- Create a new query with sample data that lists all the Microsoft OS versions and

the year they were released
- Explain my current query

Pipeline prompts

Copilot prompt

- Create a pipeline to copy data from SQL Server to Azure Data Lake
- Ingest data from this source to that destination
- Summarize this pipeline
- Explain what this pipeline does

⚠ Note

AI powers Copilot, so surprises and mistakes are possible.

Responsible AI use of Copilot

Microsoft is committed to ensuring that our AI systems are guided by our [AI principles](#) and [Responsible AI Standard](#). These principles include empowering our customers to use these systems effectively and in line with their intended uses. Our approach to responsible AI is continually evolving to address emerging issues proactively.

For specific guidelines on responsible AI use in Data Factory, see [Privacy, security, and responsible use of Copilot in Fabric in the Data Factory workload](#).

Limitations

Here are the current limitations of Copilot in the Data Factory workload:

- Copilot can't perform transformations or explanations across multiple queries in a single input. For instance, you can't ask Copilot to "Capitalize all the column headers for each query in my dataflow."
- Copilot doesn't understand previous inputs and can't undo changes after a user commits a change when authoring, either via the user interface or the chat pane. For example, you can't ask Copilot to "Undo my last five inputs." However, users can still use the existing user interface options to delete unwanted steps or queries.
- Copilot can't make layout changes to queries in your session. For example, if you tell Copilot to create a new group for queries in the editor, it doesn't work.

- Copilot might produce inaccurate results when the intent is to evaluate data that isn't present within the sampled results imported into the session's data.
- Copilot doesn't produce a message for the skills that it doesn't support. For example, if you ask Copilot to "Perform statistical analysis and write a summary over the contents of this query", it doesn't complete the instruction successfully as mentioned previously. Unfortunately, it doesn't give an error message either.

Related content

- [Privacy, security, and responsible use of Copilot in Fabric in the Data Factory workload](#)
- [Tutorial: Create an end-to-end pipeline](#)
- [Tutorial: Create an end-to-end dataflow](#)

ⓘ Note: The author created this article with assistance from AI. [Learn more](#)

What is Copilot in Fabric in the Data Warehouse workload (Preview)?

09/02/2025

Applies to:  SQL analytics endpoint and Warehouse in Microsoft Fabric

Copilot in Fabric Data Warehouse is an AI assistant designed to streamline your data warehousing tasks. Copilot integrates seamlessly with your data warehouse in Fabric, providing intelligent insights to help you along each step of the way in your T-SQL explorations.

Copilot in Fabric Data Warehouse utilizes table and view names, column names, primary key, and foreign key metadata to generate T-SQL code. Copilot in Fabric Data Warehouse doesn't use data in tables to generate T-SQL suggestions.

Features of Copilot in Fabric Data Warehouse

Copilot in Fabric Data Warehouse offers the following features:

- **Natural Language to SQL:** Ask Copilot to generate SQL queries using simple natural language questions.
- **Code completion:** Enhance your coding efficiency with AI-powered code completions.
- **Quick actions:** Quickly fix and explain SQL queries with readily available actions.
- **Intelligent Insights:** Receive smart suggestions and insights based on your warehouse schema and metadata.

There are three ways to interact with Copilot in the Fabric Warehouse editor.

- **Copilot chat pane in Fabric Data Warehouse:** Use the chat pane to ask questions to Copilot through natural language. Copilot responds with a generated SQL query or natural language based on the question asked.
 - **Natural Language to SQL:** Generate T-SQL code and get suggestions of questions to ask to accelerate your workflow.
- **Copilot code completion in Fabric Data Warehouse:** Start writing T-SQL in the SQL query editor and Copilot automatically generates a code suggestion to help complete your query. The **Tab** key accepts the code suggestion, or keeps typing to ignore the suggestion.
- **Copilot quick actions in Fabric Data Warehouse:** In the ribbon of the SQL query editor, the **Fix** and **Explain** options are quick actions. Highlight a SQL query of your choice and select one of the quick action buttons to perform the selected action on your query.

- **Explain:** Copilot can provide natural language explanations of your SQL query and warehouse schema in comments format.
- **Fix:** Copilot can fix errors in your code as error messages arise. Error scenarios can include incorrect/unsupported T-SQL code, wrong spellings, and more. Copilot also provides comments that explain the changes and suggest SQL best practices.

Enable Copilot

- Your administrator needs to enable the tenant switch before you start using Copilot. For more information, see [Copilot tenant settings](#).
- Your **F2 or P1 capacity** needs to be in one of the regions listed in [Fabric region availability](#).
- If your tenant or capacity is outside the US or France, Copilot is disabled by default unless your Fabric tenant admin enables the [Data sent to Azure OpenAI can be processed outside your tenant's geographic region, compliance boundary, or national cloud instance](#) tenant setting in the Fabric Admin portal.
- Copilot in Microsoft Fabric isn't supported on trial SKUs. Only paid SKUs (F2 or higher, or P1 or higher) are supported at this time.
- For more information, see [Overview of Copilot in Fabric and Power BI](#).

Best practices for using Copilot in Fabric Data Warehouse

Here are some tips for maximizing productivity with Copilot.

- When crafting prompts, be sure to start with a clear and concise description of the specific information you're looking for.
- Natural language to SQL depends on expressive table and column names. If your table and columns aren't expressive and descriptive, Copilot might not be able to construct a meaningful query.
- Use natural language that is applicable to your table and view names, column names, primary keys, and foreign keys of your warehouse. This context helps Copilot generate accurate queries. Specify what columns you wish to see, aggregations, and any filtering criteria as explicitly as possible. Copilot should be able to correct typos or understand context given your schema context.
- Create relationships in the model view of the warehouse to increase the accuracy of `JOIN` statements in your generated SQL queries.
- When using code completions, leave a comment at the top of the query with `--` to help guide the Copilot with context about the query you're trying to write.
- Avoid ambiguous or overly complex language in your prompts. Simplify the question while maintaining its clarity. This editing ensures Copilot can effectively translate it into a

meaningful T-SQL query that retrieves the desired data from the associated tables and views.

- Currently, natural language to SQL supports English language to T-SQL.

Example prompts

- The following example prompts are clear, specific, and tailored to the properties of your schema and data warehouse, making it easier for Copilot to generate accurate T-SQL queries:

Copilot prompt

- Show me all properties that sold last year
- Count all the products, group by each category
- Show all agents who sell properties in California
- Show agents who have listed more than two properties for sale
- Show the rank of each agent by property sales and show name, total sales, and rank

 Note

AI powers Copilot, so surprises and mistakes are possible.

Responsible AI use of Copilot

To view Microsoft's guidelines for responsible AI in Fabric Data Warehouse, see [Privacy, security, and responsible use of Copilot](#).

Microsoft is committed to ensuring that our AI systems are guided by our [AI principles](#) and [Responsible AI Standard](#). These principles include empowering our customers to use these systems effectively and in line with their intended uses. Our approach to responsible AI is continually evolving to proactively address emerging issues.

Limitations

Here are the current limitations of Copilot in Fabric in Data Warehouse:

- Copilot doesn't understand previous inputs and can't undo changes after a user commits a change when authoring, either via user interface or the chat pane. For example, you can't ask Copilot to *Undo my last five inputs*. However, users can still use the existing user interface options to delete unwanted changes or queries.

- Copilot can't make changes to existing SQL queries. For example, if you ask Copilot to edit a specific part of an existing query, it doesn't work.
- Copilot might produce inaccurate results when the intent is to evaluate data. Copilot only has access to the warehouse schema, none of the data inside.
- Copilot responses can include inaccurate or low-quality content, so make sure to review outputs before using them in your work.
- People who are able to meaningfully evaluate the content's accuracy and appropriateness should review the outputs.

Related content

- [Copilot tenant settings](#)
- [How to: Use the Copilot chat pane in Fabric in SQL database](#)
- [How to: Use Copilot quick actions in Fabric in SQL database](#)
- [How to: Use Copilot code completion in Fabric in SQL database](#)
- [Privacy, security, and responsible use of Copilot in Fabric in Data Warehouse](#)

Writing queries with Copilot in Fabric in the Real-time intelligence workload

08/22/2025

You can use Copilot to translate your natural language questions into Kusto Query Language (KQL) queries. Simply describe what you want to analyze or find in plain language, and Copilot generates the corresponding KQL query for you. This feature makes it easier for anyone—regardless of their familiarity with KQL—to explore and analyze data efficiently.

For billing information about Copilot, see [Announcing Copilot in Fabric pricing](#).

Prerequisites

- A [workspace](#) with a Microsoft Fabric-enabled [capacity](#)
- Write access to a [KQL queryset](#)

(!) Note

- Your administrator needs to enable the tenant switch before you start using Copilot. See the article [Copilot tenant settings](#) for details.
- Your F2 or P1 capacity needs to be in one of the regions listed in this article, [Fabric region availability](#).
- If your tenant or capacity is outside the US or France, Copilot is disabled by default unless your Fabric tenant admin enables the [Data sent to Azure OpenAI can be processed outside your tenant's geographic region, compliance boundary, or national cloud instance](#) tenant setting in the Fabric Admin portal.
- Copilot in Microsoft Fabric isn't supported on trial SKUs. Only paid SKUs (F2 or higher, or P1 or higher) are supported.
- See the article [Overview of Copilot in Fabric and Power BI](#) for more information.

Capabilities of Copilot for writing queries in KQL

Copilot lets you effortlessly translate natural language queries into Kusto Query Language (KQL). The copilot acts as a bridge between everyday language and KQL's technical intricacies, and in doing so removes adoption barriers for data analysts and citizen data scientists. By harnessing OpenAI's advanced language understanding, this feature allows you to submit business questions in a familiar, natural language format, which are then converted into KQL

queries. Copilot accelerates productivity by simplifying the query creation process with a user-friendly and efficient approach to data analysis.

Copilot supports **conversational interactions** which allows you to clarify, adapt, and extend your queries dynamically, all while maintaining the context of your previous inputs. You can refine queries and ask follow-up questions without starting over:

- Dynamic query refinement: You can refine the initial KQL generated by Copilot by refining your prompt to remove ambiguity, specify tables or columns, or provide more context.
- Seamless follow-up questions: If the generated KQL is correct but you want to explore the data more deeply, you can ask follow-up questions related to the same task. You can expand the scope of your query, add filters, or explore related data points by building on previous dialogue.

Using Copilot for writing queries in KQL

You can access Copilot in two ways:

- **Through a KQL queryset:** Go to a new or existing [KQL queryset](#) and use the Copilot feature to generate queries from natural language prompts.
- **Through the Edit tile in Real-Time Dashboards:** When editing a tile in a [Real-Time dashboard](#), use Copilot to help create or refine KQL queries directly within the dashboard editing experience.

Follow the steps below to use Copilot in either context:

1. In the Copilot pane, enter your business question in natural language.
2. Press **Enter**.

After a few seconds, Copilot generates a KQL query based on your input. You can copy the query to the clipboard, **Insert** it to the query editor, or **Replace** the query in context with it. To run the query in the query editor, you must have write access to the KQL queryset.

3. Select the **Run** button to execute the query.

The screenshot shows the Stream Analytics studio interface. At the top, there's a navigation bar with 'Home' and 'Help' options, followed by 'Save' and 'Copilot' buttons. The 'Copilot' button is highlighted with a red box. Below the navigation is a toolbar with 'Samples' and a '+' icon, along with 'Run', 'Preview', 'Recall', 'Copy query', 'Pin to dashboard', 'KQL Tools', 'Export to CSV', 'Power BI', and 'Set alert' buttons.

The main area has a 'Database' sidebar on the left with 'Samples', 'Tables', 'Materialized View', 'Shortcuts', and 'Functions' sections. The 'Samples' section is expanded, showing a KQL query:

```
1 // how many storm events happened in 2004
2 //
3 StormEvents
4 | where StartTime between (datetime(2004-01-01) .. datetime(2004-12-31))
5 | summarize EventCount = count()
6 //
7 // how many of those were in CALIFORNIA
8 //
9 StormEvents
10 | where StartTime between (datetime(2004-01-01) .. datetime(2004-12-31))
11 | where State == "CALIFORNIA"
12 | summarize EventCount = count()
```

Below the query is a table named 'Table 1' with one row of data:

EventCount
0

To the right of the main area is a 'Copilot' pane with a red border. It contains three sections:

- how many storm events happened in 2004**: A text input field with the query 'StormEvents | where StartTime between (datetime(2004-01-01) .. datetime(2004-12-31)) | summarize EventCount = count()' and a note 'Insert' and 'AI-generated content may be incorrect Review terms'.
- how many of those were in CALIFORNIA**: A text input field with the query 'StormEvents | where StartTime between (datetime(2004-01-01) .. datetime(2004-12-31)) | where State == "CALIFORNIA" | summarize EventCount = count()' and a note 'Insert' and 'AI-generated content may be incorrect Review terms'.
- how many storm events happened in 2004**: A text input field with the query 'StormEvents | where StartTime between (datetime(2004-01-01) .. datetime(2004-12-31)) | summarize EventCount = count()' and a note '0 / 500'.

ⓘ Note

- Copilot doesn't generate control commands.
- Copilot doesn't automatically run the generated KQL query. Users are advised to run the queries at their own discretion.

You can continue to ask follow-up questions or further refine your query. To start a new chat, select the speech bubble on the top right of the Copilot pane (1).

Hover over a previous question (2) and select the pencil icon to copy it to the question box to edit it or copy it to your clipboard.



Copilot

Preview

2



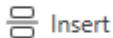
1



how many storm events happened in 2004

Insert this query into your editor:

```
StormEvents | where StartTime between (datetime(2004-01-01) .. datetime(2004-12-31)) | summarize EventCount = count()
```

AI-generated content may be incorrect [Review terms](#)

how many of those were in CALIFORNIA

Insert this query into your editor:

```
StormEvents | where StartTime between (datetime(2004-01-01) .. datetime(2004-12-31)) | where State == "CALIFORNIA" | summarize EventCount = count()
```

AI-generated content may be incorrect [Review terms](#)

how many storm events happened in 2004

0 / 500



Improve the accuracy of Copilot for writing KQL queries

Here are some tips that can help improve the accuracy of the KQL queries generated by Copilot:

- Start with simple natural language prompts to learn the current capabilities and limitations. Then, gradually proceed to more complex prompts.
- State the task precisely, and avoid ambiguity. Imagine you shared the natural language prompt with a few KQL experts from your team without adding oral instructions - would they be able to generate the correct query?

- To generate the most accurate query, supply any relevant information that can help the model. If you can, specify tables, operators, or functions that are critical to the query.
- Prepare your database: Add docstring properties to describe common tables and columns. This step might be redundant for descriptive names (for example, timestamp) but is critical to describe tables or columns with meaningless names. You don't have to add docstring to tables or columns that are rarely used. For more information, visit [alter table column-docstrings command](#).
- To improve Copilot results, select either the **like** or **dislike** icon to submit your comments in the **Submit feedback** form.

 **Note**

The **Submit feedback** form submits the name of the database, its URL, the KQL query generated by copilot, and any free text response you include in the feedback submission. Results of the executed KQL query aren't sent.

Limitations and considerations

- Copilot might suggest potentially inaccurate or misleading suggested KQL queries due to:
 - Complex and long user input.
 - User input that directs to database entities that aren't KQL Database tables or materialized views (for example KQL function.)
- More than 10,000 concurrent users within an organization can result in failure or a major performance hit.

Related content

- [Generate Real-Time dashboard with Copilot in Fabric in the Real-time intelligence workload](#)
- [Privacy, security, and responsible use of Copilot for Real-Time Intelligence](#)
- [Copilot in Fabric](#)
- [Copilot for Microsoft Fabric: FAQ](#)

Generate Real-time dashboards with Copilot in Fabric in the Real-time intelligence workload

08/22/2025

Copilot makes it easy to create dashboards by automating the initial setup. You don't need any technical expertise. The process includes selecting a data table in Real-Time Hub or KQL Queryset and using AI to generate a Real-Time Dashboard. The dashboard includes an insights page for a quick overview and a data profile page.

For billing information about Copilot, see [Announcing Copilot in Fabric pricing ↗](#).

Prerequisites

- A [workspace](#) with a Microsoft Fabric-enabled [capacity](#)
- Write access to a [KQL queryset](#) or [Real-Time Dashboard](#)

(!) Note

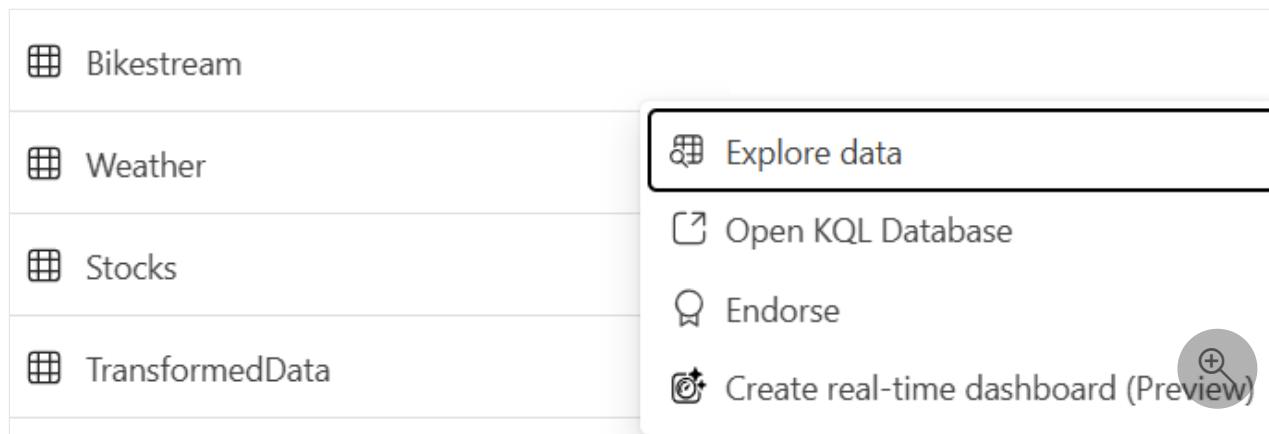
- Your administrator needs to enable the tenant switch before you start using Copilot. See the article [Copilot tenant settings](#) for details.
- Your F2 or P1 capacity needs to be in one of the regions listed in this article, [Fabric region availability](#).
- If your tenant or capacity is outside the US or France, Copilot is disabled by default unless your Fabric tenant admin enables the [Data sent to Azure OpenAI can be processed outside your tenant's geographic region, compliance boundary, or national cloud instance](#) tenant setting in the Fabric Admin portal.
- Copilot in Microsoft Fabric isn't supported on trial SKUs. Only paid SKUs (F2 or higher, or P1 or higher) are supported.
- See the article [Overview of Copilot in Fabric and Power BI](#) for more information.

Creating a Real-Time Dashboard with Copilot

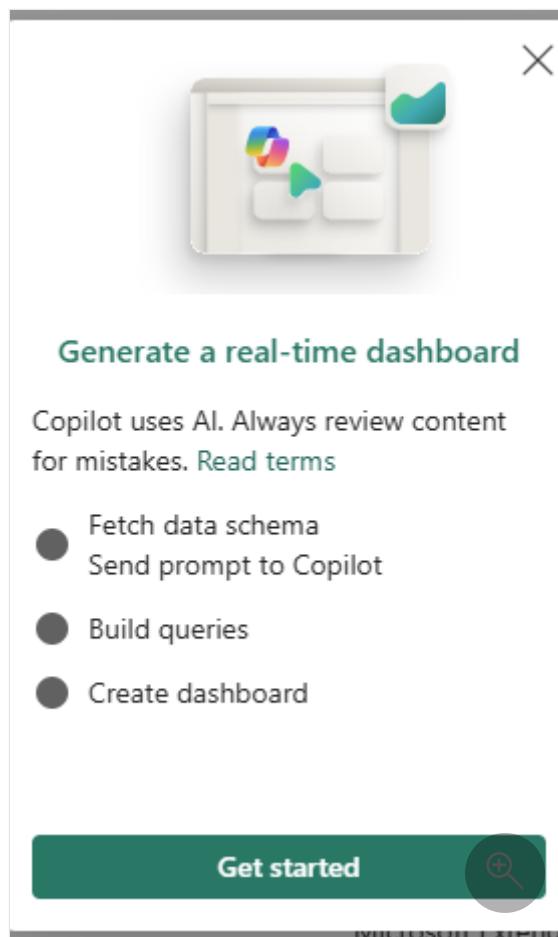
You can create a Real-Time Dashboard with Copilot in several ways:

- **From the Real-Time Hub:** Create a dashboard directly from the Real-Time Hub by selecting a data stream and then a table.
- **From the KQL Queryset:** Create a dashboard from a KQL Queryset by selecting a table.

1. Select the three dots next to the table name and select **Create Real-Time Dashboard**.

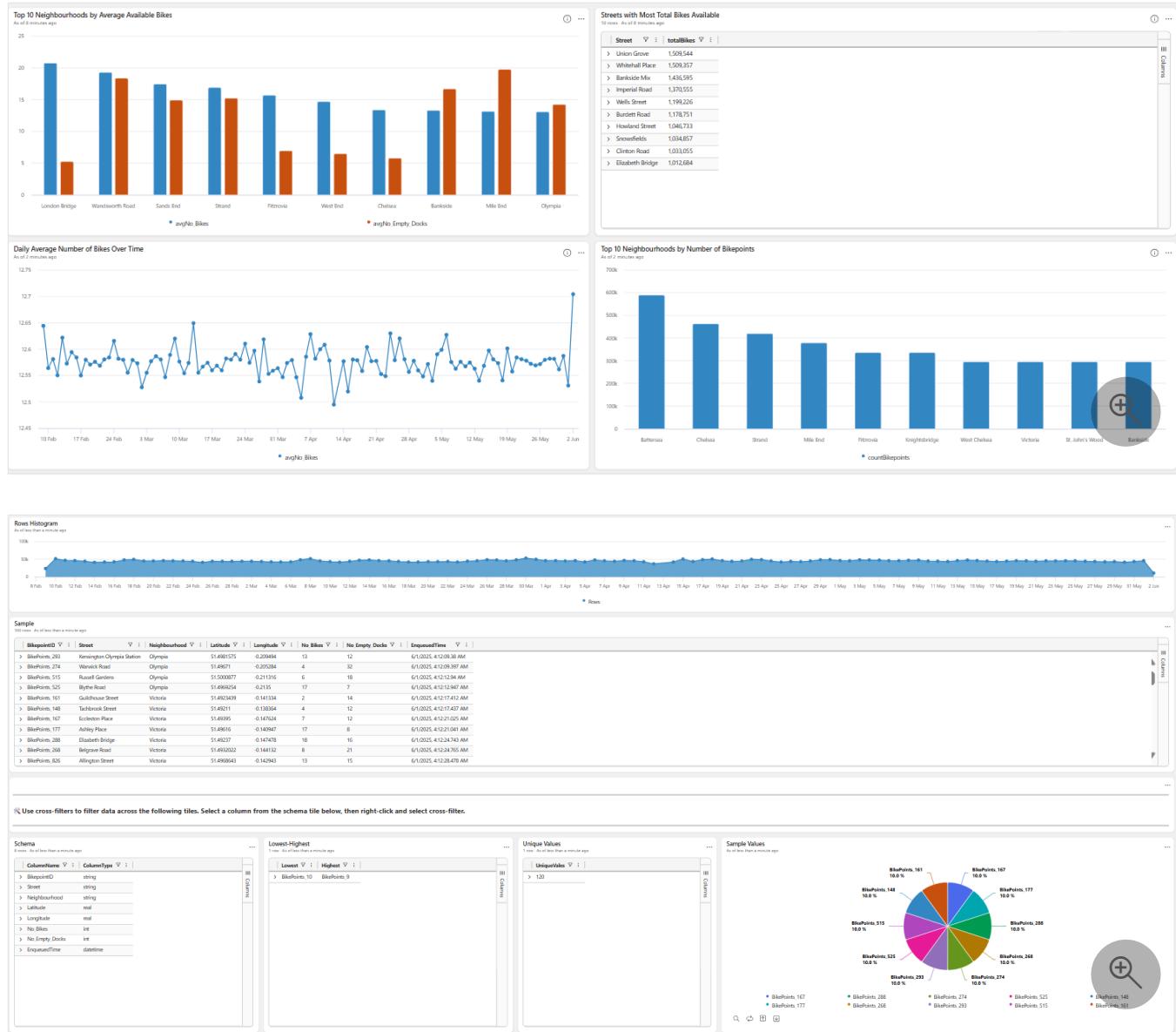


2. In the dialog box, select **Get started** to proceed. You can stop the process at any time while the dashboard is being created.



Insights Page and Data Profile Page

Copilot automatically generates the Insights Page and Data Profile Page. The Insights Page provides a quick overview of the data, while the Data Profile Page offers detailed information about the data structure and statistics.



Related content

- [Query data in a KQL queryset](#)
- [Privacy, security, and responsible use of Copilot for Real-Time Intelligence](#)
- [Copilot in Fabric](#)
- [Copilot for Microsoft Fabric: FAQ](#)

Overview of chat-magics in Microsoft Fabric notebooks (preview)

06/19/2025

ⓘ Important

This feature is in [preview](#).

The Chat-magics Python library enhances your data science and engineering workflow in Microsoft Fabric notebooks. It seamlessly integrates with the Fabric environment, and allows execution of specialized IPython magic commands in a notebook cell, to provide real-time outputs. IPython magic commands and more background on usage can be found here: <https://ipython.readthedocs.io/en/stable/interactive/magics.html#>.

! Note

- Your administrator needs to enable the tenant switch before you start using Copilot. See the article [Copilot tenant settings](#) for details.
- Your F2 or P1 capacity needs to be in one of the regions listed in this article, [Fabric region availability](#).
- If your tenant or capacity is outside the US or France, Copilot is disabled by default unless your Fabric tenant admin enables the [Data sent to Azure OpenAI can be processed outside your tenant's geographic region, compliance boundary, or national cloud instance](#) tenant setting in the Fabric Admin portal.
- Copilot in Microsoft Fabric isn't supported on trial SKUs. Only paid SKUs (F2 or higher, or P1 or higher) are supported.
- See the article [Overview of Copilot in Fabric and Power BI](#) for more information.

Capabilities of Chat-magics

Instant query and code generation

The `%%chat` command allows you to ask questions about the state of your notebook. The `%%code` enables code generation for data manipulation or visualization.

Dataframe descriptions

The `%describe` command provides summaries and descriptions of loaded dataframes. This command simplifies the data exploration phase.

Commenting and debugging

The `%%add_comments` and `%%fix_errors` commands help add comments to your code and fix errors respectively. This helps make your notebook more readable and error-free.

Privacy controls

Chat-magics also offers granular privacy settings, which allows you to control what data is shared with the Azure OpenAI Service. The `%set_sharing_level` and `%configure_privacy_settings` commands, for example, provide this functionality.

How can Chat-magics help you?

Chat-magics enhances your productivity and workflow in Microsoft Fabric notebooks. It accelerates data exploration, simplifies notebook navigation, and improves code quality. It adapts to multilingual code environments, and it prioritizes data privacy and security. Through cognitive load reductions, it allows you to more closely focus on problem-solving. Whether you're a data scientist, data engineer, or business analyst, Chat-magics seamlessly integrates robust, enterprise-level Azure OpenAI capabilities directly into your notebooks. This makes it an indispensable tool for efficient and streamlined data science and engineering tasks.

Get started with Chat-magics

1. Open a new or existing Microsoft Fabric notebook.
2. Select the **Copilot** button on the notebook ribbon to output the Chat-magics initialization code into a new notebook cell.
3. Run the cell when it's added at the top of your notebook.

Verify the Chat-magics installation

1. Create a new cell in the notebook, and run the `%chat_magics` command to display the help message. This step verifies proper Chat-magics installation.

Introduction to basic commands: %%chat and %%code

Using %%chat (Cell Magic)

1. Create a new cell in your notebook.
2. Type `%%chat` at the top of the cell.
3. Enter your question or instruction below the `%%chat` command - for example, **What variables are currently defined?**
4. Execute the cell to see the Chat-magics response.

Using %%code (Cell Magic)

1. Create a new cell in your notebook.
2. Type `%%code` at the top of the cell.
3. Below `%%code`, specify the code action you'd like - for example, **Load my_data.csv into a pandas dataframe.**
4. Execute the cell, and review the generated code snippet.

Customizing output and language settings

1. Use the `%set_output` command to change the default for how magic commands provide output. The options can be viewed by running `%set_output?`
2. Choose where to place the generated code, from options like
 - current cell
 - new cell
 - cell output
 - into a variable

Advanced commands for data operations

`%describe`, `%%add_comments`, and `%%fix_errors`

1. Use `%describe DataFrameName` in a new cell to obtain an overview of a specific dataframe.
2. To add comments to a code cell for better readability, type `%%add_comments` to the top of the cell you want to annotate and then execute. Be sure to validate the code is correct

3. For code error fixing, type `%%fix_errors` at the top of the cell that contained an error and execute it.

Privacy and security settings

1. By default, your privacy configuration shares previous messages sent to and from the Language Learning Model (LLM). However, it doesn't share cell contents, outputs, or any schemas or sample data from data sources.
2. Use `%set_sharing_level` in a new cell to adjust the data shared with the AI processor.
3. For more detailed privacy settings, use `%configure_privacy_settings`.

Context and focus commands

Using `%pin`, `%new_task`, and other context commands

1. Use `%pin DataFrameName` to help the AI focus on specific dataframes.
2. To clear the AI to focus on a new task in your notebook, type `%new_task` followed by a task that you're about to undertake. This clears the execution history that copilot knows about to this point and can make future responses more relevant.

Related content

- [How to use Copilot Pane](#)

Use the Copilot for Data Science and Data Engineering chat panel (preview)

06/11/2025

ⓘ Important

This feature is in [preview](#).

Copilot for Data Science and Data Engineering notebooks is an AI assistant that helps you analyze and visualize data. It works with lakehouse tables, Power BI Datasets, and pandas/spark dataframes, providing answers and code snippets directly in the notebook. The most effective way of using Copilot is to load your data as a dataframe. You can use the chat panel to ask your questions, and the AI provides responses or code to copy into your notebook. It understands your data's schema and metadata, and if data is loaded into a dataframe, it has awareness of the data inside of the data frame as well. You can ask Copilot to provide insights on data, create code for visualizations, or provide code for data transformations, and it recognizes file names for easy reference. Copilot streamlines data analysis by eliminating complex coding.

! Note

- Your administrator needs to enable the tenant switch before you start using Copilot. See the article [Copilot tenant settings](#) for details.
- Your F2 or P1 capacity needs to be in one of the regions listed in this article, [Fabric region availability](#).
- If your tenant or capacity is outside the US or France, Copilot is disabled by default unless your Fabric tenant admin enables the [Data sent to Azure OpenAI can be processed outside your tenant's geographic region, compliance boundary, or national cloud instance](#) tenant setting in the Fabric Admin portal.
- Copilot in Microsoft Fabric isn't supported on trial SKUs. Only paid SKUs (F2 or higher, or P1 or higher) are supported.
- See the article [Overview of Copilot in Fabric and Power BI](#) for more information.

Azure OpenAI enablement

Azure OpenAI must be enabled within Fabric at the tenant level.

⚠ Note

If your workspace is provisioned in a region without GPU capacity, and your data isn't enabled to flow cross-geo, Copilot won't function properly and you'll see errors.

Successful execution of Chat-magics installation cell

Follow this procedure:

1. To use the Copilot pane, the installation cell for Chat-magics must successfully execute within your Spark session.

The screenshot shows a Jupyter Notebook interface. On the left, there's a sidebar with 'Lakehouses' and 'Tables' sections. The main area has a red box highlighting a code cell. The code in the cell is:

```
1 #Run this cell to install the required packages for Copilot
2 %pip install https://aka.ms/chat-magics-0.0.0-py3-none-any.whl
3 %load_ext chat_magics
4
5 ✓ -Command executed in 15 sec 426 ms
Output is hidden
```

Below this cell, another identical cell is shown with the same code and execution status. The notebook title is 'Introduction'.

ⓘ Important

If your Spark session terminates, the context for Chat-magics will also terminate, also wiping the context for the Copilot pane.

2. Verify that all these conditions are met before proceeding with the Copilot chat pane.

Open Copilot chat panel inside the notebook

Follow this procedure:

1. Select the Copilot button on the notebook ribbon.

The screenshot shows a Jupyter Notebook interface. At the top, there's a toolbar with Home, Edit, Run, Data, View, Stop session, Language (PySpark (Python)), Environment (Workspace default), Open in VS Code, and a Copilot button (highlighted with a red box). Below the toolbar, the left sidebar shows a 'Lakehouses' section with a folder named 'rajlH' containing Tables (df_clean, df_pred_results) and Files (churn). The main content area has a section titled 'Run the cell below to install the required packages for Copilot' with the following code:

```
1 #Run this cell to install the required packages for Copilot
2 %pip install https://aka.ms/chat-magics-0.0.0-py3-none-any.whl
3 %load_ext chat_magics
4
5
```

Output: -Command executed in 15 sec 426 ms
Output is hidden

Below this, another identical code block is shown with the same output message.

On the right side of the notebook, there's a 'Copilot' panel with a magnifying glass icon. The main content area contains an 'Introduction' section with a brief description of the scenario and steps, followed by a list of main steps:

1. Install custom libraries
2. Load the data
3. Understand and process the data through exploratory data analysis and demonstrate the use of Fabric Data Wrangler feature
4. Train machine learning models using Scikit-Learn and LightGBM, and track experiments using MLflow and Fabric Autologging feature
5. Evaluate and save the final machine learning model
6. Demonstrate the model performance via visualizations in Power BI

2. To open Copilot, select the **Copilot** button at the top of the notebook.

3. The Copilot chat panel opens on the right side of your notebook.

4. A panel opens to provide overview information and helpful links.

The screenshot shows the same Jupyter Notebook interface as above, but now with the Copilot panel open on the right side. The Copilot panel has a title 'Copilot Preview' and a 'Welcome to Copilot in notebooks' message. It also includes a note about 'Inaccuracies are possible.' and 'Customer data will be temporarily stored.' There are buttons for 'Learn more', 'Read preview terms', and 'Transparency note'. At the bottom right of the panel is a 'Get started' button.

The main content area of the notebook is identical to the first screenshot, showing the 'Run the cell below to install the required packages for Copilot' section and the 'Introduction' section with its steps.

Key capabilities

- **AI assistance:** Generate code, query data, and get suggestions to accelerate your workflow.
- **Data insights:** Quick data analysis and visualization capabilities.

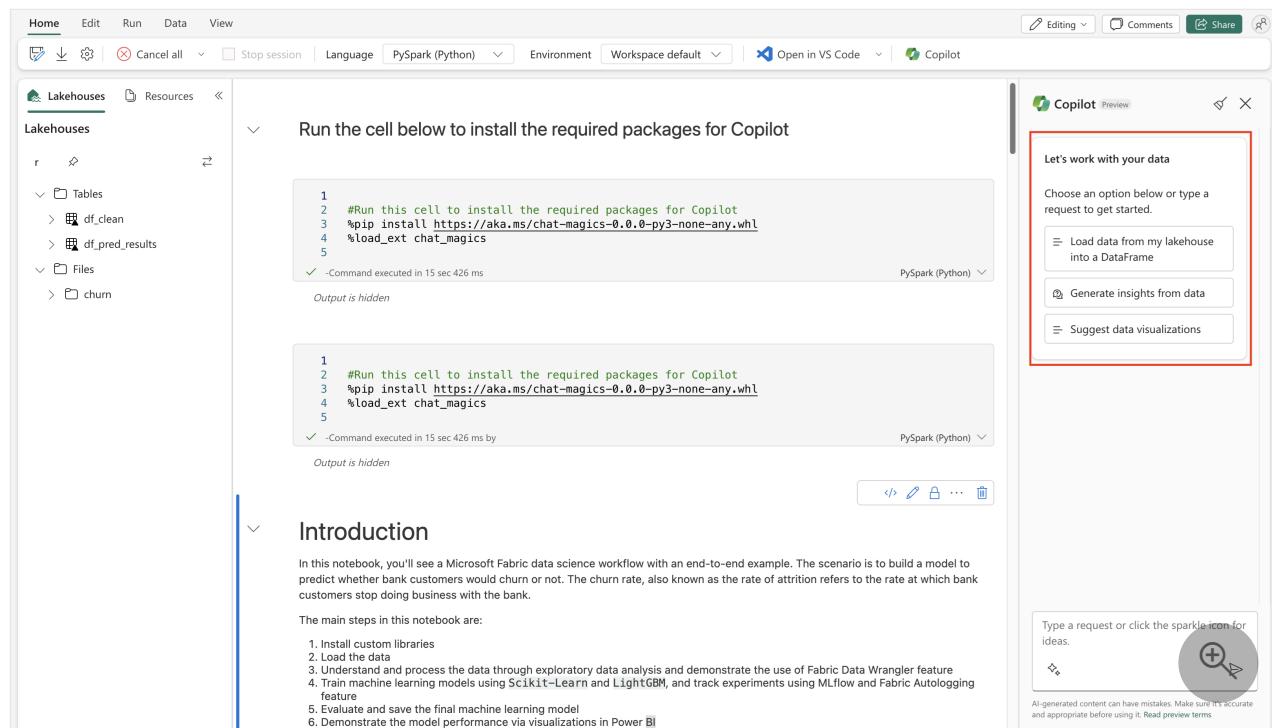
- **Explanations:** Copilot can provide natural language explanations of notebook cells, and can provide an overview for notebook activity as it runs.
- **Fixing errors:** Copilot can also fix notebook run errors as they arise. Copilot shares context with the notebook cells (executed output) and can provide helpful suggestions.

Important notices

- **Inaccuracies:** Potential for inaccuracies exists. Review AI-generated content carefully.
- **Data storage:** Customer data is temporarily stored, to identify harmful use of AI.

Getting started with Copilot chat in notebooks

1. Copilot for Data Science and Data Engineering offers helpful starter prompts to get started. For example, "Load data from my lakehouse into a dataframe", or "Generate insights from data".



2. Each of these selections outputs chat text in the text panel. As the user, you must fill out the specific details of the data you'd like to use.
3. You can then input any type of request you have in the chat box.

Regular usage of the Copilot chat panel

- The more specifically you describe your goals in your chat panel entries, the more accurate the Copilot responses.

- You can "copy" or "insert" code from the chat panel. At the top of each code block, two buttons allow input of items directly into the notebook.
- To clear your conversation, select the  icon at the top to remove your conversation from the pane. It clears the pane of any input or output, but the context remains in the session until it ends.
- Configure the Copilot privacy settings with the `%configure_privacy_settings` command, or the `%set_sharing_level` command in the Chat-magics library.
- Transparency: Read our Transparency Note for details on data and algorithm use.

Related content

[How to use Chat-magics](#)

Overview of Copilot for Data Science and Data Engineering (preview)

08/15/2025

ⓘ Important

This feature is in [preview](#).

Copilot for Data Science and Data Engineering is an AI assistant that helps analyze and visualize data. It works with Lakehouse tables and files, Power BI Datasets, and pandas/spark/fabric dataframes to provide answers and code snippets directly in a notebook. Connections to OneLake and default attached Lakehouses allow Copilot to provide contextualized code suggestions and natural language responses tailored to your data.

Copilot can help you understand your data better and offer suggestions to begin your notebook, including generating code for the initial cells. After identifying and adding data sources through the Fabric object explorer, Copilot Chat suggests model types to implement. You can copy these recommendations directly into your notebook to start development. If you're unsure of your next steps, you can invoke Copilot in-cell for model direction insights.

When you encounter errors, Copilot provides suggested fixes. For further help, you can chat with Copilot for more options, avoiding constant online searches.

You also benefit from automatic documentation with a simple "Add Comments" feature that summarizes code and data changes. This makes cells clear for you and others. Throughout your workflow, you can consult Copilot at specific points, receiving real-time support and guidance to accelerate your development process.

ⓘ Note

With Spark 3.4 and later versions in Microsoft Fabric, no installation cell is required to use Copilot in your notebook. Previous versions that required an installation cell (Spark 3.3 and earlier) are no longer supported.

ⓘ Note

- Your administrator needs to enable the tenant switch before you start using Copilot. See the article [Copilot tenant settings](#) for details.

- Your F2 or P1 capacity needs to be in one of the regions listed in this article, [Fabric region availability](#).
- If your tenant or capacity is outside the US or France, Copilot is disabled by default unless your Fabric tenant admin enables the [Data sent to Azure OpenAI can be processed outside your tenant's geographic region, compliance boundary, or national cloud instance](#) tenant setting in the Fabric Admin portal.
- Copilot in Microsoft Fabric isn't supported on trial SKUs. Only paid SKUs (F2 or higher, or P1 or higher) are supported.
- See the article [Overview of Copilot in Fabric and Power BI](#) for more information.

Introduction to Copilot for Data Science and Data Engineering for Fabric Data Science

With Copilot for Data Science and Data Engineering, you can chat with an AI assistant to handle your data analysis and visualization tasks. You can ask Copilot questions about lakehouse tables, Power BI Datasets, or Pandas/Spark dataframes inside notebooks. Copilot answers in natural language or code snippets. Copilot can also generate data-specific code for you, depending on the task. For example, Copilot for Data Science and Data Engineering can generate code for:

- Chart creation
- Filtering data
- Applying transformations
- Machine learning models

First, select the Copilot icon in the notebooks ribbon. The Copilot chat panel opens, and a new cell appears at the top of your notebook. You might also select Copilot at the top of your Fabric Notebooks cell.

To maximize Copilot's effectiveness, load a table or dataset as a dataframe in your notebook. The AI can then access the data and understand its structure and content. Next, start chatting with the AI. Select the chat icon in the notebook toolbar, and type your question or request in the chat panel. For example, you can ask:

- "What is the average age of customers in this dataset?"
- "Show me a bar chart of sales by region."

Copilot responds with the answer or the code, which you can copy and paste into your notebook. Copilot for Data Science and Data Engineering is a convenient, interactive way to explore and analyze your data.

Using the Copilot Chat Panel to Interact with Your Data

To chat with your data and get insights, select the chat icon in the notebook toolbar to open the Copilot chat panel. Type your questions or requests in the chat panel. For example, you can ask:

- "What is the average age of customers in this dataset?"
- "Show me a bar chart of sales by region."

Copilot responds with the answer or the code, which you can copy and paste into your notebook. Additionally, Copilot can suggest what to do next with your data. Copilot provides suggestions and generates relevant code snippets to help you proceed with your data analysis and visualization tasks.

To interact with the Copilot chat panel in Microsoft Fabric notebooks, follow these steps:

1. **Open the Copilot Chat Panel:** Select the chat icon in the notebook toolbar.
2. **Ask Questions or Make Requests:** Type your questions or requests in the chat panel. Here are some specific examples for data science and data engineering:
 - **Data Exploration:**
 - "What is the distribution of the 'age' column in this dataset?"
 - "Show me a histogram of the 'income' column."
 - **Data Cleaning:**
 - "How can I handle missing values in this dataset?"
 - "Generate code to remove duplicates from this dataframe."
 - **Data Transformation:**
 - "How do I normalize the 'sales' column?"
 - "Create a new column 'profit' by subtracting 'cost' from 'revenue'."
 - **Visualization:**
 - "Plot a scatter plot of 'height' vs 'weight'."
 - "Generate a box plot for the 'salary' column."
 - **Machine Learning:**
 - "Train a decision tree classifier on this dataset."
 - "Generate code for a k-means clustering algorithm with 3 clusters."
 - **Model Evaluation:**
 - "How do I evaluate the accuracy of a logistic regression model?"

- "Generate a confusion matrix for the predictions."
1. **Receive Responses:** Copilot responds with natural language explanations or code snippets. You can copy and paste the code into your notebook to execute it.
2. **Get Suggestions:** If you don't know how to proceed, ask Copilot for suggestions:

- "What should I do next with this dataset?"
- "What are some recommended feature engineering techniques for this data?"

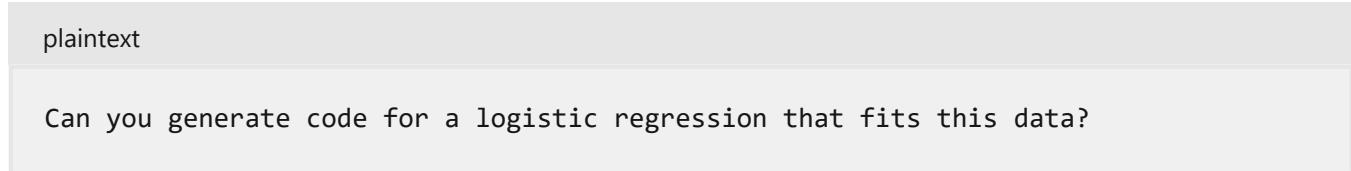
1. **Use Generated Code:** Copy the generated code snippets from the chat panel, and paste them into your notebook cells to run them.

With these steps and the provided examples, you can effectively interact with the Copilot chat panel to enhance your data science and data engineering workflows in Microsoft Fabric notebooks.

Using the Copilot In-Cell Panel and Quick Actions

You can interact with Copilot directly within your notebook cells to generate code and perform quick actions on your code cells. Here's how to use the Copilot in-cell panel:

1. **Generate Code:** To generate code for specific tasks, you can use the Copilot in-cell panel. For example, you can type your request in the text panel above the code cell:



Copilot provides the necessary code snippet directly in the cell below.

1. **Fix Code:** You can ask Copilot to fix errors in your code. Type your request in the text panel above the code cell, and Copilot suggests corrections.
2. **Add Comments:** To automatically document your code, use the "Add Comments" feature. Copilot generates comments that summarize the code and data changes, making your notebook more readable.
3. **Optimize Code:** For performance improvements, you can ask Copilot to optimize your code. Copilot provides suggestions to enhance the efficiency of your code.
4. **Explain Code:** If you need clarification about a piece of code, ask Copilot for an explanation. Copilot provides a detailed explanation of the code's functionality.

Steps to Use Quick Actions

1. **Invoke Copilot In-Cell:** Select the Copilot icon in the notebook toolbar to start interacting with Copilot.

2. **Type Your Request:** Enter your request or question in the text panel above the code cell.
For example:

plaintext

Explain the following code snippet.

1. **Receive Suggestions:** Copilot responds with the relevant code, fixes, comments, optimizations, or explanations.

2. **Apply Suggestions:** Copy the generated code or suggestions from Copilot and paste them into your notebook cells to execute them.

With the Copilot in-cell panel, you can generate code, fix errors, add comments, optimize performance, and understand your code better, all within your Microsoft Fabric notebooks.

The screenshot shows a Microsoft Fabric notebook interface. On the left, there's a sidebar for 'Lakehouses' with a 'sample' dataset selected, showing tables like 'df_clean' and 'df_pred_results'. The main workspace shows a code cell with three lines of Python code: '%chat', 'df', and 'Analyze the pandas dataframe and recommend a few machine learning models'. A red box highlights this code cell. To the right, the Copilot panel is open with the title 'Copilot Preview'. It contains a section titled 'Let's work with your data' with options like 'Load data from my lakehouse into a DataFrame', 'Generate insights from data', and 'Suggest data visualizations'. Below this, there's a text area with steps for data analysis, starting with 'Data Exploration'. At the bottom of the Copilot panel, there's a note about AI-generated content and a 'Type a request or click the sparkle icon for ideas.' button with a magnifying glass icon.

Copilot for Data Science and Data Engineering also has schema and metadata awareness of lakehouse tables. Copilot can provide relevant information in the context of your data hosted in an attached lakehouse. For example, you can ask:

- "How many tables are in the lakehouse?"
- "What are the columns of the table customers?"

Copilot responds with the relevant information if you added the lakehouse to the notebook. Copilot also has awareness of the names of files added to any lakehouse attached to the notebook. You can refer to those files by name in your chat. For example, if you have a file named `sales.csv` in your lakehouse, you can ask Copilot to "Create a dataframe from sales.csv". Copilot generates the code and displays it in the chat panel. With Copilot for notebooks, you can easily access and query your data from different sources. You don't need the exact command syntax to do it.

Copilot inline code completion (Preview)

Copilot inline code completion is an AI-powered feature that helps you to write code faster and more efficiently in Fabric Notebooks. This feature provides intelligent, context-aware code suggestions as you type code. To learn more see, [Copilot inline code completion](#)

Tips

- "Clear" your conversation in the Copilot chat panel with the broom located at the top of the chat panel. Copilot retains knowledge of any inputs or outputs during the session, but this helps if you find the current content distracting.
- Use the chat magics library to configure settings about Copilot, including privacy settings. The default sharing mode maximizes the context sharing Copilot can access. Therefore, limiting the information provided to Copilot can directly and significantly affect the relevance of its responses.
- When Copilot first launches, it offers a set of helpful prompts that can help you get started. They can help kickstart your conversation with Copilot. To refer to prompts later, you can use the sparkle button at the bottom of the chat panel.
- You can "drag" the sidebar of the Copilot chat to expand the chat panel, to view the code more clearly or to improve the readability of the outputs on your screen.

Limitations

- Copilot features in the Data Science experience are currently scoped to notebooks. These features include the Copilot chat pane, IPython magic commands that can be used within a code cell, and automatic code suggestions as you type in a code cell. Copilot can also read Power BI semantic models using an integration of semantic link.
- If your tenant is configured with private link, the Copilot chat (sidecar chat) experience will not function. Copilot's inline code suggestions and quick actions may still work, but chat interactions will fail to load.

- Copilot has two key intended uses:
 - You can ask Copilot to examine and analyze data in your notebook (for example, by first loading a DataFrame and then asking Copilot about data inside the DataFrame).
 - You can ask Copilot to generate a range of suggestions about your data analysis process - for example, what predictive models might be relevant, code to perform different types of data analysis, and documentation for a completed notebook.
- Code generation with fast-moving or recently released libraries might include inaccuracies or fabrications.

Deletion and Export of Data

Copilot in notebooks provides users with two essential commands to manage chat history within notebook cells: `show_chat_history` and `clear_chat_history`. The `show_chat_history` command exports the complete chat history for compliance purposes, to ensure that all necessary interactions are documented and accessible for review. For example, executing `show_chat_history` generates a comprehensive log of the chat history, which can then be reviewed or archived for compliance.

The `clear_chat_history` command removes all previous conversations from the notebook, so that the user can start fresh. This command clears out old interactions, to start a new conversation thread. For instance, executing `clear_chat_history` deletes all previous chat history, to leave the notebook free of any past conversations. These features enhance the overall functionality and user experience of Copilot in notebooks.

Related Content

- [How to use Chat-magics](#)
- [How to use the Copilot Chat Pane](#)

Copilot in Fabric consumption

Article • 02/19/2025

This page contains information on how the Fabric Copilot usage is billed and reported. Copilot usage is measured by the number of tokens processed. Tokens can be thought of as pieces of words. Approximately 1,000 tokens are about 750 words. Prices are calculated per 1,000 tokens, and input and output tokens are consumed at different rates.

ⓘ Note

The Copilot for Fabric billing will become effective on March 1st, 2024, as part of your existing Power BI Premium or Fabric Capacity.

Consumption rate

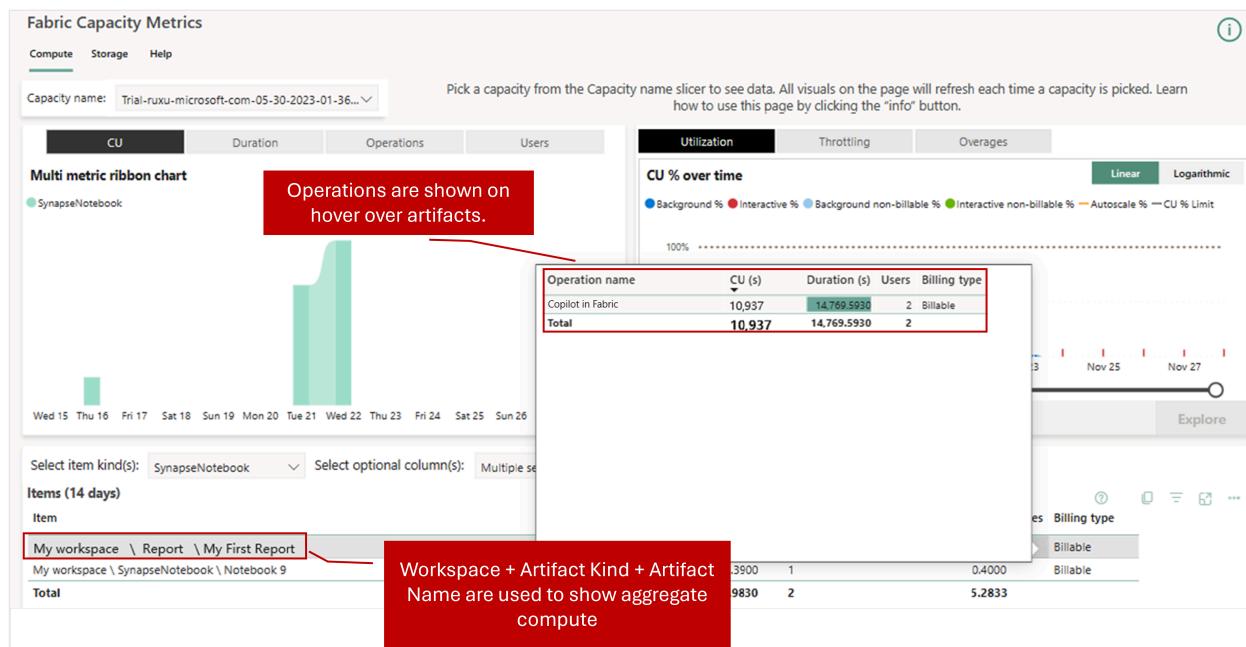
Requests to Copilot consume Fabric Capacity Units. This table defines how many capacity units (CU) are consumed when Copilot is used. For example, when user using [Copilot for Power BI](#), [Copilot for Data Factory](#), or [Copilot for Data Science and Data Engineering](#).

[+] Expand table

Operation in Metrics App	Description	Operation Unit of Measure	Consumption rate
Copilot in Fabric	The input prompt	Per 1,000 Tokens	100 CU seconds
Copilot in Fabric	The output completion	Per 1,000 Tokens	400 CU seconds

Monitor the usage

The [Fabric Capacity Metrics app](#) displays the total capacity usage for Copilot operations under the name "Copilot in Fabric." Additionally, Copilot users are able to view a summary of their billing charges for Copilot usage under the invoicing item "Copilot in Fabric."



Capacity utilization type

Fabric Copilots are classified as "background jobs" to handle a higher volume of Copilot requests during peak hours.

Fabric is designed to provide lightning-fast performance by allowing operations to access more CU (Capacity Units) resources than are allocated to capacity. Fabric smooths or averages the CU usage of an "interactive job" over a minimum of 5 minutes and a "background job" over a 24-hour period. According to the Fabric throttling policy, the first phase of throttling begins when a capacity has consumed all its available CU resources for the next 10 minutes.

For example, assume each Copilot request has 2,000 input tokens and 500 output tokens. The price for one Copilot request is calculated as follows: $(2,000 \times 100 + 500 \times 400) / 1,000 = 400.00$ CU seconds = 6.67 CU minutes.

Since Copilot is a background job, each Copilot request (~6.67 CU minute job) consumes only one CU minute of each hour of a capacity. For a customer on F64 who has $64 * 24$ CU Hours (1,536) in a day, and each Copilot job consumes (6.67 CU mins / 60 mins) = 0.11 CU Hours, customers can run over 13,824 requests before they exhaust the capacity. However, once the capacity is exhausted, all operations will shut down.

Region mapping

Fabric Copilot is powered by Azure OpenAI large language models that are currently deployed to [limited data centers](#). However, customers can [enable cross-geo process tenant settings](#) to use Copilots by processing their data in another region where Azure

OpenAI Service is available. This region could be outside of the user's geographic region, compliance boundary, or national cloud instance. While performing region mapping, we prioritize data residency as the foremost consideration and attempt to map to a region within the same geographic area whenever feasible.

The cost of Fabric Capacity Units can vary depending on the region. Regardless of the consumption region where GPU capacity is utilized, customers are billed based on the Fabric Capacity Units pricing in their billing region. For example, if a customer's requests are mapped from `region 1` to `region 2`, with `region 1` being the billing region and `region 2` being the consumption region, the customer is charged based on the pricing in `region 1`.

Changes to Copilot in Fabric consumption rate

Consumption rates are subject to change at any time. Microsoft uses reasonable efforts to provide notice via email or through in-product notification. Changes shall be effective on the date stated in Microsoft's Release Notes or Microsoft Fabric Blog. If any change to a Copilot in Fabric Consumption Rate materially increases the Capacity Units (CU) required to use Copilot in Fabric, customers can use the cancellation options available for the chosen payment method.

Related content

- [Overview of Copilot in Fabric](#)
- [Copilot in Fabric: FAQ](#)
- [AI services in Fabric \(preview\)](#)

Feedback

Was this page helpful?



[Provide product feedback ↗](#) | [Ask the community ↗](#)

Data agent in Fabric consumption

Article • 04/01/2025

This page contains information on how the Fabric Data agent usage is billed and reported. Data agent usage is measured by the number of tokens processed. When you query Data agent using natural language, Fabric generates tokens that represent the number of words in the query. For every 750 words, approximately 1,000 tokens are generated.

Consumption rate

The table below defines consumption in Capacity Units (CUs), when Data agent leverages Azure OpenAI models to process and generate responses.

 Expand table

Metrics App Operation Name	Description	Operation Unit of Measure	Consumption rate
AI Query	The input prompt	Per 1,000 Tokens	100 CU seconds
AI Query	The output completion	Per 1,000 Tokens	400 CU seconds

In addition to token consumption, the Data agent might generate and execute queries as part of answering user requests. The execution of these queries is billed separately to the corresponding query engine item. For example, if a query is generated for a Data Warehouse, its execution is billed through the SQL Query operation.

Monitor the usage

The [Fabric Capacity Metrics app](#) displays the total capacity usage for Data agent operations under the name *AI Query*. Additionally, Data agent users are able to view a summary of their billing charges for the Data agent usage under the *LlmPlugin* item kind.

Capacity utilization type

The AI related activity within the Data agent is classified as *background jobs* to handle a higher volume of Data agent requests during peak hours.

For example, assume each Data agent request has 2,000 input tokens and 500 output tokens. The price for one Data agent request is calculated as follows: $(2,000 \times 100 + 500 \times 400) / 1,000 = 400.00$ CU seconds = 6.67 CU minutes. The cost of executing the AI-generated queries is billed through the corresponding query engine running the query.

Since Data agent is a background job, each Data agent request (~6.67 CU minute job) consumes only one CU minute of each hour of a capacity. If you're using an F64 SKU that has $64 * 24 = 1,536$ CU hours a day, and each Data agent job consumes 6.67 CU mins / 60 mins = 0.11 CU hours, you can run over 13,824 requests before they exhaust the capacity. However, once the capacity is exhausted, all operations will shut down.

Region mapping

The Data agent is powered by Azure OpenAI large language models, which are deployed to [a select set of data centers](#). Customers can [enable cross-geo processing in the tenant settings](#) to use Copilot and the Data agent. This setting allows data to be processed in a region where the Azure OpenAI Service is available. This region could be outside of the user's geographic region, compliance boundary, or national cloud instance. During region mapping, data residency is treated as the primary constraint. Regions are mapped within the same geographic area whenever possible.

The cost of Fabric CUs can vary depending on the region. Regardless of the consumption region where GPU capacity is utilized, customers are billed based on the Fabric pricing in their billing region. For example, if a customer's requests are mapped from `region 1` to `region 2`, with `region 1` being the billing region and `region 2` being the consumption region, the customer is charged based on the pricing in `region 1`.

Changes to Data agent in Fabric consumption rate

Consumption rates are subject to change at any time. Microsoft uses reasonable efforts to provide notice by email or through in-product notification. Changes become effective on the date stated in Microsoft's Release Notes or Microsoft Fabric Blog. If any change to a Data agent in Fabric Consumption Rate materially increases the Capacity Units (CU) required to use Data agent in Fabric, customers can use the cancellation options available for the chosen payment method.

Related content

- [Overview of the Data agent in Fabric](#)

- Background jobs in Fabric
-

Feedback

Was this page helpful?

 Yes

 No

[Provide product feedback ↗](#) | [Ask the community ↗](#)

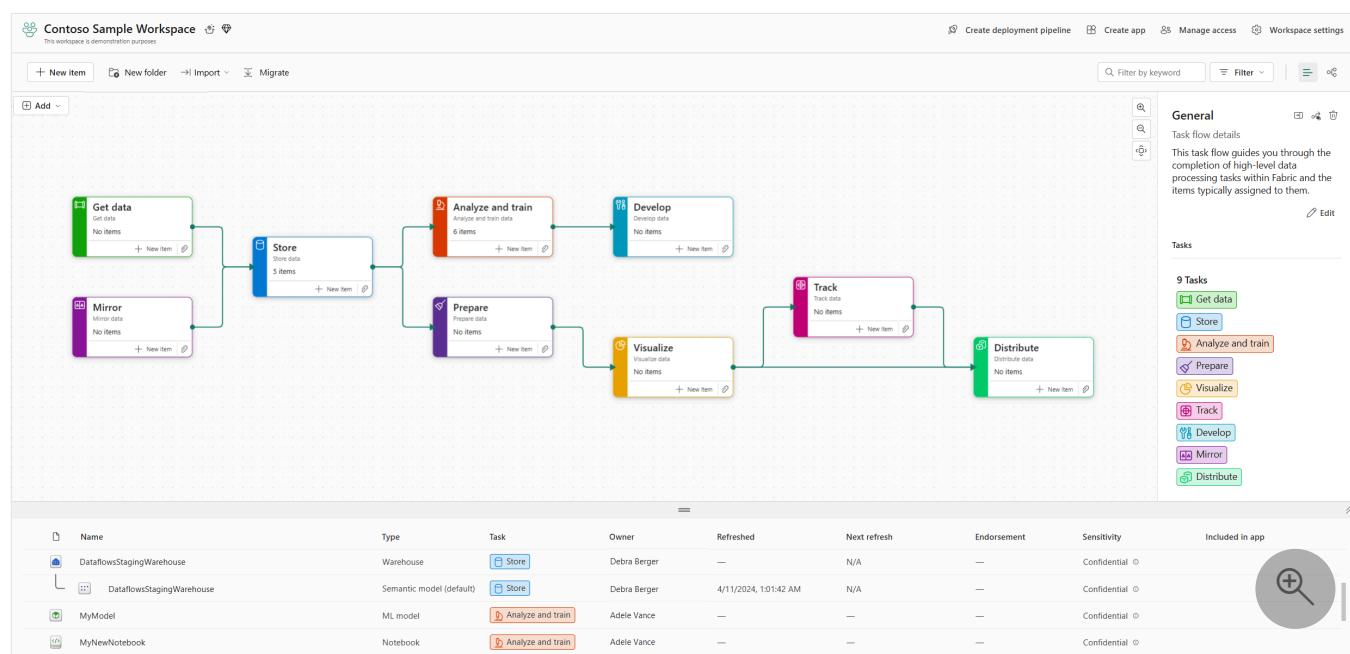
Task flows in Microsoft Fabric

Article • 05/06/2025

This article describes the task flows feature in Microsoft Fabric. Its target audience is data analytics solution architects who want to use a task flow to build a visual representation of their project, engineers who are working on the project and want to use the task flow to facilitate their work, and others who want to use the task flow to filter the item list to help navigate and understand the workspace.

Overview

Fabric task flow is a workspace feature that enables you to build a visualization of the flow of work in the workspace. The task flow helps you understand how items are related and work together in your workspace, and makes it easier for you to navigate your workspace, even as it becomes more complex over time. Moreover, the task flow can help you standardize your team's work and keep your design and development work in sync to boost the team's collaboration and efficiency.



Fabric provides a range possibilities for creating a task flow:

- You can start with one of the predefined, end-to-end task flows provided by Fabric. These predefined task flows are based on industry best practices and are intended to make it easier to get started with your project. Once you've got the predefined task flow, you can customize it to meet your needs.
- You can create your own task flow from scratch to suit your specific needs and requirements.

- You can import a task flow that you or someone else has created previously and customize it to meet your needs.

Each workspace has one task flow. The task flow occupies the upper part of workspace list view. It consists of a canvas where you can build the visualization of your data analytics project, and a side pane where you can see and edit details about the task flow, tasks, and connectors.

 **Note**

You can [resize or hide the task flow](#) using the controls on the horizontal separator bar.

Key concepts

Key concepts to know when working with a task flow are described in the following sections.

Task flow

A task flow is a collection of connected tasks that represent relationships in a process or collection of processes that complete an end-to-end data solution. A workspace has one task flow. You can either build it from scratch, use one of Fabric's predefined task flows, or import an existing task flow.

Task

A task is a unit of process in the task flow. A task has recommended item types to help you select the appropriate items when building your solution. Tasks also help you navigate the items in the workspace.

Task type

Each task has a task type that classifies the task based on its key capabilities in the data process flow. The predefined task types are:

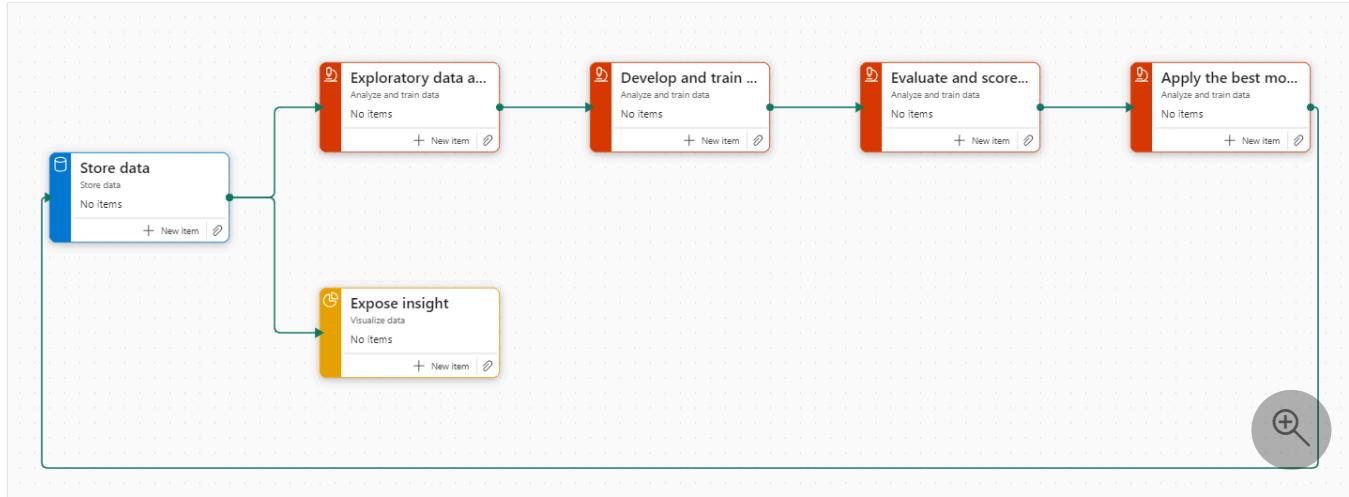
 Expand table

Task type	What you want to do with the task
General	Create a customized task for your project needs that you can assign available item types to.
Get data	Ingest batch and real-time data into a single location within your Fabric workspace.

Task type	What you want to do with the task
Mirror data	Replicate your data from any location to OneLake in near real-time.
Store data	Organize, query, and store your ingested data in an easily retrievable format.
Prepare data	Clean, transform, extract, and load your data for analysis and modeling tasks.
Analyze and train data	Propose hypotheses, train models, and explore your data to make decisions and predictions.
Track data	Monitor your streaming or nearly real-time operational data, and make decisions based on gained insights.
Visualize data	Present your data as rich visualizations and insights that can be shared with others.
Distribute data	Package your items for distribution as customized, easy-to-use apps.
Develop data	Create and build your software, applications, and data solutions.

Connector

Connectors are arrows that represent logical connections between the tasks in the task flow. They don't represent the flow of data, nor do they create any actual data connections.



Considerations and limitations

- Creating paginated reports, dataflows Gen1, and semantic models from a task isn't supported.
- Creating reports from a task is supported only if a published semantic model is picked.

Related content

- Set up a task flow
- Work with task flows

Set up a task flow

Article • 05/06/2025

This article describes how to start building a task flow. It targets data analytics solution architects and others who want to create a visualization of a data project.

Prerequisites

To create a task flow in a workspace, you must be a workspace admin, member, or contributor.

Open the workspace

Navigate to the workspace where you want to create your task flow. It should open in list view, but if not, select the **List view** icon. You'll see that the workspace view is split between the task flow, where you'll build your task flow, and the items list, which shows you the items in the workspace. A moveable separator bar allows you to adjust the size of the views. You can also hide the task flow if you want to get it out of the way.

The screenshot shows the Microsoft Power BI workspace interface. At the top, there's a navigation bar with icons for 'Create deployment pipeline', 'Create app', 'Manage access', and 'Workspace settings'. Below the navigation bar, there are buttons for '+ New item', 'New folder', 'Import', 'Migrate', a search bar 'Filter by keyword' with a 'Filter' button (circled in red), and a 'Resize' icon. The main area is divided into two sections: a 'Task flow canvas' on the left and an 'Items list' on the right. The Task flow canvas features a large circular icon with a stack of cards and a plus sign, with a red circle labeled '②' above it. Below this is a prompt: 'Choose from predesigned task flows or add a task to build one' and 'Select from one of Microsoft's predesigned task flows or add a task to start building one yourself.' There are two buttons: 'Select a predesigned task flow' and 'Add a task'. A red circle labeled '③' is placed over the 'Select a predesigned task flow' button. To the right of the Task flow canvas is a red circle labeled '④' with a small arrow pointing towards the items list. The Items list table has columns: Name, Type, Task, Owner, Refreshed, Next refresh, Endorsement, Sensitivity, and Included in app. The table contains several items, including 'DataflowsStagingWarehouse' (Warehouse), 'MLModel 1' (ML model), 'Notebook 3' (Notebook), 'Pipeline 1' (Data pipeline), 'Notebook 1' (Notebook), 'Notebook 2' (Notebook), 'Pipeline 2' (Data pipeline), and 'Sample Spark job definition' (Spark Job Definition). A red circle labeled '⑤' is placed over the 'Included in app' column header. In the bottom right corner of the items list area, there's a magnifying glass icon inside a circle, with a red circle labeled '⑥' next to it.

Name	Type	Task	Owner	Refreshed	Next refresh	Endorsement	Sensitivity	Included in app
DataflowsStagingWarehouse	Warehouse	—	Debra Berger	—	N/A	—	Confidential ⓘ	
DataflowsStagingWarehouse	Semantic model (default)	—	Adele Vance	4/11/2024, 1:01:42 AM	N/A	—	Confidential ⓘ	
MLModel 1	ML model	—	Debra Berger	—	—	—	Confidential ⓘ	
Notebook 3	Notebook	—	Contoso Workspace	—	—	—	Confidential ⓘ	
Pipeline 1	Data pipeline	—	Contoso Workspace	—	—	—	Confidential ⓘ	
Notebook 1	Notebook	—	Admin	—	—	—	Confidential ⓘ	
Notebook 2	Notebook	—	Lynn Robinson	—	—	—	Confidential ⓘ	
Pipeline 2	Data pipeline	—	Megan Bowen	—	—	—	Confidential ⓘ	
Sample Spark job definition	Spark Job Definition	—	Lynn Robinson	—	—	—	Confidential ⓘ	

1. List view selector
2. Task flow canvas
3. Resize bar
4. Show/hide task flow
5. Items list

When no task flow has been configured, the task flow area prompts you to choose between starting with a predesigned task flow, adding a task to start building your own custom task

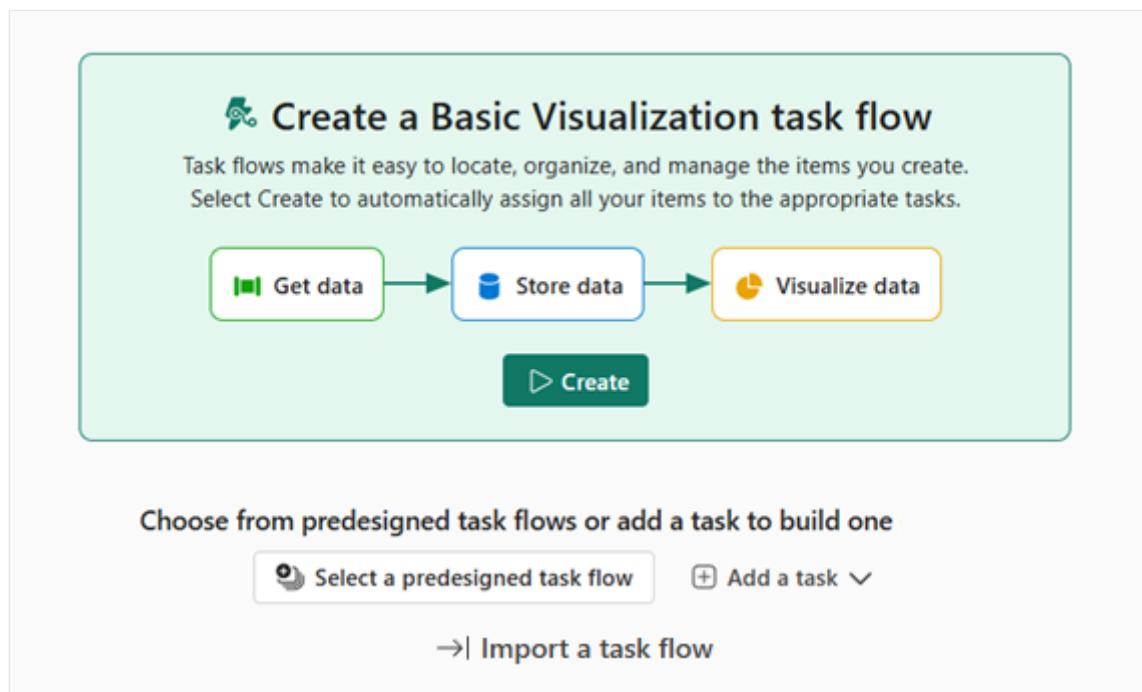
flow, or importing a saved task flow.

To build a task flow, you need to:

- Add tasks to the task flow canvas.
- Arrange the tasks on the task flow canvas in such a way that illustrates the logic of the project.
- Connect the tasks to show the logical structure of the project.
- Assign items to the tasks in the workflow.

To get started, choose either [Select a predesigned task flow](#), [Add a task](#) (to start building one from scratch), or [Import a task flow](#) (to start with a saved task flow).

If the workspace contains Power BI items only, the task flow canvas will display a basic task flow designed to meet the basic needs of a solution based on Power BI items only.



Select **Create** if you want to start with this task flow, or choose either of the previously mentioned options, [Select a predesigned task flow](#), [Add a task](#), or [Import a task flow](#).

Start with a predesigned task flow

In the empty task flow area, choose [Select a predesigned task flow](#).

The side pane lists the predesigned task flows provided by Microsoft. Each predefined task flow has a brief description of its use case. When you select one of the flows, you'll see a more detailed description of the flow and how to use it, and also the workloads and item types that the flow requires.

Choose from predesigned task flows or add a task to build

Select from one of Microsoft's predesigned task flows or add a task to start building.

Select a predesigned task flow

General
A high-level data processing task flow that guides you through typical tasks and the items assigned to them.

Basic data analytics
A basic, step-by-step task flow for batch data analysis.

Data analytics using a SQL analytics endpoint
Select unstructured, semi-structured, or structured data from lakehouse files, and then create reports.

Medallion
Organize and improve data progressively as it moves through each layers.

Event analytics
Process and analyze real-time data as it is generated to extract insights quickly.

Lambda
Process batch and real-time data in one data process flow.

Sensitive data insights
Process and analyze your sensitive data.

9 Tasks
Keep your data more secure by applying security features and access controls to your sensitive data while processing and performing analysis tasks. Apply strict access permissions while performing analytics.

Recommended workloads

- Data Engineering
- Data Science
- Power BI

Recommended item types

- Dataflow Gen2
- Warehouse
- Notebook
- Report
- ML model
- Environment
- Lakehouse
- Data pipeline
- Spark Job Definition
- Dashboard
- Experiment

1. List of predesigned task flows.
2. Layout of selected predesigned task flow.
3. Name of selected predesigned task flow.
4. Number of tasks in the task flow.
5. Detailed description of the task flow and how it's used.
6. The workloads that the task flow typically requires.
7. The item types that are typically used in task flow.

Select the task flow that best fits your project needs and then choose **Select**. The selected task flow will be applied to the task flow canvas.

9 Tasks

This task flow guides you through the completion of high-level data processing tasks within Fabric and the items typically assigned to them.

Tasks

- Get data
- Store
- Analyze and train
- Develop
- Mirror
- Prepare
- Visualize
- Track
- Distribute

Name	Type	Task	Owner	Refreshed	Next refresh	Endorsement	Sensitivity	Included in app
DataflowsStagingWarehouse	Warehouse	—	Debra Berger	—	N/A	—	Confidential	○
DataflowsStagingWarehouse	Semantic model (default)	—	Adele Vance	4/11/2024, 1:01:42 AM	N/A	—	Confidential	○
MLModel 1	ML model	—	Debra Berger	—	—	—	Confidential	○
Notebook 3	Notebook	—	Contoso Workspace	—	—	—	Confidential	○
Pipeline 1	Data pipeline	—	Contoso Workspace	—	—	—	Confidential	○
Notebook 1	Notebook	—	Admin	—	—	—	Confidential	○
Notebook 2	Notebook	—	Lynn Robinson	—	—	—	Confidential	○
Pipeline 2	Data pipeline	—	Megan Bowen	—	—	—	Confidential	○
Sample Spark job definition	Spark Job Definition	—	Lynn Robinson	—	—	—	Confidential	○

The task flow canvas provides a graphic view of the tasks and how they're connected logically.

The side pane now shows detailed information about the task flow you selected, including:

- Task flow name.
- Task flow description.
- Total number of tasks in the task flow.
- A list of the tasks in the task flow.

It's recommended that you change the task flow name and description to something meaningful that enables others to better understand what the task flow is all about. To change the name and description, select **Edit** in the task flow side pane. For more information, see [Edit task flow details](#).

The items list shows all the items and folders in the workspace, including those items that are assigned to tasks in the task flow. When you select a task in the task flow, the items list is filtered to show just the items that are assigned to the selected task.

 **Note**

Selecting a predefined task flow just places the tasks involved in the task flow on the canvas and indicates the connections between them. It's just a graphical representation - no actual items or data connections are created at this point, and no existing items are assigned to tasks in the flow.

After you've added the predefined task flow to the canvas, you can start modifying it to suit your needs - [arranging the tasks on the canvas](#), [updating task names and descriptions](#), [assigning items to tasks](#), etc. For more information, see [Working with task flows](#).

Start with a custom task flow

If you already have a clear idea of what the structure of your task flow needs to be, or if none of the predesigned task flows fit your needs, you can build a custom task flow from scratch task by task.

1. In the empty task flow area, select **Add a task** and choose a task type.



Choose from predesigned task flows or add a task to build one

Select from one of Microsoft's predesigned task flows or add a task to start building one yourself.

The screenshot shows the Microsoft Power BI interface. At the top, there is a green button labeled "Select a predesigned task flow". To its right is a dropdown menu labeled "Add a task" with a downward arrow. Below these are two buttons: "Import a task flow" and "Get data". The "Get data" button is highlighted with a red rectangle. A list of other tasks follows: "General", "Mirror data", "Store data", "Prepare data", "Analyze and train data", "Track data", "Visualize data", "Distribute data", and "Develop data". On the left side of the screen, there is a table with columns for "Owner" and "Next refresh". The "Owner" column lists "Finance Dept". The "Next refresh" column has two blank entries. The overall interface is clean and modern, typical of Microsoft's product design.

2. A task card appears on the canvas and the task details pane opens to the side.

The screenshot shows the Microsoft Fabric workspace interface. On the left, there is a large, empty task flow canvas with a grid of small squares. In the top right corner of the canvas area, there is a green rectangular callout box containing the text "Get data", "Get data", "No items", and a "New item" button. To the right of the canvas, there is a sidebar with several icons: a magnifying glass, a search icon, a refresh icon, and a trash bin. Above these icons is a section titled "Get data" with three buttons: a copy icon, a settings icon, and a delete icon. Below this is a message "No items". Underneath is a descriptive text block: "Ingest batch and real-time data into a single location within your Fabric workspace." At the bottom of this sidebar is a red-bordered button labeled "Edit".

Get data

No items

Ingest batch and real-time data into a single location within your Fabric workspace.

Edit

Task type

Select a task type to filter the list of items recommended.

Get data

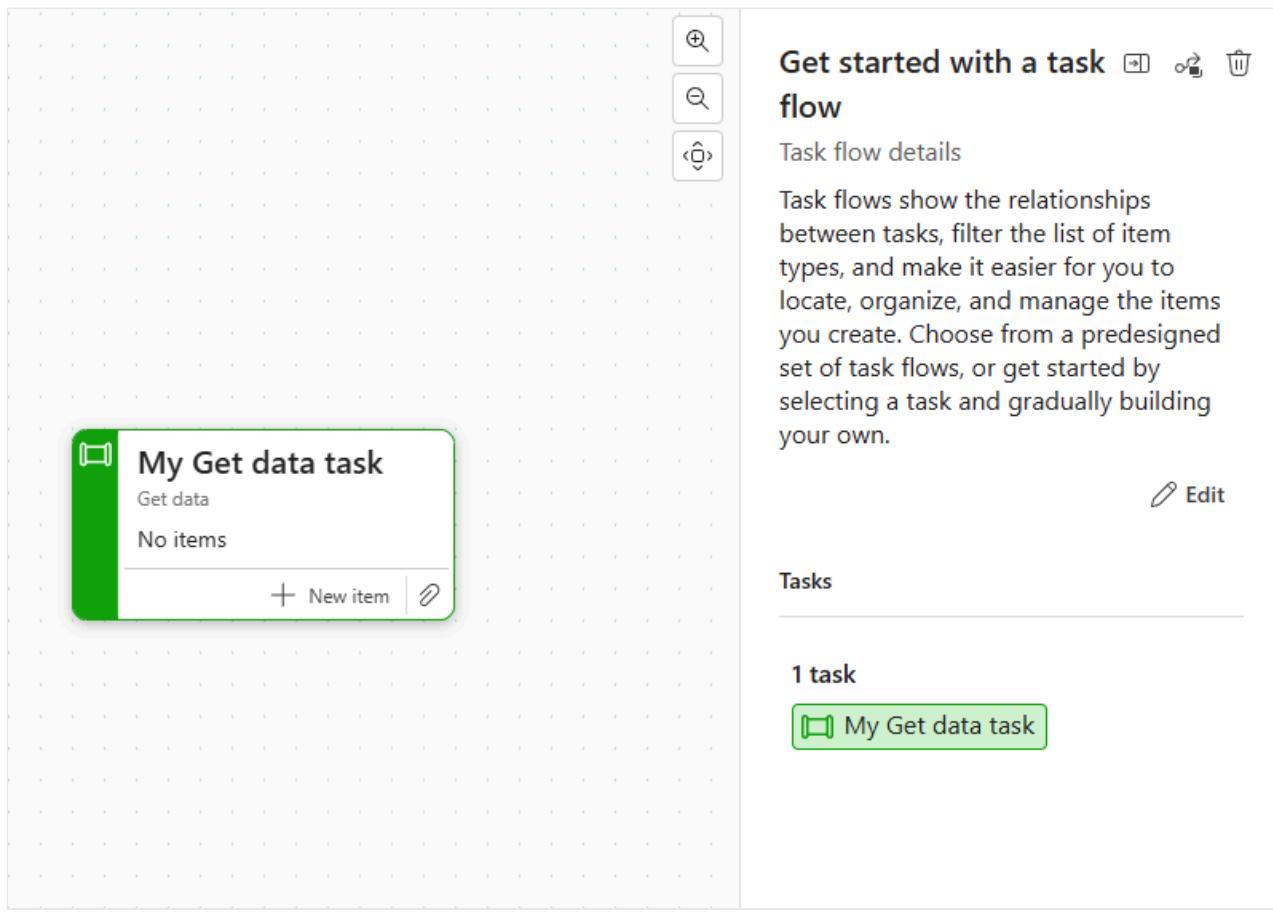
Item recommendation

Select an item type from the predefined list.

Get data
Copy job
Data pipeline
Dataflow Gen2
Eventstream
Notebook
Spark Job Definition
User data functions

It's recommended to provide a meaningful name and description of the task to help other members of the workspace understand what the task is for. In the task details side pane, select **Edit**, to provide a meaningful name and description.

3. Deselect the task by clicking on a blank area of the task flow canvas. The side pane will display the task flow details with a default name (*Get started with a task flow*) and description. Note that the task you just created is listed under the **Tasks** section.



Select **Edit** and provide a meaningful name and description for your new task flow to help other members of the workspace understand your project and the task flow you're creating. For more information, see [Edit task flow details](#).

You can continue to [add more tasks to the canvas](#). You'll also have to perform other actions, such as [arranging the tasks on the canvas](#), [connecting the tasks](#), [assigning items to the tasks](#), etc. For more information, see [Working with task flows](#).

Start by importing an existing task flow

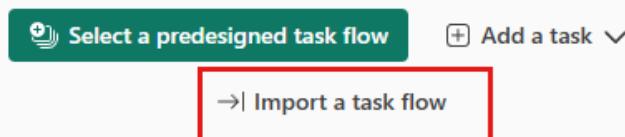
Task flows can be exported as `.json` files from the workspace they were created in. These `.json` files can then be imported into other workspaces for reuse. If there is a `.json` file of a task flow that would help you get started, you can import it into your project's workspace, and then modify it as necessary to suit your project's needs.

1. In the empty task flow area, choose **Import a task flow**.

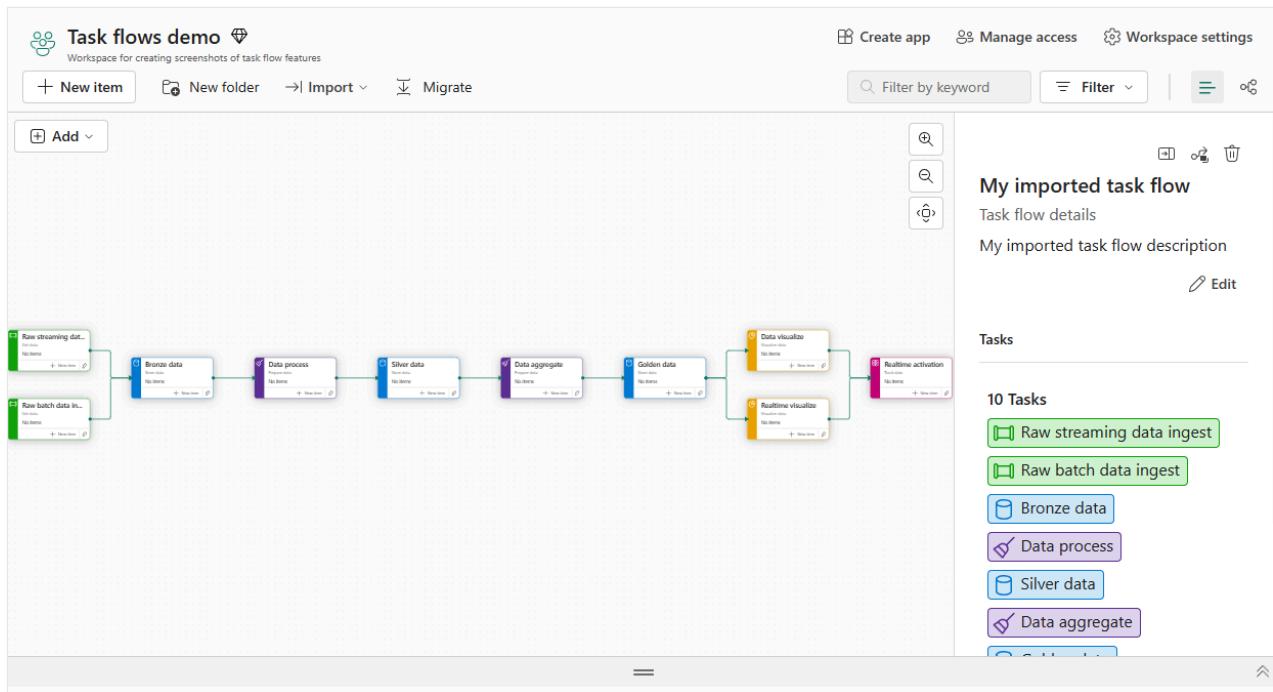


Choose from predesigned task flows or add a task to build one

Select from one of Microsoft's predesigned task flows or add a task to start building one yourself.



2. In the **Open** window that appears, navigate to the desired *.json* file and open it. The task flow will appear on the canvas, with the task flow details pane at the side.



If necessary, change the task flow name and description to something that suits your task flow and enables others to better understand what your task flow is all about. To change the name and description, select **Edit** in the task flow side pane. For more information, see [Edit task flow details](#).

After you've imported the task flow into the canvas, you can start modifying it to suit your needs - [arranging the tasks on the canvas](#), [updating task names and descriptions](#), [assigning items to tasks](#), etc. For more information, see [Working with task flows](#).

For more detail about importing and exporting task flows, see [Import or export a task flow](#).

Related concepts

- [Task flow overview](#)
- [Work with task flows](#)

Work with task flows

Article • 05/06/2025

This article describes how to work with tasks. The target audience is data analytics solution architects who are designing a data analytics solution, engineers who need to know how to use task flows to facilitate their work, and others who want to use the task flow to filter the item list to help navigate and understand the workspace.

Prerequisites

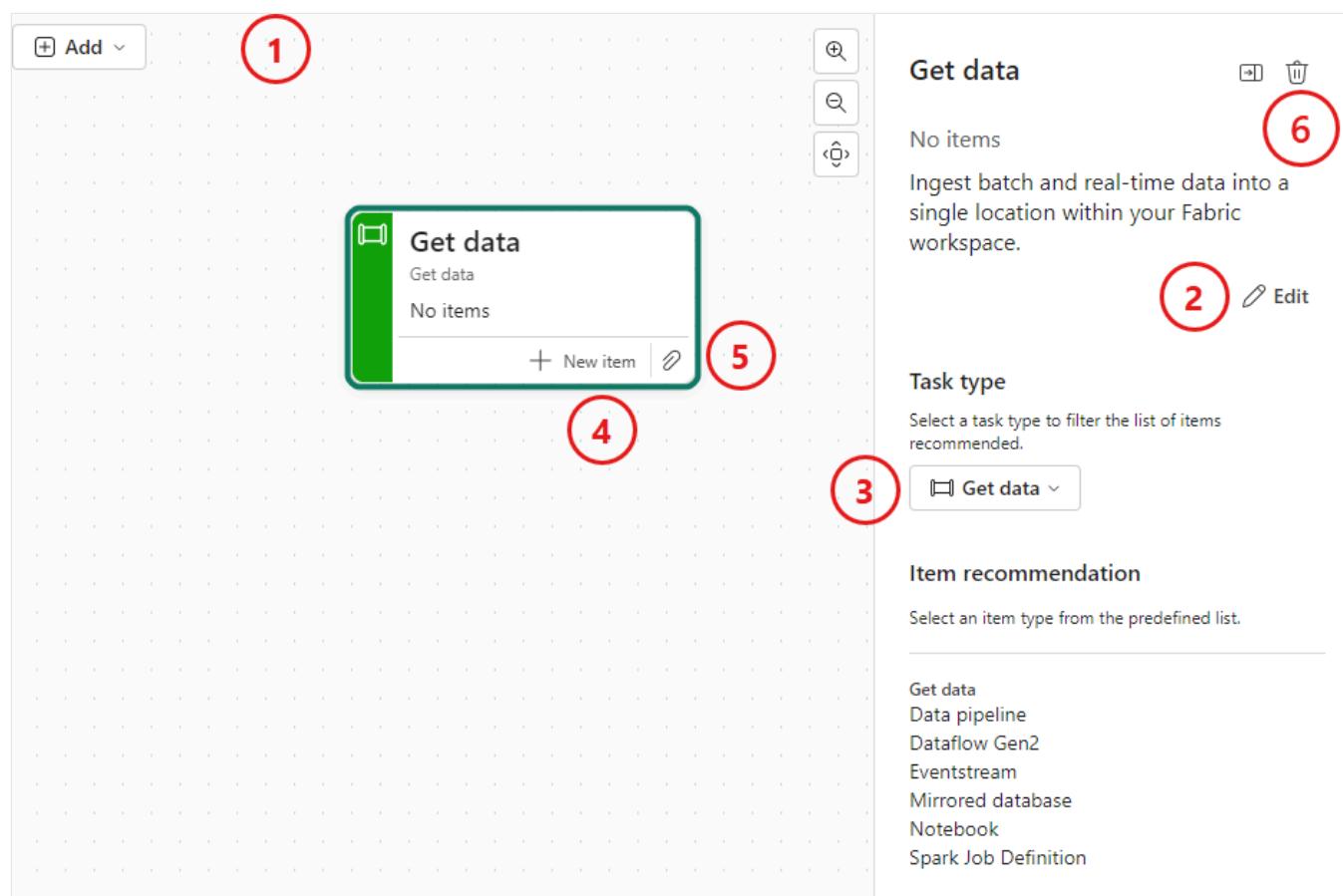
To create or edit the task flow, and to create items in the workspace via the task flow, you need to be an Admin, Member, or Contributor in the workspace.

Admins, Members, Contributors, and Viewers can use the task flow to [filter the items list](#).

Task controls

Much of the work with tasks is accomplished either in the task details pane or via controls on the task card or on the task flow canvas.

Select a task to display the task details pane. The following image shows the main controls for working with tasks.

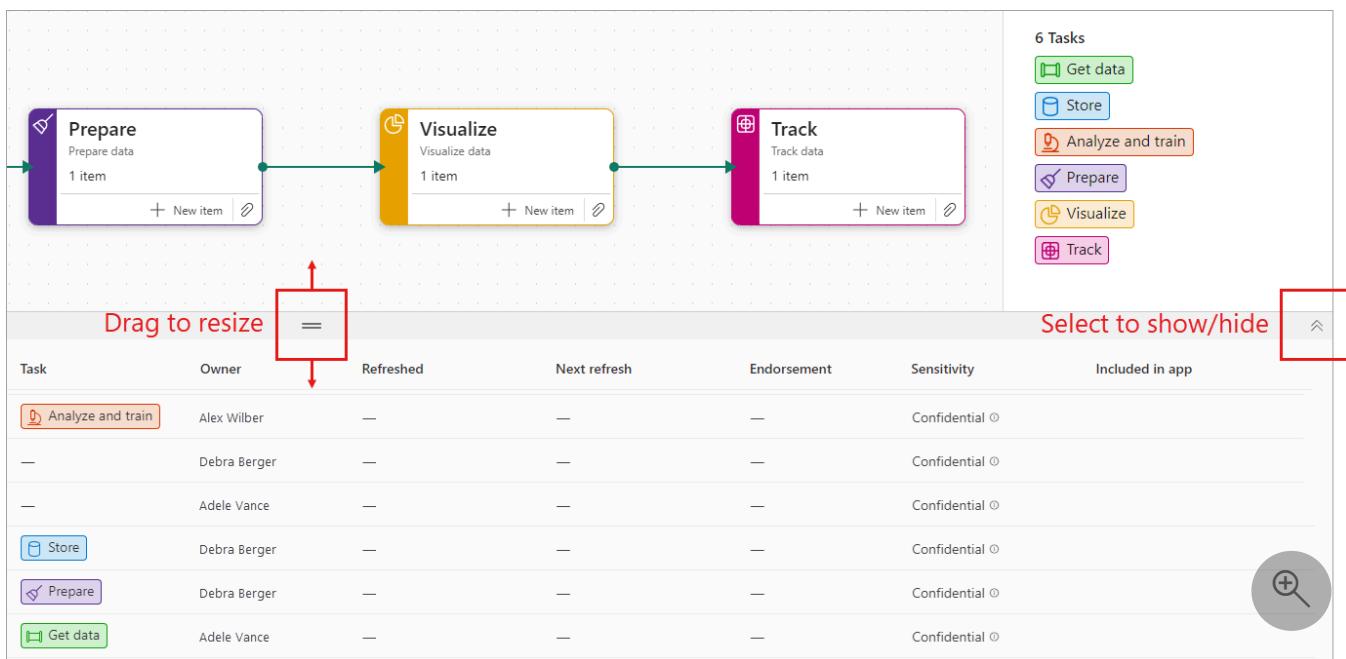


1. Add task or connector
2. Edit task name and description
3. Change task type
4. Create new item for task
5. Assign existing items to task
6. Delete task

Resize or hide the task flow

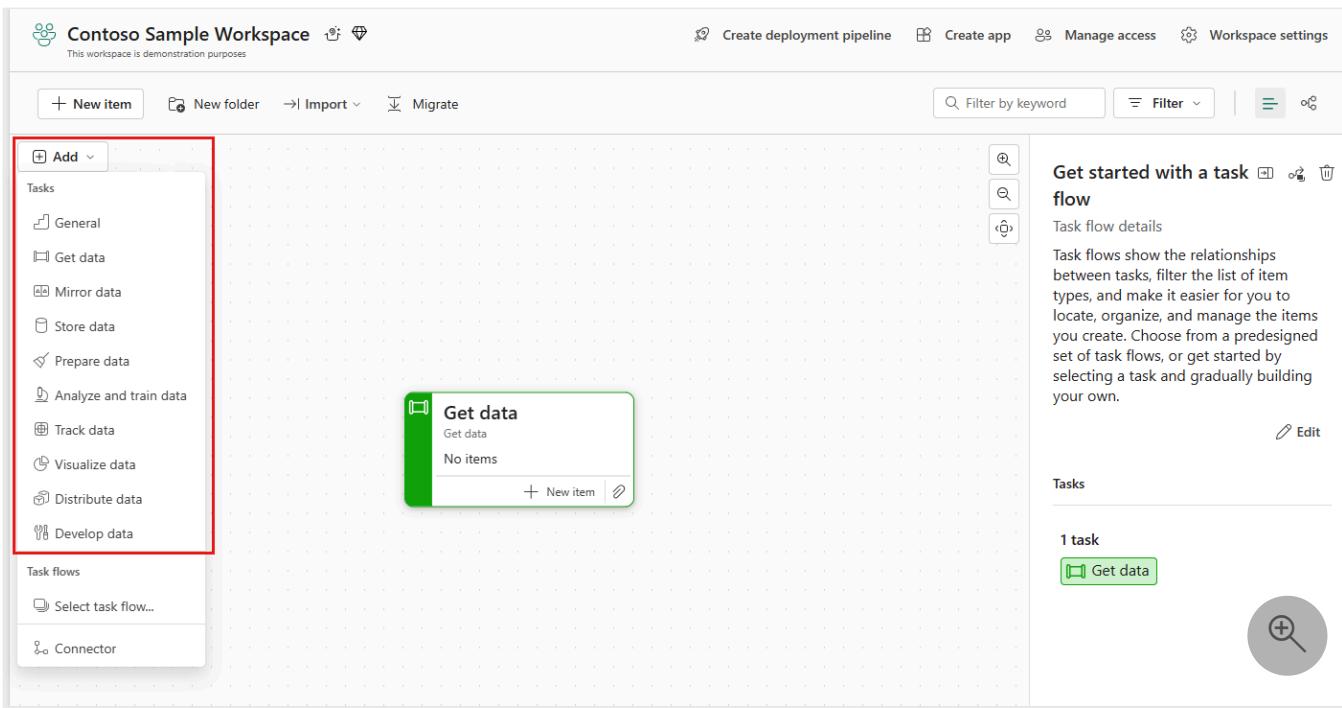
You can resize the task flow, or even hide it, according to your personal needs and preferences. Fabric remembers task flow resize and show/hide choices per user and per workspace, so each time you return to a workspace, the task flow size and show/hide status will be the same as it was the last time you left the workspace.

- To resize the task flow, drag the resize bar on the horizontal separator up or down.
- To show/hide the task flow, select the show/hide control at the right side of the separator.



Add a task

To add a new task to the task flow canvas, open the **Add** dropdown menu and select the desired task type.



The task of the selected task type is added onto the canvas. The name and description of the new task are the default name and description of the task type. Consider [changing the name and description](#) of the new task to better describe its purpose in the work flow. A good task name should identify the task and provide a clear indication of its intended use.

Edit task name and description

To edit a task's name or description:

1. Select the task on the canvas to open the [task details pane](#).
2. Select **Edit** and change the name and description fields as desired. When done, select **Save**.

Change task type

To change a task to a different type:

1. Select the task on the canvas to open the [task details pane](#).
2. Open the **Task type** dropdown menu and choose the new desired task type.

⚠ Note

Changing the task type doesn't change the task name or description. Consider changing these fields to suit the new task type.

Arrange tasks on the canvas

Part of building a task flow is arranging the tasks in the proper order. To arrange the tasks, select and drag each task to the desired position in the task flow.

💡 Tip

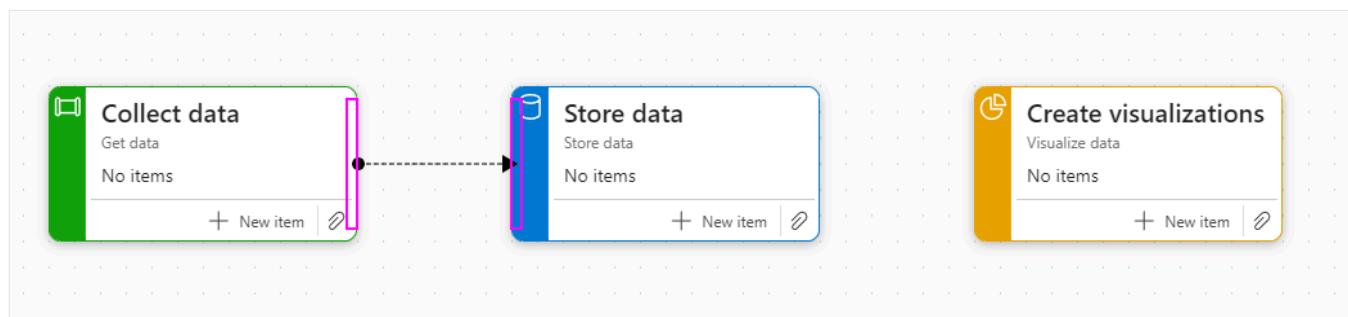
When you move tasks around on the canvas, they stay in the place where you put them. However, due to a known issue, when you add a new task to the canvas, any unconnected tasks will move back to their default positions. Therefore, to safeguard your arrangement of tasks, it's highly recommended to connect them all with connectors before adding any new tasks to the canvas.

Connect tasks

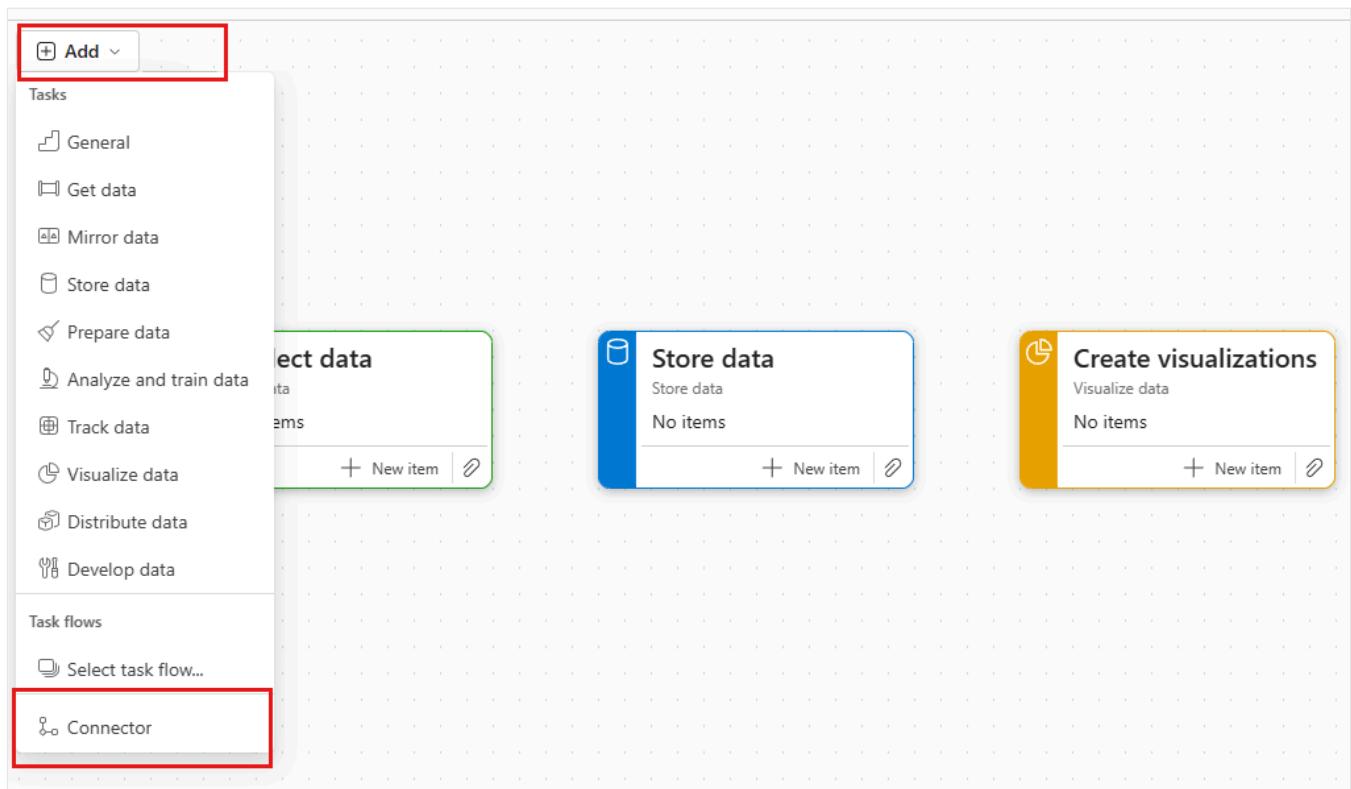
Connectors show the logical flow of work. They don't make or indicate any actual data connections - they are graphic representations of the flow of tasks only.

Add a connector

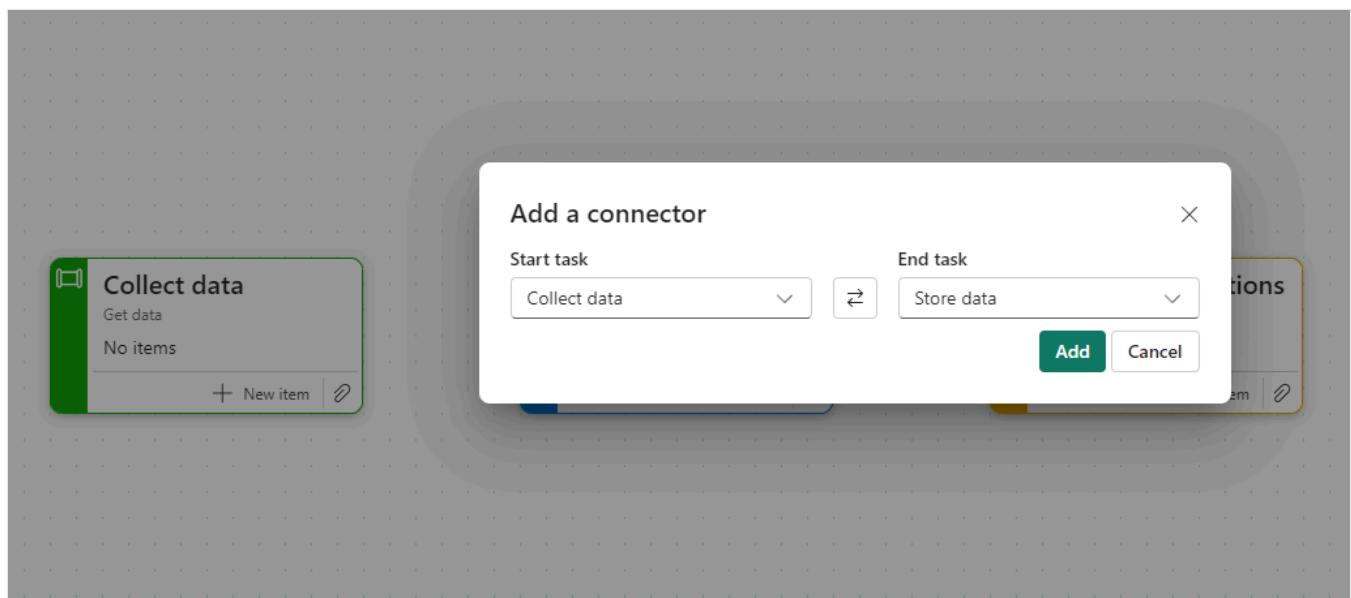
To connect two tasks, select the edge of the starting task and drag to an edge of the next task.



Alternatively, you can select **Add > Connector** from the **Add** dropdown on the canvas.



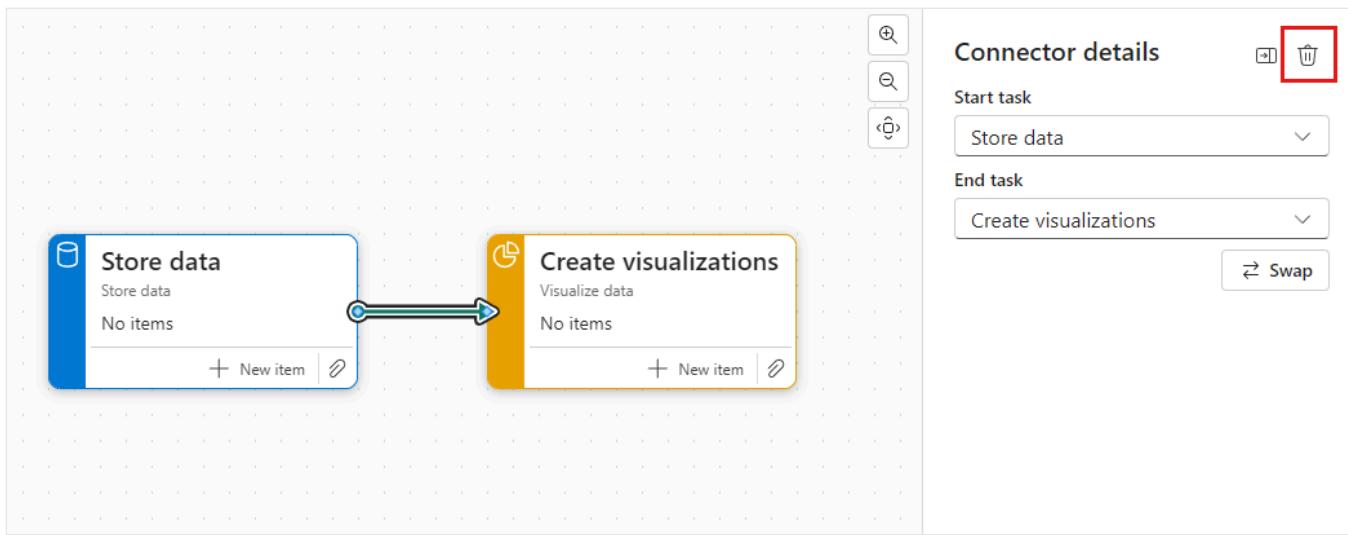
Then, in the **Add connector** dialog, select the start and end tasks, then select **Add**.



Delete a connector

To delete a connector, select it and press **Enter**.

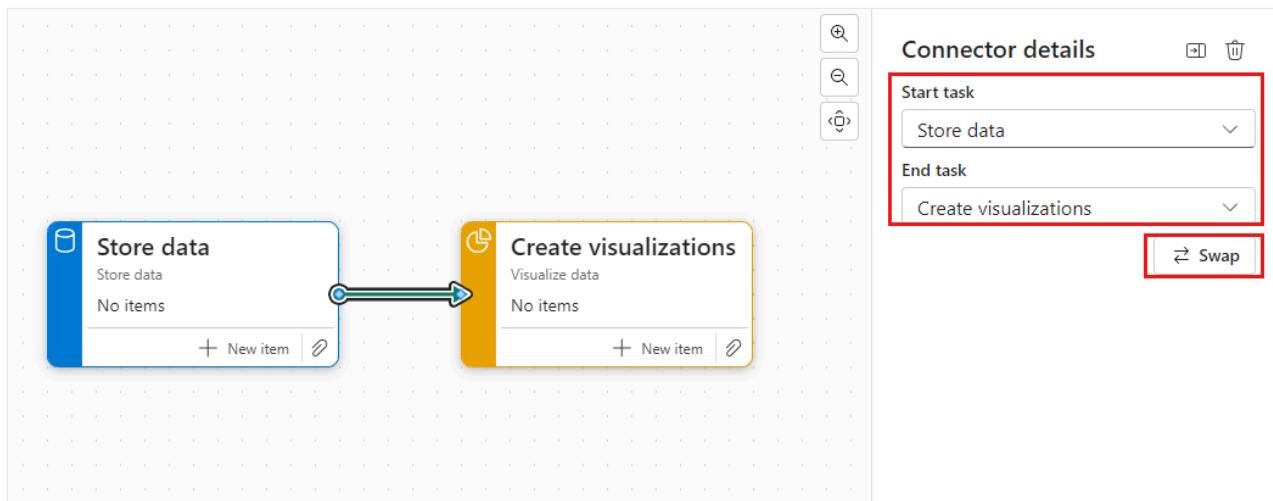
Alternatively, select the connector to open the connector details pane, then select the trash can icon.



Change connector start and end points or direction

To change a connector's start and end values, or switch its direction:

1. Select the connector to open the connector details pane.
2. In the details pane, change the start and end values as desired, or select **Swap** to change connector direction.



Assign items to a task

Once a task has been placed on the canvas, you can assign items to it to help structure and organize your work. You can [create new items to be assigned to the task](#), or you can [assign items that already exist in the workspace](#).

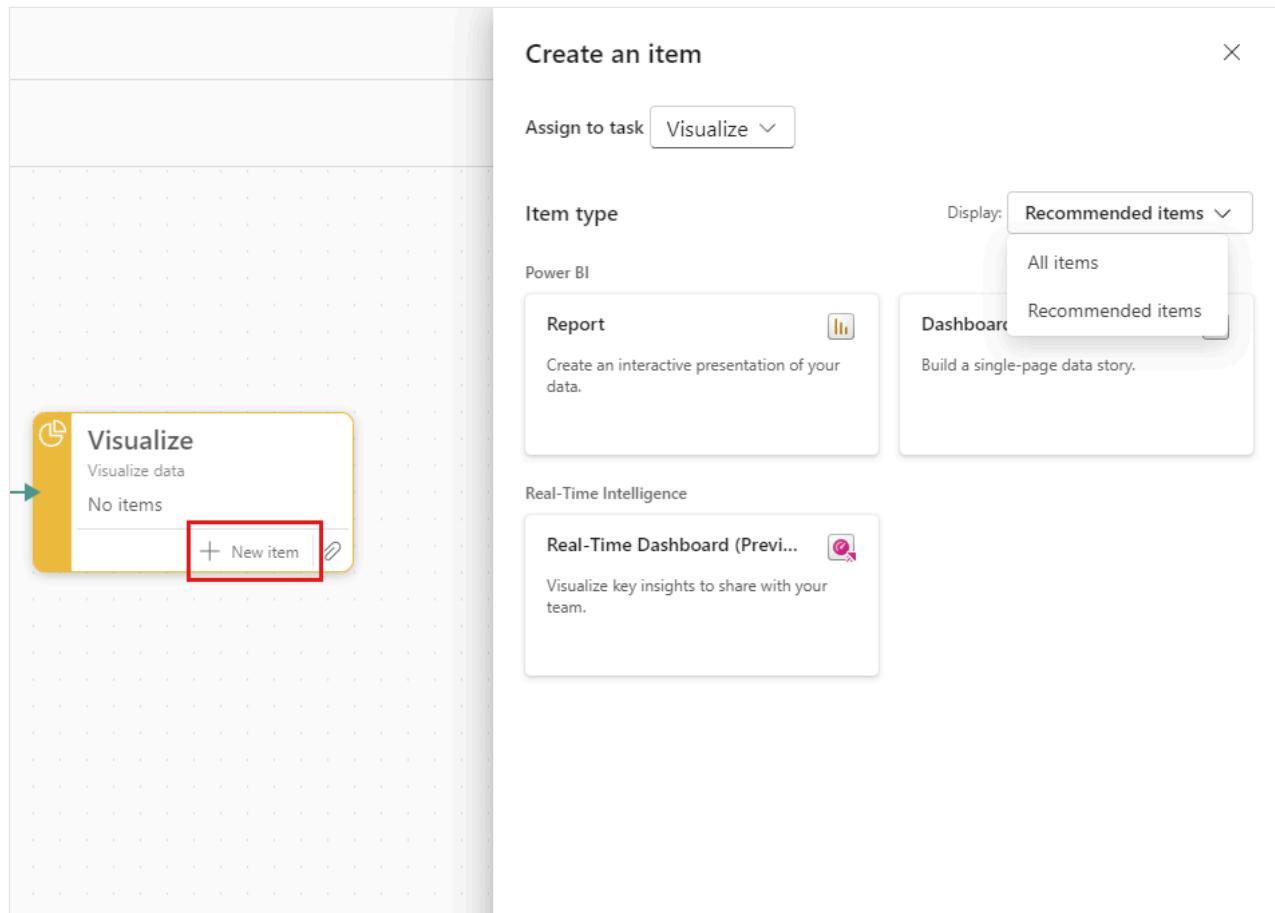
! Note

An item can only be assigned to a single task. It can't be assigned to multiple tasks.

Create a new item for a task

To create a new item for a specific task:

1. Select **+ New item** on the task.



2. On the **Create an item** pane that opens, the recommended item types for the task are displayed by default. Choose one of the recommended types.

If you don't see the item type you want, change the **Display** selector from *Recommended items* to *All items*, and then choose the item type you want.

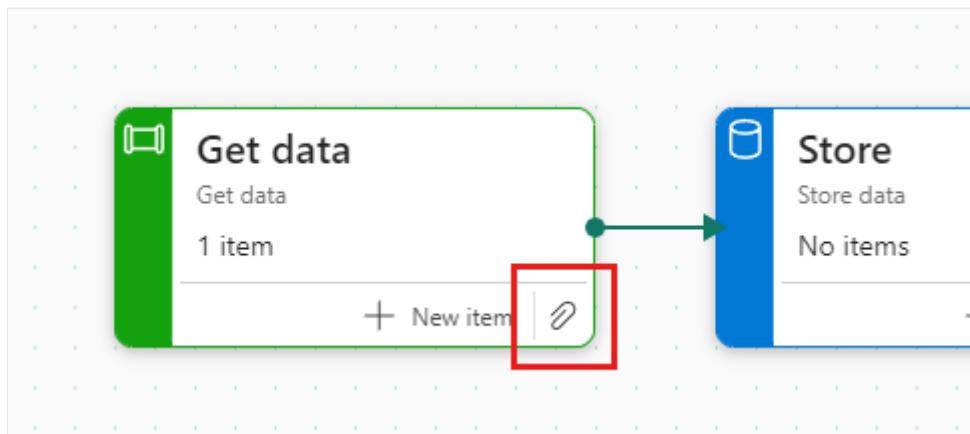
(!) Note

When you first save a new report, you'll be given the opportunity to assign it to any task that exists in the workspace.

Assign existing items to a task

To assign existing items to a task:

1. Select the clip icon on the task.



2. In the **Assign item** dialog box that opens, hover over item you want to assign to the task and mark the checkbox. You can assign more than one item. When you're done choosing the items you want to assign to the task, choose **Select** to assign the selected items to the task.

Assign item to Get data

Contoso Task Flow Workspace

<input type="checkbox"/>	Name	Task	Type	Owner
<input type="checkbox"/>	DataflowsStagingLakehouse		SQL analytics endpoint	Contoso
<input type="checkbox"/>	DataflowsStagingLakehouse		Semantic model (default)	Contoso
<input type="checkbox"/>	DataflowsStagingWarehouse		Warehouse	Pau
<input type="checkbox"/>	DataflowsStagingWarehouse		Semantic model (default)	Contoso
<input checked="" type="checkbox"/>	MyNewNotebook		Notebook	Pau
<input type="checkbox"/>	MyPipeline		Data pipeline	Pau

Select **Cancel**

The items you selected items are assigned to the task. In the item list, task assignments are shown in the **Task** column.

Unassign items from tasks

You can unassign items from a selected task or from multiple tasks.

! Note

Unassigning items from tasks **does not** remove the items from the workspace.

Unassign items from a task

To unassign items from a task:

1. Select the task you want to unassign the items from. This filters the item list to show just the items that are assigned to the task.
2. In the item list, hover over the items you want to unassign and mark the checkboxes that appear.
3. On the workspace toolbar, choose **Unassign from task** (or **Unassign from all tasks**, if you've selected multiple items).

The screenshot shows the Contoso Task Flow Workspace interface. At the top, there's a toolbar with buttons for '1 Selected' (highlighted with a red box), 'Move', and 'X Unassign from task'. Below the toolbar, a task flow is displayed with three sequential steps: 'Get data' (green), 'Store' (blue), and 'Prepare' (purple). Arrows connect the steps. The 'Store' step has a note: 'No items'. The 'Prepare' step also has a note: 'No items'. Below the task flow is a table listing workspace items. The table has columns: Name, Type, Task, Owner, Refreshed, and Next refresh. A red box highlights the 'MyPipeline' row, which is selected. The 'Task' column for 'MyPipeline' shows a 'Get data' button, indicating it is assigned to the 'Get data' task in the flow.

Name	Type	Task	Owner	Refreshed	Next refresh
DataflowsStagingLakehouse	SQL analytics end...	Contoso Task Flo...	—	N/A	N/A
DataflowsStagingLakehouse	Semantic model ...	Contoso Task Flo...	4/11/24, 1:01:41 AM	N/A	N/A
DataflowsStagingWarehouse	Warehouse	Get data	Debra Berger	—	N/A
DataflowsStagingWarehouse	Semantic model ...	Get data	Contoso Task Flo...	4/11/24, 1:01:42 AM	N/A
MyNewNotebook	Notebook	Get data	Debra Berger	—	—
<input checked="" type="checkbox"/> MyPipeline	Data pipeline	Get data	Debra Berger	—	—

Unassign items from multiple tasks

To unassign items from multiple tasks:

1. Select **Clear all** at the top of the items list to clear all filters so that you can see all the items in the workspace. Note that items that are assigned to tasks list the task name in

the Task column.

2. Hover over the items you want to unassign and mark the checkboxes.
3. When you've finished making your selections, select **Unassign from all tasks** in the workspace toolbar.

The screenshot shows the Contoso Task Flow Workspace interface. At the top, there's a toolbar with buttons for '4 Selected' (highlighted with a red box), 'Move', and 'Unassign from all tasks'. Below the toolbar is a task flow canvas with three tasks connected by arrows: 'Get data' (green), 'Store' (blue), and 'Prepare' (purple). The 'Get data' task has 2 items. The 'Store' task has 4 items. The 'Prepare' task has 0 items. Below the canvas is a table titled 'Tasks' listing various items:

	Name	Type	Task	Owner	Refreshed	Next refresh
<input checked="" type="checkbox"/>	DataflowsStagingLakehouse	SQL analytics end...	Store	Contoso Task Flo...	—	N/A
<input type="checkbox"/>	DataflowsStagingLakehouse	Semantic model (...)	Store	Contoso Task Flo...	4/11/24, 1:01:41 AM	N/A
<input checked="" type="checkbox"/>	DataflowsStagingWarehouse	Warehouse	Store	Debra Berger	—	N/A
<input type="checkbox"/>	DataflowsStagingWarehouse	Semantic model (...)	Store	Contoso Task Flo...	4/11/24, 1:01:42 AM	N/A
<input checked="" type="checkbox"/>	MyNewNotebook	Notebook	Get data	Debra Berger	—	—
<input checked="" type="checkbox"/>	MyPipeline	Data pipeline	Get data	Debra Berger	—	—

A red box highlights the checkboxes in the first column of the tasks list, indicating selected items. A magnifying glass icon is in the bottom right corner of the tasks list area.

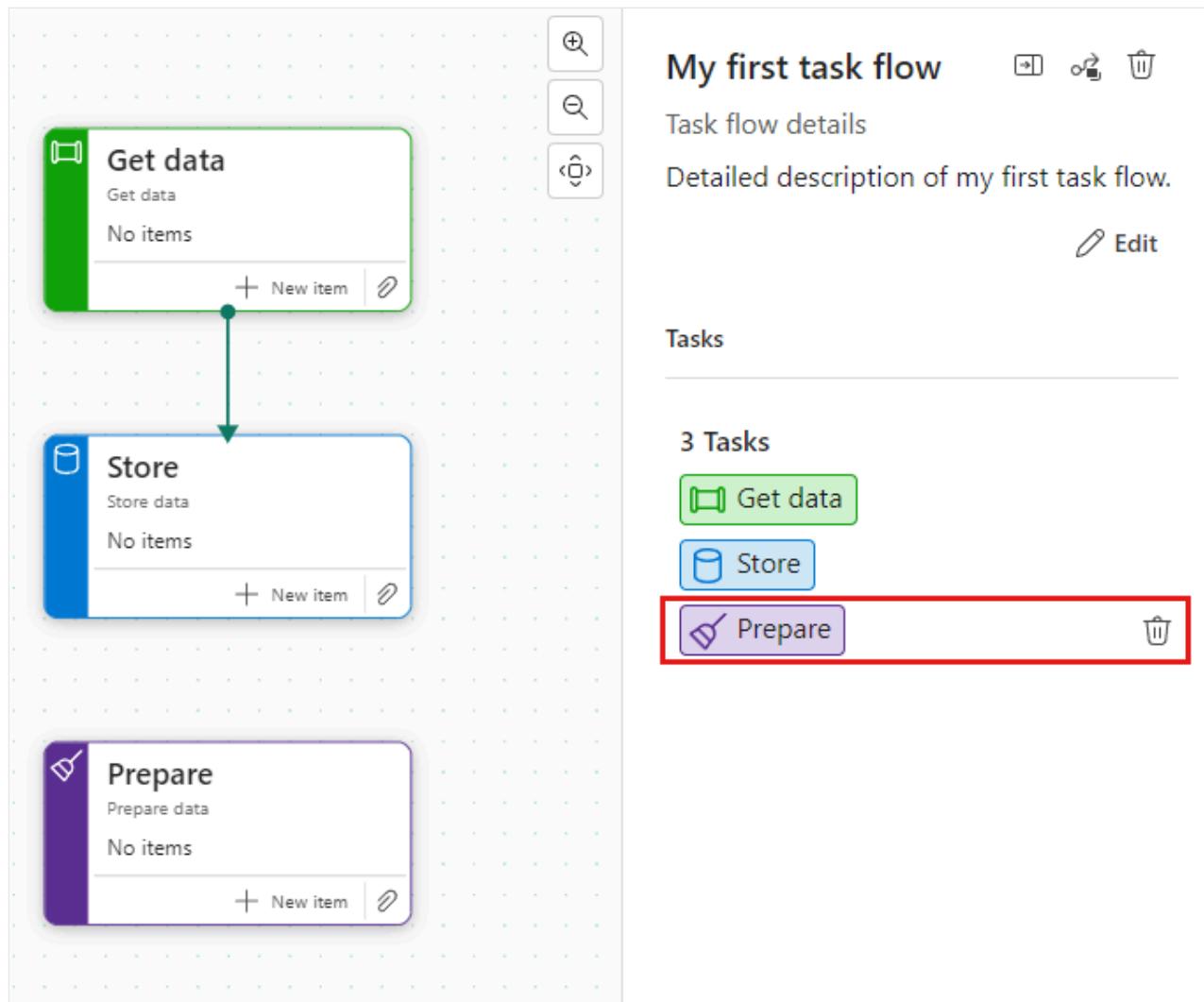
Delete a task

To delete a task:

1. Select the task to open the [task details pane](#).
2. Select the trash can icon.

Alternatively,

1. Select the task flow canvas to open the task flow details pane.
2. In the task flow details pane, hover over the task you want to delete in the Tasks list and select the trash can icon.



ⓘ Note

Deleting a task doesn't delete the items assigned to it. They remain in the workspace.

Navigate items with the task flow

With items assigned to tasks in a task flow, you can use the task flow to quickly understand how the items in the workspace work together, and get a clear picture of your work in the workspace.

- For each item that you see in the items list, you can see the item type and what task it's assigned to, if any.

Name	Type	Owner	Refreshed
DataflowsStagingLakehouse	SQL analytics endpoint	Contoso Task Flow Workspace	—
DataflowsStagingLakehouse	Semantic model (default)	Contoso Task Flow Workspace	4/11/24, 1:01:41 AM
DataflowsStagingWarehouse	Warehouse	Debra Berger	—
DataflowsStagingWarehouse	Semantic model (default)	Contoso Task Flow Workspace	4/11/24, 1:01:42 AM
MyNewNotebook	Notebook	Debra Berger	—
MyPipeline	Data pipeline	Debra Berger	—

- When you select a task, the items list is filtered to show only the items that are assigned to that task.

The screenshot shows a Power BI canvas with three task flow steps: 'Get data', 'Store', and 'Prepare'. The 'Store' step is selected, indicated by a red box around its card. Below the canvas is a table listing items assigned to the 'Store' task:

Name	Type	Task	Owner	Refreshed	Next refresh
DataflowsStagingLakehouse	SQL analytics end...	Store	Contoso Task Flo...	—	N/A
DataflowsStagingLakehouse	Semantic model (...)	Store	Contoso Task Flo...	4/11/24, 1:01:41 AM	N/A
DataflowsStagingWarehouse	Warehouse	Store	Paul Inbar	—	N/A
DataflowsStagingWarehouse	Semantic model (...)	Store	Contoso Task Flo...	4/11/24, 1:01:42 AM	N/A

Select a new predefined task flow

At any point, you can choose to apply one of the predefined task flows to the canvas.

To select one of the predefined task flows:

- Open the **Add** dropdown on the canvas and choose **Select task flow**. The predefined task flows pane will open.
- Choose one of the predefined task flows and the select **Select**. If there already is a task flow on the canvas, you'll be asked whether to overwrite the current task flow or to append the predefined task flow to the current task flow.

Edit task flow details

To edit the task flow name or description:

- Open the task flow details pane by selecting the task flow canvas.

2. Select **Edit** and change the name and description fields as desired. When done, select **Save**.

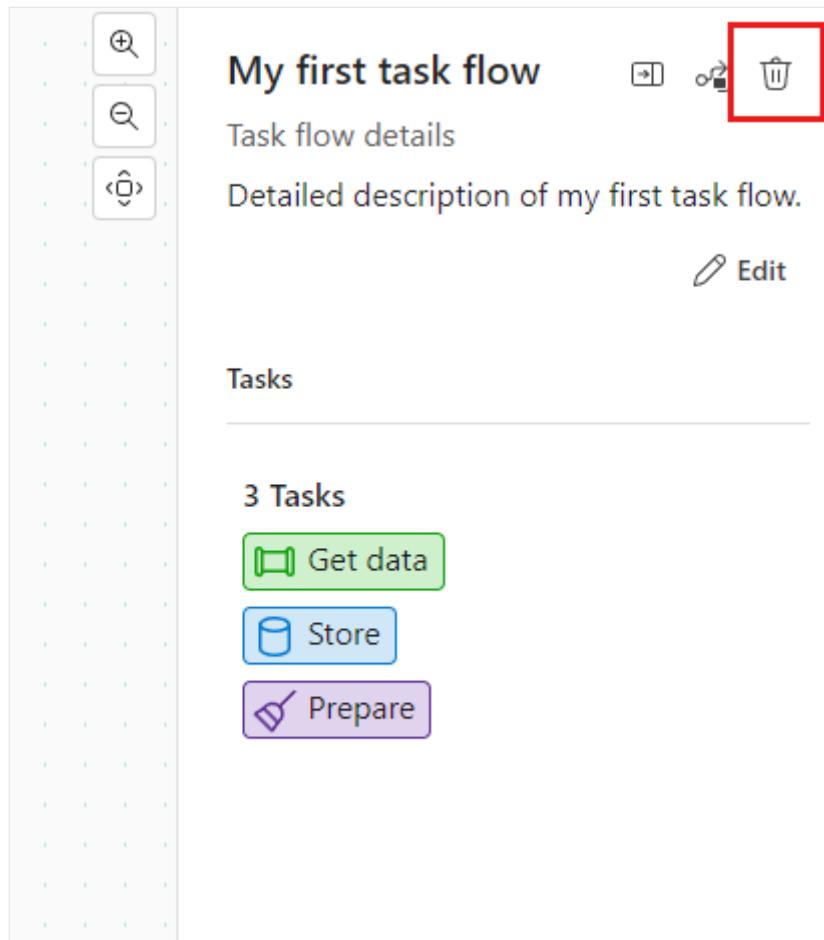
! Note

A good task flow name and description should help others understand the intended purpose and use of the task flow.

Delete a task flow

To delete a task flow:

1. Select a blank area of the canvas to display the task flow details pane.
2. Select the trash icon to delete the task flow.



Deleting a task flow removes all tasks, the task list, and any item assignments, and resets the task flow to its original default empty state.

! Note

Items that were assigned to tasks in the deleted task flow remain in the workspace. When you create a new task flow, you need to assign them to the tasks in the new flow.

Import or export a task flow

If you have a task flow that you'd like to reuse, you can export it from the workspace it's in and import it into other workspaces where you'd like to use it.

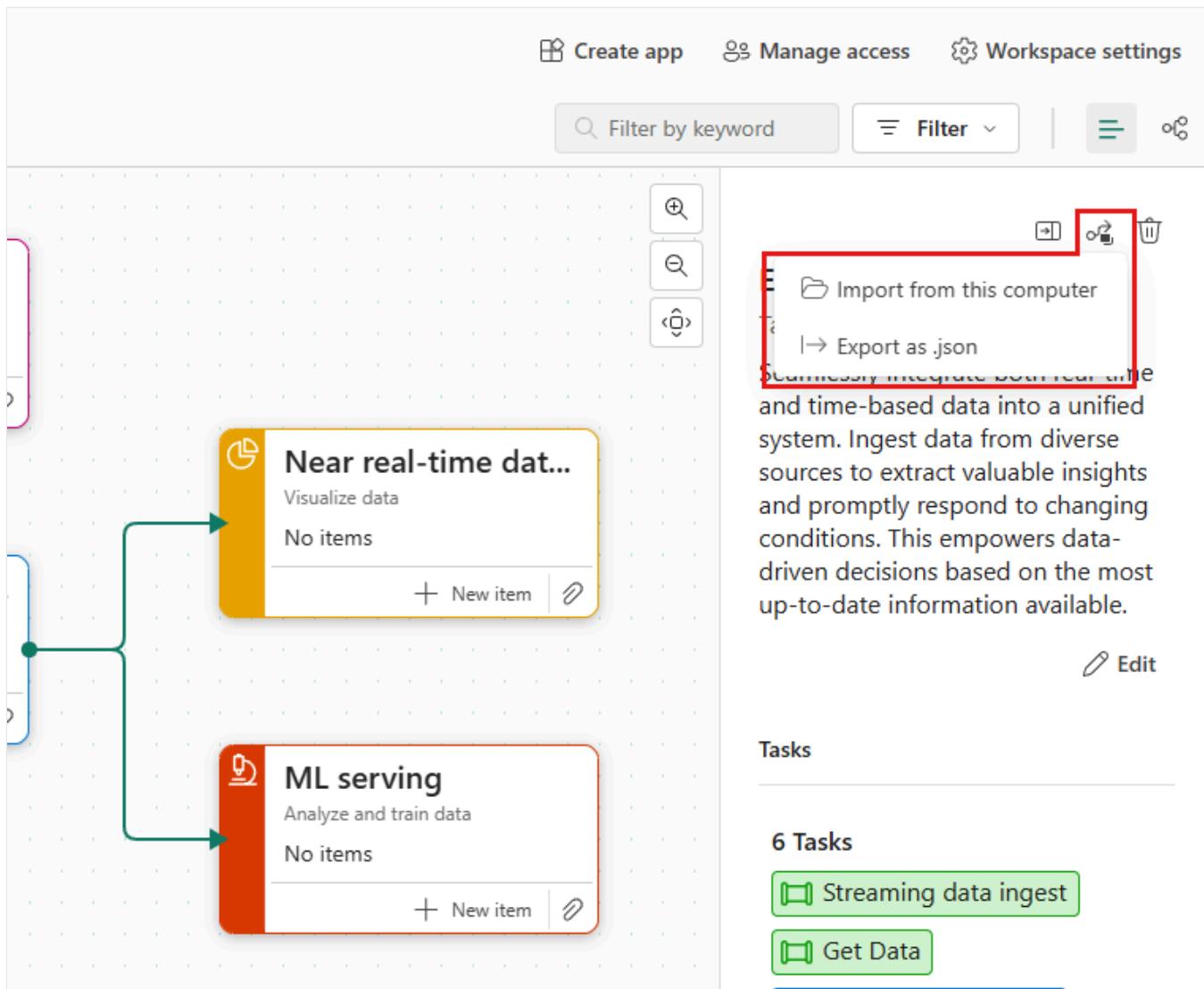
The task flow is exported as a *.json* file that you save to a location of your choice. The *.json* file preserves the structure and flow of the task flow, and includes:

- The task flow name and description.
- The tasks, along with their names and descriptions.
- The connectors between the tasks.

The *.json* file doesn't include item associations. When you import a task flow into a workspace, you have to create the item associations there.

After you've imported the task flow into a new workspace, modify it to suit your needs as described in this article. Make sure the task flow name and description suit the task flow in its new context, and adjust if necessary.

To import or export a task flow select the **Import and export task flow** icon in the task flow details pane and choose the relevant option.



Related concepts

- [Task flow overview](#)
- [Set up a task flow](#)

Microsoft Fabric decision guide: copy activity, Copy job, dataflow, Eventstream, or Spark

06/04/2025

Use this reference guide and the example scenarios to help you in deciding whether you need a copy activity, Copy job, a dataflow, an Eventstream, or Spark for your Microsoft Fabric workloads.

Copy activity, Copy job, dataflow, Eventstream, and Spark properties

 Expand table

	Pipeline copy activity	Copy job	Dataflow Gen 2	Eventstream	Spark
Use case	Data lake and data warehouse migration, data ingestion, lightweight transformation	Data Ingestion, Incremental copy, Replication, Data Lake and Data Warehouse migration, lightweight transformation	Data ingestion, data transformation, data wrangling, data profiling	event data ingestion, event data transformation	Data ingestion, data transformation, data processing, data profiling
Primary developer persona	Data engineer, data integrator	Business Analyst, Data Integrator, Data Engineer	Data engineer, data integrator, business analyst	Data engineer, data scientist, data developer	Data integrator, data engineer
Primary developer skill set	ETL, SQL, JSON	ETL, SQL, JSON	ETL, M, SQL	SQL, JSON, messaging	Spark (Scala, Python, Spark SQL, R)
Code written	No code, low code	No code, low code	No code, low code	No Code, low code	Code
Data volume	Low to high	Low to high	Low to high	Medium to High	Low to high

	Pipeline copy activity	Copy job	Dataflow Gen 2	Eventstream	Spark
Development interface	Wizard, canvas	Wizard, canvas	Power query	Canvas	Notebook, Spark job definition
Sources	50+ connectors	50+ connectors	150+ connectors	Database supporting CDC (Change Data Capture), Kafka, Messaging Systems that support publish and subscribe pattern, Event streams	Hundreds of Spark libraries
Destinations	40+ connectors	40+ connectors	Lakehouse, Azure SQL database, Azure Data explorer, Azure Synapse analytics	Eventhouse, Lakehouse, Activator Alert, Derived Stream, Custom Endpoint	Hundreds of Spark libraries
Transformation complexity	Low: lightweight - type conversion, column mapping, merge/split files, flatten hierarchy	Low: lightweight - type conversion, column mapping, merge/split files, flatten hierarchy	Low to high: 300+ transformation functions	Low: lightweight	Low to high: support for native Spark and open-source libraries

Scenarios

Review the following scenarios for help with choosing how to work with your data in Fabric.

Scenario 1

Leo, a data engineer, needs to ingest a large volume of data from external systems, both on-premises and cloud. These external systems include databases, file systems, and APIs. Leo

doesn't want to write and maintain code for each connector or data movement operation. He wants to follow the medallion layers best practices, with bronze, silver, and gold. Leo doesn't have any experience with Spark, so he prefers the drag and drop UI as much as possible, with minimal coding. And he also wants to process the data on a schedule.

The first step is to get the raw data into the bronze layer lakehouse from Azure data resources and various third party sources (like Snowflake Web, REST, AWS S3, GCS, etc.). He wants a consolidated lakehouse, so that all the data from various LOB, on-premises, and cloud sources reside in a single place. Leo reviews the options and selects **pipeline copy activity** as the appropriate choice for his raw binary copy. This pattern applies to both historical and incremental data refresh. With copy activity, Leo can load Gold data to a data warehouse with no code if the need arises and pipelines provide high scale data ingestion that can move petabyte-scale data. Copy activity is the best low-code and no-code choice to move petabytes of data to lakehouses and warehouses from varieties of sources, either ad-hoc or via a schedule.

Scenario 2

Mary is a data engineer with a deep knowledge of the multiple LOB analytic reporting requirements. An upstream team has successfully implemented a solution to migrate multiple LOB's historical and incremental data into a common lakehouse. Mary has been tasked with cleaning the data, applying business logics, and loading it into multiple destinations (such as Azure SQL DB, ADX, and a lakehouse) in preparation for their respective reporting teams.

Mary is an experienced Power Query user, and the data volume is in the low to medium range to achieve desired performance. Dataflows provide no-code or low-code interfaces for ingesting data from hundreds of data sources. With dataflows, you can transform data using 300+ data transformation options, and write the results into multiple destinations with an easy to use, highly visual user interface. Mary reviews the options and decides that it makes sense to use **Dataflow Gen 2** as her preferred transformation option.

Scenario 3

Prashant, a data integrator with deep expertise in business processes and systems. An upstream team has successfully exposed event data from business applications as messages that can be consumed through downstream systems. Prashant has been assigned to integrate event data from business applications into Microsoft Fabric for real-time decision support.

Given the medium to high data volume and the organization's preference for no-code solutions, Prashant seeks a way to seamlessly forward events as they occur without managing extraction schedules. To meet this need, he chooses **Eventstreams** in Microsoft Fabric.

Eventstreams within the Real-Time Intelligence experience enables real-time data ingestion, transformation, and routing to various destinations—all without writing any code.

Scenario 4

Adam is a data engineer working for a large retail company that uses a lakehouse to store and analyze its customer data. As part of his job, Adam is responsible for building and maintaining the data pipelines that extract, transform, and load data into the lakehouse. One of the company's business requirements is to perform customer review analytics to gain insights into their customers' experiences and improve their services.

Adam decides the best option is to use **Spark** to build the extract and transformation logic. Spark provides a distributed computing platform that can process large amounts of data in parallel. He writes a Spark application using Python or Scala, which reads structured, semi-structured, and unstructured data from OneLake for customer reviews and feedback. The application cleanses, transforms, and writes data to Delta tables in the lakehouse. The data is then ready to be used for downstream analytics.

Scenario 5

Rajesh, a data engineer, is tasked with ingesting incremental data from an on-premises SQL Server into an Azure SQL Database. Rajesh's On-premises SQL Server instance already has Change Data Capture (CDC) enabled on key tables.

Rajesh is looking for a simple, low-code, wizard-driven solution that enables him to:

- Select multiple native CDC enabled source tables
- Perform an initial full load
- Automatically switch to incremental data loads based on CDC
- Schedule data refreshes for recurring updates

He wants to avoid writing custom code or managing complex orchestrations. Ideally, he wants a "5x5 wizard" where he can accomplish the setup in just a few clicks.

Rajesh chooses the Copy job feature in Microsoft Fabric. With on-premises gateway support, he securely connects to his SQL Server, selects the desired tables, and configures the flow to land into the target Azure SQL Database.

The Copy job provides a low-friction and scalable data movement experience, meeting Rajesh's requirements without the need to maintain complex pipelines.

Related content

- [How to copy data using copy activity](#)
- [Quickstart: Create your first dataflow to get and transform data](#)
- [How to create an Apache Spark job definition in Fabric](#)
- [How to create an Eventstream in Fabric](#)

Microsoft Fabric decision guide: Choose a data integration strategy

09/26/2025

Microsoft Fabric has a comprehensive suite of tools to handle data and analytics workloads efficiently. With so many options available, including batch, pipeline, and real-time streaming capabilities, it can be challenging to pick the right tool for your specific needs. This decision guide provides a roadmap to help you select the right strategy.

		Data movement				Orchestration		Transformation	
		Mirroring	Copy Job	Copy Activity (Pipeline)	Eventstream	Pipeline	Apache Airflow Job	Notebooks	Dataflow Gen 2
Use Case	Data Replication	Data Ingestion & Replication	Data Ingestion	Stream Data Ingestion & Processing	Low Code Orchestration	Code-first Orchestration	Code-first Data Prep / Transform	Code-free Data Prep / Transform	
Flagship Scenarios	Near real-time sync with turn-key set up. Replication.	Incremental Copy / Replication (water-mark + Native CDC), Data Lake / Storage Data Migration, Medallion Ingestion, Out-of-the-box multi-table copy.	Data Lake / Storage Data Migration, Medallion Ingestion, Incremental copy via pipeline expressions & control tables (watermark only)	Incremental processing, event-driven and real-time AI applications.	Logical grouping of several activities together to perform a task.	Python Code-Centric Authoring	Complex Transformations	Transformation & Profiling	
Source	6+ connectors  	50+ connectors	50+ connectors	25+ connectors, custom endpoint (AMQP, Kafka, HTTP)	All Fabric compatible sources (depending on selected pipeline activities)	100+ connectors	100+ Spark Libraries	170+ built-in connectors    + Custom SDK	
Destination	Mirrored database (stored as read-only Delta table in Fabric OneLake)	40+ connectors 	40+ connectors 	Eventhouse, Activator, Lakehouse, custom endpoint (AMQP, Kafka, HTTP), Spark	All Fabric compatible sources (depending on selected pipeline activities)	100+ connectors	100+ Spark Libraries	7+ connectors   	
Type of Incoming Data	Near Real-time	Batch / Incremental Copy (water-mark based & change data capture) / Near Real-time	Batch / Bulk / Manual Watermark-based incremental copy	Real-time streaming data, change data capture feeds	All types	All types	All types	All types	
Persona	Business Analyst, Database Administrator	Business Analyst, Data Integrator, Data Engineer	Data Integrator, Business Analyst, Data Engineer	Data analyst, data engineer, & integrator	Data Integrator, Business Analyst, Data Engineer	Apache Airflow Users	Data Scientist, Developer	Data Engineer, Data Integrator, Business Analyst	
Skillset	None	ETL, SQL	ETL, SQL	SQL, ETL, KQL	ETL, SQL, Spark (Scala, Py, SQL, R)	Python	Spark (Scala, Py, SQL, R)	ETL, M, SQL	
Coding Level	No code	No code / Low code	No code / Low code	No code / Low code	No code / Low code	Code-first	Code-first	No code / Low code	
Transformation Support	None	Low	Low	Medium (stream analytics)	None	None	High	High (400+ activities)	

To choose the right data integration service in Microsoft Fabric, consider these questions:

- **What's your primary goal?** Do you want to ingest data, transform it, replicate it, orchestrate data movement, or stream and act on data in real-time?
- **What's your technical skill level?** Do you prefer no-code or low-code solutions, or are you comfortable working with code?
- **What type of data workload are you working with?** Is it batch, bulk, incremental, continuous streaming, or near real-time?
- **What kind of data transformation do you need?** Are you doing light transformations or complex ones?

For the list of supported connectors across Copy job, Copy activity, and Dataflow Gen 2, see the [connector overview](#). For the list of supported Eventstream sources, see the [sources list](#).

Data movement strategies

 Expand table

	Mirroring	Copy Job	Copy Activity (Pipeline)	Eventstreams
Use Case	Data Replication	Data Ingestion & Replication	Data Ingestion	Streaming Data Ingestion & Processing
Flagship Scenarios	Near real-time sync with turn-key setup. Replication	Incremental Copy / Replication (watermark + Native CDC), Data Lake / Storage Data Migration, Medallion Ingestion, Out-of-the-box multi-table copy.	Data Lake / Storage Data Migration, Medallion Ingestion, Incremental copy via pipeline expressions & control tables (water-mark only)	Incremental processing, event-driven, and real-time AI applications
Source	6+ connectors	50+ connectors	50+ connectors	25+ sources
Destination	Mirrored database (stored as read-only Delta table in Fabric OneLake)	40+ connectors	40+ connectors	4+ destinations
Type of Incoming Data	Near Real-time	Batch / Incremental Copy (water-mark based & change data capture) / Near Real-time	Batch / Bulk / Manual Watermark-based incremental copy	Real-time streaming data, Change Data Capture/Feeds
Persona	Business Analyst, Database Administrator	Business Analyst, Data Integrator, Data Engineer	Data Integrator, Business Analyst, Data Engineer	Data Engineer & Integrator, Data Analyst
Skillset	None	ETL, SQL	ETL, SQL	ETL, SQL, KQL
Coding Level	No code	No code / Low code	No code / Low code	No code / Low code
Transformation Support	None	Low	Low	Medium (stream analytics)

For more details, see the [data movement strategy](#).

Orchestration strategies

[] [Expand table](#)

Pipeline		Apache Airflow Job
Use Case	Low Code Orchestration	Code-first Orchestration
Flagship Scenarios	Logical grouping of several activities together to perform a task.	Python Code-Centric Authoring
Source	All Fabric compatible sources (depending on selected pipeline activities)	100+ connectors
Destination	All Fabric compatible sources (depending on selected pipeline activities)	100+ connectors
Type of Incoming Data	All types	All types
Persona	Data Integrator, Business Analyst, Data Engineer	Apache Airflow Users
Skillset	ETL, SQL, Spark (Scala, Py, SQL, R)	Python
Coding Level	No code / Low code	Code-first
Transformation Support	None	None

Transformation strategies

[] [Expand table](#)

	Notebooks	Dataflow Gen 2	Eventstreams
Use Case	Code-first Data Prep / Transform	Code-free Data Prep / Transform	Code-free Transformation / SQL-based Stream Analytics
Flagship Scenarios	Complex Transformations	Transformation & Profiling	Stream Processing & Analytics
Source	100+ Spark Libraries	170+ built-in connectors + Custom SDK	25+ sources
Destination	100+ Spark Libraries	7+ connectors	4+ destinations

	Notebooks	Dataflow Gen 2	Eventstreams
Type of Incoming Data	All types	All types	All Types incl. JSON, AVRO, CSV, XML, TXT etc.
Persona	Data Scientist, Developer	Data Engineer, Data Integrator, Business Analyst	Data Engineer & Analyst
Skillset	Spark (Scala, Py, SQL, R)	ETL, M, SQL	SQL, KQL
Coding Level	Code-first	No code / Low code	No code / Low code
Transformation Support	High	High (400+ activities)	Medium

Scenarios

Review these scenarios to help you choose which data integration strategy to use in Microsoft Fabric.

Scenario 1

Hanna is a database administrator for a financial services company. She manages multiple critical SQL Server databases that power the organization's trading applications. The business needs near real-time access to this transactional data for regulatory reporting and risk analysis. However, Hanna needs to avoid impacting the performance of the production systems.

Hanna's challenge is providing analytics teams with up-to-date data without creating extra load on the operational databases. She doesn't want to build complex ETL pipelines or manage data movement processes. The data volumes are substantial, and the business needs the data available for analysis within minutes of transactions occurring in the source systems.

Hanna reviews the options and chooses **Mirroring** as the ideal solution. With Mirroring, she can set up near real-time data replication from her SQL Server databases to Microsoft Fabric with minimal configuration. The mirrored data becomes available in OneLake as Delta tables, enabling downstream analytics without affecting source system performance. Mirroring provides the turnkey setup she needs, automatically managing the complexity of data replication while ensuring business continuity.

Scenario 2

Charlie is a data analyst at a retail company. He's responsible for consolidating sales data from multiple regional databases into a central data warehouse. The company operates across different time zones, and each region's database uses change data capture (CDC) to track inventory and sales transactions. Charlie needs a solution that can handle the initial full load of historical data and then switch to incremental updates based on CDC.

Charlie wants a no-code, wizard-driven approach that lets him select multiple tables from various regional SQL Server instances, perform the initial bulk migration, and then automatically maintain up-to-date data through CDC-based incremental loads. The solution needs to handle both inserts and updates, and should merge changes into the destination without manual intervention.

Charlie evaluates the options and selects **Copy Job** as his preferred approach. Copy Job provides the multi-table selection capability he needs, supports both watermark-based and native CDC incremental copying, and offers an intuitive wizard interface. The out-of-the-box functionality lets him configure the entire data replication process without writing code, and the automatic detection of CDC-enabled tables simplifies the setup process.

Scenario 3

Rukmina is a data engineer at a manufacturing company. She needs to migrate large volumes of historical production data from an on-premises Oracle database to a new Fabric Warehouse. The migration involves copying hundreds of tables with millions of records, and she needs to implement a medallion architecture with bronze, silver, and gold layers. Rukmina has experience with SQL but prefers low-code solutions when possible.

The project requires her to copy raw data to the bronze layer, then apply lightweight transformations like data type conversions and column mapping as the data moves through the medallion layers. Rukmina needs to ensure the solution can handle the high data volumes efficiently and can be scheduled to run incrementally for ongoing operations. The stakeholders want a solution that can scale from gigabytes to petabytes of data as the business grows.

Rukmina reviews the available options and chooses **Copy Activity in Pipelines**. This approach gives her the drag-and-drop interface she prefers while providing the scalability needed for large data volumes. Copy Activity supports the 50+ connectors she needs for various source systems, and the pipeline framework lets her orchestrate the movement between medallion layers. With copy activity, she can implement both historical and incremental data refresh patterns while maintaining the performance required for petabyte-scale operations.

Scenario 4

Julian is a business analyst with strong SQL skills. He needs to orchestrate a complex data processing workflow that involves multiple steps: extracting data from various systems, running data quality checks, performing transformations, loading data into multiple destinations, and sending notifications to stakeholders. The workflow needs to run on a schedule and handle dependencies between different activities.

Julian's organization uses a mix of Azure services and on-premises systems, and the workflow requires both data movement and orchestration logic. He needs to coordinate activities like running stored procedures, calling web APIs, moving files, and executing other pipelines. While Julian is comfortable with SQL and basic scripting, he prefers a visual, low-code approach for building and maintaining these complex workflows.

Julian evaluates the options and selects **Pipelines** as the best fit for his requirements. Pipelines provide the visual canvas and drag-and-drop activities he needs to build complex orchestration workflows. The solution supports logical grouping of activities, dependency management, and scheduling capabilities. With 50+ connectors and various activity types (copy, lookup, stored procedure, web, etc.), Pipelines give him the flexibility to coordinate diverse tasks while maintaining the low-code approach he prefers.

Scenario 5

Darshan is a data scientist with extensive Python experience. He needs to build and maintain complex data processing workflows that integrate machine learning models, custom algorithms, and various external APIs. His organization's data science team prefers code-first approaches and wants to leverage their existing Python expertise, including custom libraries and advanced orchestration patterns.

Darshan needs a solution that supports Python-based directed acyclic graphs (DAGs), can handle complex dependencies between tasks, and integrates with the team's existing DevOps processes. The workflows involve data ingestion from multiple sources, feature engineering, model training, batch scoring, and custom business logic that requires the flexibility of full Python programming. The team values Apache Airflow's ecosystem and wants to maintain compatibility with their existing workflows.

Darshan reviews the options and chooses **Apache Airflow Jobs** as the ideal solution. This code-first approach lets his team use their Python expertise while building sophisticated data processing workflows. Apache Airflow Jobs provides the DAG-based orchestration they're familiar with, supports 100+ connectors through the Airflow ecosystem, and lets them implement custom business logic using Python. The managed service approach eliminates infrastructure concerns while preserving the flexibility and power of Apache Airflow.

Scenario 6

René is a data scientist at a research university. She needs to perform complex data analysis and transformation tasks on large datasets stored across multiple formats and sources. Her work involves statistical analysis, machine learning model development, and custom data processing algorithms that require the full power of distributed computing.

René works with structured and unstructured data including CSV files, JSON documents, Parquet files, and real-time streams. Her analysis requires complex transformations like joins across multiple large datasets, aggregations, statistical computations, and custom algorithms implemented in Python and Scala. She needs the flexibility to work interactively during exploration phases and then operationalize her code for production workloads.

René evaluates her options and chooses **Notebooks** as her primary tool. Notebooks provide the code-first environment she needs with full access to Spark's distributed computing capabilities. She can work with hundreds of Spark libraries, implement complex transformations using multiple languages (Python, Scala, SQL, R), and use the interactive development environment for data exploration. The notebook interface lets her combine code, visualizations, and documentation while providing the high-performance compute needed for her large-scale data processing requirements.

Scenario 7

Ako is a business analyst at a healthcare organization. She needs to integrate data from multiple sources including databases, web services, and file systems to create clean, business-ready datasets. Ako has extensive experience with Power Query from her work in Excel and Power BI, and she prefers visual, no-code interfaces for data preparation tasks.

Ako's responsibilities include cleaning healthcare data, applying business rules, validating data quality, and creating standardized datasets that feed into regulatory reporting systems. The data sources include patient management systems, laboratory information systems, and external API services. She needs to perform complex transformations like data profiling, duplicate removal, standardization of medical codes, and creation of calculated fields based on business logic.

Ako reviews the available options and selects **Dataflow Gen 2** as her preferred solution. Dataflow Gen 2 provides the familiar Power Query experience she knows from other Microsoft tools, while offering enhanced performance and capabilities. With 170+ built-in connectors, she can connect to all her diverse data sources, apply 300+ transformation functions through the visual interface, and take advantage of data profiling tools to ensure data quality. The no-code approach lets her focus on the business logic rather than technical implementation details.

Scenario 8

Ash is a product manager at a telecom company. Her team needs to monitor customer support metrics, like call volumes, wait times, and agent performance, in real time to ensure service-level agreements (SLAs) are met. The data comes from multiple operational systems including CRM, call center logs, and agent assignment databases.

Ash wants to build real-time dashboards and trigger automated workflows when thresholds are breached (for example, when wait times exceed SLA limits). She also wants to avoid building complex ETL pipelines or managing infrastructure.

Ash evaluates the options and selects Fabric Eventstreams. With Eventstreams, she can ingest data from multiple sources using streaming connectors, apply lightweight transformations, and route events to destinations like Eventhouse and Data Activator. She sets up alerts and dashboards that update in seconds, enabling her team to respond quickly to operational issues.

Fabric Eventstreams and Real-Time Intelligence provides the low-latency, low-code experience Ash needs to build event-driven applications without disrupting existing systems.

Get started

Now that you understand which service to use, you can start building your data integration solutions in Microsoft Fabric.

- [Get started with Mirroring](#)
- [Create a Copy Job](#)
- [Create a Copy Activity](#)
- [Get started with Pipelines](#)
- [Get started with Eventstreams](#)
- [Get started with Apache Airflow Jobs](#)
- [Create and use Notebooks](#)
- [Get started with dataflows](#)

ⓘ **Note:** The author created this article with assistance from AI. [Learn more](#)

Microsoft Fabric decision guide: Choose a data movement strategy

09/25/2025

Microsoft Fabric gives you several ways to bring data into Fabric, based on what you need. Today, you can use **Mirroring**, **Copy activities in Pipelines**, **Copy job**, or **Eventstreams**. Each option offers a different level of control and complexity, so you can pick what fits your scenario best.

Mirroring is designed to be simple and free solution to mirror database to Fabric, but it won't cover every advanced scenario. Copy activities in pipelines give you fully customizable data ingestion features, but they require you to build and manage pipeline by yourself. Copy job fills the gap between these 2 options. It gives you more flexibility and control than Mirroring, plus native support for both batch and incremental copying, without the complexity of building pipelines.

For real-time streaming ingestion and event-driven scenarios, try Eventstreams in Real-Time Intelligence. They provide low-latency data movement, let you transform data with no code or SQL transformations, and support content-based routing to multiple destinations including Eventhouse, Lakehouse and Activator.

Capability	Mirroring	Copy job	Copy Activity (Pipeline)	Eventstream
Sources	Databases + 3rd party integration into Open Mirroring	All supported data sources and formats	All supported data sources and formats	25+ sources and all formats
Destinations	Tabular format in Fabric OneLake (read-only)	All supported destinations and formats	All supported destinations and formats	4+ destinations
Flexibility	Turn-key setup with fixed behavior	Simple to use + Advanced knobs	Advanced and fully customized knobs	Simple and customizable options
Custom scheduling	●	●	●	●
Table and Column management	●	●	●	●
Copy behavior: Append, Upsert, Override	●	●	●	●
Advanced observability + auditing	●	●	●	●
Copy modes				
CDC-based continuous replication	●	●	●	●
Batch or bulk copy	●	●	●	●
Native support for Incremental copy (watermark-based)	●	●	●	●
Copy using user defined query	●	●	●	●
Use cases				
Continuous Replication for analytics and reporting	●	●	●	●
Metadata driven ELT/ETL for data warehousing	●	●	●	●
Data consolidation	●	●	●	●
Data migration / Data backup / Data sharing	●	●	●	●
Free of cost	●	●	●	●
Predictable performance	●	●	●	●

Key concepts

- Mirroring gives you a **simple and free** way to mirror operational data into Fabric for analytics. It's optimized for ease of use with minimal setup, and it writes to a single, read-only destination in OneLake.
- **Copy activities in Pipelines** is built for users who need **orchestrated, pipeline-based data ingestion workflows**. You can customize it extensively and add transformation logic, but you need to define and manage pipeline components yourself, including tracking the state of the last run for incremental copy.
- **Copy Job** makes data ingestion easier with **native support for multiple delivery styles, including bulk copy, incremental copy, and change data capture (CDC) replication, and you don't need to build pipelines**, while still giving you access to many advanced options. It supports many sources and destinations, and works well when you want more control than Mirroring but less complexity than managing pipelines with Copy activity.
- **Eventstreams**: Designed for real-time ingestion, transformation and processing of streaming data. Supports low-latency pipelines, schema management, and routing to destinations like Eventhouse, Lakehouse, Activator and Custom Endpoints supporting (AMQP, Kafka and HTTP endpoints).

Data movement decision guide

[+] [Expand table](#)

	Mirroring	Copy job	Copy Activity (Pipeline)	Eventstreams
Sources	Databases + third-party integration into Open Mirroring	All supported data sources and formats	All supported data sources and formats	25+ sources and all formats
Destinations	Tabular format in Fabric OneLake (read-only)	All supported destinations and formats	All supported destinations and formats	4+ destinations
Flexibility	Simple setup with fixed behavior	Easy to use + Advanced options	Advanced and fully customizable options	Simple and customizable options

[+] [Expand table](#)

Capability	Mirroring	Copy job	Copy Activity (Pipeline)	Eventstreams
Custom scheduling	Yes	Yes		Continuous
Table and Column management	Yes	Yes	Yes (schema, event & field management)	
Copy behavior: Append, Upsert, Override	Yes	Yes	Yes	Append
Advanced observability + auditing	Yes	Yes	Yes	
Copy modes				
CDC-based continuous replication	Yes	Yes		Yes
Batch or bulk copy	Yes	Yes	Yes	Yes (CDC initial snapshot replication)
Native support for Incremental copy (watermark-based)		Yes		
Copy using user defined query	Yes	Yes	Yes	
Use cases				
Continuous Replication for analytics and reporting	Yes	Yes		Yes
Metadata driven ELT/ETL for data warehousing	Yes	Yes	Yes	
Data consolidation	Yes	Yes	Yes	Yes
Data migration / Data backup / Data sharing	Yes	Yes	Yes	Yes
Free of cost	Yes			
Predictable performance	Yes	Yes	Yes	Yes

Scenarios

Review these scenarios to help you choose which data movement strategy works best for your needs.

Scenario 1

James is a finance manager at an insurance company. His team uses Azure SQL Database to track policy data, claims, and customer information across multiple business units. The executive team wants to create real-time dashboards for business performance monitoring, but James can't allow analytics queries to slow down the operational systems that process thousands of daily transactions.

James needs continuous data replication without any setup complexity or ongoing maintenance. He doesn't want to manage scheduling, configure incremental loads, or worry about table selection - he needs everything mirrored automatically. Since this is for executive reporting only, having the data in a read-only format in OneLake works perfectly. The solution also needs to be cost-effective since it's coming out of his department budget.

James looks at the options and chooses **Mirroring**. Mirroring provides the CDC-based continuous replication he needs, automatically handling all tables without any configuration. The simple setup means he doesn't need technical expertise, and the free cost fits his budget. The read-only tabular format in OneLake gives his team the real-time analytics access they need without impacting operational performance.

Scenario 2

Lisa is a business analyst at a logistics company. She needs to copy shipment data from multiple Snowflake databases into Fabric Lakehouse tables for supply chain analysis. The data includes both historical records for the initial load and new shipments that arrive throughout the day. Lisa wants to run this process on a custom schedule - every 4 hours during business hours.

Lisa needs to select specific tables from each Snowflake instance, map columns to standardized names, and use upsert behavior to handle updates to existing shipment records. She needs table and column management capabilities to handle different schemas across regions, and she wants advanced monitoring to track data quality and processing performance.

Lisa looks at the options and selects **Copy job**. Copy job provides the custom scheduling she needs for her business hours requirements, supports all data sources including Snowflake, and offers the table and column management capabilities for her multi-region setup. The easy-to-use interface with advanced configuration options lets her handle incremental copy with watermark-based detection and upsert behavior without building pipelines.

Scenario 3

David is a senior data engineer at a telecommunications company. He's building a complex data ingestion workflow that needs to extract customer usage data from Oracle using custom SQL queries, apply business transformations, and load it into multiple destinations including

both Fabric Warehouse and external systems. The workflow also needs to coordinate with other pipeline activities like data validation and notification steps.

David needs full control over the copy process, including the ability to use user-defined queries to join tables and filter data at the source. He needs advanced and fully customizable configuration options, predictable performance for large data volumes, and the ability to integrate the copy process into broader pipeline orchestration workflows with dependencies and error handling.

David reviews the available options and chooses **Copy Activities in Pipelines**. This approach gives him the advanced and fully customizable configuration he needs, supports user-defined queries for complex data extraction, and provides the pipeline-based orchestration required for his workflow. The advanced monitoring and auditing capabilities help him track the complex process, while the pipeline framework lets him coordinate copy activities with other data processing steps.

Scenario 4

Ash is a product manager at a telecom company. Her team needs to monitor customer support metrics like call volumes, wait times, and agent performance, in real time to ensure SLA compliance and improve customer satisfaction. The data comes from multiple operational systems including CRM platforms, call center logs, and agent assignment databases, and arrives at high frequency throughout the day.

Ash uses **Fabric Eventstreams** to ingest and transform this data in motion. She configures streaming connectors to pull data from various sources, applies transformations using the no-code experience, and routes the processed events to **Eventhouse** for real-time analytics. She integrates **Data Activator** to trigger alerts and automated workflows when SLA thresholds are breached so she can send notifications to supervisors or adjusting staffing levels dynamically.

The result is a real-time dashboard that updates within seconds, giving Ash's team visibility into live performance metrics and enabling fast, data-driven decisions. This streaming architecture eliminates the latency of batch pipelines and empowers the business to respond instantly to customer needs.

Get started

Now that you have an idea of which data movement strategy to use, you can get started with these resources:

- [Get started with Mirroring](#)
- [Get started with Eventstreams](#)

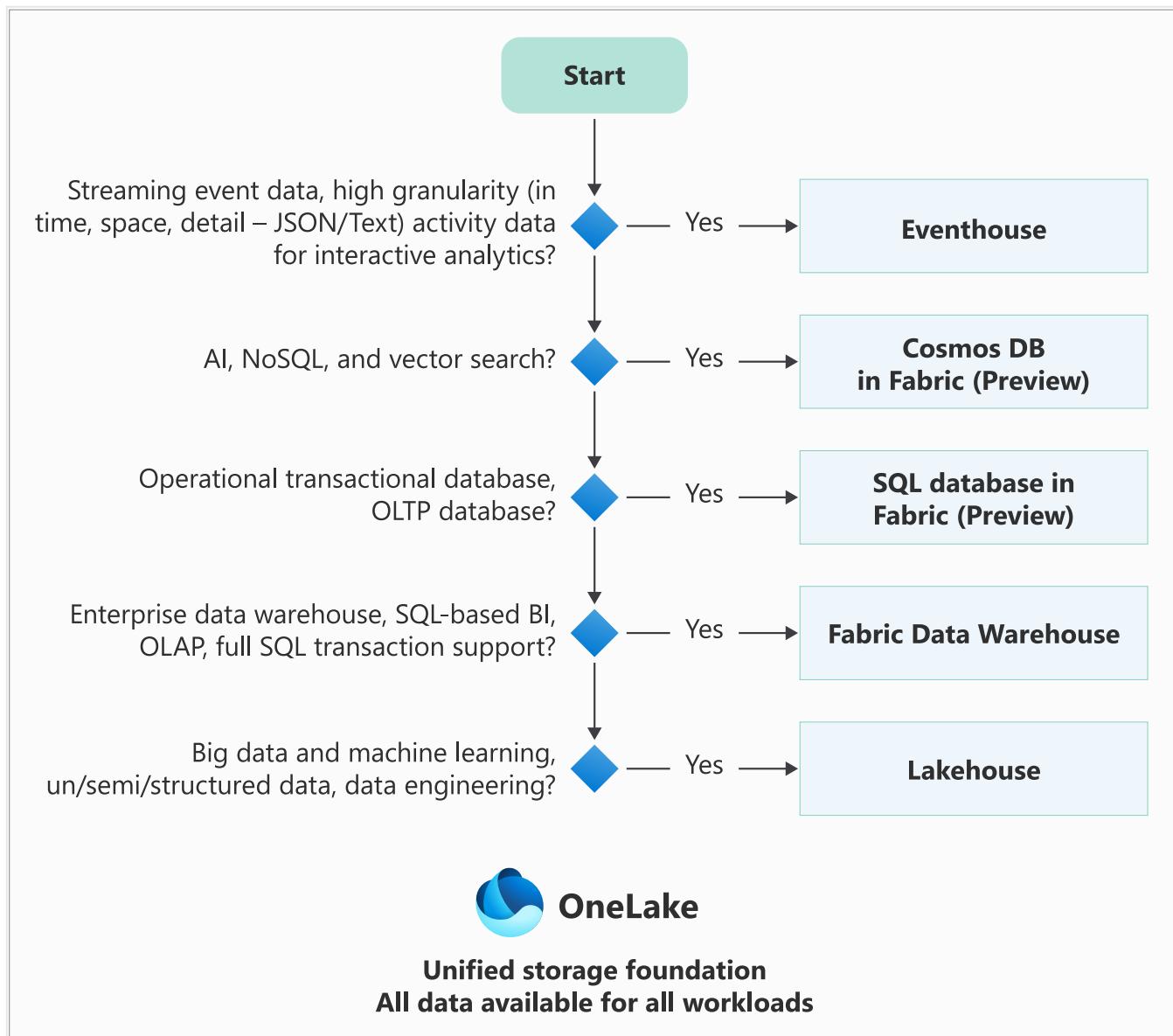
- [Create a Copy Job](#)
- [Create a Copy Activity](#)

 **Note:** The author created this article with assistance from AI. [Learn more](#)

Microsoft Fabric decision guide: choose a data store

09/09/2025

Use this reference guide and the example scenarios to help you choose a data store for your Microsoft Fabric workloads, all available in a unified storage in the OneLake.



Expand table

Ideal use case	Microsoft Fabric workload	Data available in OneLake in open table format by default
Streaming event data, high granularity (in time, space, detail – JSON/Text) activity data for interactive analytics	Eventhouse	Yes

Ideal use case	Microsoft Fabric workload	Data available in OneLake in open table format by default
AI, NoSQL, and vector search	Cosmos DB in Fabric (Preview)	Yes
Operational transactional database, OLTP database	SQL database in Fabric (Preview)	Yes
Enterprise data warehouse, SQL-based BI, OLAP, full SQL transaction support	Data Warehouse	Yes
Big data and machine learning, un/semi/structured data, data engineering	Lakehouse	Yes

Personas and skillsets

[Expand table](#)

Microsoft Fabric workload	Primary developer personas	Primary skillsets, tooling	Primary languages
Eventhouse	App developer, Data scientist, Data engineer	No code, KQL, SQL	KQL (Kusto query language) , T-SQL
Cosmos DB in Fabric (Preview)	AI developer, App developer	NoSQL concepts, REST APIs, similar to Azure Cosmos DB	REST API integration via JavaScript/TypeScript, Python, C#, Java, and others
SQL database in Fabric (Preview)	AI developer, App developer, Database developer, Database admin	Database administration and development, similar to Azure SQL Database, SSMS, VS Code, and SQL Server-compatible query tools	T-SQL
Fabric Data Warehouse	Data warehouse developer, Data architect, Data engineer, Database developer	Data warehousing concepts, star schema database design , SSMS, VS Code, and SQL Server-compatible query tools	T-SQL, No code
Lakehouse	Data engineer, Data scientist	PySpark, Delta Lake, notebooks	Spark (Scala, PySpark, Spark SQL, R)

Scenarios

Review these scenarios for help with choosing a data store in Fabric.

Scenario 1

Susan, a professional developer, is new to Microsoft Fabric. They're ready to get started cleaning, modeling, and analyzing data but need to decide to build a data warehouse or a lakehouse. After review of the details in the previous table, the primary decision points are the available skill set and the need for multi-table transactions.

Susan has spent many years building data warehouses on relational database engines, and is familiar with SQL syntax and functionality. Thinking about the larger team, the primary consumers of this data are also skilled with SQL and SQL analytical tools. Susan decides to use a [Fabric warehouse](#), which allows the team to interact primarily with T-SQL, while also allowing any Spark users in the organization to access the data.

Susan creates a new data warehouse and interacts with it using T-SQL just like her other SQL server databases. Most of the existing T-SQL code she has written to build her warehouse on SQL Server will work on the Fabric data warehouse making the transition easy. If she chooses to, she can even use the same tools that work with her other databases, like SQL Server Management Studio. Using the SQL editor in the Fabric portal, Susan and other team members write analytic queries that reference other data warehouses and Delta tables in lakehouses simply by using three-part names to perform cross-database queries.

Scenario 2

Rob, a data engineer, needs to store and model several terabytes of data in Fabric. The team has a mix of PySpark and T-SQL skills. Most of the team running T-SQL queries are consumers, and therefore don't need to write INSERT, UPDATE, or DELETE statements. The remaining developers are comfortable working in notebooks, and because the data is stored in Delta, they're able to interact with a similar SQL syntax.

Rob decides to use a [lakehouse](#), which allows the data engineering team to use their diverse skills against the data, while allowing the team members who are highly skilled in T-SQL to consume the data.

Scenario 3

Daisy is business analyst experienced with using Power BI to analyze supply chain bottlenecks for a large global retail chain. They need to build a scalable data solution that can handle

billions of rows of data and can be used to build dashboards and reports that can be used to make business decisions. The data comes from plants, suppliers, shippers, and other sources in various structured, semi-structured, and unstructured formats.

Daisy decides to use an [Eventhouse](#) because of its scalability, quick response times, advanced analytics capabilities including time series analysis, geospatial functions, and fast direct query mode in Power BI. Queries can be executed using Power BI and KQL to compare between current and previous periods, quickly identify emerging problems, or provide geo-spatial analytics of land and maritime routes.

Scenario 4

Kirby is an application architect experienced in developing .NET applications for operational data. They need a high concurrency database with full ACID transaction compliance and strongly enforced foreign keys for relational integrity. Kirby wants the benefit of automatic performance tuning to simplify day-to-day database management.

Kirby decides on a [SQL database in Fabric](#), with the same SQL Database Engine as Azure SQL Database. SQL databases in Fabric automatically scale to meet demand throughout the business day. They have the full capability of transactional tables and the flexibility of transaction isolation levels from serializable to read committed snapshot. SQL database in Fabric automatically creates and drops nonclustered indexes based on strong signals from execution plans observed over time.

In Kirby's scenario, data from the operational application must be joined with other data in Fabric: in Spark, in a warehouse, and from real-time events in an Eventhouse. Every Fabric database includes a SQL analytics endpoint, so data to be accessed in real time from Spark or with Power BI queries using DirectLake mode. These reporting solutions spare the primary operational database from the overhead of analytical workloads, and avoid denormalization. Kirby also has existing operational data in other SQL databases, and needs to import that data without transformation. To import existing operational data without any data type conversion, Kirby designs pipelines with Fabric Data Factory to import data into the Fabric SQL database.

Next step

[Learn about Fabric migration](#)

Microsoft Fabric decision guide: Choose between Warehouse and Lakehouse

Article • 01/26/2025

Microsoft Fabric offers two enterprise-scale, open standard format workloads for data storage: [Warehouse](#) and [Lakehouse](#). This article compares the two platforms and the decision points for each.

Criterion



No Code or Pro Code solutions: How do you want to develop?

- Spark
 - Use **Lakehouse**
- T-SQL
 - Use **Warehouse**

Warehousing needs: Do you need multi-table transactions?

- Yes
 - Use **Warehouse**
- No
 - Use **Lakehouse**

Data complexity: What type of data are you analyzing?

- Don't know
 - Use **Lakehouse**
- Unstructured and structured data
 - Use **Lakehouse**
- Structured data only
 - Use **Warehouse**

Choose a candidate service

Perform a detailed evaluation of the service to confirm that it meets your needs.

The **Warehouse** item in Fabric Data Warehouse is an enterprise scale data warehouse with open standard format.

- No knobs performance with minimal set-up and deployment, no configuration of compute or storage needed.
- Simple and intuitive warehouse experiences for both beginner and experienced data professionals (no/pro code).
- Lake-centric warehouse stores data in OneLake in open Delta format with easy data recovery and management.
- Fully integrated with all Fabric workloads.
- Data loading and transforms at scale, with full multi-table transactional guarantees provided by the SQL engine.
- Virtual warehouses with cross-database querying and a fully integrated semantic layer.
- Enterprise-ready platform with end-to-end performance and usage visibility, with built-in governance and security.
- Flexibility to build data warehouse or data mesh based on organizational needs and choice of no-code, low-code, or T-SQL for transformations.

The **Lakehouse** item in Fabric Data Engineering is a data architecture platform for storing, managing, and analyzing structured and unstructured data in a single location.

- Store, manage, and analyze structured and unstructured data in a single location to gain insights and make decisions faster and efficiently.
- Flexible and scalable solution that allows organizations to handle large volumes of data of all types and sizes.
- Easily ingest data from many different sources, which are converted into a unified Delta format
- Automatic table discovery and registration for a fully managed file-to-table experience for data engineers and data scientists.
- Automatic SQL analytics endpoint and default dataset that allows T-SQL querying of delta tables in the lake

Both are included in Power BI Premium or Fabric capacities.

Compare different warehousing capabilities

This table compares the Warehouse to the SQL analytics endpoint of the Lakehouse.

Microsoft Fabric offering

Warehouse

SQL analytics endpoint of the Lakehouse

Primary capabilities

ACID compliant, full data warehousing with transactions support in T-SQL.

Read only, system generated SQL analytics endpoint for Lakehouse for T-SQL querying and serving. Supports analytics on the Lakehouse Delta tables, and the Delta Lake folders referenced via [shortcuts](#).

Developer profile

SQL Developers or citizen developers

Data Engineers or SQL Developers

Data loading

SQL, pipelines, dataflows

Spark, pipelines, dataflows, shortcuts

Delta table support

Reads and writes Delta tables

Reads delta tables

Storage layer

Open Data Format - Delta

Open Data Format - Delta

Recommended use case

- Data Warehousing for enterprise use
 - Data Warehousing supporting departmental, business unit or self service use
 - Structured data analysis in T-SQL with tables, views, procedures and functions and Advanced SQL support for BI
 - Exploring and querying delta tables from the lakehouse
 - Staging Data and Archival Zone for analysis
 - [Medallion lakehouse architecture](#) with zones for bronze, silver and gold analysis
 - Pairing with Warehouse for enterprise analytics use cases
-

Development experience

- Warehouse Editor with full support for T-SQL data ingestion, modeling, development, and querying UI experiences for data ingestion, modeling, and querying
 - Read / Write support for 1st and 3rd party tooling
 - Lakehouse SQL analytics endpoint with limited T-SQL support for views, table valued functions, and SQL Queries
 - UI experiences for modeling and querying
 - Limited T-SQL support for 1st and 3rd party tooling
-

T-SQL capabilities

Full DQL, DML, and DDL T-SQL support, full transaction support

Full DQL, No DML, limited DDL T-SQL Support such as SQL Views and TVFs

Related content

- [Microsoft Fabric decision guide: choose a data store](#)
-

Feedback

Was this page helpful?

 Yes

 No

[Provide product feedback](#) | [Ask the community](#)

Microsoft Fabric adoption roadmap

Article • 12/30/2024

The goal of this series of articles is to provide a roadmap. The roadmap presents a series of strategic and tactical considerations and action items that lead to the successful adoption of [Microsoft Fabric](#), and help build a data culture in your organization.

Advancing adoption and cultivating a data culture is about more than implementing technology features. Technology can assist an organization in making the greatest impact, but a healthy data culture involves many considerations across the spectrum of people, processes, and technology.

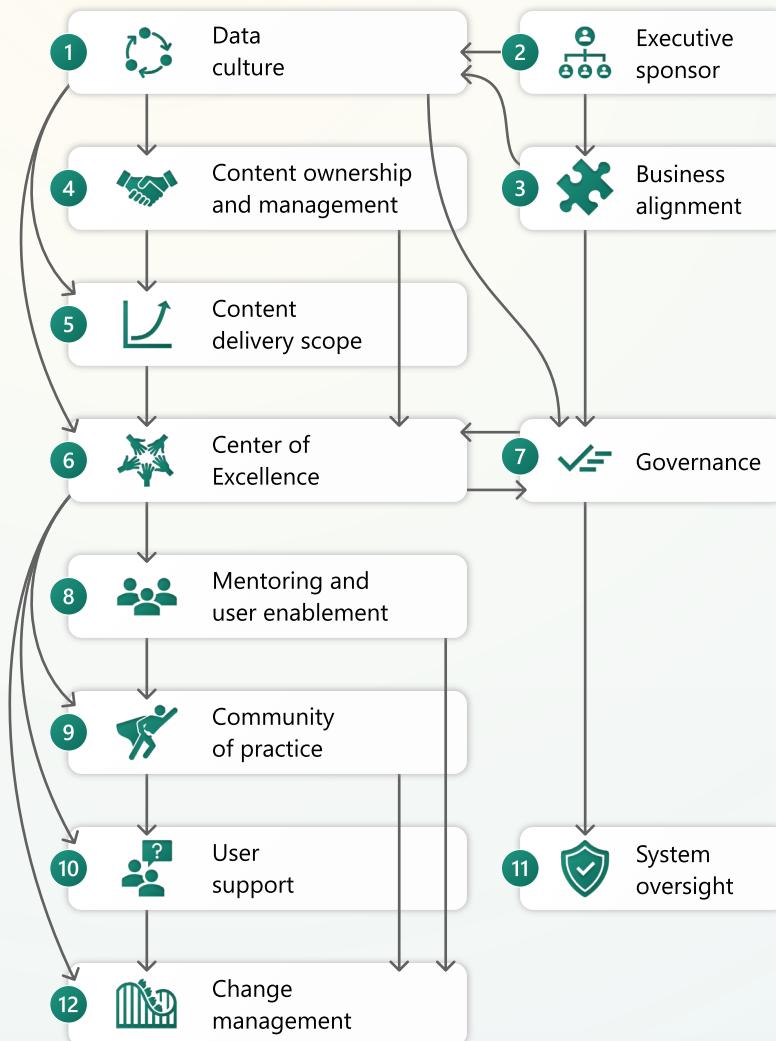
ⓘ Note

While reading this series of articles, we recommended that you also take into consideration [Power BI implementation planning](#) guidance. After you're familiar with the concepts in the Microsoft Fabric adoption roadmap, consider reviewing the [usage scenarios](#). Understanding the diverse ways Power BI is used can influence your implementation strategies and decisions for all of Microsoft Fabric.

The diagram depicts the following areas of the Microsoft Fabric adoption roadmap.



Microsoft Fabric adoption roadmap



The areas in the above diagram include:

[Expand table](#)

Area	Description
1	Data culture: Data culture refers to a set of behaviors and norms in the organization that encourages a data-driven culture. Building a data culture is closely related to adopting Fabric, and it's often a key aspect of an organization's digital transformation.
2	Executive sponsor: An executive sponsor is someone with credibility, influence, and authority throughout the organization. They advocate for building a data culture and adopting Fabric.
3	Business Alignment: How well the data culture and data strategy enable business users to achieve business objectives. An effective BI data strategy aligns with the business strategy.

Area	Description
4	Content ownership and management: There are three primary strategies for how business intelligence (BI) and analytics content is owned and managed: business-led self-service BI, managed self-service BI, and enterprise BI. These strategies have a significant influence on adoption, governance, and the Center of Excellence (COE) operating model.
5	Content delivery scope: There are four primary strategies for content and data delivery: personal, team, departmental, and enterprise. These strategies have a significant influence on adoption, governance, and the COE operating model.
6	Center of Excellence: A Fabric COE is an internal team of technical and business experts. These experts actively assist others who are working with data within the organization. The COE forms the nucleus of the broader community to advance adoption goals that are aligned with the data culture vision.
7	Governance: Data governance is a set of policies and procedures that define the ways in which an organization wants data to be used. When adopting Fabric, the goal of governance is to empower the internal user community to the greatest extent possible, while adhering to industry, governmental, and contractual requirements and regulations.
8	Mentoring and user enablement: A critical objective for adoption efforts is to enable users to accomplish as much as they can within the guardrails established by governance guidelines and policies. The act of mentoring users is one of the most important responsibilities of the COE. It has a direct influence on adoption efforts.
9	Community of practice: A community of practice comprises a group of people with a common interest, who interact with and help each other on a voluntary basis. An active community is an indicator of a healthy data culture. It can significantly advance adoption efforts.
10	User support: User support includes both informally organized and formally organized methods of resolving issues and answering questions. Both formal and informal support methods are critical for adoption.
11	System oversight: System oversight includes the day-to-day administration responsibilities to support the internal processes, tools, and people.
12	Change management: Change management involves procedures to address the impact of change for people in an organization. These procedures safeguard against disruption and productivity loss due to changes in solutions or processes. An effective data strategy describes who is responsible for managing this change and the practices and resources needed to realize it.

The relationships in the above diagram can be summarized as follows.

- Your organizational **data culture** vision will strongly influence the strategies that you follow for self-service and enterprise **content ownership and management** and **content delivery scope**.

- These strategies will, in turn, have a big impact on the operating model for your **Center of Excellence** and governance decisions.
- The established **governance** guidelines, policies, and processes affect the implementation methods used for **mentoring and enablement**, the **community of practice**, and **user support**.
- Governance decisions will dictate the day-to-day **system oversight** (administration) activities.
- Adoption and governance decisions are implemented alongside **change management** to mitigate the impact and disruption of change on existing business processes.
- All data culture and adoption-related decisions and actions are accomplished more easily with guidance and leadership from an **executive sponsor**, who facilitates **business alignment** between the business strategy and data strategy. This alignment in turn informs data culture and governance decisions.

Each individual article in this series discusses key topics associated with the items in the diagram. Considerations and potential action items are provided. Each article concludes with a set of **maturity levels** to help you assess your current state so you can decide what action to take next.

Microsoft Fabric adoption

Successful adoption of analytical tools like Fabric involves making effective processes, support, tools, and data available and integrated into regular ongoing patterns of usage for content creators, consumers, and stakeholders in the organization.

Important

This series of adoption articles is focused on *organizational* adoption. See [**Microsoft Fabric adoption maturity levels**](#) for an introduction to the three types of adoption: organizational, user, and solution.

A common misconception is that adoption relates primarily to usage or the number of users. There's no question that usage statistics are an important factor. However, usage isn't the only factor. Adoption isn't just about *using* the technology regularly; it's about using it *effectively*. Effectiveness is much more difficult to define and measure.

Whenever possible, adoption efforts should be aligned across analytics platforms and BI services.

ⓘ Note

Individuals—and the organization itself—are continually learning, changing, and improving. That means there's no formal end to adoption-related efforts.

The remaining articles in this Power BI adoption series discuss the following aspects of adoption.

- Adoption maturity levels
- Data culture
- Executive sponsorship
- Business alignment
- Content ownership and management
- Content delivery scope
- Center of Excellence
- Governance
- Mentoring and enablement
- Community of practice
- User support
- System oversight
- Change management
- Conclusion and additional resources

ⓘ Important

You might be wondering how this Fabric adoption roadmap is different from the [Power BI adoption framework](#). The adoption framework was created primarily to support Microsoft partners. It's a lightweight set of resources to help partners deploy Power BI solutions for their customers.

This adoption series is more current. It's intended to guide any person or organization that is using—or considering using—Fabric. If you're seeking to improve your existing Power BI or Fabric implementation, or planning a new Power BI or Fabric implementation, this adoption roadmap is a great place to start.

Target audience

The intended audience of this series of articles is interested in one or more of the following outcomes.

- Improving their organization's ability to effectively use analytics.
- Increasing their organization's maturity level related to the delivery of analytics.
- Understanding and overcoming adoption-related challenges faced when scaling and growing.
- Increasing their organization's return on investment (ROI) in data and analytics.

This series of articles will be most helpful to those who work in an organization with one or more of the following characteristics.

- Power BI or other Fabric workloads are deployed with some successes.
- There are pockets of viral adoption, but analytics isn't being purposefully governed across the entire organization.
- Analytics solutions are deployed with some meaningful scale, but there remains a need to determine:
 - What is effective and what should be maintained.
 - What should be improved.
 - How future deployments could be more strategic.
- An expanded implementation of analytics is under consideration or is planned.

This series of articles will also be helpful for:

- Organizations that are in the early stages of an analytics implementation.
- Organizations that have had success with adoption and now want to evaluate their current maturity level.

Assumptions and scope

The primary focus of this series of articles is on the Microsoft Fabric platform.

To fully benefit from the information provided in these articles, you should have an understanding of [Power BI foundational concepts](#) and [Fabric foundational concepts](#).

Related content

In the [next article in this series](#), learn about the Fabric adoption maturity levels. The maturity levels are referenced throughout the entire series of articles. Also, see the [conclusion article](#) for additional adoption-related resources.

Other helpful resources include:

- [Power BI implementation planning](#)
- Questions? [Try asking the Fabric Community ↗](#)

- Suggestions? [Contribute ideas to improve Fabric](#)

Experienced partners are available to help your organization succeed with adoption initiatives. To engage with a partner, visit the [Power BI partner portal](#).

Acknowledgments

The Microsoft Fabric adoption roadmap articles are written by [Melissa Coates](#), [Kurt Buhler](#), and [Peter Myers](#). [Matthew Roche](#), from the Fabric Customer Advisory Team, provides strategic guidance and feedback to the subject matter experts. Reviewers include [Cory Moore](#), James Ward, [Timothy Bindas](#), [Greg Moir](#), and [Chuy Varela](#).

Feedback

Was this page helpful?



[Provide product feedback](#) | [Ask the community](#)

Microsoft Fabric adoption roadmap maturity levels

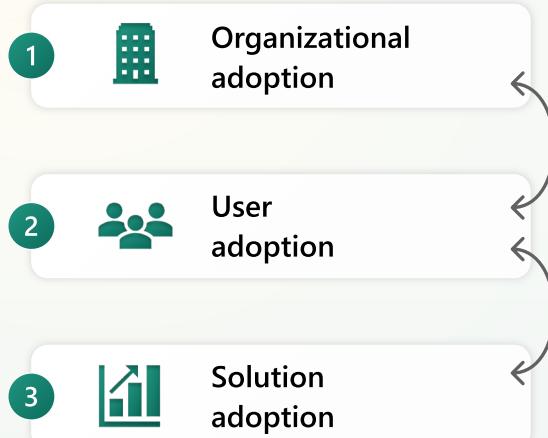
Article • 12/30/2024

ⓘ Note

This article forms part of the *Microsoft Fabric adoption roadmap* series of articles. For an overview of the series, see [Microsoft Fabric adoption roadmap](#).

There are three inter-related perspectives to consider when adopting an analytics technology like Microsoft Fabric.

Types of adoption



The three types of adoption depicted in the above diagram include:

 [Expand table](#)

Type	Description
1	Organizational adoption refers to the effectiveness of your analytics governance processes. It also refers to data management practices that support and enable analytics and business intelligence (BI) efforts.
2	User adoption is the extent to which consumers and creators continually increase their knowledge. It's concerned with whether they're actively using analytics tools, and whether they're using them in the most effective way.

Type	Description
3	Solution adoption refers to the impact and business value achieved for individual requirements and analytical solutions.

As the four arrows in the previous diagram indicate, the three types of adoption are all strongly inter-related:

- **Solution adoption affects user adoption.** A well-designed and well-managed solution—which could be many things, such as a set of reports, a Power BI app, a semantic model, or a Fabric lakehouse—impacts and guides users on how to use analytics in an optimal way.
- **User adoption impacts organizational adoption.** The patterns and practices used by individual users influence organizational adoption decisions, policies, and practices.
- **Organizational adoption influences user adoption.** Effective organizational practices—including mentoring, training, support, and community—encourage users to do the right thing in their day-to-day workflow.
- **User adoption affects solution adoption.** Stronger user adoption, because of the effective use of analytics by educated and informed users, contributes to stronger and more successful individual solutions.

The remainder of this article introduces the three types of adoption in more detail.

Organizational adoption maturity levels

Organizational adoption measures the state of analytics governance and data management practices. There are several organizational adoption goals:

- Effectively support the community of creators, consumers, and stakeholders
- Enable and empower users
- Right-sized governance of analytics, BI, and data management activities
- Oversee information delivery via enterprise BI and self-service BI with continuous improvement cycles

It's helpful to think about organizational adoption from the perspective of a maturity model. For consistency with the [Power CAT adoption maturity model](#) and the [maturity model for Microsoft 365](#), this Microsoft Fabric adoption roadmap aligns with the five levels from the [Capability Maturity Model](#), which were later enhanced by the Data Management Maturity (DMM) model from ISACA (note that the DMM was a paid resource that has since been retired).

Every organization has limited time, funding, and people. So, it requires them to be selective about where they prioritize their efforts. To get the most from your investment in analytics, seek to attain at least maturity level 300 or 400, as discussed below. It's common that different business units in the organization evolve and mature at different rates, so be conscious of the organizational state as well as progress for key business units.

ⓘ Note

Organizational adoption maturity is a long journey. It takes time, effort, and planning to progress to the higher levels.

Maturity level 100 – Initial

Level 100 is referred to as *initial* or *performed*. It's the starting point for new data-related investments that are new, undocumented, and without any process discipline.

Common characteristics of maturity level 100 include:

- Pockets of success and experimentation with Fabric exist in one or more areas of the organization.
- Achieving quick wins has been a priority, and solutions have been delivered with some success.
- Organic growth has led to the lack of a coordinated strategy or [governance](#) approach.
- Practices are undocumented, with significant reliance on tribal knowledge.
- There are few formal processes in place for effective data management.
- Risk exists due to a lack of awareness of how data is used throughout the organization.
- The potential for a strategic investment with analytics is acknowledged. However, there's no clear path forward for purposeful, organization-wide execution.

Maturity level 200 – Repeatable

Level 200 is referred to as *repeatable* or *managed*. At this point on the maturity curve, data management is planned and executed. Defined processes exist, though these processes might not apply uniformly throughout the organization.

Common characteristics of maturity level 200 include:

- Certain analytics content is now critical in importance and/or it's broadly used by the organization.
- There are attempts to document and define repeatable practices. These efforts are siloed, reactive, and deliver varying levels of success.
- There's an over-reliance on individuals having good judgment and adopting healthy habits that they learned on their own.
- Analytics adoption continues to grow organically and produces value. However, it takes place in an uncontrolled way.
- Resources for an internal community are established, such as a Teams channel or Yammer group.
- Initial planning for a consistent analytics governance strategy is underway.
- There's recognition that a [Center of Excellence \(COE\)](#) can deliver value.

Maturity level 300 – Defined

Level 300 is referred to as *defined*. At this point on the maturity curve, a set of standardized data management processes are established and consistently applied across organizational boundaries.

Common characteristics of maturity level 300 include:

- Measurable success is achieved for the effective use of analytics.
- Progress is made on the standardization of repeatable practices. However, less-than-optimal aspects could still exist due to early uncontrolled growth.
- The [COE](#) is established. It has clear goals and scope of responsibilities.
- The internal [community of practice](#) gains traction with the participation of a growing number of users.
- [Champions](#) emerge in the internal user community.
- Initial investments in [training](#), [documentation](#), and resources (such as [template files](#)) are made.
- An initial [governance](#) model is in place.
- There's an active and engaged [executive sponsor](#).
- [Roles and responsibilities](#) for all analytics stakeholders are well understood.

Maturity level 400 – Capable

Level 400 is known as *capable* or *measured*. At this point on the maturity curve, data is well-managed across its entire lifecycle.

Common characteristics of maturity level 400 include:

- Analytics and business intelligence efforts deliver significant value.

- Approved tools are commonly used for delivering critical content throughout the organization.
- There's an established and accepted [governance](#) model with cooperation from all key business units.
- Training, documentation, and resources are readily available for, and actively used by, the internal community of users.
- Standardized processes are in place for the oversight and monitoring of analytics usage and practices.
- The [COE](#) includes representation from all key business units.
- A [champions network](#) supports the internal community. The champions actively work with their colleagues as well as the COE.

Maturity level 500 – Efficient

Level 500 is known as *efficient* or *optimizing* because at this point on the maturity curve, the emphasis is now on automation and continuous improvement.

Common characteristics of maturity level 500 include:

- The value of analytics solutions is prevalent in the organization. Fabric is widely accepted throughout the organization.
- Analytics skillsets are highly valued in the organization, and they're recognized by leadership.
- The internal user community is self-sustaining, with support from the COE. The community isn't over-reliant on key individuals.
- The COE reviews key performance indicators regularly to measure success of implementation and adoption goals.
- Continuous improvement is a continual priority.
- Use of automation adds value, improves productivity, or reduces risk for error.

Note

The characteristics above are generalized. When considering maturity levels and designing a plan, you'll want to consider each topic or goal independently. In reality, it's probably not possible to reach level 500 maturity level for every aspect of Fabric adoption for the entire organization. So, assess maturity levels independently per goal. That way, you can prioritize your efforts where they will deliver the most value. The remainder of the articles in this Fabric adoption series present maturity levels on a per-topic basis.

Individuals—and the organization itself—continually learn, change, and improve. That means there's no formal end to adoption-related efforts. However, it's common that effort is reduced as higher maturity levels are reached.

The remainder of this article introduces the second and third types of adoption: [user adoption](#) and [solution adoption](#).

① Note

The remaining articles in this series focus primarily on organizational adoption.

User adoption stages

User adoption measures the extent to which content consumers and self-service content creators are actively and effectively using analytics tools such as Fabric. Usage statistics alone don't indicate successful user adoption. User adoption is also concerned with individual user behaviors and practices. The aim is to ensure users engage with solutions, tools, and processes in the correct way and to their fullest extent.

User adoption encompasses how consumers view content, as well as how self-service creators generate content for others to consume.

User adoption occurs on an individual user basis, but it's measured and analyzed in the aggregate. Individual users progress through the four stages of user adoption at their own pace. An individual who adopts a new technology will take some time to achieve proficiency. Some users will be eager; others will be reluctant to learn yet another tool, regardless of the promised productivity improvements. Advancing through the user adoption stages involves time and effort, and it involves behavioral changes to become aligned with organizational adoption objectives. The extent to which the organization supports users advancing through the user adoption stages has a direct correlation to the organizational-level adoption maturity.

User adoption stage 1 – Awareness

Common characteristics of stage 1 user adoption include:

- An individual has heard of, or been initially exposed to, analytics in some way.
- An individual might have access to a tool, such as Fabric, but isn't yet actively using it.

User adoption stage 2 – Understanding

Common characteristics of stage 2 user adoption include:

- An individual develops understanding of the benefits of analytics and how it can support decision-making.
- An individual shows interest and starts to use analytics tools.

User adoption stage 3 – Momentum

Common characteristics of stage 3 user adoption include:

- An individual actively gains analytics skills by attending formal training, self-directed learning, or experimentation.
- An individual gains basic competency by using or creating analytics relevant to their role.

User adoption stage 4 – Proficiency

Common characteristics of stage 4 user adoption include:

- An individual actively uses analytics regularly.
- An individual understands how to use analytic tools in the way in which they were intended, as relevant for their role.
- An individual modifies their behavior and activities to align with organizational governance processes.
- An individual's willingness to support organizational processes and change efforts is growing over time, and they become an advocate for analytics in the organization.
- An individual makes the effort to continually improve their skills and stay current with new product capabilities and features.

It's easy to underestimate the effort it takes to progress from stage 2 (understanding) to stage 4 (proficiency). Typically, it takes the longest time to progress from stage 3 (momentum) to stage 4 (proficiency).

Important

By the time a user reaches the momentum and proficiency stages, the organization needs to be ready to support them in their efforts. You can consider some proactive efforts to encourage users to progress through stages. For more information, see the [community of practice](#) and the [user support](#) articles.

Solution adoption phases

Solution adoption is concerned with measuring the impact of content that's been deployed. It's also concerned with the level of value solutions provide. The scope for evaluating solution adoption is for one set of requirements, like a set of reports, a lakehouse, or a single Power BI app.

ⓘ Note

In this series of articles, *content* is synonymous with *solution*.

As a solution progresses to phases 3 or 4, expectations to operationalize the solution are higher.

💡 Tip

The importance of scope on expectations for governance is described in the [content delivery scope](#) article. That concept is closely related to this topic, but this article approaches it from a different angle. It considers when you already have a solution that is operationalized and distributed to many users. That doesn't immediately equate to phase 4 solution adoption, as the concept of solution adoption focuses on how much value the content delivers.

Solution phase 1 – Exploration

Common characteristics of phase 1 solution adoption include:

- Exploration and experimentation are the main approaches to testing out new ideas. Exploration of new ideas can occur through informal self-service efforts, or through a formal proof of concept (POC), which is purposely narrow in scope. The goal is to confirm requirements, validate assumptions, address unknowns, and mitigate risks.
- A small group of users test the proof of concept solution and provide useful feedback.
- For simplicity, all exploration—and initial feedback—could occur within local user tools (such as Power BI Desktop or Excel) or within a single Fabric workspace.

Solution phase 2 – Functional

Common characteristics of phase 2 solution adoption include:

- The solution is functional and meets the basic set of user requirements. There are likely plans to iterate on improvements and enhancements.
- The solution is deployed to the Fabric portal.
- All necessary supporting components are in place (for example, a gateway to support scheduled data refresh).
- Target users are aware of the solution and show interest in using it. Potentially, it could be a limited preview release, and might not yet be ready to promote to a production [workspace](#).

Solution phase 3 – Valuable

Common characteristics of phase 3 solution adoption include:

- Target users find the solution to be valuable and experience tangible benefits.
- The solution is promoted to a production [workspace](#) that's managed, secured, and audited.
- Validations and testing occur to ensure data quality, accurate presentation, accessibility, and acceptable performance.
- Content is [endorsed](#), when appropriate.
- Usage metrics for the solution are actively monitored.
- User feedback loops are in place to facilitate suggestions and improvements that can contribute to future releases.
- Solution documentation is generated to support the needs of information consumers (such as data sources used or how metrics are calculated). The documentation helps future content creators (for example, for documenting any future maintenance or planned enhancements).
- Ownership and subject matter experts for the content are clear.
- Report branding and theming are in place and in line with governance guidelines.

Solution phase 4 – Essential

Common characteristics of phase 4 solution adoption include:

- Target users actively and routinely use the solution, and it's considered essential for decision-making purposes.
- The solution resides in a [production workspace](#) well separated from development and test content. [Change management](#) and release management are carefully controlled due to the impact of changes.
- A subset of users regularly provides feedback to ensure the solution continues to meet evolving requirements.
- Expectations for the success of the solution are clear and are measured.

- Expectations for support of the solution are clear, especially if there are service level agreements.
- The solution aligns with organizational [governance](#) guidelines and practices.
- Most content is [certified](#) due to its critical nature.
- Formal user acceptance testing for new changes might occur, particularly for IT-managed content.

Related content

In the [next article](#) in the Microsoft Fabric adoption roadmap series, learn about the organizational data culture and its impact on adoption efforts.

Feedback

Was this page helpful?

 Yes

 No

[Provide product feedback ↗](#) | [Ask the community ↗](#)

Microsoft Fabric adoption roadmap: Data culture

Article • 12/30/2024

ⓘ Note

This article forms part of the *Microsoft Fabric adoption roadmap* series of articles. For an overview of the series, see [Microsoft Fabric adoption roadmap](#).

Building a data culture is closely related to adopting analytics, and it's often a key aspect of an organization's digital transformation. The term *data culture* can be defined in different ways by different organizations. In this series of articles, data culture means a set of behaviors and norms in an organization. It encourages a culture that regularly employs informed data decision-making:

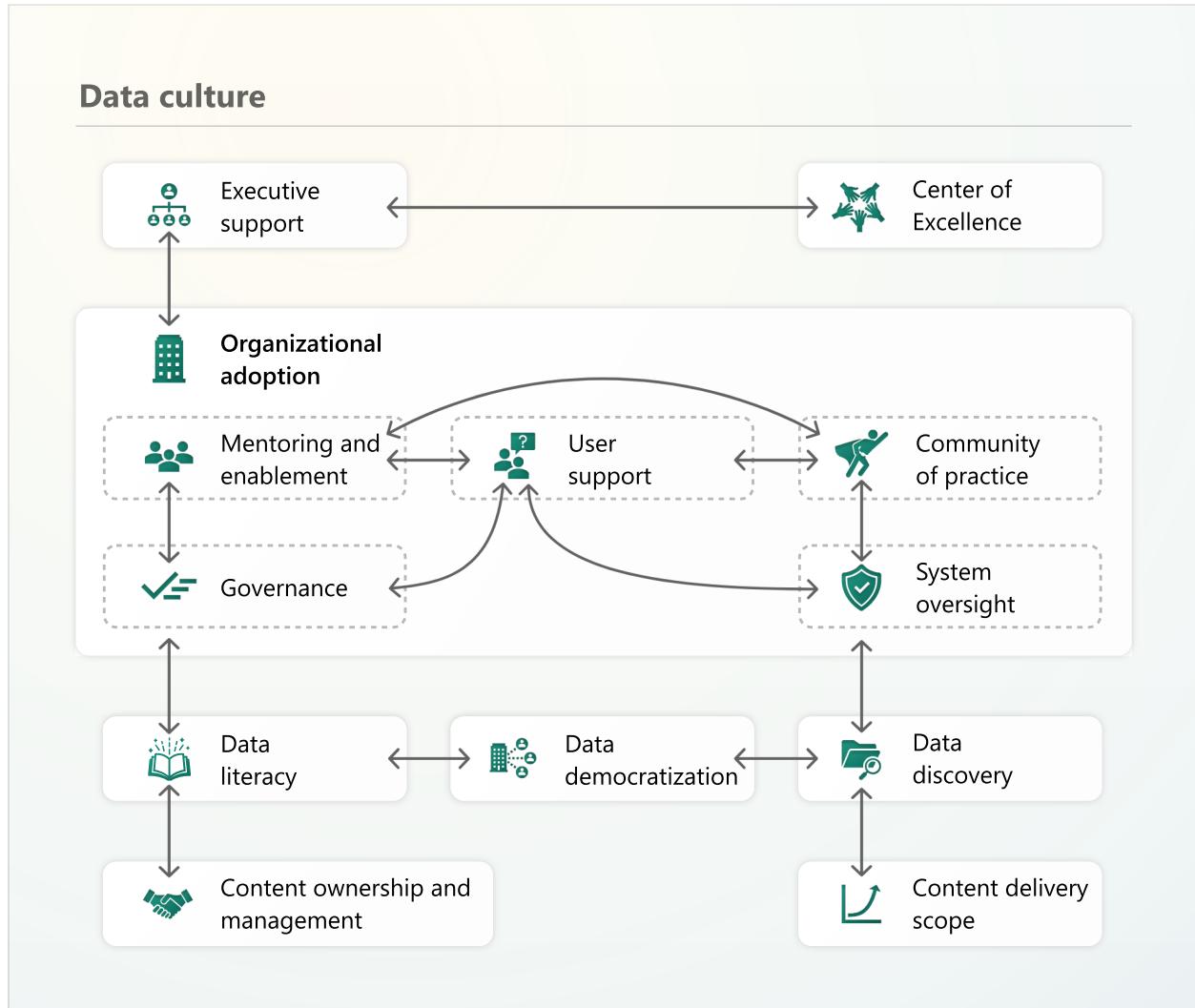
- By more stakeholders throughout more areas of the organization.
- Based on analytics, not opinion.
- In an effective, efficient way that's based on best practices approved by the [Center of Excellence \(COE\)](#).
- Based on trusted data.
- That reduces reliance on undocumented tribal knowledge.
- That reduces reliance on hunches and gut decisions.

ⓘ Important

Think of data culture as what you do, not what you say. Your data culture is not a set of rules (that's governance). So, data culture is a somewhat abstract concept. It's the behaviors and norms that are allowed, rewarded, and encouraged—or those that are disallowed and discouraged. Bear in mind that a healthy data culture motivates employees at all levels of the organization to generate and distribute actionable knowledge.

Within an organization, certain business units or teams are likely to have their own behaviors and norms for getting things done. The specific ways to achieve data culture objectives can vary across organizational boundaries. What's important is that they should all align with the organizational data culture objectives. You can think of this structure as *aligned autonomy*.

The following circular diagram conveys the interrelated aspects that influence your data culture:



The diagram depicts the somewhat ambiguous relationships among the following items:

- Data culture is the outer circle. All topics within it contribute to the state of the data culture.
- **Organizational adoption** (including the implementation aspects of **mentoring and user enablement**, **user support**, **community of practice**, **governance**, and **system oversight**) is the inner circle. All topics are major contributors to the **data culture**.
- **Executive support** and the **Center of Excellence** are drivers for the success of organizational adoption.
- **Data literacy**, **data democratization**, and **data discovery** are data culture aspects that are heavily influenced by organizational adoption.
- **Content ownership and management**, and **content delivery scope**, are closely related to **data democratization**.

The elements of the diagram are discussed throughout this series of articles.

Data culture vision

The concept of data culture can be difficult to define and measure. Even though it's challenging to articulate data culture in a way that's meaningful, actionable, and measurable, you need to have a well-understood definition of what a healthy data culture means to your organization. This vision of a healthy data culture should:

- Originate from the executive level.
- Align with organizational objectives.
- Directly influence your adoption strategy.
- Serve as the high-level guiding principles for enacting governance policies and guidelines.

Data culture outcomes aren't specifically mandated. Rather, the state of the data culture is the result of following the governance rules as they're enforced (or the lack of governance rules). Leaders at all levels need to actively demonstrate through their actions what's important to them, including how they praise, recognize, and reward staff members who take initiative.

Tip

If you can take for granted that your efforts to develop a data solution (such as a semantic model, a lakehouse, or a report) will be valued and appreciated, that's an excellent indicator of a healthy data culture. Sometimes, however, it depends on what your immediate manager values most.

The initial motivation for establishing a data culture often comes from a specific strategic business problem or initiative. It might be:

- A reactive change, such as responding to new agile competition.
- A proactive change, such as starting a new line of business or expanding into new markets to seize a "green field" opportunity. Being data driven from the beginning can be relatively easier when there are fewer constraints and complications, compared with an established organization.
- Driven by external changes, such as pressure to eliminate inefficiencies and redundancies during an economic downturn.

In each of these situations, there's often a specific area where the data culture takes root. The specific area could be a scope of effort that's smaller than the entire organization, even if it's still significant. After necessary changes are made at this smaller scope, they can be incrementally replicated and adapted for the rest of the organization.

Although technology can help advance the goals of a data culture, implementing specific tools or features isn't the objective. This series of articles covers a lot of topics that contribute to adoption of a healthy data culture. The remainder of this article addresses three essential aspects of data culture: [data discovery](#), [data democratization](#), and [data literacy](#).

Data discovery

A successful data culture depends on users working with the right data in their day-to-day activities. To achieve this goal, users need to find and access data sources, reports, and other items.

Data discovery is the ability to effectively locate relevant data assets across the organization. Primarily, data discovery is concerned with improving awareness that data exists, which can be particularly challenging when data is siloed in departmental systems.

Data discovery is a slightly different concept from *search*, because:

- Data discovery allows users to see metadata for an item, like the name of a semantic model, even if they don't currently have access to it. After a user is aware of its existence, that user can go through the standard process to request access to the item.
- Search allows users to locate an existing item when they already have security access to the item.

💡 Tip

It's important to have a clear and simple process so users can request access to data. Knowing that data exists—but being unable to access it within the guidelines and processes that the domain owner has established—can be a source of frustration for users. It can force them to use inefficient workarounds instead of requesting access through the proper channels.

Data discovery contributes to adoption efforts and the implementation of governance practices by:

- Encouraging the use of trusted high-quality data sources.
- Encouraging users to take advantage of existing investments in available data assets.

- Promoting the use and enrichment of existing data items (such as a lakehouse, data warehouse, data pipeline, dataflow, or semantic model) or reporting items (such as reports, dashboards, or metrics).
- Helping people understand who owns and manages data assets.
- Establishing connections between consumers, creators, and owners.

The [OneLake catalog](#) and the [use of endorsements](#) are key ways to promote data discovery in your organization.

Furthermore, data catalog solutions are extremely valuable tools for data discovery. They can record metadata tags and descriptions to provide deeper context and meaning. For example, [Microsoft Purview](#) can scan and catalog items from a Fabric tenant (as well as many other sources).

Questions to ask about data discovery



Use questions like those found below to assess data discovery.

- Is there a data catalog where business users can search for data?
- Is there a metadata catalog that describes definitions and data locations?
- Are high-quality data sources endorsed by [certifying](#) or [promoting](#) them?
- To what extent do redundant data sources exist because people can't find the data they need? What roles are expected to create data items? What roles are expected to create reports or perform ad hoc analysis?
- Can end users find and use existing reports, or do they insist on data exports to create their own?
- Do end users know which reports to use to address specific business questions or find specific data?
- Are people using the appropriate data sources and tools, or resisting them in favor of legacy ones?
- Do analysts understand how to enrich existing certified semantic models with new data—for example, by using a [Power BI composite model](#)?
- How consistent are data items in their quality, completeness, and naming conventions?
- Can data item owners follow [data lineage](#) to perform impact analysis of data items?

Maturity levels of data discovery



The following maturity levels can help you assess your current state of data discovery.

[] Expand table

Level	State of Fabric data discovery
100: Initial	<ul style="list-style-type: none">• Data is fragmented and disorganized, with no clear structures or processes to find it.• Users struggle to find and use data they need for their tasks.
200: Repeatable	<ul style="list-style-type: none">• Scattered or organic efforts to organize and document data are underway, but only in certain teams or departments.• Content is occasionally endorsed, but these endorsements aren't defined and the process isn't managed. Data remains siloed and fragmented, and it's difficult to access.
300: Defined	<ul style="list-style-type: none">• A central repository, like the OneLake catalog, is used to make data easier to find for people who need it.• An explicit process is in place to endorse quality data and content.• Basic documentation includes catalog data, definitions, and calculations, as well as where to find them.
400: Capable	<ul style="list-style-type: none">• Structured, consistent processes guide users how to endorse, document, and find data from a central hub. Data silos are the exception instead of the rule.• Quality data assets are consistently endorsed and easily identified.• Comprehensive data dictionaries are maintained and improve data discovery.
500: Efficient	<ul style="list-style-type: none">• Data and metadata is systematically organized and documented with a full view of the data lineage.• Quality assets are endorsed and easily identified.• Cataloging tools, like Microsoft Purview, are used to make data discoverable for both use and governance.

Data democratization

Data democratization refers to putting data into the hands of more users who are responsible for solving business problems. It's about enabling more users to make better data-driven decisions.

ⓘ Note

The concept of data democratization doesn't imply a lack of security or a lack of justification based on job role. As part of a healthy data culture, data democratization helps reduce *shadow IT* by providing semantic models that:

- Are secured, governed, and well managed.
- Meet business needs in cost-effective and timely ways.

Your organization's position on data democratization will have a wide-reaching impact on adoption and governance-related efforts.

⚠ Warning

If access to data or the ability to perform analytics is limited to a select number of individuals in the organization, that's typically a warning sign because the ability to work with data is a key characteristic of a healthy data culture.

Questions to ask about data democratization



Use questions like those found below to assess data democratization.

- Is data and analytics readily accessible, or restricted to limited roles and individuals?
- Is an effective process in place for people to request access to new data and tools?
- Is data readily shared between teams and business units, or is it siloed and closely guarded?
- Who is permitted to have Power BI Desktop installed?

- Who is permitted to have Power BI Pro or Power BI Premium Per User (PPU) licenses?
- Who is permitted to create assets in Fabric workspaces?
- What's the desired level of self-service analytics and business intelligence (BI) user enablement? How does this level vary depending on business unit or job role?
- What's the desired balance between enterprise and self-service analytics, and BI?
- What data sources are strongly preferred for what topics and business domains? What's the allowed use of unsanctioned data sources?
- Who can manage content? Is this decision different for data versus reports? Is the decision different for enterprise BI users versus decentralized users? Who can own and manage self-service BI content?
- Who can consume content? Is this decision different for external partners, customers, or suppliers?

Maturity levels of data democratization



The following maturity levels can help you assess your current state of data democratization.

[] Expand table

Level	State of data democratization
100: Initial	<ul style="list-style-type: none"> • Data and analytics are limited to a small number of roles, who gatekeep access to others. • Business users must request access to data or tools to complete tasks. They struggle with delays or bottlenecks. • Self-service initiatives are taking place with some success in various areas of the organization. These activities are occurring in a somewhat chaotic manner, with few formal processes and no strategic plan. There's a lack of oversight and visibility into these self-service activities. The success or failure of each solution isn't well understood. • The enterprise data team can't keep up with the needs of the business. A significant backlog of requests exists for this team.

Level	State of data democratization
200: Repeatable	<ul style="list-style-type: none"> • There are limited efforts underway to expand access to data and tools. • Multiple teams have had measurable success with self-service solutions. People in the organization are starting to pay attention. • Investments are being made to identify the ideal balance of enterprise and self-service solutions.
300: Defined	<ul style="list-style-type: none"> • Many people have access to the data and tools they need, although not all users are equally enabled or held accountable for the content they create. • Effective self-service data practices are incrementally and purposely replicated throughout more areas of the organization.
400: Capable	<ul style="list-style-type: none"> • Healthy partnerships exist among enterprise and self-service solution creators. Clear, realistic user accountability and policies mitigate risk of self-service analytics and BI. • Clear and consistent processes are in place for users to request access to data and tools. • Individuals who take initiative in building valuable solutions are recognized and rewarded.
500: Efficient	<ul style="list-style-type: none"> • User accountability and effective governance give central teams confidence in what users do with data. • Automated, monitored processes enable people to easily request access to data and tools. Anyone with the need or interest to use data can follow these processes to perform analytics.

Data literacy

Data literacy refers to the ability to interpret, create, and communicate with data and analytics accurately and effectively.

Training efforts, as described in the [mentoring and user enablement](#) article, often focus on how to use the technology itself. Technology skills are important to producing high-quality solutions, but it's also important to consider how to purposely advance data literacy throughout the organization. Put another way, successful adoption takes a lot more than merely providing software and licenses to users.

How you go about improving data literacy in your organization depends on many factors, such as current user skillsets, complexity of the data, and the types of analytics

that are required. You might choose to focus on these types of activities related to data literacy:

- Interpreting charts and graphs
- Assessing the validity of data
- Performing root cause analysis
- Discerning correlation from causation
- Understanding how context and outliers affect how results are presented
- Using storytelling to help consumers quickly understand and act

💡 Tip

If you're struggling to get data culture or governance efforts approved, focusing on tangible benefits that you can achieve with data discovery ("find the data"), data democratization ("use the data"), or data literacy ("understand the data") can help. It can also be helpful to focus on specific problems that you can solve or mitigate through data culture advancements.

Getting the right stakeholders to agree on the problem is usually the first step. Then, it's a matter of getting the stakeholders to agree on the strategic approach to a solution, along with the solution details.

Questions to ask about data literacy



Use questions like those found below to assess data literacy.

- Does a common analytical vocabulary exist in the organization to talk about data and BI solutions? Alternatively, are definitions fragmented and different across silos?
- How comfortable are people with making decisions based on data and evidence compared to intuition and subjective experience?
- When people who hold an opinion are confronted with conflicting evidence, how do they react? Do they critically appraise the data, or do they dismiss it? Can they alter their opinion, or do they become entrenched and resistant?
- Do training programs exist to support people in learning about data and analytical tools?

- Is there significant resistance to visual analytics and interactive reporting in favor of static spreadsheets?
- Are people open to new analytical methods and tools to potentially address their business questions more effectively? Alternatively, do they prefer to keep using existing methods and tools to save time and energy?
- Are there methods or programs to assess or improve data literacy in the organization? Does leadership have an accurate understanding of the data literacy levels?
- Are there roles, teams, or departments where data literacy is particularly strong or weak?

Maturity levels of data literacy



The following maturity levels can help you assess your current state of data literacy.

[\[+\] Expand table](#)

Level	State of data literacy
100: Initial	<ul style="list-style-type: none"> Decisions are frequently made based on intuition and subjective experience. When confronted with data that challenges existing opinions, data is often dismissed. Individuals have low confidence to use and understand data in decision-making processes or discussions. Report consumers have a strong preference for static tables. These consumers dismiss interactive visualizations or sophisticated analytical methods as "fancy" or unnecessary.
200: Repeatable	<ul style="list-style-type: none"> Some teams and individuals inconsistently incorporate data into their decision making. There are clear cases where misinterpretation of data has led to flawed decisions or wrong conclusions. There's some resistance when data challenges pre-existing beliefs. Some people are skeptical of interactive visualizations and sophisticated analytical methods, though their use is increasing.

Level	State of data literacy
300: Defined	<ul style="list-style-type: none"> The majority of teams and individuals understand data relevant to their business area and use it implicitly to inform decisions. When data challenges pre-existing beliefs, it produces critical discussions and sometimes motivates change. Visualizations and advanced analytics are more widely accepted, though not always used effectively.
400: Capable	<ul style="list-style-type: none"> Data literacy is recognized explicitly as a necessary skill in the organization. Some training programs address data literacy. Specific efforts are taken to help departments, teams, or individuals that have particularly weak data literacy. Most individuals can effectively use and apply data to make objectively better decisions and take actions. Visual and analytical best practices are documented and followed in strategically important data solutions.
500: Efficient	<ul style="list-style-type: none"> Data literacy, critical thinking, and continuous learning are strategic skills and values in the organization. Effective programs monitor progress to improve data literacy in the organization. Decision making is driven by data across the organization. Decision intelligence or prescriptive analytics are used to recommend key decisions and actions. Visual and analytical best practices are seen as essential to generate business value with data.

Considerations and key actions



Checklist - Here are some considerations and key actions that you can take to strengthen your data culture.

- ✓ **Align your data culture goals and strategy:** Give serious consideration to the type of data culture that you want to cultivate. Ideally, it's more from a position of user empowerment than a position of command and control.
- ✓ **Understand your current state:** Talk to stakeholders in different business units to understand which analytics practices are currently working well and which practices

aren't working well for data-driven decision-making. Conduct a series of workshops to understand the current state and to formulate the desired future state.

- ✓ **Speak with stakeholders:** Talk to stakeholders in IT, BI, and the COE to understand which [governance](#) constraints need consideration. These conversations can present an opportunity to educate teams on topics like security and infrastructure. You can also use the opportunity to educate stakeholders on the features and capabilities included in Fabric.
- ✓ **Verify executive sponsorship:** Verify the level of [executive sponsorship](#) and support that you have in place to advance data culture goals.
- ✓ **Make purposeful decisions about your data strategy:** Decide what the ideal balance of business-led self-service, managed self-service, and enterprise data, analytics and BI use cases should be for the key business units in the organization (covered in the [content ownership and management](#) article). Also consider how the data strategy relates to the extent of published content for personal, team, departmental, and enterprise analytics and BI (described in the [content delivery scope](#) article). Define your high-level goals and priorities for this strategic planning. Determine how these decisions affect your tactical planning.
- ✓ **Create a tactical plan:** Begin creating a tactical plan for immediate, short-term, and long-term action items. Identify business groups and problems that represent "quick wins" and can make a visible difference.
- ✓ **Create goals and metrics:** Determine how you'll measure effectiveness for your data culture initiatives. Create key performance indicators (KPIs) or objectives and key results (OKRs) to validate the results of your efforts.

Questions to ask about data culture



Use questions like those found below to assess data culture.

- Is data regarded as a strategic asset in the organization?
- Is there a vision of a healthy data culture that originates from executive leadership and aligns with organizational objectives?
- Does the data culture guide creation of governance policies and guidelines?
- Are organizational data sources trusted by content creators and consumers?
- When justifying an opinion, decision, or choice, do people use data as evidence?
- Is knowledge about analytics and data use documented or is there a reliance on undocumented tribal knowledge?

- Are efforts to develop a data solution valued and appreciated by the user community?

Maturity levels of data culture



The following maturity levels will help you assess the current state of your data culture.

[Expand table](#)

Level	State of data culture
100: Initial	<ul style="list-style-type: none"> • Enterprise data teams can't keep up with the needs of the business. A significant backlog of requests exists. • Self-service data and BI initiatives are taking place with some success in various areas of the organization. These activities occur in a somewhat chaotic manner, with few formal processes and no strategic plan. • There's a lack of oversight and visibility into self-service BI activities. The successes or failures of data and BI solutions aren't well understood.
200: Repeatable	<ul style="list-style-type: none"> • Multiple teams have had measurable successes with self-service solutions. People in the organization are starting to pay attention. • Investments are being made to identify the ideal balance of enterprise and self-service data, analytics, and BI.
300: Defined	<ul style="list-style-type: none"> • Specific goals are established for advancing the data culture. These goals are implemented incrementally. • Learnings from what works in individual business units is shared. • Effective self-service practices are incrementally and purposely replicated throughout more areas of the organization.
400: Capable	<ul style="list-style-type: none"> • The data culture goals to employ informed decision-making are aligned with organizational objectives. They're actively supported by the executive sponsor, the COE, and they have a direct impact on adoption strategies. • A healthy and productive partnership exists between the executive sponsor, COE, business units, and IT. The teams are working towards shared goals.

Level	State of data culture
	<ul style="list-style-type: none">• Individuals who take initiative in building valuable data solutions are recognized and rewarded.
500: Efficient	<ul style="list-style-type: none">• The business value of data, analytics, and BI solutions is regularly evaluated and measured. KPIs or OKRs are used to track data culture goals and the results of these efforts.• Feedback loops are in place, and they encourage ongoing data culture improvements.• Continual improvement of organizational adoption, user adoption, and solution adoption is a top priority.

Related content

In the [next article](#) in the Microsoft Fabric adoption roadmap series, learn about the importance of an executive sponsor.

Feedback

Was this page helpful?

 Yes

 No

[Provide product feedback ↗](#) | [Ask the community ↗](#)

Microsoft Fabric adoption roadmap: Executive sponsorship

Article • 12/30/2024

ⓘ Note

This article forms part of the *Microsoft Fabric adoption roadmap* series of articles. For an overview of the series, see [Microsoft Fabric adoption roadmap](#).

When planning to advance the [data culture](#) and the state of [organizational adoption](#) for data and analytics, it's crucial to have executive support. An executive sponsor is imperative because analytics adoption is far more than just a technology project.

Although some successes can be achieved by a few determined individual contributors, the organization is in a significantly better position when a senior leader is engaged, supportive, informed, and available to assist with the following activities.

- Formulating a strategic vision, goals, and priorities for data, analytics, and business intelligence (BI).
- Providing top-down guidance and reinforcement for the data strategy by regularly promoting, motivating, and investing in strategic and tactical planning.
- Leading by example by actively using data and analytics in a way that's consistent with data culture and adoption goals.
- Allocating staffing and prioritizing resources.
- Approving funding (for example, [Fabric licenses](#)).
- Removing barriers to enable action.
- Communicating announcements that are of critical importance, to help them gain traction.
- Decision-making, particularly for strategic-level [governance](#) decisions.
- Dispute resolution (for escalated issues that can't be resolved by operational or tactical personnel).
- Supporting organizational change initiatives (for example, creating or expanding the [Center of Excellence](#)).

ⓘ Important

The ideal executive sponsor has sufficient credibility, influence, and authority throughout the organization. They also have an invested stake in data efforts and

the data strategy. When the BI strategy is successful, the ideal executive sponsor also experiences success in their role.

Identifying an executive sponsor

There are multiple ways to identify an executive sponsor.

Top-down pattern

An executive sponsor might be selected by a more senior executive. For example, the Chief Executive Officer (CEO) could hire a Chief Data Officer (CDO) or Chief Analytics Officer (CAO) to explicitly advance the organization's data culture objectives or lead digital transformation efforts. The CDO or CAO then becomes the ideal candidate to serve as the executive sponsor for Fabric (or for data and analytics in general).

Here's another example: The CEO might empower an existing executive, such as the Chief Financial Officer (CFO), because they have a good track record leading data and analytics in their organization. As the new executive sponsor, the CFO could then lead efforts to replicate the finance team's success to other areas of the organization.

ⓘ Note

Having an executive sponsor at the C-level is an excellent leading indicator. It indicates that the organization recognizes the importance of data as a strategic asset and is advancing its data culture in a positive direction.

Bottom-up pattern

Alternatively, a candidate for the executive sponsor role could emerge due to the success they've experienced with creating data solutions. For example, a business unit within the organization, such as Finance, has organically achieved great success with their use of data and analytics. Essentially, they've successfully formed their own data culture on a smaller scale. A junior-level leader who hasn't reached the executive level (such as a director) might then grow into the executive sponsor role by sharing successes with other business units across the organization.

The bottom-up approach is more likely to occur in smaller organizations. It might be because the return on investment and strategic imperative of a data culture (or digital transformation) isn't yet an urgent priority for C-level executives.

The success for a leader using the bottom-up pattern depends on being recognized by senior leadership.

With a bottom-up approach, the sponsor might be able to make some progress, but they won't have formal authority over other business units. Without clear authority, it's only a matter of time until challenges occur that are beyond their level of authority. For this reason, the top-down approach has a higher probability of success. However, initial successes with a bottom-up approach can convince leadership to increase their level of sponsorship, which might start a healthy competition across other business units in the adoption of data and BI.

Considerations and key actions



Checklist - Here's a list of considerations and key actions you can take to establish or strengthen executive support for analytics.

- ✓ **Identify an executive sponsor with broad authority:** Find someone in a sufficient position of influence and authority (across organizational boundaries) who understands the value and impact of BI. It is important that the individual has a vested interest in the success of analytics in the organization.
- ✓ **Involve your executive sponsor:** Consistently involve your executive sponsor in all strategic-level governance decisions involving data management, BI, and analytics. Also involve your sponsor in all governance data culture initiatives to ensure alignment and consensus on goals and priorities.
- ✓ **Establish responsibilities and expectation:** Formalize the arrangement with documented responsibilities for the executive sponsor role. Ensure that there's no uncertainty about expectations and time commitments.
- ✓ **Identify a backup for the sponsor:** Consider naming a backup executive sponsor. The backup can attend meetings in the sponsor's absence and make time-sensitive decisions when necessary.
- ✓ **Identify business advocates:** Find influential advocates in each business unit. Determine how their cooperation and involvement can help you to accomplish your objectives. Consider involving advocates from various levels in the organization chart.

Questions to ask



Use questions like those found below to assess data literacy.

- Has an executive sponsor of Fabric or other analytical tools been identified?
- If so, who is the executive sponsor?
- If not, is there an informal executive sponsor? Who is the closest to this role? Can you define the business impact of having no executive sponsor?
- To what extent is the strategic importance of Fabric and analytics understood and endorsed by executives?
- Are executives using Fabric and the results of data and BI initiatives? What's the sentiment among executives for the effectiveness of data solutions?
- Is the executive sponsor leading by example in the effective use of data and BI tools?
- Does the executive sponsor provide the appropriate resources for data initiatives?
- Is the executive sponsor involved in dispute resolution and change management?
- Does the executive sponsor engage with the user community?
- Does the executive sponsor have sufficient credibility and healthy relationships across organizational boundaries (particularly the business and IT)?

Maturity levels



The following maturity levels will help you assess your current state of executive support.

[] Expand table

Level	State of executive support
100: Initial	<ul style="list-style-type: none">• There might be awareness from at least one executive about the strategic importance of how analytics can advance the organization's data culture goals. However, neither a sponsor nor an executive-level decision-maker is identified.
200:	<ul style="list-style-type: none">• Informal executive support exists for analytics through informal channels and

Level	State of executive support
Repeatable	relationships.
300: Defined	<ul style="list-style-type: none"> An executive sponsor is identified. Expectations are clear for the role.
400: Capable	<ul style="list-style-type: none"> An executive sponsor is well established with someone with sufficient authority across organizational boundaries. A healthy and productive partnership exists between the executive sponsor, COE, business units, and IT. The teams are working towards shared data culture goals.
500: Efficient	<ul style="list-style-type: none"> The executive sponsor is highly engaged. They're a key driver for advancing the organization's data culture vision. The executive sponsor is involved with ongoing organizational adoption improvements. KPIs (key performance indicators) or OKRs (objectives and key results) are used to track data culture goals and the results of data, analytics, and BI efforts.

Related content

In the [next article](#) in the Microsoft Fabric adoption roadmap series, learn about the importance of business alignment with organizational goals.

Feedback

Was this page helpful?

 Yes
 No

[Provide product feedback ↗](#) | [Ask the community ↗](#)

Microsoft Fabric adoption roadmap: Business alignment

Article • 12/30/2024

ⓘ Note

This article forms part of the *Microsoft Fabric adoption roadmap* series of articles. For an overview of the series, see [Microsoft Fabric adoption roadmap](#).

Business intelligence (BI) activities and solutions have the best potential to deliver value when they're well aligned to organizational business goals. In general, effective business alignment helps to improve adoption. With effective business alignment, the [data culture](#) and [data strategy](#) enable business users to achieve their business objectives.

You can achieve effective business alignment with data activities and solutions by having:

- An understanding of the strategic importance of data and analytics in achieving measurable progress toward business goals.
- A shared awareness of the business strategy and key business objectives among content owners, creators, consumers, and administrators. A common understanding should be integral to the data culture and decision-making across the organization.
- A clear and unified understanding of the business data needs, and how meeting these needs helps content creators and content consumers achieve their objectives.
- A [governance strategy](#) that effectively balances user enablement with risk mitigation.
- An engaged [executive sponsor](#) who provides top-down guidance to regularly promote, motivate, and support the data strategy and related activities and solutions.
- Productive and solution-oriented discussions between business teams and technical teams that address business data needs and problems.
- Effective and flexible requirements gathering processes to design and [plan solutions](#).
- Structured and consistent processes to [validate](#), [deploy](#), and [support](#) solutions.
- Structured and sustainable processes to regularly update existing solutions so that they remain relevant and valuable, despite changes in technology or business objectives.

Effective business alignment brings significant benefits to an organization. Here are some benefits of effective business alignment.

- Improved adoption, because content consumers are more likely to use solutions that enable them to achieve their objectives.
- Increased business return on investment (ROI) for analytics initiatives and solutions, because these initiatives and solutions will be more likely to directly advance progress toward business goals.
- Less effort and fewer resources spent on [change management](#) and changing business requirements, due to an improved understanding of business data needs.

Achieve business alignment

There are multiple ways to achieve business alignment of data activities and initiatives.

Communication alignment

Effective and consistent communication is critical to aligning processes. Consider the following actions and activities when you want to improve communication for successful business alignment.

- Make and follow a plan for central teams and the user community to follow.
- Plan regular alignment meetings between different teams and groups. For example, central teams can plan regular planning and priority alignments with business units. Another example is when central teams schedule regular meetings to mentor and enable self-service users.
- Set up a [centralized portal](#) to consolidate communication and documentation for user communities. For strategic solutions and initiatives, consider using a [communication hub](#).
- Limit complex business and technical terminology in cross-functional communications.
- Strive for concise communication and documentation that's formatted and well organized. That way, people can easily find the information that they need.
- Consider maintaining a visible roadmap that shows the planned solutions and activities relevant to the user community in the next quarter.
- Be transparent when communicating policies, decisions, and changes.
- Create a process for people to provide feedback, and review that feedback regularly as part of regular [planning activities](#).

 **Important**

To achieve effective business alignment, you should make it a priority to identify and dismantle any communication barriers between business teams and technical teams.

Strategic alignment

Your business strategy should be well aligned with your data and BI strategy. To incrementally achieve this alignment, we recommend that you commit to following structured, iterative planning processes.

- **Strategic planning:** Define data, analytics, and BI goals and priorities based on the business strategy and current state of adoption and implementation. Typically, strategic planning occurs every 12-18 months to iteratively define high-level desired outcomes. You should synchronize strategic planning with key business planning processes.
- **Tactical planning:** Define objectives, action plans, and a backlog of solutions that help you to achieve your data and BI goals. Typically, tactical planning occurs quarterly to iteratively re-evaluate and align the data strategy and activities to the business strategy. This alignment is informed by business feedback and changes to business objectives or technology. You should synchronize tactical planning with key project planning processes.
- **Solution planning:** Design, develop, test, and deploy solutions that support content creators and consumers in achieving their business objectives. Both centralized content creators and self-service content creators conduct solution planning to ensure that the solutions they create are well aligned with business objectives. You should synchronize solution planning with key adoption and governance planning processes.

ⓘ Important

Effective business alignment is a key prerequisite for a successful [data strategy](#).

Governance and compliance alignment

A key aspect of effective business alignment is balancing user enablement and risk mitigation. This balance is an important aspect of your [governance strategy](#), together with other activities related to compliance, security and privacy, that can include:

- Transparently document and justify compliance criteria, [key governance decisions](#), and [policies](#) so that content creators and consumers know what's expected of

them.

- Regularly [audit and assess](#) activities to identify risk areas or strong deviations from the desired behaviors.
- Provide mechanisms for content owners, content creators, and content consumers to request clarification or provide feedback about existing policies.

Caution

A governance strategy that's poorly aligned with business objectives can result in more conflicts and compliance risk, because users will often pursue workarounds to complete their tasks.

Executive alignment

Executive leadership plays a key role in defining the business strategy and business goals. To this end, executive engagement is an important part of achieving top-down business alignment.

To achieve executive alignment, consider the following key considerations and activities.

- Work with your [executive sponsor](#) to organize short, quarterly executive feedback sessions about the use of data in the organization. Use this feedback to identify changes in business objectives, re-assess the data strategy, and inform future actions to improve business alignment.
- Schedule regular alignment meetings with the executive sponsor to promptly identify any potential changes in the business strategy or data needs.
- Deliver monthly executive summaries that highlight relevant information, including:
 - [Key performance indicators \(KPIs\)](#) that measure progress toward data, analytics, and BI goals.
 - Fabric adoption and implementation milestones.
 - Technology changes that might impact organizational business goals.

Important

Don't underestimate the importance of the role your [executive sponsor](#) has in achieving and maintaining effective business alignment.

Maintain business alignment

Business alignment is a continual process. To maintain business alignment, consider the following factors.

- **Assign a responsible team:** A working team reviews feedback and organizes re-alignment sessions. This team is responsible for the alignment of planning and priorities between the business and data strategy.
- **Create and support a feedback process:** Your user community requires the means to provide feedback. Examples of feedback can include requests to change existing solutions, or to create new solutions and initiatives. This feedback is essential for bottom-up business user alignment, and it drives iterative and continuous improvement cycles.
- **Measure the success of business alignment:** Consider using surveys, sentiment analysis, and usage metrics to assess the success of business alignment. When combined with other concise feedback mechanisms, this can provide valuable input to help define future actions and activities to improve business alignment and Fabric adoption.
- **Schedule regular re-alignment sessions:** Ensure that data strategic planning and tactical planning occur alongside relevant business strategy planning (when business leadership review business goals and objectives).

Note

Because business objectives continually evolve, you should understand that solutions and initiatives will change over time. Don't assume that requirements for data and BI projects are rigid and can't be altered. If you struggle with changing requirements, it might be an indication that your requirements-gathering process is ineffective or inflexible, or that your development workflows don't sufficiently incorporate regular feedback.

Important

To effectively maintain business alignment, it's essential that user feedback be promptly and directly addressed. Regularly review and analyze feedback, and consider how you can integrate it into iterative strategic planning, tactical planning, and solution planning processes.

Questions to ask



Use questions like those found below to assess [business alignment](#).

- Can people articulate the goals of the organization and the business objectives of their team?
- To what extent do descriptions of organizational goals align across the organization? How do they align between the business user community and leadership community? How do they align between business teams and technical teams?
- Does executive leadership understand the strategic importance of data in achieving business objectives? Does the user community understand the strategic importance of data in helping them succeed in their jobs?
- Are changes in the business strategy reflected promptly in changes to the data strategy?
- Are changes in business user data needs addressed promptly in data and BI solutions?
- To what extent do data policies support or conflict with existing business processes and the way that users work?
- Do solution requirements focus more on technical features than addressing business questions? Is there a structured requirements gathering process? Do content owners and creators interact effectively with stakeholders and content consumers during requirements gathering?
- How are decisions about data or BI investments made? Who makes these decisions?
- How well do people trust existing data and BI solutions? Is there a single version of truth, or are there regular debates about who has the correct version?
- How are data and BI initiatives and strategy communicated across the organization?

Maturity levels



A business alignment assessment evaluates integration between the business strategy and data strategy. Specifically, this assessment focuses on whether or not data and BI initiatives and solutions support business users to achieve business strategic objectives.

The following maturity levels will help you assess your current state of business alignment.

 [Expand table](#)

Level	State of data and business alignment**
100: Initial	<ul style="list-style-type: none">Business and data strategies lack formal alignment, which leads to reactive implementation and misalignment between data teams and business users.Misalignment in priorities and planning hinders productive discussions and effectiveness.Executive leadership doesn't recognize data as a strategic asset.
200: Repeatable	<ul style="list-style-type: none">There are efforts to align data and BI initiatives with specific data needs without a consistent approach or understanding of their success.Alignment discussions focus on immediate or urgent needs and focus on features, solutions, tools or data, rather than strategic alignment.People have a limited understanding of the strategic importance of data in achieving business objectives.
300: Defined	<ul style="list-style-type: none">Data and BI initiatives are prioritized based on their alignment with strategic business objectives. However, alignment is siloed and typically focuses on local needs.Strategic initiatives and changes have a clear, structured involvement of both the business and data strategic decision makers. Business teams and technical teams can have productive discussions to meet business and governance needs.
400: Capable	<ul style="list-style-type: none">There's a consistent, organization-wide view of how data initiatives and solutions support business objectives.Regular and iterative strategic alignments occur between the business and technical teams. Changes to the business strategy result in clear actions that are reflected by changes to the data strategy to better support business needs.Business and technical teams have healthy, productive relationships.
500: Efficient	<ul style="list-style-type: none">The data strategy and the business strategy are fully integrated. Continuous improvement processes drive consistent alignment, and they are themselves data driven.

Level	State of data and business alignment**
	<ul style="list-style-type: none">Business and technical teams have healthy, productive relationships.

Related content

In the [next article](#) in the Microsoft Fabric adoption roadmap series, learn more about content ownership and management, and its effect on business-led self-service BI, managed self-service BI, and enterprise BI.

Feedback

Was this page helpful?



Yes



No

[Provide product feedback](#) | [Ask the community](#)

Microsoft Fabric adoption roadmap: Content ownership and management

Article • 12/30/2024

ⓘ Note

This article forms part of the *Microsoft Fabric adoption roadmap* series of articles. For an overview of the series, see [Microsoft Fabric adoption roadmap](#).

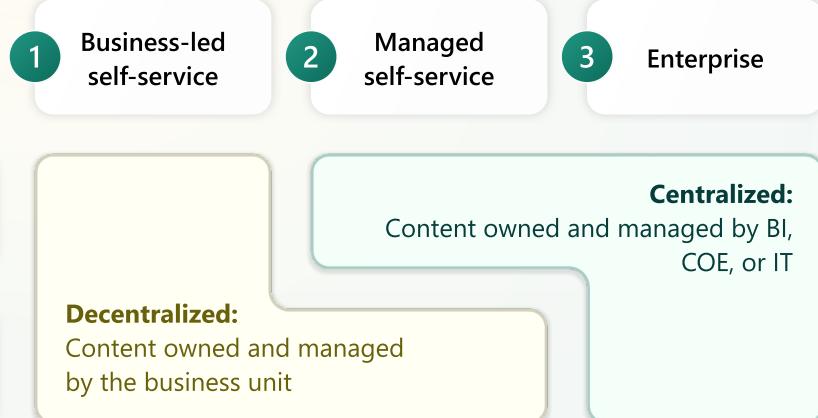
ⓘ Note

The Power BI implementation planning [usage scenarios](#) explore many concepts discussed in this article, focusing on the Power BI workload in [Microsoft Fabric](#). The usage scenario articles include detailed diagrams that you might find helpful to support your planning and decision making.

There are three primary strategies for how data, analytics, and business intelligence (BI) content is owned and managed: business-led self-service, managed self-service, and enterprise. For the purposes of this series of articles, the term *content* refers to any type of data item (like a notebook, semantic model, report, or dashboard).

The organization's data culture is the driver for why, how, and by whom each of these three content ownership strategies is implemented.

Content ownership patterns



The areas in the above diagram include:

 Expand table

Area	Description
1	Business-led self-service: All content is owned and managed by the creators and subject matter experts within a business unit. This ownership strategy is also known as a <i>decentralized</i> or <i>bottom-up</i> strategy.
2	Managed self-service: The data is owned and managed by a centralized team, whereas business users take responsibility for reports and dashboards. This ownership strategy is also known as <i>discipline at the core and flexibility at the edge</i> .
3	Enterprise: All content is owned and managed by a centralized team such as IT, enterprise BI, or the Center of Excellence (COE).

It's unlikely that an organization operates exclusively with one content ownership and management strategy. Depending on your data culture, one strategy might be far more dominant than the others. The choice of strategy could differ from solution to solution, or from team to team. In fact, a single team can actively use multiple strategies if it's both a consumer of enterprise content and a producer of its own self-service content.

The strategy to pursue depends on factors such as:

- Requirements for a solution (such as a collection of reports, a Power BI app, or a lakehouse).
- User skills.
- Ongoing commitment for training and skills growth.
- Flexibility required.
- Complexity level.
- Priorities and leadership commitment level.

The organization's [data culture](#)—particularly its position on [data democratization](#)—has considerable influence on the extent of which of the three content ownership strategies are used. While there are common patterns for success, there's no one-size-fits-all approach. Each organization's governance model and approach to content ownership and management should reflect the differences in data sources, applications, and business context.

How content is owned and managed has a significant effect on [governance](#), the extent of [mentoring and user enablement](#), needs for [user support](#), and the [COE](#) operating model.

As discussed in the [governance](#) article, the level of governance and oversight depends on:

- Who owns and manages the content.
- The [scope of content delivery](#).
- The data subject area and sensitivity level.
- The importance of the data, and whether it's used for critical decision making.

In general:

- Business-led self-service content is subject to the least stringent governance and oversight controls. It often includes [personal BI](#) and [team BI](#) solutions.
- Managed self-service content is subject to moderately stringent governance and oversight controls. It frequently includes [team BI](#) and [departmental BI](#) solutions.
- [Enterprise](#) solutions are subject to more rigorous governance controls and oversight.

As stated in the [adoption maturity levels](#) article, organizational adoption measures the state of data management processes and governance. The choices made for content ownership and management significantly affect how organizational adoption is achieved.

Ownership and stewardship

There are many roles related to data management. Roles can be defined in many ways and can be easily misunderstood. The following table presents possible ways you might conceptually define these roles:

[\[\] Expand table](#)

Role	Description
Data steward	Responsible for defining and/or managing acceptable data quality levels as well as master data management (MDM).
Subject matter expert (SME)	Responsible for defining what the data means, what it's used for, who might access it, and how the data is presented to others. Collaborates with domain owner as needed and supports colleagues in their use of data.
Technical owner	Responsible for creating, maintaining, publishing, and securing access to data and reporting items.
Domain owner	Higher-level decision-maker who collaborates with governance teams on data management policies, processes, and requirements. Decision-maker for defining appropriate and inappropriate uses of the data. Participates on the data governance board, as described in the governance article.

Assigning ownership for a data domain tends to be more straightforward when managing transactional source systems. In analytics and BI solutions, data is integrated from multiple domain areas, then transformed and enriched. For downstream analytical solutions, the topic of ownership becomes more complex.

Note

Be clear about who is responsible for managing data items. It's crucial to ensure a good experience for content consumers. Specifically, clarity on ownership is helpful for:

- Who to contact with questions.
- Feedback.
- Enhancement requests.
- Support requests.

In the Fabric portal, content owners can set the [contact list property](#) for many types of items. The contact list is also used in security workflows. For example, when a user is sent a URL to open a [Power BI app](#) but they don't have permission, they will be presented with an option to make a request for access.

Guidelines for being successful with ownership:

- Define how ownership and stewardship terminology is used in your organization, including expectations for these roles.
- Set [contacts for each workspace](#) and for individual items to communicate ownership and/or support responsibilities.
- Specify between two and four [workspace administrators](#) and conduct an [audit](#) of workspace admins regularly (perhaps twice a year). Workspace admins might be directly responsible for managing workspace content, or it could be that those tasks are assigned to colleagues who do the hands-on work. In all cases, workspace admins should be able to easily contact owners of specific content.
- Include consistent branding on reports to indicate who produced the content and who to contact for help. A small image or text label located in the report footer is valuable, especially when the report is exported from the Fabric portal. A standard [template file](#) can encourage and simplify the consistent use of branding.
- Make use of [best practices reviews](#) and [co-development projects](#) with the [COE](#).

The remainder of this article covers considerations related to the three content ownership and management strategies.

Business-led self-service

With a business-led self-service approach to data and BI, all content is owned and managed by creators and subject matter experts. Because responsibility is retained within a business unit, this strategy is often described as the *bottom-up*, or *decentralized*, approach. Business-led self-service is often a good strategy for [personal BI](#) and [team BI](#) solutions.

Important

The concept of business-led self-service isn't the same as shadow IT. In both scenarios, data and BI content is created, owned, and managed by business users. However, shadow IT implies that the business unit is circumventing IT and so the solution is not sanctioned. With business-led self-service BI solutions, the business unit has full authority to create and manage content. Resources and support from the [COE](#) are available to self-service content creators. It's also expected that the business unit will comply with all established data governance guidelines and policies.

Business-led self-service is most suitable when:

- Decentralized data management aligns with the organization's data culture, and the organization is prepared to support these efforts.
- Data exploration and freedom to innovate is a high priority.
- The business unit wants to have the most involvement and retain the highest level of control.
- The business unit has skilled users capable of—and fully committed to—supporting solutions through the entire lifecycle. It covers all types of items, including the data (such as a lakehouse, data warehouse, data pipeline, dataflow, or semantic model), the visuals (such as reports and dashboards), and Power BI apps.
- The flexibility to respond to changing business conditions and react quickly outweighs the need for stricter governance and oversight.

Here are some guidelines to help become successful with business-led self-service data and BI.

- Teach your creators to use the same techniques that IT would use, like [shared semantic models](#) and [dataflows](#). Make use of a well-organized [OneLake](#). Centralize data to reduce maintenance, improve consistency, and reduce risk.

- Focus on providing mentoring, training, resources, and documentation (described in the [Mentoring and user enablement](#) article). The importance of these efforts can't be overstated. Be prepared for skill levels of self-service content creators to vary significantly. It's also common for a solution to deliver excellent business value yet be built in such a way that it won't scale or perform well over time (as historic data volumes increase). Having the [COE](#) available to help when these situations arise is very valuable.
- Provide guidance on the best way to use endorsements. The [promoted endorsement](#) is for content produced by self-service creators. Consider reserving use of the [certified endorsement](#) for enterprise BI content and managed self-service BI content (described next).
- Analyze the [activity log](#) to discover situations where the COE could proactively contact self-service owners to offer helpful information. It's especially useful when a suboptimal usage pattern is detected. For example, log activity could reveal overuse of individual item sharing when [Power BI app audiences](#) or [workspace roles](#) might be a better choice. The data from the activity log allows the COE to offer support and advice to the business units. In turn, this information can help increase the quality of solutions, while allowing the business to retain full ownership and control of their content. For more information, see [Auditing and monitoring](#).

Managed self-service

Managed self-service BI is a blended approach to data and BI. The data is owned and managed by a centralized team (such as IT, enterprise BI, or the COE), while responsibility for reports and dashboards belongs to creators and subject matter experts within the business units. Managed self-service BI is frequently a good strategy for [team BI](#) and [departmental BI](#) solutions.

This approach is often called [discipline at the core and flexibility at the edge](#). It's because the data architecture is maintained by a single team with an appropriate level of discipline and rigor. Business units have the flexibility to create reports and dashboards based on centralized data. This approach allows report creators to be far more efficient because they can remain focused on delivering value from their data analysis and visuals.

Managed self-service BI is most suitable when:

- Centralized data management aligns with the organization's data culture.
- The organization has a team of BI experts who manage the data architecture.

- There's value in the reuse of data by many self-service report creators across organizational boundaries.
- Self-service report creators need to produce analytical content at a pace faster than the centralized team can accommodate.
- Different users are responsible for handling data preparation, data modeling, and report creation.

Here are some guidelines to help you become successful with managed self-service BI.

- Teach users to [separate model and report development](#). They can use [live connections](#) to create reports based on existing semantic models. When the semantic model is decoupled from the report, it promotes data reuse by many reports and many authors. It also facilitates the separation of duties.
- Use [dataflows](#) to centralize data preparation logic and to share commonly used data tables—like date, customer, product, or sales—with many semantic model creators. Refine the dataflow as much as possible, using friendly column names and correct data types to reduce the downstream effort required by semantic model authors, who consume the dataflow as a source. Dataflows are an effective way to reduce the time involved with data preparation and improve data consistency across semantic models. The use of dataflows also reduces the number of data refreshes on source systems and allows fewer users who require direct access to source systems.
- When self-service creators need to augment an existing semantic model with departmental data, educate them to create [composite models](#). This feature allows for an ideal balance of self-service enablement while taking advantage of the investment in data assets that are centrally managed.
- Use the [certified endorsement](#) for semantic models and dataflows to help content creators identify trustworthy sources of data.
- Include consistent branding on all reports to indicate who produced the content and who to contact for help. Branding is particularly helpful to distinguish content that is produced by self-service creators. A small image or text label in the report footer is valuable when the report is exported from the Fabric portal.
- Consider implementing separate [workspaces](#) for storing data and reports. This approach allows for better clarity on who is responsible for content. It also allows for more restrictive [workspace roles](#) assignments. That way, report creators can only publish content to their reporting workspace; and, read and build semantic model permissions allow creators to create new reports with row-level security (RLS) in effect, when applicable. For more information, see [Workspace-level planning](#). For more information about RLS, see [Content creator security planning](#).
- Use the [Power BI REST APIs](#) to compile an inventory of Power BI items. Analyze the ratio of semantic models to reports to evaluate the extent of semantic model

reuse.

Enterprise

[Enterprise](#) is a centralized approach to delivering data and BI solutions in which all solution content is owned and managed by a centralized team. This team is usually IT, enterprise BI, or the COE.

Enterprise is the most suitable when:

- Centralizing content management with a single team aligns with the organization's data culture.
- The organization has data and BI expertise to manage all items end-to-end.
- The content needs of consumers are well-defined, and there's little need to customize or explore data beyond the reporting solution that's delivered.
- Content ownership and direct access to data needs to be limited to a small number of experts and owners.
- The data is highly sensitive or subject to regulatory requirements.

Here are some guidelines to help you become successful with enterprise data and BI.

- Implement a rigorous process for use of the [certified endorsement](#) for content. Not all enterprise content needs to be certified, but much of it probably should be. Certified content should indicate that data quality has been validated. Certified content should also follow change management rules, have formal support, and be fully documented. Because certified content has passed rigorous standards, the expectations for trustworthiness are higher.
- Include consistent branding on enterprise BI reports to indicate who produced the content, and who to contact for help. A small image or text label in the report footer is valuable when the report is exported by a user.
- If you use specific report branding to indicate enterprise BI content, be careful with the *save a copy* functionality that would allow a user to download a copy of a report and personalize it. Although this functionality is an excellent way to bridge enterprise BI with managed self-service BI, it dilutes the value of the branding. A more seamless solution is to provide a separate [Power BI Desktop template file](#) for self-service authors. The template defines a starting point for report creation with a live connection to an existing semantic model, and it doesn't include branding. The template file can be shared as a link within a Power BI app, or from the [community portal](#).

Ownership transfers

Occasionally, the ownership of a particular solution might need to be transferred to another team. An ownership transfer from a business unit to a centralized team can happen when:

- A business-led solution is used by a significant number of users, or it now supports critical business decisions. In these cases, the solution should be managed by a team with processes in place to implement higher levels of governance and support.
- A business-led solution is a candidate to be used far more broadly throughout the organization, so it needs to be managed by a team who can set security and deploy content widely throughout the organization.
- A business unit no longer has the expertise, budget, or time available to continue managing the content, but the business need for the content remains.
- The size or complexity of a solution has grown to a point where a different data architecture or redesign is required.
- A proof of concept is ready to be operationalized.

The [COE](#) should have well-documented procedures for identifying when a solution is a candidate for ownership transfer. It's very helpful if help desk personnel know what to look for as well. Having a customary pattern for self-service creators to build and grow a solution, and hand it off in certain circumstances, is an indicator of a productive and healthy data culture. A simple ownership transfer could be addressed during COE [office hours](#); a more complex transfer could warrant a small project managed by the COE.

Note

There's potential that the new owner will need to do some refactoring and data validations before they're willing to take full ownership. Refactoring is most likely to occur with the less visible aspects of data preparation, data modeling, and calculations. If there are any manual steps or flat file sources, now is an ideal time to apply those enhancements. The branding of reports and dashboards might also need to change (for example, if there's a footer indicating report contact or a text label indicating that the content is certified).

It's also possible for a centralized team to transfer ownership to a business unit. It could happen when:

- The team with domain knowledge is better equipped to own and manage the content going forward.
- The centralized team has created the solution for a business unit that doesn't have the skills to create it from scratch, but it can maintain and extend the solution

going forward.

💡 Tip

Don't forget to recognize and reward the work of the original creator, particularly if ownership transfers are a common occurrence.

Considerations and key actions



Checklist - Here's a list of considerations and key actions you can take to strengthen your approach to content ownership and management.

- ✓ **Gain a full understanding of what's currently happening:** Ensure you deeply understand how content ownership and management is happening throughout the organization. Recognize that there likely won't be a one-size-fits-all approach to apply uniformly across the entire organization. Review the implementation planning [usage scenarios](#) to understand how Power BI and Fabric can be used in diverse ways.
- ✓ **Conduct discussions:** Determine what is currently working well, what isn't working well, and what the desired balance is between the three ownership strategies. If necessary, schedule discussions with specific people on various teams. Develop a plan for moving from the current state to the desired state.
- ✓ **Perform an assessment:** If your enterprise data team currently has challenges related to scheduling and priorities, do an assessment to determine if a managed self-service strategy can be put in place to empower more content creators throughout the organization. Managed self-service data and BI can be extremely effective on a global scale.
- ✓ **Clarify terminology:** Clarify terms used in your organization for owner, data steward, and subject matter expert.
- ✓ **Assign clear roles and responsibilities:** Make sure roles and responsibilities for owners, stewards, and subject matter experts are documented and well understood by everyone involved. Include backup personnel.
- ✓ **Ensure community involvement:** Ensure that all your content owners—from both the business and IT—are part of your [community of practice](#).
- ✓ **Create user guidance for owners and contacts in Fabric:** Determine how you will use the contacts feature in Fabric. Communicate with content creators about how it

should be used, and why it's important.

- ✓ **Create a process for handling ownership transfers:** If ownership transfers occur regularly, create a process for how it will work.
- ✓ **Support your advanced content creators:** Determine your strategy for using [external tools](#) for advanced authoring capabilities and increased productivity.

Questions to ask



Use questions like those found below to assess content ownership and management.

- Do central teams that are responsible for Fabric have a clear understanding of who owns what BI content? Is there a distinction between report and data items, or different item types (like Power BI semantic models, data science notebooks, or lakehouses)?
- Which [usage scenarios](#) are in place, such as [personal BI](#), [team BI](#), [departmental BI](#), or [enterprise BI](#)? How prevalent are they in the organization, and how do they differ between key business units?
- What activities do business analytical teams perform (for example, data integration, data modeling, or reporting)?
- What kinds of roles in the organizations are expected to create and own content? Is it limited to central teams, analysts, or also functional roles, like sales?
- Where does the organization sit on the spectrum of [business-led self-service](#), [managed self-service](#), or [enterprise](#)? Does it differ between key business units?
- Do strategic data and BI solutions have [ownership](#) roles and stewardship roles that are clearly defined? Which are missing?
- Are content creators and owners also responsible for supporting and updating content once it's released? How effective is the ownership of content support and updates?
- Is a clear process in place to [transfer ownership](#) of solutions (where necessary)? An example is when an external consultant creates or updates a solution.
- Do data sources have data stewards or subject matter experts (SMEs) who serve as a special point of contact?
- If your organization is already using Fabric or Power BI, does the current [workspace setup](#) comply with the content ownership and delivery strategies that are in place?

Maturity levels



The following maturity levels will help you assess the current state of your content ownership and management.

[] [Expand table](#)

Level	State of content ownership and management
100: Initial	<ul style="list-style-type: none">• Self-service content creators own and manage content in an uncontrolled way, without a specific strategy.• A high ratio of semantic models to reports exists. When many semantic models exist only support one report, it indicates opportunities to improve data reusability, improve trustworthiness, reduce maintenance, and reduce the number of duplicate semantic models.• Discrepancies between different reports are common, causing distrust of content produced by others.
200: Repeatable	<ul style="list-style-type: none">• A plan is in place for which content ownership and management strategy to use and in which circumstances.• Initial steps are taken to improve the consistency and trustworthiness levels for self-service efforts.• Guidance for the user community is available that includes expectations for self-service versus enterprise content.• Roles and responsibilities are clear and well understood by everyone involved.
300: Defined	<ul style="list-style-type: none">• Managed self-service is a priority and an area of investment to further advance the data culture. The priority is to allow report creators the flexibility they need while using well-managed, secure, and trustworthy data sources.• Report branding is consistently used to indicate who produced the content.• A mentoring program exists to educate self-service content creators on how to apply best practices and make good decisions.
400: Capable	<ul style="list-style-type: none">• Criteria are defined to align governance requirements for self-service versus enterprise content.

Level	State of content ownership and management
	<ul style="list-style-type: none">• There's a plan in place for how to request and handle ownership transfers.• Managed self-service—and techniques for the reuse of data—are commonly used and well-understood.
500: Efficient	<ul style="list-style-type: none">• Proactive steps to communicate with users occur when any concerning activities are detected in the activity log. Education and information are provided to make gradual improvements or reduce risk.• Third-party tools are used by highly proficient content creators to improve productivity and efficiency.

Related content

In the [next article](#) in the Microsoft Fabric adoption roadmap series, learn about the scope of content delivery.

Feedback

Was this page helpful?

 Yes

 No

[Provide product feedback](#) | [Ask the community](#)

Microsoft Fabric adoption roadmap: Content delivery scope

Article • 12/30/2024

ⓘ Note

This article forms part of the *Microsoft Fabric adoption roadmap* series of articles. For an overview of the series, see [Microsoft Fabric adoption roadmap](#).

The four delivery scopes described in this article include [personal](#), [team](#), [departmental](#), and [enterprise](#). To be clear, focusing on the scope of a delivered data and business intelligence (BI) solution does refer to the number of people who might view the solution, though the impact is much more than that. The scope strongly influences best practices for not only content distribution, but also [content management](#), [security](#), and [information protection](#). The scope has a direct correlation to the level of [governance](#) (such as requirements for change management, support, or documentation), the extent of [mentoring and user enablement](#), and needs for [user support](#). It also influences [user licensing](#) decisions.

The related [content ownership and management](#) article makes similar points. Whereas the focus of that article was on the content creator, the focus of this article is on the target content usage. Both inter-related aspects need to be considered to arrive at governance decisions and the [Center of Excellence \(COE\)](#) operating model.

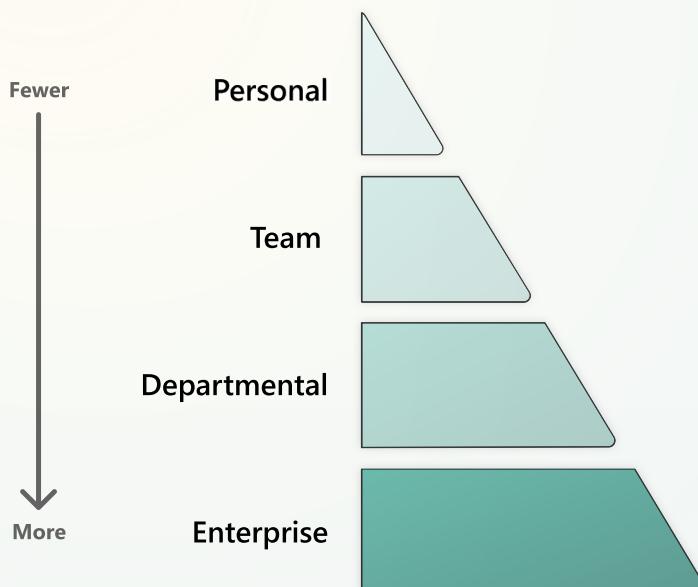
ⓘ Important

Not all data and solutions are equal. Be prepared to apply different levels of data management and governance to different teams and various types of content. Standardized rules are easier to maintain. However, flexibility or customization is often necessary to apply the appropriate level of oversight for particular circumstances. Your [executive sponsor](#) can prove invaluable by reaching consensus across stakeholder groups when difficult situations arise.

Scope of content delivery

The following diagram focuses on the number of *target consumers* who will consume the content.

Number of target consumers

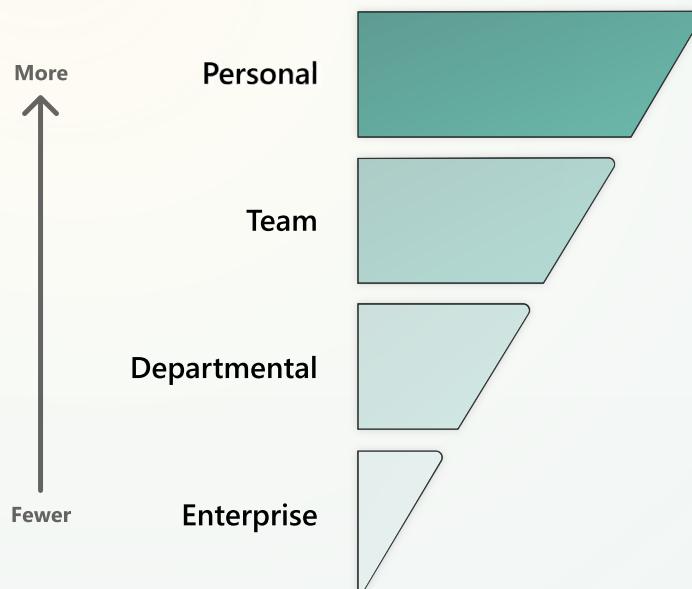


The four scopes of content delivery shown in the above diagram include:

- **Personal:** Personal solutions are, as the name implies, intended for use by the creator. Sharing content with others isn't an objective. Therefore, a personal data and BI solution has the fewest number of target consumers.
- **Team:** Collaborates and shares content with a relatively small number of colleagues who work closely together.
- **Departmental:** Delivers content to a large number of consumers, who can belong to a department or business unit.
- **Enterprise:** Delivers content broadly across organizational boundaries to the largest number of target consumers. Enterprise content is most often managed by a centralized team and is subject to additional [governance](#) requirements.

Contrast the above four scopes of content delivery with the following diagram, which has an inverse relationship with respect to the number of *content creators*.

Number of content creators



The four scopes of content creators shown in the above diagram include:

- **Personal:** Represents the largest number of creators because the [data culture](#) encourages any user to work with data using business-led self-service data and BI methods. Although managed self-service BI methods can be used, it's less common with personal data and BI efforts.
- **Team:** Colleagues within a team collaborate and share with each other by using [business-led self-service](#) patterns. It has the next largest number of creators in the organization. [Managed self-service](#) patterns could also begin to emerge as skill levels advance.
- **Departmental:** Involves a smaller population of creators. They're likely to be considered power users who are using sophisticated tools to create sophisticated solutions. [Managed self-service](#) practices are very common and highly encouraged.
- **Enterprise:** Involves the smallest number of content creators because it typically includes only professional data and BI developers who work in the BI team, the COE, or in IT.

The [content ownership and management](#) article introduced the concepts of business-led self-service, managed self-service, and enterprise. The most common alignment between ownership and delivery scope is:

- **Business-led self-service ownership:** Commonly deployed as personal and team solutions.
- **Managed self-service ownership:** Can be deployed as personal, team, or departmental solutions.

- **Enterprise ownership:** Typically deployed as enterprise-scoped solutions.

Some organizations also equate self-service content with community-based support. It's the case when self-service content creators and owners are responsible for supporting the content they publish. The [user support](#) article describes multiple informal and formal levels for support.

① Note

The term *sharing* can be interpreted two ways: It's often used in a general way related to sharing content with colleagues, which could be implemented multiple ways. It can also reference a [specific feature in Fabric](#), which is a specific implementation where a user or group is granted access to a single item. In this article, the term *sharing* is meant in a general way to describe sharing content with colleagues. When the per-item permissions are intended, this article will make a clear reference to that feature. For more information, see [Report consumer security planning](#).

Personal

The [Personal](#) delivery scope is about enabling an individual to gain analytical value. It's also about allowing them to more efficiently perform business tasks through the effective personal use of data, information, and analytics. It could apply to any type of information worker in the organization, not just data analysts and developers.

Sharing content with others isn't the objective. Personal content can reside in Power BI Desktop or in a personal workspace in the Fabric portal.

Here are the characteristics of creating content for a personal delivery scope.

- The creator's primary intention is data exploration and analysis, rather than report delivery.
- The content is intended to be analyzed and consumed by one person: the creator.
- The content might be an exploratory proof of concept that may, or may not, evolve into a project.

Here are a few guidelines to help you become successful with content developed for personal use.

- Consider personal data and BI solutions to be like an *analytical sandbox* that has little formal governance and oversight from the governance team or COE. However, it's still appropriate to educate content creators that some general

governance guidelines could still apply to personal content. Valid questions to ask include: Can the creator export the personal report and email it to others? Can the creator store a personal report on a non-organizational laptop or device? What limitations or requirements exist for content that contains sensitive data?

- See the techniques described for business-led self-service, and managed self-service in the [content ownership and management](#) article. They're highly relevant techniques that help content creators create efficient and personal data and BI solutions.
- Analyze data from the [activity log](#) to discover situations where personal solutions appear to have expanded beyond the original intended usage. It's usually discovered by detecting a significant amount of content sharing from a personal workspace.

Tip

For information about how users progress through the stages of user adoption, see the [Microsoft Fabric adoption roadmap maturity levels](#). For more information about using the activity log, see [Tenant-level auditing](#).

Team

The [Team](#) delivery scope is focused on a team of people who work closely together, and who are tasked with solving closely related problems using the same data. Collaborating and sharing content with each other in a workspace is usually the primary objective.

Content is often shared among the team more informally as compared to departmental or enterprise content. For instance, the workspace is often sufficient for consuming content within a small team. It doesn't require the formality of publishing the workspace to distribute it as an app. There isn't a specific number of users when team-based delivery is considered too informal; each team can find the right number that works for them.

Here are the characteristics of creating content for a team delivery scope.

- Content is created, managed, and viewed among a group of colleagues who work closely together.
- Collaboration and co-management of content is the highest priority.
- Formal delivery of content might occur for report viewers (especially for managers of the team), but it's usually a secondary priority.
- Reports aren't always highly sophisticated or attractive; functionality and accessing the information is what matters most.

Here are some guidelines to help you become successful with content developed for team use.

- Ensure the COE is prepared to support the efforts of self-service creators publishing content for their team.
- Make purposeful decisions about how [workspace management](#) will be handled. The workspace is a place to organize related content, a permissions boundary, and the scope for a Power BI app. It's tempting to start with one workspace per team, but that might not be flexible enough to satisfy all needs.
- See the techniques described for business-led self-service and managed self-service in the [content ownership and management](#) article. They're highly relevant techniques that help content creators create efficient and effective team data and BI solutions.

💡 Tip

For more information, see [Workspace-level planning](#).

Departmental

Content is delivered to members of a department or business unit. Content distribution to a larger number of consumers is a priority for [departmental](#) delivery scopes.

Here are the characteristics of departmental content delivery.

- A few content creators typically publish content for colleagues to consume.
- Formal delivery of reports by using Power BI apps is a high priority to ensure consumers have the best experience.
- Additional effort is made to deliver more sophisticated and polished reports. Following best practices for data preparation and higher quality data modeling is also expected.
- Needs for change management and [lifecycle management](#) begin to emerge to ensure release stability and a consistent experience for consumers.

Here are a few guidelines to help you become successful with departmental BI delivery.

- Ensure that the COE is prepared to support the efforts of self-service creators. Creators who publish content used throughout their department or business unit might emerge as candidates to become champions. Or, they might become candidates to join the COE as a [satellite member](#).

- Make purposeful decisions about how [workspace management](#) will be handled. The workspace is a place to organize related content, a permissions boundary, and the scope for an app. Several workspaces will likely be required to meet all the needs of a large department or business unit.
- Plan how [Power BI apps](#) will distribute content to the enterprise. An app can provide a significantly better user experience for consuming content. In many cases, content consumers can be granted permissions to view content via the app only, reserving workspace permissions management for content creators and reviewers only. The use of app audience groups allows you to *mix and match* content and target audience in a flexible way.
- Be clear about what data quality validations have occurred. As the importance and criticality level grows, expectations for trustworthiness grow too.
- Ensure that adequate training, mentoring, and documentation is available to support content creators. Best practices for data preparation, data modeling, and data presentation will result in better quality solutions.
- Provide guidance on the best way to use the [promoted endorsement](#), and when the [certified endorsement](#) could be permitted for departmental solutions.
- Ensure that the owner is identified for all departmental content. Clarity on ownership is helpful, including who to contact with questions, feedback, enhancement requests, or support requests. In the Fabric portal, content owners can set the [contact list property](#) for many types of items (like reports and dashboards). The contact list is also used in security workflows. For example, when a user is sent a URL to open an app but they don't have permission, they'll be presented with an option to make a request for access.
- Consider using [deployment pipelines](#) in conjunction with separate [workspaces](#). Deployment pipelines can support development, test, and production environments, which provide more stability for consumers.
- Consider enforcing the use of [sensitivity labels](#) to implement [information protection](#) on all content.
- Include consistent branding on reports by:
 - Using departmental colors and styling to indicate who produced the content.
For more information, see [Content ownership and management](#).
 - Adding a small image or text label to the report footer, which is valuable when the report is exported from the Fabric portal.
 - Using a standard Power BI Desktop template file. For more information, see [Mentoring and user enablement](#).
- Apply the techniques described for business-led self-service and managed self-service content delivery in the [Content ownership and management](#) article. They're highly relevant techniques that can help content creators to create efficient and effective departmental solutions.

Enterprise

[Enterprise](#) content is typically managed by a centralized team and is subject to additional governance requirements. Content is delivered broadly across organizational boundaries.

Here are the characteristics of enterprise content delivery.

- A centralized team of experts manages the content end-to-end and publishes it for others to consume.
- Formal delivery of data solutions like reports, lakehouses, and Power BI apps is a high priority to ensure consumers have the best experience.
- The content is highly sensitive, subject to regulatory requirements, or is considered extremely critical.
- Published enterprise-level semantic models and dataflows might be used as a source for self-service creators, thus creating a chain of dependencies to the source data.
- Stability and a consistent experience for consumers are highly important. Application lifecycle management, such as [deployment pipelines](#) and [DevOps techniques](#), is commonly used. Change management processes to review and approve changes before they're deployed are commonly used for enterprise content, for example, by a change review board or similar group.
- Processes exist to gather requirements, prioritize efforts, and plan for new projects or enhancements to existing content.
- Integration with other enterprise-level data architecture and management services could exist, possibly with other Azure services and Power Platform products.

Here are some guidelines to help you become successful with enterprise content delivery.

- Governance and oversight techniques described in the [governance](#) article are relevant for managing an enterprise solution. Techniques primarily include change management and [lifecycle management](#).
- Plan for how to effectively use [Premium Per User](#) or [Fabric capacity](#) licensing per workspace. Align your workspace management strategy, like how [workspaces](#) will be organized and secured, to the planned [licensing](#) strategy.
- Plan how Power BI apps will distribute enterprise content to consumers. An app can provide a significantly better user experience for consuming content. Align the app distribution strategy with your workspace management strategy.
- Consider enforcing the use of [sensitivity labels](#) to implement [information protection](#) on all content.

- Implement a rigorous process for use of the [certified endorsement](#) for enterprise reports and apps. Data assets can be certified, too, when there's the expectation that self-service creators will build solutions based on them. Not all enterprise content needs to be certified, but much of it probably will be.
- Make it a common practice to announce when changes will occur. For more information, see the [community of practice](#) article for a description of communication types.
- Include consistent branding on reports, by:
 - Using specific colors and styling, which can also indicate who produced the content. For more information, see [Content ownership and management](#).
 - Adding a small image or text label to the report footer, which can be valuable when the report is exported from the Fabric portal.
 - Using a standard Power BI Desktop template file. For more information, see [Mentoring and user enablement](#).
- Actively use the [lineage view](#) to understand dependencies, perform impact analysis, and communicate to downstream content owners when changes will occur.
- See the techniques described for enterprise content delivery in the [content ownership and management](#) article. They're highly relevant techniques that help content creators create efficient and effective enterprise solutions.
- See the techniques described in the [system oversight](#) article for auditing, governing, and the oversight of enterprise content.

Considerations and key actions



Checklist - Considerations and key actions you can take to strengthen your approach to content delivery.

- ✓ **Align goals for content delivery:** Ensure that guidelines, documentation, and other resources align with the strategic goals defined for Fabric adoption.
- ✓ **Clarify the scopes for content delivery in your organization:** Determine who each scope applies to, and how each scope aligns with governance decisions. Ensure that decisions and guidelines are consistent with how [content ownership and management](#) is handled.
- ✓ **Consider exceptions:** Be prepared for how to handle situations when a smaller team wants to publish content for an enterprise-wide audience.

- Will it require the content be owned and managed by a centralized team? For more information, see the [Content ownership and management](#) article, which describes an inter-related concept with content delivery scope.
 - Will there be an approval process? [Governance](#) can become more complicated when the content delivery scope is broader than the owner of the content. For example, when an app that's owned by a divisional sales team is distributed to the entire organization.
- ✓ **Create helpful documentation:** Ensure that you have sufficient training documentation and support so that your content creators understand when it's appropriate to use [workspaces](#), [apps](#), or [per-item sharing \(direct access or link\)](#).
- ✓ **Create a licensing strategy:** Ensure that you have a specific strategy in place to handle [Fabric licensing](#) considerations. Create a process for how workspaces could be assigned each license type, and the prerequisites required for the type of content that could be assigned to Premium.

ⓘ Important

At times this article refers to Power BI Premium or its capacity subscriptions (P SKUs). Be aware that Microsoft is currently consolidating purchase options and retiring the Power BI Premium per capacity SKUs. New and existing customers should consider purchasing Fabric capacity subscriptions (F SKUs) instead.

For more information, see [Important update coming to Power BI Premium licensing](#) and [Power BI Premium FAQ](#).

Questions to ask



Use questions like those found below to assess content delivery scope.

- Do central teams that are responsible for Fabric have a clear understanding of who creates and delivers content? Does it differ by business area, or for different content item types?
- Which [usage scenarios](#) are in place, such as [personal BI](#), [team BI](#), [departmental BI](#), or [enterprise BI](#)? How prevalent are they in the organization? Are there advanced scenarios, like [advanced data preparation](#) or [advanced data model management](#), or niche scenarios, like [self-service real-time analytics](#)?

- For the identified content delivery scopes in place, to what extent are guidelines being followed?
- Are there trajectories for helpful self-service content to be "promoted" from personal to team content delivery scopes and beyond? What systems and processes enable sustainable, bottom-up scaling and distribution of useful self-service content?
- What are the guidelines for publishing content to, and using, personal workspaces?
- Are personal workspaces assigned to dedicated [Fabric capacity](#)? In what circumstances are personal workspaces intended to be used?
- On average, how many reports does someone have access to? How many reports does an executive have access to? How many reports does the CEO have access to?
- If your organization is using Fabric or Power BI today, does the current [workspace setup](#) comply with the content ownership and delivery strategies that are in place?
- Is there a clear licensing strategy? How many licenses are used today? How many tenants and capacities exist, who uses them, and why?
- How do central teams decide what gets published to Premium (or Fabric) dedicated capacity, and what uses shared capacity? Do development workloads use separate Premium Per User (PPU) licensing to avoid affecting production workloads?

Maturity levels



The following maturity levels will help you assess the current state of your content delivery.

[\[\] Expand table](#)

Level	State of content delivery
100: Initial	<ul style="list-style-type: none"> Content is published for consumers by self-service creators in an uncontrolled way, without a specific strategy.
200: Repeatable	<ul style="list-style-type: none"> Pockets of good practices exist. However, good practices are overly dependent on the knowledge, skills, and habits of the content creator.

Level	State of content delivery
300: Defined	<ul style="list-style-type: none"> Clear guidelines are defined and communicated to describe what can and can't occur within each delivery scope. These guidelines are followed by some—but not all—groups across the organization.
400: Capable	<ul style="list-style-type: none"> Criteria are defined to align governance requirements for self-service versus enterprise content.
	<ul style="list-style-type: none"> Guidelines for content delivery scope are followed by most, or all, groups across the organization. Change management requirements are in place to approve critical changes for content that's distributed to a larger-sized audience. Changes are announced and follow a communication plan. Content creators are aware of the downstream effects on their content. Consumers are aware of when reports and apps are changed.
500: Efficient	<ul style="list-style-type: none"> Proactively take steps to communicate with users occur when any concerning activities are detected in the activity log. Education and information are provided to make gradual improvements or reduce risk. The business value that's achieved for deployed solutions is regularly evaluated.

Related content

In the [next article](#) in the Microsoft Fabric adoption roadmap series, learn about the Center of Excellence (COE).

Feedback

Was this page helpful?

 Yes

 No

[Provide product feedback ↗](#) | [Ask the community ↗](#)

Microsoft Fabric adoption roadmap: Center of Excellence

Article • 12/30/2024

ⓘ Note

This article forms part of the *Microsoft Fabric adoption roadmap* series of articles. For an overview of the series, see [Microsoft Fabric adoption roadmap](#).

A data or analytics Center of Excellence (COE) is an internal team of technical and business experts. The team actively assists others within the organization who are working with data. The COE forms the nucleus of the broader community to advance adoption goals, which align with the data culture vision.

A COE might also be known as *competency center*, *capability center*, or a *center of expertise*. Some organizations use the term *squad*. Many organizations perform the COE responsibilities within their data, analytics, or business intelligence (BI) team.

ⓘ Note

Having a COE team formally recognized in your organizational chart is recommended, but not required. What's most important is that the COE roles and responsibilities are identified, prioritized, and assigned. It's common for a centralized data or analytics team to take on many of the COE responsibilities; some responsibilities might also reside within IT. For simplicity, in this series of articles, COE means a *specific group of people*, although you might implement it differently. It's also very common to implement the COE with a scope broader than Fabric or Power BI alone: for instance, a Power Platform COE, a data COE, or an analytics COE.

Goals for a COE

Goals for a COE include:

- Evangelizing a data-driven culture.
- Promoting the adoption of analytics.
- Nurturing, mentoring, guiding, and educating internal users to increase their skills and level of self-reliance.

- Coordinating efforts and disseminating knowledge across organizational boundaries.
- Creating consistency and transparency for the user community, which reduces friction and pain points related to finding relevant data and analytics content.
- Maximizing the benefits of self-service BI, while reducing the risks.
- Reducing technical debt by helping users make good decisions that increase consistency and result in fewer inefficiencies.

Important

One of the most powerful aspects of a COE is the cross-departmental insight into how analytics tools like Fabric are used by the organization. This insight can reveal which practices work well and which don't, that can facilitate a bottom-up approach to governance. A primary goal of the COE is to learn which practices work well, share that knowledge more broadly, and replicate best practices across the organization.

Scope of COE responsibilities

The scope of COE responsibilities can vary significantly between organizations. In a way, a COE can be thought of as a consultancy service because its members routinely provide expert advice to the internal community of users. To varying degrees, most COEs handle hands-on work too.

Common COE responsibilities include:

- Mentoring and facilitating [knowledge sharing](#) within the internal Fabric community.
- Holding [office hours](#) to engage with the internal Fabric community.
- Conducting [co-development projects](#) and [best practices reviews](#) in order to actively help business units deliver solutions.
- Managing the [centralized portal](#).
- Producing, curating, and promoting [training materials](#).
- Creating [documentation](#) and other resources, such as [template files](#), to encourage consistent use of standards and best practices.
- Applying, communicating, and assisting with [governance](#) guidelines.
- Handling and assisting with [system oversight](#) and Fabric administration.
- Responding to [user support](#) issues escalated from the help desk.
- Developing solutions and/or proofs of concept.
- Establishing and maintaining the BI platform and data architecture.

- Communicating regularly with the internal community of users.

Staffing a COE

People who are good candidates as COE members tend to be those who:

- Understand the analytics vision for the organization.
- Have a desire to continually improve analytics practices for the organization.
- Have a deep interest in, and expertise with, analytics tools such as Fabric.
- Are interested in seeing Fabric used effectively and adopted successfully throughout the organization.
- Take the initiative to continually learn, adapt, and grow.
- Readily share their knowledge with others.
- Are interested in repeatable processes, standardization, and governance with a focus on user enablement.
- Are hyper-focused on collaboration with others.
- Are comfortable working in an agile fashion.
- Have an inherent interest in being involved and helping others.
- Can effectively translate business needs into solutions.
- Communicate well with both technical and business colleagues.

💡 Tip

If you have self-service content creators in your organization who constantly push the boundaries of what can be done, they might be a great candidate to become a recognized [champion](#), or perhaps even a satellite member of the COE.

When recruiting for the COE, it's important to have a mix of complementary analytical skills, technical skills, and business skills.

Roles and responsibilities

Very generalized roles within a COE are listed below. It's common for multiple people to overlap roles, which is useful from a backup and cross-training perspective. It's also common for the same person to serve multiple roles. For instance, most COE members also serve as a coach or mentor.

 Expand table

Role	Description
COE leader	Manages the day-to-day operations of the COE. Interacts with the executive sponsor and other organizational teams, such as the data governance board, as necessary. For an overview of additional roles and responsibilities, see the Governance article.
Coach	Coaches and educates others on data and BI skills via office hours (community engagement), best practices reviews , or co-development projects . Oversees and participates in the discussion channel of the internal community. Interacts with, and supports, the champions network .
Trainer	Develops, curates, and delivers internal training materials, documentation, and resources.
Data analyst	Domain-specific subject matter expert. Acts as a liaison between the COE and the business unit. Content creator for the business unit. Assists with content certification. Works on co-development projects and proofs of concept.
Data modeler	Creates and manages data assets (such as shared semantic model and dataflows) to support other self-service content creators.
Report creator	Creates and publishes reports, dashboards, and metrics.
Data engineer	Plans for deployment and architecture, including integration with other services and data platforms. Publishes data assets which are utilized broadly across the organization (such as a lakehouse, data warehouse, data pipeline, dataflow, or semantic model).
User support	Assists with the resolution of data discrepancies and escalated help desk support issues.

As mentioned previously, the scope of responsibilities for a COE can vary significantly between organizations. Therefore, the roles found for COE members can vary too.

Structuring a COE

The selected COE structure can vary among organizations. It's also possible for multiple structures to exist inside of a single large organization. That's particularly true when there are subsidiaries or when acquisitions have occurred.

Note

The following terms might differ to those defined for your organization, particularly the meaning of *federated*, which tends to have many different IT-related meanings.

Centralized COE

A centralized COE comprises a single shared services team.

Pros:

- There's a single point of accountability for a single team that manages standards, best practices, and delivery end-to-end.
- The COE is one group from an organizational chart perspective.
- It's easy to start with this approach and then evolve to the unified or federated model over time.

Cons:

- A centralized team might have an authoritarian tendency to favor one-size-fits-all decisions that don't always work well for all business units.
- There can be a tendency to prefer IT skills over business skills.
- Due to the centralized nature, it might be more difficult for the COE members to sufficiently understand the needs of all business units.

Unified COE

A unified COE is a single, centralized, shared services team that has been expanded to include embedded team members. The embedded team members are dedicated to supporting a specific functional area or business unit.

Pros:

- There's a single point of accountability for a single team that includes cross-functional involvement from the embedded COE team members. The embedded COE team members are assigned to various areas of the business.
- The COE is one group from an organizational chart perspective.
- The COE understands the needs of business units more deeply due to dedicated members with domain expertise.

Cons:

- The embedded COE team members, who are dedicated to a specific business unit, have a different organizational chart responsibility than the people they serve directly within the business unit. The organizational structure could potentially lead to complications, differences in priorities, or necessitate the involvement of the executive sponsor. Preferably, the executive sponsor has a scope of authority that includes the COE and all involved business units to help resolve conflicts.

Federated COE

A federated COE comprises a shared services team (the core COE members) plus satellite members from each functional area or major business unit. A federated team works in coordination, even though its members reside in different business units. Typically, satellite members are primarily focused on development activities to support their business unit while the shared services personnel support the entire community.

Pros:

- There's cross-functional involvement from satellite COE members who represent their specific functional area and have domain expertise.
- There's a balance of centralized and decentralized representation across the core and satellite COE members.
- When distributed data ownership situations exist—as could be the case when business units take direct responsibility for data management activities—this model is effective.

Cons:

- Since core and satellite members span organizational boundaries, the federated COE approach requires strong leadership, excellent communication, robust project management, and ultra-clear expectations.
- There's a higher risk of encountering competing priorities due to the federated structure.
- This approach typically involves part-time people and/or *dotted line* organizational chart accountability that can introduce competing time pressures.

Tip

Some organizations have success by using a *rotational program*. It involves federated members joining the core COE for a period of time, such as six months. This type of program allows federated members to learn best practices and understand more deeply how and why things are done. Although each federated member remains focused on their specific business unit, they gain a deeper understanding of the organization's challenges. This deeper understanding leads to a more productive partnership over time.

Decentralized COE

Decentralized COEs are independently managed by business units.

Pros:

- A specialized data culture exists that's focused on the business unit, making it easier to learn quickly and adapt.
- Policies and practices are tailored to each business unit.
- Agility, flexibility, and priorities are focused on the individual business unit.

Cons:

- There's a risk that decentralized COEs operate in isolation. As a result, they might not share best practices and lessons learned outside of their business unit.
- Collaboration with a centralized team might be informal and/or inconsistent.
- Inconsistent policies are created and applied across business units.
- It's difficult to scale a decentralized model.
- There's potential rework to bring one or more decentralized COEs in alignment with organizational-wide policies.
- Larger business units with significant funding might have more resources available to them, which might not serve cost optimization goals from an organizational-wide perspective.

Important

A highly centralized COE tends to be more *authoritarian*, while highly decentralized COEs tend to be more *siloed*. Each organization will need to weigh the pros and cons that apply to them to determine the best choice. For most organizations, the most effective approach tends to be the unified or federated, which bridges organizational boundaries.

Funding the COE

The COE might obtain its operating budget in multiple ways:

- Cost center.
- Profit center with project budget(s).
- A combination of cost center and profit center.

When the COE operates as a cost center, it absorbs the operating costs. Generally, it involves an approved annual budget. Sometimes this is called a *push* engagement model.

When the COE operates as a profit center (for at least part of its budget), it could accept projects throughout the year based on funding from other business units. Sometimes

this is called a *pull* engagement model.

Funding is important because it impacts the way the COE communicates and engages with the internal community. As the COE experiences more and more successes, they might receive more requests from business units for help. It's especially the case as awareness grows throughout the organization.

💡 Tip

The choice of funding model can determine how the COE actively grows its influence and ability to help. The funding model can also have a big impact on where authority resides and how decision-making works. Further, it impacts the types of services a COE can offer, such as co-development projects and/or best practices reviews. For more information, see the [Mentoring and user enablement](#) article.

Some organizations cover the COE operating costs with chargebacks to business units based on the usage goals of Fabric. For a shared capacity, this could be based on number of active users. For Premium capacity, chargebacks could be allocated based on which business units are using the capacity. Ideally, chargebacks are directly correlated to the business value gained.

ⓘ Important

At times this article refers to Power BI Premium or its capacity subscriptions (P SKUs). Be aware that Microsoft is currently consolidating purchase options and retiring the Power BI Premium per capacity SKUs. New and existing customers should consider purchasing Fabric capacity subscriptions (F SKUs) instead.

For more information, see [Important update coming to Power BI Premium licensing](#) and [Power BI Premium FAQ](#).

Considerations and key actions



Checklist - Considerations and key actions you can take to establish or improve your COE.

- ✓ **Define the scope of responsibilities for the COE:** Ensure that you're clear on what activities the COE can support. Once the scope of responsibilities is known, identify the skills and competencies required to fulfill those responsibilities.
- ✓ **Identify gaps in the ability to execute:** Analyze whether the COE has the required systems and infrastructure in place to meet its goals and scope of responsibilities.
- ✓ **Determine the best COE structure:** Identify which COE structure is most appropriate (centralized, unified, federated, or decentralized). Verify that staffing, roles and responsibilities, and appropriate organizational chart relationships (HR reporting) are in place.
- ✓ **Plan for future growth:** If you're starting out with a centralized or decentralized COE, consider how you will scale the COE over time by using the unified or federated approach. Plan for any actions that you can take now that'll facilitate future growth.
- ✓ **Identify customers:** Identify the internal community members, and any external customers, to be served by the COE. Decide how the COE will generally engage with those customers, whether it's a push model, pull model, or both models.
- ✓ **Verify the funding model for the COE:** Decide whether the COE is purely a cost center with an operating budget, whether it will operate partially as a profit center, and/or whether chargebacks to other business units will be required.
- ✓ **Create a communication plan:** Create your [communications strategy](#) to educate the internal community of users about the services the COE offers, and how to engage with the COE.
- ✓ **Create goals and metrics:** Determine how you'll measure effectiveness for the COE. Create KPIs (key performance indicators) or OKRs (objectives and key results) to validate that the COE consistently provides value to the user community.

Questions to ask



Use questions like those found below to assess the effectiveness of a COE.

- Is there a COE? If so, who is in the COE and what's the structure?
- If there isn't a COE, is there a central team that performs a similar function? Do data decision makers in the organization understand what a COE does?
- If there isn't a COE, does the organization aspire to create one? Why or why not?
- Are there opportunities for federated or decentralized COE models due to a mix of [enterprise](#) and [departmental](#) solutions?

- Are there any missing roles and responsibilities from the COE?
- To what extent does the COE engage with the user community? Do they mentor users? Do they curate a centralized portal? Do they maintain centralized resources?
- Is the COE recognized in the organization? Does the user community consider them to be credible and helpful?
- Do business users see central teams as enabling or restricting their work with data?
- What's the COE funding model? Do COE customers financially contribute in some way to the COE?
- How consistent and transparent is the COE with their communication?

Maturity levels



The following maturity levels will help you assess the current state of your COE.

[Expand table](#)

Level	State of the Center of Excellence
100: Initial	<ul style="list-style-type: none"> • One or more COEs exist, or the activities are performed within the data team, BI team, or IT. There's no clarity on the specific goals nor expectations for responsibilities. • Requests for assistance from the COE are handled in an unplanned manner.
200: Repeatable	<ul style="list-style-type: none"> • The COE is in place with a specific charter to mentor, guide, and educate self-service users. The COE seeks to maximize benefits of self-service approaches to data and BI while reducing the risks. • The goals, scope of responsibilities, staffing, structure, and funding model are established for the COE.
300: Defined	<ul style="list-style-type: none"> • The COE operates with active involvement from all business units in a unified or federated mode.
400: Capable	<ul style="list-style-type: none"> • The goals of the COE align with organizational goals, and they are reassessed regularly. • The COE is well-known throughout the organization, and consistently proves its value to the internal user community.

Level	State of the Center of Excellence
500: Efficient	<ul style="list-style-type: none">• Regular reviews of KPIs or OKRs evaluate COE effectiveness in a measurable way.• Agility and implementing continual improvements from lessons learned (including scaling out methods that work) are top priorities for the COE.

Related content

In the [next article](#) in the Microsoft Fabric adoption roadmap series, learn about implementing governance guidelines, policies, and processes.

Feedback

Was this page helpful?



[Provide product feedback ↗](#) | [Ask the community ↗](#)

Microsoft Fabric adoption roadmap: Governance

Article • 12/30/2024

ⓘ Note

This article forms part of the *Microsoft Fabric adoption roadmap* series of articles. For an overview of the series, see [Microsoft Fabric adoption roadmap](#).

Data governance is a broad and complex topic. This article introduces key concepts and considerations. It identifies important actions to take when adopting Microsoft Fabric, but it's not a comprehensive reference for data governance.

As defined by the [Data Governance Institute](#), data governance is "a system of decision rights and accountabilities for information-related processes, executed according to agreed-upon models which describe who can take what actions, with what information, and when, under what circumstances, using what methods."

The term *data governance* is a misnomer. The primary focus for governance isn't on the data itself. The focus is on governing *what users do with the data*. Put another way: the true focus is on governing user's behavior to ensure organizational data is well managed.

When focused on self-service data and business intelligence (BI), the primary goals of governance are to achieve the proper balance of:

- **User empowerment:** Empower the internal user community to be productive and efficient, within requisite guardrails.
- **Regulatory compliance:** Comply with the organization's industry, governmental, and contractual regulations.
- **Internal requirements:** Adhere to the organization's internal requirements.

The optimal balance between control and empowerment will differ between organizations. It's also likely to differ among different business units within an organization. You'll be most successful with a platform like Fabric when you put as much emphasis on user empowerment as on clarifying its practical usage within established guardrails.

💡 Tip

Think of governance as a set of established guidelines and formalized policies. All governance guidelines and policies should align with your organizational [data culture](#) and adoption objectives. Governance is enacted on a day-to-day basis by your [system oversight](#) (administration) activities.

Governance strategy

When considering data governance in any organization, the best place to start is by defining a governance strategy. By focusing first on the strategic goals for data governance, all detailed decisions when implementing governance policies and processes can be informed by the strategy. In turn, the governance strategy will be defined by the organization's [data culture](#).

Governance decisions are implemented with documented guidance, policies, and processes. Objectives for governance of a self-service data and BI platform, such as Fabric, include:

- Empowering users throughout the organization to use data and make decisions, within the defined boundaries.
- Improving the user experience by providing clear and transparent guidance (with minimal friction) on what actions are permitted, why, and how.
- Ensuring that the data usage is appropriate for the needs of the business.
- Ensuring that content ownership and stewardship responsibilities are clear. For more information, see the [Content ownership and management](#) article.
- Enhancing the consistency and standardization of working with data across organizational boundaries.
- Reducing risk of data leakage and misuse of data. For more information, see the [information protection and data loss prevention series of articles](#) article.
- Meeting regulatory, industry, and internal requirements for the proper use of data.

💡 Tip

A well-executed data governance strategy makes it easier for more users to work with data. When governance is approached from the perspective of user empowerment, users are more likely to follow the documented processes. Accordingly, the users become a trusted partner too.

Governance success factors

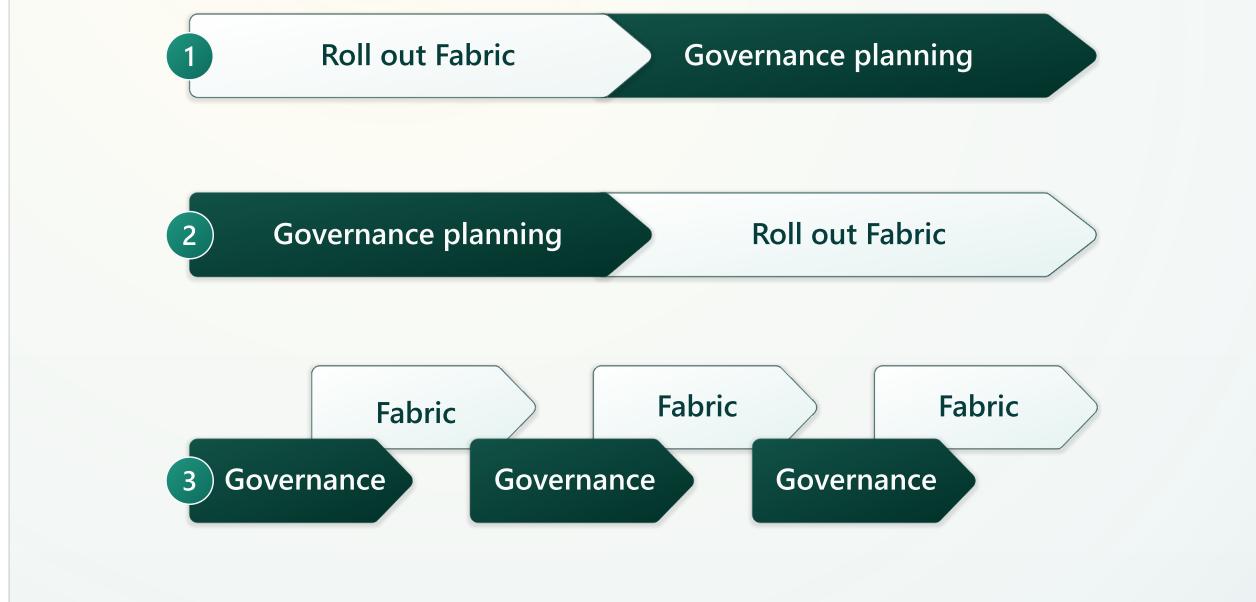
Governance isn't well-received when it's enacted with top-down mandates that are focused more on control than empowerment. Governing Fabric is most successful when:

- The most lightweight governance model that accomplishes required objectives is used.
- Governance is approached on an iterative basis and doesn't significantly impede productivity.
- A bottom-up approach to formulating governance guidelines is used whenever practical. The [Center of Excellence \(COE\)](#) and/or the data governance team observes successful behaviors that are occurring within a business unit. The COE then takes action to scale out to other areas of the organization.
- Governance decisions are co-defined with input from different business units before they're enacted. Although there are times when a specific directive is necessary (particularly in heavily regulated industries), mandates should be the exception rather than the rule.
- Governance needs are balanced with flexibility and the ability to be productive.
- Governance requirements can be satisfied as part of users' regular workflow, making it easier for users to do the right thing in the right way with little friction.
- The answer to new requests for data isn't "no" by default, but rather "yes and" with clear, simple, transparent rules for what governance requirements are for data access, usage, and sharing.
- Users that need access to data have incentive to do so through normal channels, complying with governance requirements, rather than circumventing them.
- Governance decisions, policies, and requirements for users to follow are in alignment with organizational data culture goals as well as other existing data governance initiatives.
- Decisions that affect what users can—and can't—do aren't made solely by a system administrator.

Introduce governance to your organization

There are three primary timing methods organizations take when introducing Fabric governance to an organization.

Approaches to governance planning



The methods in the above diagram include:

[Expand table](#)

Method	Strategy followed
1	Roll out Fabric first, then introduce governance: Fabric is made widely available to users in the organization as a new self-service data and BI tool. Then, at some time in the future, a governance effort begins. This method prioritizes agility.
2	Full governance planning first, then roll out Fabric: Extensive governance planning occurs prior to permitting users to begin using Fabric. This method prioritizes control and stability.
3	Iterative governance planning with rollouts of Fabric in stages: Just enough governance planning occurs initially. Then Fabric is iteratively rolled out in stages to individual teams while iterative governance enhancements occur. This method equally prioritizes agility and governance.

Choose method 1 when Fabric is already used for self-service scenarios, and you're ready to start working in a more efficient manner.

Choose method 2 when your organization already has a well-established approach to governance that can be readily expanded to include Fabric.

Choose method 3 when you want to have a balance of control agility. This balanced approach is the best choice for most organizations and most scenarios.

Each method is described in the following sections.

Method 1: Roll out Fabric first

Method 1 prioritizes agility and speed. It allows users to quickly get started creating solutions. This method occurs when Fabric has been made widely available to users in the organization as a new self-service data and BI tool. Quick wins and some successes are achieved. At some point in the future, a governance effort begins, usually to bring order to an unacceptable level of chaos since the self-service user population didn't receive sufficient guidance.

Pros:

- Fastest to get started
- Highly capable users can get things done quickly
- Quick wins are achieved

Cons:

- Higher effort to establish governance once Fabric is used prevalently throughout the organization
- Resistance from self-service users who are asked to change what they've been doing
- Self-service users need to figure out things on their own, which is inefficient and results in inconsistencies
- Self-service users need to use their best judgment, which produces technical debt to be resolved

See other possible cons in the [Governance challenges](#) section below.

Method 2: In-depth governance planning first

Method 2 prioritizes control and stability. It lies at the opposite end of the spectrum from method 1. Method 2 involves doing extensive governance planning before rolling out Fabric. This situation is most likely to occur when the implementation of Fabric is led by IT. It's also likely to occur when the organization operates in a highly regulated industry, or when an existing data governance board imposes significant prerequisites and up-front requirements.

Pros:

- More fully prepared to meet regulatory requirements
- More fully prepared to support the user community

Cons:

- Favors enterprise content development more than self-service
- Slower to allow the user population to begin to get value and improve decision-making
- Encourages poor habits and workarounds when there's a significant delay in allowing the use of data for decision-making

Method 3: Iterative governance with rollouts

Method 3 seeks a balance between agility and governance. It's an ideal scenario that does *just enough* governance planning upfront. Frequent and continual governance improvements iteratively occur over time alongside Fabric development projects that deliver value.

Pros:

- Puts equal priority on governance and user productivity
- Emphasizes a *learning as you go* mentality
- Encourages iterative releases to groups of users in stages

Cons:

- Requires a high level of communication to be successful with agile governance practices
- Requires additional discipline to keep documentation and training current
- Introducing new governance guidelines and policies too often causes a certain level of user disruption

For more information about up-front planning, see the [Preparing to migrate to Power BI](#) article.

Governance challenges

If your organization has implemented Fabric without a governance approach or strategic direction (as described above by method 1), there could be numerous challenges requiring attention. Depending on the approach that you've taken and your current state, some of the following challenges could be applicable to your organization.

Strategy challenges

- Lack of a cohesive data governance strategy that aligns with the business strategy
- Lack of executive support for governing data as a strategic asset

- Insufficient adoption planning for advancing adoption and the maturity level of BI and analytics

People challenges

- Lack of aligned priorities between centralized teams and business units
- Lack of identified champions with sufficient expertise and enthusiasm throughout the business units to advance organizational adoption objectives
- Lack of awareness of self-service best practices
- Resistance to following newly introduced governance guidelines and policies
- Duplicate effort spent across business units
- Lack of clear accountability, roles, and responsibilities

Process challenges

- Lack of clearly defined processes resulting in chaos and inconsistencies
- Lack of standardization or repeatability
- Insufficient ability to communicate and share lessons learned
- Lack of documentation and over-reliance on tribal knowledge
- Inability to comply with security and privacy requirements

Data quality and data management challenges

- Sprawl of data and reports
- Inaccurate, incomplete, or outdated data
- Lack of trust in the data, especially for content produced by self-service content creators
- Inconsistent reports produced without sufficient data validation
- Valuable data not used or difficult to access
- Fragmented, siloed, and duplicated data
- Lack of data catalog, inventory, glossary, or lineage
- Unclear data ownership and stewardship

Skills and data literacy challenges

- Varying levels of ability to interpret, create, and communicate with data effectively
- Varying levels of technical skillsets and skill gaps
- Lack of ability to confidently manage data diversity and volume
- Underestimating the level of complexity for BI solution development and management throughout its entire lifecycle

- Short tenure with continual staff transfers and turnover
- Coping with the speed of change for cloud services

💡 Tip

Identifying your current challenges—as well as your strengths—is essential to do proper governance planning. There's no single straightforward solution to the challenges listed above. Each organization needs to find the right balance and approach that solves the challenges that are most important to them. The challenges presented above will help you identify how they might affect your organization, so you can start thinking about what the right solution is for your circumstances.

Governance planning

Some organizations have implemented Fabric without a governance approach or clear strategic direction (as described above by method 1). In this case, the effort to begin governance planning can be daunting.

If a formal governance body doesn't currently exist in your organization, then the focus of your governance planning and implementation efforts will be broader. If, however, there's an existing data governance board in the organization, then your focus is primarily to integrate with existing practices and customize them to accommodate the objectives for self-service and enterprise data and BI scenarios.

ⓘ Important

Governance is a big undertaking, and it's never completely *done*. Relentlessly prioritizing and iterating on improvements will make the scope more manageable. If you track your progress and accomplishments each week and each month, you'll be amazed at the impact over time. The [maturity levels](#) at the end of each article in this series can help you to assess where you are currently.

Some potential governance planning activities and outputs that you might find valuable are described next.

Strategy

Key activities:

- Conduct a series of workshops to gather information and assess the current state of data culture, adoption, and data and BI practices. For guidance about how to gather information and define the current state of BI adoption, including governance, see [BI strategic planning](#).
- Use the current state assessment and information gathered to define the desired future state, including governance objectives. For guidance about how to use this current state definition to decide on your desired future state, see [BI tactical planning](#).
- Validate the focus and scope of the governance program.
- Identify existing bottom-up initiatives in progress.
- Identify immediate pain points, issues, and risks.
- Educate senior leadership about governance, and ensure [executive sponsorship](#) is sufficient to sustain and grow the program.
- Clarify where Power BI fits in to the overall [BI and analytics strategy](#) for the organization.
- Assess internal factors such as organizational readiness, maturity levels, and key challenges.
- Assess external factors such as risk, exposure, regulatory, and legal requirements—including regional differences.

Key output:

- Business case with cost/benefit analysis
- Approved governance objectives, focus, and priorities that are in alignment with high-level business objectives
- Plan for short-term goals and priorities (quick wins)
- Plan for long-term and deferred goals and priorities
- Success criteria and measurable key performance indicators (KPIs)
- Known risks documented with a mitigation plan
- Plan for meeting industry, governmental, contractual, and regulatory requirements that impact BI and analytics in the organization
- Funding plan

People

Key activities:

- Establish a governance board and identify key stakeholders.
- Determine focus, scope, and a set of responsibilities for the governance board.
- Establish a COE.
- Determine focus, scope, and a set of responsibilities for COE.
- Define roles and responsibilities.

- Confirm who has decision-making, approval, and veto authority.

Key output:

- Charter for the governance board
- Charter and priorities for the COE
- Staffing plan
- Roles and responsibilities
- Accountability and decision-making matrix
- Communication plan
- Issue management plan

Policies and processes

Key activities:

- Analyze immediate pain points, issues, risks, and areas to improve the user experience.
- Prioritize data policies to be addressed by order of importance.
- Identify existing processes in place that work well and can be formalized.
- Determine how new data policies will be socialized.
- Decide to what extent data policies might differ or be customized for different groups.

Key output:

- Process for how data policies and documentation will be defined, approved, communicated, and maintained
- Plan for requesting valid exceptions and departures from documented policies

Project management

The implementation of the governance program should be planned and managed as a series of projects.

Key activities:

- Establish a timeline with priorities and milestones.
- Identify related initiatives and dependencies.
- Identify and coordinate with existing bottom-up initiatives.
- Create an iterative project plan that's aligned with high-level prioritization.
- Obtain budget approval and funding.
- Establish a tangible way to track progress.

Key output:

- Project plan with iterations, dependencies, and sequencing
- Cadence for retrospectives with a focus on continual improvements

(i) Important

The scope of activities listed above that will be useful to take on will vary considerably between organizations. If your organization doesn't have existing processes and workflows for creating these types of outputs, refer to the guidance found in the [adoption roadmap conclusion](#) for some helpful resources, as well as the [implementation planning BI strategy articles](#).

Governance policies

Decision criteria

All governance decisions should be in alignment with the established goals for [organizational adoption](#). Once the strategy is clear, more tactical governance decisions will need to be made which affect the day-to-day activities of the self-service user community. These types of tactical decisions correlate directly to the data policies that get created.

How we go about making governance decisions depends on:

- **Who owns and manages the data and BI content?** The [Content ownership and management](#) article introduced three types of strategies: business-led self-service, managed self-service, and enterprise. Who owns and manages the content has a significant impact on governance requirements.
- **What is the scope for delivery of the data and BI content?** The [Content delivery scope](#) article introduced four scopes for delivery of content: personal, team, departmental, and enterprise. The scope of delivery has a considerable impact on governance requirements.
- **What is the data subject area?** The data itself, including its sensitivity level, is an important factor. Some data domains inherently require tighter controls. For instance, personally identifiable information (PII), or data subject to regulations, should be subject to stricter governance requirements than less sensitive data.
- **Is the data, and/or the BI solution, considered critical?** If you can't make an informed decision easily without this data, you're dealing with critical data elements. Certain reports and apps could be deemed critical because they meet a

set of predefined criteria. For instance, the content is delivered to executives. Predefined criteria for what's considered *critical* helps everyone have clear expectations. Critical data is usually subject to stricter governance requirements.

💡 Tip

Different combinations of the above four criteria will result in different governance requirements for Fabric content.

Key Fabric governance decisions

As you explore your goals and objectives and pursue more tactical data governance decisions as described above, it will be important to determine what the highest priorities are. Deciding where to focus your efforts can be challenging.

The following list includes items that you might choose to prioritize when introducing governance for Fabric.

- Recommendations and requirements for [content ownership and management](#)
- Recommendations and requirements for [content delivery scope](#)
- Recommendations and requirements for content [distribution and sharing](#) with colleagues, as well as for [external users](#), such as customers, partners, or vendors
- How users are permitted to work with regulated data and highly sensitive data
- Allowed use of unverified data sources that are unknown to IT
- When manually maintained data sources, such as Excel or flat files, are permitted
- Who is permitted to [create a workspace](#)
- How to manage [workspaces](#) effectively
- How [personal workspaces](#) are effectively used
- Which workspaces are assigned to [Fabric capacity](#)
- Who is allowed to be a [Fabric administrator](#)
- [Security](#), privacy, and data protection requirements, and allowed actions for content assigned to each [sensitivity label](#)
- Allowed or encouraged use of [personal gateways](#)
- Allowed or encouraged use of [self-service purchasing](#) of user licenses
- Requirements for who can [certify](#) content, as well as requirements that must be met
- Application lifecycle management for managing content through its entire lifecycle, including [development, test, and production stages](#)
- Additional requirements applicable to critical content, such as data quality verifications and documentation

- Requirements to use standardized master data and common data definitions to improve consistency across data assets
- Recommendations and requirements for use of [external tools](#) by advanced content creators

If you don't make governance decisions and communicate them well, users will use their own judgment for how things should work—and that often results in inconsistent approaches to common tasks.

Although not every governance decision needs to be made upfront, it's important that you identify the areas of greatest risk in your organization. Then, incrementally implement governance policies and processes that will deliver the most impact.

Data policies

A data policy is a document that defines what users can and can't do. You might call it something different, but the goal remains the same: when decisions—such as those discussed in the previous section—are made, they're documented for use and reference by the community of users.

A data policy should be as short as possible. That way, it's easy for people to understand what is being asked of them.

A data policy should include:

- Policy name, purpose, description, and details
- Specific responsibilities
- Scope of the policy (organization-wide versus departmental-specific)
- Audience for the policy
- Policy owner, approver, and contact
- How to request an exception
- How the policy will be audited and enforced
- Regulatory or legal requirements met by the policy
- Reference to terminology definitions
- Reference to any related guidelines or policies
- Effective date, last revision date, and change log

Note

Locate, or link to, data policies from your [centralized portal](#).

Here are three common data policy examples you might choose to prioritize.

Policy	Description
Data ownership policy	Specifies when an owner is required for a data asset, and what the data owner's responsibilities include, such as: supporting colleagues who view the content, maintaining appropriate confidentiality and security, and ensuring compliance.
Data certification (endorsement) policy	Specifies the process that is followed to certify content. Requirements might include activities such as: data accuracy validation, data source and lineage review, technical review of the data model, security review, and documentation review.
Data classification and protection policy	Specifies activities that are allowed and not allowed per classification (sensitivity level). It should specify activities such as: allowed sharing with external users, with or without a non-disclosure agreement (NDA), encryption requirements, and ability to download the data. Sometimes, it's also called a <i>data handling policy</i> or a <i>data usage policy</i> . For more information, see the Information protection for Power BI article.

⊗ Caution

Having a lot of documentation can lead to a false sense that everything is under control, which can lead to complacency. The level of engagement that the [COE](#) has with the user community is one way to improve the chances that governance guidelines and policies are consistently followed. Auditing and monitoring activities are also important.

Scope of policies

Governance decisions will rarely be one-size-fits-all across the entire organization. When practical, it's wise to start with standardized policies, and then implement exceptions as needed. Having a clearly defined strategy for how policies will be handled for centralized and decentralized teams will make it much easier to determine how to handle exceptions.

Pros of organization-wide policies:

- Much easier to manage and maintain
- Greater consistency
- Encompasses more use cases
- Fewer policies overall

Cons of organization-wide policies:

- Inflexible
- Less autonomy and empowerment

Pros of departmental-scope policies:

- Expectations are clearer when tailored to a specific group
- Customizable and flexible

Cons of departmental-scope policies:

- More work to manage
- More policies that are siloed
- Potential for conflicting information
- Difficult to scale more broadly throughout the organization

💡 Tip

Finding the right balance of standardization and customization for supporting self-service data and BI across the organization can be challenging. However, by starting with organizational policies and mindfully watching for exceptions, you can make meaningful progress quickly.

Staffing and accountability

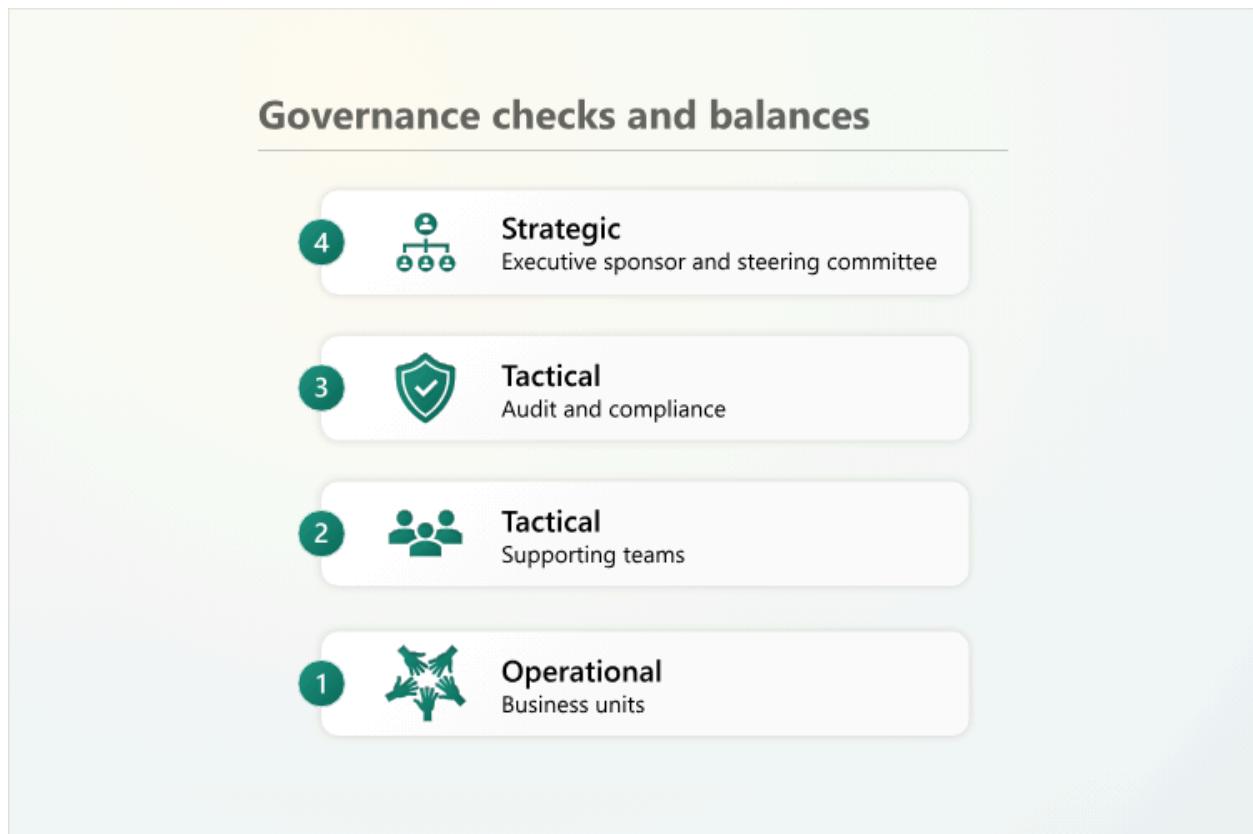
The organizational structure for data governance varies substantially between organizations. In larger organizations there might be a data governance office with dedicated staff. Some organizations have a data governance board, council, or steering committee with assigned members coming from different business units. Depending on the extent of the data governance body within the organization, there could be an executive team separate from a functional team of people.

ⓘ Important

Regardless of how the governance body is structured, it's important that there's a person or group with sufficient influence over data governance decisions. This person should have authority to enforce those decisions across organizational boundaries.

Checks and balances

Governance accountability is about checks and balances.



Starting with the first level, the levels of checks and balances in the above diagram include:

[\[+\] Expand table](#)

Level	Description
1	Operational - Business units: Level 1 is the foundation of a well-governed system, which includes users within the business units performing their work. Self-service data and BI creators have a lot of responsibilities related to authoring, publishing, sharing, security, and data quality. Self-service data and BI consumers also have responsibilities for the proper use of data.
2	Tactical - Supporting teams: Level 2 includes several groups that support the efforts of the users in the business units. Supporting teams include the COE, enterprise data and BI, the data governance office, as well as other ancillary teams. Ancillary teams can include IT, security, HR, and legal. A change control board is included here as well.
3	Tactical - Audit and compliance: Level 3 includes internal audit, risk management, and compliance teams. These teams provide guidance to levels 1 and 2. They also provide enforcement when necessary.
4	Strategic - Executive sponsor and steering committee: The highest level includes the executive-level oversight of strategy and priorities. This level handles any escalated issues that couldn't be solved at lower levels. Therefore, it's important to have a leadership team with sufficient authority to be able to make decisions when necessary.

ⓘ Important

Everyone has a responsibility to adhere to policies for ensuring that organizational data is secure, protected, and well-managed as an organizational asset. Sometimes this is cited as *everyone is a data steward*. To make this a reality, start with the users in the business units (level 1 described above) as the foundation.

Roles and responsibilities

Once you have a sense for your governance strategy, roles and responsibilities should be defined to establish clear expectations.

Governance team structure, roles (including terminology), and responsibilities vary widely among organizations. Very generalized roles are described in the table below. In some cases, the same person could serve multiple roles. For instance, the Chief Data Officer (CDO) could also be the executive sponsor.

[\[+\] Expand table](#)

Role	Description
Chief Data Officer or Chief Analytics Officer	Defines the strategy for use of data as an enterprise asset. Oversees enterprise-wide governance guidelines and policies.
Data governance board	Steering committee with members from each business unit who, as domain owners, are empowered to make enterprise governance decisions. They make decisions on behalf of the business unit <i>and</i> in the best interest of the organization. Provides approvals, decisions, priorities, and direction to the enterprise data governance team and working committees.
Data governance team	Creates governance policies, standards, and processes. Provides enterprise-wide oversight and optimization of data integrity, trustworthiness, privacy, and usability. Collaborates with the COE to provide governance education, support, and mentoring to data owners and content creators.
Data governance working committees	Temporary or permanent teams that focus on individual governance topics, such as security or data quality.
Change management board	Coordinates the requirements, processes, approvals, and scheduling for release management processes with the objective of reducing risk and minimizing the impact of changes to critical applications.
Project	Manages individual governance projects and the ongoing data governance

Role	Description
management office	program.
Fabric executive sponsor	Promotes adoption and the successful use of Fabric. Actively ensures that Fabric decisions are consistently aligned with business objectives, guiding principles, and policies across organizational boundaries. For more information, see the Executive sponsorship article.
Center of Excellence	Mentors the community of creators and consumers to promote the effective use of Fabric for decision-making. Provides cross-departmental coordination of Fabric activities to improve practices, increase consistency, and reduce inefficiencies. For more information, see the Center of Excellence article.
Fabric champions	A subset of content creators found within the business units who help advance the adoption of Fabric. They contribute to data culture growth by advocating the use of best practices and actively assisting colleagues. For more information, see the Community of practice article.
Fabric administrators	Day-to-day-system oversight responsibilities to support the internal processes, tools, and people. Handles monitoring, auditing, and management. For more information, see the System oversight article.
Information technology	Provides occasional assistance to Fabric administrators for services related to Fabric, such as Microsoft Entra ID, Microsoft 365, Teams, SharePoint, or OneDrive.
Risk management	Reviews and assesses data sharing and security risks. Defines ethical data policies and standards. Communicates regulatory and legal requirements.
Internal audit	Auditing of compliance with regulatory and internal requirements.
Data steward	Collaborates with governance committee and/or COE to ensure that organizational data has acceptable data quality levels.
All BI creators and consumers	Adheres to policies for ensuring that data is secure, protected, and well-managed as an organizational asset.

💡 Tip

Name a backup for each person in key roles, for example, members of the data governance board. In their absence, the backup person can attend meetings and make time-sensitive decisions when necessary.

Considerations and key actions



Checklist - Considerations and key actions you can take to establish or strengthen your governance initiatives.

- ✓ **Align goals and guiding principles:** Confirm that the high-level goals and guiding principles of the data culture goals are clearly documented and communicated. Ensure that alignment exists for any new governance guidelines or policies.
- ✓ **Understand what's currently happening:** Ensure that you have a deep understanding of how Fabric is currently used for self-service and enterprise data and BI scenarios. Document opportunities for improvement. Also, document strengths and good practices that would be helpful to scale out more broadly.
- ✓ **Prioritize new governance guidelines and policies:** For prioritizing which new guidelines or policies to create, select an important pain point, high priority need, or known risk for a data domain. It should have significant benefit and can be achieved with a feasible level of effort. When you implement your first governance guidelines, choose something users are likely to support because the change is low impact, or because they are sufficiently motivated to make a change.
- ✓ **Create a schedule to review policies:** Determine the cadence for how often data policies are reevaluated. Reassess and adjust when needs change.
- ✓ **Decide how to handle exceptions:** Determine how conflicts, issues, and requests for exceptions to documented policies will be handled.
- ✓ **Understand existing data assets:** Confirm that you understand what critical data assets exist. Create an inventory of ownership and lineage, if necessary. Keep in mind that you can't govern what you don't know about.
- ✓ **Verify executive sponsorship:** Confirm that you have support and sufficient attention from your [executive sponsor](#), as well as from business unit leaders.
- ✓ **Prepare an action plan:** Include the following key items:
 - **Initial priorities:** Select one data domain or business unit at a time.
 - **Timeline:** Work in iterations long enough to accomplish meaningful progress, yet short enough to periodically adjust.
 - **Quick wins:** Focus on tangible, tactical, and incremental progress.
 - **Success metrics:** Create measurable metrics to evaluate progress.

Questions to ask



Use questions like those found below to assess governance.

- At a high level, what's the current governance strategy? To what extent is the purpose and importance of this governance strategy clear to both end users and the central data and BI teams?
- In general, is the current governance strategy effective?
- What are the key regulatory and compliance criteria that the organization (or specific business units) must adhere to? Where's this criteria documented? Is this information readily available to people who work with data and share data items as a part of their role?
- How well does the current governance strategy align to the user's way of working?
- Is a specific role or team responsible for governance in the organization?
- Who has the authority to create and change governance policies?
- Do governance teams use [Microsoft Purview](#) or another tool to support governance activities?
- What are the prioritized governance risks, such as risks to [security](#), [information protection](#), and [data loss prevention](#)?
- What's the potential business impact of the identified governance risks?
- How frequently is the governance strategy re-evaluated? What metrics are used to evaluate it, and what mechanisms exist for business users to provide feedback?
- What types of user behaviors create risk when users work with data? How are those risks mitigated?
- What sensitivity labels are in place, if any? Are data and BI decision makers aware of sensitivity labels and the benefits to the business?
- What data loss prevention policies are in place, if any?
- How is "Export to Excel" handled? What steps are taken to prevent data loss prevention? What's the prevalence of "Export to Excel"? What do people do with data once they have it in Excel?
- Are there practices or solutions that are out of regulatory compliance that must be urgently addressed? Are these examples justified with an explanation of the potential business impact, should they not be addressed?

💡 Tip

"Export to Excel" is typically a controversial topic. Often, business users focus on the requirement to have "Export to Excel" possible in BI solutions. Enabling "Export to

"Excel" can be counter-productive because a business objective isn't to get data into Excel. Instead, define why end users need the data in Excel. Ask what they do with the data once it's in Excel, which business questions they try to answer, what decisions they make, and what actions they take with the data.

Focusing on business decisions and actions helps steer focus away from tools and features and toward helping people achieve their business objectives.

Maturity levels



The following maturity levels will help you assess the current state of your governance initiatives.

[] [Expand table](#)

Level	State of governance
100: Initial	<ul style="list-style-type: none">• Due to a lack of governance planning, the good data management and informal governance practices that are occurring are overly reliant on judgment and experience level of individuals.• There's a significant reliance on undocumented tribal knowledge.
200: Repeatable	<ul style="list-style-type: none">• Some areas of the organization have made a purposeful effort to standardize, improve, and document their data management and governance practices.• An initial governance approach exists. Incremental progress is being made.
300: Defined	<ul style="list-style-type: none">• A complete governance strategy with focus, objectives, and priorities is enacted and broadly communicated.• Specific governance guidelines and policies are implemented for the top few priorities (pain points or opportunities). They're actively and consistently followed by users.• Roles and responsibilities are clearly defined and documented.
400: Capable	<ul style="list-style-type: none">• All Fabric governance priorities align with organizational goals and business objectives. Goals are reassessed regularly.• Processes exist to customize policies for decentralized business units, or to

Level	State of governance
	<p>handle valid exceptions to standard governance policies.</p> <ul style="list-style-type: none">• It's clear where Fabric fits into the overall data and BI strategy for the organization.• Fabric activity log and API data is actively analyzed to monitor and audit Fabric activities. Proactive action is taken based on the data.
500: Efficient	<ul style="list-style-type: none">• Regular reviews of KPIs or OKRs evaluate measurable governance goals. Iterative, continual progress is a priority.• Agility and implementing continual improvements from lessons learned (including scaling out methods that work) are top priorities for the COE.• Fabric activity log and API data is actively used to inform and improve adoption and governance efforts.

Related content

In the [next article](#) in the Microsoft Fabric adoption roadmap series, learn about mentoring and user enablement.

Feedback

Was this page helpful?

 Yes

 No

[Provide product feedback ↗](#) | [Ask the community ↗](#)

Microsoft Fabric adoption roadmap: Mentoring and user enablement

Article • 12/30/2024

ⓘ Note

This article forms part of the *Microsoft Fabric adoption roadmap* series of articles. For an overview of the series, see [Microsoft Fabric adoption roadmap](#).

A critical objective for adoption efforts is to enable users to accomplish as much as they can within the requisite guardrails established by [governance guidelines and policies](#). For this reason, the act of mentoring users is one of the most important responsibilities of the [Center of Excellence](#) (COE), and it has a direct influence on how user adoption occurs. For more information about user adoption, see [Microsoft Fabric adoption maturity levels](#).

Skills mentoring

Mentoring and helping users in the Fabric community become more effective can take on various forms, such as:

- Office hours
- Co-development projects
- Best practices reviews
- Extended support

Office hours

Office hours are a form of ongoing community engagements managed by the COE. As the name implies, office hours are times of regularly scheduled availability where members of the community can engage with experts from the COE to receive assistance with minimal process overhead. Office hours are usually group-based, so Fabric champions and other members of the community can also help solve an issue if a topic is in their area of expertise.

Office hours are a very popular and productive activity in many organizations. Some organizations call them *drop-in hours* or even a fun name such as *Power Hour* or *Fabric Fridays*. The primary goal is usually to get questions answered, solve problems, and

remove blockers. Office hours can also be used as a platform for the user community to share ideas, suggestions, and even complaints.

The COE publishes the times for regular office hours when one or more COE members are available. Ideally, office hours are held on a regular and frequent basis. For instance, it could be every Tuesday and Thursday. Consider offering different time slots or rotating times if you have a global workforce.

💡 Tip

One option is to set specific office hours each week. However, users might not show up, so that can end up being inefficient. Alternatively, consider leveraging [Microsoft Bookings](#) to schedule office hours. It shows the blocks of time when each COE expert is available, with Outlook integration ensuring availability is up to date.

Office hours are an excellent user enablement approach because:

- Content creators and the COE actively collaborate to answer questions and solve problems together.
- Real work is accomplished while learning and problem solving.
- Others might observe, learn, and participate.
- Individual groups can head to a breakout room to solve a specific problem.

Office hours benefit the COE as well because:

- They're a great way for the COE to identify champions or users with specific skills that the COE didn't previously know about.
- The COE can learn what users throughout the organization are struggling with. It helps inform whether additional resources, documentation, or training might be required.

💡 Tip

It's common for some tough issues to come up during office hours that cannot be solved quickly, such as getting a complex DAX calculation to work, or addressing performance challenges in a complex solution. Set clear expectations for what's in scope for office hours, and if there's any commitment for follow up.

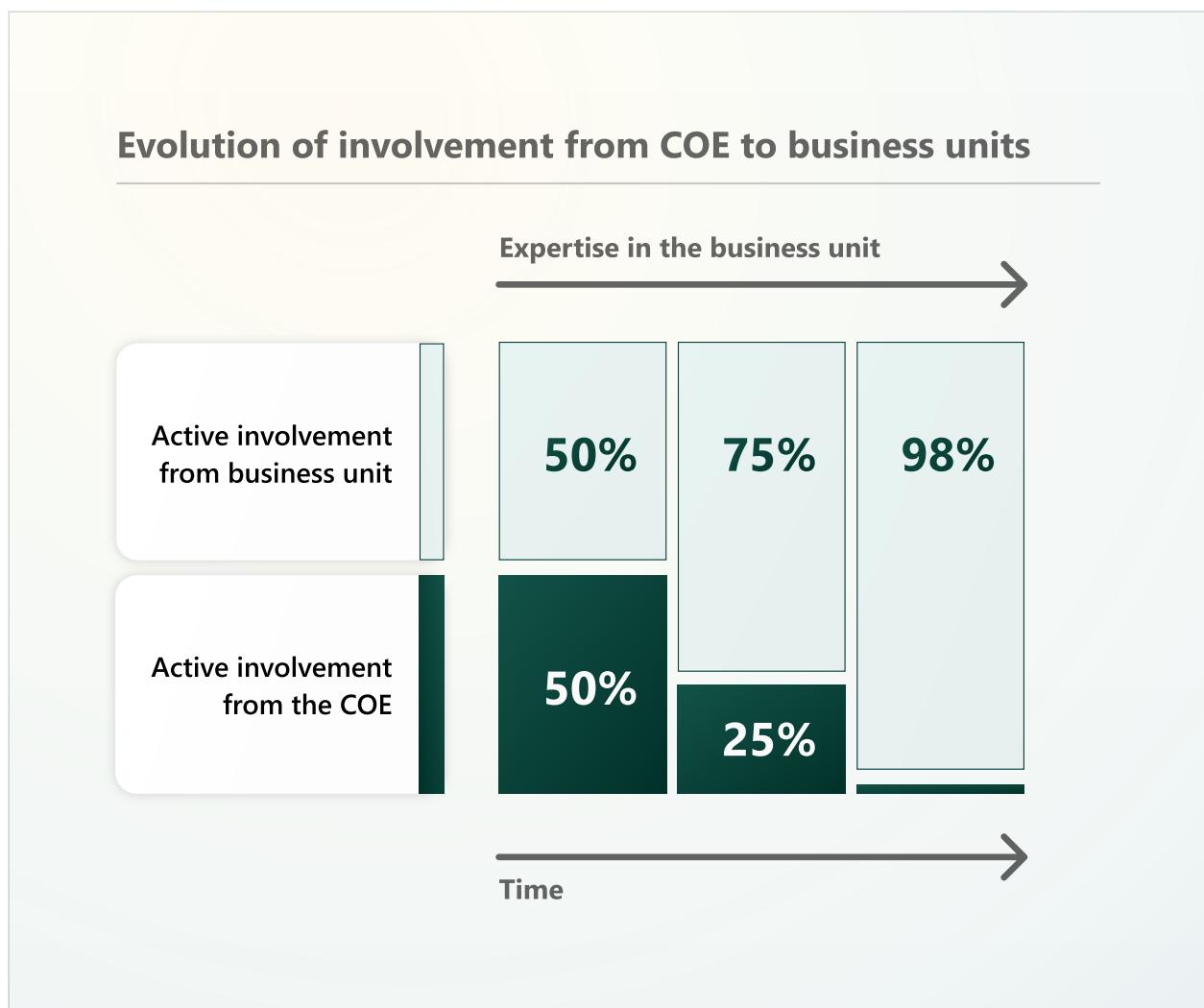
Co-development projects

One way the COE can provide mentoring services is during a *co-development project*. A co-development project is a form of assistance offered by the COE where a user or business unit takes advantage of the technical expertise of the COE to solve business problems with data. Co-development involves stakeholders from the business unit and the COE working in partnership to build a high-quality self-service analytics or business intelligence (BI) solution that the business stakeholders couldn't deliver independently.

The goal of co-development is to help the business unit develop expertise over time while also delivering value. For example, the sales team has a pressing need to develop a new set of commission reports, but the sales team doesn't yet have the knowledge to complete it on their own.

A co-development project forms a partnership between the business unit and the COE. In this arrangement, the business unit is fully invested, deeply involved, and assumes ownership of the project.

Time involvement from the COE reduces over time until the business unit gains expertise and becomes self-reliant.



- **Business unit:** 50% initially, up to 75%, finally at 98%-100%.
- **COE:** 50% initially, down to 25%, finally at 0%-2%.

Ideally, the period for the gradual reduction in involvement is identified up-front in the project. This way, both the business unit and the COE can sufficiently plan the timeline and staffing.

Co-development projects can deliver significant short- and long-term benefits. In the short term, the involvement from the COE can often result in a better-designed and better-performing solution that follows best practices and aligns with organizational standards. In the long term, co-development helps increase the knowledge and capabilities of the business stakeholder, making them more self-sufficient, and more confident to deliver quality self-service data and BI solutions in the future.

Important

Essentially, a co-development project helps less experienced users learn the right way to do things. It reduces the risk that refactoring might be needed later, and it increases the ability for a solution to scale and grow over time.

Best practices reviews

The COE could also offer *best practices reviews*. A best practices review can be extremely helpful for content creators who would like to validate their work. They might also be known as *advisory services*, *internal consulting time*, or *technical reviews*. Unlike a co-development project (described previously), a best practices review occurs after the solution has been developed.

During a review, an expert from the COE evaluates self-service Fabric content developed by a member of the community and identifies areas of risk or opportunities for improvement.

Here are some examples of when a best practices review could be beneficial.

- The sales team has a [Power BI app](#) that they intend to distribute to thousands of users throughout the organization. Since the app represents high priority content distributed to a large audience, they'd like to have it [certified](#). The standard process to certify content includes a best practices review.
- The finance team would like to [assign a workspace to a capacity](#). A review of the workspace content is required to ensure sound development practices are followed. This type of review is common when the capacity is shared among

multiple business units. (A review might not be required when the capacity is assigned to only one business unit.)

- The operations team is creating a new Fabric solution they expect to be widely used. They would like to request a best practices review before it goes into user acceptance testing (UAT), or before a request is submitted to the change management board.

A best practices review is most often focused on the semantic model design, though the review can encompass all types of data items (such as a lakehouse, data warehouse, data pipeline, dataflow, or semantic model). The review can also encompass reporting items (such as reports, dashboards, or metrics).

Before content is deployed, a best practices review can be used to verify other design decisions, like:

- Code in notebooks follows organizational standards and best practices.
- The appropriate data preparation approach (dataflows, pipelines, notebooks, and others) are used where needed.
- **Data sources** used are appropriate and **query folding** is invoked whenever possible where Power Query and dataflows are used.
- **Data preparation** steps are clean, orderly, and **efficient**.
- **Connectivity mode** and **storage mode** choices (for example, Direct Lake, import, live connection, DirectQuery, and composite model frameworks) are appropriate.
- Location for data sources, like flat files, and original Power BI Desktop files are suitable (preferably stored in a backed-up location with versioning and appropriate security, such as **Teams files or a SharePoint shared library**).
- **Semantic models** are well-designed, clean, and understandable, and use a **star schema** design.
- **Model relationships** are configured correctly.
- **DAX calculations** use efficient coding practices (particularly if the data model is large).
- The semantic model size is within a reasonable limit and **data reduction techniques** are applied.
- **Row-level security (RLS)** appropriately enforces data permissions.
- Data is accurate and has been validated against the authoritative source(s).
- Approved common definitions and terminology are used.
- Good **data visualization** ↗ practices are followed, including **designing for accessibility**.

Once the content has been deployed, the best practices review isn't necessarily complete yet. Completing the remainder of the review could also include items such as:

- The target [workspace](#) is suitable for the content.
- [Workspace security roles](#) are appropriate for the content.
- Other permissions (such as [app audience permissions](#), [Build](#) permission, or use of the [individual item sharing feature](#)) are correctly and appropriately configured.
- [Contacts](#) are identified, and correctly correlate to the [owners of the content](#).
- [Sensitivity labels](#) are correctly assigned.
- Fabric item [endorsement](#) (certified or promoted) is appropriate.
- [Data refresh](#) is configured correctly, failure notifications include the proper users, and uses the appropriate [data gateway](#) in standard mode (if applicable).
- All appropriate semantic model [best practices rules](#) are followed and, preferably, are automated via a community tool called Best Practices Analyzer for maximum efficiency and productivity.

Extended support

From time to time, the COE might get involved with complex issues escalated from the help desk. For more information, see the [User support](#) article.

Note

Offering mentoring services might be a culture shift for your organization. Your reaction might be that users don't usually ask for help with a tool like Excel, so why would they with Power BI? The answer lies in the fact that Power BI and Fabric are extraordinarily powerful tools. They provide data preparation and data modeling capabilities in addition to data visualization. Having the ability to aid and enable users can significantly improve their skills and increase the quality of their solutions—it reduces risks too.

Centralized portal

A single centralized portal, or hub, is where the user community can find:

- Access to the community Q&A forum.
- Announcements of interest to the community, such as new features and release plan updates.
- Schedules and registration links for office hours, lunch and learns, training sessions, and user group meetings.
- Announcements of key changes to content and change log (if appropriate).
- How to request help or support.
- Training materials.

- Documentation, onboarding materials, and frequently asked questions (FAQ).
- Governance guidance and approaches recommended by the COE.
- Report templates.
- Examples of best practices solutions.
- Recordings of knowledge sharing sessions.
- Entry points for accessing managed processes, such as license acquisition, access requests, and gateway configuration.

💡 Tip

In general, only 10%-20% of your community will go out of their way to actively seek out training and educational information. These types of users might naturally evolve to become your champions. Everyone else is usually just trying to get the job done as quickly as possible, because their time, focus, and energy are needed elsewhere. Therefore, it's crucial to make information easy for your community users to find.

The goal is to consistently direct users in the community to the centralized portal to find information. The corresponding obligation for the COE is to ensure that the information users need is available in the centralized portal. Keeping the portal updated requires discipline when everyone is busy.

In larger organizations, it can be difficult to implement one single centralized portal. When it's not practical to consolidate into a single portal, a centralized hub can serve as an aggregator, which contains links to the other locations.

ⓘ Important

Although saving time finding information is important, the goal of a centralized portal is more than that. It's about making information readily available to help your user community do the right thing. They should be able to find information during their normal course of work, with as little friction as possible. Until it's easier to complete a task within the guardrails established by the COE and data governance team, some users will continue to complete their tasks by circumventing policies that are put in place. The recommended path must become the path of least resistance. Having a centralized portal can help achieve this goal.

It takes time for community users to think of the centralized portal as their natural first stop for finding information. It takes consistent redirection to the portal to change habits. Sending someone a link to an original document location in the portal builds

better habits than, for instance, including the answer in an email response. It's the same challenge described in the [User support](#) article.

Training

A key factor for successfully enabling self-service users in a Fabric community is training. It's important that the right training resources are readily available and easily discoverable. While some users are so enthusiastic about analytics that they'll find information and figure things out on their own, it isn't true for most of the user community.

Making sure your self-service users (particularly content creators and owners) have access to the training resources they need to be successful doesn't mean that you need to develop your own training content. Developing training content is often counterproductive due to the rapidly evolving nature of the product. Fortunately, an abundance of training resources is available in the worldwide community. A curated set of links goes a long way to help users organize and focus their training efforts, especially for tool training, which focuses on the technology. All external links should be validated by the COE for accuracy and credibility. It's a key opportunity for the COE to add value because COE stakeholders are in an ideal position to understand the learning needs of the community, and to identify and locate trusted sources of quality learning materials.

You'll find the greatest return on investment with creating custom training materials for *organizational-specific* processes, while relying on content produced by others for everything else. It's also useful to have a short training class that focuses primarily on topics like how to find documentation, getting help, and interacting with the community.

Tip

One of the goals of training is to help users learn new skills while helping them avoid bad habits. It can be a balancing act. For instance, you don't want to overwhelm new users by adding in a lot of complexity and friction to a beginner-level class for report creators. However, it's a great investment to make newer content creators aware of things that could otherwise take them a while to figure out. An ideal example is teaching the ability to use a [live connection](#) to report from an existing semantic model. By teaching this concept at the earliest logical time, you can save a less experienced creator thinking they always need one semantic model for every report (and encourage the good habit of reusing existing semantic models across reports).

Some larger organizations experience continual employee transfers and turnover. Such frequent change results in an increased need for a repeatable set of training resources.

Training resources and approaches

There are many training approaches because people learn in different ways. If you can monitor and measure usage of your training materials, you'll learn over time what works best.

Some training might be delivered more formally, such as classroom training with hands-on labs. Other types of training are less formal, such as:

- Lunch and learn presentations
- Short how-to videos targeted to a specific goal
- Curated set of online resources
- Internal user group presentations
- One-hour, one-week, or one-month challenges
- Hackathon-style events

The advantages of encouraging knowledge sharing among colleagues are described in the [Community of practice](#) article.

💡 Tip

Whenever practical, learning should be correlated with building something meaningful and realistic. However, simple demo data does have value during a training course. It allows a learner to focus on how to use the technology rather than the data itself. After completion of introductory session(s), consider offering a *bring your own data* type of session. These types of sessions encourage the learner to apply their new technical skills to an actual business problem. Try to include multiple facilitators from the COE during this type of follow-up session so questions can be answered quickly.

The types of users you might target for training include:

- Content owners, subject matter experts (SMEs), and workspace administrators
- Data creators (for example, users who create semantic models for report creators to use, or who create dataflows, lakehouses, or warehouses for other semantic model creators to use)
- Report creators
- Content consumers and viewers
- Satellite COE members and the [champions network](#)

- Fabric administrators

ⓘ Important

Each type of user represents a different audience that has different training needs. The COE will need to identify how best to meet the needs of each audience. For instance, one audience might find a standard introductory Power BI Desktop class overwhelming, whereas another will want more challenging information with depth and detail for end-to-end solutions that include multiple Fabric workloads. If you have a diverse population of Fabric content creators, consider creating personas and tailoring the experience to an extent that's practical.

The completion of training can be a leading indicator for success with [user adoption](#). Some organizations add an element of fun by granting badges, like *blue belt* or *black belt*, as users progress through the training programs.

Give some consideration to how you want to handle users at various stages of [user adoption](#). Training needs are very different for:

- Onboarding new users (sometimes referred to as *training day zero*).
- Users with minimal experience.
- More experienced users.

How the COE invests its time in creating and curating training materials will change over time as adoption and maturity grows. You might also find over time that some community champions want to run their own tailored set of training classes within their functional business unit.

Sources for trusted Fabric training content

A curated set of online resources is valuable to help community members focus and direct their efforts on what's important. Some publicly available training resources you might find helpful include:

- [Microsoft Learn training for Power BI](#)
- [Microsoft Learn training for Fabric](#)
- [Power BI courses and "in a day" training materials ↗](#)
- [LinkedIn Learning for Power BI ↗](#)
- [LinkedIn Learning for Fabric ↗](#)

Consider using [Microsoft Viva Learning ↗](#), which is integrated into Microsoft Teams. It includes content from sources such as [Microsoft Learn](#) and [LinkedIn Learning ↗](#). Custom

content produced by your organization can be included as well.

In addition to Microsoft content and custom content produced by your organization, you might choose to provide your user community with a curated set of recommended links to trusted online sources. There's a wide array of videos, blogs, and articles produced by the worldwide community. The community comprises Fabric and Power BI experts, [Microsoft Most Valued Professions \(MVPs\)](#), and enthusiasts. Providing a curated learning path that contains specific, reputable, current, and high-quality resources will provide the most value to your user community.

If you do make the investment to create custom in-house training, consider creating short, targeted content that focuses on solving one specific problem. It makes the training easier to find and consume. It's also easier to maintain and update over time.

Tip

The *Help and Support* menu in the Fabric portal is customizable. When your centralized location for training documentation is operational, update the [tenant setting in the Admin portal](#) with the link. The link can then be accessed from menu when users select the *Get Help* option. Also, be sure to teach users about the *Help* ribbon tab in Power BI Desktop. It includes links to guided learning, training videos, documentation, and more.

Documentation

Concise, well-written documentation can be a significant help for users trying to get things done. Your needs for documentation, and how it's delivered, will depend on how Fabric is managed in your organization. For more information, see the [Content ownership and management](#) article.

Certain aspects of Fabric tend to be managed by a centralized team, such as the COE. The following types of documentation are helpful in these situations:

- How to request a Power BI license (and whether there are requirements for manager approval)
- How to request a new capacity
- How to request a new workspace
- How to request a workspace be added to an existing capacity
- How to request access to a gateway data source
- How to request software installation

💡 Tip

For certain activities that are repeated over and over, consider automating them using Power Apps and Power Automate. In this case, your documentation will also include how to access and use the Power Platform functionality.

Different aspects of your documentation can be managed by self-service users, decentralized teams, or by a centralized team. The following types of documentation might differ based on who owns and manages the content:

- How to request a new report
- How to request a report enhancement
- How to request access to data
- How to request new data be prepared and made available for use
- How to request an enhancement to existing data or visualizations

💡 Tip

When planning for a centralized portal, as described earlier in this article, plan how to handle situations when guidance or governance policies need to be customized for one or more business units.

There are also going to be some [governance](#) decisions that have been made and should be documented, such as:

- How to request content be certified
- What are the approved file storage locations
- What are the data retention and purge requirements
- What are the requirements for handling sensitive data and personally identifiable information (PII)

Documentation should be located in your centralized portal, which is a searchable location where, preferably, users already work. Either [Teams](#) or [SharePoint](#) work very well. Creating documentation in either wiki pages or in documents can work equally well, provided that the content is organized well and is easy to find. Shorter documents that focus on one topic are usually easier to consume than long, comprehensive documents.

ⓘ Important

One of the most helpful pieces of documentation you can publish for the community is a description of the [tenant settings](#), and the group memberships required for each tenant setting. Users read about features and functionality online, and sometimes find that it doesn't work for them. When they are able to quickly look up your organization's tenant settings, it can save them from becoming frustrated and attempting workarounds. Effective documentation can reduce the number of help desk tickets that are submitted. It can also reduce the number of people who need to be assigned the Fabric administrator role (who might have this role solely for the purpose of viewing settings).

Over time, you might choose to allow certain types of documentation to be maintained by the community if you have willing volunteers. In this case, you might want to introduce an approval process for changes.

When you see questions repeatedly arise in the Q&A forum (as described in the [User support](#) article), during office hours, or during lunch and learns, it's a great indicator that creating new documentation might be appropriate. When the documentation exists, it allows colleagues to reference it when needed. Documentation contributes to user enablement and a self-sustaining community.

Tip

When creating custom documentation or training materials, reference existing Microsoft sites using links whenever possible. Most community bloggers don't keep blog posts or videos up to date.

Power BI template files

A [Power BI template](#) is a .pbbit file. It can be provided as a starting point for content creators. It's the same as a .pbix file, which can contain queries, a data model, and a report, but with one exception: the template file doesn't contain any data. Therefore, it's a smaller file that can be shared with content creators and owners, and it doesn't present a risk of inappropriately sharing data.

Providing Power BI template files for your community is a great way to:

- Promote consistency.
- Reduce learning curve.
- Show good examples and best practices.
- Increase efficiency.

Power BI template files can improve efficiency and help people learn during the normal course of their work. A few ways that template files are helpful include:

- Reports can use examples of good visualization practices
- Reports can incorporate organizational branding and design standards
- Semantic models can include the structure for commonly used tables, like a date table
- Helpful DAX calculations can be included, like a year-over-year (YoY) calculation
- Common parameters can be included, like a data source connection string
- An example of report and/or semantic model documentation can be included

 **Note**

Providing templates not only saves your content creators time, it also helps them move quickly beyond a blank page in an empty solution.

Power BI project files

A [Power BI project](#) is a .pbip file. Like a template file (previously described), a project file doesn't contain any data. It's a file format that advanced content creators can use for [advanced data model](#) and report management scenarios. For example, you can use project files to save time in development by sharing common model patterns, like date tables, DAX measure expressions, or calculation groups.

You can use Power BI project files with [Power BI Desktop developer mode](#) for:

- Advanced editing and authoring (for example, in a code editor such as Visual Studio Code).
- Purposeful separation of semantic model and report items (unlike the .pbix or .pbit files).
- Enabling multiple content creators and developers to work on the same project concurrently.
- Integrating with source control (such as by using Fabric Git integration).
- Using continuous integration and continuous delivery (CI/CD) techniques to automate integration, testing and deployment of changes, or versions of content.

 **Note**

Power BI includes capabilities such as .pbit template files and .pbip project files that make it simple to share starter resources with authors. Other Fabric workloads provide different approaches to content development and sharing. Having a set of

starter resources is important regardless of the items being shared. For example, your portal might include a set of SQL scripts or notebooks that present tested approaches to solve common problems.

Considerations and key actions



Checklist - Considerations and key actions you can take to establish, or improve, mentoring and user enablement.

- ✓ **Consider what mentoring services the COE can support:** Decide what types of mentoring services the COE is capable of offering. Types can include office hours, co-development projects, and best practices reviews.
- ✓ **Communicate regularly about mentoring services:** Decide how you will communicate and advertise mentoring services, such as office hours, to the user community.
- ✓ **Establish a regular schedule for office hours:** Ideally, hold office hours at least once per week (depending on demand from users as well as staffing and scheduling constraints).
- ✓ **Decide what the expectations will be for office hours:** Determine what the scope of allowed topics or types of issues users can bring to office hours. Also, determine how the queue of office hours requests will work, whether any information should be submitted ahead of time, and whether any follow up afterwards can be expected.
- ✓ **Create a centralized portal:** Ensure that you have a well-supported centralized hub where users can easily find training materials, documentation, and resources. The centralized portal should also provide links to other community resources such as the Q&A forum and how to find help.
- ✓ **Create documentation and resources:** In the centralized portal, create, compile, and publish useful documentation. Identify and promote the top 3-5 resources that will be most useful to the user community.
- ✓ **Update documentation and resources regularly:** Ensure that content is reviewed and updated on a regular basis. The objective is to ensure that the information available in the portal is current and reliable.
- ✓ **Compile a curated list of reputable training resources:** Identify training resources that target the training needs and interests of your user community. Post the list in the centralized portal and create a schedule to review and validate the list.

- ✓ **Consider whether custom in-house training will be useful:** Identify whether custom training courses, developed in-house, will be useful and worth the time investment. Invest in creating content that's specific to the organization.
- ✓ **Provide templates and projects:** Determine how you'll use templates including Power BI template files and Power BI project files. Include the resources in your centralized portal, and in training materials.
- ✓ **Create goals and metrics:** Determine how you'll measure effectiveness of the mentoring program. Create KPIs (key performance indicators) or OKRs (objectives and key results) to validate that the COE's mentoring efforts strengthen the community and its ability to provide self-service BI.

Questions to ask



Use questions like those found below to assess mentoring and user enablement.

- Is there an effective process in place for users to request training?
- Is there a process in place to evaluate user skill levels (such as beginner, intermediate, or advanced)? Can users study for and achieve Microsoft certifications by using company resources?
- What's the onboarding process to introduce new people in the user community to data and BI solutions, tools, and processes?
- Have all users followed the appropriate Microsoft Learn learning paths for their roles during onboarding?
- What kinds of challenges do users experience due to lack of training or mentorship?
- What impact does lack of enablement have on the business?
- When users exhibit behavior that creates governance risks, are they punished or do they undergo education and mentorship?
- What training materials are in place to educate people about governance processes and policies?
- Where's the central documentation maintained? Who maintains it?
- Do central resources exist, like organizational design guidelines, [themes](#), or [template files](#)?

Maturity levels



The following maturity levels will help you assess the current state of your mentoring and user enablement.

[Expand table](#)

Level	State of mentoring and user enablement
100: Initial	<ul style="list-style-type: none">Some documentation and resources exist. However, they're siloed and inconsistent.Few users are aware of, or take advantage of, available resources.
200: Repeatable	<ul style="list-style-type: none">A centralized portal exists with a library of helpful documentation and resources.A curated list of training links and resources are available in the centralized portal.Office hours are available so the user community can get assistance from the COE.
300: Defined	<ul style="list-style-type: none">The centralized portal is the primary hub for community members to locate training, documentation, and resources. The resources are commonly referenced by champions and community members when supporting and learning from each other.The COE's skills mentoring program is in place to assist users in the community in various ways.
400: Capable	<ul style="list-style-type: none">Office hours have regular and active participation from all business units in the organization.Best practices reviews from the COE are regularly requested by business units.Co-development projects are repeatedly executed with success by the COE and members of business units.
500: Efficient	<ul style="list-style-type: none">Training, documentation, and resources are continually updated and improved by the COE to ensure the community has current and reliable information.Measurable and tangible business value is gained from the mentoring program by using KPIs or OKRs.

Related content

In the [next article](#) in the Microsoft Fabric adoption roadmap series, learn about the community of practice.

Feedback

Was this page helpful?



[Provide product feedback ↗](#) | [Ask the community ↗](#)

Microsoft Fabric adoption roadmap: Community of practice

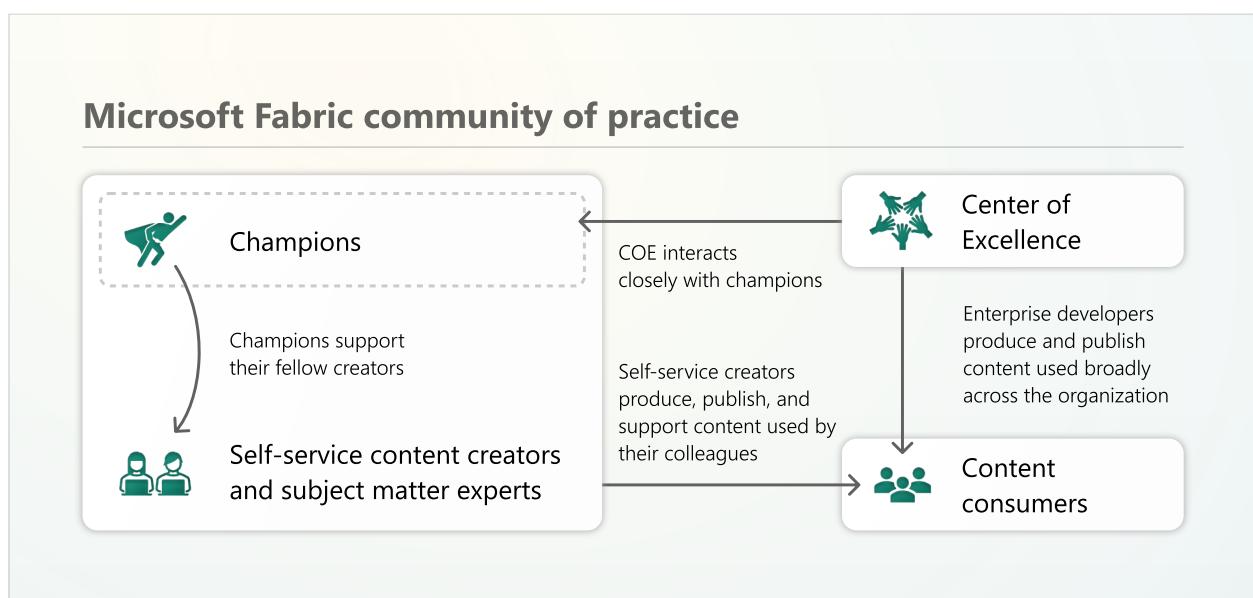
Article • 12/30/2024

ⓘ Note

This article forms part of the *Microsoft Fabric adoption roadmap* series of articles. For an overview of the series, see [Microsoft Fabric adoption roadmap](#).

A *community of practice* is a group of people with a common interest that interacts with, and helps, each other on a voluntary basis. Using a tool such as Microsoft Fabric to produce effective analytics is a common interest that can bring people together across an organization.

The following diagram provides an overview of an internal community.



The above diagram shows the following:

- The **community of practice** includes everyone with an interest in Fabric.
- The **Center of Excellence (COE)** forms the nucleus of the community. The **COE** oversees the entire community and interacts most closely with its champions.
- **Self-service content creators and subject matter experts (SMEs)** produce, publish, and support content that's used by their colleagues, who are consumers.
- **Content consumers** view content produced by both self-service creators and enterprise business intelligence (BI) developers.
- **Champions** are a subset of the self-service content creators. Champions are in an excellent position to support their fellow content creators to generate effective

analytics solutions.

Champions are the smallest group among creators and SMEs. Self-service content creators and SMEs represent a larger number of people. Content consumers represent the largest number of people in most organizations.

Note

All references to the Fabric community in this adoption series of articles refer to internal users, unless explicitly stated otherwise. There's an active and vibrant worldwide community of bloggers and presenters who produce a wealth of knowledge about Fabric. However, internal users are the focus of this article.

For information about related topics including resources, documentation, and training provided for the Fabric community, see the [Mentoring and user enablement](#) article.

Champions network

One important part of a community of practice is its *champions*. A champion is a self-service content creator who works in a business unit that engages with the COE. A champion is recognized by their peers as the *go-to* expert. A champion continually builds and shares their knowledge even if it's not an official part of their job role. Champions influence and help their colleagues in many ways including solution development, learning, skills improvement, troubleshooting, and keeping up to date.

Champions emerge as leaders of the community of practice who:

- Have a deep interest in analytics being used effectively and adopted successfully throughout the organization.
- Possess strong technical skills as well as domain knowledge for their functional business unit.
- Have an inherent interest in getting involved and helping others.
- Are early adopters who are enthusiastic about experimenting and learning.
- Can effectively translate business needs into solutions.
- Communicate well with colleagues.

Tip

To add an element of fun, some organizations refer to their champions network as *ambassadors*, *Jedis*, *ninjas*, or *rangers*. Microsoft has an internal community called *BI Champs*.

Often, people aren't directly asked to become champions. Commonly, champions are identified by the COE and recognized for the activities they're already doing, such as frequently answering questions on an internal discussion channel or participating in lunch and learn sessions.

Different approaches will be more effective for different organizations, and each organization will find what works best for them as their maturity level increases.

Important

Someone very well might be acting in the role of a champion without even knowing it, and without any formal recognition. The COE should always be on the lookout for champions. COE members should actively monitor the discussion channel to see who is particularly helpful. The COE should deliberately encourage and support potential champions, and when appropriate, invite them into a champions network to make the recognition formal.

Knowledge sharing

The overriding objective of a community of practice is to facilitate knowledge sharing among colleagues and across organizational boundaries. There are many ways knowledge sharing occurs. It could be during the normal course of work. Or, it could be during a more structured activity, such as:

 Expand table

Activity	Description
Discussion channel	A Q&A forum where anyone in the community can post and view messages. Often used for help and announcements. For more information, see the User support article.
Lunch and learn sessions	Regularly scheduled sessions where someone presents a short session about something they've learned or a solution they've created. The goal is to get a variety of presenters involved, because it's a powerful message to hear firsthand what colleagues have achieved.
Office hours with the COE	Regularly scheduled times when COE experts are available so the community can engage with them. Community users can receive assistance with minimal process overhead. For more information, see the Mentoring and user enablement article.
Internal blog posts or wiki posts	Short blog posts, usually covering technical how-to topics.

Activity	Description
Internal analytics user group	A subset of the community that chooses to meet as a group on a regularly scheduled basis. User group members often take turns presenting to each other to share knowledge and improve their presentation skills.
Book club	A subset of the community select a book to read on a schedule. They discuss what they've learned and share their thoughts with each other.
Internal analytics conferences or events	An annual or semi-annual internal conference that delivers a series of sessions focused on the needs of self-service content creators, subject matter experts, and stakeholders.

💡 Tip

Inviting an external presenter can reduce the effort level and bring a fresh viewpoint for learning and knowledge sharing.

Incentives

A lot of effort goes into forming and sustaining a successful community. It's advantageous to everyone to empower and reward users who work for the benefit of the community.

Rewarding community members

Incentives that the entire community (including champions) find particularly rewarding can include:

- **Contests with a small gift card or time off:** For example, you might hold a performance tuning event with the winner being the person who successfully reduced the size of their data model the most.
- **Ranking based on help points:** The more frequently someone participates in Q&A, they achieve a change in status on a leaderboard. This type of gamification promotes healthy competition and excitement. By getting involved in more conversations, the participant learns and grows personally in addition to helping their colleagues.
- **Leadership communication:** Reach out to a manager when someone goes above and beyond so that their leader, who might not be active in the community, sees the value that their staff member provides.

Rewarding champions

Different types of incentives will appeal to different types of people. Some community members will be highly motivated by praise and feedback. Some will be inspired by gamification and a bit of fun. Others will highly value the opportunity to improve their level of knowledge.

Incentives that champions find particularly rewarding can include:

- **More direct access to the COE:** The ability to have *connections* in the COE is valuable. It's depicted in the diagram shown earlier in this article.
- **Champion of the month:** Publicly thank one of your champions for something outstanding they did recently. It could be a fun tradition at the beginning of a monthly lunch and learn.
- **A private experts discussion area:** A private area for the champions to share ideas and learn from each other is usually highly valued.
- **Specialized or deep dive information and training:** Access to additional information to help champions grow their skillsets (as well as help their colleagues) will be appreciated. It could include attending advanced training classes or conferences.

Communication plan

Communication with the community occurs through various types of communication channels. Common communication channels include:

- Internal discussion channel or forum.
- Announcements channel.
- Organizational newsletter.

The most critical communication objectives include ensuring your community members know that:

- The COE exists.
- How to get help and support.
- Where to find resources and documentation.
- Where to find governance guidelines.
- How to share suggestions and ideas.

 Tip

Consider requiring a simple quiz before a user is granted a Power BI or Fabric license. This *quiz* is a misnomer because it doesn't focus on any technical skills. Rather, it's a short series of questions to verify that the user knows where to find help and resources. It sets them up for success. It's also a great opportunity to have users acknowledge any governance policies or data privacy and protection agreements you need them to be aware of. For more information, see the [System oversight](#) article.

Types of communication

There are generally four types of communication to plan for:

- **New employee communications** can be directed to new employees (and contractors). It's an excellent opportunity to provide onboarding materials for how to get started. It can include articles on topics like how to get Power BI Desktop installed, how to request a license, and where to find introductory training materials. It can also include general data governance guidelines that all users should be aware of.
- **Onboarding communications** can be directed to employees who are just acquiring a license or are getting involved with the community of practice. It presents an excellent opportunity to provide the same materials as given to new employee communications (as mentioned above).
- **Ongoing communications** can include regular announcements and updates directed to all users, or subsets of users, like:
 - Announcements about changes that are planned to key organizational content. For example, changes are to be published for a critical shared semantic model that's used heavily throughout the organization. It can also include the announcement of new features. For more information about planning for change, see the [Tenant-level monitoring](#) article.
 - Feature announcements, which are more likely to receive attention from the reader if the message includes meaningful context about why it's important. (Although an RSS feed can be a helpful technique, with the frequent pace of change, it can become noisy and might be ignored.)
- **Situational communications** can be directed to specific users or groups based on a specific occurrence discovered while [monitoring the platform](#). For example, perhaps you notice a significant amount of sharing from the personal workspace a particular user, so you choose to send them some information about the benefits of workspaces and Power BI apps.



Tip

One-way communication to the user community is important. Don't forget to also include bidirectional communication options to ensure the user community has an opportunity to provide feedback.

Community resources

Resources for the internal community, such as documentation, templates, and training, are critical for adoption success. For more information about resources, see the [Mentoring and user enablement](#) article.

Considerations and key actions



Checklist - Considerations and key actions you can take for the community of practice follow.

Initiate, grow, and sustain your champions network:

- ✓ **Clarify goals:** Clarify what your specific goals are for cultivating a champions network. Make sure these goals align with your overall data and BI strategy, and that your executive sponsor is on board.
- ✓ **Create a plan for the champions network:** Although some aspects of a champions network will always be informally led, determine to what extent the COE will purposefully cultivate and support champion efforts throughout individual business units. Consider how many champions is ideal for each functional business area. Usually, 1-2 champions per area works well, but it can vary based on the size of the team, the needs of the self-service community, and how the COE is structured.
- ✓ **Decide on commitment level for champions:** Decide what level of commitment and expected time investment will be required of champions. Be aware that the time investment will vary from person to person, and team to team due to different responsibilities. Plan to clearly communicate expectations to people who are interested in getting involved. Obtain manager approval when appropriate.
- ✓ **Decide how to identify champions:** Determine how you will respond to requests to become a champion, and how the COE will seek out champions. Decide if you will openly encourage interested employees to self-identify as a champion and ask to learn more (less common). Or, whether the COE will observe efforts and extend a private invitation (more common).

- ✓ **Determine how members of the champions network will be managed:** One excellent option for managing who the champions are is with a security group.
- Consider:
- How you will communicate with the champions network (for example, in a Teams channel, a Yammer group, and/or an email distribution list).
 - How the champions network will communicate and collaborate with each other directly (across organizational boundaries).
 - Whether a private and exclusive discussion forum for champions and COE members is appropriate.
- ✓ **Plan resources for champions:** Ensure members of the champions network have the resources they need, including:
- Direct access to COE members.
 - Influence on data policies being implemented (for example, requirements for a semantic model certification policy).
 - Influence on the creation of best practices and guidance (for example, recommendations for accessing a specific source system).
- ✓ **Involve champions:** Actively involve certain champions as satellite members of the COE. For more information about ways to structure the COE, see the [Center of Excellence](#) article.
 - ✓ **Create a feedback loop for champions:** Ensure that members of the champions network can easily provide information or submit suggestions to the COE.
 - ✓ **Routinely provide recognition and incentives for champions:** Not only is praise an effective motivator, but the act of sharing examples of successful efforts can motivate and inspire others.

Improve knowledge sharing:

- ✓ **Identify knowledge sharing activities:** Determine what kind of activities for knowledge sharing fit well into the organizational data culture. Ensure that all planned knowledge sharing activities are supportable and sustainable.
- ✓ **Confirm roles and responsibilities:** Verify who will take responsibility for coordinating all knowledge sharing activities.

Introduce incentives:

- ✓ **Identify incentives for champions:** Consider what type of incentives you could offer to members of your champions network.
- ✓ **Identify incentives for community members:** Consider what type of incentives you could offer to your broader internal community.

Improve communications:

- ✓ **Establish communication methods:** Evaluate which methods of communication fit well in your data culture. Set up different ways to communicate, including history retention and search.
- ✓ **Identify responsibility:** Determine who will be responsible for different types of communication, how, and when.

Questions to ask



Use questions like those found below to assess the community of practice.

- Is there a centralized portal for a community of practice to engage in knowledge sharing?
- Do technical questions and requests for support always go through central teams like the COE or support? Alternatively, to what extent is the community of practice engaging in knowledge sharing?
- Do any incentives exist for people to engage in knowledge sharing or improve their skills with data and BI tools?
- Is there a system of recognition to acknowledge significant self-service efforts in teams?
- Are champions recognized among the user community? If so, what explicit recognition do they get for their expertise? How are they identified?
- If no champions are recognized, are there any potential candidates?
- What role do central teams envision that champions play in community of practice?
- How often do central data and BI teams engage with the user community? What medium do these interactions take? Are they bidirectional discussions or unidirectional communications?
- How are changes and announcements communicated within the community of practice?
- Among the user community, who is the most enthusiastic about analytics and BI tools? Who is the least enthusiastic, or the most negative, and why?

Maturity levels



The following maturity levels will help you assess the current state of your community of practice.

 [Expand table](#)

Level	State of the community of practice
100: Initial	<ul style="list-style-type: none">• Some self-service content creators are doing great work throughout the organization. However, their efforts aren't recognized.• Efforts to purposefully share knowledge across the organizational boundaries are rare and unstructured.• Communication is inconsistent, without a purposeful plan.
200: Repeatable	<ul style="list-style-type: none">• The first set of champions are identified.• The goals for a champions network are identified.• Knowledge sharing practices are gaining traction.
300: Defined	<ul style="list-style-type: none">• Knowledge sharing in multiple forms is a normal occurrence. Information sharing happens frequently and purposefully.• Goals for transparent communication with the user community are defined.
400: Capable	<ul style="list-style-type: none">• Champions are identified for all business units. They actively support colleagues in their self-service efforts.• Incentives to recognize and reward knowledge sharing efforts are a common occurrence.• Regular and frequent communication occurs based on a predefined communication plan.
500: Efficient	<ul style="list-style-type: none">• Bidirectional feedback loops exist between the champions network and the COE.• Key performance indicators measure community engagement and satisfaction.• Automation is in place when it adds direct value to the user experience (for example, automatic access to a group that provides community resources).

Related content

In the [next article](#) in the Microsoft Fabric adoption roadmap series, learn about user support.

Feedback

Was this page helpful?

 Yes

 No

[Provide product feedback ↗](#) | [Ask the community ↗](#)

Microsoft Fabric adoption roadmap: User support

Article • 12/30/2024

ⓘ Note

This article forms part of the *Microsoft Fabric adoption roadmap* series of articles. For an overview of the series, see [Microsoft Fabric adoption roadmap](#).

This article addresses user support. It focuses primarily on the resolution of issues.

The first sections of this article focus on user support aspects you have control over internally within your organization. The final topics focus on external resources that are available.

For a description of related topics, including skills mentoring, training, documentation, and co-development assistance provided to the internal Fabric user community, see the [Mentoring and user enablement](#) article. The effectiveness of those activities can significantly reduce the volume of formal user support requests and increase user experience overall.

Types of user support

If a user has an issue, do they know what their options are to resolve it?

The following diagram shows some common types of user support that organizations employ successfully:

Internal support



External support



The six types of user support shown in the above diagram include:

[+] [Expand table](#)

Type	Description
1	Intra-team support (internal) is very informal. Support occurs when team members learn from each other during the natural course of their job.
2	Internal community support (internal) can be organized informally, formally, or both. It occurs when colleagues interact with each other via internal community channels.
3	Help desk support (internal) handles formal support issues and requests.
4	Extended support (internal) involves handling complex issues escalated by the help desk.
5	Microsoft support (external) includes support for licensed users and Fabric administrators. It also includes comprehensive documentation .
6	Community support (external) includes the worldwide community of experts, Microsoft Most Valued Professionals (MVPs) , and enthusiasts who participate in forums and publish content.

In some organizations, intra-team and internal community support are most relevant for self-service data and business intelligence (BI)—content is owned and managed by creators and owners in decentralized business units. Conversely, the help desk and extended support are reserved for technical issues and enterprise data and BI (content is owned and managed by a centralized BI team or [Center of Excellence](#)). In some organizations, all four types of support could be relevant for any type of content.

💡 Tip

For more information about business-led self-service, managed self-service, and enterprise data and BI concepts, see the [Content ownership and management](#) article.

Each of the six types of user support introduced above are described in further detail in this article.

Intra-team support

Intra-team support refers to when team members learn from and help each other during their daily work. Self-service content creators who emerge as your [champions](#) tend to take on this type of informal support role voluntarily because they have an intrinsic desire to help. Although it's an informal support mode, it shouldn't be undervalued. Some estimates indicate that a large percentage of learning at work is peer learning, which is particularly helpful for analysts who are creating domain-specific analytics solutions.

⚠ Note

Intra-team support does not work well for individuals who are the only data analyst within a department. It's also not effective for those who don't have very many connections yet in their organization. When there aren't any close colleagues to depend on, other types of support, as described in this article, become more important.

Internal community support

Assistance from your fellow community members often takes the form of messages in a discussion channel, or a forum set up specifically for the [community of practice](#). For example, someone posts a message that they're having problems getting a DAX calculation to work or are looking for the right Python module to import. They then receive a response from someone in the organization with suggestions or links.

💡 Tip

The goal of an internal Fabric community is to be self-sustaining, which can lead to reduced formal support demands and costs. It can also facilitate managed self-

service content creation occurring on a broader scale versus a purely centralized approach. However, there will always be a need to monitor, manage, and nurture the internal community. Here are two specific tips:

- Be sure to cultivate multiple experts in the more difficult topics like [T-SQL](#), [Python](#), [Data Analysis eXpressions \(DAX\)](#), and the [Power Query M formula language](#). When a community member becomes a recognized expert, they could become overburdened with too many requests for help.
- A greater number of community members might readily answer certain types of questions (for example, report visualizations), whereas a smaller number of members will answer others (for example, complex T-SQL or DAX). It's important for the COE to allow the community a chance to respond yet also be willing to promptly handle unanswered questions. If users repeatedly ask questions and don't receive an answer, it will significantly hinder growth of the community. In this case, a user is likely to leave and never return if they don't receive any responses to their questions.

An internal community discussion channel is commonly set up as a Teams channel or a Yammer group. The technology chosen should reflect where users already work, so that the activities occur within their natural workflow.

One benefit of an internal discussion channel is that responses can come from people that the original requester has never met before. In larger organizations, a [community of practice](#) brings people together based on a common interest. It can offer diverse perspectives for getting help and learning in general.

Use of an internal community discussion channel allows the [Center of Excellence \(COE\)](#) to monitor the kind of questions people are asking. It's one way the COE can understand the issues users are experiencing (commonly related to content creation, but it could also be related to consuming content).

Monitoring the discussion channel can also reveal additional analytics experts and potential champions who were previously unknown to the COE.

Important

It's a best practice to continually identify emerging champions, and to engage with them to make sure they're equipped to support their colleagues. As described in the [Community of practice](#) article, the COE should actively monitor the discussion channel to see who is being helpful. The COE should deliberately encourage and

support community members. When appropriate, invite them into the champions network.

Another key benefit of a discussion channel is that it's searchable, which allows other people to discover the information. It is, however, a change of habit for people to ask questions in an open forum rather than private messages or email. Be sensitive to the fact that some individuals aren't comfortable asking questions in such a public way. It openly acknowledges what they don't know, which might be embarrassing. This reluctance might reduce over time by promoting a friendly, encouraging, and helpful discussion channel.

💡 Tip

You might be tempted to create a bot to handle some of the most common, straightforward questions from the community. A bot can work for uncomplicated questions such as "How do I request a license?" or "How do I request a workspace?" Before taking this approach, consider if there are enough routine and predictable questions that would make the user experience better rather than worse. Often, a well-created FAQ (frequently asked questions) works better, and it's faster to develop and easier to maintain.

Help desk support

The help desk is usually operated as a shared service, staffed by the IT department. Users who will likely rely on a more formal support channel include those who are:

- Less experienced users.
- Newer to the organization.
- Reluctant to post a message to the internal discussion community.
- Lacking connections and colleagues within the organization.

There are also certain technical issues that can't be fully resolved without IT involvement, like software installation and upgrade requests when machines are IT-managed.

Busy help desk personnel are usually dedicated to supporting multiple technologies. For this reason, the easiest types of issues to support are those which have a clear resolution and can be documented in a knowledgebase. For instance, software installation prerequisites or requirements to get a license.

Some organizations ask the help desk to handle only very simple break-fix issues. Other organizations have the help desk get involved with anything that is repeatable, like new

workspace requests, managing [gateway data sources](#), or requesting a new capacity.

Important

Your Fabric governance decisions will directly impact the volume of help desk requests. For example, if you choose to limit [workspace creation permissions in the tenant settings](#), it will result in users submitting help desk tickets. While it's a legitimate decision to make, you must be prepared to satisfy the request very quickly. Respond to this type of request within 1-4 hours, if possible. If you delay too long, users will use what they already have or find a way to work around your requirements. That might not be the ideal scenario. Promptness is critical for certain help desk requests. Consider that automation by using [Power Apps](#) and [Power Automate](#) can help make some processes more efficient. For more information, see [Tenant-level workspace planning](#).

Over time, troubleshooting and problem resolution skills become more effective as help desk personnel expand their knowledgebase and experience with supporting Fabric. The best help desk personnel are those who have a good grasp of what users need to accomplish.

Tip

Purely technical issues, for example [data refresh](#) failure or the need to [add a new user to a gateway data source](#), usually involve straightforward responses associated with a service-level agreement (SLA). For instance, there could be an SLA to respond to blocking issues within one hour and resolve them within eight hours. It's generally more difficult to define SLAs for troubleshooting issues, like data discrepancies.

Extended support

Since the [COE](#) has deep insight into how Fabric is used throughout the organization, they're a great option for extended support should a complex issue arise. Involving the COE in the support process should be by an escalation path.

Managing requests as purely an escalation path from the help desk gets difficult to enforce since COE members are often well-known to business users. To encourage the habit of going through the proper channels, COE members should redirect users to submit a help desk ticket. It will also improve the data quality for analyzing help desk requests.

Microsoft support

In addition to the internal user support approaches discussed in this article, there are valuable [external support options](#) directly available to users and Fabric administrators that shouldn't be overlooked.

Microsoft documentation

Check the [Fabric support website](#) for high-priority issues that broadly affect all customers. Global Microsoft 365 administrators have access to additional support issue details within the Microsoft 365 portal.

Refer to the comprehensive [Fabric documentation](#). It's an authoritative resource that can aid troubleshooting and search for information. You can prioritize results from the documentation site. For example, enter a site-targeted search request into your web search engine, like `power bi gateway site:learn.microsoft.com`.

Power BI Pro and Premium Per User end-user support

Licensed users are eligible to [log a support ticket with Microsoft](#).

Tip

Make it clear to your internal user community whether you prefer technical issues to be reported to the internal help desk. If your help desk is equipped to handle the workload, having a centralized internal area collect user issues can provide a superior user experience versus every user trying to resolve issues on their own.

Having visibility and analyzing support issues is also helpful for the [COE](#).

Administrator support

There are several support options available for [Fabric administrators](#).

For customers who have a [Microsoft Unified Support](#) contract, consider granting help desk and COE members access to the [Microsoft Services Hub](#). One advantage of the Microsoft Services Hub is that your help desk and COE members can be set up to [submit and view support requests](#).

Worldwide community support

In addition to the internal user support approaches described in this article, and Microsoft support options described previously, you can leverage the worldwide Fabric community.

The worldwide community is useful when a question can be easily understood by someone without domain knowledge, and when it doesn't involve confidential data or sensitive internal processes.

Publicly available community forums

There are several [public community forums ↗](#) where users can post issues and receive responses from any user in the world. Getting answers from anyone, anywhere, can be very powerful and exceedingly helpful. However, as is the case with any public forum, it's important to validate the advice and information posted on the forum. The advice posted on the internet might not be suitable for your situation.

Publicly available discussion areas

It's very common to see people posting Fabric technical questions on social media platforms. You might find discussions, post announcements, and users helping each other.

Community documentation

The Fabric global community is vibrant. Every day, there are a great number of Fabric blog posts, articles, webinars, and videos published. When relying on community information for troubleshooting, watch out for:

- How recent the information is. Try to verify when it was published or last updated.
- Whether the situation and context of the solution found online truly fits your circumstance.
- The credibility of the information being presented. Rely on reputable blogs and sites.

Considerations and key actions



Checklist - Considerations and key actions you can take for user support follow.

Improve your intra-team support:

- ✓ **Provide recognition and encouragement:** Provide incentives to your champions as described in the [Community of practice](#) article.
- ✓ **Reward efforts:** Recognize and praise meaningful grassroots efforts when you see them happening.
- ✓ **Create formal roles:** If informal intra-team efforts aren't adequate, consider formalizing the roles you want to enact in this area. Include the expected contributions and responsibilities in the HR job description, when appropriate.

Improve your internal community support:

- ✓ **Continually encourage questions:** Encourage users to ask questions in the designated community discussion channel. As the habit builds over time, it will become normalized to use that as the first option. Over time, it will evolve to become more self-supporting.
- ✓ **Actively monitor the discussion area:** Ensure that the appropriate COE members actively monitor this discussion channel. They can step in if a question remains unanswered, improve upon answers, or make corrections when appropriate. They can also post links to additional information to raise awareness of existing resources. Although the goal of the community is to become self-supporting, it still requires dedicated resources to monitor and nurture it.
- ✓ **Communicate options available:** Make sure your user population knows the internal community support area exists. It could include the prominent display of links. You can include a link in regular communications to your user community. You can also [customize the help menu links](#) in the Fabric portal to direct users to your internal resources.
- ✓ **Set up automation:** Ensure that all licensed users automatically have access to the community discussion channel. It's possible to automate license setup by using [group-based licensing](#).

Improve your internal help desk support:

- ✓ **Determine help desk responsibilities:** Decide what the initial scope of Fabric support topics that the help desk will handle.
- ✓ **Assess the readiness level:** Determine whether your help desk is prepared to handle Fabric support. Identify whether there are readiness gaps to be addressed.
- ✓ **Arrange for additional training:** Conduct knowledge transfer sessions or training sessions to prepare the help desk staff.
- ✓ **Update the help desk knowledgebase:** Include known questions and answers in a searchable knowledgebase. Ensure someone is responsible for regular updates to the knowledgebase to reflect new and enhanced features over time.

- ✓ **Set up a ticket tracking system:** Ensure a good system is in place to track requests submitted to the help desk.
- ✓ **Decide whether anyone will be on-call for any issues related to Fabric:** If appropriate, ensure the expectations for 24/7 support are clear.
- ✓ **Determine what SLAs will exist:** When a specific service level agreement (SLA) exists, ensure that expectations for response and resolution are clearly documented and communicated.
- ✓ **Be prepared to act quickly:** Be prepared to address specific common issues extremely quickly. Slow support response will result in users finding workarounds.

Improve your internal COE extended support:

- ✓ **Determine how escalated support will work:** Decide what the escalation path will be for requests the help desk cannot directly handle. Ensure that the COE (or equivalent personnel) is prepared to step in when needed. Clearly define where help desk responsibilities end, and where COE extended support responsibilities begin.
- ✓ **Encourage collaboration between COE and system administrators:** Ensure that COE members and Fabric administrators have a direct escalation path to reach global administrators for Microsoft 365 and Azure. It's critical to have a communication channel when a widespread issue arises that's beyond the scope of Fabric.
- ✓ **Create a feedback loop from the COE back to the help desk:** When the COE learns of new information, the IT knowledgebase should be updated. The goal is for the primary help desk personnel to continually become better equipped at handling more issues in the future.
- ✓ **Create a feedback loop from the help desk to the COE:** When support personnel observe redundancies or inefficiencies, they can communicate that information to the COE, who might choose to improve the knowledgebase or get involved (particularly if it relates to governance or security).

Questions to ask



Use questions like those found below to assess user support.

- Who is responsible for supporting enterprise data and BI solutions? What about self-service solutions?
- How are the business impact and urgency of issues identified to effectively detect and prioritize critical issues?
- Is there a clear process for business users to report issues with data and BI solutions? How does this differ between enterprise and self-service solutions? What are the escalation paths?
- What types of issues do content creators and consumers typically experience? For example, do they experience data quality issues, performance issues, access issues, and others?
- Are any issues closed without them being resolved? Are there "known issues" in data items or reports today?
- Is a process in place for data asset owners to escalate issues with self-service BI solutions to central teams like the COE?
- How frequent are issues in the data and existing solutions? What proportion of these issues are found before they impact business end users?
- How long does it typically take to resolve issues? Is this timing sufficient for business users?
- What are examples of recent issues and the concrete impact on the business?
- Do enterprise teams and content creators know how to report Fabric issues to Microsoft? Can enterprise teams effectively leverage community resources to unblock critical issues?

⊗ Caution

When assessing user support and describing risks or issues, be careful to use neutral language that doesn't place blame on individuals or teams. Ensure everyone's perspective is fairly represented in an assessment. Focus on objective facts to accurately understand and describe the context.

Maturity levels



The following maturity levels will help you assess the current state of your Power BI user support.

Level	State of user support
100: Initial	<ul style="list-style-type: none"> Individual business units find effective ways of supporting each other. However, the tactics and practices are siloed and not consistently applied. An internal discussion channel is available. However, it's not monitored closely. Therefore, the user experience is inconsistent.
200: Repeatable	<ul style="list-style-type: none"> The COE actively encourages intra-team support and growth of the champions network. The internal discussion channel gains traction. It's become known as the default place for questions and discussions. The help desk handles a small number of the most common technical support issues.
300: Defined	<ul style="list-style-type: none"> The internal discussion channel is popular and largely self-sustaining. The COE actively monitors and manages the discussion channel to ensure that all questions are answered quickly and correctly. A help desk tracking system is in place to monitor support frequency, response topics, and priorities. The COE provides appropriate extended support when required.
400: Capable	<ul style="list-style-type: none"> The help desk is fully trained and prepared to handle a broader number of known and expected technical support issues. SLAs are in place to define help desk support expectations, including extended support. The expectations are documented and communicated so they're clear to everyone involved.
500: Efficient	<ul style="list-style-type: none"> Bidirectional feedback loops exist between the help desk and the COE. Key performance indicators measure satisfaction and support methods. Automation is in place to allow the help desk to react faster and reduce errors (for example, use of APIs and scripts).

Related content

In the [next article](#) in the Microsoft Fabric adoption roadmap series, learn about system oversight and administration activities.

Feedback

Was this page helpful?

 Yes

 No

[Provide product feedback ↗](#) | [Ask the community ↗](#)

Microsoft Fabric adoption roadmap: System oversight

Article • 12/30/2024

ⓘ Note

This article forms part of the *Microsoft Fabric adoption roadmap* series of articles. For an overview of the series, see [Microsoft Fabric adoption roadmap](#).

System oversight—also known as Fabric administration—is the ongoing, day-to-day, administrative activities. It's specifically concerned with:

- **Governance:** Enact governance guidelines and policies to support self-service and enterprise data and business intelligence (BI) scenarios.
- **User empowerment:** Facilitate and support the internal processes and systems that empower the internal user community to the extent possible, while adhering to the organization's regulations and requirements.
- **Adoption:** Allow for broader organizational adoption of Fabric with effective governance and data management practices.

ⓘ Important

Your organizational [data culture](#) objectives provide direction for your [governance](#) decisions, which in turn dictate how [Fabric administration](#) activities take place and by whom.

System oversight is a broad and deep topic. The goal of this article is to introduce some of the most important considerations and actions to help you become successful with your [organizational adoption](#) objectives.

Fabric administrators

The Fabric administrator role is a defined role in Microsoft 365, which delegates a [subset](#) of management activities. Global Microsoft 365 administrators are implicitly Fabric administrators. Power Platform administrators are also implicitly Fabric administrators.

A key governance decision is who to assign as a Fabric administrator. It's a centralized role that affects your entire [tenant](#). Ideally, there are [two to four people in the](#)

organization who are capable of managing Fabric. Your administrators should operate in close coordination with the [Center of Excellence \(COE\)](#).

High privilege role

The Fabric administrator role is a high privilege role because:

- **User experience:** Settings that are managed by a Fabric administrator have a significant effect on user capabilities and user experience. For more information, see [Govern tenant settings](#).
- **Full security access:** Fabric administrators can update access permissions for workspaces in the tenant. The result is that an administrator can allow permission to view or download data and reports as they see fit. For more information, see [Govern tenant settings](#).
- **Personal workspace access:** Fabric administrators can access contents and govern the [personal workspace](#) of any user.
- **Metadata:** Fabric administrators can view all tenant metadata, including all user activities that occur in the Fabric portal (described in the [Auditing and monitoring](#) section below).

Important

Having too many Fabric administrators is a risk. It increases the probability of unapproved, unintended, or inconsistent management of the tenant.

Roles and responsibilities

The types of activities that an administrator will do on a day-to-day basis will differ between organizations. What's important, and given priority in your data culture, will heavily influence [what an administrator does](#) to support business-led self-service, managed self-service, and enterprise data and BI scenarios. For more information, see the [Content ownership and management](#) article.

Tip

The best type of person to serve as a Fabric administrator is one who has enough knowledge about the tools and workloads to understand what self-service users need to accomplish. With this understanding, the administrator can balance user empowerment and governance.

In addition to the [Fabric administrator](#), there are other roles which use the term *administrator*. The following table describes the roles that are commonly and regularly used.

[+] [Expand table](#)

Role	Scope	Description
Fabric administrator	Tenant	Manages tenant settings and other settings in the Fabric portal. All general references to <i>administrator</i> in this article refer to this type of administrator.
Capacity administrator	One capacity	Manages workspaces and workloads, and monitors the health of a Fabric capacity.
Data gateway administrator	One gateway	Manages gateway data source configuration, credentials, and users assignments. Might also handle gateway software updates (or collaborate with infrastructure team on updates).
Workspace administrator	One workspace	Manages workspace settings and access.

The Fabric ecosystem of workloads is broad and deep. There are many ways that Fabric integrates with other systems and platforms. From time to time, it'll be necessary to work with other administrators and IT professionals. For more information, see [Collaborate with other administrators](#).

The remainder of this article provides an overview of the most common activities that a Fabric administrator does. It focuses on activities that are important to carry out effectively when taking a strategic approach to [organizational adoption](#).

Service management

Overseeing the tenant is a crucial aspect to ensure that all users have a good experience with Power BI. A few of the key governance responsibilities of a Fabric administrator include:

- **Tenant settings:** Control which Power BI features and capabilities are enabled, and for which users in your organization.
- **Domains:** Group together two or more workspaces that have similar characteristics.
- **Workspaces:** Review and manage workspaces in the tenant.
- **Embed codes:** Govern which reports have been published publicly on the internet.
- **Organizational visuals:** Register and manage organizational visuals.

- **Azure connections:** Integrate with Azure services to provide additional functionality.

For more information, see [Tenant administration](#).

User machines and devices

The adoption of Fabric depends directly on content creators and consumers having the tools and applications they need. Here are some important questions to consider.

- How will users request access to new tools? Will access to licenses, data, and training be available to help users use tools effectively?
- How will content consumers view content that's been published by others?
- How will content creators develop, manage, and publish content? What's your criteria for deciding which tools and applications are appropriate for which use cases?
- How will you install and set up tools? Does that include related prerequisites and data connectivity components?
- How will you manage ongoing updates for tools and applications?

For more information, see [User tools and devices](#).

Architecture

In the context of Fabric, architecture relates to data architecture, capacity management, and data gateway architecture and management.

Data architecture

Data architecture refers to the principles, practices, and methodologies that govern and define what data is collected, and how it's ingested, stored, managed, integrated, modeled, and used.

There are many data architecture decisions to make. Frequently the COE engages in data architecture design and planning. It's common for administrators to get involved as well, especially when they manage databases or Azure infrastructure.

Important

Data architecture decisions have a significant impact on Fabric adoption, user satisfaction, and individual project success rates.

A few data architecture considerations that affect adoption include:

- Where does Fabric fit into the organization's entire data architecture? Are there other existing components such as an enterprise data warehouse (EDW) or a data lake that will be important to factor into plans?
- Is Fabric used end-to-end for data preparation, data modeling, and data presentation or is Fabric used for only some of those capabilities?
- Are [managed self-service](#) patterns followed to find the best balance between data reusability and report creator flexibility?
- Where will users consume the content? Generally, the three main ways to deliver content are: the Fabric portal, Power BI Report Server, and embedded in custom applications. Additionally, [Microsoft Teams](#) is a convenient alternative for users who spend a lot of time in Teams.
- Who is responsible for managing and maintaining the data architecture? Is it a centralized team, or a decentralized team? How is the [COE](#) represented in this team? Are certain skillsets required?
- What [data sources](#) are the most important? What types of data will we be acquiring?
- What [semantic model connectivity mode](#) and [storage mode](#) choices (for example, Direct Lake, import, live connection, DirectQuery, or composite model frameworks) are the best fit for the use cases?
- To what extent is data reusability encouraged using [lakehouses](#), [warehouses](#), and [shared semantic models](#)?
- To what extent is the reusability of data preparation logic and advanced data preparation encouraged by using [data pipelines](#), [notebooks](#), and [dataflows](#)?

It's important for administrators to become fully aware of Fabric's technical capabilities—as well as the needs and goals of their stakeholders—before they make architectural decisions.

Tip

Get into the good habit of completing a technical proof of concept (POC) to test out assumptions and ideas. Some organizations also call them *micro-projects* when the goal is to deliver a small unit of work. The goal of a POC is to address unknowns and reduce risk as early as possible. A POC doesn't have to be throwaway work, but it should be narrow in scope. Best practices reviews, as described in the [Mentoring and user enablement](#) article, are another useful way to help content creators with important architectural decisions.

Capacity management

Capacity includes features and capabilities to deliver analytics solutions at scale. There are two types of Fabric organizational licenses: Premium per User (PPU) and capacity. There are several types of capacity licenses. The type of capacity license determines which Fabric workloads are supported.

Important

At times this article refers to Power BI Premium or its capacity subscriptions (P SKUs). Be aware that Microsoft is currently consolidating purchase options and retiring the Power BI Premium per capacity SKUs. New and existing customers should consider purchasing Fabric capacity subscriptions (F SKUs) instead.

For more information, see [Important update coming to Power BI Premium licensing](#) and [Power BI Premium FAQ](#).

The use of capacity can play a significant role in your strategy for creating, managing, publishing, and distributing content. A few of the top reasons to invest in capacity include:

- Unlimited Power BI content distribution to large numbers of read-only users. Content consumption by users with a free Power BI license is available in Premium capacity only, not PPU. Content consumption by free users is also available with an F64 Fabric capacity license or higher.
- Access to [Fabric experiences](#) for producing end-to-end analytics.
- [Deployment pipelines](#) to manage the publication of content to development, test, and production workspaces. They're highly recommended for critical content to improve release stability.
- [XMLA endpoint](#), which is an industry standard protocol for managing and publishing a semantic model, or querying the semantic model from any XMLA-compliant tool.
- Increased model size limits, including [large semantic model](#) support.
- More frequent [data refreshes](#).
- [Storage of data](#) in a specific geographic area that's different from the home region.

The above list isn't all-inclusive. For a complete list, see [Power BI Premium features](#).

Manage Fabric capacity

Overseeing the health of Fabric capacity is an essential ongoing activity for administrators. Each capacity SKU includes a set of resources. Capacity units (CUs) are used to measure compute resources for each SKU.

Caution

Lack of management, and consistently exceeding the limits of your capacity resources can often result in performance challenges and user experience challenges. Both challenges, if not managed correctly, can contribute to negative impact on adoption efforts.

Suggestions for managing Fabric capacity:

- Define who is responsible for managing the capacity. Confirm the roles and responsibilities so that it's clear what action will be taken, why, when, and by whom.
- Create a specific set of criteria for content that will be published to capacity. It's especially relevant when a single capacity is used by multiple business units because the potential exists to disrupt other users if the capacity isn't well-managed. Consider requiring a [best practices review](#) (such as reasonable semantic model size and efficient calculations) before publishing new content to a production capacity.
- Regularly use the [Fabric capacity metrics app](#) to understand resource utilization and patterns for the capacity. Most importantly, look for consistent patterns of overutilization, which will contribute to user disruptions. An analysis of usage patterns should also make you aware if the capacity is underutilized, indicating more value could be gained from the investment.
- Set the [tenant setting](#) so Fabric notifies you if the [capacity becomes overloaded](#), or if an outage or incident occurs.

Autoscale

[Autoscale](#) is intended to handle occasional or unexpected bursts in capacity usage levels. Autoscale can respond to these bursts by automatically increasing CPU resources to support the increased workload.

Automated scaling up reduces the risk of performance and user experience challenges in exchange for a financial impact. If the capacity isn't well-managed, autoscale might trigger more often than expected. In this case, the [metrics app](#) can help you to determine underlying issues and do capacity planning.

Decentralized capacity management

Capacity administrators are responsible for [assigning workspaces](#) to a specific capacity.

Be aware that workspace administrators can also assign a workspace to PPU if the workspace administrator possesses a PPU license. However, it would require that all other workspace users must also have a PPU license to collaborate on, or view, Power BI content in the workspace. Other Fabric workloads can't be included in a workspace assigned to PPU.

It's possible to set up multiple capacities to facilitate decentralized management by different business units. Decentralizing management of certain aspects of Fabric is a great way to balance agility and control.

Here's an example that describes one way you could manage your capacity.

- Purchase a P3 capacity node in Microsoft 365. It includes 32 virtual cores (v-cores).
- Use 16 v-cores to create the first capacity. It will be used by the Sales team.
- Use 8 v-cores to create the second capacity. It will be used by the Operations team.
- Use the remaining 8 v-cores to create the third capacity. It will support general use.

The previous example has several advantages.

- Separate [capacity administrators](#) can be set up for each capacity. Therefore, it facilitates decentralized management situations.
- If a capacity isn't well-managed, the effect is confined to that capacity only. The other capacities aren't impacted.
- Billing and chargebacks to other business units are straightforward.
- Different workspaces can be easily assigned to the separate capacities.

However, the previous example has disadvantages, too.

- The [limits per capacity](#) are lower. The maximum memory size allowed for semantic models isn't the entire P3 capacity node size that was purchased. Rather, it's the assigned capacity size where the semantic model is hosted.
- It's more likely one of the smaller capacities will need to be scaled up at some point in time.
- There are more capacities to manage in the tenant.

Note

Resources for Power BI Premium per Capacity are referred to as v-cores. However, a Fabric capacity refers to them as capacity units (CUs). The scale for CUs and v-cores

is different for each SKU. For more information, see the [Fabric licensing](#) documentation.

Data gateway architecture and management

A [data gateway](#) facilitates the secure and efficient transfer of data between organizational data sources and the Fabric service. A data gateway is needed for data connectivity to on-premises or cloud services when a data source is:

- Located within the enterprise data center.
- Configured behind a firewall.
- Within a virtual network.
- Within a virtual machine.

There are three types of gateways.

- **On-premises data gateway (standard mode)** is a gateway service that supports connections to registered data sources for many users to use. The gateway software installations and updates are installed on a machine that's managed by the customer.
- **On-premises data gateway (personal mode)** is a gateway service that supports data refresh only. This gateway mode is typically installed on the PC of a content creator. It supports use by one user only. It doesn't support live connection or DirectQuery connections.
- **Virtual network data gateway** is a Microsoft managed service that supports connectivity for many users. Specifically, it supports connectivity for semantic models and dataflows stored in workspaces assigned to Premium capacity or Premium Per User.

Tip

The decision of [who can install gateway software](#) is a governance decision. For most organizations, use of the data gateway in standard mode, or a virtual network data gateway, should be strongly encouraged. They're far more scalable, manageable, and auditable than data gateways in personal mode.

Decentralized gateway management

The On-premises data gateway (standard mode) and Virtual network data gateway support specific data source types that can be registered, together with connection

details and how credentials are stored. Users can be granted permission to use the gateway data source so that they can schedule a refresh or run DirectQuery queries.

Certain aspects of gateway management can be done effectively on a decentralized basis to balance agility and control. For example, the Operations group might have a gateway dedicated to its team of self-service content creators and data owners.

Decentralized gateway management works best when it's a joint effort as follows.

Managed by the decentralized data owners:

- Departmental data source [connectivity information and privacy levels](#).
- Departmental data source [stored credentials](#) (including responsibility for updating routine password changes).
- Departmental data source [users](#) who are permitted to use each data source.

Managed by centralized data owners (includes data sources that are used broadly across the organization; management is centralized to avoid duplicated data sources):

- Centralized data source [connectivity information and privacy levels](#).
- Centralized data source [stored credentials](#) (including responsibility for updating routine password changes).
- Centralized data source [users](#) who are permitted to use each data source.

Managed by IT:

- Gateway software updates (gateway updates are usually released monthly).
- Installation of drivers and custom connectors (the same ones that are installed on [user machines](#)).
- Gateway cluster management (number of machines in the gateway cluster for high availability, disaster recovery, and to eliminate a single point of failure, which can cause significant user disruptions).
- Server management (for example, operating system, RAM, CPU, or networking connectivity).
- Management and backup of gateway encryption keys.
- Monitoring of gateway logs to assess when scale-up or scale-out is necessary.
- Alerting of downtime or persistent low resources on the gateway machine.

Tip

Allowing a decentralized team to manage certain aspects of the gateway means they can move faster. The tradeoff of decentralized gateway management does mean running more gateway servers so that each can be dedicated to a specific area of the organization. If gateway management is handled entirely by IT, it's

imperative to have a good process in place to quickly handle requests to add data sources and apply user updates.

User licenses

Every user needs a commercial license, which is integrated with a Microsoft Entra identity. The user license could be Free, Pro, or Premium Per User (PPU).

A user license is obtained via a subscription, which authorizes a certain number of licenses with a start and end date.

ⓘ Note

Although each user requires a license, a Pro or PPU license is only required to share Power BI content. Users with a free license can create and share Fabric content other than Power BI items.

There are two approaches to procuring subscriptions.

- **Centralized:** Microsoft 365 billing administrator purchases a subscription for [Pro or PPU ↗](#). It's the most common way to manage subscriptions and assign licenses.
- **Decentralized:** Individual departments purchase a subscription via [self-service purchasing](#).

Self-service purchasing

An important [governance](#) decision relates to what extent self-service purchasing will be allowed or encouraged.

Self-service purchasing is useful for:

- Larger organizations with decentralized business units that have purchasing authority and want to handle payment directly with a credit card.
- Organizations that intend to make it as easy as possible to purchase subscriptions on a monthly commitment.

Consider disabling self-service purchasing when:

- Centralized procurement processes are in place to meet regulatory, security, and governance requirements.
- Discounted pricing is obtained through an Enterprise Agreement (EA).

- Existing processes are in place to handle intercompany chargebacks.
- Existing processes are in place to handle **group-based** licensing assignments.
- Prerequisites are required for obtaining a license, such as approval, justification, training, or a governance policy requirement.
- There's a valid need, such as a regulatory requirement, to control access closely.

User license trials

Another important governance decision is whether user license trials are allowed. By default, trials are enabled. That means when content is shared with a colleague, if the recipient doesn't have a Pro or PPU license, they'll be prompted to start a trial to view the content (if the content doesn't reside within a workspace backed by capacity). The trial experience is intended to be a convenience that allows users to continue with their normal workflow.

Generally, disabling trials isn't recommended. It can encourage users to seek workarounds, perhaps by exporting data or working outside of supported tools and processes.

Consider disabling trials only when:

- There are serious cost concerns that would make it unlikely to grant full licenses at the end of the trial period.
- Prerequisites are required for obtaining a license (such as approval, justification, or a training requirement). It's not sufficient to meet this requirement during the trial period.
- There's a valid need, such as a regulatory requirement, to control access to the Fabric service closely.

💡 Tip

Don't introduce too many barriers to obtaining a Fabric license. Users who need to get work done will find a way, and that way might involve workarounds that aren't ideal. For instance, without a license to use Fabric, people might rely far too much on sharing files on a file system or via email when significantly better approaches are available.

Cost management

Managing and optimizing the cost of cloud services, like Fabric, is an important activity. Here are several activities you can consider.

- Analyze who is using—and, more to the point, not using—their allocated Fabric licenses and make necessary adjustments. Fabric usage is analyzed using the [activity log](#).
- Analyze the cost effectiveness of [capacity](#) or [Premium Per User](#). In addition to the [additional features](#), perform a cost/benefit analysis to determine whether capacity licensing is more cost-effective when there are a large number of consumers.
- Carefully [monitor and manage Fabric capacity](#). Understanding usage patterns over time will allow you to predict when to purchase [more capacity](#). For example, you might choose to scale up a single capacity from a P1 to P2, or scale out from one P1 capacity to two P1 capacities.
- If there are occasional spikes in the level of usage, use of [autoscale](#) with Fabric is recommended to ensure the user experience isn't interrupted. Autoscale will scale up capacity resources for 24 hours, then scale them back down to normal levels (if sustained activity isn't present). Manage autoscale cost by constraining the maximum number of v-cores, and/or with spending limits set in Azure. Due to the pricing model, autoscale is best suited to handle occasional unplanned increases in usage.
- For Azure data sources, co-locate them in the same region as your Fabric tenant whenever possible. It will avoid incurring [Azure egress charges](#). Data egress charges are minimal, but at scale can add up to be considerable unplanned costs.

Security, information protection, and data loss prevention

Security, information protection, and data loss prevention (DLP) are joint responsibilities among all content creators, consumers, and administrators. That's no small task because there's sensitive information everywhere: personal data, customer data, or customer-authored data, protected health information, intellectual property, proprietary organizational information, just to name a few. Governmental, industry, and contractual regulations could have a significant impact on the [governance](#) guidelines and policies that you create related to security.

The [Power BI security whitepaper](#) is an excellent resource for understanding the breadth of considerations, including aspects that Microsoft manages. This section will introduce several topics that customers are responsible for managing.

User responsibilities

Some organizations ask Fabric users to accept a self-service user acknowledgment. It's a document that explains the user's responsibilities and expectations for safeguarding

organizational data.

One way to automate its implementation is with a [Microsoft Entra terms of use policy](#). The user is required to view and agree to the policy before they're permitted to visit the Fabric portal for the first time. You can also require it to be acknowledged on a recurring basis, like an annual renewal.

Data security

In a [cloud shared responsibility model](#), securing the data is always the responsibility of the customer. With a self-service data platform, self-service content creators have responsibility for properly securing the content that they shared with colleagues.

The COE should provide [documentation and training](#) where relevant to assist content creators with best practices (particularly situations for dealing with ultra-sensitive data).

Administrators can help by following best practices themselves. Administrators can also raise concerns when they see issues that could be discovered when [managing workspaces](#), [auditing user activities](#), or managing [gateway credentials and users](#). There are also several [tenant settings](#) that are usually restricted except for a few users (for instance, the ability to [publish to web](#) or the ability to [publish apps to the entire organization](#)).

External guest users

External users—such as partners, customers, vendors, and consultants—are a common occurrence for some organizations, and rare for others. How you handle external users is a governance decision.

External user access is controlled by [tenant settings](#) and certain Microsoft Entra ID settings. For details of external user considerations, review the [Distribute Power BI content to external guest users using Microsoft Entra B2B](#) whitepaper.

Information protection and data loss prevention

Fabric supports capabilities for information protection and data loss prevention (DLP) in the following ways.

- **Information protection:** [Microsoft Purview Information Protection](#) (formerly known as Microsoft Information Protection) includes capabilities for discovering, classifying, and protecting data. A key principle is that data can be better protected

once it's been classified. The key building block for classifying data is [sensitivity labels](#). For more information, see [Information protection for Power BI planning](#).

- **Data loss prevention for Power BI:** Microsoft Purview Data Loss Prevention (formerly known as Office 365 Data Loss Prevention) supports [DLP policies for Power BI](#). By using sensitivity labels or sensitive information types, DLP policies for Power BI help an organization locate sensitive semantic models. For more information, see [Data loss prevention for Power BI planning](#).
- **Microsoft Defender for Cloud Apps:** [Microsoft Defender for Cloud Apps](#) (formerly known as Microsoft Cloud App Security) supports policies that help protect data, including real-time controls when users interact with the Power BI service. For more information, see [Defender for Cloud Apps for Power BI planning](#).

Data residency

For organizations with requirements to store data within a geographic region, Fabric capacity can be [set for a specific region](#) that's different from the home region of the Fabric tenant.

Encryption keys

Microsoft handles encryption of *data at rest* in Microsoft data centers with transparent server-side encryption and auto-rotation of certificates. For customers with regulatory requirements to [manage the Premium encryption key themselves](#), Premium capacity can be configured to use [Azure Key Vault](#). Using customer-managed keys—also known as *bring-your-own-key* or *BYOK*—is a precaution to ensure that, in the event of a human error by a service operator, customer data can't be exposed.

Be aware that [Premium Per User \(PPU\)](#) only supports BYOK when it's enabled for the entire Fabric tenant.

Auditing and monitoring

It's critical that you make use of auditing data to analyze adoption efforts, understand usage patterns, educate users, support users, mitigate risk, improve compliance, manage license costs, and monitor performance. For more information about why auditing your data is valuable, see [Auditing and monitoring overview](#).

There are different ways to approach auditing and monitoring depending on your role and your objectives. The following articles describe various considerations and planning activities.

- **Report-level auditing:** Techniques that report creators can use to understand which users are using the reports that they create, publish, and share.
- **Data-level auditing:** Methods that data creators can use to track the performance and usage patterns of data assets that they create, publish, and share.
- **Tenant-level auditing:** Key decisions and actions administrators can take to create an end-to-end auditing solution.
- **Tenant-level monitoring:** Tactical actions administrators can take to monitor the Power BI service, including updates and announcements.

REST APIs

The [Power BI REST APIs](#) and the [Fabric REST APIs](#) provide a wealth of information about your Fabric tenant. Retrieving data by using the REST APIs should play an important role in managing and governing a Fabric implementation. For more information about planning for the use of REST APIs for auditing, see [Tenant-level auditing](#).

You can retrieve auditing data to build an auditing solution, manage content programmatically, or increase the efficiency of routine actions. The following table presents some actions you can perform with the REST APIs.

 [Expand table](#)

Action	Documentation resource(s)
Audit user activities	REST API to get activity events
Audit workspaces, items, and permissions	Collection of asynchronous metadata scanning REST APIs to obtain a tenant inventory
Audit content shared to entire organization	REST API to check use of widely shared links
Audit tenant settings	REST API to check tenant settings
Publish content	REST API to deploy items from a deployment pipeline or clone a report to another workspace
Manage content	REST API to refresh a semantic model or take over ownership of a semantic model
Manage gateway data sources	REST API to update credentials for a gateway data source
Export content	REST API to export a report
Create workspaces	REST API to create a new workspace

Action	Documentation resource(s)
Manage workspace permissions	REST API to assign user permissions to a workspace
Update workspace name or description	REST API to update workspace attributes
Restore a workspace	REST API to restore a deleted workspace
Programmatically retrieve a query result from a semantic model	REST API to run a DAX query against a semantic model
Assign workspaces to capacity	REST API to assign workspaces to capacity
Programmatically change a data model	Tabular Object Model (TOM) API
Embed Power BI content in custom applications	Power BI embedded analytics client APIs

💡 Tip

There are many other Power BI REST APIs. For a complete list, see [Using the Power BI REST APIs](#).

Planning for change

Every month, Microsoft releases new Fabric features and capabilities. To be effective, it's crucial that everyone involved with system oversight stays current. For more information, see [Tenant-level monitoring](#).

ⓘ Important

Don't underestimate the importance of staying current. If you get a few months behind on announcements, it can become difficult to properly manage Fabric and support your users.

Considerations and key actions



Checklist - Considerations and key actions you can take for system oversight follow.

Improve system oversight:

- ✓ **Verify who is permitted to be a Fabric administrator:** If possible, reduce the number of people granted the Fabric administrator role if it's more than a few people.
- ✓ **Use PIM for occasional administrators:** If you have people who *occasionally* need Fabric administrator rights, consider implementing [Privileged Identity Management \(PIM\)](#) in Microsoft Entra ID. It's designed to assign just-in-time role permissions that expire after a few hours.
- ✓ **Train administrators:** Check the status of cross-training and documentation in place for handling Fabric administration responsibilities. Ensure that a backup person is trained so that needs can be met timely, in a consistent way.

Improve management of the Fabric service:

- ✓ **Review tenant settings:** Conduct a review of all tenant settings to ensure they're aligned with [data culture](#) objectives and [governance](#) guidelines and policies. Verify which groups are assigned for each setting.
- ✓ **Document the tenant settings:** Create documentation of your tenant settings for the internal Fabric community and post it in the centralized portal. Include which groups a user would need to request to be able to use a feature. Use the [Get Tenant Settings REST API](#) to make the process more efficient, and to create snapshots of the settings on a regular basis.
- ✓ **Customize the Get Help links:** When user resources are established, as described in the [Mentoring and user enablement](#) article, update the [tenant setting](#) to customize the links under the *Get Help* menu option. It will direct users to your documentation, community, and help.

Improve management of user machines and devices:

- ✓ **Create a consistent onboarding process:** Review your process for how onboarding of new content creators is handled. Determine if new requests for software, such as Power BI Desktop, and user licenses (Free, Pro, or PPU) can be handled together. It can simplify onboarding since new content creators won't always know what to ask for.
- ✓ **Handle user machine updates:** Ensure an automated process is in place to install and update software, drivers, and settings to ensure all users have the same version.

Data architecture planning:

- ✓ **Assess what your end-to-end data architecture looks like:** Make sure you're clear on:

- How Fabric is currently used by the different business units in your organization versus how you want Fabric to be used. Determine if there's a gap.
 - If there are any risks that should be addressed.
 - If there are any high-maintenance situations to be addressed.
 - What data sources are important for Fabric users, and how they're documented and discovered.
- ✓ Review existing data gateways:** Find out what gateways are being used throughout your organization. Verify that gateway administrators and users are set correctly. Verify who is supporting each gateway, and that there's a reliable process in place to keep the gateway servers up to date.
- ✓ Verify use of personal gateways:** Check the number of personal gateways that are in use, and by whom. If there's significant usage, take steps to move towards use of the standard mode gateway.

Improve management of user licenses:

- ✓ Review the process to request a user license:** Clarify what the process is, including any prerequisites, for users to obtain a license. Determine whether there are improvements to be made to the process.
- ✓ Determine how to handle self-service license purchasing:** Clarify whether self-service licensing purchasing is enabled. Update the settings if they don't match your intentions for how licenses can be purchased.
- ✓ Confirm how user trials are handled:** Verify user license trials are enabled or disabled. Be aware that all user trials are Premium Per User. They apply to Free licensed users signing up for a trial, and Pro users signing up for a Premium Per User trial.

Improve cost management:

- ✓ Determine your cost management objectives:** Consider how to balance cost, features, usage patterns, and effective utilization of resources. Schedule a routine process to evaluate costs, at least annually.
- ✓ Obtain activity log data:** Ensure you have access to the activity log data to assist with cost analysis. It can be used to understand who is—or isn't—using the license assigned to them.

Improve security and data protection:

- ✓ Clarify exactly what the expectations are for data protection:** Ensure the expectations for data protection, such as how to use sensitivity labels, are documented and communicated to users.
- ✓ Determine how to handle external users:** Understand and document the organizational policies around sharing Fabric content with external users. Ensure

that settings in Fabric support your policies for external users.

- ✓ **Set up monitoring:** Investigate the use of Microsoft Defender for Cloud Apps to monitor user behavior and activities in Fabric.

Improve auditing and monitoring:

- ✓ **Plan for auditing needs:** Collect and document the key business requirements for an auditing solution. Consider your priorities for auditing and monitoring. Make key decisions related to the type of auditing solution, permissions, technologies to be used, and data needs. Consult with IT to clarify what auditing processes currently exist, and what preferences of requirements exist for building a new solution.
- ✓ **Consider roles and responsibilities:** Identify which teams will be involved in building an auditing solution, as well as the ongoing analysis of the auditing data.
- ✓ **Extract and store user activity data:** If you aren't currently extracting and storing the raw data, begin retrieving [user activity data](#).
- ✓ **Extract and store snapshots of tenant inventory data:** Begin retrieving metadata to build a [tenant inventory](#), which describes all workspaces and items.
- ✓ **Extract and store snapshots of users and groups data:** Begin retrieving metadata about [users, groups, and service principals](#).
- ✓ **Create a curated data model:** Perform data cleansing and transformations of the raw data to create a curated data model that'll support analytical reporting for your auditing solution.
- ✓ **Analyze auditing data and act on the results:** Create analytic reports to analyze the curated auditing data. Clarify what actions are expected to be taken, by whom, and when.
- ✓ **Include additional auditing data:** Over time, determine whether other auditing data would be helpful to complement the activity log data, such as [security data](#).

💡 Tip

For more information, see [Tenant-level auditing](#).

Use the REST APIs:

- ✓ **Plan for your use of the REST APIs:** Consider what data would be most useful to retrieve from the Power BI REST APIs and the Fabric REST APIs.
- ✓ **Conduct a proof of concept:** Do a small proof of concept to validate data needs, technology choices, and permissions.

Questions to ask



Use questions like those found below to assess system oversight.

- Are there atypical administration settings enabled or disabled? For example, is the entire organization allowed to publish to web (we strongly advise restricting this feature).
- Do administration settings and policies align with, or inhibit, business the way user work?
- Is there a process in place to critically appraise new settings and decide how to set them? Alternatively, are only the most restrictive settings set as a precaution?
- Are Microsoft Entra security groups used to manage who can do what?
- Do central teams have visibility of effective [auditing and monitoring](#) tools?
- Do monitoring solutions depict information about the data assets, user activities, or both?
- Are auditing and monitoring tools actionable? Are there clear thresholds and actions set, or do monitoring reports simply describe what's in the data estate?
- Is [Azure Log Analytics](#) used (or planned to be used) for detailed monitoring of Fabric capacities? Are the potential benefits and cost of Azure Log Analytics clear to decision makers?
- Are sensitivity labels and data loss prevention policies used? Are the potential benefits and cost of these clear to decision makers?
- Do administrators know the current number of licenses and licensing cost? What proportion of the total BI spend goes to Fabric capacity, and to Pro and PPU licenses? If the organization is only using Pro licenses for Power BI content, could the number of users and usage patterns warrant a cost-effective switch to Power BI Premium or Fabric capacity?

Maturity levels



The following maturity levels will help you assess the current state of your Power BI system oversight.

Level	State of system oversight
100: Initial	<ul style="list-style-type: none"> Tenant settings are configured independently by one or more administrators based on their best judgment. Architecture needs, such as gateways and capacities, are satisfied on an as-needed basis. However, there isn't a strategic plan. Fabric activity logs are unused, or selectively used for tactical purposes.
200: Repeatable	<ul style="list-style-type: none"> The tenant settings purposefully align with established governance guidelines and policies. All tenant settings are reviewed regularly. A small number of specific administrators are selected. All administrators have a good understanding of what users are trying to accomplish in Fabric, so they're in a good position to support users. A well-defined process exists for users to request licenses and software. Request forms are easy for users to find. Self-service purchasing settings are specified. Sensitivity labels are configured in Microsoft 365. However, use of labels remains inconsistent. The advantages of data protection aren't well understood by users.
300: Defined	<ul style="list-style-type: none"> The tenant settings are fully documented in the centralized portal for users to reference, including how to request access to the correct groups. Cross-training and documentation exist for administrators to ensure continuity, stability, and consistency. Sensitivity labels are assigned to content consistently. The advantages of using sensitivity labels for data protection are understood by users. An automated process is in place to export Fabric activity log and API data to a secure location for reporting and auditing.
400: Capable	<ul style="list-style-type: none"> Administrators work closely with the COE and governance teams to provide oversight of Fabric. A balance of user empowerment and governance is successfully achieved. Decentralized management of data architecture (such as gateways or capacity management) is effectively handled to balance agility and control. Automated policies are set up and actively monitored in Microsoft Defender for Cloud Apps for data loss prevention. Activity log and API data is actively analyzed to monitor and audit Fabric activities. Proactive action is taken based on the data.

Level	State of system oversight
500: Efficient	<ul style="list-style-type: none"> The Fabric administrators work closely with the COE actively stay current. Blog posts and release plans from the Fabric product team are reviewed frequently to plan for upcoming changes. Regular cost management analysis is done to ensure user needs are met in a cost-effective way. The Fabric REST API is used to retrieve tenant setting values on a regular basis. Activity log and API data is actively used to inform and improve adoption and governance efforts.

Related content

For more information about system oversight and Fabric administration, see the following resources.

- [Administer Microsoft Fabric](#)
- [Administer Power BI - Part 1](#)
- [Administer Power BI - Part 2](#)
- [Administrator in a Day Training – Day 1 ↗](#)
- [Administrator in a Day Training – Day 2 ↗](#)
- [Power BI security whitepaper](#)
- [External guest users whitepaper](#)
- [Power BI implementation planning](#)

In the [next article](#) in the Microsoft Fabric adoption roadmap series, learn about effective change management.

Feedback

Was this page helpful?

👍 Yes
👎 No

[Provide product feedback ↗](#) | [Ask the community ↗](#)

Microsoft Fabric adoption roadmap: Change management

Article • 12/30/2024

ⓘ Note

This article forms part of the *Microsoft Fabric adoption roadmap* series of articles. For an overview of the series, see [Microsoft Fabric adoption roadmap](#).

When working toward improved data and business intelligence (BI) adoption, you should plan for effective *change management*. In the context of data and BI, change management includes procedures that address the impact of change for people in an organization. These procedures safeguard against disruption and productivity loss due to changes in solutions or processes.

ⓘ Note

Effective change management is particularly important when you [migrate to Power BI](#).

Effective change management improves adoption and productivity because it:

- Helps content creators and consumers use analytics more effectively and sooner.
- Limits redundancy in data, analytical tools, and solutions.
- Reduces the likelihood of risk-creating behaviors that affect shared resources (like Fabric capacity) or organizational compliance (like data security and privacy).
- Mitigates resistance to change that obstructs planning and inhibits user adoption.
- Mitigates the impact of change and improving user wellbeing by reducing the potential for disruption, stress, and conflict.

Effective change management is critical for successful adoption at all levels. To successfully manage change, consider the key actions and activities described in the following sections.

ⓘ Important

Change management is a fundamental obstacle to success in many organizations. Effective change management requires that you understand that it's about people—not tools or processes.

Successful change management involves empathy and communication. Ensure that change isn't forced or resistance to change is ignored, because it can widen organizational divides and further inhibit effectiveness.

💡 Tip

Whenever possible, we recommend that you describe and promote change as *improvement*—it's much less threatening. For many people, *change* implies a cost in terms of effort, focus, and time. Alternatively, *improvement* means a benefit because it's about making something better.

Types of change to manage

When implementing data and BI solutions, you should manage different types of change. Also, depending on the scale and scope of your implementation, you should address different aspects of change.

Consider the following types of change to manage when you plan for Fabric adoption.

Process-level changes

Process-level changes are changes that affect a broader user community or the entire organization. These changes typically have a larger impact, and so they require more effort to manage. Specifically, this change management effort includes specific plans and activities.

Here are some examples of process-level changes.

- Change from centralized to decentralized approaches to ownership (change in [content ownership and management](#)).
- Change from enterprise to departmental, or from team to personal content delivery (change in [content delivery scope](#)).
- Change of central team structure (for example, forming a [Center of Excellence](#)).
- Changes in [governance](#) policies.
- [Migration](#) from other analytics products to Fabric, and the changes this migration involves, like:
 - The [separation of semantic models and reports](#), and a model-based approach to analytics.
 - Transitioning from exports or static reports to interactive analytical reports, which can involve filtering and cross-filtering.

- Moving from distributing reports as PowerPoint files or flat files to accessing reports directly from the Fabric portal.
- Shifting from information in tables, paginated reports, and spreadsheets to interactive visualizations and charts.
- Changing from an on-premises or platform as a service (PaaS) platform to a software as a service (SaaS) tool.

 **Note**

Typically, giving up export-based processes or Excel reporting is a significant challenge. That's because these methods are usually deeply engrained in the organization and are tied to the autonomy and data skills of your users.

Solution-level changes

Solution-level changes are changes that affect a single solution or set of solutions. These changes limit their impact to the user community of those solutions and their dependent processes. Although solution-level changes typically have a lower impact, they also tend to occur more frequently.

 **Note**

In the context of this article, a *solution* is built to address specific business needs for users. A solution can take many forms, such as a data pipeline, a lakehouse, a semantic model, or a report. The considerations for change management described in this article are relevant for all types of solutions, and not only reporting projects.

Here are some examples of solution-level changes.

- Changes in calculation logic for KPIs or measures.
- Changes in how master data or hierarchies for business attributes are mapped, grouped, or described.
- Changes in data freshness, detail, format, or complexity.
- Introduction of advanced analytics concepts, like predictive analytics or prescriptive analytics, or general statistics (if the user community isn't familiar with these concepts, already).
- Changes in the presentation of data, like:
 - Styling, colors, and other formatting choices for visuals.
 - The type of visualization.

- How data is grouped or summarized (such as changing from different measures of central tendency, like average, median, or geometric mean).
- Changes in how content consumers interact with data (like connecting to a [shared semantic model](#) instead of exporting information for [personal usage scenarios](#)).

How you prepare change management plans and activities will depend on the types of change. To successfully and sustainably manage change, we recommend that you implement incremental changes.

Address change incrementally

Change management can be a significant undertaking. Taking an incremental approach can help you facilitate change in a way that's sustainable. To adopt an incremental approach, you identify the highest priority changes and break them into manageable parts, implementing each part with iterative phases and action plans.

The following steps outline how you can incrementally address change.

- 1. Define what's changing:** Describe the change by outlining the before and after states. Clarify the specific parts of the process or situation that you'll change, remove, or introduce. Justify why this change is necessary, and when it should occur.
- 2. Describe the impact of the change:** For each of these changes, estimate the business impact. Identify which processes, teams, or individuals the change affects, and how disruptive it will be for them. Also consider any downstream effects the change has on other dependent solutions or processes. Downstream effects might result in other changes. Additionally, consider how long the situation remained the same before it was changed. Changes to longer-standing processes tend to have a higher impact, as preferences and dependencies arise over time.
- 3. Identify priorities:** Focus on the changes with the highest potential impact. For each change, outline a more detailed description of the changes and how it will affect people.
- 4. Plan how to incrementally implement the change:** Identify whether any high-impact changes can be broken into stages or parts. For each part, describe how it might be incrementally implemented in phases to limit its impact. Determine whether there are any constraints or dependencies (such as when changes can be made, or by whom).
- 5. Create an action plan for each phase:** Plan the actions you will take to implement and support each phase of the change. Also, plan for how you can mitigate disruption in high-impact phases. Be sure to include a rollback plan in your action plan, whenever possible.

💡 Tip

Iteratively plan how you'll implement each phase of these incremental changes as part of your quarterly [tactical planning](#).

When you plan to mitigate the impact of changes on Power BI adoption, consider the activities described in the following sections.

Effectively communicate change

Ensure that you clearly and concisely describe planned changes for the user community. Important communication should originate from the executive sponsor, or another leader with relevant authority. Be sure to communicate the following details.

- **What's changing:** What the situation is now and what it will be after the change.
- **Why it's changing:** The benefit and value of the change for the audience.
- **When it's changing:** An estimation of when the change will take effect.
- **Further context:** Where people can go for more information.
- **Contact information:** Who people should contact provide feedback, ask questions, or raise concerns.

Consider maintaining a history of communications in your [centralized portal](#). That way, it's easy to find communications, timings, and details of changes after they've occurred.

ⓘ Important

You should communicate change with sufficient advanced notice so that people are prepared. The higher the potential impact of the change, the earlier you should communicate it. If unexpected circumstances prevent advance notice, be sure to explain why in your communication.

Plan training and support

Changes to tools, processes, and solutions typically require training to use them effectively. Additionally, extra support might be required to address questions or respond to support requests.

Here are some actions you can take to plan for training and support.

- Centralize training and support by using a [centralized portal](#). The portal can help organize discussions, collect feedback, and distribute training materials or

documentation by topic.

- Consider [incentives](#) to encourage self-sustaining support within a community.
- Schedule recurring [office hours](#) to answer questions and provide mentorship.
- Create and demonstrate end-to-end scenarios for people to practice a new process.
- For high-impact changes, prepare training and support plans that realistically assess the effort and actions needed to prevent the change from causing disruption.

Note

These training and support actions will differ depending on the scale and scope of the change. For high-impact, large-scale changes (like transitioning from enterprise to managed self-service approaches to data and BI), you'll likely need to plan iterative, multi-phase plans that span multiple planning periods. In this case, carefully consider the effort and resources needed to deliver success.

Involve executive leadership

Executive support is critical to effective change management. When an executive supports a change, it demonstrates its strategic importance or benefit to the rest of the organization. This top-down endorsement and reinforcement is particularly important for high-impact, large-scale changes, which have a higher potential for disruption. For these scenarios, ensure that you actively engage and involve your [executive sponsor](#) to endorse and reinforce the change.

Caution

Resistance to change from the executive leadership is often a warning sign that stronger [business alignment](#) is needed between the business and BI strategies. In this scenario, consider specific alignment sessions and change management actions with executive leadership.

Involve stakeholders

To effectively manage change, you can also take a bottom-up approach by engaging the stakeholders, who are the people the change affects. When you create an action plan to address the changes, identify and engage key stakeholders in focused, limited sessions. In this way you can understand the impact of the change on the people whose work will

be affected by the change. Take note of their concerns and their ideas for how you might lessen the impact of this change. Ensure that you identify any potentially unexpected effects of the change on other people and processes.

Handle resistance to change

It's important to address resistance to change, as it can have substantial negative impacts on adoption and productivity. When you address resistance to change, consider the following actions and activities.

- **Involve your executive sponsor:** The authority, credibility, and influence of the executive sponsor is essential to support change management and resolve disputes.
- **Identify blocking issues:** When change disrupts the way people work, this change can prevent people from effectively completing tasks in their regular activities. For such blocking issues, identify potential workarounds when you take into account the changes.
- **Focus on data and facts instead of opinions:** Resistance to change is sometimes due to opinions and preferences, because people are familiar with the situation prior to the change. Understand why people have these opinions and preferences. Perhaps it's due to convenience, because people don't want to invest time and effort in learning new tools or processes.
- **Focus on business questions and processes instead of requirements:** Changes often introduce new processes to address problems and complete tasks. New processes can lead to a resistance to change because people focus on what they miss instead of fully understanding what's new and why.

Additionally, you can have a significant impact on change resistance by engaging *promoters* and *detractors*.

Identify and engage promoters

Promoters are vocal, credible individuals in a user community who advocate in favor of a tool, solution, or initiative. Promoters can have a positive impact on adoption because they can influence peers to understand and accept change.

To effectively manage change, you should identify and engage promoters early in the process. You should involve them and inform them about the change to better utilize and amplify their advocacy.

 Tip

The promoters you identify might also be great candidates for your [champions network](#).

Identify and engage detractors

Detractors are the opposite of promoters. They are vocal, credible individuals in a user community who advocate against a tool, solution, or initiative. Detractors can have a significant negative influence on adoption because they can convince peers that the change isn't beneficial. Additionally, detractors can advocate for alternative or solutions marked for retirement, making it more difficult to decommission old tools, solutions, or processes.

To effectively manage change, you should identify and engage detractors early in the process. That way, you can mitigate the potential negative impact they have. Furthermore, if you address their concerns, you might convert these detractors into promoters, helping your adoption efforts.

💡 Tip

A common source of detractors is content owners for solutions that are going to be modified or replaced. The change can sometimes threaten these content owners, who are incentivized to resist the change in the hope that their solution will remain in use. In this case, identify these content owners early and involve them in the change. Giving these individuals a sense of ownership of the implementation will help them embrace, and even advocate in favor, of the change.

Questions to ask



Use questions like those found below to assess change management.

- Is there a role or team responsible for change management in the organization? If so, how are they involved in data and BI initiatives?
- Is change seen as an obstacle to achieving strategic success among people in the organization? Is the importance of change management acknowledged in the organization?

- Are there any significant promoters for data and BI solutions and processes in the user community? Conversely, are there any significant detractors?
- What communication and training efforts are performed to launch new data tools and solutions? How long do they last?
- How is change in the user community handled (for example, with new hires or promoted individuals)? What onboarding activities introduce these new individuals to existing solutions, processes, and policies?
- Do people who create Excel reports feel threatened or frustrated by initiatives to automate reporting with BI tools?
- To what extent do people associate their identities with the tools they use and the solutions they have created and own?
- How are changes to existing solutions planned and managed? Are changes planned, with a visible roadmap, or are they reactive? Do people get sufficient notification about upcoming changes?
- How frequently do changes disrupt existing processes and tools?
- How long does it take to decommission legacy systems or solutions when new ones become available? How long does it take to implement changes to existing solutions?
- To what extent do people agree with the statement *I am overwhelmed with the amount of information I am required to process*? To what extent do people agree with the sentiment *things are changing too much, too quickly*?

Maturity levels



An assessment of change management evaluates how effectively the organization can enact and respond to change.

The following maturity levels will help you assess your current state of change management, as it relates to data and BI initiatives.

[] Expand table

Level	State of change management
100: Initial	<ul style="list-style-type: none"> • Change is usually reactive, and it's also poorly communicated. • The purpose or benefits of change aren't well understood, and resistance to

Level	State of change management
	<p>change causes conflict and disruption.</p> <ul style="list-style-type: none"> No clear teams or roles are responsible for managing change for data initiatives.
200: Repeatable	<ul style="list-style-type: none"> Executive leadership and decision makers recognize the need for change management in data and BI projects and initiatives. Some efforts are taken to plan or communicate change, but they're inconsistent and often reactive. Resistance to change is still common. Change often disrupts existing processes and tools.
300: Defined	<ul style="list-style-type: none"> Formal change management plans or roles are in place. These plans include communication tactics and training, but they're not consistently or reliably followed. Change occasionally disrupts existing processes and tools. Successful change management is championed by key individuals that bridge organizational boundaries.
400: Capable	<ul style="list-style-type: none"> Empathy and effective communication are integral to change management strategies. Change management efforts are owned by particular roles or teams, and effective communication results in a clear understanding of the purpose and benefits of change. Change rarely interrupts existing processes and tools.
500: Efficient	<ul style="list-style-type: none"> Change is an integral part of the organization. People in the organization understand the inevitability of change, and see it as a source for momentum instead of disruption. Change almost never unnecessarily interrupts existing processes or tools. Systematic processes address change as a challenge of people and not processes.

Related content

In the [next article](#) in the Microsoft Fabric adoption roadmap series, in conclusion, learn about adoption-related resources that you might find valuable.

Feedback

Was this page helpful?



[Provide product feedback ↗](#) | [Ask the community ↗](#)

Microsoft Fabric adoption roadmap conclusion

Article • 12/30/2024

ⓘ Note

This article forms part of the *Microsoft Fabric adoption roadmap* series of articles. For an overview of the series, see [Microsoft Fabric adoption roadmap](#).

This article concludes the series on Microsoft Fabric adoption. The strategic and tactical considerations and action items presented in this series will assist you in your analytics adoption efforts, and with creating a productive data culture in your organization.

This series covered the following aspects of Fabric adoption.

- Adoption introduction
- Adoption maturity levels
- Data culture
- Executive sponsorship
- Business alignment
- Content ownership and management
- Content delivery scope
- Center of Excellence
- Governance
- Mentoring and enablement
- Community of practice
- User support
- System oversight
- Change management

The rest of this article includes suggested next actions to take. It also includes other adoption-related resources that you might find valuable.

Next actions to take

It can be overwhelming to decide where to start. The following series of steps provides a process to help you approach your next actions.

1. **Learn:** First, read this series of articles end-to-end. Become familiar with the strategic and tactical considerations and action items that directly lead to successful analytics adoption. They'll help you to build a data culture in your organization. Discuss the concepts with your colleagues.
2. **Assess current state:** For each area of the adoption roadmap, assess your current state. Document your findings. Your goal is to have full clarity on where you're now so that you can make informed decisions about what to do next.
3. **Clarify your strategic goals:** Ensure that you're clear on what your organization's goals are for adopting Fabric. Confirm that your adoption and data culture goals align with your organization's broader strategic goals for the use of data, analytics, and business intelligence (BI) in general. Focus on what your immediate strategy is for the next 3-12 months. For more information about defining your goals, see the [strategic planning](#) article.
4. **Prioritize:** Clarify what's most important to achieve in the next 12-18 months. For instance, you might identify specific user enablement or risk reduction areas that are a higher priority than other areas. Determine which advancements in maturity levels you should prioritize first. For more information about defining your priorities, see the [strategic planning](#) article.
5. **Identify future state:** For each area of the roadmap, identify the gaps between what you want to happen (your future state) and what's happening (your current state). Focus on the next 12-18 months for identifying your desired future state.
6. **Customize maturity levels:** Using the information you have on your strategy and future state, customize the maturity levels for each area of the roadmap. Update or delete the description for each maturity level so that they're realistic, based on your goals and strategy. Your current state, priorities, staffing, and funding will influence the time and effort it will take to advance to higher maturity levels.
7. **Define measurable objectives:** Create KPIs (key performance indicators) or OKRs (objectives and key results) to define specific goals for the next quarter. Ensure that the objectives have clear owners, are measurable, time-bound, and achievable. Confirm that each objective aligns with your strategic BI goals and priorities.
8. **Create tactical plans:** Add specific action items to your project plan. Action items will identify who will do what, and when. Include short, medium, and longer-term (backlog) items in your project plan to make it easy to track and reprioritize.
9. **Track action items:** Use your preferred project planning software to track continual, incremental progress of your action items. Summarize progress and status every quarter for your executive sponsor.
10. **Adjust:** As new information becomes available—and as priorities change—reevaluate and adjust your focus. Reexamine your strategic goals, objectives, and action items once a quarter so you're certain that you're focusing on the right actions.

11. **Celebrate:** Pause regularly to appreciate your progress. Celebrate your wins.
Reward and recognize people who take the initiative and help achieve your goals.
Encourage healthy partnerships between IT and the different areas of the business.
12. **Repeat:** Continue learning, experimenting, and adjusting as you progress with your implementation. Use feedback loops to continually learn from everyone in the organization. Ensure that continual, gradual, improvement is a priority.

A few important key points are implied within the previous suggestions.

- **Focus on the near term:** Although it's important to have an eye on the big picture, we recommend that you focus primarily on the next quarter, next semester, and next year. It's easier to assess, plan, and act when you focus on the near term.
- **Progress will be incremental:** Changes that happen every day, every week, and every month add up over time. It's easy to become discouraged and sense a lack of progress when you're working on a large adoption initiative that takes time. If you keep track of your incremental progress, you'll be surprised at how much you can accomplish over the course of a year.
- **Changes will continually happen:** Be prepared to reconsider decisions that you make, perhaps every quarter. It's easier to cope with continual change when you expect the plan to change.
- **Everything correlates together:** As you progress through each of the steps listed above, it's important that everything's correlated from the high-level strategic organizational objectives, all the way down to more detailed action items. That way, you'll know that you're working on the right things.

Power BI implementation planning

Successfully implementing analytics throughout the organization requires deliberate thought and planning. The [Power BI implementation planning](#) series of articles, which is a work in progress, is intended to complement the Microsoft Fabric adoption roadmap. It includes key considerations, actions, decision-making criteria, recommendations, and it describes implementation patterns for important common usage scenarios.

Power BI adoption framework

The [Power BI adoption framework](#) describes additional aspects of *how* to adopt Power BI in more detail. The original intent of the framework was to support Microsoft partners with a lightweight set of resources for use when helping their customers deploy and adopt Power BI.

The framework can augment this Microsoft Fabric adoption roadmap series. The roadmap series focuses on the *why* and *what* of adopting Fabric, more so than the *how*.

ⓘ Note

When completed, the Power BI implementation planning series (described in the previous section) will replace the Power BI adoption framework.

Microsoft's BI transformation

Consider reading about [Microsoft's journey and experience with driving a data culture](#). This article describes the importance of two terms: *discipline at the core* and *flexibility at the edge*. It also shares Microsoft's views and experience about the importance of establishing a COE.

Power Platform adoption

The Power Platform team has an excellent set of adoption-related content. Its primary focus is on Power Apps, Power Automate, and Power Virtual Agents. Many of the ideas presented in this content can be applied to Power BI also.

The [Power CAT Adoption Maturity Model](#), published by the Power CAT team, describes repeatable patterns for successful Power Platform adoption.

The [Power Platform Center of Excellence Starter Kit](#) is a collection of components and tools to help you develop a strategy for adopting and supporting Microsoft Power Platform.

The [Power Platform adoption best practices](#) includes a helpful set of documentation and best practices to help you align business and technical strategies.

The [Power Platform adoption framework](#) is a community-driven project with excellent resources on adoption of Power Platform services at scale.

Microsoft 365 and Azure adoption

You might also find useful adoption-related guidance published by other Microsoft technology teams.

- The [Maturity Model for Microsoft 365](#) provides information and resources to use capabilities more fully and efficiently.

- Microsoft Learn has a learning path for [using the Microsoft service adoption framework to drive adoption in your enterprise](#).
- The [Microsoft Cloud Adoption Framework for Azure](#) is a collection of documentation, implementation guidance, best practices, and tools to accelerate your cloud adoption journey.

A wide variety of other adoption guides for individual technologies can be found online. A few examples include:

- [Microsoft Teams adoption guide](#).
- [Microsoft Security and Compliance adoption guide](#).
- [SharePoint Adoption Resources](#).

Industry guidance

The [Data Management Book of Knowledge](#) (DMBOK2) is a book available for purchase from DAMA International. It contains a wealth of information about maturing your data management practices.

Note

The additional resources provided in this article aren't required to take advantage of the guidance provided in this Fabric adoption series. They're reputable resources should you wish to continue your journey.

Partner community

Experienced partners are available to help your organization succeed with adoption initiatives. To engage a partner, visit the [Power BI partner portal](#).

Feedback

Was this page helpful?

 Yes

 No

[Provide product feedback](#) | [Ask the community](#)

IDEAS journey to a modern data platform with Microsoft Fabric - from petabytes to insights

Article • 03/31/2025

Microsoft Fabric is an AI-powered SaaS platform for end-to-end enterprise analytics. It efficiently supports various data roles across an organization. To optimize data consistency and accessibility, Microsoft used Fabric to enhance its internal analytics infrastructure during rapid AI advancements. Microsoft established IDEAS (Insights, Data, Engineering, Analytics, Systems) organization to build and maintain a comprehensive data analytics platform. IDEAS aims to unify data sources, eliminate silos, and create a single source of truth, boosting productivity and AI adoption across Microsoft. Initially supporting Office products, IDEAS now powers data-driven insights across Microsoft 365, Security, and over 600 internal teams driving AI adoption and productivity. This article details IDEAS's journey with adopting Fabric.

A key function of IDEAS is to serve as the central data and growth engine for the Experiences and Devices(E+D) and Security divisions. IDEAS also acts as the central data plane for all Copilot experiences, driving Copilot's success by aggregating key insights, enabling research, and powering AI experiences across Microsoft. It manages 420 PiB (Pebibyte) of data from 2,700 sources, personalizing experiences across more than 350 product surfaces and billions of customer interactions annually.

Because of its scale and role in powering key Microsoft initiatives like Copilot, IDEAS serves as a real-world testing ground for emerging data technologies. IDEAS is a pilot user and strategic 'customer zero' for Microsoft Fabric. It provides valuable feedback and validates the Fabric's capabilities at a various levels. IDEAS provides key insights that shape Fabric's development, while Fabric enables IDEAS to achieve its vision for the future of its AI-driven data platform. Specifically, Fabric offers key benefits in following four key areas:

- **Activating data for AI innovation:** Fabric's seamless integration with Microsoft tools like Office and Azure AI accelerates the creation of custom AI models and solutions.
- **Streamlining analytics with a unified toolchain:** By providing a unified toolchain for all data roles, Fabric empowers everyone within IDEAS to enhance collaboration, streamline workflows, and maximize the data value.

- **Increasing collaboration and flexibility:** Fabric enables collaboration across different data personas using the same datasets and tools. This flexibility simplifies working with diverse data formats, locations, optimizes engineering processes, and enables teams to work more effectively.
- **Reducing costs and risks:** Fabric's unified data lake minimizes data movement, reducing engineering costs and compliance risks by allowing multiple compute engines to operate on the same copy of data. By maintaining a single copy of data, teams can efficiently use it for multiple purposes, which support effective data governance and compliance.

This partnership aims to deliver substantial business and productivity value by creating a modern data platform to meet today's technological demands. This article explains IDEAS's journey with adopting Fabric.

Building a scalable data foundation with OneLake and Delta lake

A strong, scalable foundation is key to any modern data platform. At the core of Microsoft Fabric is Delta Lake, an open-source storage layer that ensures reliability, performance, and data management for data lakes. Its broad compatibility with data analytics tools supports a unified data ecosystem.

Delta Lake is the foundation of [OneLake](#), Fabric's unified logical data lake. OneLake optimizes data value by eliminating duplication, and ensuring a single source of truth. All Fabric experiences automatically store or mirror data in OneLake using the Delta Lake format. OneLake integrates seamlessly with existing ADLS Gen2 storage enabling a smooth transition for existing datasets. Shortcuts to ADLS Gen2 avoid large-scale data migrations and enhance manageability through centralized access and governance. It also supports various analysis tools, including Spark, SQL, and Power BI.

Power BI's Direct Lake mode enhances this unified experience by enabling fast querying and visualization of data directly from OneLake, eliminating data movement and the need for traditional data marts. This direct access to Delta Lake streamlines analytics workflows. Fabric is also fully integrated with Copilot and AI across all surfaces. These features boost productivity through AI-assisted coding and data analysis, supporting data-driven decision-making.

To apply these capabilities within IDEAS, the first step was to ensure the data integration pipelines could seamlessly generate Delta Lake tables. IDEAS uses the following two ISO-certified data engineering systems:

- **Pharos** [🔗](#): A low-code platform for data preparation and staging. It simplifies data transformation by focusing on well-defined data shapes with consistent metadata, and declarative definitions for output generation.
- **Nitro Hubs** [🔗](#): A comprehensive data engineering system for pipeline authoring and management, with strong data privacy and compliance controls.

IDEAS enhanced these services to generate optimized Delta Lake outputs using the Fabric Spark engine, employing techniques like [v-order](#), partitioning, and appropriate row group sizes. When storing data, IDEAS focuses on organizing it for fast and efficient retrieval, as the workloads are read-intensive. Integrating this capability with core services that manage thousands of pipelines enabled the quick writing of several thousand data assets to ADLS Gen2 storage.

IDEAS analytics require 13 months of historical data, but due to personal identifiers, we must adhere to General Data Protection Regulation(GDPR). To comply, we extended Nitro Hubs GDPR processing capabilities to handle delete requests in Delta Lake tables, using merge commands in Fabric Spark notebooks. We also implemented Time-To-Live (TTL) expiration for date-partitioned Delta tables, ensuring personal data removal within GDPR timeframes. In contrast, our Gold layer data (using the [medallion architecture](#)), is aggregated and free of personal identifiers. We currently store over 4 PiB of data in IDEAS OneLake.

Powering Microsoft 365 Copilot Analytics with Fabric

IDEAS manages 420 PiB of data across over 600 teams within Microsoft. The data platform is built entirely on Azure to use scalability for a team of over 600 people. By extending Azure's capabilities, IDEAS has developed a robust and adaptable system. To learn more about the core systems that drive the data lifecycle see [Data productivity in ideas](#) [🔗](#)

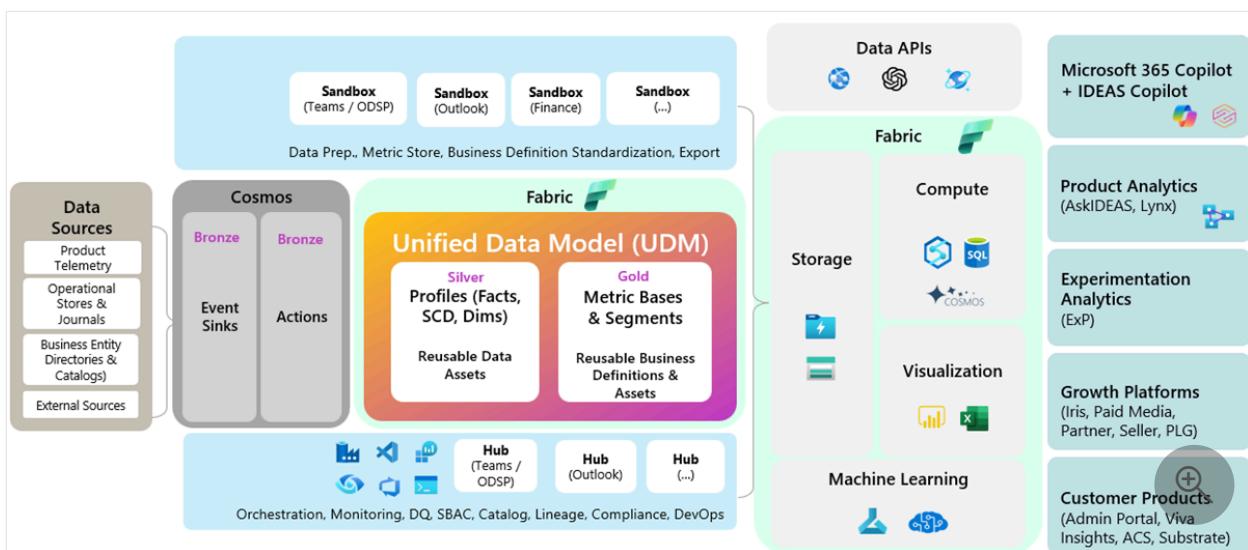
Efficient data access is essential to IDEAS, and Microsoft Fabric has become a key enabler in our strategy. We wanted to shorten the feedback loop for interactive queries and empower faster report and dashboard creation. Our foundation is the [Unified Data Model \(UDM\)](#) [🔗](#), a set of durable and extensible data assets designed for company-wide reuse. This reusability is key to maintaining consistency and efficiency.

IDEAS employs the [medallion architecture](#) to organize data across three layers: Bronze (raw data), Silver (cleaned and enriched data for analysis), and Gold (curated, aggregated data for business intelligence and reporting with tools like Power BI and Excel).



By making our gold and silver layers available as UDM assets in Fabric through Delta Lake, we enhanced the Microsoft 365 Copilot analytics plane. We provided direct access to preprocessed Silver layer Microsoft 365 Copilot data as Delta Lake tables in OneLake. It dramatically improved query performance and dashboard rendering by eliminating repeated transformations.

Furthermore, exposing our Gold layer Microsoft 365 Copilot metrics as Delta Lake tables simplified data discovery and usability. It enabled the creation of rich dashboards that support business leaders and product teams with Copilot's adoption, performance, and growth. This approach reduced data movement, streamlined the data graph, and cut infrastructure costs. As a result, Microsoft 365 Copilot analytics, now powered by Fabric, plays a vital role in several Microsoft projects.



Scaling governance and automation in Fabric

Our next priorities were organizing workspaces, optimizing lakehouse structure, and automating operations across thousands of assets managed in Fabric. At our scale, governance demands strict adherence to policies that grant access only for legitimate data use scenarios, making manual operations infeasible. To address this, we have partnered closely with the Fabric SDK/API teams to ensure the availability of APIs that enable us to programmatically create Fabric artifacts and apply granular permissions to the appropriate identities. This fully automated approach provides consistency and scalability.

We organized our workspaces into production, development, and exploration environments. Production data is accessible through shortcuts within the production workspace. Only a dedicated workspace identity has privileged access to create and modify them, while all other users have read-only access. Lakehouses reside within the production workspace with broad read access and are referred by internal shortcuts from within exploration workspaces. This approach effectively isolates production data while allowing users to interact with it in a nonproduction setting.

Next sections will delve into our semantic workspaces that are dedicated to host only semantic models and reports. The lakehouses behind the semantic model is in production workspace to control versioning and change management. As Fabric's unified security features evolve, we continue refining our lakehouse access configuration to further streamline our access governance processes. This automated, API-driven approach is essential for data management at scale and for consistent, secure access.

Simplifying reporting with Direct Lake

One of the primary drivers for IDEAS's early adoption of Fabric is the [Direct Lake semantic model](#). This feature enables unified reporting, eliminating the need to manage separate SQL and SSAS infrastructure and allowing users to work in an integrated Fabric interface.

IDEAS utilizes semantic models for a various use cases, which include:

- Single-table reports
- Azure Analysis Services cubes
- Import mode star schemas with multiple dimensions
- Cohort analytics for the Microsoft 365 Copilot analytics plane

Our validation of the Direct Lake approach involved migrating existing reports and models to Fabric, yielding several key findings, which include:

- The importance of effective data modeling. For models containing billions of rows, a robust star schema with numeric keys is crucial to achieve optimal query performance.
- Optimizing data with V-Order during creation using Fabric Spark is critical for maximizing Direct Lake performance.
- Proper Delta table partitioning and row group sizing is vital for optimizing both cold and warm cache query performance.

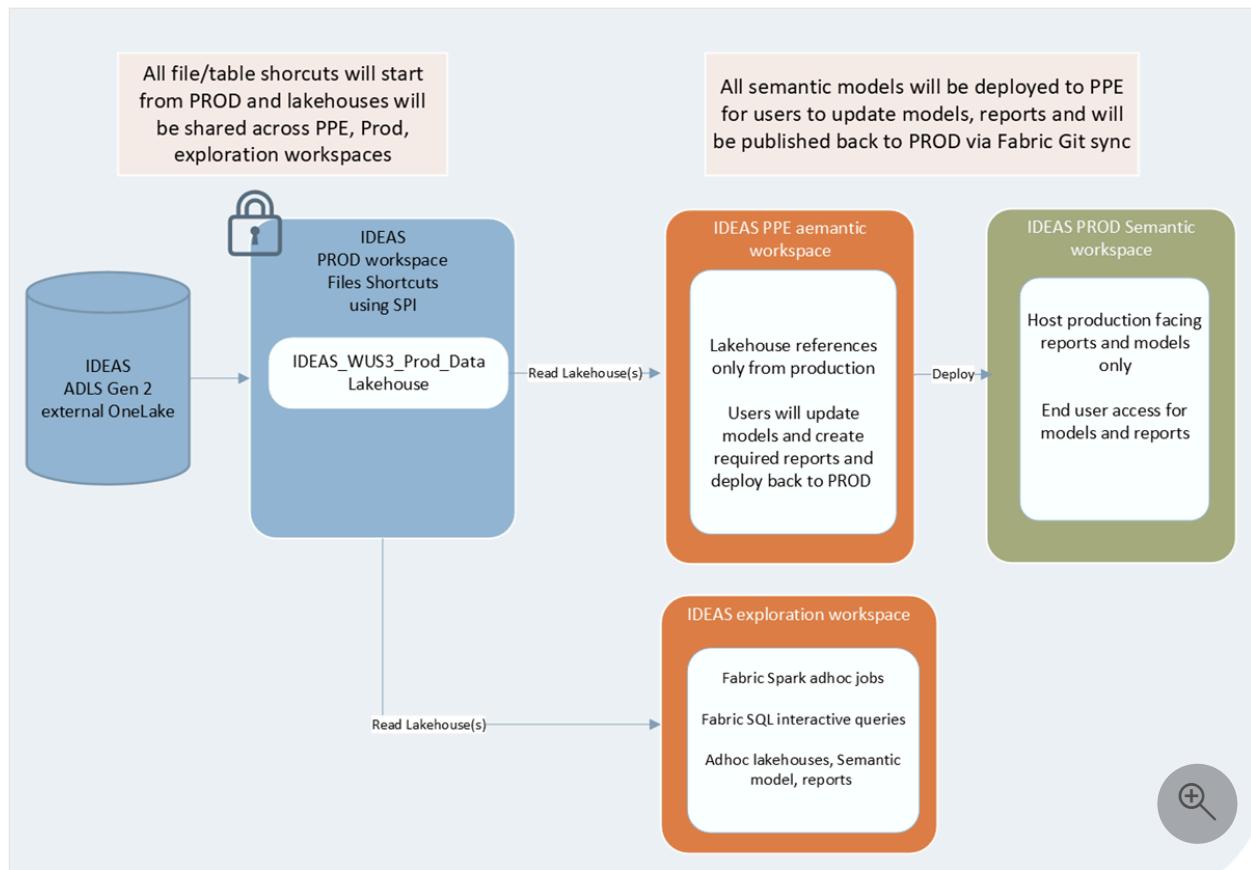
This effort led to the full migration of the Microsoft 365 Copilot analytics plane to Fabric in December 2024. This plane now delivers key business insights for Microsoft 365 Copilot across Microsoft.

Managing the Fabric development lifecycle for compliance and reliability

IDEAS ensures compliance and reliability through strict change management, production isolation, and validation. To meet these requirements within Fabric, we implemented a robust development lifecycle using Git integration and a well-defined workspace organization. This approach ensures that changes are thoroughly tested and validated before reaching production, minimizing disruptions, and preserving data integrity.

We have created dedicated "semantic workspaces" for semantic models and reporting artifacts, ensuring clear separation of concerns. As previously mentioned, lakehouse artifacts reside in a secure, read-only, production workspace, with semantic workspaces referring to these centralized data assets. This architecture supports both compliance and performance.

Our semantic model lifecycle involves individuals making changes within a workspace dedicated to this category of development. Following validation, Fabric's Git integration commits these changes to the appropriate preproduction branch. Through Azure DevOps (ADO) release pipelines, these changes are then promoted to the production Git branch and later synchronized to the production semantic workspaces. This ensures that the production semantic workspaces (where end-user-facing models and reports reside) always reflects validated and approved changes. This way it contributes to the stability and reliability of our services.



To further enhance the reliability of our Fabric deployment, we developed a user experience and performance dashboard using workspace telemetry. The Fabric workspace analytics logs provide data on query execution times and errors in semantic models and Power BI reports. Our dashboard, built on Fabric event houses, tracks key query performance metrics and monitors error categories and rates for each query.

In addition to identifying and addressing potential issues, we monitor the impact of issues and the number of affected users. This dual approach allows us to proactively address issues before they spread and to understand and trend the reliability of our reports and semantic models through user feedback. By monitoring the frequency and breadth of user-reported issues, we can directly correlate our reliability targets with real-world usage and reduce user impact over time.

As the Fabric product group improves telemetry and log data, we'll incorporate richer KPIs and metrics into our dashboard. These enhancements improve our ability to proactively detect issues, ensuring optimal performance and reliability. In the next phase, we plan to extend this monitoring process to other Fabric items, including Lakehouse SQL endpoints and Spark notebooks.

Enabling interactive analytics with Fabric

Data users often start with Power BI reports but quickly need deeper exploration beyond the reporting layer. Fabric offers two powerful options for interactive analysis: Fabric

Spark and the SQL analytics endpoint, enabling users to explore data in the Silver and Gold layers of the Unified Data Model (UDM). The OneLake Data Hub, Lakehouse Explorer, and Lineage View provide quick access to data dependencies and upstream sources. However, as data complexity and size increase from Gold to Bronze, querying becomes more challenging.

To build a scalable data platform and prevent fragmentation, IDEAS implemented a federation strategy for key UDM Silver layer assets, serving as authoritative sources of truth. This allowed partner teams to extend these assets with domain-specific attributes. A robust governance process that encompasses review, extension design refinement, data interface definition, and exposure control, ensures data integrity and compliance.

While extensions address data bottlenecks and separate core data from external attributes, they introduced a performance challenge for interactive querying, which typically requires sub-60-second response times. The reliance on repetitive joins between base data and extensions created a bottleneck. To overcome this challenge, we enhanced our data engineering systems to materialize views, prejoining base data with extensions to minimize query-time join operations. Delta Lake's merge and locking capabilities enabled efficient partition updates and merging of extension data per entity. These precomputed Delta tables are now exposed as shortcuts within our lakehouses for both Fabric SQL and Spark access. We're also collaborating with the Fabric product group to explore potential native integration of this functionality. Furthermore, we developed Python modules with multi-parameter input to optimize row filtering and column selection, providing quick access to column descriptions and data freshness within the notebook environment.

Initial testing with Fabric Spark queries on these materialized assets has shown significant performance gains of over 30X.

Securing Our Fabric Environment: A Holistic Approach to Data Governance

Over the past year, we've progressed from an exploratory Fabric workspace to managing multiple F2048 production workspaces with over 4 PiB of data in Delta Lake format. However, data discovery and compliance remain complex challenges, especially as privacy regulations evolve. As IDEAS makes more data available in Fabric, our compliance obligations extend beyond GDPR and Microsoft's commitment to data residency within the EU Data Boundary, ensuring commercial personal data is stored and processed exclusively in Europe.

Microsoft's global scale and handling of sensitive data drive IDEAS' strong commitment to data privacy and governance. This extends beyond baseline requirements, adhering to various international and industry-specific standards. It translates into robust controls and processes for managing data access.

At IDEAS, we strongly adhere to the principle of least privilege and scenario-based data use for security and compliance. This principle means granting data access only to users or identities with legitimate approval for specific use cases. To prevent unauthorized data transfers, IDEAS actively monitors for data exfiltration within Fabric workspaces. While Fabric provides tenant-level monitoring, Microsoft requires more granular control at the workspace level.

To address this, IDEAS developed Data Exfiltration Monitoring (DEM), a custom capability that collects Fabric telemetry data into a centralized metadata store and applies rules to detect violations. When a violation is detected, DEM triggers corrective actions, such as notifying the user, revoking access, or blocking future access. This allows IDEAS to make sensitive data available within Fabric while maintaining strict compliance. Combined with our investments in automating workspace provisioning, we can manage compliant workspaces across expanding data boundaries. Data exfiltration protection is a key area of focus for the Fabric product group, and we look forward to further enhancements in this space.

Ultimately, we believe that data privacy and governance aren't merely a compliance burden but a fundamental component of building trust and a significant competitive advantage in today's data-driven world. Microsoft prioritizes trust, emphasizing data privacy, user control, and responsible data handling across all services and products. IDEAS fully subscribes to this ethos, recognizing that robust data governance is fundamental to the success and sustainability of our data platform.

Conclusion

Integrating Microsoft Fabric into the IDEAS data platform has enhanced data access and boosted productivity for our data scientists and engineers. By building a unified foundation with OneLake and Delta Lake, enabling interactive analytics, and establishing strong governance, Fabric has provided a robust data analytics environment. As we continue to explore and implement Fabric's capabilities, particularly in areas like real-time analytics and advanced AI integration, we're confident that we're building a unified and innovative platform that will drive greater insights and impact for Microsoft.

Feedback

Was this page helpful?

 Yes

 No

[Provide product feedback ↗](#) | [Ask the community ↗](#)

Learn about Microsoft Fabric feedback

08/04/2025

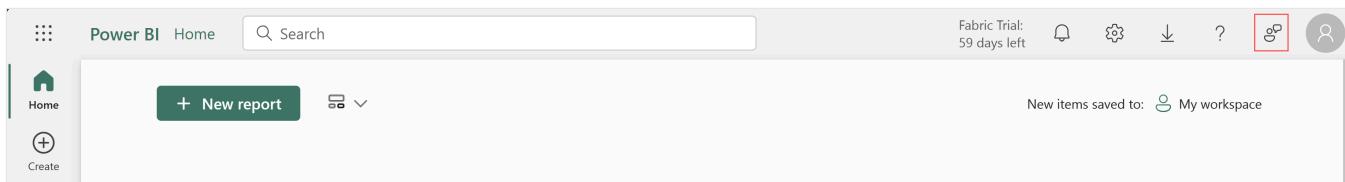
Your feedback is important to us. We want to hear about your experiences with Microsoft Fabric. Your feedback is used to improve the product and shape the way it evolves. This article describes how you can give feedback about Microsoft Fabric, how the feedback is collected, and how we handle this information.

Feedback types

There are three ways to give feedback about Microsoft Fabric, *in-product feedback*, *in-product surveys*, and *community feedback*.

In-product feedback

Give in-product feedback by selecting the **Feedback** button next to your profile picture in the Microsoft Fabric portal.



In-product surveys

From time to time, Microsoft Fabric initiates in-product surveys to collect feedback from users. When you see a prompt, you can choose to give feedback or dismiss the prompt. If you dismiss the prompt, you won't see it again for some time.

Community feedback

There are a few ways you can give feedback while engaging with the Microsoft Fabric community:

- [Ideas](#) - Submit and vote on ideas for Microsoft Fabric.
- [Issues](#) - Discuss issues and workarounds with the community.
- [Community Feedback](#) - Give feedback about Microsoft Fabric and vote for publicly submitted feedback. Top known feedback items remain available in the new portal.

Fabric user panel

Join the [Microsoft Fabric user panel](#) to help shape the future of Microsoft Fabric and Power BI. By signing up, you can share real-world experiences and feedback with the Fabric and Power BI product teams through surveys and 1:1 meetings. This is a free opportunity to engage directly with the engineering team behind Fabric and Power BI. Your input plays a key role in improving the tools and experiences we build.

To sign up for our Fabric User Panel, use the following steps:

- Visit the [Fabric user panel](#) site to complete the Opt-in form with your details, as well as answer a few Fabric-related questions. These questions help us customize communications and feedback invites based on your interests and usage.
- For each Fabric study or campaign that you'd be a good fit for, you will receive a formal email invite with details on the study and how to participate.
- For any questions on this user panel, [contact us](#).

What kind of feedback is best?

Try to give detailed and actionable feedback. If you have issues, or suggestions for how we can improve, we'd like to hear it.

- **Descriptive title** - Descriptive and specific titles help us understand the issue being reported.
- **One issue** - Providing feedback for one issue ensures the correct logs and data are received with each submission and can be assigned for follow-up. If you want to give feedback for multiple issues, give feedback for each issue separately. Giving feedback for separate issues helps us identify the volume of feedback we're receiving for a particular issue. If you have more than one issue, submit a new feedback request for each issue.
- **Give details** - Give details about your issue in the description box. Information about your device, operating system, and apps are automatically included in each reported feedback. Add any additional information you think is important. Include detailed steps to reproduce the issue.

How Microsoft uses feedback

Microsoft uses feedback to improve Microsoft products. We get user feedback in the form of questions, problems, compliments, and suggestions. We make sure this feedback makes it back

to the appropriate teams, who use feedback to identify, prioritize and make improvements to Microsoft products. Feedback is essential for our product teams to understand our user's experiences, and directly influences the priority of fixes and improvements.

What do we collect?

Here are the most common items collected or calculated.

- **Comments User** - Submitted comments in the original language.
- **Submission date** - Date and time we got the feedback.
- **Language** - The original language the comment was submitted in.
- **Feedback type** - The type of feedback: Survey feedback or in-product feedback.
- **Survey questions** - Questions that we asked the user during the survey.
- **Survey responses** - User responses to survey questions.
- **App language** - The language of the Microsoft product that was captured on submission.
- **Tenant ID** - When the feedback is submitted from a Microsoft Entra account.
- **User ID** - Microsoft Entra ID or email address of the authenticated user submitting the feedback.

Data handling and privacy

We understand that when you use our cloud services, you're entrusting us with one of your most valuable assets: your data. We make sure the feedback we receive is stored and handled under Microsoft governance rules, and that it can only be accessed for approved uses. We don't use your email, chat, files, or other personal content to target ads to you. When we collect data, we use it to make your experiences better.

To learn more about how we protect the privacy and confidentiality of your data, and how we ensure that it will be used only in a way that is consistent with your expectations, review our privacy principles at the [Microsoft Trust Center](#).

Fabric known issues

07/21/2025

Microsoft Fabric Known issues are no longer published on Microsoft Learn. To view the latest updates, visit the [Fabric support page](#). If you bookmarked the previous location, please update your link to the [new page](#).

Currently active known issues

To see active known issues, follow the below steps:

1. Go to the new [Known Issues page](#)
2. On the left menu, select the workload in which you're working
3. On the top right of the screen, select the **Filters** to open the filters
4. Uncheck the **Closed** option so that only **Active** is selected
5. Select **Apply** and view your active known issues

Recently closed known issues

To see closed known issues, follow the below steps:

1. Go to the new [Known Issues page](#)
2. On the left menu, select the workload in which you're working
3. On the top right of the screen, select the **Filters** to open the filters
4. Uncheck the **Active** option so that only **Closed** is selected
5. Select **Apply** and view your active known issues

Microsoft Fabric product, workload, and item icons

07/03/2025

This article provides information about the official collection of icons for Microsoft Fabric that you can use in architectural diagrams, training materials, slide decks or documentation.

Do's

- Use the icons to illustrate how products can work together.
- In diagrams, we recommend including a label that contains the product, experience, or item name somewhere close to the icon.
- Use the icons as they appear within the product.

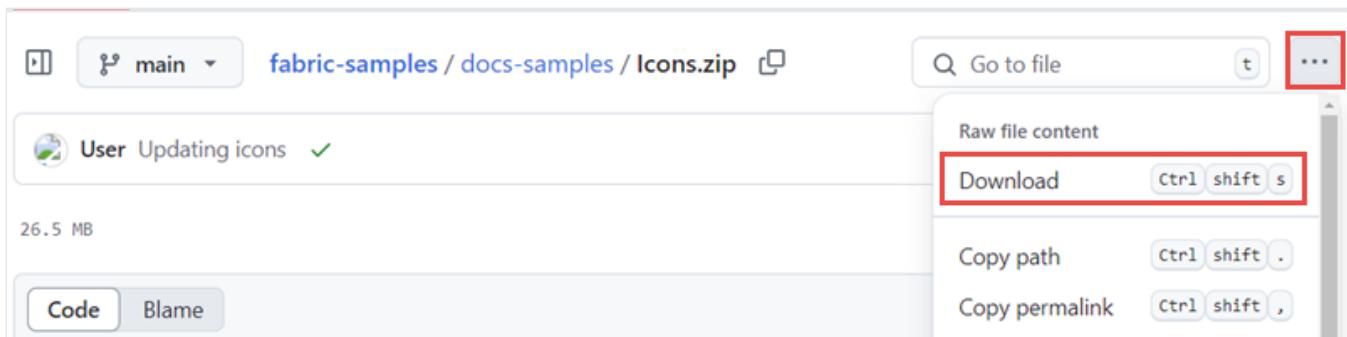
Don'ts

- Don't crop, flip, or rotate icons.
- Don't distort or change icon shape in any way.
- Don't use Microsoft product icons to represent your product or service.

Terms

Microsoft permits the use of these icons in architectural diagrams, training materials, or documentation. You can copy, distribute, and display the icons only for the permitted use unless granted explicit permission by Microsoft. Microsoft reserves all other rights. Fabric icons are also available as a [npm package](#) for use in Microsoft Fabric platform extension development. To use these icons, import the package into your project, then use individual SVG files as an image source or as an SVG. You can also directly download the icons from the following GitHub repository. Select the following button to open the repo, select ... from the right hand corner and select **Download**:

[Download icons from GitHub](#)



Related content

- [Microsoft Power Platform icons](#)
- [Azure icons](#)
- [Dynamics 365 icons](#)

What's new in Microsoft Fabric? archive

09/18/2025

This archive page is periodically updated with an archival of previous year's content from [What's new in Microsoft Fabric?](#)

To follow the latest in Fabric news and features, see the [Microsoft Fabric Blog](#). Also follow the latest in Power BI at [What's new in Power BI?](#)

New to Microsoft Fabric?

This section includes past articles and announcements that are useful to users new to Microsoft Fabric.

- [Learning Paths for Fabric](#)
- [Get started with Microsoft Fabric](#)
- [End-to-end tutorials in Microsoft Fabric](#)
- [Definitions of terms used in Microsoft Fabric](#)

[] [Expand table](#)

Month	Feature	Learn more
March 2024	Microsoft Fabric is now HIPAA compliant	We're excited to announce that Microsoft Fabric, our all-in-one analytics solution for enterprises, has achieved new certifications for HIPAA and ISO 27017, ISO 27018, ISO 27001, ISO 27701 .
March 2024	Exam DP-600 is now available	Exam DP-600 is now available, leading to the Microsoft Certified: Fabric Analytics Engineer Associate certification . The Fabric Career Hub can help you learn quickly and get certified.
March 2024	Fabric Copilot Pricing: An End-to-End example	Copilot in Fabric begins billing on March 1, 2024 as part of your existing Power BI Premium or Fabric Capacity. Learn how Fabric Copilot usage is calculated .
January 2024	Microsoft Fabric Copilot for Data Science and Data Engineering	Copilot for Data Science and Data Engineering is now available worldwide. What can Copilot for Data Science and Data Engineering do for you?

Generally available features

The following table lists the features of Microsoft Fabric that have transitioned from preview to general availability (GA).

[+] Expand table

Month	Feature	Learn more
May 2025	Azure Data Factory item in Microsoft Fabric	Azure Data Factory is now generally available in Microsoft Fabric ↗ allows you to seamlessly connect your existing Azure Data Factory (ADF) pipelines to Fabric workspaces , eliminating the need to manually rebuild or migrate them. CI/CD and REST APIs support is also for the Azure Data Factory items ↗ in Microsoft Fabric.
May 2025	Fabric CLI	The Fabric CLI (<code>fab</code>) is a fast, file-system-inspired command-line interface for Microsoft Fabric. Explore, automate, and script your Fabric environment—right from your terminal. Get started at https://aka.ms/FabCLI ↗ .
May 2025	Eventhouse Query Acceleration for OneLake Shortcuts	Query Acceleration for OneLake Shortcuts in Eventhouse ↗ speeds up ad hoc queries over data in OneLake. OneLake shortcuts are references from an Eventhouse that point to internal Fabric or external sources. Previously, queries run over OneLake shortcuts were less performant than on data that is ingested directly to Eventhouses due to various factors. For more information, see Query acceleration for OneLake shortcuts - overview .
May 2025	Task flows in Microsoft Fabric	With Task flows , now generally available, you no longer need to use a whiteboard to sketch out the different parts of the project and their interrelationships. Instead, you can use a task flow to build and bring this key information into the project itself. For more information, see Task flows in Microsoft Fabric (Generally Available) ↗ .
May 2025	Microsoft Fabric Spark Native Execution Engine now generally available	The Microsoft Fabric Spark Native Execution Engine is now generally available ↗ as part of Fabric Runtime 1.3 and provides improved performance and efficiency for Spark workloads in Microsoft Fabric. For more information, see Native execution engine for Fabric Spark .
May 2025	Dataflow Gen2 CI/CD support	CI/CD and Git integration are now supported for Dataflow Gen2 as a generally available feature. For more information, see Dataflow Gen2 CI/CD support ↗ .
May 2025	OneLake shortcut cache and on-premises gateway support now generally available	Shortcut cache and on-premises gateway support is now generally available ↗ . Use OneLake shortcut cache to quickly and easily source data from external cloud providers. The on-premises gateway allows you to securely connect to your data through multiple network restricted scenarios. For more information, see Create shortcuts to on-premises data .

Month	Feature	Learn more
May 2025	Open mirroring	Open mirroring enables any application to write change data directly into a mirrored database in Fabric, based on the open mirroring public APIs and approach. Open mirroring , now generally available, is designed to be extensible, customizable, and open. It's a powerful feature that extends mirroring in Fabric based on open Delta Lake table format. To get started, see Tutorial: Configure Microsoft Fabric open mirrored databases .
May 2025	JSON Aggregate support	Fabric warehouses now support JSON aggregate functions as generally available features. For more information, see JSON_ARRAYAGG and JSON_OBJECTAGG .
May 2025	Semantic model refresh activity	Use the Semantic model refresh activity to refresh a Power BI Dataset , the most effective way to refresh your Fabric semantic models. For more information, see Semantic Model Refresh Activity (Generally Available) .
April 2025	Fabric Spark connector for Fabric Data Warehouse in Spark runtime	The Spark connector for Data Warehouse , now generally available, enables a Spark developer or a data scientist to access and work on data from a warehouse or SQL analytics endpoint of the lakehouse (either from within the same workspace or from across workspaces) with a simplified Spark API.
April 2025	Session-scoped distributed #temp tables	Distributed session-scoped temporary tables in Fabric Data Warehouse and Fabric Lakehouse SQL analytics endpoints are now generally available. Now, <code>#temp</code> tables are supported as session scoped or local temp tables. For more information, see Tables in Fabric Data Warehouse .
April 2025	BULK INSERT support	The T-SQL BULK INSERT statement in Fabric Data Warehouse is now generally available. For more information, see BULK INSERT statement is generally available .
April 2025	Multi-tenant organization (MTO)	Support for multitenant organizations in Fabric is now generally available (GA). Microsoft Entra ID users of type external member are supported across the Fabric platform.
April 2025	Tags	Tags help admins categorize and organize data , enhancing the searchability of your data and boosting success rates and efficiency for end users. Tags in Microsoft Fabric are now generally available.
April 2025	OneLake SAS	Support for short-lived, user-delegated OneLake SAS is now generally available. This functionality allows applications to request a User Delegation Key backed by Microsoft Entra ID, and then use this key to construct a OneLake SAS token. This token can be handed off to provide delegated access to another tool, node, or user, ensuring secure and controlled access.

Month	Feature	Learn more
April 2025	Data pipeline capabilities in Copilot for Data Factory	Data pipeline capabilities in Copilot for Data Factory ↗ are now generally available. These features function as an AI expert to help users build, troubleshoot, and maintain data pipelines.
April 2025	CI/CD for Fabric Data Pipelines	Git Integration and integration with built-in Deployment Pipelines to Data Factory data pipelines is now generally available. For more information, see CI/CD for Data pipelines and REST API capabilities for Data pipelines .
April 2025	Data Factory Apache Airflow jobs	Apache Airflow job in Data Factory ↗ , powered by Apache Airflow, are now generally available. An Apache Airflow Job in Microsoft Fabric offers seamless authoring, scheduling, and monitoring experience for Python-based data processes defined as Directed Acyclic Graphs (DAGs). For more information, see Quickstart: Create an Apache Airflow Job .
April 2025	High concurrency mode for Notebooks in Pipelines	High concurrency mode for notebooks in pipelines ↗ , now generally available, enables users to share Spark sessions across multiple notebooks within a pipeline. With high concurrency mode , users can trigger pipeline jobs, and these jobs are automatically packed into existing high concurrency sessions.
April 2025	OPENROWSET support	The T-SQL OPENROWSET(BULK) function is now generally available in Fabric warehouse. For more examples, see Browse file content using OPENROWSET function . For more information, see OPENROWSET function in Fabric Data Warehouse now generally available ↗ .
March 2025	Terraform provider GA	The Terraform Provider for Microsoft Fabric is now generally available, enabling seamless infrastructure management and automation. For more information, use cases, and benefits, see Terraform Provider for Microsoft Fabric (Generally Available) ↗ .
February 2025	REST APIs for Fabric Data Factory pipelines	The Fabric data pipeline public REST API enables you to extend the built-in capability in Fabric to create, read, update, delete, and list pipelines.
February 2025	Copy job	The Copy job in Data Factory has advantages over the Copy activity. For more information, see What is the Copy Job in Microsoft Fabric . For a tutorial, see Learn how to create a Copy job in Data Factory for Microsoft Fabric .
February 2025	Nested Common Table Expressions (CTEs) (GA)	Fabric Data Warehouse and SQL analytics endpoint both support standard, sequential, and nested CTEs as generally available features ↗ now. For more information, see nested common table expressions (CTE) in Fabric data warehousing (Transact-SQL) .

Month	Feature	Learn more
January 2025	Real-time intelligence ALM and REST API GA	Application Lifecycle Management (ALM) and Fabric REST APIs are now generally available for all RTI items: Eventstream, Eventhouse, KQL Database, Realtime dashboard, Query set and Data Activator. ALM includes both deployment pipelines and Git integration . REST APIs allow you to programmatically create / read / update / delete items.
January 2025	Warehouse restore points and restore in place	You can now create restore points and perform an in-place restore of a warehouse to a past point in time. Restore in-place is an essential part of data warehouse recovery , which allows to restore the data warehouse to a prior known reliable state by replacing or over-writing the existing data warehouse from which the restore point was created.
December 2024	Folder in Workspace	As an organizational unit, the workspace folder addresses this pain point by providing a hierarchical structure for organizing and managing your items. This feature is now generally available, and includes new filter features. For more information, see Create folders in workspaces .
November 2024	Workspace monitoring	Workspace monitoring is a Microsoft Fabric database that collects data from a range of Fabric items in your workspace, and lets users access and analyze logs and metrics. For more about this feature, see Announcing preview of workspace monitoring .
November 2024	OneLake external data sharing (GA)	OneLake external data sharing makes it possible for Fabric users to share data from within their Fabric tenant with users in another Fabric tenant.
November 2024	GraphQL API in Microsoft Fabric GA	The API for GraphQL , now generally available, is a data access layer that allows us to query multiple data sources quickly and efficiently in Fabric. For more information, see What is Microsoft Fabric API for GraphQL?
November 2024	Real-Time Intelligence: now Generally Available	We're excited to announce that Real-Time Intelligence is now generally available (GA) . This includes the Real-Time hub , enhanced Eventstream , Eventhouse , Real-Time Dashboards , and Activator . For more information, see What is Real-Time Intelligence?
November 2024	Fabric workload dev kit (GA)	The Microsoft Fabric workload development kit is now generally available. This robust developer toolkit is for designing, developing, and interoperating with Microsoft Fabric using frontend SDKs and backend REST APIs .
November 2024	Mirroring for Azure SQL Database GA	With Azure SQL Database mirroring in Fabric, you can easily replicate data from Azure SQL Database into OneLake in Microsoft Fabric .

Month	Feature	Learn more
November 2024	Real-Time hub	Real-Time hub is now generally available ↗ . For more information, see Introduction to Fabric Real-Time hub .
October 2024	Notebook Git integration	Notebook Git integration ↗ now supports persisting the mapping relationship of the attached Environment when syncing to new workspace. For more information, see Notebook source control and deployment
October 2024	Notebook in Deployment Pipeline	Now you can also use notebooks to deploy your code across different environments ↗ , such as development, test, and production. You can also use deployment rules to customize the behavior of your notebooks when they're deployed, such as changing the default Lakehouse of a Notebook. Get started with deployment pipelines , and Notebook shows up in the deployment content automatically.
September 2024	Mirroring for Snowflake	With Mirroring for Snowflake in Fabric, you can easily bring your Snowflake data into OneLake ↗ . For more information, see Mirroring Snowflake .
September 2024	Copilot for Data Factory	Copilot for Data Factory ↗ is now generally available and included in the Dataflow Gen2 experience. For more information, see Copilot for Data Factory overview .
September 2024	Fast Copy in Dataflow Gen2	The Fast copy feature in Dataflows Gen2 is now generally available. For more information, read Announcing the General Availability of Fast Copy in Dataflows Gen2 ↗ .
September 2024	Fabric Pipeline Integration in On-premises Data Gateway GA	On-premises connectivity for Data pipelines in Microsoft Fabric is now generally available. Learn How to access on-premises data sources in Data Factory for Microsoft Fabric .
September 2024	Data Wrangler for Spark DataFrames	Data Wrangler on Spark DataFrames . A notebook-based tool for exploratory data analysis, Data Wrangler works for both pandas DataFrames and Spark DataFrames ↗ and arrives at general availability with new usability improvements ↗ .
September 2024	Fabric Runtime 1.3	Fabric Runtime 1.3 (GA) includes Apache Spark 3.5, Delta Lake 3.1, R 4.4.1, Python 3.11, support for Starter Pools, integration with Environment, and library management capabilities. For more information, see Fabric Runtime 1.3 is Generally Available! ↗ .
September 2024	OneLake Shortcuts API	REST APIs for OneLake Shortcuts allow programmatic creation and management of shortcuts, now generally available. You can now programmatically create, read, and delete OneLake shortcuts . For example, see Use OneLake shortcuts REST APIs .

Month	Feature	Learn more
September 2024	GitHub integration for source control	Fabric developers can now choose GitHub or GitHub Enterprise as their source control tool ↗ , and version their Fabric items there. For more information, see What is Microsoft Fabric Git integration?
September 2024	OneLake shortcuts to Google Cloud Storage	Create a Google Cloud Storage (GCS) shortcut to connect to your existing data through a single unified name space without having to copy or move data. For more information, see Google Cloud Storage shortcuts generally available ↗ .
September 2024	OneLake shortcuts to S3-compatible data sources	Create an S3 compatible shortcut to connect to your existing data through a single unified name space without having to copy or move data. For more information, see S3 compatible shortcuts generally available ↗ .
July 2024	Update records in a KQL Database preview	The .update command is now generally available. Learn more about how to Update records in a Kusto database ↗ .
July 2024	Warehouse queries with time travel (GA)	Warehouse in Microsoft Fabric offers the capability to query the historical data as it existed in the past at the statement level, now generally available. The ability to query data from a specific timestamp ↗ is known in the data warehousing industry as <i>time travel</i> .
June 2024	OneLake availability of Eventhouse in Delta Lake format	As part of the One logical copy promise , we're excited to announce that OneLake availability of Eventhouse in Delta Lake format is Generally Available ↗ .
May 2024	Microsoft Fabric Private Links	Azure Private Link for Microsoft Fabric secures access to your sensitive data in Microsoft Fabric by providing network isolation and applying required controls on your inbound network traffic. For more information, see Announcing General Availability of Fabric Private Links ↗ .
May 2024	Trusted workspace access	Trusted workspace access in OneLake shortcuts is now generally available ↗ . You can now create data pipelines to access your firewall-enabled Azure Data Lake Storage Gen2 (ADLS Gen2) accounts using Trusted workspace access (preview) in your Fabric Data Pipelines. Use the workspace identity to establish a secure and seamless connection between Fabric and your storage accounts ↗ . Trusted workspace access also enables secure and seamless access to ADLS Gen2 storage accounts from OneLake shortcuts in Fabric ↗ .
May 2024	Managed private endpoints	Managed private endpoints for Microsoft Fabric allow secure connections over managed virtual networks to data sources that are behind a firewall or not accessible from the public internet. For more information, see Announcing General Availability of Fabric

Month	Feature	Learn more
		Private Links, Trusted Workspace Access, and Managed Private Endpoints ↗ .
May 2024	Eventhouse	Eventhouse is a new, dynamic workspace hosting multiple KQL databases ↗ , generally available as part of Fabric Real-Time Intelligence. An Eventhouse offers a robust solution for managing and analyzing substantial volumes of real-time data. Get started with a guide to Create and manage an Eventhouse .
May 2024	Data Engineering: Environment	The Environment in Fabric is now generally available. The Environment is a centralized item ↗ that allows you to configure all the required settings for running a Spark job in one place. At GA, we added support for Git, deployment pipelines, REST APIs, resource folders, and sharing.
May 2024	Microsoft Fabric Core REST APIs	Microsoft Fabric Core APIs are now generally available. The Fabric user APIs ↗ are a major enabler for both enterprises and partners to use Microsoft Fabric as they enable end-to-end fully automated interaction with the service, enable integration of Microsoft Fabric into external web applications, and generally enable customers and partners to scale their solutions more easily.
May 2024	Power Query Dataflow Gen2 SDK for VS Code	The Power Query SDK ↗ is now generally available in Visual Studio Code! To get started with the Power Query SDK in Visual Studio Code, install it from the Visual Studio Code Marketplace ↗ .
April 2024	Semantic Link	Semantic links are now generally available! The package comes with our default VHD, and you can now use Semantic link in Fabric right away without any pip installation.
March 2024	VNet Gateways in Dataflow Gen2	VNet Data Gateway support for Dataflows Gen2 in Fabric is now generally available. The VNet data gateway helps to connect from Fabric Dataflows Gen2 to Azure data services within a VNet, without the need of an on-premises data gateway.

Community

This section summarizes previous Microsoft Fabric community opportunities for prospective and current influencers and MVPs. To learn about the Microsoft MVP Award and to find MVPs, see [mvp.microsoft.com](#) [↗](#).

 [Expand table](#)

Month	Feature	Learn more
May 2025	Announcing the winners of Hack Together: The Microsoft Data & AI Kenya Hack	Announcing the winners of Hack Together: The Microsoft Data & AI Kenya Hack! Congratulations to all the creative, innovative, and inspiring projects built by the Data & AI community in Kenya!
May 2025	Power Designer	Power Designer , now generally available at powerbi.tips/PowerDesigner , is sleek, intuitive, and fun, making designing reports feel less like work and more like unleashing your inner artist.
February 2025	Hack Together: The Microsoft Data + AI Kenya Hack	To join the Hack Together: The Microsoft Data + AI Kenya Hack from March 12th to April 11th , form a team of 3 members and register at https://aka.ms/data-ai-hack-kenya/register .
December 2024	Announcing the winners of the Microsoft Fabric and AI Learning Hackathon!	See the winners of the Microsoft Fabric Focused Hackathon event , where we partnered with DevPost to challenge the world to build the next wave of innovative AI powered data analytics applications with Microsoft Fabric!
October 2024	Fabric Influencers Spotlight October 2024	Check out Microsoft MVPs & Fabric Super Users doing amazing work in October 2024 on all aspects of Microsoft Fabric.
October 2024	Microsoft Fabric and AI Learning Hackathon: Copilot in Fabric	Part of the Microsoft Fabric and AI Learning Hackathon , read this guide of various capabilities that Copilot offers in Microsoft Fabric , empowering you to enhance productivity and streamline your workflows.
October 2024	Get certified in Microsoft Fabric—for free!	For a limited time, the Microsoft Fabric Community team is offering 5,000 free DP-600 exam vouchers to eligible Fabric Community members . Complete your exam by the end of the year and join the ranks of certified experts.
October 2024	DP-700: Implementing Data Engineering Solutions Using Microsoft Fabric (beta)	The new Microsoft Certified: Fabric Data Engineer Associate certification helps demonstrate your skills with data ingestion, transformation, administration, monitoring, and performance optimization in Fabric. To learn more, see DP-700: Implementing Data Engineering Solutions Using Microsoft Fabric (beta) .
October 2024	FabCon Europe 2024	Read a recap of Europe's first Fabric Community Conference and a Recap of Data Factory announcements .
October 2024	Fabric Influencers Spotlight September 2024	The Fabric Influencers Spotlight September 2024 shines a bright light on the places on the internet where Microsoft MVPs & Fabric Super Users are doing some amazing work on all aspects of Microsoft Fabric.

Month	Feature	Learn more
September 2024	Announcing: The Microsoft Fabric & AI Learning Hackathon	Get ready for the Microsoft Fabric & AI Learning Hackathon ! We're calling all Data/AI Enthusiasts and Data/AI practitioners to join us for another exciting opportunity to upskill and build the next generation of Data + AI solutions with Microsoft Fabric! The Hackathon is open for a seven-week submission period and offers a total of \$10,000 in prizes!
August 2024	Fabric Influencers Spotlight August 2024	The Fabric Influencers Spotlight August 2024 highlights and amplifies blog posts, videos, presentations, and other content related to Microsoft Fabric from members of Microsoft MVPs & Fabric Super Users from the Fabric community.
August 2024	Winners of the Fabric Community Sticker Challenge	Congratulations to the winners of the Fabric Community Sticker Challenge !
July 2024	Fabric Influencers Spotlight	Introducing the new Fabric Influencers Spotlight series of articles to highlight and amplify blog posts, videos, presentations, and other content related to Microsoft Fabric. Read blogs from Microsoft MVPs and Fabric Super Users from the Fabric community .
June 2024	Solved Fabric Community posts are now available in the Fabric Help Pane	You can now find solved posts from Fabric Community discussions in the Fabric Help Pane .
May 2024	Announcing Microsoft Fabric Community Conference Europe	Announcing the Microsoft Fabric Community Conference Europe on September 24, 2024. Register today !
May 2024	Register for the Microsoft Build: Microsoft Fabric Cloud Skills Challenge	Starting May 21, 2024, sign up for the Microsoft Build: Microsoft Fabric Cloud Skills Challenge and prepare for Exam DP-600 and upskill to the Fabric Analytics Engineer Associate certification.
March 2024	Exam DP-600 is now available	Exam DP-600 is now available, leading to the Microsoft Certified: Fabric Analytics Engineer Associate certification . The Fabric Career Hub can help you learn quickly and get certified.
March 2024	Microsoft Fabric Community Conference	Join us in Las Vegas March 26-28, 2024 for the first annual Microsoft Fabric Community Conference. See firsthand how Microsoft Fabric and the rest of the data and AI products at Microsoft can help your organization prepare for the era of AI. Register today using code <code>MSCUST</code> for an exclusive discount!
March 2024	Announcing the winners of "HackTogether: The	We received 50 Hackathon project submissions from over 100 registrants, participating from every corner of the world. Our judges were blown away by the breadth, depth, and overall

Month	Feature	Learn more
	Microsoft Fabric Global AI Hack"	quality of submissions. Meet the winners of the Fabric Global AI Hack!
January 2024	Announcing Fabric Career Hub	The new Fabric Career Hub is your one-stop-shop for professional growth! We've created a comprehensive learning journey with the best free on-demand and live training, plus exam discounts.
January 2024	Hack Together: The Microsoft Fabric Global AI Hack	Hack Together is a global online hackathon that runs from February 15 to March 4, 2024. Join us for Hack Together: The Microsoft Fabric Global AI Hack, a virtual event where you can learn, experiment, and hack together with the new Copilot and AI features in Microsoft Fabric! For more information, see Microsoft Fabric Global AI Hack .

Fabric samples and guidance

This section summarizes archived guidance and sample project resources for Microsoft Fabric.

[] [Expand table](#)

Month	Feature	Learn more
March 2024	Protect PII information in your Microsoft Fabric Lakehouse with Responsible AI	One possible way to use Azure AI to identify and extract personally identifiable information (PII) in Microsoft Fabric is to use Azure AI Language to detect and categorize PII entities in text data, such as names, addresses, emails, phone numbers, social security numbers, etc.
February 2024	Building Common Data Architectures with OneLake in Microsoft Fabric	Read more about common data architecture patterns and how they can be secured with Microsoft Fabric , and the basic building blocks of security for OneLake.
January 2024	New Fabric certification and Fabric Career Hub	Beta availability of Microsoft Certification Exam DP-600: Implementing Analytics Solutions with Microsoft Fabric is available for a limited time. Passing this exam earns the Microsoft Certified: Fabric Analytics Engineer Associate certification.

Microsoft Copilot in Microsoft Fabric

This section summarizes archived announcements about [Copilot in Fabric](#).

Month	Feature	Learn more
May 2025	Evaluate your Fabric data agents with the Python SDK (preview)	You can now use the Python SDK to programmatically evaluate Fabric data agents . For more information, see Consume a Fabric Data Agent in Microsoft Copilot Studio (preview) .
April 2025	Fabric data agent integration with Azure AI Agent Service (preview)	We're excited to launch the integration of data agents in Fabric with Azure AI Agent Service from Azure AI Foundry. To get started, see Consume a Fabric Data Agent in Microsoft Copilot Studio (preview) . The Fabric data agent SDK is also available in preview.
March 2025	Copilot and AI capabilities for all paid SKUs	Copilot and AI capabilities are now accessible to all paid SKUs in Microsoft Fabric. For more information, see Copilot and AI Capabilities Now Accessible to All Paid SKUs in Microsoft Fabric and Fabric Copilot capacity .
February 2025	Enhanced conversation with Microsoft Fabric Copilot (Preview)	We're introducing improvements to AI functionalities in Microsoft Fabric , including a new way to store chat prompts and history, improved accuracy of responses, and better context knowledge retention.
October 2024	Microsoft Fabric and AI Learning Hackathon: Copilot in Fabric	Part of the Microsoft Fabric and AI Learning Hackathon , read this guide of various capabilities that Copilot offers in Microsoft Fabric , empowering you to enhance productivity and streamline your workflows.
October 2024	Use Azure OpenAI to turn whiteboard sketches into data pipelines	Read this blog to learn how to turn whiteboard sketches into data pipelines , using the GPT-4o model through Azure OpenAI Service.
September 2024	Creating a real time dashboard by Copilot	Copilot can review a table and automatically create a dashboard with insights and a profile of the data with a sample.
September 2024	Copilot in Dataflow Gen2 GA	Copilot for Data Factory is now generally available and included in the Dataflow Gen2 experience. For more information, see Copilot for Data Factory overview .
September 2024	Copilot for Data Warehouse	Copilot for Data Warehouse is now available, offering the Copilot chat pane , quick actions , and code completions . For more information and sample scenarios, see Announcing the Preview of Copilot for Data Warehouse in Microsoft Fabric .
June 2024	Copilot privacy and security	For more information on the privacy and security of Copilot in Microsoft Fabric, and for detail information on each workload, see Privacy, security, and responsible use for Copilot in Microsoft Fabric (preview) .

Month	Feature	Learn more
May 2024	The AI and Copilot setting automatically delegated to capacity admins	In the tenant admin portal, you can delegate the enablement of AI and Copilot features to Capacity administrators . This AI and Copilot setting is automatically delegated to capacity administrators and tenant administrators won't be able to turn off the delegation.
February 2024	Fabric Change the Game: How easy is it to use Copilot in Microsoft Fabric	This blog post shows how simple is to enable Copilot, a generative AI that brings new ways to transform and analyze data, generate insights, and create visualizations and reports in Microsoft Fabric.
February 2024	Copilot for Data Factory in Microsoft Fabric	Copilot for Data Factory in Microsoft Fabric is now available in preview and included in the Dataflow Gen2 experience. For more information, see Copilot for Data Factory .
January 2024	Microsoft Fabric Copilot for Data Science and Data Engineering	Copilot for Data Science and Data Engineering is now available worldwide. What can Copilot for Data Science and Data Engineering do for you?
January 2024	How to enable Copilot in Fabric for Everyone	Follow this guide to get Copilot in Fabric enabled for everyone in your organization. For more information, see Overview of Copilot for Microsoft Fabric (preview) .
January 2024	Copilot in Fabric is available worldwide	Copilot in Fabric is now available to all customers, including Copilot for Power BI , Data Factory , and Data Science & Data Engineering . Read more in our Overview on Copilot in Fabric .

Data Factory in Microsoft Fabric

This section summarizes archived new features and capabilities of [Data Factory in Microsoft Fabric](#). Follow issues and feedback through the [Data Factory Community Forum](#).

[] [Expand table](#)

Month	Feature	Learn more
May 2025	New pipeline activities support for on-premises data gateway and vNet data gateway	Fabric Data Factory pipelines now support the on-premises data gateway and Virtual Network Gateway for activity types Web , Webhook , Azure Functions , and User Data Functions .
May 2025	Azure Data Factory item in Microsoft Fabric	Azure Data Factory is now generally available in Microsoft Fabric allows you to seamlessly connect your existing Azure Data Factory (ADF) pipelines to Fabric workspaces, eliminating the need to manually rebuild or migrate them.

Month	Feature	Learn more
May 2025	On-premises data gateway May 2025 release	The on-premises data gateway (version 3000.270) now supports the Fabric Pipeline Copy Activity, an additional endpoint for on-premises data gateway communication, and connections to the Vertica database with the user-installed ODBC driver.
May 2025	Dataflow Gen2 Public APIs (preview)	Data Factory APIs enable users to automate and manage dataflows, including creation, management, scheduling, and monitoring. For more information, see Dataflow APIs .
May 2025	Dataflow Gen2 parameterization (preview)	Data Factory parameterization makes workflows more efficient and adaptable to varying inputs and scenarios. For more information, see Use public parameters in Dataflow Gen2 (preview) .
May 2025	Lakehouse as an incremental refresh destination in Dataflow Gen2 (preview)	For scenarios when you need to refresh only new or updated data, you can now enable incremental data refresh from a Lakehouse in Dataflow Gen2 for Microsoft Fabric Data Factory. For more information, see Incremental refresh in Dataflow Gen2 .
May 2025	SharePoint files as a destination in Dataflow Gen2 (preview)	You can now configure dataflow queries to output data into specific folders within SharePoint . For more information, see Dataflow Gen2 data destinations and managed settings .
May 2025	Copy job support for change data capture (CDC) (preview)	Change Data Capture (CDC) in Copy Job is a powerful capability in Data Factory Data pipelines that enables efficient and automated replication of changed data including inserted, updated, and deleted records from a source to a destination.
May 2025	Dataflow Gen2 CI/CD support	CI/CD and Git integration are now supported for Dataflow Gen2 as a generally available feature. For more information, see Dataflow Gen2 CI/CD support .
May 2025	Orchestrate your Databricks jobs with Fabric Data Pipelines	You can run and manage Azure Databricks jobs from Fabric Data Pipelines as part of end-to-end workflows in Fabric Data Pipelines. For more information, see Transform data by running an Azure Databricks activity .
April 2025	Passing parameter values to refresh a Dataflow Gen2 (preview)	Learn more about public parameters for Dataflow Gen2 with CI/CD support, as well as the support for this new mode within the Dataflow refresh activity in Data Pipelines.
April 2025	On-premises data gateway April 2025 release	The on-premises data gateway (version 3000.266) now supports the <code>time</code> data type, Teradata support in Fabric Pipeline Copy Activity, and Power BI Desktop Compatibility.

Month	Feature	Learn more
April 2025	Recap of Data Factory Announcements at Fabric Conference US 2025	Read more for a recap of Data Factory in Fabric announcements .
April 2025	Data pipeline capabilities in Copilot for Data Factory	Data pipeline capabilities in Copilot for Data Factory are now generally available. These features function as an AI expert to help users build, troubleshoot, and maintain data pipelines.
April 2025	Copy job	The Copy job item in Data Factory is now generally available. Copy Job has advantages over the Copy activity. To get started, see Learn how to create a Copy job (preview) in Data Factory for Microsoft Fabric .
April 2025	CI/CD for Fabric Data Pipelines	Git Integration and integration with built-in Deployment Pipelines to Data Factory data pipelines is now generally available. For more information, see CI/CD for Data pipelines and REST API capabilities for Data pipelines .
April 2025	Incremental refresh for Dataflow Gen2 (GA)	Incremental refresh in Dataflow Gen2 is designed to optimize data ingestion and transformation, particularly as your data continues to expand. For more information, see Incremental Refresh for Dataflow Gen2 is now generally available .
April 2025	Latest innovations in Data Factory in Fabric	Read for more information on Lakehouse connector deletion vector , Salesforce and Snowflake connectors , and new certified connectors .
April 2025	Virtual network Data Gateway support	Virtual Network Data Gateway support for Fabric Pipeline Copy , Fast Copy in Dataflow Gen2 , and Copy Job is now in preview. For more information, see What is a virtual network data gateway?
April 2025	Data Factory Apache Airflow jobs	Apache Airflow job in Data Factory , powered by Apache Airflow, are now generally available. An Apache Airflow Job in Microsoft Fabric offers seamless authoring, scheduling, and monitoring experience for Python-based data processes defined as Directed Acyclic Graphs (DAGs). For more information, see Quickstart: Create an Apache Airflow Job .
April 2025	High concurrency mode for Notebooks in Pipelines	High concurrency mode for notebooks in pipelines , now generally available, enables users to share Spark sessions across multiple notebooks within a pipeline. With high concurrency mode , users can trigger pipeline jobs, and these jobs are automatically packed into existing high concurrency sessions.
March 2025	Fabric Data Factory and Roadmap	Discover the latest updates and future plans for Fabric Data Factory, including new features for data integration and

Month	Feature	Learn more
		orchestration. For more information, see What's New with Fabric Data Factory and Roadmap .
March 2025	REST APIs for Fabric Data Factory pipelines	The Fabric data pipeline public REST API enables you to extend the built-in capability in Fabric to create, read, update, delete, and list pipelines.
March 2025	Copy job (preview)	The Copy job in Data Factory has advantages over the Copy activity. For more information, see What is the Copy Job in Microsoft Fabric . For a tutorial, see Learn how to create a Copy job in Data Factory for Microsoft Fabric .
March 2025	Copy Job enhancements	Learn more about three new user experience improvements in the Data Factory Copy Job .
January 2025	Dataflow Gen2 CI/CD support (preview)	CI/CD and Git integration are now supported for Dataflow Gen2, as a preview feature. For more information, see Dataflow Gen2 CI/CD support .
December 2024	Data Factory Announcements at Ignite 2024 Recap	A couple of weeks ago we had such an exciting week for Fabric during the Ignite Conference, filled with several product announcements and sneak previews of upcoming new features for Data Factory in Fabric.
November 2024	REST APIs for connections and gateways (preview)	REST APIs for connections and gateways are now in preview . These new APIs allow developers to programmatically manage and interact with connections and gateways within Fabric.
November 2024	Iceberg format via Azure Data Lake Storage Gen2 Connector in Data pipeline	Fabric Data Factory now supports writing data in Iceberg format via Azure Data Lake Storage Gen2 Connector in Data pipeline. For more information, see Iceberg format for Data Factory in Microsoft Fabric .
November 2024	Data Factory Copy Job – CI/CD now available	CI/CD for Copy job (preview) in Data Factory in Microsoft Fabric is now available. Copy Job now supports Git Integration and Deployment Pipeline .
November 2024	Semantic model refresh activity (preview)	Use the Semantic model refresh activity to refresh a Power BI Dataset (Preview) , the most effective way to refresh your Fabric semantic models. For more information, see New Features for Fabric Data Factory Pipelines Announced at Ignite .
November 2024	New connectors for Fabric SQL database	In the Data Factory, both data pipeline and Dataflow Gen2 now natively support the SQL database in Fabric (Preview) connector as source and destination. More connector updates for MariaDB, Snowflake, Dataverse, and PostgreSQL also announced.

Month	Feature	Learn more
November 2024	OneLake catalog	OneLake data hub has been rebranded as the OneLake catalog in Modern Get Data. When you use Get data inside Pipeline, Copy job, Mirroring and Dataflow Gen2, you'll find the OneLake data hub has been renamed to OneLake catalog.
November 2024	Data pipeline capabilities in Copilot for Data Factory (preview)	The new Data pipeline capabilities in Copilot for Data Factory are now available in preview. These features function as an AI expert to help users build, troubleshoot, and maintain data pipelines.
November 2024	Legacy Timestamp Support in Native Execution Engine for Fabric Runtime 1.3	The recent update to Native Execution Engine on Fabric Runtime 1.3 brings support for legacy timestamp handling, allowing seamless processing of timestamp data created by different Spark versions. Read to learn why legacy timestamp support matters .
November 2024	Dataflow Gen2 CI/CD, GIT source control integration and Public APIs support are now in preview	With this new set of features , you can now seamlessly integrate your dataflow with your existing CI/CD pipelines and version control of your workspace in Fabric. This integration allows for better collaboration, versioning, and automation of your deployment process across dev, test, and production environments. For more information, see Dataflow Gen2 with CI/CD and Git integration support (preview) .
October 2024	New Features and Enhancements for Virtual Network Data Gateway	We're excited to announce several powerful updates to the Virtual Network (VNET) Data Gateway , designed to further enhance performance and improve the overall user experience.
October 2024	Recap of Data Factory Announcements at Fabric Community Conference Europe	Read a recap of Data Factory announcements from Fabric Community Conference Europe 2024.
September 2024	Copilot in Dataflow Gen2 GA	Copilot for Data Factory is now generally available and included in the Dataflow Gen2 experience. For more information, see Copilot for Data Factory overview .
September 2024	Fast Copy in Dataflow Gen2 GA	The Fast copy in Dataflows Gen2 is now generally available. For more information, read Announcing the General Availability of Fast Copy in Dataflows Gen2 .
September 2024	Incremental refresh for Dataflow Gen2 (preview)	Incremental refresh in Dataflow Gen2 (Preview) is designed to optimize data ingestion and transformation, particularly as your data continues to expand. For more information, see Announcing Preview: Incremental Refresh in Dataflow Gen2 .

Month	Feature	Learn more
September 2024	Certified connector updates	Updated Dataflow Gen2 connectors in Microsoft Fabric have been released, as well as an updated Data pipeline connectors for Salesforce and Vertica. For more information, see the Certified connector updates .
September 2024	Fabric Pipeline Integration in On-premises Data Gateway GA	On-premises connectivity for Data pipelines in Microsoft Fabric is now generally available. Learn How to access on-premises data sources in Data Factory for Microsoft Fabric .
September 2024	Invoke remote pipeline (preview) in Data pipeline	You can now use the Invoke Pipeline (preview) activity to call pipelines from Azure Data Factory or Synapse Analytics pipelines . This feature allows you to utilize your existing ADF or Synapse pipelines inside of a Fabric pipeline by calling it inline through this new Invoke Pipeline activity.
September 2024	Spark Job environment parameters	You can now reuse existing Spark sessions with Session tags . In the Fabric Spark Notebook activity, tag your Spark session, then reuse the existing session using that same tag.
September 2024	Azure Data Factory item in Fabric (preview)	You can now bring your existing Azure Data Factory (ADF) to your Fabric workspace . This new preview capability allows you to connect to your existing Azure Data Factory from your Fabric workspace. Select "Create Azure Data Factory" inside of your Fabric Data Factory workspace, and you can manage your Azure data factories directly from the Fabric workspace.
September 2024	Copy job (preview)	The Copy job (preview) has advantages over the legacy Copy activity. For more information, see Announcing Preview: Copy Job in Microsoft Fabric . For a tutorial, see Learn how to create a Copy job (preview) in Data Factory for Microsoft Fabric .
September 2024	Lakehouse Connector in Fabric Data Factory introduces Schema Support	Fabric Lakehouse supports the creation of custom schemas . When reading from a Lakehouse table with the Lakehouse Connector in Fabric Data Factory , custom schema information is now automatically included.
September 2024	Storage Integration Support in Snowflake Connector for Fabric Data Factory	You can now connect Snowflake with external storage solutions (such as Azure Blob Storage) using a secure and centralized approach. For more information, see Snowflake SQL storage integration .
September 2024	New Data Factory Connectors Released in Q3 2024	New Data Factory Connectors include Salesforce, Azure MySQL Database, and Azure Cosmos DB for MongoDB.
August 2024	Certified connector updates	Updated Dataflow Gen2 connectors have been released, as well as two new Data pipeline connectors for Salesforce and

Month	Feature	Learn more
		Vertica. For more information, see the August 2024 Certified connector updates .
August 2024	Data Warehouse Connector Supports TLS 1.3	The Data Warehouse connector now supports TLS 1.3 , the latest version of the Transport Layer Security protocol.
August 2024	Connect to your Azure Resources by Modern Get Data Experience in Data pipeline	You can easily browse and connect to your Azure resources automatically with the modern data experience of Data Pipeline .
July 2024	Use existing connections from the OneLake Data hub integration	You can now select any existing connections from OneLake Datahub , not just your recent and favorite ones. This makes it easier to access your data sources from the homepage of modern get data in data pipeline. For more information, see Modern Get Data experience .
July 2024	Snowflake storage integration	Connect and integrate Snowflake's storage integration to streamline data workflows and optimize performance across all staging scenarios, without the need to bring external storage to stage your dataset. For more information, see Snowflake connector .
July 2024	Edit JSON code for Data pipelines	You can now edit the JSON behind your Data Factory pipelines in Fabric. When you design low-code pipeline workflows, directly editing the JSON code behind your visual pipeline canvas can increase your flexibility and improve your market time.
July 2024	Dataflow Gen2 certified connector updates	New and updated Dataflow Gen2 connectors have been released, including two new connectors in Fabric Data Factory data pipeline: Azure MySQL Database Connector and Azure Cosmos DB for MongoDB Connector. For more information, see the July 2024 Certified connector updates .
July 2024	Support for editing Navigation steps	Introducing a new experience to edit navigation steps within Dataflow, to connect to a different object, inside of the Applied steps section of the Query settings pane. For more information, see Editing Navigation steps .
July 2024	Global view in Manage connections	The new Global view in Manage connections allows you to see all the available connections in your Fabric environment so you can modify them or delete them without ever having to leave the Dataflow experience. For more information, see Global view in Manage connections .
July 2024	Fast Copy with On-premises Data Gateway	Fast Copy (preview) in Dataflow Gen2 now supports on-premises data stores using a gateway to access on-

Month	Feature	Learn more
	Support in Dataflow Gen2	premises stores like SQL Server with Fast Copy in Dataflow Gen2 .
July 2024	Fabric API for GraphQL (preview) pricing	API for GraphQL in Fabric starts billing on July 12, 2024, as part of your existing Power BI Premium or Fabric Capacity. Use the Fabric Capacity Metrics app to track capacity usage for API for GraphQL operations, under the name "Query".
June 2024	Dataflow Gen2 certified connector updates	New and updated Dataflow Gen2 connectors have been released. For more information, see the June 2024 Certified connector updates .
June 2024	New data pipeline connector updates	More connectors are now available for data pipeline . For more information, see the June 2024 Fabric update .
June 2024	Lakehouse schemas feature	The Lakehouse schemas feature (preview) introduces data pipeline support for reading the schema info from Lakehouse tables and supports writing data into tables under specified schemas. Lakehouse schemas allow you to group your tables together for better data discovery, access control, and more.
June 2024	Move Data Across Workspace via Data pipeline Modern Get Data Experience	You can now move data among Lakehouses, warehouses, etc. across different workspaces . In Pipeline Modern Get Data, select a Fabric item from another workspace under Explorer on the left side of the OneLake data hub.
June 2024	Create a new Warehouse as destination in Data pipeline	You can now create a new Warehouse as a destination in Data Pipeline , instead of only selecting an existing one.
May 2024	Data Factory Announcements at Microsoft Build Recap	Don't miss any of the Data Factory in Fabric announcements, here's a recap of all new features in Data Factory in Fabric from Build 2024 .
May 2024	New certified connectors	The Power Query SDK and Power Query Connector Certification process has introduced several new Power Query connectors , including connectors for Oracle database, MySQL, Oracle Cloud Storage, Azure AI, Azure Files, Dynamics AX, Google Bigquery, Snowflake ADBC, and more coming soon.
May 2024	API for GraphQL in Microsoft Fabric (preview)	The new API for GraphQL is a data access layer that allows us to query multiple data sources quickly and efficiently in Fabric. For more information, see What is Microsoft Fabric API for GraphQL?
May 2024	Power Query Dataflow Gen2 SDK for VS Code GA	The Power Query SDK is now generally available in Visual Studio Code! To get started with the Power Query SDK in

Month	Feature	Learn more
		Visual Studio Code, install it from the Visual Studio Code Marketplace .
May 2024	Refresh the Refresh History Dialog	The Refresh History details popup window now has a Refresh button.
May 2024	New and updated certified connectors	The Power Query SDK and Power Query Connector Certification process has introduced four new and updated Power Query connectors .
May 2024	Data workflows in Data Factory preview	Data workflows (preview) in Data Factory , powered by Apache Airflow, offer seamless authoring, scheduling, and monitoring experience for Python-based data processes defined as Directed Acyclic Graphs (DAGs). For more information, see Quickstart: Create a Data workflow .
May 2024	Trusted Workspace Access in Fabric Data Pipelines preview	Use the workspace identity to establish a secure and seamless connection between Fabric and your storage accounts. You can now create data pipelines to access your firewall-enabled Azure Data Lake Storage Gen2 (ADLS Gen2) accounts using Trusted workspace access (preview) in your Fabric Data Pipelines.
May 2024	Blob storage Event Triggers for Data Pipelines preview	Azure Blob storage event triggers (preview) in Fabric Data Factory Data Pipelines use Fabric Reflex alerts and eventstreams to create event subscriptions to your Azure storage accounts.
May 2024	Azure HDInsight activity for data pipelines	The Azure HDInsight activity allows you to execute Hive queries, invoke a MapReduce program, execute Pig queries, execute a Spark program, or a Hadoop Stream program.
May 2024	Copy data assistant	Start using the Modern Get Data experience by selecting Copy data assistant in the Pipeline landing page or Use copy assistant in the Copy data drop down . You can easily connect to recently used Fabric items and provides an intuitive way to read sources from sample data and new connections.
May 2024	Edit the Destination Table Column Type when Copying Data	You can edit destination table column types when copying data for a new or autocreated destination table for many data stores. For more information, see Configure Lakehouse in a copy activity .
April 2024	Spark job definition activity	With the new Spark job definition activity , you'll be able to run a Spark job definition in your pipeline.
April 2024	Fabric Warehouse in ADF copy activity	You can now connect to your Fabric Warehouse from an Azure Data Factory/Fabric Warehouse pipeline . You can find this new connector when creating a new source or sink

Month	Feature	Learn more
		destination in your copy activity, in the Lookup activity, Stored Procedure activity, Script activity, and Get Metadata activity.
April 2024	Edit column type to destination table support added to Fabric Warehouse and other SQL data stores	When moving data from any supported data sources into Fabric Warehouse or other SQL data stores (SQL Server, Azure SQL Database, Azure SQL Managed Instance, or Azure Synapse Analytics) via data pipelines, users can now specify the data type for each column .
April 2024	Performance improvements when writing data to SFTP	The SFTP connector has been improved to offer better performance when writing to SFTP as destination.
April 2024	Service Principal Name authentication kind support for On-Premises and virtual network data gateways	Azure Service Principals (SPN) are now supported for on-premises data gateways and virtual network data gateways. Learn how to use the service principal authentication kind in Azure Data Lake Storage, Dataverse, Azure SQL Database, Web connector, and more.
April 2024	New and updated Certified connectors	The Power Query SDK and Power Query Connector Certification process has introduced 11 new and updated custom Power Query connectors .
April 2024	New Expression Builder Experience	A new experience in the Script activity in Fabric Data Factory pipelines to make it even easier to build expressions using the pipeline expression language.
April 2024	Data Factory Increases Maximum Activities Per Pipeline to 80	We have doubled the limit on number of activities you can define in a pipeline from 40 to 80.
April 2024	REST APIs for Fabric Data Factory pipelines preview	The REST APIs for Fabric Data Factory Pipelines are now in preview. REST APIs for Data Factory pipelines enable you to extend the built-in capability in Fabric to create, read, update, delete, and list pipelines.
March 2024	Fast copy in Dataflows Gen2	With Fast copy , you can ingest terabytes of data with the easy experience of dataflows, but with the scalable backend of Pipeline's Copy activity.
March 2024	Integrating On-Premises Data into Microsoft Fabric Using Data Pipelines in Data Factory preview	With the on-premises Data Gateway (preview), customers can connect to on-premises data sources using dataflows and data pipelines with Data Factory . For more information, see How to access on-premises data sources in Data Factory for Microsoft Fabric .
March 2024	CI/CD for Fabric Data Pipelines preview	Git Integration and integration with built-in Deployment Pipelines to Data Factory data pipelines is now in preview. For

Month	Feature	Learn more
		more information, see Data Factory Adds CI/CD to Fabric Data Pipelines .
March 2024	Browse Azure resources with Get Data	Learn how to browse and connect to all your Azure resources with the 'browse Azure' functionality in Get Data . You can browse Azure resources then connect to Synapse, blob storage, or ADLS Gen2 resources easily.
March 2024	Dataflow Gen2 Support for VNet Gateways now generally available	VNet Data Gateway support for Dataflows Gen2 in Fabric is now generally available. The VNet data gateway helps to connect from Fabric Dataflows Gen2 to Azure data services within a VNet, without the need of an on-premises data gateway.
March 2024	Privacy levels support in Dataflows	You can now set privacy levels for your connections in your Dataflow Gen2. Privacy levels are critical to configure correctly so that sensitive data is only viewed by authorized users.
March 2024	Copy data to S3 Compatible via Fabric Data Factory Data Pipeline	Copying data to S3 Compatible is now available in Data pipeline of Fabric Data Factory! You can use Copy assistant and Copy activity in your Data pipeline to finish this data movement.
February 2024	Dataflows Gen2 data destinations and managed settings	New features for Dataflows Gen2 include destinations, managed settings, and advanced topics.
February 2024	Copilot for Data Factory in Microsoft Fabric	Copilot for Data Factory in Microsoft Fabric is now available in preview and included in the Dataflow Gen2 experience. For more information, see Copilot for Data Factory .
February 2024	Certified Connector updates	The Power Query SDK enables you to create new connectors for both Power BI and Dataflow. New certified Power Query connectors are available to the list of Certified Connectors in Power Query .
February 2024	Data pipeline connector updates	New connectors are available in your Data Factory data pipelines , including S3 compatible and Google Cloud Storage data sources. For more information, see Data pipeline connectors in Microsoft Fabric .
January 2024	Automate Fabric Data Warehouse Queries and Commands with Data Factory	In Fabric Data Factory, there are many ways to query data, retrieve data, and execute commands from your warehouse using pipeline activities that can then be easily automated .

Month	Feature	Learn more
January 2024	Use Fabric Data Factory Data Pipelines to Orchestrate Notebook-based Workflows	Guidance and good practices when building Fabric Spark Notebook workflows using Data Factory in Fabric with data pipelines.

Data Factory in Microsoft Fabric samples and guidance

 [Expand table](#)

Month	Feature	Learn more
April 2025	Metadata-driven Lakehouse implementation	Learn how to design and implement an end-to-end metadata-driven Lakehouse using Microsoft Fabric .
March 2025	Build RAG Data pipeline from Azure Blob Storage to SQL Database in minutes	This blog post provides step-by-step instructions for creating a Retrieval Augmented Generation (RAG) pipeline to prepare your data for AI integration using SQL database in Microsoft Fabric.
January 2025	Enhancing data quality with Copilot for Data Factory	Read this blog for a guide on using Copilot for Data Factory to clean and transform data .
November 2024	Boosting Data Ingestion in Data Factory: Continuous Innovations in Performance Optimization	Here's a closer look at how recent advancements are transforming data ingestion in Data Factory .
November 2024	Copy Job upsert to SQL & overwrite to Fabric Lakehouse	The Copy Job simplifies your data ingestion with non-compromising experience from any source to any destination. By default, Copy Job appends data to your destination so that you never miss any change history. However, you can also customize the write behavior to upsert data on Azure SQL Database or SQL Server and overwrite data on Fabric Lakehouse tables, giving you full flexibility to match your needs.
September 2024	Integrate your SAP data into Microsoft Fabric	Learn more about an overview of SAP data options in Microsoft Fabric , along with some guidance on the respective use cases.
July 2024	Connect to your Azure Resources from Fabric with the Data Pipeline	Learn how to connect to your Azure resources automatically with the modern get data experience of Data Pipelines .

Month	Feature	Learn more
	Modern Get Data Experience	
July 2024	Fabric Data Pipelines – Advanced Scheduling Techniques (Part 2: Run a Pipeline on a Specific Day)	This blog provides a tutorial on the ability to schedule a Pipeline on a specific day of the month , including both the start of the month along with the last day of the month.
June 2024	A Data Factory Pipeline Navigator mind map	The ultimate Data Factory Pipeline Mind Map helps you navigate Data Factory pipelines on your Data Factory journey to build a successful Data Integration project.
May 2024	Semantic model refresh activity	Learn how to use the much-requested Semantic model refresh activity in Data pipelines and how you can now create a complete end-to-end solution that spans the entire pipeline lifecycle.
February 2024	Fabric Data Pipelines – Advanced Scheduling Techniques	This blog series covers Advanced Scheduling techniques in Microsoft Fabric Data Pipelines .

Fabric Data Engineering

This section summarizes archived new features and capabilities of data engineering, including [Data Factory in Microsoft Fabric](#).

[] [Expand table](#)

Month	Feature	Learn more
May 2025	Boost performance effortlessly with Automated Table Statistics in Fabric Spark	Automated Table Statistics are now generally available, automatically optimizing query performance by maintaining up-to-date statistics in Fabric Spark. For more information, see Configure and manage Automated Table Statistics in Fabric Spark .
May 2025	Authenticate to Fabric data connections using Azure Key Vault (preview)	You can now authenticate to Fabric data connections using Azure Key Vault stored secrets (preview) . Azure Key Vault references enable secure and centralized secret management for your data connections. For more information, see Azure Key Vault references overview (preview) and get started at Configure Azure Key Vault references .
May 2025	Shortcut transformations (preview)	Shortcut transformations let you automatically transform data as you bring it into OneLake or move it between

Month	Feature	Learn more
		OneLake data items. For more information, see Shortcuts file transformations .
May 2025	Microsoft Fabric Spark Native Execution Engine now generally available	The Microsoft Fabric Spark Native Execution Engine is now generally available as part of Fabric Runtime 1.3 and provides improved performance and efficiency for Spark workloads in Microsoft Fabric. For more information, see Native execution engine for Fabric Spark .
May 2025	Azure Blob Storage in OneLake shortcut type (preview)	You can now create shortcuts to Azure Blob Storage in OneLake , making it easier to integrate and access blob data in Microsoft Fabric. For more information, see Create an Azure Blob Storage shortcut (preview) .
May 2025	Materialized Lake views (preview)	Materialized Lake Views were announced at Build 2025 . Materialized Lake Views in Microsoft Fabric enable fast and efficient querying of data stored in OneLake.
May 2025	Inline code completion in Fabric notebooks (preview)	Fabric notebooks with inline code completion helps users write code faster and with fewer errors. For more information, see Copilot for Data Science and Data Engineering (preview) .
May 2025	OneLake shortcut cache and on-premises gateway support now generally available	Shortcut cache and on-premises gateway support is now generally available . Use OneLake shortcut cache to quickly and easily source data from external cloud providers. The on-premises gateway allows you to securely connect to your data through multiple network restricted scenarios. For more information, see Create shortcuts to on-premises data .
April 2025	Fabric Spark connector for Fabric Data Warehouse in Spark runtime	The Spark connector for Data Warehouse , now generally available, enables a Spark developer or a data scientist to access and work on data from a warehouse or SQL analytics endpoint of the lakehouse (either from within the same workspace or from across workspaces) with a simplified Spark API.
April 2025	Purview DLP Policies with Restrict Access for Fabric Lakehouses (preview)	Microsoft Purview's Data Loss Prevention (DLP) policies can now restrict access in Fabric Lakehouses .
April 2025	OneLake SAS	Support for short-lived, user-delegated OneLake SAS is now generally available. This functionality allows applications to request a User Delegation Key backed by Microsoft Entra ID, and then use this key to construct a OneLake SAS token. This token can be handed off to provide delegated access to another tool, node, or user, ensuring secure and controlled access.

Month	Feature	Learn more
April 2025	Row-level and Column-level security in Spark	Row and column level security for Spark within Microsoft Fabric are now available. This update significantly enhances data governance by incorporating fine-grained security controls within Spark.
April 2025	Environment sharing across workspaces (preview)	You can now attach Environments from different workspaces in your Notebooks and Spark job definitions ↗ , as a preview feature. For more information, see Create, configure, and use an environment in Microsoft Fabric .
April 2025	OPTIMIZE FAST and FSCK commands in Fabric Runtime 1.3 for Apache Spark	The Spark SQL FSCK REPAIR TABLE command and fast OPTIMIZE for V-Order are now available on Fabric Runtime 1.3 (Spark 3.5 / Delta 3.2) ↗ . For more information, see Fabric Runtime 1.3 (GA) .
April 2025	Fabric Spark Monitoring APIs (preview)	Fabric Spark Monitoring APIs , currently in preview, are a robust set of tools designed to enhance observability and streamline the monitoring and management of Spark applications within Microsoft Fabric.
April 2025	Fabric User Data Functions (preview)	Fabric User Data Functions ↗ let you create functions that contain business logic and connect to Fabric data sources, and/or invoke them from other Fabric items such as Data pipelines, Notebooks and Power BI reports. The Functions Hub provides a single location to view, access, and manage your User Data Functions ↗ . For more information, see Fabric User data functions (preview) .
April 2025	Azure Key Vault and AWS KMS for S3 support for OneLake shortcuts	OneLake shortcuts now support Azure Key Vault and AWS KMS for S3 buckets ↗ . OneLake shortcuts now support connecting to Azure Key Vault references for ADLS Gen2 and S3 buckets secured with AWS KMS .
April 2025	OneLake shortcuts Fabric SQL databases	OneLake shortcuts now support connections to Fabric SQL databases ↗ , allowing users to seamlessly integrate SQL data into their unified data lake environment using the OneLake catalog explorer.
April 2025	CI/CD support OneLake shortcuts	OneLake shortcuts now support batch creation via the API and management with CI/CD ↗ .
April 2025	High concurrency mode for Notebooks in Pipelines	High concurrency mode for notebooks in pipelines ↗ , now generally available, enables users to share Spark sessions across multiple notebooks within a pipeline. With high concurrency mode , users can trigger pipeline jobs, and these jobs are automatically packed into existing high concurrency sessions.

Month	Feature	Learn more
April 2025	Supercharge your workloads: write-optimized default Spark configurations in Microsoft Fabric	With predefined Spark resource profiles , it's easier than ever for data engineers to optimize their compute configurations based on workload needs. For more information, see Supercharge your workloads: write-optimized default Spark configurations .
March 2025	Enhancing AI productivity in Fabric Notebooks	The latest Copilot updates improve productivity with in-cell interactions, better code generation, and seamless integration with Fabric. For more information, see What's New in Copilot updates for Fabric notebooks .
March 2025	Autoscale billing for Spark	The new autoscale billing model offer greater flexibility and cost efficiency for Spark workloads. For more information, see Introducing Autoscale Billing for Spark in Microsoft Fabric .
February 2025	T-SQL notebook enhancements	The T-SQL notebook now includes more T-SQL code snippets, easy open within Excel, traceability of the warehouse, and CI/CD support. For more information, see T-SQL notebook enhancements .
February 2025	Centralized data governance in the OneLake catalog (preview)	A new centralized data governance experience in the OneLake catalog is in preview. Data owners can view aggregated insights on the items they created, consider improving their governance by taking recommended actions, and access more information along with all available tools in Fabric.
February 2025	Managed private endpoint and private link support for Native Execution Engine in Spark	Private Links and Managed Private Endpoints are now supported for Native Execution Engine. Learn more about the Native execution engine for Fabric Spark .
February 2025	Capacity settings include option to Disable Starter Pool	New controls in Data Engineering/Science Capacity settings include the option to Disable Starter Pool for workspaces , to help capacity admins have better compute restrictions on workspaces attached to their Fabric Capacity.
February 2025	Monitoring for high concurrency in T-SQL notebooks	New features like log segmentation and auto-mapping of jobs, stages, and tasks in Notebooks allow for better tracking and troubleshooting of high concurrency Notebook executions.
February 2025	Enhancements to support additional notebook run scenarios	Support for notebook runs triggered by NotebookUtils, snapshots for running notebooks, and Enhanced visibility into parallel notebook runs have been introduced.
February 2025	Fabric Spark Resource Analysis	The Fabric Spark Resource Utilization Analysis feature provides in-depth insights into your Apache Spark

Month	Feature	Learn more
		applications within Microsoft Fabric. For more information, see Monitor Apache Spark applications resource utilization .
February 2025	AI functions (preview)	AI functions for data engineering with GenAI ↗ are now in preview. With AI functions, you can harness the power of GenAI for summarization, classification, text generation, and so much more—all with a single line of code.
February 2025	Fabric Spark connector for Fabric Data Warehouse in Spark runtime (preview)	The Spark connector for Data Warehouse enables a Spark developer or a data scientist to access and work on data from a warehouse or SQL analytics endpoint of the lakehouse (either from within the same workspace or from across workspaces) with a simplified Spark API. For more information, see Spark Connector for Fabric Data Warehouse - Preview ↗ .
February 2025	ArcGIS GeoAnalytics for Microsoft Fabric Spark (preview)	Microsoft and Esri have partnered to bring spatial analytics into Microsoft Fabric ↗ . To learn more about ArcGIS integration within Microsoft Fabric Spark, see ArcGIS GeoAnalytics for Microsoft Fabric (preview) ↗ and ArcGIS in Fabric integrations ↗ .
February 2025	What's new in OneLake catalog: Data governance and more	Read more about recent OneLake improvements ↗ involving the Catalog, data governance, personalized insights and actions, and more.
January 2025	Simplified enablement and transition to Runtime 1.3 from Runtime 1.2	We recommend upgrading to Runtime 1.3 to maintain support, as native acceleration will soon be unavailable on Runtime 1.2. Now, activating Native Execution Engine on Runtime 1.3 is as easy as a switch ↗ . You'll find the new toggle button in the Acceleration tab within your environment settings.
January 2025	Notebook and Spark Job definition execution with service principal	You can now run a Notebook/Spark Job Definition execution under the credentials of a service principal ↗ . Use the Fabric Job Scheduler API with a service principal's access token, to run the Spark Job within the security context of that service principal.
January 2025	Building Apps with Microsoft Fabric API for GraphQL	Microsoft Fabric has an API for GraphQL ↗ to build your data applications, enabling you to pull data from sources such as Data Warehouses, Lakehouse, Mirrored Databases, and DataMart in Microsoft Fabric.
January 2025	Efficient log management with Microsoft Fabric	For a tutorial and walkthrough of efficient log files collection processing and analysis with Real-Time Intelligence, read this new blog post on Efficient log management with Microsoft Fabric ↗ .

Month	Feature	Learn more
January 2025	Folder security within a shortcut in OneLake	Now you can define security on any subfolder within the shortcut root. For more information and an example, see Define security on folders within a shortcut using OneLake data access roles .
December 2024	REST API for Livy (preview)	The Fabric Livy endpoint lets users submit and execute their Spark code on the Spark compute within a designated Fabric workspace, eliminating the need to create a Notebook or Spark Job Definition items. The Livy API offers the ability to customize the execution environment through its integration with the Environment .
December 2024	Notebook version history (preview)	Fabric notebook version history provides robust built-in version control capabilities, including automatic and manual checkpoints, tracked changes, version comparisons, and previous version restore. For more information, see Notebook version history .
December 2024	Python Notebook (preview)	Python Notebooks are for BI Developers and Data Scientists working with smaller datasets using Python as their primary language. To get started, see Use Python experience on Notebook .
November 2024	Workspace monitoring (preview)	Workspace monitoring is a Microsoft Fabric database that collects data from a range of Fabric items in your workspace, and lets users access and analyze logs and metrics. For more about this feature, see Announcing preview of workspace monitoring .
November 2024	The new OneLake catalog	The OneLake catalog is the next evolution of the OneLake data hub . For more information about the new catalog, Discover and explore Fabric items in the OneLake catalog .
November 2024	OneLake external data sharing (GA)	OneLake external data sharing , now generally available, makes it possible for Fabric users to share data from within their Fabric tenant with users in another Fabric tenant.
November 2024	Purview Data Loss Prevention policies now support the restrict access action for semantic models	Restricting access based on sensitive content for semantic models, now in preview, helps you to automatically detect sensitive information as it is uploaded into Fabric lakehouses and semantic models .
November 2024	Iceberg data in OneLake using Snowflake and shortcuts (preview)	You can now consume Iceberg-formatted data across Microsoft Fabric with no data movement or duplication , plus Snowflake has added the ability to write Iceberg tables directly to OneLake. For more information, see Use Iceberg tables with OneLake .

Month	Feature	Learn more
November 2024	Notebook display chart upgrade	The new and improved chart view brings multiple new capabilities to the notebook display. To access the new chart view just open your Fabric notebook and run the <code>display(df)</code> statement.
November 2024	Mirrored databases in Spark Notebooks	Mirrored databases in Spark Notebooks allow you to seamlessly explore and run read-only queries on your open-format tables just like Lakehouses, all while taking full advantage of our advanced analytics engines—without the need to migrate any of your data into Fabric.
November 2024	Jar libraries	Java Archive (JAR) files are a popular packaging format used in the Java ecosystem, and are now supported in Fabric Environments.
November 2024	Legacy Timestamp Support in Native Execution Engine for Fabric Runtime 1.3	The recent update to Native Execution Engine on Fabric Runtime 1.3 brings support for legacy timestamp handling, allowing seamless processing of timestamp data created by different Spark versions. Read to learn why legacy timestamp support matters .
October 2024	Native Execution Engine available at no additional cost	The Native Execution Engine is now available at no additional cost . The Native Execution Engine now supports Fabric Runtime 1.3, which includes Apache Spark 3.5 and Delta Lake 3.2. This upgrade enhances Microsoft Fabric's Data Engineering and Data Science workflows, offering boosts in performance and flexibility.
October 2024	Use OneLake shortcuts to access data across capacities: Even when the producing capacity is paused	Learn how OneLake capacity consumption works when accessing data through a shortcut, particularly across capacities .
October 2024	Purview Data Loss Prevention policies have been extended to Fabric lakehouses	Extending Microsoft Purview's Data Loss Prevention (DLP) policies into Fabric lakehouses is now in preview.
October 2024	API for GraphQL support for Service Principal Names (SPNs)	Service Principal Names (SPN) support for API for GraphQL offers organizations looking to integrate their apps with API for GraphQL in Microsoft Fabric tie seamlessly with their enterprise identity and access management systems. For more information, see Service Principal Names (SPNs) in Fabric API for GraphQL .
October 2024	Automatic code generation in API for	Fabric API for GraphQL now adds the ability to automatically generate Python and Node.js code based on GraphQL

Month	Feature	Learn more
	GraphQL	queries tested in the API Explorer.
October 2024	Notebook Git integration GA	Notebook Git integration now supports persisting the mapping relationship of the attached Environment when syncing to new workspace. For more information, see Notebook source control and deployment
October 2024	Notebook in deployment pipeline GA	Now you can also use notebooks to deploy your code across different environments , such as development, test, and production. You can also use deployment rules to customize the behavior of your notebooks when they're deployed, such as changing the default Lakehouse of a Notebook. Get started with deployment pipelines , and Notebook shows up in the deployment content automatically.
October 2024	Notebook in Org APP	The Notebook feature is now supported in Org APP . You can easily embed Notebook code and markdown cells, visuals, tables, charts, and widgets in OrgAPP, as a practical storytelling tool.
October 2024	Notebook onboarding tour	The new Fabric Notebook Onboarding Tour is now available. This guided tour is designed to help you get started with the essential Notebook features and learn the new capabilities.
October 2024	Notebook mode switcher	The Notebook mode switcher provides flexible access modes (Develop, Run Only, Edit, View) for your notebooks, which can help you easily manage the permissions to the notebook and the corresponding view.
October 2024	Free selection support on display() table view	The free selection function on the rich dataframe preview in the notebook can improve the data analysis experience. To see the new features, read Free selection support on display() table view .
October 2024	Filter, sort and search your Lakehouse objects	Sorting, Filtering, and Searching capabilities make data exploration and analysis more efficient by allowing you to quickly retrieve the information you need based on specific criteria, right within the Lakehouse environment.
September 2024	Fabric Runtime 1.3 GA	Fabric Runtime 1.3 (GA) , now generally available, includes Apache Spark 3.5, Delta Lake 3.1, R 4.4.1, Python 3.11, support for Starter Pools, integration with Environment, and library management capabilities. For more information, see Fabric Runtime 1.3 is Generally Available! .
September 2024	Native Execution Engine on Runtime 1.3 (preview)	Native execution engine for Fabric Spark for Fabric Runtime 1.3 is now available in preview, offering superior query performance across data processing, ETL, data science, and

Month	Feature	Learn more
		interactive queries. No code changes are required to speed up the execution of your Apache Spark jobs when using the Native Execution Engine .
September 2024	High concurrency mode for Notebooks in Pipelines (preview)	High concurrency mode for Notebooks in Pipelines enables users to share Spark sessions across multiple notebooks within a pipeline. With high concurrency mode , users can trigger pipeline jobs, and these jobs are automatically packed into existing high concurrency sessions.
September 2024	Reserve maximum cores for jobs (preview)	A new workspace-level setting allows you to reserve maximum cores for your active jobs for Spark workloads . For more information, see High concurrency mode in Apache Spark for Fabric .
September 2024	Session Expiry Control in Workspace Settings for Notebook Interactive Runs (preview)	A new session expiry control in Data Engineering/Science workspace settings allows you to set the maximum expiration time limit for notebook interactive sessions. By default, sessions expire after 20 minutes, but you can now customize the maximum expiration duration .
September 2024	Fabric Spark Diagnostic Emitter (preview)	The Fabric Apache Spark Diagnostic Emitter (preview) allows Apache Spark users to collect logs, event logs, and metrics from their Spark applications and send them to various destinations, including Azure Event Hubs , Azure Storage , and Azure Log Analytics .
September 2024	Environment integration with Data Engineering VS Code extension	You can now create, configure, and use an environment in Fabric in VS Code with the Data Engineering VS Code extension .
September 2024	Notebook debug within vscode.dev (preview)	You can now place breakpoints and debug your Notebook code with the Synapse VS Code - Remote extension in vscode.dev . This update first starts with the Fabric Runtime 1.3 .
September 2024	Invoke Fabric User Data Functions in Notebook	You can now invoke User Defined Functions (UDFs) in your PySpark code directly from Microsoft Fabric Notebooks or Spark jobs. With NotebookUtils integration, invoking UDFs is as simple as writing a few lines of code .
September 2024	Functions Hub	The new Functions Hub provides a single location to view, access, and manage your User Data Functions.
September 2024	Support for spaces in Lakehouse Delta table names	You can now create and query Delta tables with spaces in their names , such as "Sales by Region" or "Customer Feedback". All Fabric Runtimes and Spark authoring experiences support table names with spaces.

Month	Feature	Learn more
September 2024	Enable/Disable Functionality in API for GraphQL	The Enable/Disable feature for queries and mutations in GraphQL API provides administrators and developers with granular control over API access and usage.
September 2024	Public REST API of Livy endpoint	The Fabric Livy endpoint lets users submit and execute their Spark code on the Spark compute within a designated Fabric workspace, eliminating the need to create any Notebook or Spark Job Definition.
September 2024	OneLake SAS (preview)	Support for OneLake SAS is now in preview . This functionality allows applications to request a User Delegation Key backed by Microsoft Entra ID, and then use this key to construct a short-lived, user-delegated OneLake SAS token. This token can be handed off to provide delegated access to another tool, node, or user, ensuring secure and controlled access.
September 2024	Access Databricks Unity Catalog tables from Fabric (preview)	A mirrored Azure Databricks Unity Catalog in Fabric allows you to read data managed by Unity Catalog from Fabric workloads from the Lakehouse. In Fabric, you can now create a new data item called "Mirrored Azure Databricks Catalog". For more information, see Databricks Unity Catalog tables available in Microsoft Fabric .
September 2024	T-SQL support in Fabric notebooks	The T-SQL notebook feature in Microsoft Fabric lets you write and run T-SQL code within a notebook. You can use them to manage complex queries and write better markdown documentation. It also allows direct execution of T-SQL on connected warehouse or SQL analytics endpoint. To learn more, see T-SQL support in Microsoft Fabric notebooks .
September 2024	OneLake shortcuts to Google Cloud Storage	Now a generally available feature, Create a Google Cloud Storage (GCS) shortcut to connect to your existing data through a single unified name space without having to copy or move data.
September 2024	OneLake shortcuts to S3-compatible data sources	Now a generally available feature, Create an S3 compatible shortcut to connect to your existing data through a single unified name space without having to copy or move data.
August 2024	MsSparkUtils upgrade to NotebookUtils	The library MsSparkUtils has been rebranded as NotebookUtils . While <code>NotebookUtils</code> is backward compatible with <code>MsSparkUtils</code> , new features will only be added to the <code>NotebookUtils</code> namespace. For more information, see NotebookUtils (former MSSparkUtils) for Fabric .

Month	Feature	Learn more
August 2024	Import Notebook UX improvement	The Import Notebook feature user interface has been enhanced - you can now effortlessly import notebooks, reports, or paginated reports using the unified entry in the workspace toolbar.
August 2024	Lifecycle of Apache Spark runtimes in Fabric	The Lifecycle of Apache Spark runtimes in Fabric document details the release cadence and versioning for the Azure-integrated platform based on Azure Spark. For more information, see the Fabric runtime lifecycle blog post .
July 2024	MSSparkUtils API	The <code>mssparkutils.runtime.context</code> is a new API that provides context information of the current live session, including the notebook name, default lakehouse, workspace info, if it's a pipeline run, etc. For more information, see Microsoft Spark Utilities (MSSparkUtils) for Fabric .
July 2024	Environment Resources folder	The new Environment Resources Folder is a shared repository designed to streamline collaboration across multiple notebooks.
June 2024	Fabric Spark connector for Fabric Synapse Data Warehouse in Spark runtime (preview)	The Fabric Spark connector for Synapse Data Warehouse (preview) enables a Spark developer or a data scientist to access and work on data from a warehouse or SQL analytics endpoint of the lakehouse (either from within the same workspace or from across workspaces) with a simplified Spark API.
June 2024	External data sharing public API preview	REST APIs for OneLake external data sharing are now available in preview. Users can now scale their data sharing use cases by automating the creation of shares with the public API.
June 2024	Capacity pools preview	Capacity administrators can now create custom pools (preview) based on their workload requirements, providing granular control over compute resources. Custom pools for Data Engineering and Data Science can be set as Spark Pool options within Workspace Spark Settings and environment items.
June 2024	Native Execution Engine for Apache Spark	The Native Execution Engine for Apache Spark on Fabric Data Engineering and Data Science for Fabric Runtime 1.2 is now in preview. For more information, see Native execution engine for Fabric Spark .
June 2024	OneLake data access roles API	Following the release of OneLake data access roles in preview, new APIs are available for managing data access roles . These APIs can be used to programmatically manage granular data access for your lakehouses .

Month	Feature	Learn more
May 2024	Runtime 1.3 (Apache Spark 3.5, Delta Lake 3.1, R 4.3.3, Python 3.11) (preview)	The enhancements in Fabric Runtime 1.3 include the incorporation of Delta Lake 3.1, compatibility with Python 3.11, support for Starter Pools, integration with Environment, and library management capabilities. Additionally, Fabric Runtime now enriches the data science experience by supporting the R language and integrating Copilot.
May 2024	Spark Run Series Analysis and Autotune feature preview	The Spark Monitoring Run Series Analysis features allow you to analyze the run duration trend and performance comparison for Pipeline Spark activity recurring run instances and repetitive Spark run activities, from the same Notebook or Spark Job Definition.
May 2024	OneLake shortcuts to on-premises and network-restricted data sources (preview)	Connect to on-premises data sources with a Fabric on-premises data gateway on a machine in your environment, with networking visibility of your S3 compatible, Amazon S3, or Google Cloud Storage data source. Then, you create your shortcut and select that gateway. For more information, see Create shortcuts to on-premises data .
May 2024	Comment @tagging in Notebook	Notebook now supports the ability to tag others in comments , just like the familiar functionality of using Office products.
May 2024	Notebook ribbon upgrades	New features in the Fabric notebook ribbon including the Session connect control and Data Wrangler button on the Home tab, High concurrency sessions , new View session information control including the session timeout.
May 2024	Data Engineering: Environment GA	The Environment in Fabric is now generally available. The Environment is a centralized item that allows you to configure all the required settings for running a Spark job in one place. At GA, we added support for Git, deployment pipelines, REST APIs, resource folders, and sharing.
May 2024	Public API for Workspace Data Engineering/Science	REST API support for Fabric Data Engineering/Science workspace settings allows users to create/manage their Spark compute, select the default runtime/default environment, enable or disable high concurrency mode, or ML autologging.
April 2024	Fabric Spark Optimistic Job Admission	Fabric Spark Optimistic Job Admission reduces the frequency of throttling errors (HTTP 430: Spark Capacity Limit Exceeded Response) and improves the job admission experience for our customers, especially during peak usage hours.

Month	Feature	Learn more
April 2024	Single Node support for starter pools	The Single Node support for starter pools feature lets you set your starter pool to max one node and get super-fast session start times for your Spark sessions.
April 2024	Container Image for Synapse VS Code	To simplify the development process, we have released a container image for Synapse VS Code that contains all the necessary dependencies for the extension.
April 2024	Git integration with Spark Job definition	Git integration with Spark Job definitions allows you to check in the changes of your Spark Job Definitions into a Git repository, which will include the source code of the Spark jobs and other item properties.
April 2024	New Revamped Object Explorer experience in the notebook	The new Object Explorer experience improves flexibility and discoverability of data sources in the explorer and improve the discoverability of Resource folders.
April 2024	%Run your scripts in Notebook	Now you can use %run magic command to run your Python scripts and SQL scripts in Notebook resources folder , just like Jupyter notebook <code>%run</code> command.
April 2024	OneLake shortcuts to S3-compatible data sources preview	OneLake shortcuts to S3-compatible data sources are now in preview . Create an Amazon S3 compatible shortcut to connect to your existing data through a single unified name space without having to copy or move data.
April 2024	OneLake shortcuts to Google Cloud Storage preview	OneLake shortcuts to Google Cloud Storage are now in preview . Create a Google Cloud Storage shortcut to connect to your existing data through a single unified name space without having to copy or move data.
April 2024	OneLake data access roles	OneLake data access roles for lakehouse are in preview . Role permissions and user/group assignments can be easily updated through a new folder security user interface.
March 2024	New validation enhancement for "Load to table"	The new validation enhancement to the "Load to table" feature help mitigate any validation issues and make your data loading experience smoother and faster.
March 2024	Queuing for Notebook Jobs	Now with Job Queueing for Notebook Jobs , jobs that are triggered by pipelines or job scheduler will be added to a queue and will be retried automatically when the capacity frees up. For more information, see Job queueing in Microsoft Fabric Spark .
March 2024	Autotune Query Tuning feature for Apache Spark	The Autotune Query Tuning feature for Apache Spark is now available. Autotune leverages historical data from your Spark SQL queries and machine learning algorithms to

Month	Feature	Learn more
		automatically fine-tune your configurations, ensuring faster execution times and enhanced efficiency.
March 2024	OneLake File Explorer: Editing via Excel	With our latest release v1.0.11.0 of file explorer , we're excited to announce that you can now update your files directly using Excel , mirroring the user-friendly experience available in OneDrive.
February 2024	Trusted workspace access (preview) for OneLake Shortcuts	Trusted workspace access (preview) enables secure and seamless access to ADLS Gen2 storage accounts from OneLake shortcuts in Fabric . For more information, see Trusted workspace access (preview) .
February 2024	Reduce egress costs with S3 shortcuts in OneLake	Learn how OneLake shortcuts to S3 now support caching , which can greatly reduce egress costs. Use the new Enable Cache for S3 Shortcuts setting with an S3 shortcut .
February 2024	OneLake Shortcuts API	New REST APIs for OneLake Shortcuts allow programmatic creation and management of shortcuts, currently in preview. You can now programmatically create, read, and delete OneLake shortcuts . For example, see Use OneLake shortcuts REST APIs .
February 2024	Browse code snippet	The new Browse code snippet notebook feature allows you to easily access and insert code snippets for commonly used code snippets with multiple supported languages.
February 2024	Configure session timeout	Notebooks now support configuring session timeout for the current live session. It can help you avoid wasting resources or losing context due to timeout. You can specify the maximum duration of your spark sessions, from minutes to hours, and also get alerts before the session expires and extend it.
February 2024	Fabric notebook status bar upgrade	The new Fabric Notebook status bar has three persisted info buttons: session status, save status, and cell selection status. Plus, context features include info on the git connection state, a shortcut to extend session timeout, and a failed cell navigator.
January 2024	Microsoft Fabric Copilot for Data Science and Data Engineering	Copilot for Data Science and Data Engineering is now available worldwide. What can Copilot for Data Science and Data Engineering do for you?
January 2024	Newest version of OneLake File Explorer includes Excel Integration	With the newest version of OneLake file explorer (v1.0.11.0) we bring a few updates to enhance your experience with OneLake, including Excel Integration .

Fabric Data Engineering samples and guidance

 Expand table

Month	Feature	Learn more
May 2025	Understanding OneLake Security with Shortcuts	Understanding OneLake Security with Shortcuts explains how security is managed when using shortcuts in OneLake. For more information, see OneLake shortcut security .
May 2025	Manage connections for shortcuts	Learn how to manage connections for shortcuts and centrally manage connections for OneLake shortcuts in Microsoft Fabric. For more information, see Unify data sources with OneLake shortcuts .
April 2025	Build data-driven agents with curated data from OneLake	In this blog post, learn why Fabric and OneLake are the ideal data tools to fuel your AI projects in AI Foundry .
April 2025	Best practices for Microsoft Fabric GraphQL API performance	Explore best practices for your Fabric GraphQL API . Whether you're handling complex queries or optimizing response times, these strategies help you get the best performance out of your GraphQL implementation.
April 2025	Develop, test and deploy a user data functions in Microsoft Fabric using Visual Studio Code	Fabric User data functions allow you to host and run serverless functions on Fabric. Developers can write custom logic and embed it into their Fabric ecosystem. For a sample walkthrough, see Develop, test, and deploy a user data functions in Microsoft Fabric using Visual Studio Code .
April 2025	Common use cases for building solutions with Microsoft Fabric User data functions	Fabric User data functions can make your data processes and pipelines super-efficient.
April 2025	Building an analytical web application with Microsoft Fabric	In this blog post, dive into the architecture of an analytical application powered by Microsoft Fabric and provide a step-by-step guide on how to build it .
April 2025	Metadata-driven Lakehouse implementation	Learn how to design and implement an end-to-end metadata-driven Lakehouse using Microsoft Fabric .
March 2025	Simplify Data Transformation and Management with Copilot for Data Factory	Discover how Copilot for Data Factory streamlines data transformation and management, enhancing efficiency and productivity. Learn more about Simplify Data Transformation and Management with Copilot for Data Factory .

Month	Feature	Learn more
March 2025	Virtualize your Cloudera/Hadoop data estate into Fabric OneLake with Apache Ozone	Learn more about a sample architecture using Microsoft Fabric OneLake shortcuts to virtualize data from Cloudera/Apache Ozone , using the OneLake S3 Compatible Shortcut.
March 2025	Unlock the power of your Apache Iceberg data in OneLake	It's easy to get started with OneLake's Iceberg table format support. Learn how to bring your Apache Iceberg data to Fabric .
February 2025	New lakehouse samples	Two familiar Lakehouse samples, WideWorldImporters and NYC Taxi , are designed to support deeper analysis and flexibility for both schema-enabled and non-schema Lakehouses.
February 2025	Build a python app with Fabric API for GraphQL	Fabric API for GraphQL brings GraphQL experience within Fabric to securely and efficiently access the data in Fabric items such as databases or warehouses. Learn how to build a Python application using Flask framework to connect to Fabric SQL database and query data .
February 2025	Streamline Data Engineering & Data Science with Copilot in Fabric	Contoso Retailers, a fictitious company, wants to learn how they can unlock the full potential of their data science and data engineering efforts with Copilot for Data Science and Data Engineering using Fabric .
February 2025	Private ADLS Gen2 access made easy with OneLake Shortcuts: a step-by-step guide	How can you use your existing ADLS Gen2 data lake with private storage accounts? The solution is Trusted Workspace Access , which allows secure shortcuts to data in ADLS Gen2 even when protected by a firewall or when public access is entirely disabled.
January 2025	Create a shortcut to a VPC-protected Google Cloud Storage bucket	Follow this guide to create a OneLake shortcut to a VPC-protected Google Cloud Storage (GCS) bucket .
January 2025	Best practices for Fabric API for GraphQL	The Microsoft Fabric API for GraphQL is a handy service that quickly allows you to set up a GraphQL API to pull data from places like warehouses, the lakehouse, and mirrored databases. Learn best practices when building applications using Fabric API for GraphQL .
December 2024	Troubleshooting Fabric Spark application without production workspace access	You have Fabric Spark Notebooks deployed in a production workspace, but you don't have direct access to it. The production support team reports that a Fabric Spark job has failed in the production workspace, and you need to analyze the logs to troubleshoot the issue. To troubleshoot Spark applications , Spark engineers typically use the

Month	Feature	Learn more
		Spark UI, which provides details of Jobs, Stages, Storage, Environment, Executors, and SQL.
October 2024	Optimizing Spark Compute for Medallion Architectures in Microsoft Fabric	Learn how to optimize Spark Compute for Medallion architecture : a popular data engineering approach that emphasizes modularity. It organizes the data platform into three distinct layers: Bronze, Silver, and Gold.
August 2024	Build a custom Sparklens JAR	In this blog, learn how to build the sparklens JAR for Spark 3.X , which can be used in Microsoft Fabric.
July 2024	Create a shortcut to a VPC-protected S3 bucket	Learn how to create a shortcut to a VPC-protected S3 bucket , using the on-premises data gateway and AWS Virtual Private Cloud (VPC).
July 2024	Move Your Data Across Workspaces Using Modern Get Data of Fabric Data Pipeline	The new modern get data experience of data pipeline now supports copying to Lakehouse and warehouse across different workspaces with an intuitive experience.
June 2024	Demystifying Data Ingestion in Fabric: Fundamental Components for Ingesting Data into a Fabric Lakehouse using Fabric Data Pipelines	Learn about a batch data Ingestion framework based on experience working with different customers while building a lakehouse in Fabric.
June 2024	Boost performance and save costs with Fast Copy in Dataflows Gen2	Learn how the Fast Copy feature helps to enhance the performance and cost-efficiency of your Dataflows Gen2 .
May 2024	Copy Data from Lakehouse in another Workspace using Data pipeline	Learn how to copy data between Lakehouse that cross different workspaces via Data pipeline .
May 2024	Profiling Microsoft Fabric Spark Notebooks with Sparklens	In this blog, you will learn how to leverage Sparklens, an open-source Spark profiling tool, to profile Microsoft Fabric Spark Notebooks and improve the performance of your spark code.
March 2024	Bridging Fabric Lakehouses: Delta Change Data Feed for Seamless ETL	Learn how to use the Delta Change Data Feed to facilitate seamless data synchronization across different lakehouses in your medallion architecture .
January 2024	Use Fabric Data Factory Data Pipelines to Orchestrate Notebook-based Workflows	Guidance and good practices when building Fabric Spark Notebook workflows using Data Factory in Fabric with data pipelines.

Fabric Data Science

This section summarizes archived improvements and features for the [Data Science experience in Microsoft Fabric](#).

[+] [Expand table](#)

Month	Feature	Learn more
May 2025	Fabric data agent integration with Microsoft Copilot Studio (preview)	Fabric data agent is available in preview and can be added as an agent to your custom setup in Microsoft Copilot Studio. For more information, see Fabric data agent integration with Microsoft Copilot Studio (preview) .
May 2025	Evaluate your Fabric data agents with the Python SDK (preview)	You can now use the Python SDK to programmatically evaluate Fabric data agents . For more information, see Consume a Fabric Data Agent in Microsoft Copilot Studio (preview) .
April 2025	Fabric data agent integration with Azure AI Agent Service (preview)	We're excited to launch the integration of data agents in Fabric with Azure AI Agent Service from Azure AI Foundry. To get started, see Consume a Fabric Data Agent in Microsoft Copilot Studio (preview) . The Fabric data agent SDK is also available in preview.
April 2025	High concurrency mode for Notebooks in Pipelines	High concurrency mode for notebooks in pipelines , now generally available, enables users to share Spark sessions across multiple notebooks within a pipeline. With high concurrency mode , users can trigger pipeline jobs, and these jobs are automatically packed into existing high concurrency sessions.
March 2025	Enhancing AI productivity in Fabric Notebooks	The latest Copilot updates improve productivity with in-cell interactions, better code generation, and seamless integration with Fabric. For more information, see What's New in Copilot updates for Fabric notebooks .
February 2025	Capacity settings include option to Disable Starter Pool	New controls in Data Engineering/Science Capacity settings include the option to Disable Starter Pool for workspaces , to help capacity admins have better compute restrictions on workspaces attached to their Fabric Capacity.
February 2025	AI functions (preview)	AI functions for data engineering with GenAI are now in preview. With AI functions , you can harness the power of GenAI for summarization, classification, text generation, and so much more—all with a single line of code.
February 2025	ArcGIS GeoAnalytics for Microsoft Fabric Spark (preview)	Microsoft and Esri have partnered to bring spatial analytics into Microsoft Fabric . To learn more about ArcGIS integration within Microsoft Fabric Spark, see ArcGIS

Month	Feature	Learn more
		GeoAnalytics for Microsoft Fabric (preview) and ArcGIS in Fabric integrations .
February 2025	Fabric Catalyst Portal	The Fabric Catalyst Portal is collaborative knowledge hub designed to empower our partners with best practices, technical guidance, and real-world insights to accelerate Microsoft Fabric adoption. Registration for Microsoft partners is open . The first guidance is focused on Real-Time Intelligence.
January 2025	Building Apps with Microsoft Fabric API for GraphQL	Microsoft Fabric has an API for GraphQL to build your data applications, enabling you to pull data from sources such as Data Warehouses, Lakehouse, Mirrored Databases, and DataMart in Microsoft Fabric.
December 2024	Notebook version history	Fabric notebook version history provides robust built-in version control capabilities, including automatic and manual checkpoints, tracked changes, version comparisons, and previous version restore. For more information, see Notebook version history .
December 2024	Python Notebook (preview)	Python Notebooks are for BI Developers and Data Scientists working with smaller datasets using Python as their primary language. To get started, see Use Python experience on Notebook .
November 2024	Low code AutoML user experience in Fabric (preview)	AutoML, or Automated Machine Learning, is a process that automates the time-consuming and complex tasks of developing machine learning models. The new low code AutoML experience supports a variety of tasks, including regression, forecasting, classification, and multi-class classification. To get started, Create models with Automated ML (preview) .
October 2024	Enhancing Open Source: Fabric's Contributions to FLAML for Scalable AutoML	We have focused on enhancing FLAML's capabilities for Spark workloads. We've contributed several new Spark and non-Spark estimators to the FLAML project . Try these out with AutoML in Fabric (preview) .
September 2024	Data Wrangler for Spark DataFrames GA	Data Wrangler is now generally available. A notebook-based tool for exploratory data analysis, Data Wrangler works for both pandas DataFrames and Spark DataFrames and arrives at general availability with new usability improvements .
September 2024	Session Expiry Control in Workspace Settings for Notebook Interactive Runs (preview)	A new session expiry control in Data Engineering/Science workspace settings allows you to set the maximum expiration time limit for notebook interactive sessions. By default, sessions expire after 20

Month	Feature	Learn more
		minutes, but you can now customize the maximum expiration duration .
September 2024	File editor in Notebook	The file editor feature in Fabric Notebook allows users to view and edit files directly within the notebook's resource folder and environment resource folder in notebook. Supported file types include CSV, TXT, HTML, YML, PY, SQL, and more.
August 2024	Apply MLFlow tags on ML experiment runs and model versions	You can now apply MLflow tags directly on ML experiment runs and ML model versions from the user interface .
August 2024	Track related ML Experiment runs in your Spark Application	You can now use an enhancement to the Monitoring Hub to track related ML experiment runs within Spark applications. You can also integrate Experiment items into the Monitoring Hub .
August 2024	Use PREDICT with Fabric AutoML models	You can now move from training with AutoML to making predictions by using the built-in Fabric PREDICT UI and code-first APIs for batch predictions . For more information, see Machine learning model scoring with PREDICT in Microsoft Fabric .
July 2024	Semantic link preinstalled	Semantic Link in now included in the default runtime . If you use Fabric with Spark 3.4 or later, semantic link is already in the default runtime, and you don't need to install it.
July 2024	Semantic Link Labs	Semantic Link Labs is a library of helpful python solutions for use in Microsoft Fabric notebooks . Semantic Link Labs helps Power BI developers and admins easily automate previously complicated tasks, as well as make semantic model optimization tooling more easily accessible within the Fabric ecosystem. For Semantic Link Labs documentation, see semantic-link-labs documentation . For more information and to see it in action, read the Semantic Link Labs announcement blog .
June 2024	Capacity pools preview	Capacity administrators can now create custom pools (preview) based on their workload requirements, providing granular control over compute resources. Custom pools for Data Engineering and Data Science can be set as Spark Pool options within Workspace Spark Settings and environment items.
June 2024	Native Execution Engine for Apache Spark	The Native Execution Engine for Apache Spark on Fabric Data Engineering and Data Science for Fabric Runtime

Month	Feature	Learn more
		1.2 is now in preview. For more information, see Native execution engine for Fabric Spark .
June 2024	Demystifying Data Ingestion in Fabric: Fundamental Components for Ingesting Data into a Fabric Lakehouse using Fabric Data Pipelines	Learn about a batch data Ingestion framework based on experience working with different customers while building a lakehouse in Fabric.
June 2024	Boost performance and save costs with Fast Copy in Dataflows Gen2	Learn how the Fast Copy feature helps to enhance the performance and cost-efficiency of your Dataflows Gen2 .
May 2024	Public API for Workspace Data Engineering/Science	REST API support for Fabric Data Engineering/Science workspace settings allows users to create/manage their Spark compute, select the default runtime/default environment, enable or disable high concurrency mode, or ML autologging.
April 2024	Semantic Link GA	Semantic links are now generally available! The package comes with our default VHD. You can now use Semantic link in Fabric right away without any pip installation.
April 2024	Capacity level delegation for AI and Copilot	Tenant admins can now enable AI and Copilot in Fabric for the entire organization, certain security groups, or for a specific Capacity.
March 2024	EU customers can use AI and Copilot without cross-geo setting	Since mid-March EU customers can use AI and Copilot without turning on the cross-geo setting , and their AI and Copilot requests will be processed within EUDB .
March 2024	Code-First Hyperparameter Tuning preview	FLAML is now integrated for hyperparameter tuning , currently a preview feature. Fabric's <code>flaml.tune</code> feature streamlines this process, offering a cost-effective and efficient approach to hyperparameter tuning .
March 2024	Code-First AutoML preview	With the new AutoML feature , you can automate your machine learning workflow and get the best results with less effort. AutoML, or Automated Machine Learning , is a set of techniques and tools that can automatically train and optimize machine learning models for any given data and task type.
March 2024	Compare Nested Runs	Parent and child runs in the Run List View for ML Experiments introduces a hierarchical structure, allowing users to effortlessly view various parent and child runs within a single view and seamlessly interact with them to visually compare results.

Month	Feature	Learn more
March 2024	Support for Mandatory MIP Label Enforcement	ML Model and Experiment items in Fabric now offer enhanced support for Microsoft Information Protection (MIP) labels ↗ .
January 2024	Microsoft Fabric Copilot for Data Science and Data Engineering	Copilot for Data Science and Data Engineering is now available worldwide. What can Copilot for Data Science and Data Engineering do for you? ↗

Fabric Data Science samples and guidance

[Expand table](#)

Month	Feature	Learn more
May 2025	Extracting deeper insights with Fabric data agents in Copilot in Power BI	You can use Fabric data agents in Copilot in Power BI ↗ to connect to more data sources and extract richer insights in Power BI. For more information, see Create a Fabric data agent .
May 2025	Accelerate AI on Oracle databases with Open Mirroring, Fabric Data Agent, and Azure AI Foundry	Accelerate AI on Oracle databases with Open Mirroring, Fabric Data Agent, and Azure AI Foundry ↗ shows how to integrate Oracle databases with Microsoft Fabric and Azure AI Foundry for advanced analytics and AI scenarios. For more information, see Open Mirroring in Fabric ↗ .
February 2025	Streamline Data Engineering & Data Science with Copilot in Fabric	Contoso Retailers, a fictitious company, wants to learn how they can unlock the full potential of their data science and data engineering efforts with Copilot for Data Science and Data Engineering using Fabric ↗.
September 2024	Using Microsoft Fabric for Generative AI: A Guide to Building and Improving RAG Systems	This tutorial includes three main notebooks, each covering a crucial aspect of building and optimizing RAG systems in Microsoft Fabric ↗.
June 2024	Building Custom AI Applications with Microsoft Fabric: Implementing Retrieval Augmented Generation for Enhanced Language Models	This guide walks you through implementing a RAG (Retrieval Augmented Generation) system in Microsoft Fabric using Azure OpenAI and Azure AI Search ↗.
March 2024	New AI Samples	New AutoML sample, Model Tuning, and Semantic Link samples appear in the Quick Tutorial category ↗ of the Data Science samples on Microsoft Fabric.

SQL database in Microsoft Fabric (Preview)

This section summarizes archived improvements and features for SQL database in Microsoft Fabric.

[+] [Expand table](#)

Month	Feature	Learn more
April 2025	Power BI Desktop connection to SQL database in Fabric	You can now use the OneLake catalog or Get Data experiences in Power BI Desktop to create reports on data from your SQL database in Microsoft Fabric. This Power BI Desktop feature is currently in preview. To get started, see Create simple reports on your SQL database in Power BI .
April 2025	OneLake shortcuts Fabric SQL databases	OneLake shortcuts now support connections to Fabric SQL databases ↗ , allowing users to seamlessly integrate SQL data into their unified data lake environment using the OneLake catalog explorer.
March 2025	Backup storage billing	Starting April 1, backup storage billing begins for SQL database in Microsoft Fabric. For more information, see Backup Storage Billing for SQL Database in Microsoft Fabric ↗ .
March 2025	SQL database enabled by default on March 28	SQL database in Fabric will be enabled for all users in your tenant on March 28. For more information and potential opt-out, see default checkbox changes on tenant settings for SQL database in Fabric ↗ .
February 2025	Approximate or fuzzy string matching (preview)	Check if two strings are similar, and calculate the difference between two strings. Use this capability to identify strings that might be different because of character corruption. What is fuzzy string matching?
February 2025	DATEADD number allows bigint (preview)	For <code>DATEADD (datepart , number , date)</code> , number can be expressed as a bigint. For more information, see DATEADD (Transact-SQL) .
February 2025	Regular expression functions (preview)	Regular expression (REGEX) functions return text based on values in a search pattern. For more information, see Regular expressions .
January 2025	SQL database support for tenant level private links (preview)	You can use tenant level private links to provide secure access for data traffic in Microsoft Fabric, including SQL database (in preview). For more information, see Set up and use private links and Blog: Tenant Level Private Link (Preview) ↗ .
January 2025	SQL databases billing begins	After February 1, 2025, compute and data storage for SQL database are charged to your Fabric capacity. Additionally, backup billing will

Month	Feature	Learn more
		start after April 1, 2025. For more information, see Activation of billing for SQL database in Fabric .
January 2025	Ask the Experts – Fabric Databases – Livestream January 29!	Join us for a live Q&A session on the new Fabric Databases experience ! Our product engineering team will answer your top questions in real time.
December 2024	Copilot for SQL database	Learn more about the Copilot integration for Query Editor. Copilot for SQL database in Fabric as an AI-powered assistant designed to support you regardless of your SQL expertise or role.
November 2024	New connectors for Fabric SQL database	In the Data Factory, both data pipeline and Dataflow Gen2 now natively support the Fabric SQL database connector as source and destination with the SQL database connector (Preview) . For more information, see Fabric SQL Database Connector .
November 2024	Fabric SQL database (Preview)	SQL database in Microsoft Fabric is a developer-friendly transactional database, based on Azure SQL Database , that allow you to easily create your operational database in Fabric. A SQL database in Fabric uses the SQL Database Engine as Azure SQL Database. For more on this announcement, read the SQL database in Fabric announcement blog .

SQL database in Microsoft Fabric (Preview) samples and guidance

[] [Expand table](#)

Month	Feature	Learn more
May 2025	Smart Mutations in Microsoft Fabric API for GraphQL with stored procedures	Learn how to use Smart Mutations in Microsoft Fabric API for GraphQL with Stored Procedures to create, update, and delete data in your SQL database.
May 2025	Understand Query vs Mutation in API for GraphQL	Understand the differences between Query vs Mutation in API for GraphQL and how to use them effectively. For more information, see Create an API for GraphQL in Fabric and add data and Fabric API for GraphQL frequently asked questions .
March 2025	Build RAG Data pipeline from Azure Blob Storage to SQL Database in minutes	This blog post provides step-by-step instructions for creating a Retrieval Augmented Generation (RAG) pipeline to prepare your data for AI integration using SQL database in Microsoft Fabric.
February 2025	Build a python app with Fabric API for GraphQL	Fabric API for GraphQL brings GraphQL experience within Fabric to securely and efficiently access the data in Fabric items like

Month	Feature	Learn more
		databases or warehouses. Learn how to build a Python application using Flask framework to connect to Fabric SQL database and query data .
February 2025	Why SQL database in Fabric is the best choice for low-code/no-code Developers	In this blog post, we'll explore why SQL database in Fabric is uniquely suited for low-code/no-code developers .
February 2025	Govern your data in SQL database in Microsoft Fabric with protection policies in Microsoft Purview	Microsoft Purview's protection policies help you safeguard sensitive data in Microsoft Fabric items, including SQL databases. Learn how Purview policies override Microsoft Fabric item permissions for users, apps, and groups, limiting their actions within the database .
February 2025	ICYMI: Ask the Expert – Fabric Databases	Here's a few great questions and answers about SQL database in Fabric from a recent Ask the Expert session on Microsoft Reactor.
January 2025	Manage access in SQL database with SQL native authorization controls	A follow-up to Learn how to manage Microsoft Fabric access controls in SQL database , learn how to manage access for your SQL database with SQL native access controls . SQL database in Microsoft Fabric supports two different sets of authorization controls, Microsoft Fabric access controls and SQL native access controls.
January 2025	Monitor SQL Database usage and consumption by using capacity metrics app	Learn how the capacity metrics app can be used for monitoring usage and consumption of SQL databases in Fabric .
January 2025	Performance Dashboard tutorial	For a complete walkthrough of performance troubleshooting in SQL database in Microsoft Fabric with the Performance Dashboard , see Speed up your SQL databases with the Performance Dashboard .
January 2025	Manage access for SQL databases in Microsoft Fabric with workspace roles and item permissions	SQL database (preview) supports two different sets of controls that allow you to manage access for your databases: Microsoft Fabric access controls and SQL native access controls. Learn how to manage Microsoft Fabric access controls in SQL database .
December 2024	Source control integration for SQL database	SQL database in Fabric has a tightly integrated and fully extensible DevOps feature set, including a source control integration for GitHub and Azure DevOps. Learn how to use the Fabric web-based development environment with the git repository directly through a streamlined source control panel.

Month	Feature	Learn more
December 2024	Tour the Query Editor in SQL database in Microsoft Fabric	Whether you're a seasoned data professional or a developer new to SQL, the query editor offers features that cater to all skill levels . For more information, see Query with the SQL query editor .
November 2024	Building a Smart Chatbot with SQL database in Microsoft Fabric, LangChain and Chainlit	Imagine you're the founder of Contoso, a rapidly growing e-commerce startup. As your online store grows, you realize that many customer inquiries are about basic product information: price, availability, and specific features. To automate these routine questions, you decide to build a chatbot with SQL database in Microsoft Fabric, LangChain, and Chainlit .
November 2024	Learning pathways for SQL database	For those curious about where to learn more and how to try out this new offering, read more about the upcoming episodes of SQL database in Microsoft Fabric: Learn Together .
November 2024	Data Exposed: Announcing SQL database in Microsoft Fabric preview	Watch a Data Exposed video introducing on the SQL database in Microsoft Fabric public preview .
November 2024	Guided application tutorial in Fabric SQL database	The tutorial provides a comprehensive guide to utilizing the SQL database in Fabric . This tutorial is tailored to help you navigate through the process of database creation, setting up database objects, exploring autonomous features, and combining and visualizing data. Additionally, learn how to create a GraphQL endpoint, which serves as a modern approach to connecting and querying your data efficiently.
November 2024	Get started with Fabric SQL database	Guided how-to documents on how to do basic tasks in SQL database in Fabric start with Enable SQL database in Fabric using Admin Portal tenant settings .

Fabric Data Warehouse

This section summarizes archived improvements and features for [Data Warehouse in Microsoft Fabric](#).

[] [Expand table](#)

Month	Feature	Learn more
May 2025	ALTER TABLE DROP COLUMN and sp_rename COLUMN support	Fabric Data Warehouse now supports sp_rename COLUMN and ALTER TABLE DROP COLUMN .

Month	Feature	Learn more
May 2025	JSON Aggregate support	Fabric warehouses now support JSON aggregate functions as generally available features. For more information, see JSON_ARRAYAGG and JSON_OBJECTAGG .
May 2025	Copilot for SQL analytics endpoint (preview)	The Copilot for SQL analytics endpoint introduces Copilot capabilities for the SQL analytics endpoint, enabling users to generate and optimize SQL queries using natural language. For more information, see Copilot for SQL analytics endpoint .
May 2025	Datamarts upgrade to warehouse	Beginning June 1, 2025, creating a new Power BI datamart will redirect to creating a new Fabric Warehouse. For existing Power BI datamarts, Upgrade a Power BI Datamart to a Warehouse . For more information, see Unify Datamart with Fabric Data Warehouse! .
May 2025	Warehouse snapshots (preview)	Warehouse snapshots are a point-in-time, read-only representation of your data warehouse. You can create a snapshot of your warehouse at any point in the past 30 days, connect to it and query it just like a warehouse, and "roll forward" your snapshot regularly. To get started, see Create and manage a warehouse snapshot .
April 2025	Fabric Spark connector for Fabric Data Warehouse in Spark runtime	The Spark connector for Data Warehouse , now generally available, enables a Spark developer or a data scientist to access and work on data from a warehouse or SQL analytics endpoint of the lakehouse (either from within the same workspace or from across workspaces) with a simplified Spark API.
April 2025	Session-scoped distributed #temp tables	Distributed session-scoped temporary tables in Fabric Data Warehouse and Fabric Lakehouse SQL analytics endpoints are now generally available. Now, <code>#temp</code> tables are supported as session scoped or local temp tables. For more information, see Tables in Fabric Data Warehouse .
April 2025	BULK INSERT	The T-SQL BULK INSERT statement in Fabric Data Warehouse is now generally available. For more information, see BULK INSERT statement is generally available .
April 2025	SQL Audit Logs	SQL Audit Logs provide a comprehensive and immutable record of all database activities, capturing critical details such as the event timestamp, the user or process that triggered the action, and the executed T-SQL statements. For more information, see Introducing SQL Audit Logs for Fabric Data Warehouse .
April 2025	OPENROWSET support	The T-SQL OPENROWSET(BULK) function is now generally available in Fabric Data Warehouse. For more examples, see Browse file content using OPENROWSET function (preview) . For

Month	Feature	Learn more
		more information, see OPENROWSET function in Fabric Data Warehouse now generally available .
March 2025	Migration Assistant for Fabric Data Warehouse (preview)	The new Migration Assistant simplifies the process of migrating from Azure Synapse Analytics to Fabric Data Warehouse. For more information, see Public Preview of Migration Assistant for Fabric Data Warehouse .
March 2025	Hints support	Fabric Data Warehouse now supports some T-SQL Query and Join hints . For more information, see What are hints?
February 2025	T-SQL notebook enhancements	The T-SQL notebook now includes more T-SQL code snippets, easy open within Excel, traceability of the warehouse, and CI/CD support. For more information, see T-SQL notebook enhancements .
February 2025	COLLATE support	The T-SQL COLLATE clause is now supported. For more information, see COLLATE (Transact-SQL) .
February 2025	Copilot for Data Warehouse Chat (Preview)	You will now see a Copilot button in the ribbon starts a chat with Copilot for acceleration with any data warehousing task . For more information, see How to: Use the Copilot chat pane for Fabric Data Warehouse .
February 2025	Nested Common Table Expressions (CTEs) (GA)	Fabric Warehouse and SQL analytics endpoint both support standard, sequential, and nested CTEs as generally available features now. For more information, see nested common table expressions (CTE) in Fabric data warehousing (Transact-SQL) .
February 2025	Fabric Spark connector for Fabric Data Warehouse in Spark runtime (preview)	The Spark connector for Data Warehouse enables a Spark developer or a data scientist to access and work on data from a warehouse or SQL analytics endpoint of the lakehouse (either from within the same workspace or from across workspaces) with a simplified Spark API. For more information, see Spark Connector for Fabric Data Warehouse - Preview .
February 2025	OPENROWSET and BULK INSERT support (preview)	The T-SQL OPENROWSET(BULK) function is now available in Fabric warehouse as a preview feature. For more information and examples, see Browse file content using OPENROWSET function (Preview) . For more information, see BULK INSERT statement in Fabric Data Warehouse and Fabric OPENROWSET preview .
January 2025	COPY INTO operations with row count check	The COPY INTO now allows you to control the behavior of your data ingestion jobs by checking if the count of columns in the source data matches the count of columns on your target table, with the <code>MATCH_COLUMN_COUNT</code> argument.
January 2025	Default schema in a warehouse	You can now change the default schema for users in Fabric Data Warehouse , using the ALTER USER statement, ensuring that

Month	Feature	Learn more
		every user has a predefined schema context when they connect to the database.
January 2025	Data Insights now includes Data Scanned and CPU time analytics	New columns are available in the queryinsights.exec_requests_history system view to determine if large data scans are contributing to slower query execution. For more information, see Query insights in Fabric data warehousing .
January 2025	JSON Aggregate support (preview)	Fabric warehouses now support JSON aggregate functions ↗ in preview, <code>JSON_ARRAYAGG</code> and <code>JSON_OBJECTAGG</code> .
January 2025	SET SHOWPLAN_XML support	The SET SHOWPLAN_XML T-SQL syntax is now supported as a preview feature in Fabric Data Warehouse and SQL analytics endpoint. For more information, see SHOWPLAN_XML in Fabric Data Warehouse (preview) ↗ .
January 2025	Service principal support	Service principal (SPN) support Fabric warehouse items allows developers and administrators to automate processes, streamline operations, and increase security for their data workflows. For more information, see Service principal support for Fabric Data Warehouse ↗ .
January 2025	Warehouse restore points and restore in place	You can now create restore points and perform an in-place restore of a warehouse to a past point in time. Restore in-place is an essential part of data warehouse recovery ↗ , which allows to restore the data warehouse to a prior known reliable state by replacing or over-writing the existing data warehouse from which the restore point was created.
January 2025	COPY INTO operations with granular permissions	Enhancements to the COPY INTO T-SQL command in Fabric Data Warehouse introduce granular SQL controls. For more information, see Enhancing COPY INTO operations with Granular Permissions ↗ .
December 2024	What's new in the Fabric SQL analytics endpoint?	There are several updates to improve both functionality and user experience with the SQL analytics endpoint ↗ , including metadata sync, last successful update, improved error propagation, and more.
November 2024	Open mirroring (Preview)	Open mirroring enables any application to write change data directly into a mirrored database in Fabric, based on the open mirroring public APIs and approach. Open mirroring ↗ is designed to be extensible, customizable, and open. It's a powerful feature that extends mirroring in Fabric based on open Delta Lake table format. To get started, see Tutorial: Configure Microsoft Fabric open mirrored databases .
November 2024	Fabric Mirroring for Azure SQL Managed	Fabric Database mirroring is now able to mirror Azure SQL Managed Instance databases .

Month	Feature	Learn more
Instance (Preview)		
November 2024	Mirroring for Azure SQL Database GA	With Azure SQL Database mirroring in Fabric, you can easily bring your database into OneLake in Microsoft Fabric .
October 2024	Case insensitive collation support	By default, the collation of a warehouse is case sensitive (CS) with 'Latin1_General_100_BIN2_UTF8'. You can now Create a warehouse with case-insensitive (CI) collation .
October 2024	varchar(max) and varbinary(max) support in preview	Support for the varchar(max) and varbinary(max) in data types in Fabric Data Warehouse is now in preview. For more information, see Announcing public preview of VARCHAR(MAX) and VARBINARY(MAX) types in Fabric Data Warehouse .
October 2024	Concurrency performance improvements	We have recently optimized our task scheduling algorithm in our distributed query processing engine (DQP) to reduce contention when the workspace is under moderate to heavy concurrency. In testing we have observed that this optimization makes significant performance improvements in querying workloads.
October 2024	JSON support enhancements	JSON functionalities in warehouse and SQL analytics endpoints for Lakehouse and mirrored databases have been improved. For details see, JSON support enhancements .
October 2024	Nested Common Table Expressions (CTEs) (preview)	Fabric Warehouse and SQL analytics endpoint both support <i>standard</i> , <i>sequential</i> , and <i>nested</i> CTEs. While CTEs are generally available in Microsoft Fabric, nested common table expressions (CTE) in Fabric data warehousing (Transact-SQL) are currently a preview feature.
September 2024	Mirroring for Snowflake GA	With Mirroring for Snowflake in Fabric, you can easily bring your Snowflake data into OneLake in Microsoft Fabric . For more information, see Mirroring Snowflake .
September 2024	Copilot for Data Warehouse	Copilot for Data Warehouse (preview) is now updated and available as a preview feature, offering the Copilot chat pane , quick actions, and code completions.
September 2024	Delta column mapping in the SQL analytics endpoint	SQL analytics endpoint now supports Delta tables with column mapping enabled . For more information, see Delta column mapping and Limitations of the SQL analytics endpoint . This feature is currently in preview.
September 2024	Lakehouse schemas in SQL analytics endpoint	Lakehouse schemas allow delta tables in schemas to be queried in the SQL analytics endpoint. For more information, see Lakehouse schemas feature (preview) .

Month	Feature	Learn more
September 2024	Fabric Spark connector for Fabric Data Warehouse new features (preview)	The Fabric Spark connector for Fabric Data Warehouse (preview) now supports custom or pass-through queries , PySpark, and Fabric Runtime 1.3 (Spark 3.5) .
September 2024	New editor improvements	Editor improvements for Warehouse and SQL analytics endpoint items improve the consistency and efficiency. For more information, see New editor improvements .
September 2024	T-SQL support in Fabric notebooks (preview)	The T-SQL notebook feature in Microsoft Fabric (preview) lets you write and run T-SQL code within a notebook. You can use them to manage complex queries and write better markdown documentation. It also allows direct execution of T-SQL on connected warehouse or SQL analytics endpoint. To learn more, see T-SQL support in Microsoft Fabric notebooks .
September 2024	Nested Common Table Expressions (CTEs) (preview)	Fabric Warehouse and SQL analytics endpoint both support standard, sequential, and nested CTEs . While CTEs are generally available in Microsoft Fabric, nested common table expressions (CTE) in warehouse are currently a preview feature.
September 2024	Mirrored Azure Databricks (Preview)	A mirrored Azure Databricks Unity Catalog in Fabric allows you to read data managed by Unity Catalog from Fabric workloads from the Lakehouse. For more information, see Databricks Unity Catalog tables available in Microsoft Fabric .
August 2024	Mirroring integration with modern get data experience	You can now use the Modern Get Data experience to choose from all the available mirrored databases in OneLake.
August 2024	T-SQL DDL support in Azure SQL Database mirrored database	You can now run DDL operations on a Azure SQL Database mirrored database such as Drop Table, Rename Table, and Rename Column.
August 2024	Delta Lake log publishing pause and resume	You can now pause and resume the publishing of Delta Lake Logs for Warehouses . For more information, see Delta Lake logs in Warehouse in Microsoft Fabric .
August 2024	Managing V-Order behavior of Fabric Warehouses	You can now manage V-Order behavior at the warehouse level . For more information, see Understand V-Order for Microsoft Fabric Warehouse .
August 2024	TRUNCATE T-SQL support	The TRUNCATE T-SQL command is now supported in Warehouse tables.
July 2024	ALTER TABLE and nullable column support	We've added T-SQL ALTER TABLE support for some operations, as well as nullable column support to tables in the warehouse. For more information, see ALTER TABLE (Transact-SQL) .

Month	Feature	Learn more
July 2024	Warehouse queries with time travel (GA)	Warehouse in Microsoft Fabric offers the capability to query the historical data as it existed in the past at the statement level, now generally available. The ability to query data from a specific timestamp is known in the data warehousing industry as <i>time travel</i> .
July 2024	Restore warehouse experience in the Fabric portal	You can now create restore points and perform a restore in-place of a warehouse item. For more information, see Seamless Data Recovery through Warehouse restoration .
July 2024	Warehouse source control (preview)	Using Git integration and/or deployment pipelines with your warehouse , you can manage development and deployment of versioned warehouse objects. You can use SQL Database Projects extension available inside of Azure Data Studio and Visual Studio Code . For more information on warehouse source control, see CI/CD with Warehouses in Microsoft Fabric .
July 2024	Time travel and clone table retention window expanded	The retention period for time travel queries and clone table is now 30 days.
June 2024	Restore in place portal experience	You can now create user-created restore points in your warehouse via the Fabric portal . For more information, see Restore in-place of a warehouse in Microsoft Fabric .
June 2024	Fabric Spark connector for Fabric Data Warehouse in Spark runtime (preview)	The Fabric Spark connector for Fabric Data Warehouse (preview) enables a Spark developer or a data scientist to access and work on data from Fabric DW and SQL analytics endpoint of the lakehouse (either from within the same workspace or from across workspaces) with a simplified Spark API.
May 2024	Monitor Warehouse tools	You can Monitor Fabric Data Warehouse activity with a variety of tools, including: Billing and utilization reporting in Fabric Data Warehouse , monitor connections , sessions , and requests using DMVs , Query insights , and now Query activity . For more information, read Query activity: A one-stop view to monitor your running and completed T-SQL queries .
May 2024	Copilot for Data Warehouse	Copilot for Data Warehouse (preview) is now available in limited preview, offering the Copilot chat pane , quick actions , and code completions .
May 2024	Warehouse queries with time travel (preview)	Warehouse in Microsoft Fabric offers the capability to query the historical data as it existed in the past at the statement level, currently in preview. The ability to query data from a specific timestamp is known in the data warehousing industry as <i>time travel</i> .

Month	Feature	Learn more
May 2024	COPY INTO enhancements	<code>COPY INTO</code> now supports Microsoft Entra ID authentication and access to firewall protected storage via the trusted workspace functionality. For more information, see COPY INTO enhancements and COPY INTO (Transact-SQL) .
April 2024	Fabric Warehouse in ADF copy activity	You can now connect to your Fabric Warehouse from an Azure Data Factory/Synapse pipeline . You can find this new connector when creating a new source or sink destination in your copy activity, in the Lookup activity, Stored Procedure activity, Script activity, and Get Metadata activity.
April 2024	Git integration	Git integration for the Warehouse allows you to check in the changes of your Warehouse to an Azure DevOps Git repository as a SQL database project.
April 2024	Partition elimination	Partition elimination is a performance improvement for tables with a large number of files. The SQL analytics endpoint of a Lakehouse uses partition elimination to read data from only those partitions that are relevant to the query. Recent improvements boosted performance even more when queries are aimed at a few partitions in a table that has many files.
March 2024	Mirroring in Microsoft Fabric preview	With Mirroring in Fabric, you can easily bring your databases into OneLake in Microsoft Fabric , enabling seamless zero-ETL, near real-time insights on your data – and unlocking warehousing, BI, AI, and more. For more information, see What is Mirroring in Fabric? .
March 2024	Cold cache performance improvements	Fabric stores data in Delta tables and when the data is not cached , it needs to transcode data from parquet file format structures to in-memory structures for query processing. Recent cold cache performance improvements further optimize transcoding and we observed up to 9% faster queries in our tests when data is not previously cached.
March 2024	Extract and publish a SQL database project directly through the DW editor	The SQL Database Projects extension creates a SQL project (<code>.sqlproj</code>) file, a local representation of SQL objects that comprise the schema for a single database, such as tables, stored procedures, or functions. You can now extract and publish a SQL database project directly through the DW editor .
March 2024	Change owner of Warehouse item	The new Takeover API allows you to change the warehouse owner from the current owner to a new owner, which can be an SPN or an Organizational Account.
March 2024	Clone table RLS and CLS	A cloned table now inherits the row-level security (RLS) and dynamic data masking from the source of the clone table.

Month	Feature	Learn more
February 2024	Experience performance improvements	Recent connectivity and performance enhancements include an improved experience for creating warehouses, T-SQL execution, automatic metadata discovery, and error messaging.

Fabric Data Warehouse samples and guidance

[\[+\] Expand table](#)

Month	Feature	Learn more
April 2025	Build a Data Warehouse schema with Copilot for Data Warehouse	Learn how Contoso Retailers uses Copilot for Data Warehouse to gain insights into their data, identify key drivers of sales fluctuations, and make more informed, data-driven decisions.
April 2025	Be a performance detective with Query Insights	Query Insights in Microsoft Fabric serves as a centralized repository, storing 30 days of historical query data. Learn how to use the system views and practical applications of Query Insights .
April 2025	Understand item permissions in Fabric Data Warehouse	Learn more about the need for item permissions , what permissions can be assigned to users , and how to implement them effectively .
March 2025	DacFx Integration for Warehouse ALM	Simplify your warehouse ALM with DacFx integration in Git and deployment pipelines for Fabric Warehouse (preview). For more information, see Simplify your Warehouse ALM with DacFx integration in Git and Deployment Pipelines .
March 2025	Spatial queries samples in a warehouse	Fabric Data Warehouse supports two primary spatial data types, geometry and geography. Learn more about the spatial capabilities in Fabric Data Warehouse .
February 2025	Build a python app with Fabric API for GraphQL	Fabric API for GraphQL brings GraphQL experience within Fabric to securely and efficiently access the data in Fabric items like databases or warehouses. Learn how to build a Python application using Flask framework to connect to Fabric SQL database and query data .
January 2025	Best practices for Fabric API for GraphQL	The Microsoft Fabric API for GraphQL is a handy service that quickly allows you to set up a GraphQL API to pull data from places like warehouses, the lakehouse, and mirrored databases. Learn best practices when building applications using Fabric API for GraphQL .
December 2024	Microsoft Fabric API for GraphQL™ for Azure	Learn how to integrate Azure Cosmos DB and the Microsoft Fabric API for GraphQL™ to build near real-time analytical

Month	Feature	Learn more
	Cosmos DB Mirroring	applications ↗ . For more information on how to leverage Fabric API for GraphQL in your applications, see Connect applications to Fabric API for GraphQL .
November 2024	SQL to Microsoft Fabric Migration: Beginner-Friendly Strategies for a Smooth Transition	Learn more about migrating your SQL database to Microsoft Fabric ↗ , a unified platform that brings your data and analytics together effortlessly.
October 2024	Ensuring Data Continuity in Fabric Warehouse: Best Practices for Every Scenario	Dive deep into the common recovery scenarios and features that help enable seamless end-to-end data recovery and discuss best practices to ensure data resilience ↗ .
August 2024	Mirroring SQL Server database to Fabric	While SQL Server isn't currently supported for Fabric mirrored databases, learn how to extend Fabric mirroring to an on-premises SQL Server database as a source , using a combination of SQL Server Transactional replication and Fabric Mirroring ↗ .
July 2024	Microsoft Entra authentication for Fabric Data Warehouse	For sample connection strings and more information on using Microsoft Entra as an alternative to SQL Authentication, see Microsoft Entra authentication as an alternative to SQL authentication .
June 2024	Mastering Enterprise T-SQL ETL/ELT: A Guide with Data Warehouse and Fabric Pipelines	Learn about foundational elements of an enterprise-scale ETL/ELT framework ↗ using Fabric Pipelines and a Data Warehouse for performing our transformations in T-SQL. Additionally, we will examine a dynamic SQL script designed to incrementally process tables throughout your enterprise.
April 2024	Fabric Change the Game: Azure SQL Database mirror into Microsoft Fabric	A step-by-step guide to mirror your Azure SQL Database ↗ into Microsoft Fabric.
February 2024	Mapping Azure Synapse dedicated SQL pools to Fabric data warehouse compute	Read for guidance on mapping Data Warehouse Units (DWU) from Azure Synapse Analytics dedicated SQL pool to an approximate equivalent number of Fabric Capacity Units (CU) ↗ .
January 2024	Automate Fabric Data Warehouse Queries and Commands with Data Factory	In Fabric Data Factory, there are many ways to query data, retrieve data, and execute commands from your warehouse using pipeline activities that can then be easily automated ↗ .

Fabric Mirroring

This section summarizes archived improvements and features for [Mirroring in Microsoft Fabric](#).

[] [Expand table](#)

Month	Feature	Learn more
May 2025	Private Endpoint support and more features in Mirrored Azure SQL Managed Instance	Mirroring for Azure SQL Managed Instance: Private Endpoint support and other enhancements for mirroring Azure SQL Managed Instance to Microsoft Fabric. For more information, see Mirrored Azure SQL Managed Instance .
May 2025	Mirroring in Fabric: Innovations at Microsoft Build 2025	Build 2025 announced Innovations in Fabric Mirroring , including new mirroring capabilities and enhancements for integrating external databases with Microsoft Fabric.
May 2025	Mirroring for Snowflake behind firewall (preview)	You can now mirror Snowflake protected by a firewall to Microsoft Fabric. For more information, see Mirroring for Snowflake behind firewall (preview) and Mirrored Snowflake .
May 2025	Open mirroring	Open mirroring enables any application to write change data directly into a mirrored database in Fabric, based on the open mirroring public APIs and approach. Open mirroring , now generally available, is designed to be extensible, customizable, and open. It's a powerful feature that extends mirroring in Fabric based on open Delta Lake table format. To get started, see Tutorial: Configure Microsoft Fabric open mirrored databases .
May 2025	Mirroring for SQL Server instances (preview)	Mirroring of databases from SQL Server instances is now in preview. For more information, see Mirroring for SQL Server (preview) .
April 2025	Microsoft Purview Data Loss Prevention policies for Fabric	Microsoft Purview's Data Loss Prevention (DLP) policies now support Fabric KQL and mirrored databases . Using DLP policies, security admins are able to define policies which scan data uploaded to KQL DBs or Mirrored DBs (including Snowflake, Azure, and more).
March 2025	Mirroring CI/CD	CI/CD for Mirroring is now generally available. You can integrate Git for source control and utilize ALM Deployment Pipelines, streamlining the deployment process and ensuring seamless updates to mirrored databases.
March 2025	Open Mirroring UI enhancements and CSV support	The release of support for CSV formats for Open Mirroring allows you to upload CSV files in addition to parquet files when using the API or user experience. For more information, see Open Mirroring UI enhancements and CSV support .
March 2025	Mirroring updates to support firewalls, CI/CD, and more	Discover the many enhancements recently introduced to Fabric Mirroring . Database Mirroring now supports firewall connectivity for Azure SQL Database with on-premises Data Gateway .

Month	Feature	Learn more
March 2025	Mirrored PostgreSQL Flexible Server (preview)	Fabric Database Mirroring now supports replication of your Azure Database for PostgreSQL Flexible Server as a preview feature . You can continuously replicate data in near real-time from your Flexible Server instance to Fabric OneLake. For more information, see Mirroring Azure Database for PostgreSQL flexible server .
February 2025	Support for storage accounts behind a firewall for Mirrored Azure Databricks catalog items (Preview)	Storage accounts behind a firewall for Mirrored Azure Databricks catalog items are now supported as a preview feature. You can securely access Unity Catalog data even when it's stored in ADLS accounts protected by a firewall .
February 2025	Open Mirroring for SAP sources – dab and Simplement	With open mirroring , data replication is an extensible platform that partners and customers can use to plug in their own data integration capabilities. Once data is brought in through open mirroring, it can be used in all Fabric workloads. Two partners have now taken the next step in integrating with open mirroring , and are ready to onboard customers.
January 2025	Mirroring CI/CD (preview)	Mirroring now supports CI/CD as a preview feature. You can integrate Git for source control and utilize ALM Deployment Pipelines, streamlining the deployment process and ensuring seamless updates to mirrored databases.
January 2025	Source schema support in Mirroring in Fabric	Mirroring in Fabric now supports replicating the source schema hierarchy . For more information, see Mirroring now supports replicating source schemas .
January 2025	Delta column mapping support for Mirroring	Mirroring in Fabric now supports Delta column mapping. Column mapping is a feature of Delta tables that allows users to include spaces and special characters such as <code>'`', ``;``{``}``(``)``\\n``\t``=``.``'</code> in column names. For more information, see Delta column mapping support .

Fabric Mirroring samples and guidance

 Expand table

Month	Feature	Learn more
May 2025	Mirroring in Microsoft Fabric explained	Learn more about Fabric Mirroring , when should you use it, and what value does it bring to you and your organization?

Month	Feature	Learn more
May 2025	Mirroring for Azure Database for PostgreSQL in Fabric for effortless analytics on transactional data	You can use Mirroring for Azure Database for PostgreSQL in Microsoft Fabric to replicate PostgreSQL data for analytics in Fabric.
May 2025	Accelerate AI on Oracle databases with Open Mirroring, Fabric Data Agent, and Azure AI Foundry	Accelerate AI on Oracle databases with Open Mirroring, Fabric Data Agent, and Azure AI Foundry shows how to integrate Oracle databases with Microsoft Fabric and Azure AI Foundry for advanced analytics and AI scenarios. For more information, see Open Mirroring in Fabric .

Real-Time Intelligence in Microsoft Fabric

This section summarizes archived improvements and features for [Real-Time Intelligence in Microsoft Fabric](#).

[] [Expand table](#)

Month	Feature	Learn more
May 2025	Introducing FinOps Toolkit	The new FinOps Toolkit in Fabric provides tools for financial operations and cost management in Fabric. For more information, see FinOps Toolkit in Fabric on GitHub .
May 2025	Fabric Eventstream derived streams in Direct Ingestion mode (preview)	You can ingest data from Fabric Eventstream to Eventhouse seamlessly either from an eventstream or using Eventhouse Get Data Wizard. This capability is now being extended to support Eventstream Derived streams in direct ingestion mode . For more information, see Fabric Eventhouse now supports Eventstream Derived Streams in Direct Ingestion mode (preview) .
May 2025	Semantic model refresh activity	Use the Semantic model refresh activity to refresh a Power BI Dataset , the most effective way to refresh your Fabric semantic models. For more information, see Semantic Model Refresh Activity (Generally Available) .
May 2025	Eventhouse Query Acceleration for OneLake Shortcuts	Query Acceleration for OneLake Shortcuts in Eventhouse speeds up ad hoc queries over data in OneLake. OneLake shortcuts are references from an Eventhouse that point to internal Fabric or external sources. Previously, queries run over OneLake shortcuts were less performant than on data that is ingested directly to Eventhouses due to various factors. For more information, see Query acceleration for OneLake shortcuts - overview .
May 2025	New OpenAI plugins for Eventhouse	You can now use two powerful AI plugins for Eventhouse: AI Embed Text Plugin and AI Chat Completion Prompt Plugin .

Month	Feature	Learn more
	(preview)	Connect Eventhouse data to OpenAI-powered applications for advanced analytics and AI scenarios. For more information, see ai_embed_text (preview) and ai_chat_completion (preview) .
May 2025	Continuous ingestion from Azure Storage to Eventhouse (preview)	You can now use continuous ingestion from Azure Storage to Eventhouse (preview) to automatically and efficiently ingest data from Azure Storage into Eventhouse. For more information, see Get data from Azure Storage .
May 2025	Activator as an Orchestrator of the Fabric Event Driven flows	Activator as an Orchestrator of the Fabric Event Driven flows allows users to automate actions based on real-time events in Microsoft Fabric . For more information, see Tutorial: Create and activate an Activator rule .
May 2025	Digital twin builder (preview)	Digital twin builder (preview) is a new item within the Real-Time Intelligence workload. Digital twins create data-driven, real-time representations of entities . It's a data modeling item that creates digital representations of real-world environments, to optimize physical operations using data. For more information, see What is digital twin builder (preview)? .
April 2025	Microsoft Purview Data Loss Prevention policies for Fabric	Microsoft Purview's Data Loss Prevention (DLP) policies now support Fabric KQL and mirrored databases . Using DLP policies, security admins are able to define policies which scan data uploaded to KQL DBs or Mirrored DBs (including Snowflake, Azure, and more).
April 2025	Permission model changes for OneLake events in Fabric Real-Time Hub	Users with the new <code>SubscribeOneLakeEvents</code> permission are now able to subscribe to OneLake events. For more information, see Announcing permission model changes for OneLake events in Fabric Real-Time Hub .
April 2025	New Eventstream sources	Read more about the new Eventstream sources now available , including MQTT, Solace PubSub+, Azure Data Explorer, Weather, and Azure Event Grid.
April 2025	CI/CD and REST APIs for Fabric Eventstream	Eventstream CI/CD and REST APIs are now generally available. You can programmatically create, manage, and update Eventstream items. For more information, see Eventstream CI/CD and Fabric REST APIs for Eventstream .
April 2025	Azure and Fabric Events	With Azure and Fabric Events , you can integrate event-driven solutions into workflows. Azure and Fabric Events allow you to ingest system events like OneLake events and Azure Blob Storage events, and deliver those events to consumers in Microsoft Fabric like Activator .
April 2025	Synapse Data Explorer to	The next generation of Azure Synapse Data Explorer offering is evolving to become Eventhouse . To get started, see Migrate from

Month	Feature	Learn more
	Eventhouse migration tooling (preview)	Azure Synapse Data Explorer to Fabric Eventhouse (preview).
March 2025	Solace PubSub+ Connector	Seamlessly connect Fabric Eventstream with Solace PubSub+ (preview). For more information and steps to get started, see New Solace PubSub+ Connector: seamlessly connect Fabric Eventstream with Solace PubSub+ (preview) .
March 2025	Unlock the power of Real-time Intelligence in the Era of AI	Read more about why Fabric Real-Time Intelligence is a game-changer .
March 2025	New sources for Fabric event streams	The following new event sources are supported for Fabric event streams: MQTT , Real-time weather , Azure Data Explorer , Solace PubSub+ , Azure Event Grid namespace . The following event sets are added as sample data sources: Buses , S&P 500 companies stocks .
February 2025	Configure latency of Eventhouse OneLake	Eventhouse's adaptive mechanism can delay writing operations if there isn't enough data to create optimal Parquet files. This delay is now configurable. For more information, see Eventhouse OneLake Availability .
February 2025	Real-Time Dashboard & Power BI templates for Eventhouse Monitoring	Real-Time Dashboard and Power BI Templates designed to provide an out-of-the-box graphical management experience. With these templates you can easily monitor your query performance and data ingestions. You can enable workspace monitoring , download the templates , and view a demo in the fabric-toolbox GitHub repository .
February 2025	New Real-Time Dashboard customization features	New customization features give real-time dashboard authors and viewers more control over visuals, layout, and performance, including more control, better usability, and improved performance.
February 2025	New and improved Data Source Tree in KQL Queryset	The enhanced Data Source Tree now shows all other data sources previously connected in your Queryset , including Fabric (Eventhouse/KQL database) and Azure sources (Azure Data Explorer, Application Insights, Log Analytics clusters).
February 2025	Data exploration is now available for raw KQL table data	We've made it even easier to explore your data – no code required – with the Explore Data feature, now available in additional places across the user interface .
February 2025	Eventhouse OneLake availability migration	A system migration for OneLake Availability is occurring starting April 9, 2025 . This won't have any effect on accessing the data

Month	Feature	Learn more
		within your Eventhouse, it will only affect the delta parquet files made available via the OneLake Availability feature .
January 2025	Real-time intelligence ALM and REST API GA	Application Lifecycle Management (ALM) and Fabric REST APIs are now generally available for all RTI items: Eventstream, Eventhouse, KQL Database, Realtime dashboard, Query set and Data Activator. ALM includes both deployment pipelines and Git integration . REST APIs allow you to programmatically create / read / update / delete items.
December 2024	Eventhouse Monitoring (preview)	Eventhouse monitoring in preview offers multiple events and metrics that are automatically routed and stored in Workspace Monitoring. For more information, see Manage and monitor an eventhouse .
December 2024	All Real-Time Intelligence items supported for ALM and REST API	Fabric Real-Time Intelligence items (Eventstream, Eventhouse, KQL Database, Realtime Dashboard, Query set & Activator) support Application Lifecycle Management (ALM) and REST API capabilities.
December 2024	Eventhouse Query Acceleration for OneLake Shortcuts (Preview)	Query Acceleration for OneLake Shortcuts in Eventhouse speeds up ad hoc queries over data in OneLake. OneLake shortcuts are references from an Eventhouse that point to internal Fabric or external sources. Previously, queries run over OneLake shortcuts were less performant than on data that is ingested directly to Eventhouses due to various factors.
November 2024	New event categories in Fabric Real-Time Hub	New event categories in Real-Time Hub include: OneLake events , Job events , and Capacity utilization events . These new event categories are currently in preview. For more information, see Unlocking the power of Real-Time Data with OneLake Events .
November 2024	Eventstream processing and routing events to Activator (preview)	Now, Eventstream supports processing and transforming events with business requirements before routing the events to the destination: Activator. When these transformed events reach Activator, you can establish rules or conditions for your alerts to monitor the events.
November 2024	REST APIs for Fabric Eventstream	With the Eventstream REST API , you can now programmatically create, manage, and update Eventstream items. For more information, see Fabric REST APIs for Eventstream .
November 2024	Real-Time Intelligence: now Generally Available	We're excited to announce that Real-Time Intelligence is now generally available (GA) . This includes the Real-Time hub, enhanced Eventstream , Eventhouse , Real-Time Dashboards , and Activator . For more information, see What is Real-Time Intelligence?

Month	Feature	Learn more
November 2024	Real-Time hub	Real-Time hub is now generally available . For more information, see Introduction to Fabric Real-Time hub .
November 2024	Eventstream support for Azure Service Bus and Activator	Eventstreams support Azure Service Bus source (preview) and Fabric activator destination (preview) now, and they are in preview. The following connectors are generally available now: PostgreSQL Database (DB) Change Data Capture (CDC), MySQL DB CDC, Cosmos DB CDC, Azure SQL DB CDC, Azure SQL Managed Instance DB CDC, SQL Server on virtual machine DB CDC, Google Pub/Sub, Amazon Kinesis Data Streams, Apache Kafka, Confluent Cloud Kafka, and Amazon Managed Streaming for Apache Kafka. Eventstreams support Git Integration and Deployment Pipeline by integrating with Git and deployment pipelines.
October 2024	Secure Data Streaming with Managed Private Endpoints in Eventstream (Preview)	By creating a Fabric Managed Private Endpoint, you can securely connect Eventstream to your Azure services, such as Azure Event Hubs or IoT Hub, within a private network or behind a firewall. For more information, see Secure Data Streaming with Managed Private Endpoints in Eventstream (Preview) .
October 2024	Usage reporting for Activator is now live	The Activator team has rolled out usage reporting to help you better understand your capacity consumption and future charges. When you look at the Capacity metrics app compute page you'll now see operations for the reflex items included.
October 2024	Real-Time Dashboards and underlying KQL databases access separation (preview)	With separate permissions for dashboards and underlying data, administrators now have the flexibility to allow users to view dashboards without giving access to the raw data .
October 2024	Real-Time Dashboards Integration with GitHub	Fabric's Git integration is now available for Real-Time Dashboards . For more information, see What is Microsoft Fabric Git integration?
October 2024	Quickly visualize query results in KQL Queryset	You can now graphically visualize KQL Queryset results instantly and effortlessly and control the formatting without the need for re-run queries – all using a familiar UI.
October 2024	Pin query to dashboard	You can now save the outcome of any query written in KQL Queryset directly to a new or existing Real-Time Dashboard .
September 2024	Terraform Provider for Fabric (preview)	The Terraform Provider for Microsoft Fabric is now in preview. The Terraform Provider for Microsoft Fabric supports the creation and management of many Fabric resources. For more information, see Announcing the new Terraform Provider for Microsoft Fabric .

Month	Feature	Learn more
September 2024	Announcing Service Principal support for Fabric APIs	You can now use service principal to access Fabric APIs . Service principal is a security identity that you can create in Microsoft Entra and assign permissions to it in Microsoft Entra and other Microsoft services, such as Microsoft Fabric.
September 2024	Tag your data to enrich item curation and discovery	Tags (preview) help admins categorize and organize data , enhancing the searchability of your data and boosting success rates and efficiency for end users.
September 2024	Trusted workspace access and Managed private endpoints in any Fabric capacity	Trusted workspace access and Managed private endpoints are available in any Fabric capacity . Previously, trusted workspace access and Managed private endpoints were available only in F64 or higher capacities. Managed Private endpoints are now available in Trial capacities.
September 2024	Multitenant organization (MTO) (preview)	Fabric now supports Microsoft Entra ID Multitenant Organizations (MTO) . The multitenant organizations capability in Microsoft Entra ID synchronizes users across multiple tenants, adding them as users of type external member. For more information, see Distribute Power BI content to external guest users with Microsoft Entra B2B .
September 2024	Microsoft Fabric Achieves HITRUST CSF Certification	Microsoft Fabric is now certified for the HITRUST Common Security Framework (CSF) v11.0.1 .
September 2024	Creating a real time dashboard by Copilot	Copilot can review a table and automatically create a dashboard with insights and a profile of the data with a sample.
September 2024	New Real-Time hub and KQL Database user experiences	The new user experience features new Real-Time hub navigation, a My Streams page, an enhanced database page experience , and more.
September 2024	Eventhouse as a new Destination in Eventstream	Eventhouses, equipped with KQL Databases, can handle and analyze large volumes of data. With the Eventhouse destination in Eventstream , you can efficiently process and route data streams into an Eventhouse and analyze the data in near real-time using KQL.
September 2024	Managed private endpoints for Eventstream	With a managed private endpoints for Fabric , you can now establish a private connection between your Azure services, such as Azure Event Hubs, and Fabric Eventstream. For more information, see Eventstream integration with managed private endpoint .
September 2024	Activator alerts on KQL Querysets	Now you can set up Activator (preview) alerts directly on your KQL queries in KQL querysets . For more information and samples, see Create Activator alerts from a KQL Queryset .

Month	Feature	Learn more
September 2024	Real-Time Dashboards continuous or 10s refresh rate	The dashboard auto refresh feature now supports <i>continuous</i> and 10 second refresh rates , in addition to the existing options. This upgrade, addressing a popular customer request, allows both editors and viewers to set near real-time and real-time data updates.
September 2024	Multivariate anomaly detection	A new workflow for multivariate anomaly detection of time series data is based on the algorithm that is used in the AI Anomaly Detector service (which is being retired as a standalone service). For a tutorial, see Multivariate Anomaly Detection .
September 2024	Real-Time Intelligence Copilot conversational mode	The Copilot assistant, which translates natural language into KQL, now supports conversational mode , allowing you to ask follow-up questions that build on previous queries within the chat.
September 2024	New connectors and UI in Real-Time hub	Four new connectors released on September 24, 2024: Apache Kafka , Amazon Managed Streaming for Apache Kafka , Azure SQL Managed Instance CDC , SQL Server on VM DB CDC . The tabs in the main page of Real-Time hub are replaced with menu items on the left navigation menu. For more information, see Get started with Fabric Real-Time hub . You can connect to Azure streaming sources using private endpoints now.
September 2024	Announcement: Eventhouse Standard Storage billing	Starting the week of September 16 you will start seeing billable consumption of the OneLake Storage Data Stored meter from the Eventhouse and KQL Database items.
August 2024	Fabric Real-Time hub Teaching Bubbles	New teaching bubbles provide a step-by-step guide through its major functionalities. These interactive guides allow you to seamlessly navigate each tab of the Real-Time hub. For more information, see Fabric Real-Time hub Teaching Bubble .
August 2024	KQL Queryset REST API support	The new Fabric Queryset REST APIs allow you to create/update/delete KQL Querysets in Fabric, and programmatically manage them without manual intervention. For more information, see KQL Queryset REST API support .
July 2024	Update records in a KQL Database preview	The .update command is now generally available. Learn more about how to Update records in a Kusto database .
July 2024	Real-Time Dashboards 1s and 10s refresh rate	Real-time Dashboards now support ultra-low refresh rates of just 1 or 10 seconds. For more information, see Create a Real-Time Dashboard (preview) .
June 2024	Graph Semantics in Eventhouse	Graph Semantics in Eventhouse allows users to model their data as graphs and perform advanced graph queries and analytics using the Kusto Query Language (KQL).

Month	Feature	Learn more
June 2024	Set alerts on Real-time Dashboards with Fabric Activator triggers	Real-Time Dashboard visuals now support alerts ↗ , to extend monitoring support with Activator. With integration with Activator, you'll receive timely alerts as your key metrics change in real-time.
June 2024	OneLake availability of Eventhouse in Delta Lake format GA	As part of the One logical copy promise , we're excited to announce that OneLake availability of Eventhouse in Delta Lake format is Generally Available ↗ .
June 2024	Real-Time Dashboards	Real-Time Dashboards interact with data dynamically and in real time. Real-Time Dashboards natively visualize data stored in Eventhouses. Real-time Dashboards support ultra-low refresh rates of just 1 or 10 seconds. For more information, see Visualize and Explore Data with Real-Time Dashboards ↗ .
May 2024	Eventhouse GA	Eventhouse is a new, dynamic workspace hosting multiple KQL databases ↗ , generally available as part of Fabric Real-Time Intelligence. An Eventhouse offers a robust solution for managing and analyzing substantial volumes of real-time data. Get started with a guide to Create and manage an Eventhouse .
May 2024	Copilot for Real-Time Intelligence	Copilot for Real-Time Intelligence is now in preview ↗ ! For those who are already fans of KQL or newcomers exploring its potential, Copilot can help you get started, and navigate data with ease.
May 2024	Automating Fabric items with Real-Time Intelligence	Learn how to interact with data pipelines, notebooks, spark jobs in a more event-driven way ↗ .
May 2024	Real-Time Intelligence	This month includes the announcement of Real-Time Intelligence ↗ , the next evolution of Real-Time Analytics and Activator.
May 2024	Real-Time Intelligence new preview features	At Build 2024, a dozen new features and capabilities were announced for Real-Time Intelligence, organized into categories of Ingest & Process ↗ , Analyze & Transform ↗ , and Visualize & Act ↗ .
May 2024	Real-Time hub preview	Real-Time hub ↗ is single, tenant-wide, unified, logical place for streaming data-in-motion. It enables you to easily discover, ingest, manage, and consume data-in-motion from a wide variety of sources. It lists all the streams and Kusto Query Language (KQL) tables that you can directly act on. It also gives you an easy way to ingest streaming data from Microsoft products and Fabric events. For more information, see Real-Time hub overview .
May 2024	Get Events preview	The Get Events experience ↗ allows users to connect to a wide range of sources directly from Real-Time hub, Eventstreams, Eventhouse, and Activator. Using Get Events, bring streaming data

Month	Feature	Learn more
		from Microsoft sources directly into Fabric with a first-class experience.
May 2024	Enhanced Eventstream capabilities preview	With enhanced Eventstream capabilities , you can now stream data not only from Microsoft sources but also from other platforms like Google Cloud, Amazon Kinesis, Database change data capture streams, and more, using our new messaging connectors.
May 2024	Eventstreams - enhanced capabilities preview	The preview of enhanced capabilities supports many new sources - Google Cloud Pub/Sub, Amazon Kinesis Data Streams, Confluent Cloud Kafka, Azure SQL Database Change Data Capture (CDC), PostgreSQL Database CDC, MySQL Database CDC, Azure Cosmos DB CDC, Azure Blob Storage events, and Fabric workspace item events, and a new Stream destination. It supports two distinct modes, Edit mode and Live view, in the visual designer. It also supports routing based on content in data streams. For more information, see What is Fabric eventstreams .
April 2024	Kusto Cache consumption preview	The preview of Kusto Cache consumption means that you will start seeing billable consumption of the OneLake Cache Data Stored meter from the KQL Database and Eventhouse items. For more information, see KQL Database consumption .
April 2024	Pause and Resume in Eventstream preview	The Pause and Resume feature enables you to pause data streaming from various sources and destinations within Eventstream. You can then resume data streaming seamlessly from the paused time or a customized time, ensuring no data loss.
March 2024	New Expressions "Changes by", "Increases by", and "Decreases by"	In Activator, when setting conditions on a trigger, we've added syntax to allows you to detect when there's been a change in your data by absolute number or percentage. See New Expressions "Changes by", "Increases by", and "Decreases by" .
March 2024	Fabric Real-Time Intelligence Integrates with Newly Announced Database Watcher for Azure SQL	Users of Azure SQL can use the Database Watcher monitoring solution with Microsoft Fabric . Database Watcher for Azure SQL (preview) provides advanced monitoring capabilities, and can integrate with Eventhouse KQL database .
March 2024	Update records in a KQL Database preview	The .update command is now available, as a preview feature. Learn more about how to Update records in a Kusto database .
March 2024	Query Azure Data Explorer data from Queryset	Connecting to and using data in Azure Data explorer cluster from Fabric's KQL Queryset is now available.

Month	Feature	Learn more
February 2024	Eventhouse Overview: Handling Real-Time Data with Microsoft Fabric	Eventhouse (preview) is a dynamic workspace hosting multiple KQL databases ↗ , part of Fabric Real-Time Intelligence. An Eventhouse offers a robust solution for managing and analyzing substantial volumes of real-time data. Get started with a guide to Create and manage an Eventhouse .
February 2024	KQL DB shortcut to Delta Lake tables support name-based column mapping	KQL DB now supports reading Delta tables with column name mappings . The column mapping feature allows Delta table columns and the underlying Parquet file columns to use different names. This enables Delta schema evolution operations such on a Delta table without the need to rewrite the underlying Parquet files and allows users to name Delta table columns by using characters that aren't allowed by Parquet.
February 2024	KQL DB shortcut to Delta Lake tables support deletion vectors	KQL DB can now read delta tables with deletion vectors, resolving the current table state by applying the deletions noted by deletion vectors to the most recent table version.
February 2024	Get Data in KQL DB now supports processing events before ingestion via Eventstream	The Process event before ingestion in Eventstream option enables you to process the data before it's ingested into the destination table. By selecting this option, the get data process seamlessly continues in Eventstream , with the destination table and data source details automatically populated.
February 2024	KQL DB now supports data ingestion using Apache Flink	Using the open-source Flink connector, you can send data from Flink to your table. Using Azure Data Explorer and Apache Flink , you can build fast and scalable applications targeting data driven scenarios.
February 2024	Route data from Splunk Universal Forwarder to KQL DB using Kusto Splunk Universal Connector	You can now use the Kusto Splunk Universal Connector to send data from Splunk Universal Forwarder to a table in your KQL DB .

Real-Time Intelligence samples and guidance

[\[+\] Expand table](#)

Month	Feature	Learn more
May 2025	Efficient JSON loading to Eventhouse	In this blog, review options to design efficient JSON loading to Eventhouse ↗ .
April 2025	Medallion Architecture in Fabric Real-Time	Blog: Medallion Architecture in Fabric Real-Time Intelligence ↗ introduces how to implement the Medallion architecture pattern

Month	Feature	Learn more
	Intelligence	for real-time data processing in Microsoft Fabric.
April 2025	Understanding Real-Time Intelligence CDC connector for PostgreSQL database	Understand important points to keep in mind when using PostgreSQL database CDC in Fabric Eventstream .
April 2025	Implementing proactive monitoring with KQL query alerts with Activator	Within an Eventhouse and Eventstream, stream real-time data into your KQL database and set alerts on KQL queries. For an example of the fictional Constoso Retailers company, see Implementing proactive monitoring with KQL query alerts with Activator .
April 2025	Seamlessly connect Azure Logic Apps to Fabric Eventstream using Managed Identity	Compare Microsoft Entra ID and SAS Keys auth in Fabric Eventstream, explore use cases, and walk through how to connect Azure Logic Apps to Eventstream using managed identity authentication .
February 2025	Operational Reporting with Microsoft Fabric Real-Time Intelligence	This architecture blog details how you can report faster than a typical modern data warehouse with Fabric Real-Time Intelligence .
February 2025	Real-Time Intelligence End-to-End Sample	As a demonstration of an RTI end-to-end scenario, we've created Fabric Notebook that can deploy this in a matter of minutes. For more information, see RTI End-to-End Sample .
February 2025	Template dashboards for Workspace Monitoring	Ready-to-use Power BI and real-time dashboard template reports are available for workspace monitoring in Microsoft Fabric.
January 2025	Efficient log management with Microsoft Fabric	For a tutorial and walkthrough of efficient log files collection processing and analysis with Real-Time Intelligence, read this new blog post on Efficient log management with Microsoft Fabric .
December 2024	Automate Real-Time Intelligence Eventstream deployment using PowerShell	Learn how to build a PowerShell script to automate the deployment of Eventstream with the definition of source, processing, and destination into a workspace in Microsoft Fabric .
December 2024	Monitor Fabric Spark applications using Fabric Real-Time Intelligence	Learn how to build a centralized Spark monitoring solution, leveraging Fabric Real-Time Intelligence . To do this, integrate a Fabric Spark data emitter directly with Fabric Eventstream and Eventhouse to build a centralized Spark monitoring solution.
December 2024	Easily recreate your ADX dashboards as Real-Time Dashboards	You can bring ADX dashboards into Microsoft Fabric without relocating your data. Learn how to create Real-Time Dashboards as copies of your ADX dashboards in Fabric .

Month	Feature	Learn more
December 2024	Enhance fraud detection with Activator	Activator allows you to monitor events, detect certain conditions on your data and act on them by sending alerts. Learn how to implement a system that sends teams or email alerts when a transaction is flagged as potentially fraudulent.
December 2024	Manual Migration needed for Activator preview items	If you created an item while Activator was in preview, you'll need to manually migrate these items to GA to get access to all the new features .
December 2024	Understanding Real-Time Intelligence usage reporting and billing	Learn about Real-Time Intelligence Eventstream, Eventhouse, storage, Fabric Events and Activator consumption utilization, capacity meters, and costs.
August 2024	Advanced Time Series Anomaly Detector in Fabric	Read an example using the time-series-anomaly-detector in Fabric to upload stocks change table to Fabric, train the multivariate anomaly detection model in a Python notebook using Spark engine, and predict anomalies by applying the trained model to new data using Eventhouse (Kusto) engine.
August 2024	Acting on Real-Time data using custom actions with Activator	Learn how to monitor and acting on data is to use Activator, which is a no-code experience in Microsoft Fabric for taking action automatically when the condition of the package temperature is detected in the data.
July 2024	Build real-time order notifications with Eventstream's CDC connector	Read about a real-life example of how an online store used Eventstream's CDC connector from Azure SQL Database.
July 2024	Automating Real-Time Intelligence Eventhouse deployment using PowerShell	Let's build a PowerShell script to automate the deployment of Eventhouse, KQL Database, Tables, Functions, and Materialized Views into a workspace in Microsoft Fabric.
June 2024	Power BI Admin portal Usage metrics dashboard retirement	Effective July 2024, the Power BI Admin portal Usage metrics dashboard is removed . Comparable insights are now supported out-of-the-box through the Admin monitoring workspace (preview) . The Admin monitoring workspace provides several Power BI reports and semantic models, including the Feature Usage and Adoption report which focuses on Fabric tenant inventory and audit activity monitoring.
May 2024	Alerting and acting on data from the Real-Time hub	Microsoft Fabric's new Real-Time hub and Activator provide a no-code experience for automatically taking actions when patterns or conditions are detected in changing data and is embedded

Month	Feature	Learn more
		around the Real-Time hub to make creating alerts always accessible.
May 2024	Using APIs with Fabric Real-Time Intelligence: Eventhouse and KQL DB	Learn how to create/update/delete items in Fabric with the KQL APIs , accessing the data plane of a resource.
May 2024	Connect and stream events with the Get events experience	The Get events experience streamlines the process of browsing and searching for sources and streams .
May 2024	Acquiring Real-Time Data from New Sources with Enhanced Eventstream	Learn how to connect to new sources in Eventstream. Start by creating an eventstream and choosing "Enhanced Capabilities (preview)" .
March 2024	Browse Azure resources with Get Data	Learn how to browse and connect to all your Azure resources with the 'browse Azure' functionality in Get Data . You can browse Azure resources then connect to Synapse, blob storage, or ADLS Gen2 resources easily.

Microsoft Fabric platform features

Archived news and feature announcements about the Microsoft Fabric platform experience.

[] [Expand table](#)

Month	Feature	Learn more
May 2025	Fabric CLI (GA)	The Fabric CLI is now generally available—fully supported for production use, backed by Microsoft's SLA, and built to meet the security, compliance, and reliability standards our customers expect. From CI/CD pipelines to deployment automation and governance scenarios, the CLI is ready for real-world environments, and you can confidently adopt it in production! Get started at https://aka.ms/FabCLI .
May 2025	Encrypt data at rest using customer-managed keys (preview)	By default, Fabric encrypts all data at rest using Microsoft-managed keys. You can now encrypt data at rest in your Fabric workspaces using customer-managed keys , as a preview feature, giving you greater control over data security and compliance. For more information, see Customer-managed keys for Fabric workspaces .
May 2025	Connect to your most sensitive data with end-	Azure Private Link support for workspaces, outbound access protection for Spark, and Fabric encryption with customer

Month	Feature	Learn more
	to-end network security in Fabric	managed keys have been announced in preview to enable secure access to sensitive data in Microsoft Fabric using comprehensive network security features.
May 2025	Fabric Copilot capacity for F2 and higher	Fabric Copilot capacity can now be created in F2 capacity or higher. Fabric Copilot capacity allows capacity admins to grant direct Copilot access, and to manage Copilot costs by assigning Copilot costs in other capacities to Fabric Copilot.
May 2025	Enabling broader adoption of XMLA-based tools and scenarios	Enabling broader adoption of XMLA-based tools and scenarios introduces new capabilities that make it easier to use XMLA-based tools and scenarios with Microsoft Fabric. For more information, see Semantic model connectivity .
April 2025	Item limits in a Fabric workspace	As of April 10, 2025, Microsoft Fabric has implemented updates to the total number of items permissible in a workspace . This change introduces a combined limit of 1,000 Fabric items (including Power BI items) per workspace.
April 2025	Microsoft Fabric SKU estimator (preview)	The Microsoft Fabric SKU estimator , now available in preview, is an enhanced version of the previously introduced Microsoft Fabric Capacity Calculator. For more information, see Introducing the Microsoft Fabric SKU estimator (preview) and Mastering SKU Estimations with the Microsoft Fabric SKU Estimator .
April 2025	Microsoft Fabric Extensions	Read for a summary of extensions for Visual Studio Code (VS Code) that help you manage Fabric artifacts and build analytical applications, including extensions, user data functions, and an upcoming feature roadmap.
April 2025	Content Sharing Report (preview)	The new Content Sharing report provides a comprehensive view of item access within the Fabric tenant. For more information, see Blog: Content Sharing Report (preview) .
April 2025	Variable libraries (preview)	The Variable library is a new Fabric item that functions as a bucket of variables that can be consumed by other items in the workspace, and is integrated with notebooks. For more information, see Variable library (preview) and Notebook integration with variable libraries .
April 2025	Multi-tenant organization (MTO)	Support for multitenant organizations in Fabric is now generally available (GA). Microsoft Entra ID users of type external member are supported across the Fabric platform.
April 2025	Tags	Tags help admins categorize and organize data , enhancing the searchability of your data and boosting success rates and efficiency for end users. Tags in Microsoft Fabric are now generally available.

Month	Feature	Learn more
April 2025	Folder REST API (preview)	You can now create and manage workspace folders in automation scenarios and integrate with other systems and tools. The Folder Rest API is now in preview . To get started, see Fabric REST API Folders .
April 2025	Workload Development Kit OneLake support	In the Workload Development Kit , all items now support storing data in OneLake. For more information, see Microsoft Fabric Workload Development Kit .
April 2025	Fabric CLI (preview)	The Fabric CLI (<code>fab</code>) is a fast, file-system-inspired command-line interface for Microsoft Fabric. Explore, automate, and script your Fabric environment—right from your terminal. Get started at https://aka.ms/FabCLI .
March 2025	Terraform provider GA	The Terraform Provider for Microsoft Fabric is now generally available, enabling seamless infrastructure management and automation. For more information, use cases, and benefits, see Terraform Provider for Microsoft Fabric (Generally Available) .
March 2025	Load Fabric OneLake Data in Excel	Easily load Fabric OneLake data into Excel with integrated OneLake catalog and modern Get Data experience (preview). For more information and steps to get started, see OneLake catalog and Get Data are integrated into Excel for Windows .
March 2025	Empowering agentic AI	Integrating Fabric with Azure AI Foundry enables businesses to create custom conversational AI agents leveraging domain expertise. For more information, see Empowering Agentic AI by Integrating Fabric with Azure AI Foundry .
March 2025	External data sharing enhancements	External data sharing enables Fabric users to seamlessly share data across tenant boundaries while maintaining a single logical copy. Learn about service principal support for the external data sharing API and upcoming improvements .
February 2025	Capacities Management APIs	Learn more about a new set of ARM APIs for comprehensive management of Fabric capacities .
February 2025	Cross-region deployments	Fabric Deployment pipelines APIs now include a new feature for managing cross-region deployments .
February 2025	Admin API updates and upcoming definition changes	SPN/MI support for Admin APIs and new GET/POST Admin APIs have been announced, among other changes and performance updates to Fabric Admin APIs.
February 2025	TLS deprecation for Fabric	Fabric Platform support for Transport Layer Security (TLS) 1.1 and earlier versions will end on July 31, 2025. For more information, see Deprecating TLS 1.0 and 1.1 in Power BI .

Month	Feature	Learn more
February 2025	Microsoft Fabric Quotas	Microsoft Fabric Quotas are a new feature designed to control resource governance ↗ for the acquisition of your Microsoft Fabric capacities. Fabric quotas aimed at helping customers ensure that Fabric resources are used efficiently and help manage the overall performance and reliability of the Azure platform while preventing misuse.
February 2025	Fabric Catalyst Portal	The Fabric Catalyst Portal is collaborative knowledge hub designed to empower our partners ↗ with best practices, technical guidance, and real-world insights to accelerate Microsoft Fabric adoption. Registration for Microsoft partners is open ↗ . The first guidance is focused on Real-Time Intelligence.
February 2025	How can I decide which protection method to use to protect my sensitive data in Fabric?	Learn more about when to use Purview DLP restrict access vs. Purview Protection Policies? Learn more about different protection options in Fabric ↗ .
February 2025	Understanding GraphQL API error handling	Learn more about error handling in GraphQL and some best practices for managing errors effectively ↗ .
February 2025	Billing for Workspace monitoring	Workspace Monitoring (preview) is an observability feature within Fabric that enables monitoring capabilities. For more information, see Announcing preview of workspace monitoring ↗ . Billing for this feature ↗ starts March 10, 2025.
January 2025	Building Apps with Microsoft Fabric API for GraphQL	Microsoft Fabric has an API for GraphQL ↗ to build your data applications, enabling you to pull data from sources such as Data Warehouses, Lakehouse, Mirrored Databases, and DataMart in Microsoft Fabric.
January 2025	Power BI Embedded with Direct Lake Mode (Preview)	Power BI Embedded with Direct Lake Mode is designed to enhance how developers and Independent Software Vendors (ISVs) provide embedded analytics in their applications. For more information, see Introducing Power BI Embedded with Direct Lake Mode (Preview) ↗ .
January 2025	Fabric Copilot capacity: Democratizing AI usage in Microsoft Fabric	Fabric Copilot capacity ↗ us a new billing feature designed to enhance your experience with Microsoft Fabric. With Fabric Copilot capacities, capacity admins can give Copilot access to end users directly, rather than requiring creators to move their content into a specific workspace or link a specific capacity.
January 2025	Efficient log management with Microsoft Fabric	For a tutorial and walkthrough of efficient log files collection processing and analysis with Real-Time Intelligence, read this new blog post on Efficient log management with Microsoft Fabric ↗ .

Month	Feature	Learn more
January 2025	Surge protection (preview)	With surge protection (preview) , capacity admins can set limits on background usage within a capacity. Learn more about surge protection to help protect capacities from excess usage by background workloads .
December 2024	Microsoft Fabric approved as a Service within the FedRAMP High Authorization for Azure Commercial	Microsoft Fabric is now included within the US Federal Risk and Authorization Management Program (FedRAMP) High Authorization for Azure Commercial. This Provisional Authorization to Operate (P-ATO) within the existing FedRAMP High Azure Commercial environment was approved by the FedRAMP Joint Authorization Board (JAB).
December 2024	Folder in Workspace	As an organizational unit, the workspace folder addresses this pain point by providing a hierarchical structure for organizing and managing your items. This feature is now generally available, and includes new filter features. For more information, see Create folders in workspaces .
November 2024	Workspace monitoring (preview)	Workspace monitoring (preview) is a Microsoft Fabric database that collects data from a range of Fabric items in your workspace, and lets users access and analyze logs and metrics. For more about this feature, see Announcing preview of workspace monitoring .
November 2024	OneLake external data sharing (GA)	External data sharing in Microsoft Fabric , now generally available, makes it possible for Fabric users to share data from within their Fabric tenant with users in another Fabric tenant.
November 2024	GraphQL API in Microsoft Fabric GA	The API for GraphQL , now generally available, is a data access layer that allows us to query multiple data sources quickly and efficiently in Fabric. For more information, see What is Microsoft Fabric API for GraphQL?
November 2024	The new OneLake catalog	The OneLake catalog is the next evolution of the OneLake data hub . For more information about the new catalog, Discover and explore Fabric items in the OneLake catalog .
November 2024	Fabric workload dev kit (GA)	The Microsoft Fabric workload development kit is now generally available . This robust developer toolkit is for designing, developing, and interoperating with Microsoft Fabric using frontend SDKs and backend REST APIs .
November 2024	Domains in Fabric – new enhancements	Review new features and use cases for Domains in Fabric , including Best practices for planning and creating domains in Microsoft Fabric .
October 2024	New Item panel in Workspace	Previously, by selecting +New in the workspace, you can access a dropdown menu with some pre-defined item types to get

Month	Feature	Learn more
		started. Now, the +New item button shows item types listed in a panel, categorized by tasks ↗ .
October 2024	Enhanced Tenant Setting Delegation for Export Controls	Delegation of export settings is now available to workspaces via domain ↗ . This new capability provides more granular control over data export permissions, addressing the specific needs of tenant, domain, and workspace administrators.
October 2024	APIs for Managed Private Endpoint are now available	REST APIs for managed Private Endpoints are available. You can now create , delete , get , and list Managed private endpoints via APIs ↗ .
October 2024	Important billing updates coming to Copilot and AI in Fabric	Upcoming pricing and billing updates to make Copilot and AI features in Fabric more accessible and cost-effective ↗ .
August 2024	OneLake data access role improvements	Based on key feedback, we've updated data access roles ↗ with a user interface redesign. For more information, see Get started with OneLake data access roles (preview) .
August 2024	Workspace filter improvement to support nested folders	We have upgraded the filter experience ↗ to support filtering through the entire workspace or through a specific folder with all its nested folders.
August 2024	Announcing the availability of Trusted workspace access and Managed private endpoints in any Fabric capacity	Use Trusted workspace access and Managed Private endpoints in Fabric ↗ with any F capacity and enjoy the benefits of secure and optimized data access and connectivity.
July 2024	SOC certification compliance	We are excited to announce that Microsoft Fabric, our all-in-one analytics solution for enterprises, is now System and Organization Controls (SOC) 1 Type II , SOC 2 Type II , and SOC 3 compliant ↗ .
July 2024	Microsoft Fabric .NET SDK	We are excited to announce the very first release of the Microsoft Fabric .NET SDK ↗ ! For more information on the REST API documentation, see Microsoft Fabric REST API documentation .
May 2024	Microsoft Fabric Private Links GA	Azure Private Link for Microsoft Fabric secures access to your sensitive data in Microsoft Fabric by providing network isolation and applying required controls on your inbound network traffic. For more information, see Announcing General Availability of Fabric Private Links ↗ .
May 2024	Trusted workspace access GA	Trusted workspace access in OneLake shortcuts is now generally available ↗ . You can now create data pipelines to access your firewall-enabled Azure Data Lake Storage Gen2 (ADLS Gen2)

Month	Feature	Learn more
		accounts using Trusted workspace access (preview) in your Fabric Data Pipelines. Use the workspace identity to establish a secure and seamless connection between Fabric and your storage accounts . Trusted workspace access also enables secure and seamless access to ADLS Gen2 storage accounts from OneLake shortcuts in Fabric.
May 2024	Fabric APIs walkthrough	Learn about using REST APIs in Fabric , including creating workspaces, adding permission, dropping, creating, executing data pipelines, and how to pause/resume Fabric activities using the management API.
May 2024	Managed private endpoints GA	Managed private endpoints for Microsoft Fabric allow secure connections over managed virtual networks to data sources that are behind a firewall or not accessible from the public internet. For more information, see Announcing General Availability of Fabric Private Links, Trusted Workspace Access, and Managed Private Endpoints .
May 2024	Fabric UX System	The Fabric UX System represents a leap forward in design consistency and extensibility for Microsoft Fabric.
May 2024	Microsoft Fabric Core REST APIs	Microsoft Fabric Core APIs are now generally available. The Fabric user APIs are a major enabler for both enterprises and partners to use Microsoft Fabric as they enable end-to-end fully automated interaction with the service, enable integration of Microsoft Fabric into external web applications, and generally enable customers and partners to scale their solutions more easily.
May 2024	Microsoft Fabric Admin APIs preview	Fabric Admin APIs are designed to streamline administrative tasks. Now, you can manage both Power BI and the new Fabric items (previously referred to as artifacts) using the same set of APIs. Before this enhancement, you had to navigate using two different APIs—one for Power BI items and another for new Fabric items.
May 2024	Fabric workload dev kit (preview)	The Microsoft Fabric workload development kit extends to additional workloads and offers a robust developer toolkit for designing, developing, and interoperating with Microsoft Fabric using frontend SDKs and backend REST APIs.
May 2024	Introducing external data sharing (preview)	External Data Sharing (preview) is a new feature that makes it possible for Fabric users to share data from within their Fabric tenant with users in another Fabric tenant.
May 2024	Task flows in Microsoft Fabric (preview)	The preview of task flows in Microsoft Fabric is enabled for all Microsoft Fabric users. With Fabric task flows , when designing a data project, you no longer need to use a whiteboard to sketch

Month	Feature	Learn more
		out the different parts of the project and their interrelationships. Instead, you can use a task flow to build and bring this key information into the project itself.
May 2024	Power BI: Subscriptions, licenses, and trials	Information on Power BI implementation planning and key considerations for planning subscriptions, licenses, and trials for Power BI and Fabric .
May 2024	Register for the Microsoft Build: Microsoft Fabric Cloud Skills Challenge	Starting May 21, 2024, sign up for the Microsoft Build: Microsoft Fabric Cloud Skills Challenge and prepare for Exam DP-600 and upskill to the Fabric Analytics Engineer Associate certification.
March 2024	Microsoft Fabric is now HIPAA compliant	We are excited to announce that Microsoft Fabric, our all-in-one analytics solution for enterprises, has achieved new certifications for HIPAA and ISO 27017, ISO 27018, ISO 27001, ISO 27701 .
March 2024	Folder in Workspace preview	As an organizational unit in the workspace, folder addresses this pain point by providing a hierarchical structure for organizing and managing your items. For more information, see Create folders in workspaces (preview) .
March 2024	Fabric Copilot Pricing: An End-to-End example	Copilot in Fabric begins billing on March 1, 2024 as part of your existing Power BI Premium or Fabric Capacity. Learn how Fabric Copilot usage is calculated .
March 2024	Capacity Platform Updates for Pause/Resume, Capacity Metrics, virtualized items and workspaces for Copilot, and VNET Gateways	The Fabric Capacity Platform now supports usage reporting for Pause/Resume, virtualized items and workspaces supporting Copilot, Capacity Metrics, and VNET Gateway. For more information, read Capacity Platform Updates for Pause Resume and Capacity Metrics for Copilot and VNET Gateways .
February 2024	Managed private endpoints for Microsoft Fabric (Preview)	Managed private endpoints for Microsoft Fabric (preview) allow secure connections to data sources that are behind a firewall or not accessible from the public internet. Workspaces with managed private endpoints have network isolation through a managed virtual network created by Microsoft Fabric . For more information, see Introducing Managed private endpoints for Microsoft Fabric preview .
February 2024	Azure Private Link Support for Microsoft Fabric (Preview)	Azure Private Link for Microsoft Fabric secures access to your sensitive data in Microsoft Fabric by providing network isolation and applying required controls on your inbound network traffic. For more information, see Announcing Azure Private Link Support for Microsoft Fabric in Preview .

Month	Feature	Learn more
February 2024	Domains in OneLake (preview)	Domains in OneLake help you organize your data into a logical data mesh , allowing federated governance and optimizing for business needs. You can now create sub domains, default domains for users, and move workspaces between domains. For more information, see Fabric domains .
February 2024	Customizable Fabric navigation bar	You can now customize your preferred entry points in the navigation bar , including pinning common entry points and unpinning rarely used options.
February 2024	Persistent filters in workspace	You can now save selected filters in workspace list view , and they'll be automatically applied the next time you open the workspace.

Continuous Integration/Continuous Delivery (CI/CD) in Microsoft Fabric

This section includes guidance and documentation updates on development process, tools, and versioning in the Microsoft Fabric workspace.

[Expand table](#)

Month	Feature	Learn more
April 2025	CI/CD support OneLake shortcuts	OneLake shortcuts now support batch creation via the API and management with CI/CD .
April 2025	CI/CD and REST APIs for Fabric Eventstream	Eventstream CI/CD and REST APIs are now generally available. You can programmatically create, manage, and update Eventstream items. For more information, see Eventstream CI/CD and Fabric REST APIs for Eventstream .
February 2025	Fabric CI/CD Python library Deployment Tool	The Fabric CI/CD Python library fabric-cicd is an open-source solution based on our experience using Fabric as the backbone of our platform.
November 2024	Microsoft Fabric REST APIs Integration with GitHub	These APIs enable you to automate Git integration tasks, such as connecting to GitHub, retrieving connection details, committing changes to your connected GitHub repository, updating from the repository, and more. For more information, see Automate Git integration by using APIs and code samples .
November 2024	Data Factory Copy Job – CI/CD now available	CI/CD for Copy job (preview) in Data Factory in Microsoft Fabric is now available. Copy Job now supports Git Integration and Deployment Pipeline .

Month	Feature	Learn more
July 2024	GitHub integration for source control (preview)	Fabric developers can now choose GitHub or GitHub Enterprise as their source control tool ↗ , and version their Fabric items there. For more information, see Get started with Git integration (preview) .
July 2024	Microsoft Fabric .NET SDK	We are excited to announce the very first release of the Microsoft Fabric .NET SDK ↗ ! For more information on the REST API documentation, see Microsoft Fabric REST API documentation .
June 2024	Introducing New Branching Capabilities in Fabric Git Integration	New branching capabilities ↗ in Fabric Git integration include a redesigned Source Control pane, the ability to quickly create a new connected workspace and branch, and contextual related branches to find content related to the current workspace.
May 2024	Deployment pipelines APIs for CI/CD	Fabric deployment pipelines APIs ↗ have been introduced, starting with the 'Deploy' API, which will allow you to deploy the entire workspace, or only selected items.
May 2024	New items in Fabric CI/CD	Data pipelines, Warehouse, Spark, and Spark jobs are now available for CI/CD ↗ in git integration and deployment pipelines.
April 2024	Introducing Trusted Workspace Access in Fabric Data Pipelines	Create data pipelines in Fabric to access your firewall-enabled ADLS Gen2 storage accounts ↗ with ease and security. This feature leverages the workspace identity to establish a secure and seamless connection between Fabric and your storage accounts.
March 2024	CI/CD for Fabric Data Pipelines preview	Git Integration and integration with built-in Deployment Pipelines to Data Factory data pipelines is now in preview. For more information, see Data Factory Adds CI/CD to Fabric Data Pipelines ↗ .
March 2024	System file updates for Git integration	The automatically generated system files <code>item.metadata.json</code> and <code>item.config.json</code> have been consolidated into a single system file <code>.platform</code> . For more information, see Automatically generated system files .
February 2024	REST APIs for Fabric Git integration	REST APIs for Fabric Git integration ↗ enable seamless incorporation of Fabric Git integration into your team's end-to-end CI/CD pipeline, eliminating the need for manual triggering of actions from Fabric.
February 2024	Delegation for Git integration settings	To enable more control over Git related settings ↗ , a tenant admin can now delegate these settings to both capacity admins and workspace admins via the What is the admin portal?

Continuous Integration/Continuous Delivery (CI/CD) samples

[+] [Expand table](#)

Month	Feature	Learn more
April 2025	Optimizing for CI/CD in Microsoft Fabric	Learn about Fabric CI/CD strategy, how to implement it, how to scale it, and more item-specific tips in this blog post, Optimizing for CI/CD in Microsoft Fabric .
September 2024	GitHub integration for source control	Now generally available, Fabric developers can now choose GitHub or GitHub Enterprise as their source control tool , and version their Fabric items there. For more information, see What is Microsoft Fabric Git integration?
September 2024	New Deployment Pipelines design	A new and improved design for the Deployment Pipeline introduces a range of changes, additions, and improvements designed to elevate your deployment process. Read more about What's changed in deployment pipelines .
August 2024	Exploration of Microsoft Fabric's CI/CD Features	A guided tour of Microsoft Fabric's CI/CD features for data pipelines, lakehouse, notebooks, reports, and semantic models.
June 2024	Getting started with development in isolation using a Private Workspace	In this walkthrough, we'll talk about how to set up git for a private workspace from a main branch , which is connected to a shared dev team workspace and then how to commit changes from the private workspace into the main branch of the shared workspace.
March 2024	Microsoft Fabric Lifecycle Management – Getting started with Git Integration and Deployment Pipelines	Learn the essentials of Lifecycle Management through a demo scenario, and explore what Lifecycle Management is, and what it means in Fabric.

Fabric and Microsoft 365

This section includes articles and announcements about Microsoft Fabric integration with Microsoft Graph and Microsoft 365.

[+] [Expand table](#)

Month	Feature	Learn more
March 2024	Analyze Dataverse tables from Microsoft Fabric	When creating a shortcut within Fabric, you will now see an option for Dataverse . When you choose this shortcut type and specify your Dataverse environment details, you can quickly see and work with the tables from that environment.

Migration

This section includes guidance and documentation updates on migration to Microsoft Fabric.

[+] [Expand table](#)

Month	Feature	Learn more
February 2024	Mapping Azure Synapse dedicated SQL pools to Fabric data warehouse compute	Read for guidance on mapping Data Warehouse Units (DWU) from Azure Synapse Analytics dedicated SQL pool to an approximate equivalent number of Fabric Capacity Units (CU) ↗.

Monitor

This section includes guidance and documentation updates on monitoring your Microsoft Fabric capacity and utilization, including the [Monitoring hub](#).

[+] [Expand table](#)

Month	Feature	Learn more
March 2024	Capacity Metrics support for Pause and Resume	Fabric Capacity Metrics has been updated with new system events and reconciliation logic to simplify analysis of paused capacities . Fabric Pause and Resume is a capacity management feature that lets you pause F SKU capacities to manage costs. When your capacity isn't operational, you can pause it to enable cost savings and then later, when you want to resume work on your capacity you can reactivate it.

Related content

- [Modernization Best Practices and Reusable Assets Blog](#) ↗
- [Azure Data Explorer Blog](#) ↗
- [Get started with Microsoft Fabric](#)
- [Microsoft Training Learning Paths for Fabric](#)
- [End-to-end tutorials in Microsoft Fabric](#)
- [Fabric Known Issues](#) ↗
- [Microsoft Fabric Blog](#) ↗
- [Microsoft Fabric terminology](#)
- [What's new in Power BI?](#)
- [What's new in Microsoft Fabric?](#)