Microsoft

Microsoft Fabric – Tales from a CAT

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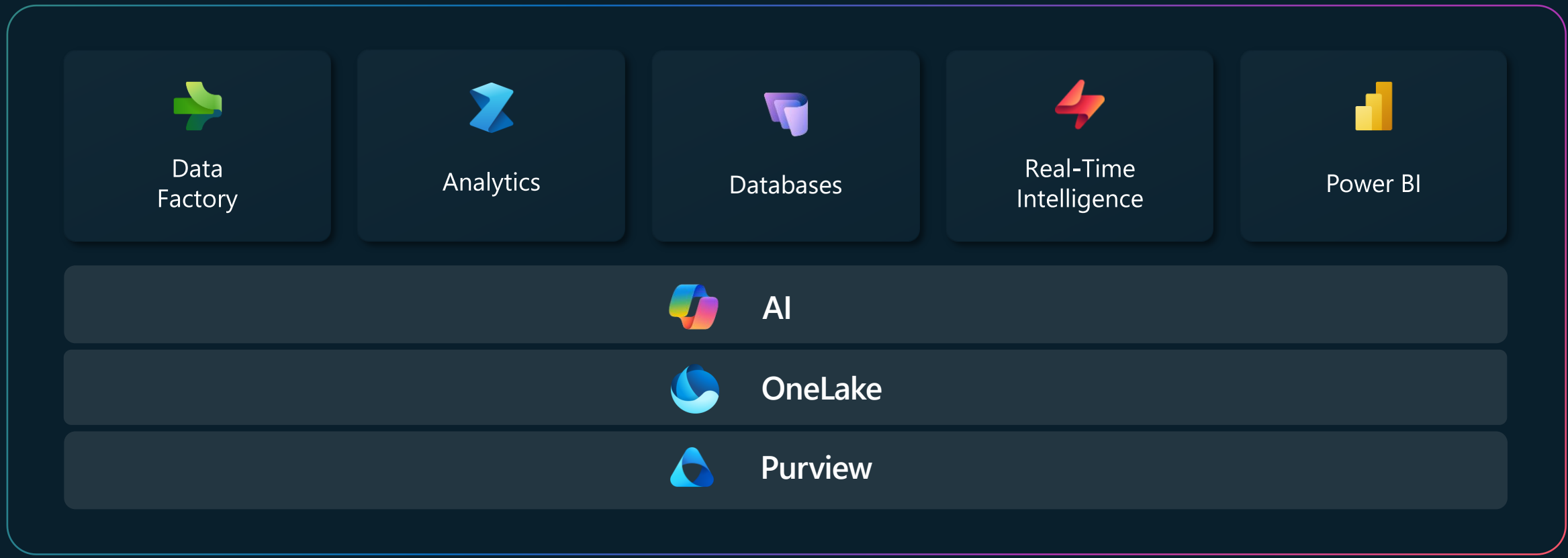
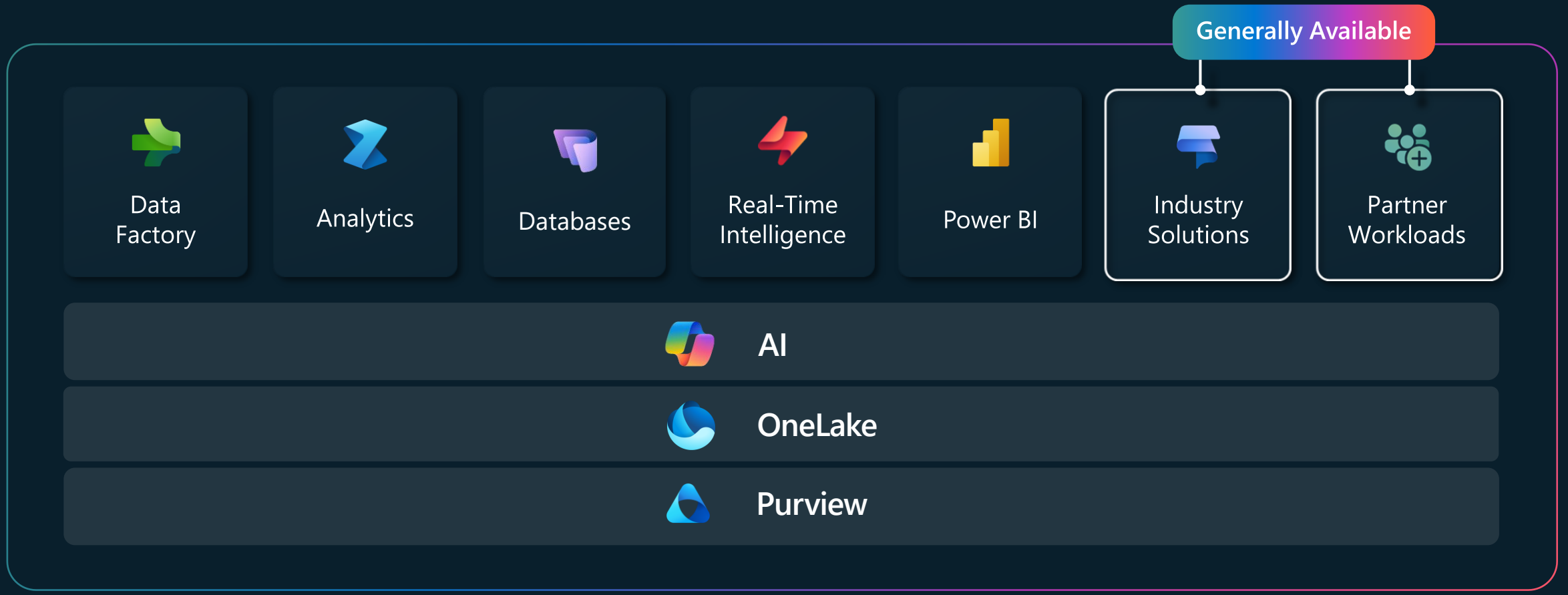
Microsoft Fabric

The unified data platform for AI transformation



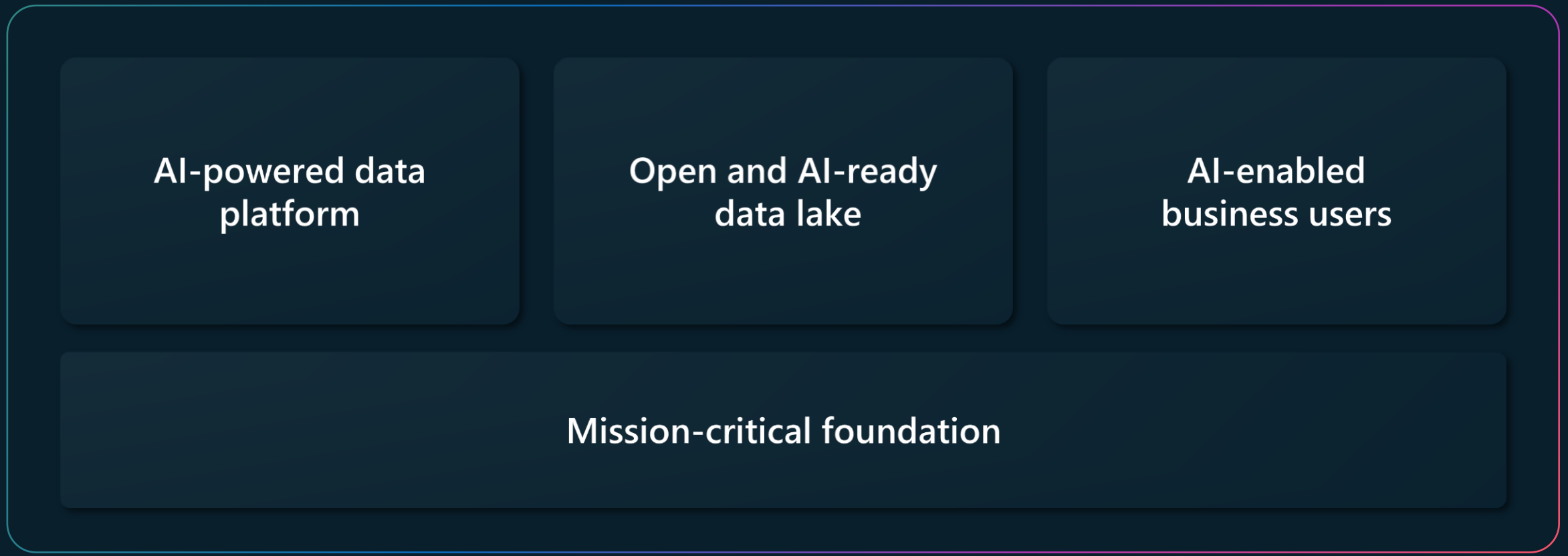
Microsoft Fabric

The unified data platform for AI transformation



Microsoft Fabric

The unified data platform for AI transformation



Early adoptions of Microsoft Fabric have ..

Early adoptions of Microsoft Fabric have ..

Understood it’s a young product

Fabric workloads are now generally available!

Activator | Announcements | Apache Spark | Data Factory | Data Science | Data Warehouse | Fabric platform | Lakehouse | OneLake

November 15, 2023 by Ryan Majidimehr 140,836 Views

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Microsoft Fabric is now generally available! Fabric brings together the best of Microsoft Power BI, Azure Synapse Analytics, and Azure Data Factory into a single software as a service (SAAS) platform. Fabric provides multiple workloads purpose-built for specific personas and specific tasks. Keep reading to learn about all of Fabric's workloads!

Early adoptions of Microsoft Fabric have ..

Defined Scope

Early adoptions of Microsoft Fabric have ..

Understood it’s a long term game

Expectations of data lakes

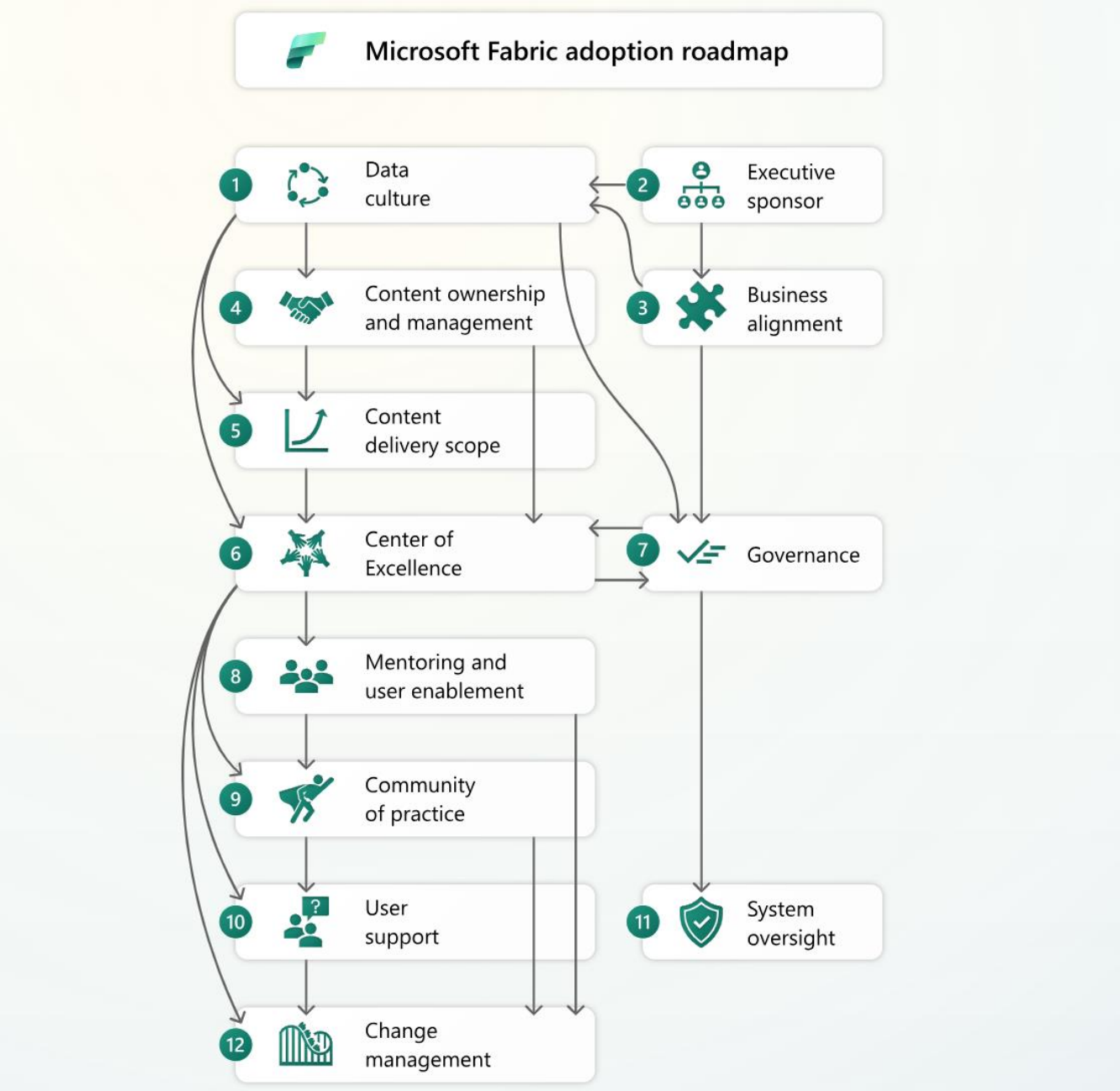
One place for an organization to land all data, structured and unstructured.

Break down data silos, making it easier to blend and analyze data together.

Simplify security, governance and data discovery enabling all user and applications to access the data they need.

Companies need a unified platform for developing real-time data solutions

FROM	TO
Fragmented, fragile tech stack	One, unified SaaS solution
Advanced skillsets required	Accessible data and analytics tools
Faster batch data processing	Real-time event ingestion
Data silos, lack of governance	Unified single data estate
Hard to find unknown unknowns	AI-powered insights and actions

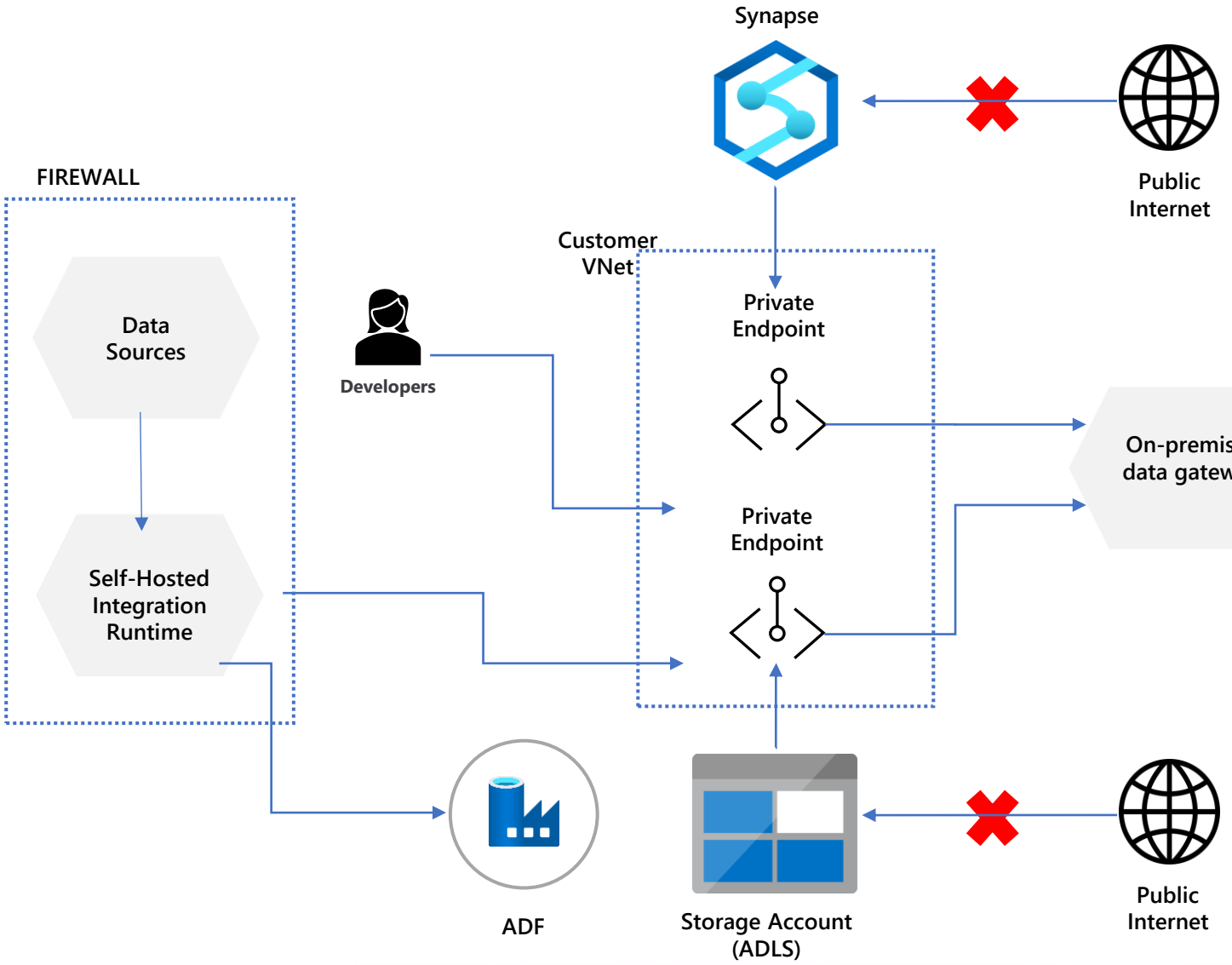


https://learn.microsoft.com/en-us/power-bi/guidance/fabric-adoption-roadmap

Early adoptions of Microsoft Fabric have ..

Understood that SaaS is different

Existing PaaS World



PaaS services are disconnected from the Public internet.

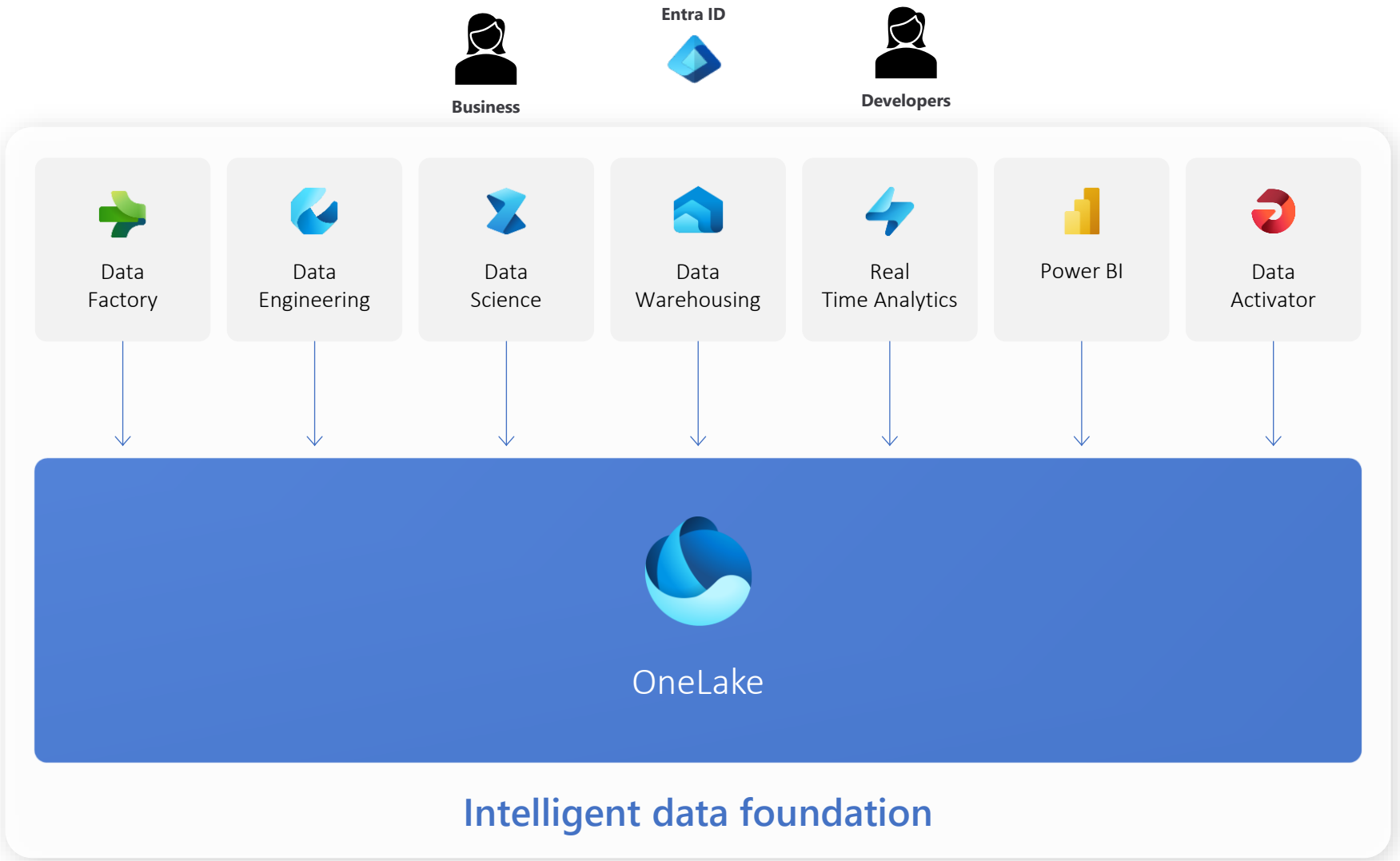
All communications between the services are configured to go through private endpoint

Developers connect to a VPN and connect to the backend services

Data sources are connected through the self-hosted runtime inside the firewall

When the CEO access the data in Power BI Report, the data is imported into Power BI or through the GW with DQ.

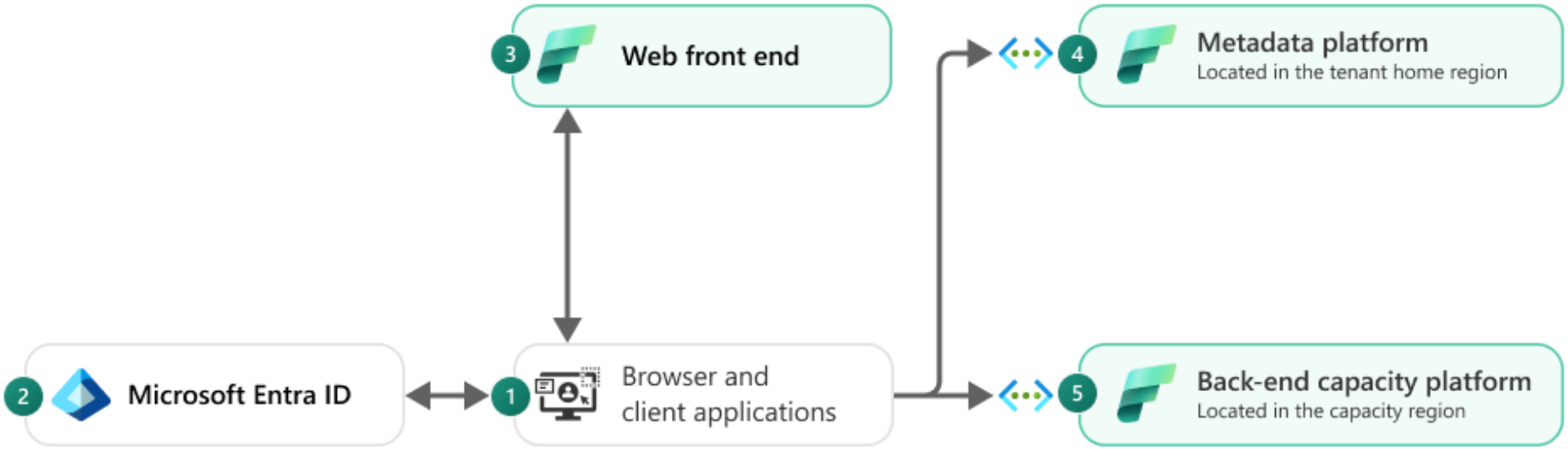
Microsoft Fabric – SaaS World



- Users connect to the SaaS service from global network
- Endpoints and access are protected using Entra ID
- All internal communications between the experiences happens through MS backbone network
- When the CEO access the data in Power BI Report, the data is fetched directly from the OneLake instantly and securely without copying or moving

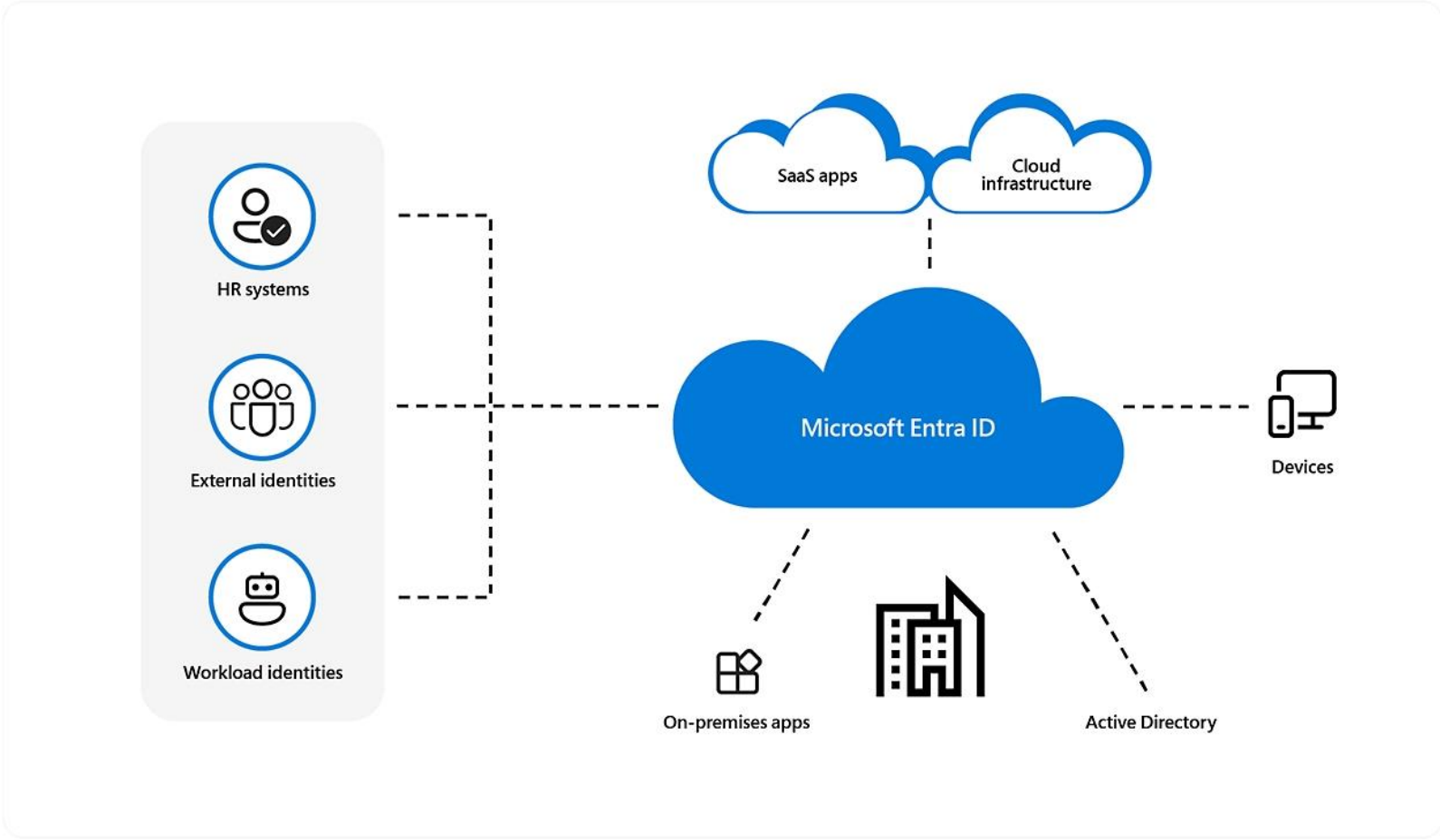
Microsoft Fabric Architecture

Fabric is built as a SaaS product.



Authentication

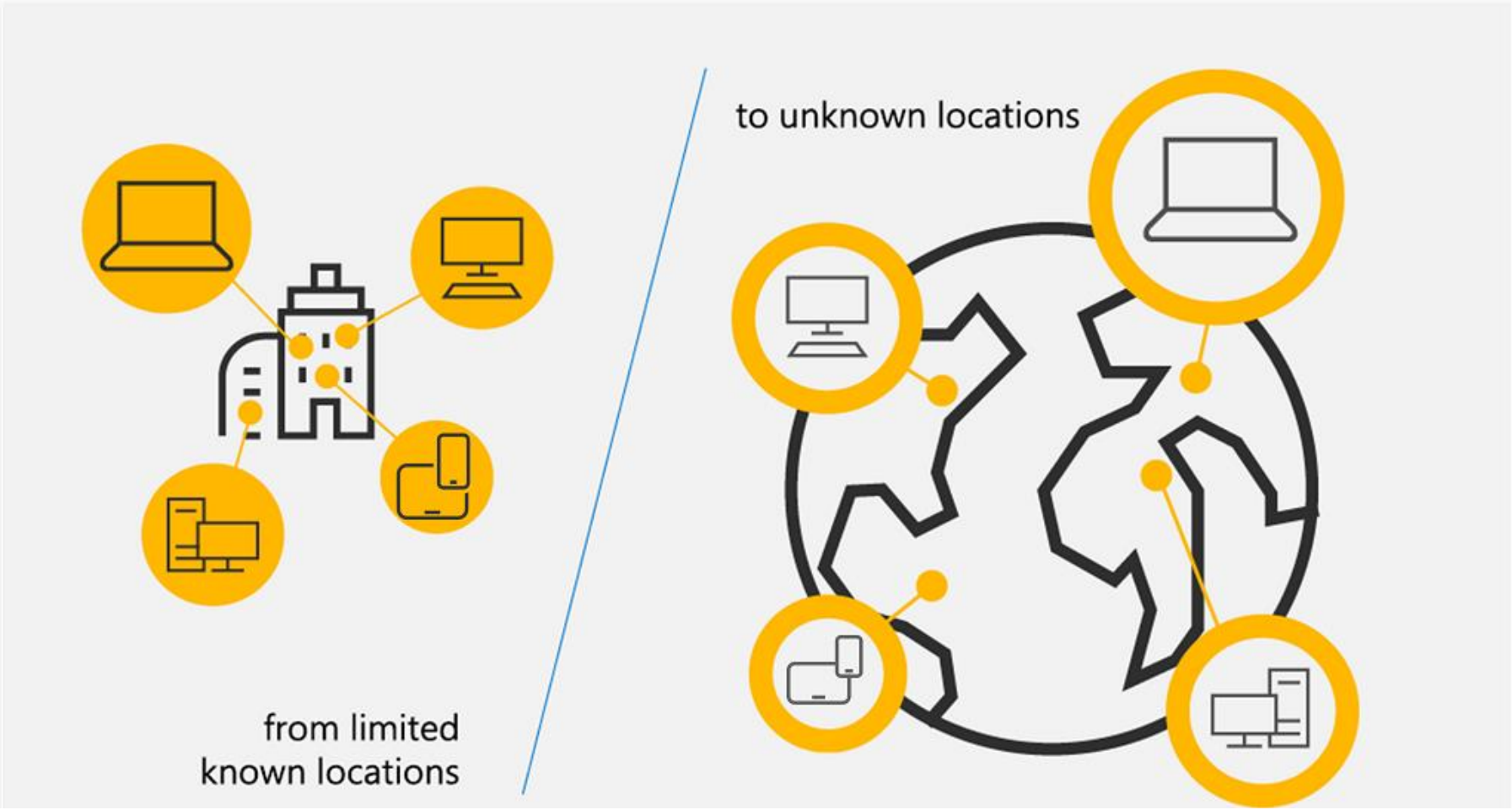
Microsoft Entra ID at the hearth of your security



Inbound protection options

Perimeter Network Security

Zero Trust Approach



Early adoptions of Microsoft Fabric have ..

Understood that Capacities power *everything*

Capacity Core Concepts

Scalable Compute Units

Resizeable, Pausable

Self-Managing with Bursting and Smoothing

But as with any resource, you still can push them too far (Throttling)

Capacity Unit Seconds (CUs) "see-yews" are the base compute unit for all Capacities.

Multiple workloads can use the same capacity at the same time. No need to preallocate resources or provision different accounts.

The **more CUs are provisioned, the more load** the capacity can support.

SKU	CUs	CUs (per 30s)	Power BI SKU	Power BI V-cores
F2	2	60	-	0.25
F4	4	120	-	0.5
F8	8	240	A1	1
F16	16	480	A2	2
F32	32	960	A3	4
F64	64	1,920	P1	8
F128	128	3,840	P2	16
F256	256	7,680	P3	32
F512	512	15,360	P4	64
F1024	1,024	30,720	P5	128
F2048	2,048	61,440	-	256

Capacity Core Concepts

Scalable Compute Units

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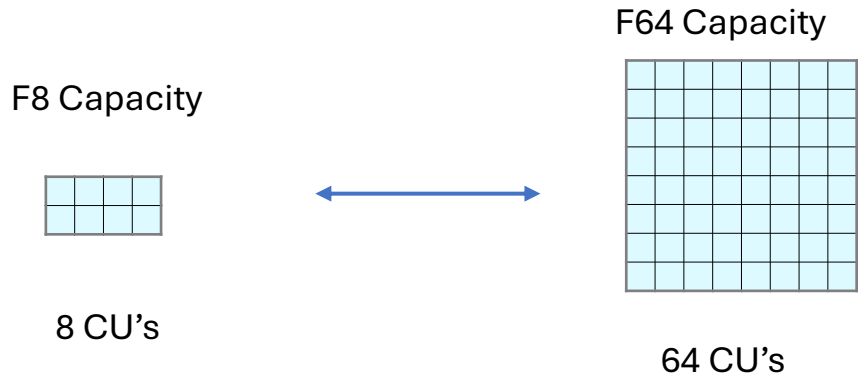
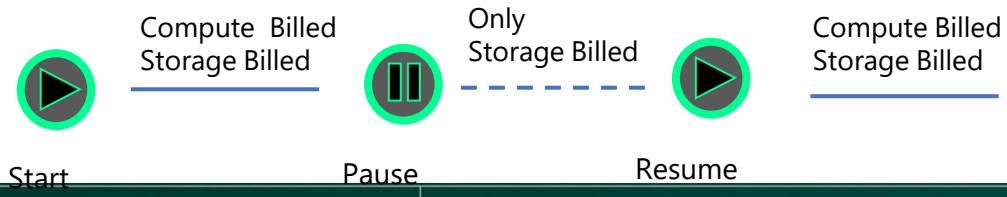
But as with any resource, you still can push them too far (Throttling)

New **Fabric SKUs** (F SKUs) enable **added flexibility**

Resize to increase or decrease the SKU to meet your compute needs.



Pause and **Resume the capacity**



Capacity Core Concepts

Scalable Compute Units

Resizeable, Pausable

Self-Managing with Bursting and Smoothing

But as with any resource, you still can push them too far (Throttling)

Self-Managing with Bursting and Smoothing

Bursting allows jobs to run at peak performance.

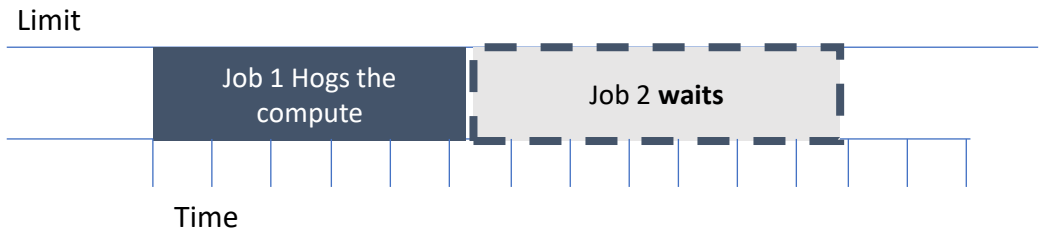
- Fewer delays reducing perception of slowness.
- Users are happier because jobs complete faster.

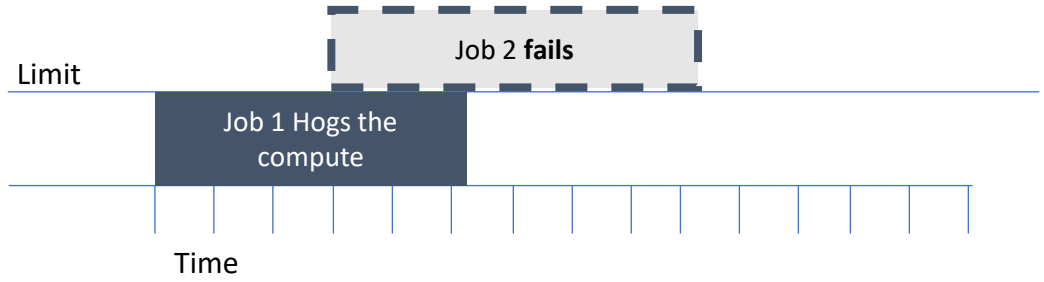
Smoothing reduces the impact of spikes in compute

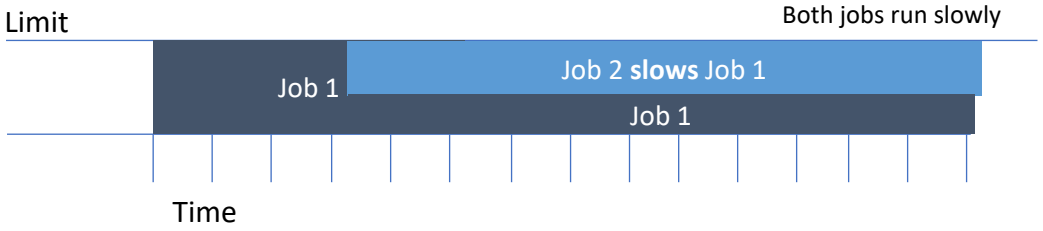
- Pay for the compute from your future capacity
- No need to schedule jobs after another one finishes

Capacities are self-managing

Traditional Systems stay within a hard compute limit.



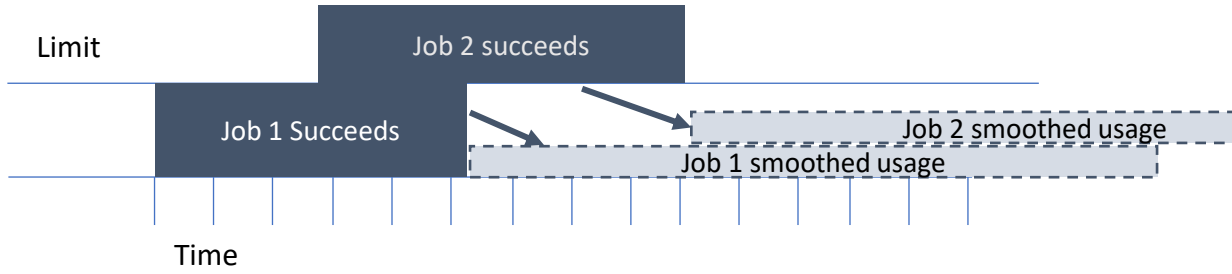




Capacities use Bursting & Smoothing to solve these problems

Bursting lets both jobs **succeed**, running at **peak performance** to finish fast.

Smoothing distributes the **cost** of jobs over a longer time-period preventing scheduling issues.



Capacity Core Concepts

Scalable Compute Units

Resizeable, Pausable

Self-Managing with Bursting and Smoothing

But as with any resource, you still can push them too far (Throttling)

Self-Managing with Bursting and Smoothing

Smoothing of compute cost depends on job type
- Interactive Jobs – up to ~1 hour
- Background Jobs – 24 hours

Reduces the impact of temporary spikes
- A single user running a big export won't block others
- A large batch jobs can run even during business hours

Works best when your capacity is not heavily utilized.

Capacity Core Concepts

Scalable Compute Units

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Self-Managing with Bursting and Smoothing

But as with any resource, you still can push them too far (Throttling)

Capacities offer **built-in resource governance**

- A **sustained overuse** will result in **throttling**.
- You won't use your monthly budget in a single day.
- Most capacities are "set and forget"

How requests are affected by Capacity Throttling

1. Interactive requests first are **delayed** and then are **rejected**
2. Background requests are **rejected**

When capacities throttle usage users will see the **CapacityLimitExceeded** error code in the detailed message.

Be aware that users may experience delays, slowness, or failures due to **workload limits**. These are unrelated to Capacity Throttling.

Capacity Core Concepts

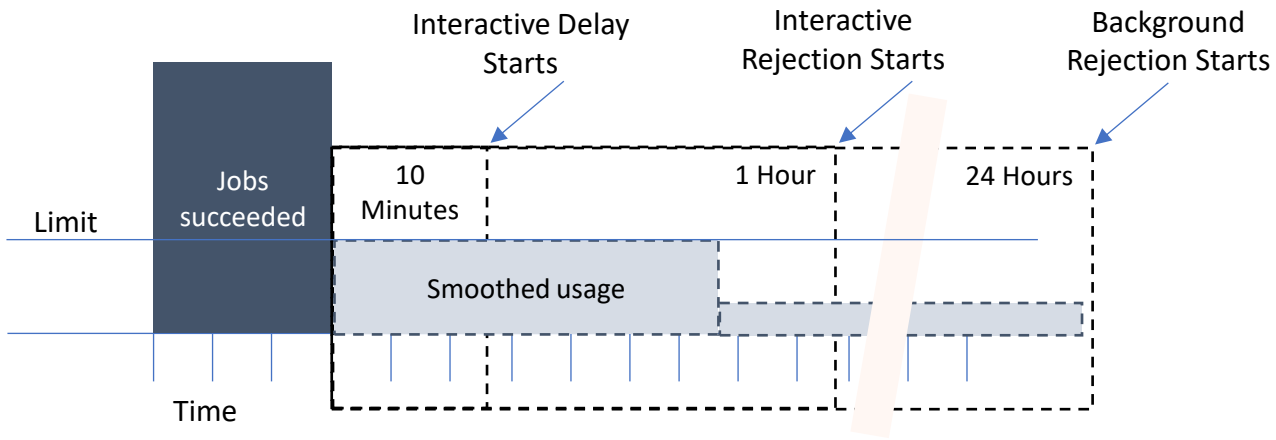
Scalable Compute Units

Resizeable, Pausable

Self-Managing with Bursting and Smoothing

But as with any resource, you still can push them too far (Throttling)

When smoothed usage builds up too much, throttling is applied.



Interactive Delays –
- Interactive requests will be delay their start by 20 seconds.
- When smoothed usage exceeds 10 minutes of 100% CUs of the SKU.

Interactive Rejections –
- Interactive requests fail.
- When smoothed usage exceeds 60 minutes of 100% CUs of the SKU.

Background Rejections –
- All requests fail, including background requests.
- When smoothed usage exceeds 24 hours of 100% CUs of the SKU.

Rejections result in **CapacityLimitExceeded** errors

Early adoptions of Microsoft Fabric have ..

Understood Microsoft Fabric has more to offer than just what we build ourselves

Industry Solutions

Sustainability

ESG analysis, compliance

Build ESG data estate to meet requirements of regulations, analytics, reduction measures.

Generally Available

Healthcare

Analytics to improve outcomes

Compare interventions and effects on outcomes; optimize targeted patient outreach.

Generally Available

Retail

Insights and shopping experience

Understand ‘bought together’ insights, enable AI shopping assistant; Sitecore integration.

Preview

Generally Available

Microsoft Fabric Workload Development kit

Seamless user experience

Discover and visualize insights in real-time

Automatically drive action from data

Developer momentum

Microsoft Fabric Workload Development Kit

Public Preview

esri | Profisee | quantexa | teradata. | sas | osmos

LSEG | NVIDIA | COGNITE | neo4j | AVEVA | Informatica

Adobe | Epic | Fivetran | Holistic AI | dataiku | KANTAR

NetApp | MINIO | ORACLE | Qlik | Snowflake | Schneider Electric

ASTRONOMER | MongoDB. | PowerBI.tips | STATSIG | striim | DATASTAX

And many more!

Early adoptions of Microsoft Fabric have ..

Realized the value of OneLake

OneLake

A single data lake for the entire organization

Unified data lake for everyone

- Connect to any source
- Infinite scale
- Dash mesh built-in

Open at every level

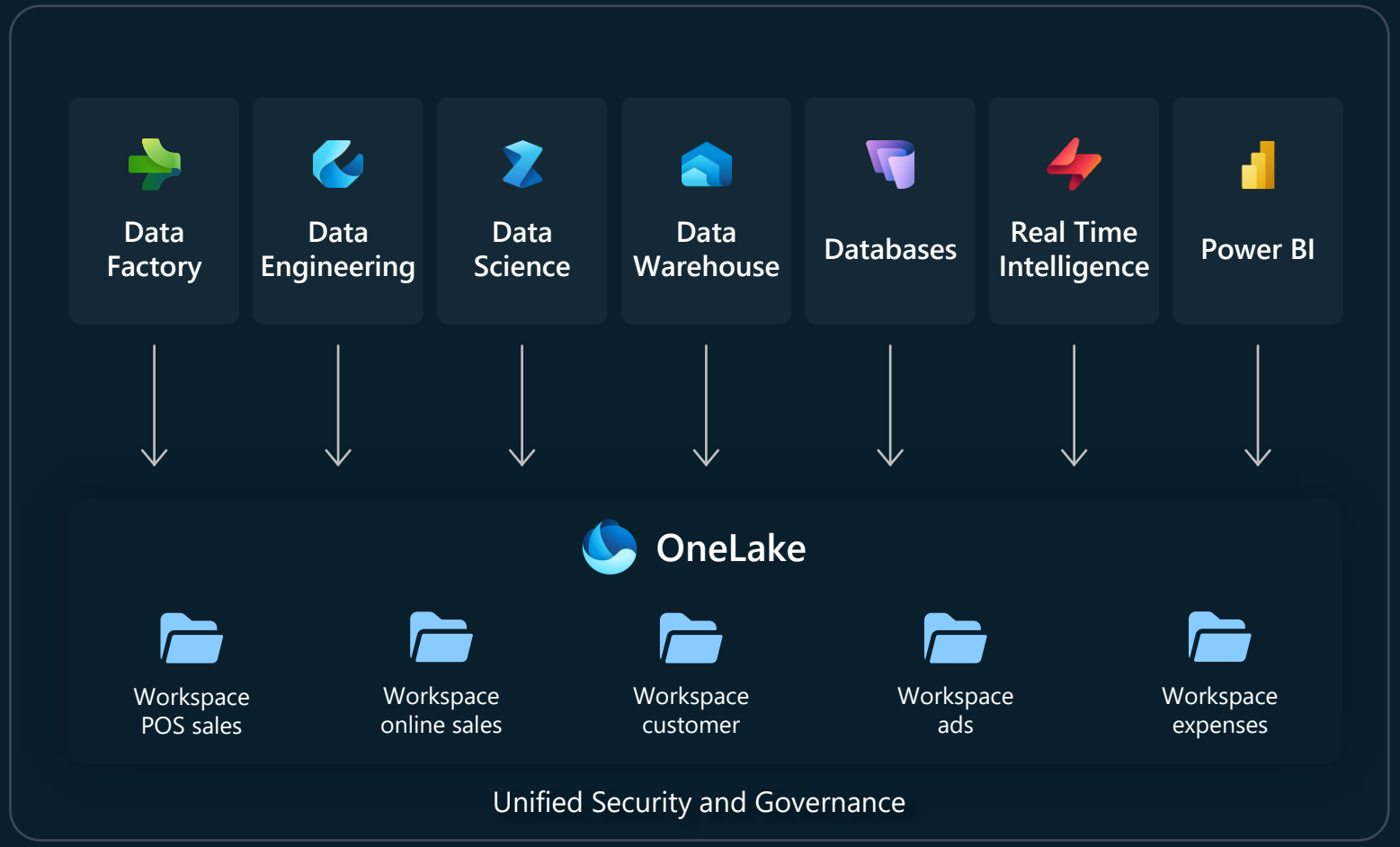
- Open Delta Parquet format
- One copy across engines
- Easy interoperability & extensibility

Discoverable while secure

- Intuitive data discovery
- Industry-leading security
- Extensive governance tools

A single unified SaaS data lake

"No Silos"



Provisioned automatically with the tenant.

Any data in OneLake works with out-of-the-box governance such as data lineage, data protection, certification, catalog integration, etc. All data is ultimately under the control of a tenant admin.

OneLake enables distributed ownership. Different workspaces allow different parts of the organization to work independently while still contributing to the same data lake. Each workspace can have its own administrator, access control, region and capacity for billing.

OneLake which logically spans the world

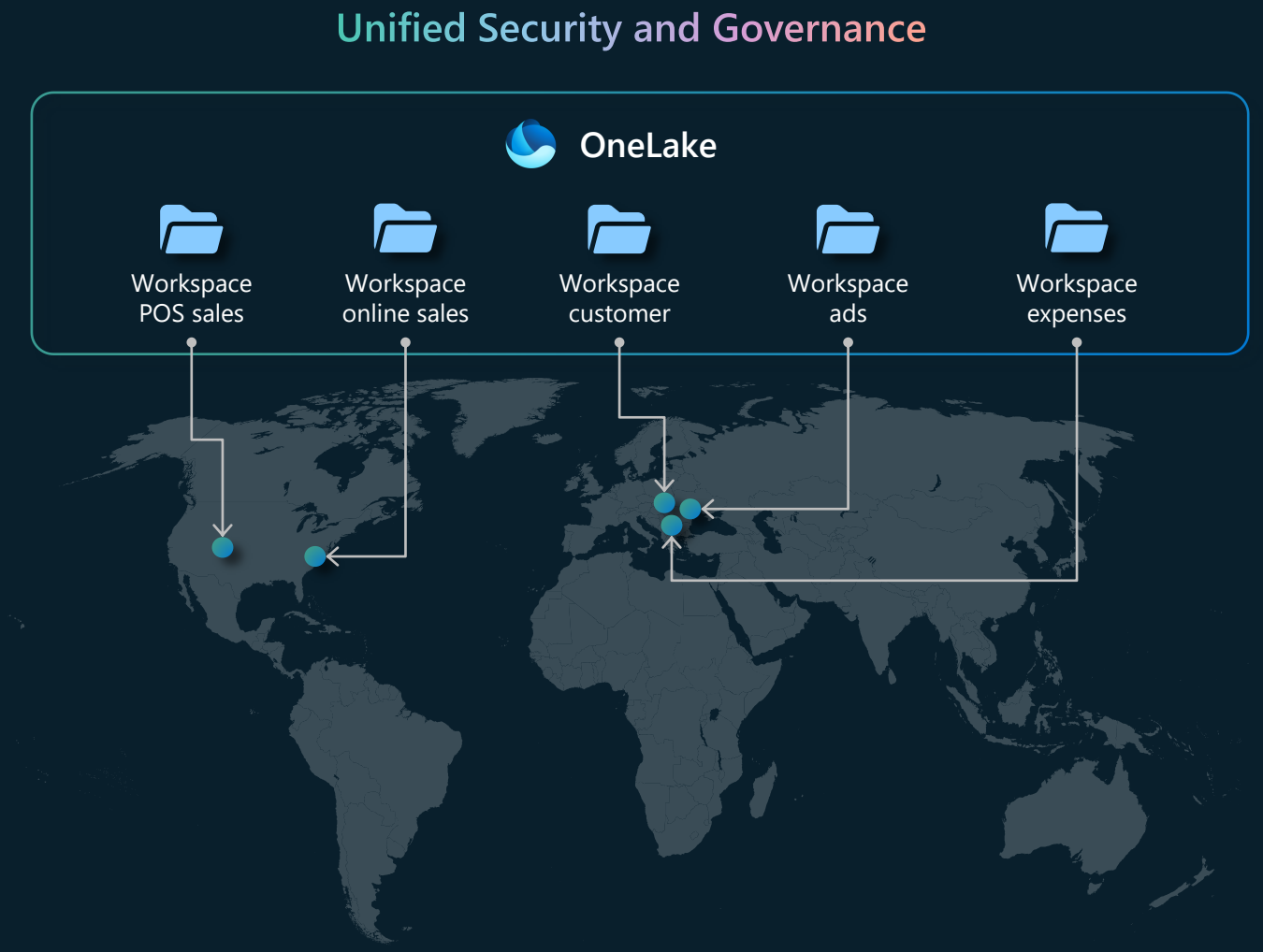
Reside workspaces in different regions around the world while still in the same data lake.

Reside data in different regions without managing different storage resources.

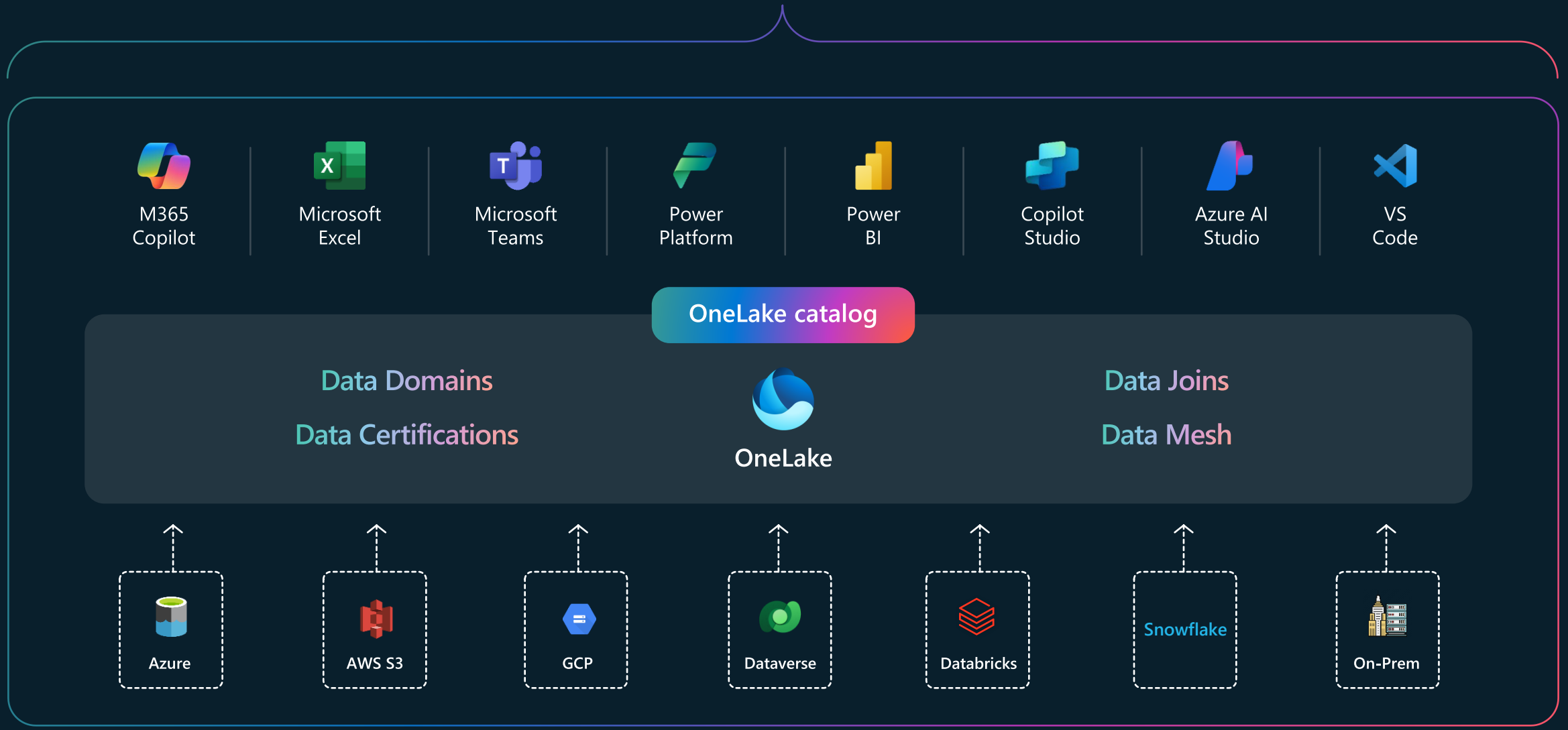
Meet demand for any scale with dedicated storage resources for each workspace (capacity, throughput and IOPS).

Underlying physical storage is virtualized away.

All storage is zone redundant by default with an option for Geo redundancy.

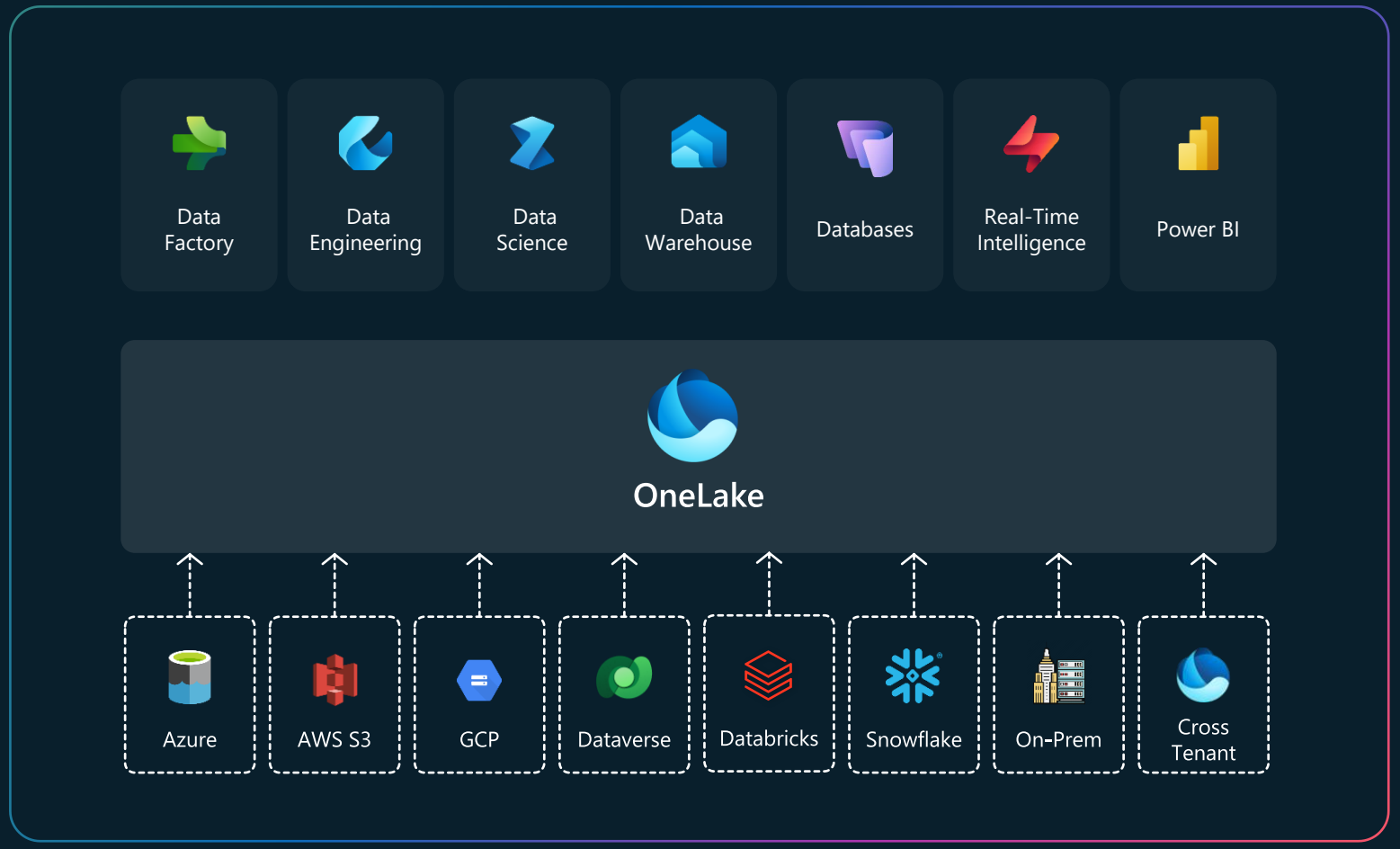


OneLake data available everywhere



Unifying data in OneLake

Cross-cloud shortcuts & mirroring



First multi-cloud SaaS data lake

Shortcuts for existing data cross clouds and on-premises

Mirroring to add whole databases into the OneLake data estate

Shortcuts virtualize data across domains and clouds

No data movements or duplication

A shortcut is a symbolic link which points from one data location to another.

Create a shortcut to make data from a warehouse part of your lakehouse.

Create a shortcut within Fabric to consolidate data across items or workspaces without changing the ownership of the data. Data can be reused multiple times without data duplication.

Existing ADLS Gen2 storage accounts and Amazon S3 buckets can be managed externally to Fabric and Microsoft while still being virtualized into OneLake with shortcuts.

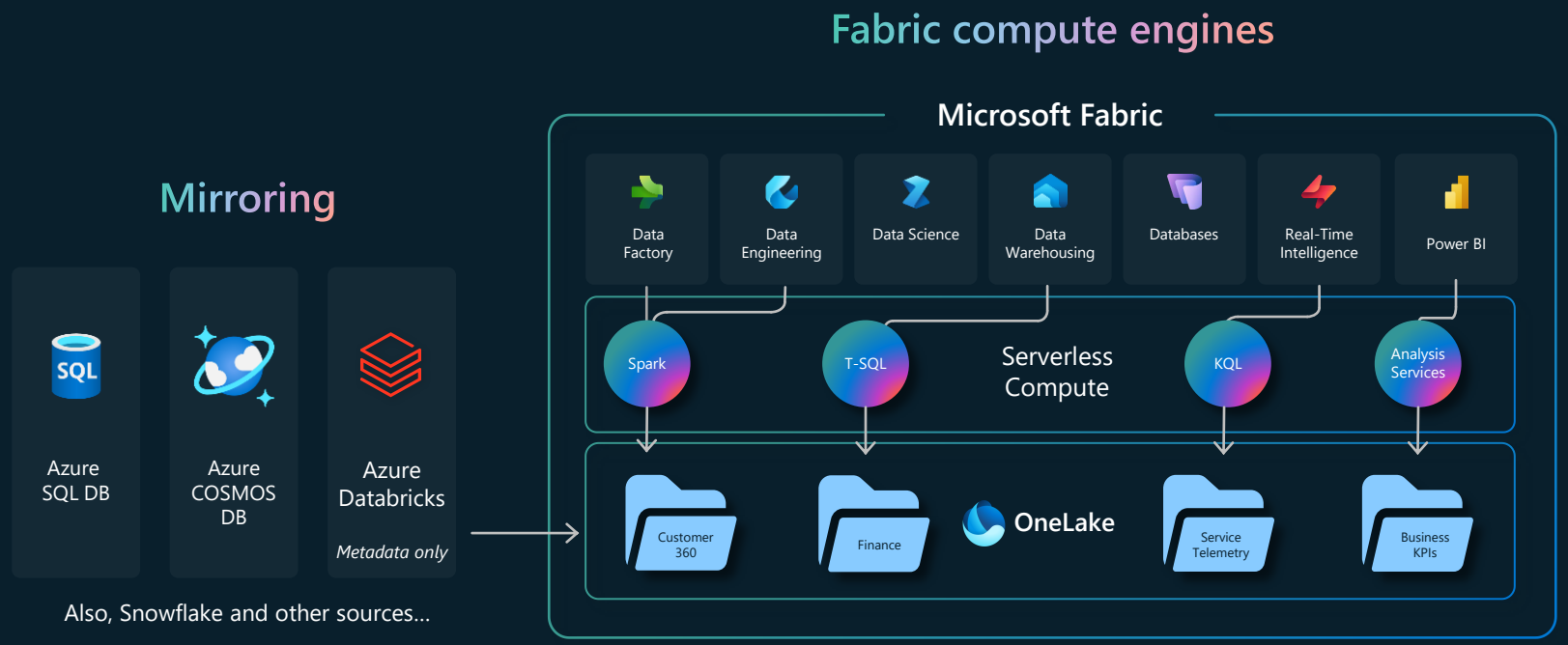
All data is mapped to a unified namespace and can be accessed using the same APIs including the ADLS Gen2 DFS APIs.

Mirroring in Microsoft Fabric

A mirrored item reflects a full external database in OneLake.

Ensures the entire database shows up in OneLake, reflecting all changes to the schema and data.

Mirroring can be done through CDC based replication for proprietary formats or by automatically maintaining a set of shortcuts to the external database for open table formats (delta and iceberg)



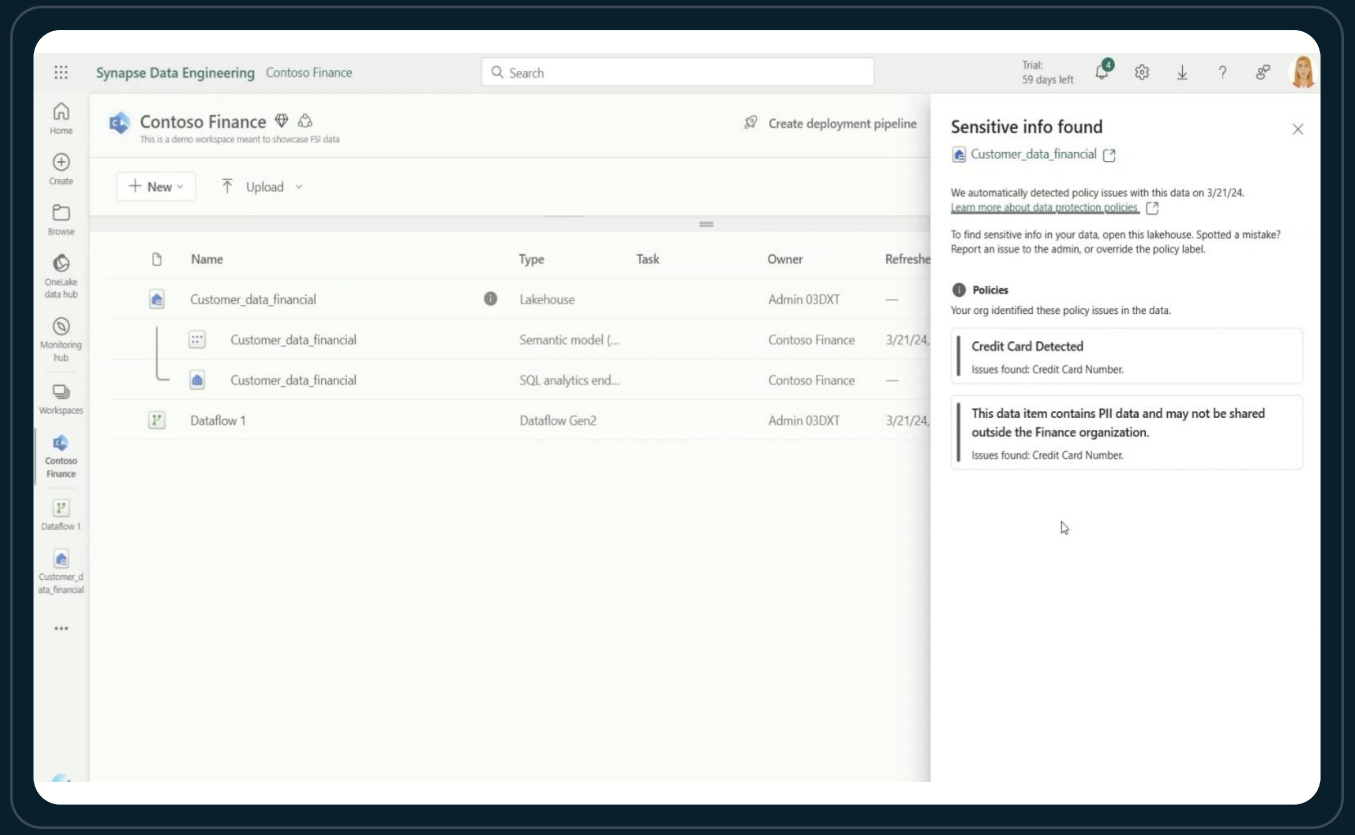
Purview Information protection & Data Loss Prevention

Data Loss Prevention policies:

- Automatically detect upload of sensitive data (e.g. PII) into Fabric and trigger risk remediation actions
- **What's new:** Public preview of Data Loss Prevention policies for Lakehouse, semantic models
- **Coming soon:** DLP for Warehouse, KustoDB;
- **Coming soon:** Restrict access action for Lakehouse

Information protection labels:

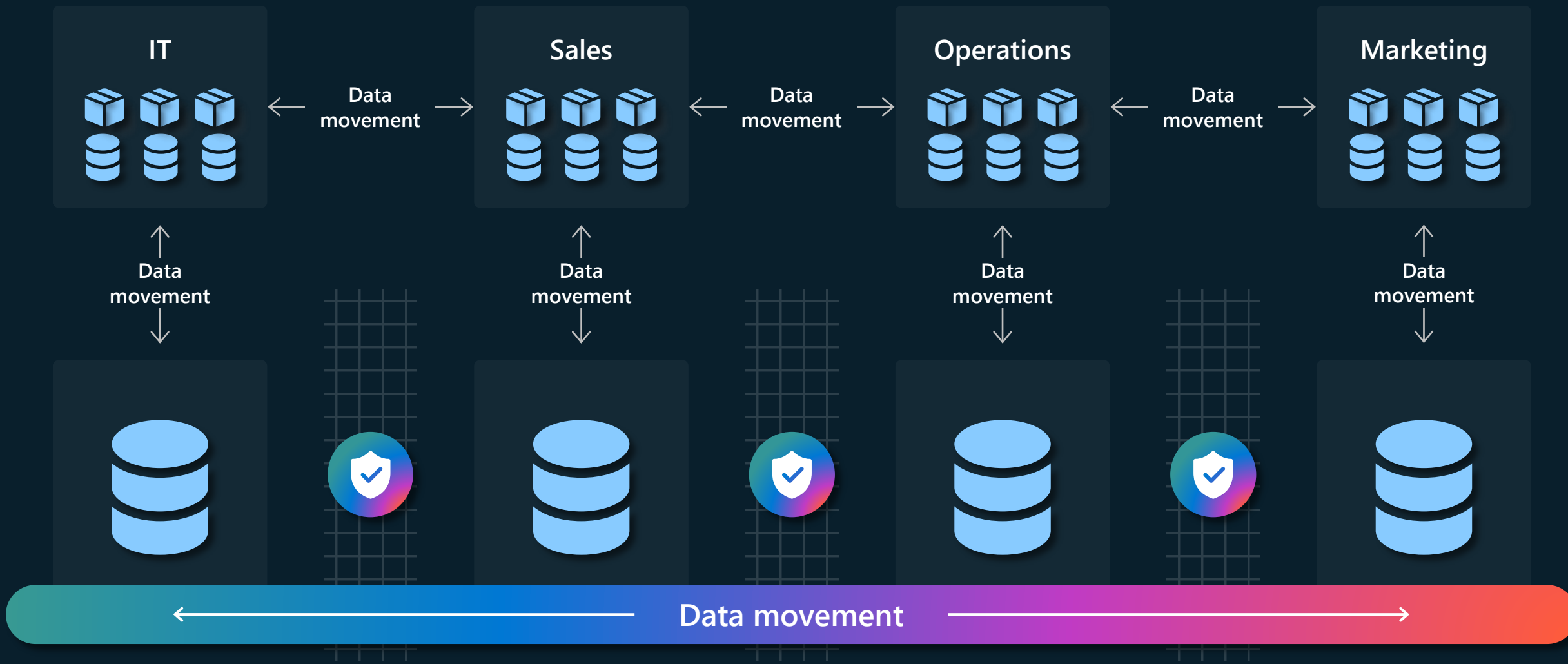
- Classify sensitive Fabric data using the same labels in M365 and enforce even upon export
- **What's new:** MIP protection policies to enforce access permissions for Fabric items& SQL DB
- **What's new:** Domain default sensitivity label
- **Coming soon:** MIP policies for PBI reports, datamarts, WH



Early adoptions of Microsoft Fabric have ..

Understood that Data Mesh is not just about technology

Today: Multiple siloed lakes with lots of duplication



Domains and subdomains

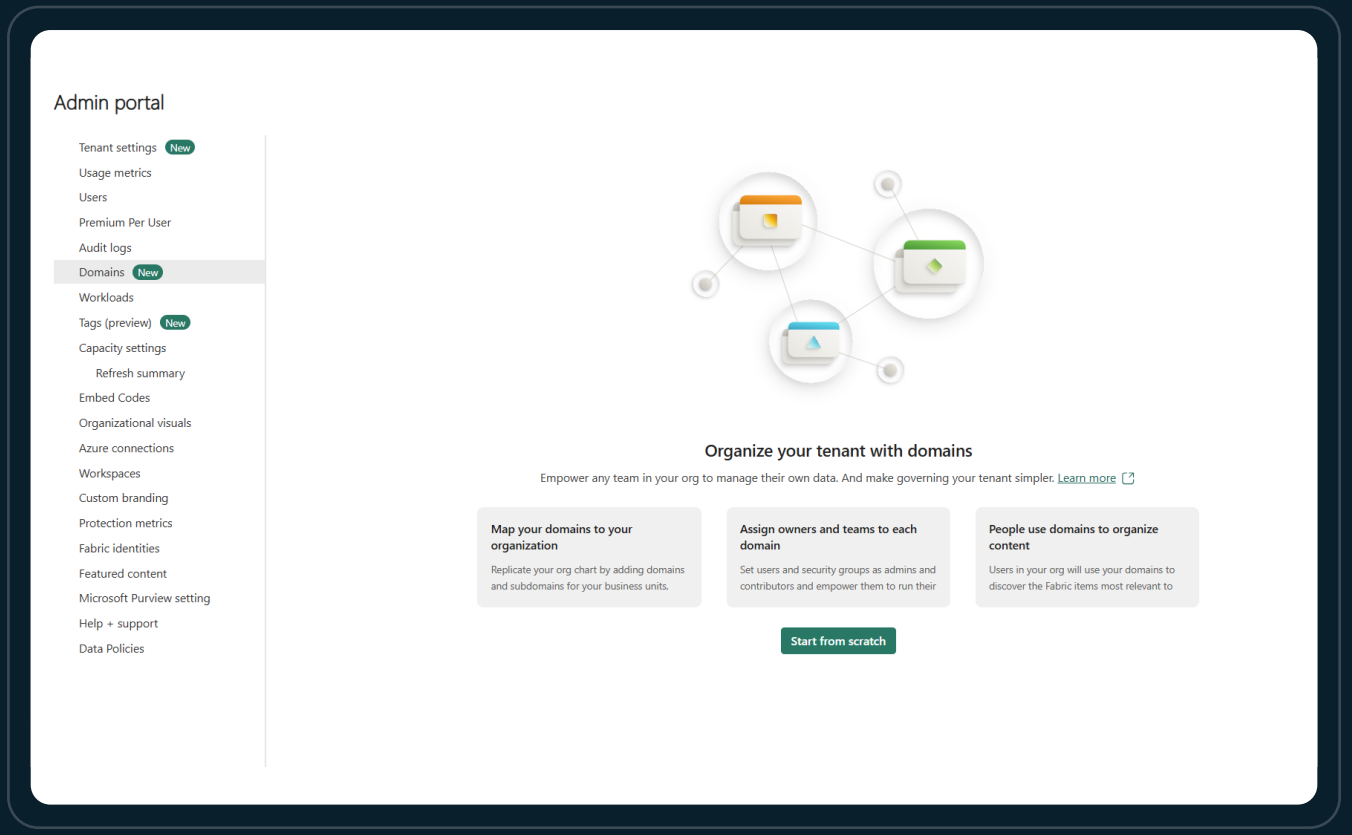
Structure data per business needs, allowing granular control, optimized consumption

Implement a data mesh pattern by logically grouping data relevant to a particular area (e.g., Sales, Finance) in domains & subdomains.

Optimize consumption & find relevant data faster by filtering/finding content by domains.

Gain granular control per business needs by delegating setting to domain-level.

Domains Management enabled also via Admin REST APIs, and traceable via domain Audit log activities.



Early adoptions of Microsoft Fabric have ..

Understood that content discovery and consumption is key

Demo

OneLake catalog

Introducing Fabric Org Apps

Broadly distribute content built in Fabric across your entire organization

Package content to distribute within your organization

Customize content, styling, navigation, & more to make it your own

New! Create multiple apps from the same workspaces!

AI Powered

Gen AI accelerates your data journey in Fabric

Copilot accelerated experiences

AI-driven insights

Custom generative AI for your data

Copilot built into every workload

Public Preview

Data Factory

Get intelligent code generation to transform data with ease and code explanations to help you better understand complex tasks.

Public Preview

Data Warehouse

Write and explain T-SQL queries, or even make intelligent suggestions and fixes while you are coding.

Public Preview

Data Engineering & Data Science

Quickly generate code in Notebooks to help work with Lakehouse data and get insights.

Public Preview

Databases

Write and explain T-SQL queries, or even make intelligent suggestions and fixes while you are coding.

GA

Real-Time Intelligence

Translate questions into KQL queries that you can execute.

GA

Power BI

Quickly create report pages, natural language summaries, and generate synonyms.

Public Preview

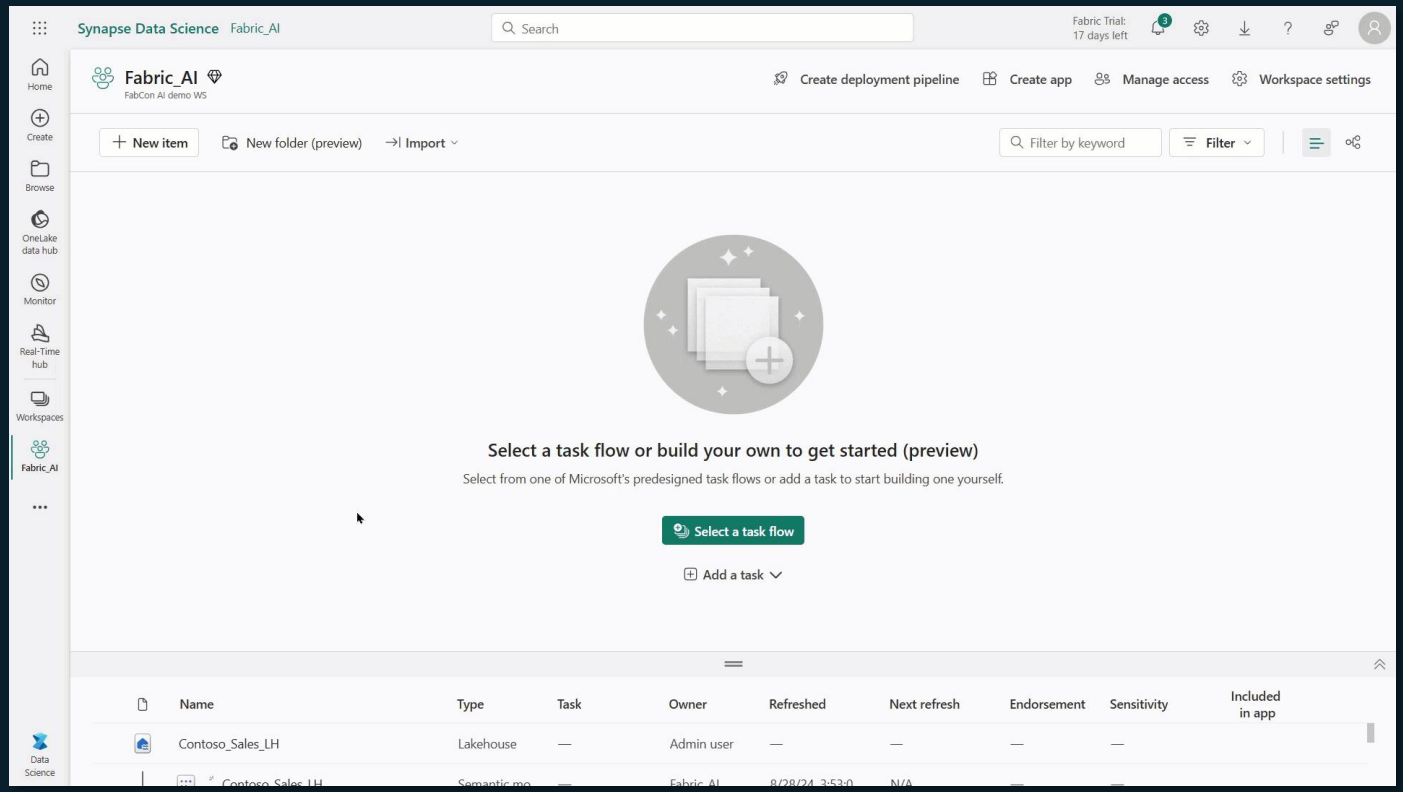
AI skills in Microsoft Fabric

AI Skill in Microsoft Fabric

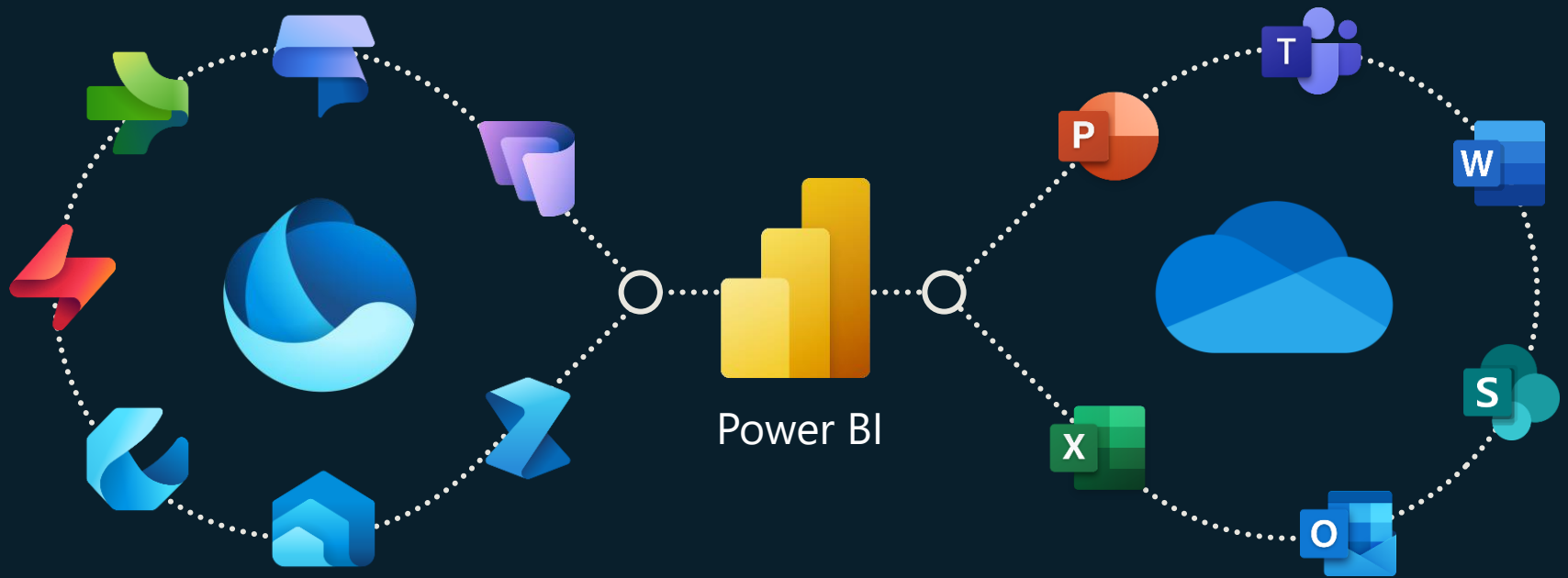
Public Preview

Deliver custom generative AI experiences for **your data** with **AI Skill**

- Allow your users to talk to your data in OneLake from your own applications
- Create, curate and configure a **Data expert** on your data domain
- Stay tuned for integrations with **Copilot Studio**, and **M365 Teams Chat**



The bridge from professional developers in Fabric to business users in Office



Copilot in Power BI

Unlock the full potential of your data

Get your data ready

Build semantic models & reports

Discover Insights

Copilot in Power BI

Unlock the full potential of your data

52%

faster task completion compared to not using copilot

36%

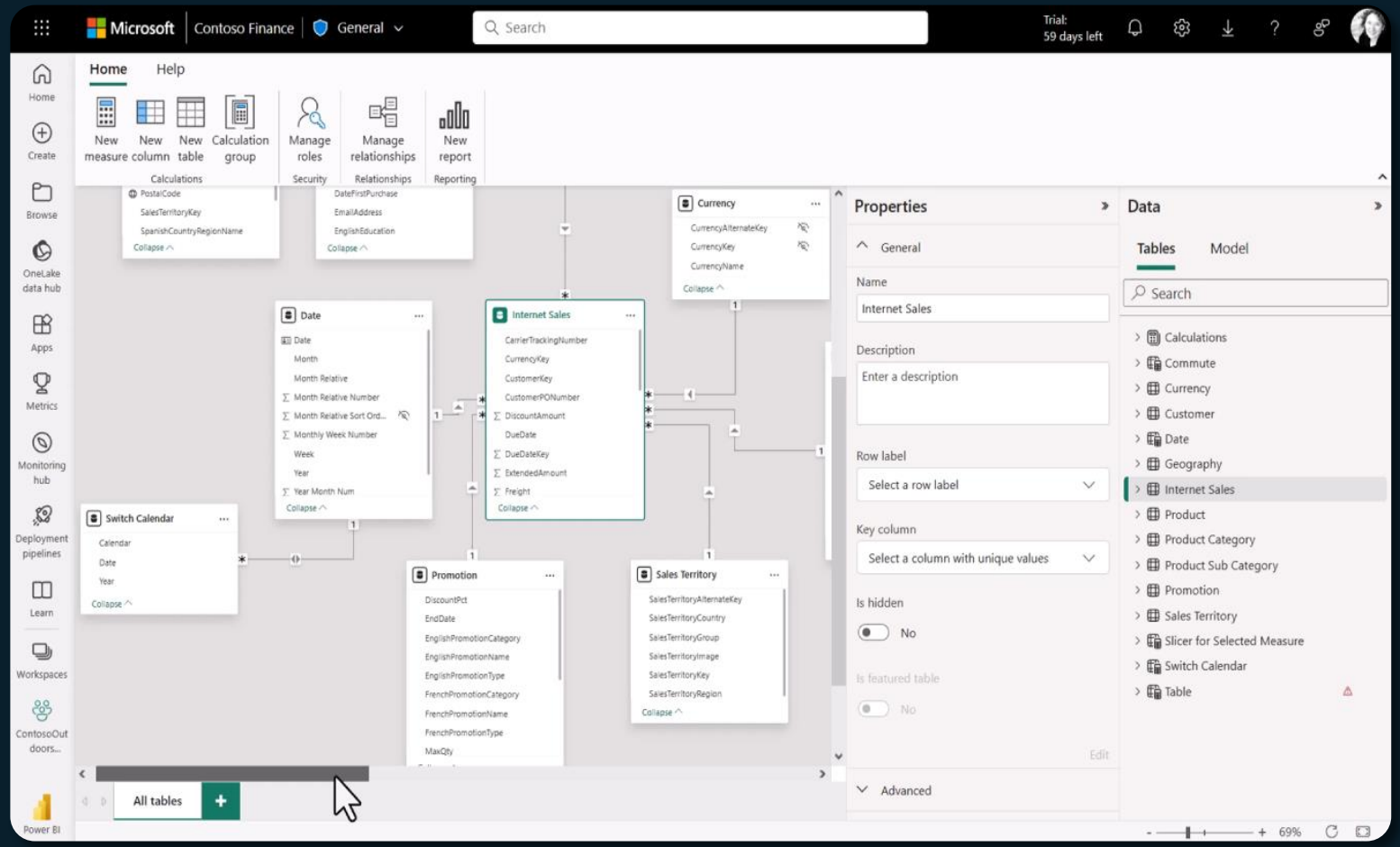
more accurate compared to not using copilot

90%

users tested were likely to adopt

SOURCE: Based upon n=209 randomized control study conducted by Microsoft Corporation in October 2024 that measured four common metrics associated with the consumption experience of Power BI in Microsoft Fabric and compared it to users that did not use copilot. Qualitative sentiment gathered upon task completion. Actual results may vary.

Semantic model superpowers



Clearly defined corporate metrics and KPIs

Friendly names for tables/columns well defined relationships

Trusted, vetted and certifiable as the basis for management reporting in Power BI and Excel

(While not perfect) help eliminate significant guess work for the AI