



EUROPEAN MICROSOFT FABRIC

Community Conference

VIENNA
15-18 SEPTEMBER 2025





Masterclass in Event-driven Architecture with Microsoft Fabric

Devang Shah, Sander van de Velde

15 September 2025

Sander van de Velde



Sander, short for Alexander

Lives in the Netherlands 

Dual MVP on both Azure IoT and Real-Time Intelligence
Principal IoT Architect at SDG Group

- specializes in Microsoft Azure IoT solutions
- involved in all aspects of Azure IoT Platform
- works on IoT innovations

Devang Shah



Lives in Paris, France 

Principal PM Manager, Microsoft

- specializes in data & insights-in-motion
- leads customer engagement and community evangelization team
- loves making others successful

Thierry Houy



Lives in Spain



Senior Program Manager, Microsoft

- specializes in Power BI
- involved in all aspects of Microsoft Fabric
- loves Real-Time Intelligence

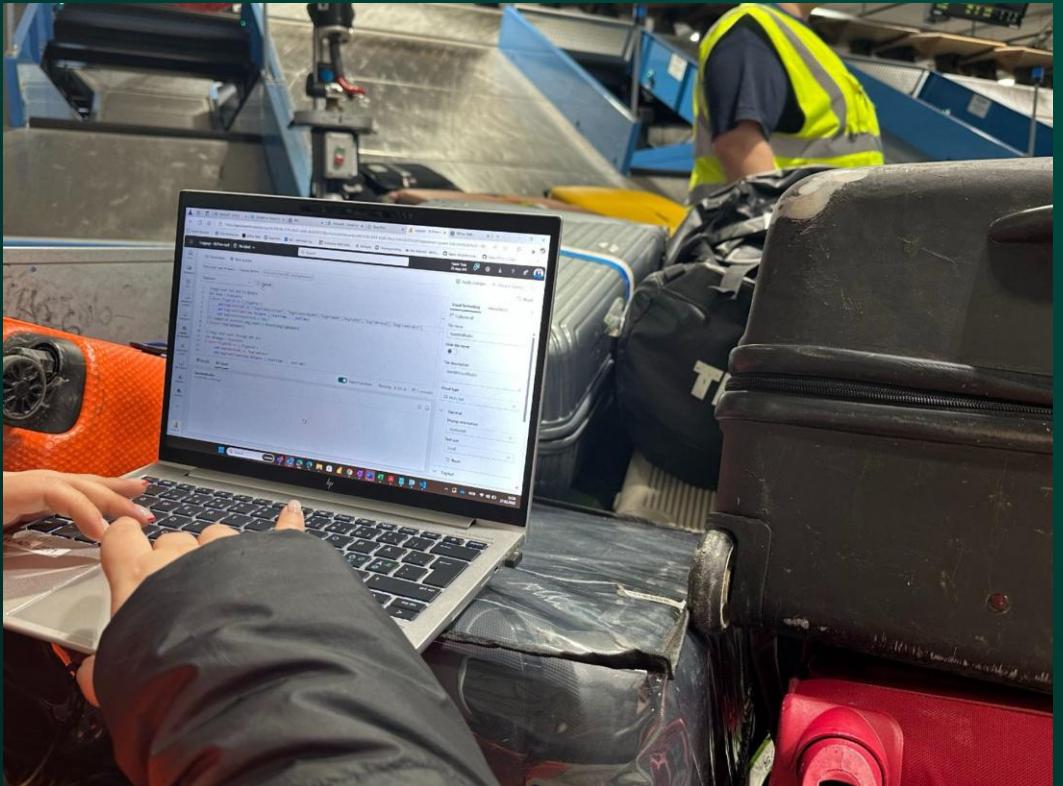
FabCon Europe 2024

Luiza Oancea
Data Engineer/BI
Architect @ Avinor

Ioana Bouariu
BI Architect @ Avinor



Learning → Applying → Sharing



Ioana Bouariu • 1st

BI Architect at Avinor | Certified Fabric Analyst and Data Engineer | Norwegian...
6mo • Edited •

A year ago, I never would have imagined that I'd be writing KQL (Kusto Query Language) on top of luggage carts and running real-time analytics on the ground at Norway's biggest airport. But here we are! Microsoft Fabric Real-Time Intelligence **#FabricRTI** is changing the game for baggage handling at Avinor, and I'm lucky to be right in the middle of it.

What started as a fun experiment for **Luiza Oancea** and me has quickly turned into something bigger - unlocking live operational insights, making baggage tracking smarter, and proving that real-time data can transform operations. And now we're taking this story to **FabCon!**

We'll be speaking at **#FabCon2025** in Las Vegas in early April, sharing hands-on lessons from this journey - how it all started, what worked, what surprised us, and what's next for real-time intelligence at **Avinor**.

If you're working with real-time analytics, KQL, or Microsoft Fabric, I'd love to hear your experiences!

And if you're attending **#FabCon2025**, let's connect - I can't wait to meet more people working hands-on with Fabric. Use my discount code BOUARIU200 and save \$200 off your conference registration: <https://lnkd.in/dbVsriTj>

📢 Who else is working with real-time data or heading to FabCon? Let's chat!
#FabricRTI #KQL #RTI #PowerBI #MicrosoftFabric #FabCon #DataGirl #Avinor

Real-Time Baggage Handling

Time range: Last 6 hours FlightId: JU393 Reset

Pages < Updating... As of less than a minute ago As of less than a minute ago As of less than a minute ago

Departure

BIA Visualizer
Arrival

Generated	BHSBin	Seen	Loaded
57	44	48	37

| As of less than a minute ago |
|------------------------------|------------------------------|------------------------------|------------------------------|
| BEG | OZ transfer | SeenlAnlegget | LoadedNoBHSBin |
| 21:25 | 0 | 0 | 7 |

Transfer Updating...

prev	IATA	total	bhs	seen	load	probIBT	pro
> SK319	HAU	1	1	1	0	2025-03-14 19:14	2025-03-14 19:14
> SK369	TRD	3	3	3	3	2025-03-14 19:24	2025-03-14 19:24
> SK373	TRD	1	1	1	1	2025-03-14 18:47	2025-03-14 18:47
> SK377	TRD	1	1	1	0	2025-03-14 19:54	2025-03-14 19:54
> SK4040	SVG	1	1	1	1	2025-03-14 18:52	2025-03-14 18:52
> TOTAL	-	7	7	7	5	-	-

Bins 2 rows · As of less than a minute ago

bins	c
T2FS104	13
T2FS103	31

Tail2tail Updating...

bagTagNumber
0115135492
2115900390
2115900391

Lost? 14 rows · As of less than a minute ago

bagTagNumber
0115135310
0115135311

What can you expect today?

- Dive into event-driven architectures and product capabilities
- Use cases and examples
- Hands-on lab

What we expect from you?

- Be curious, ask questions (raise your hand)
- Follow the instructions for hands-on lab
- Be kind to your neighbours, help each other to learn

Today's agenda

09:00 – 10:30

Welcome and introduction
Event-driven Architectures – Why & What?
Setting up the lab environment

10:30 – 11:00

Morning Break

11:00 – 12:45

Hands-on lab - Part 1
Product Deep Dives

12:45 – 13:45

Lunch Break

13:45 – 15:15

Hands-on lab - Part 2
Continuing the Product Deep Dives

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Afternoon Break

15:45 – 17:00

Completing the lab
Recap, Demo & Q&A

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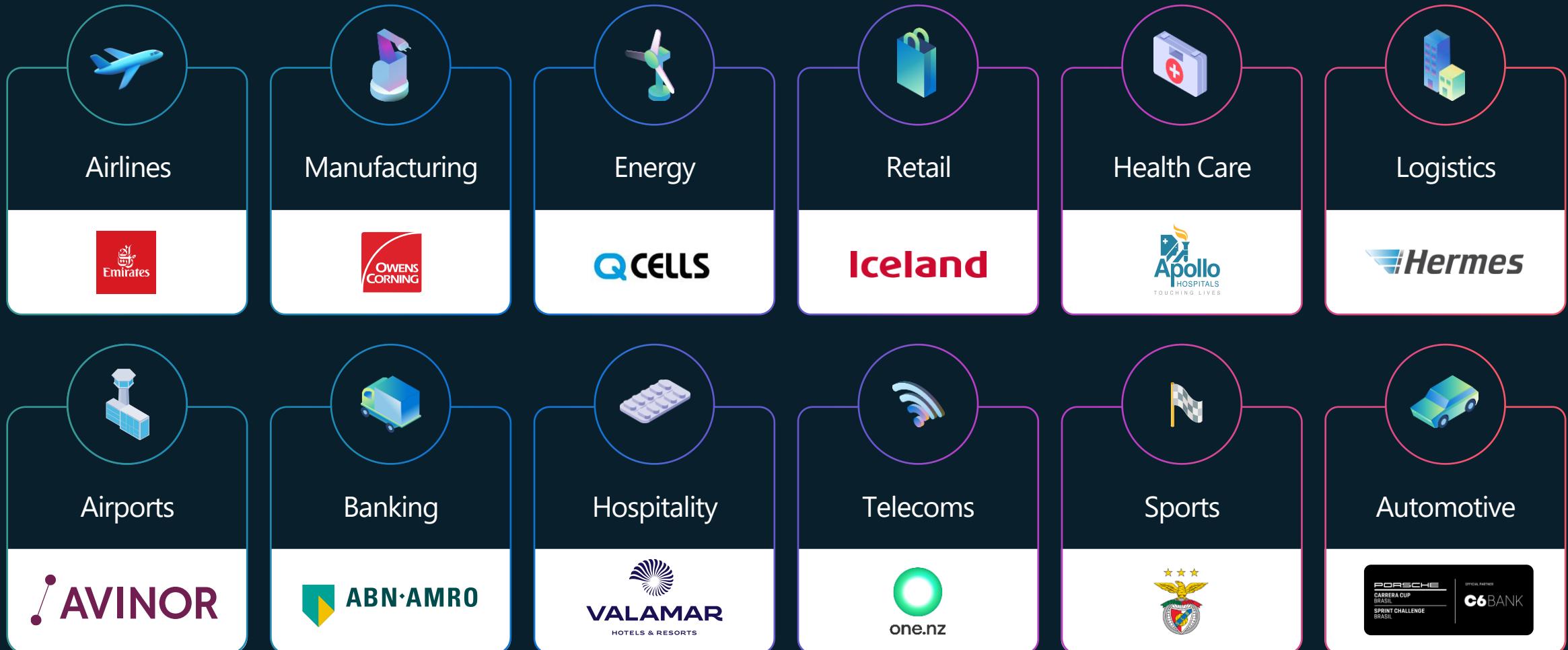
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Completing the lab
Recap, Demo & Q&A



Event-driven Architectures and Patterns

Happening across a variety of industries



Common business and operational needs today



I want to know when something changes in my operational systems (database)



I want continuous, granular insights from my assets



I want near real-time reporting, ML scoring and GenAI apps

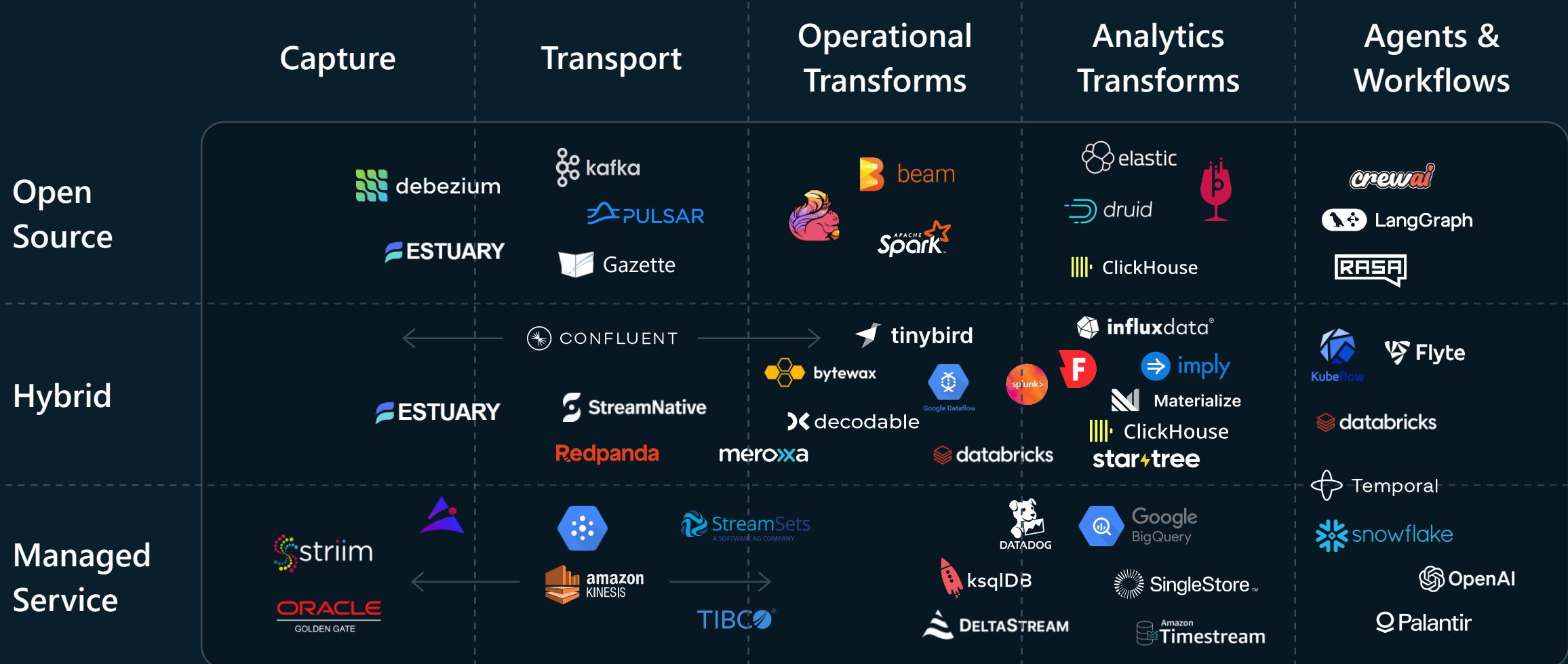


I want to process/act/react on events occurring in my physical or digital asset

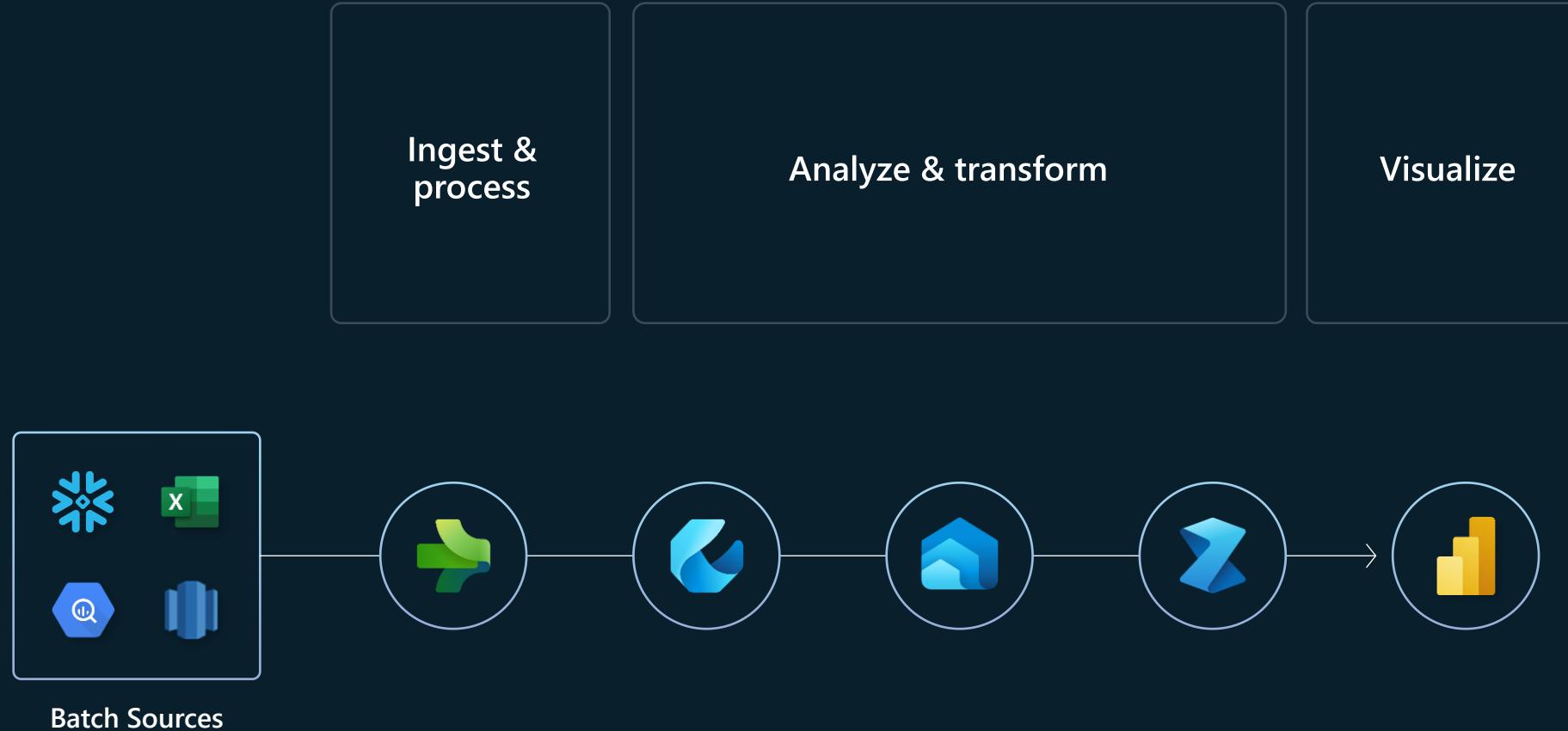


I want real-time view into customer interactions and transactions

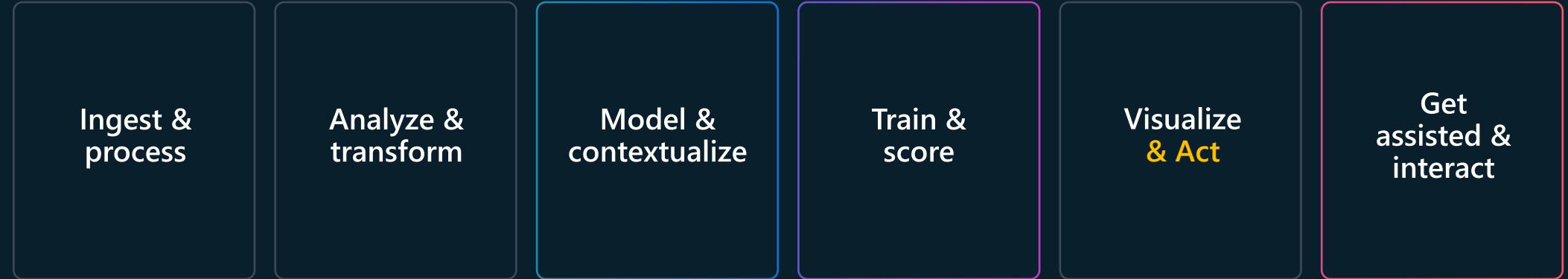
Fragmented landscape to build event-driven patterns



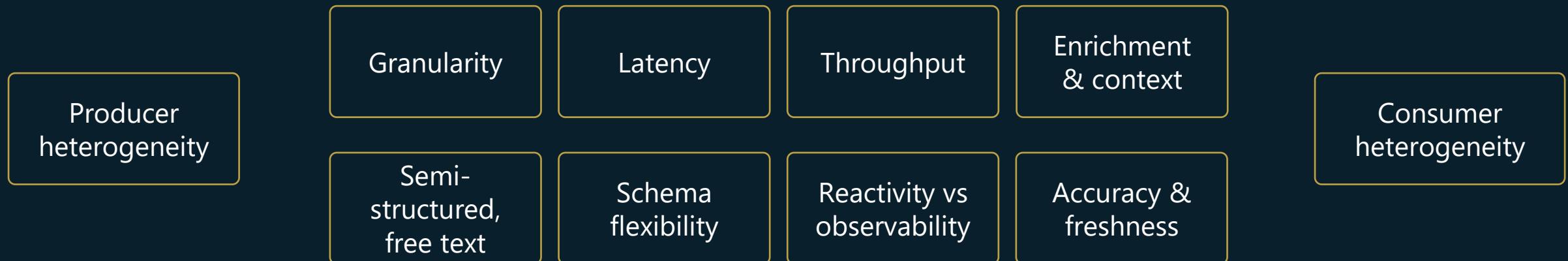
Pattern practiced and perfected over time



For increased business agility, there are additional paradigms



and new challenges



Microsoft Fabric

The unified data platform for AI transformation



Data
Factory



Analytics



Databases



Real-Time
Intelligence



Power BI



AI



OneLake



Governance

Fabric Platform



Real-Time Intelligence in Microsoft Fabric



Enterprise real-time
data platforms

Azure Event Hubs

Azure Event Grid

Azure Stream Analytics

Azure Data Explorer



Self-serve experiences
for business users

Power BI

Activator

Real-Time Hub

OneLake



Intelligent insights
and capabilities

AI skills

Anomaly detection

Agents



Real-Time Intelligence
in Microsoft Fabric

Fully integrated

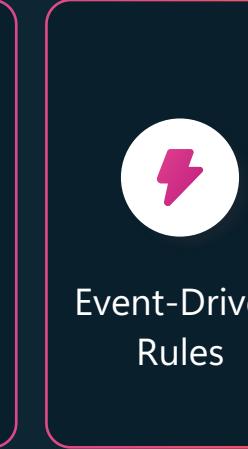
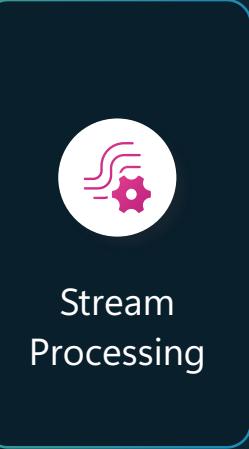
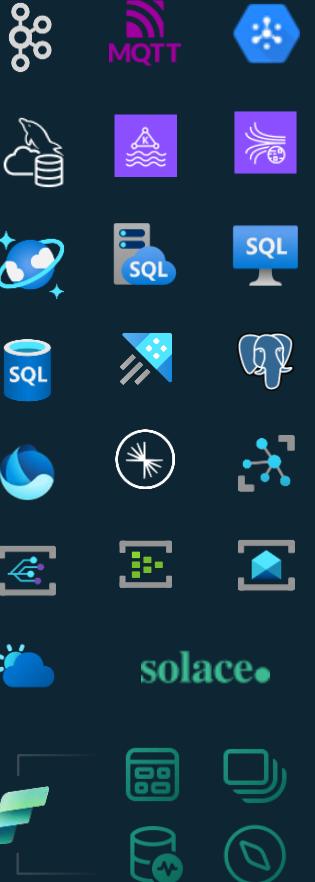
SaaS-native experiences

Single data estate

Unified data platform



Real-Time Intelligence in Microsoft Fabric



Fabric Platform



AI



OneLake



Real-Time Hub



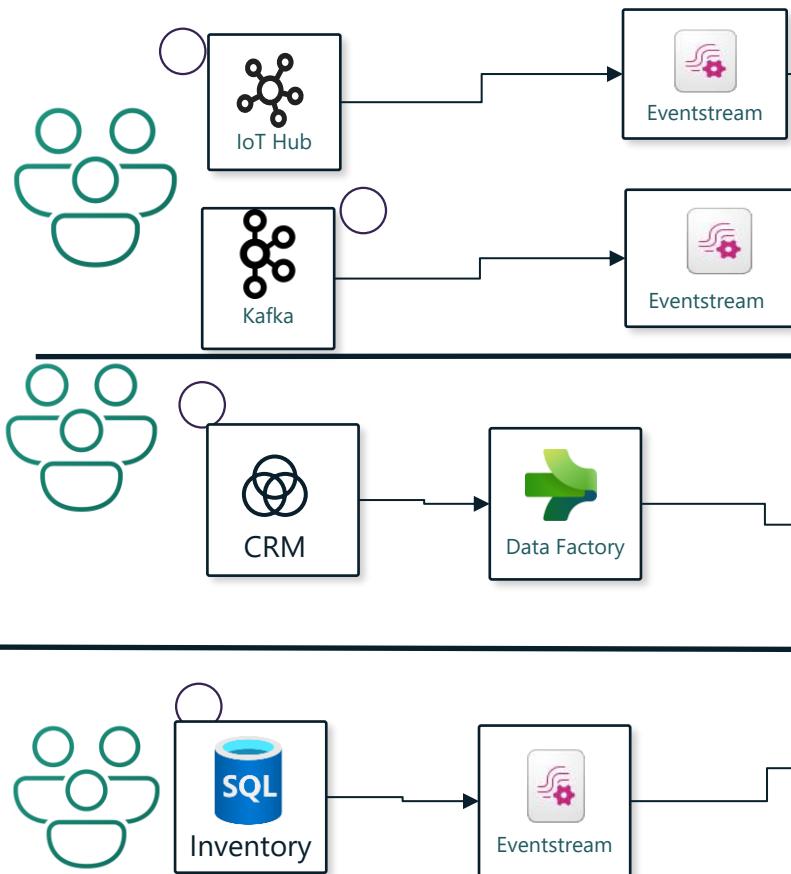
Governance

Connectors

Operational Reporting

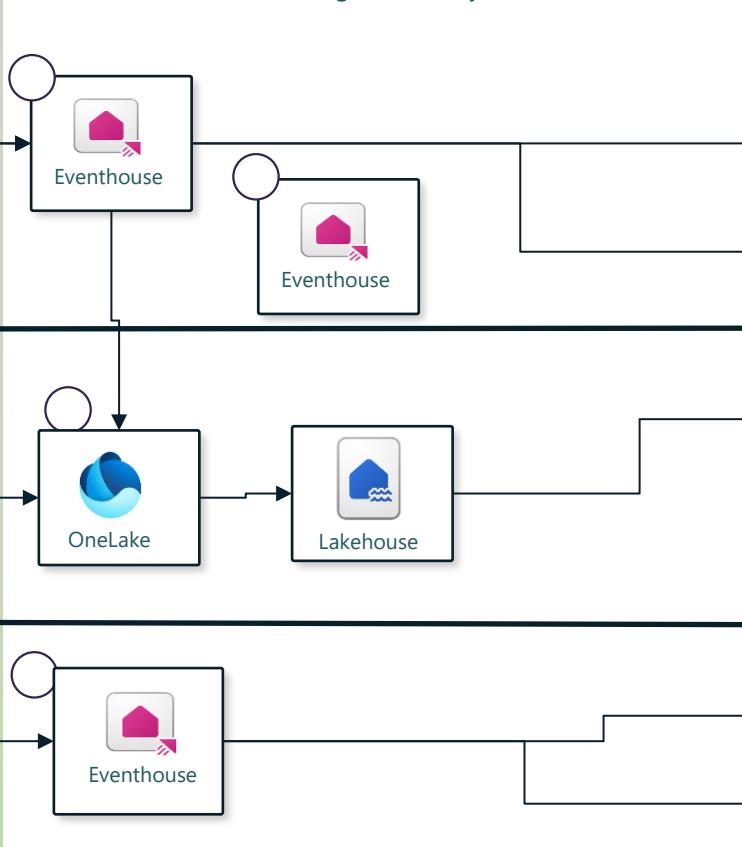
Ingest & process

1. A work order team loads vehicle telemetry in real-time into Fabric RTI
2. A finance team maintains financial reporting data in a CRM
3. Work Order data is sent via Kafka topics to an event stream in the work order workspace
4. An inventory team manages the stock across all products in the organization in a SQL Server database



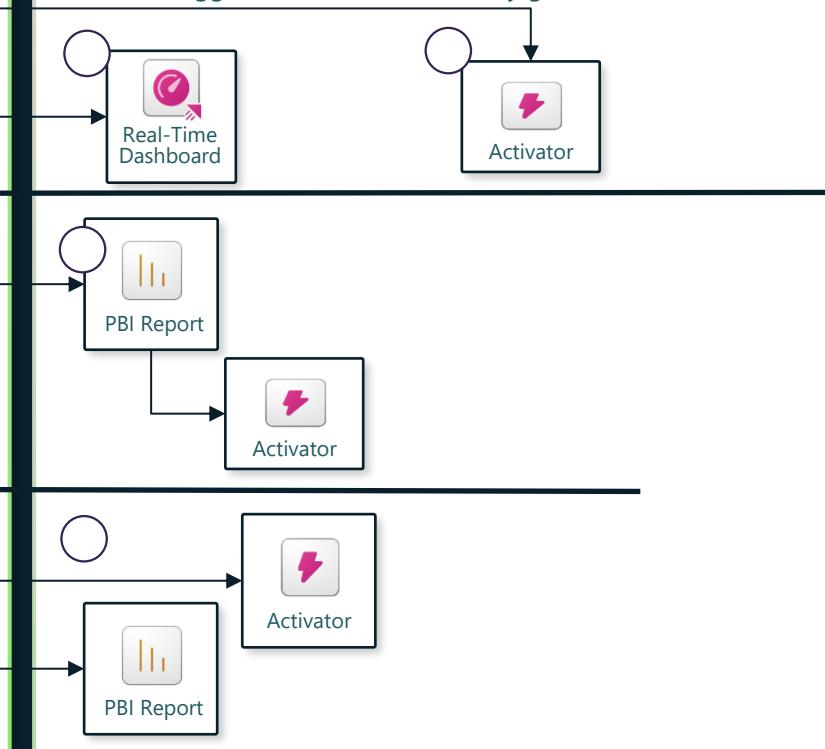
Analyze & transform

5. An eventhouse uses table update policies to load and process data
6. Finance mirrors the data to OneLake and transforms it with CRM data using either SQL or Spark
7. Inventory team loads data to Eventhouse storing up to the minute inventory data
8. An Eventhouse shortcut is created back to the Work Order team to leverage inventory data in real-time

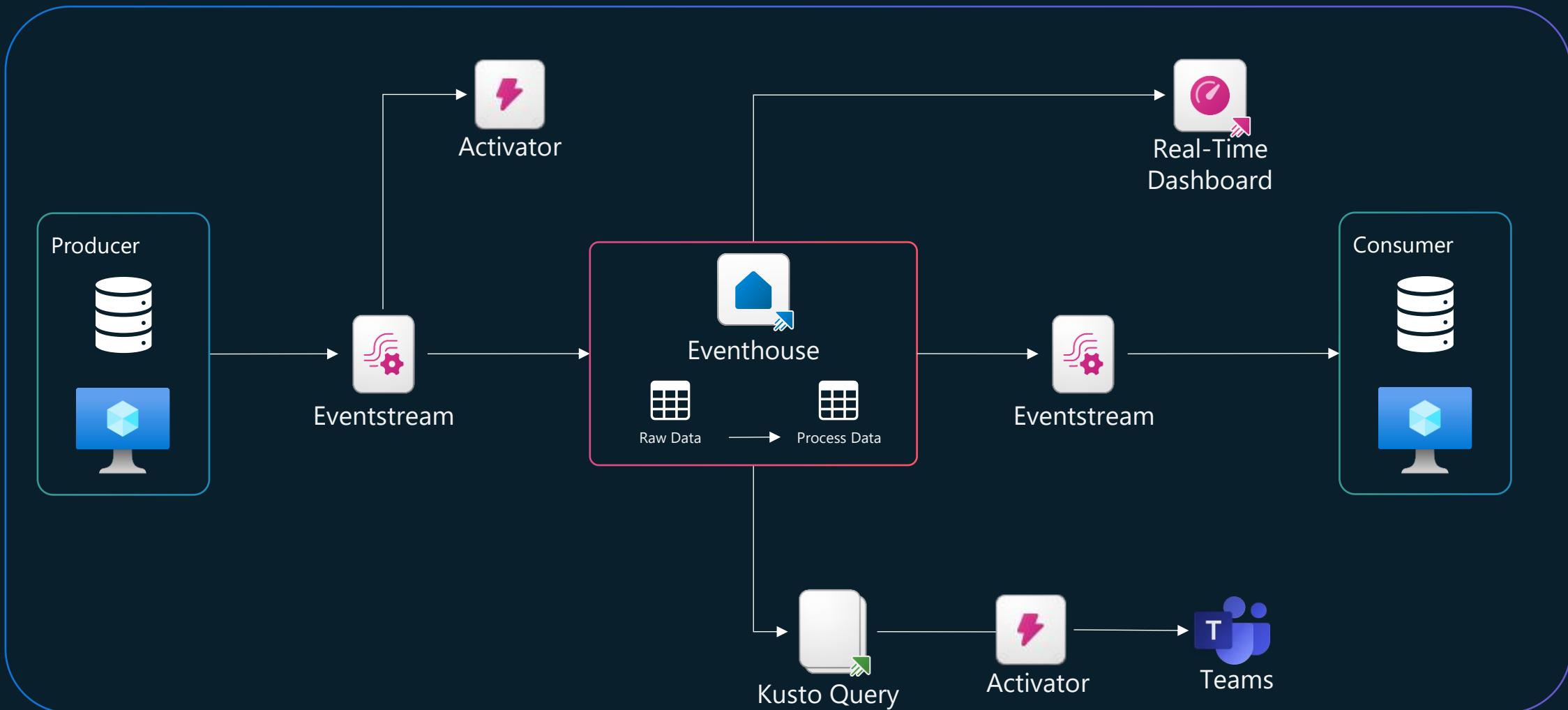


Visualize and Activate

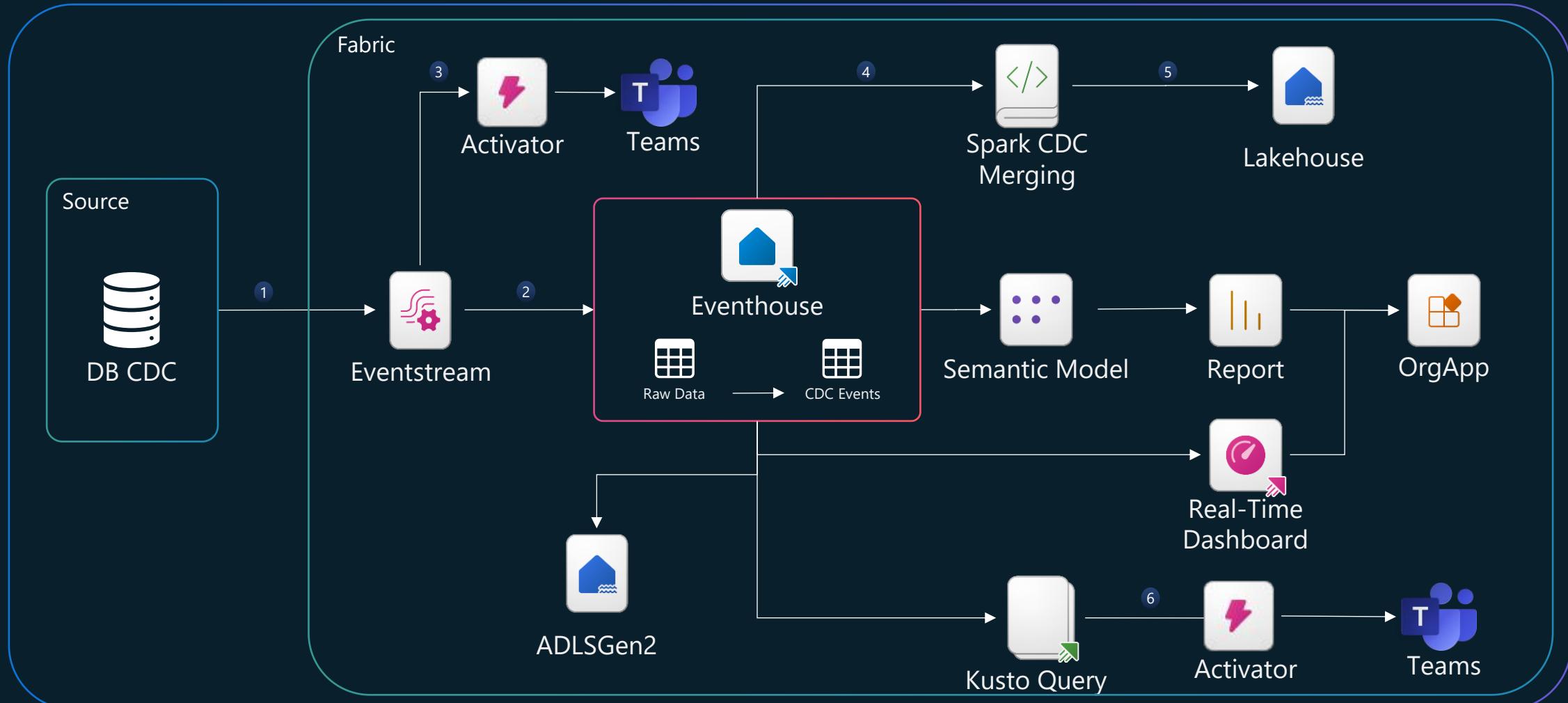
9. A real-time dashboard provides an up-to-date view of the work order system along with a map showing the closest available technician
10. An activator is triggered which creates a dispatch to the nearest available technician
11. A Power BI report runs within Finance that reconciles work orders and CRM data for monthly reporting. Finance creates an activator which creates the invoice upon work order dispatch
12. The inventory team has a Power BI report running showing up to the minute inventory information, and an activator that triggers alerts when inventory gets low



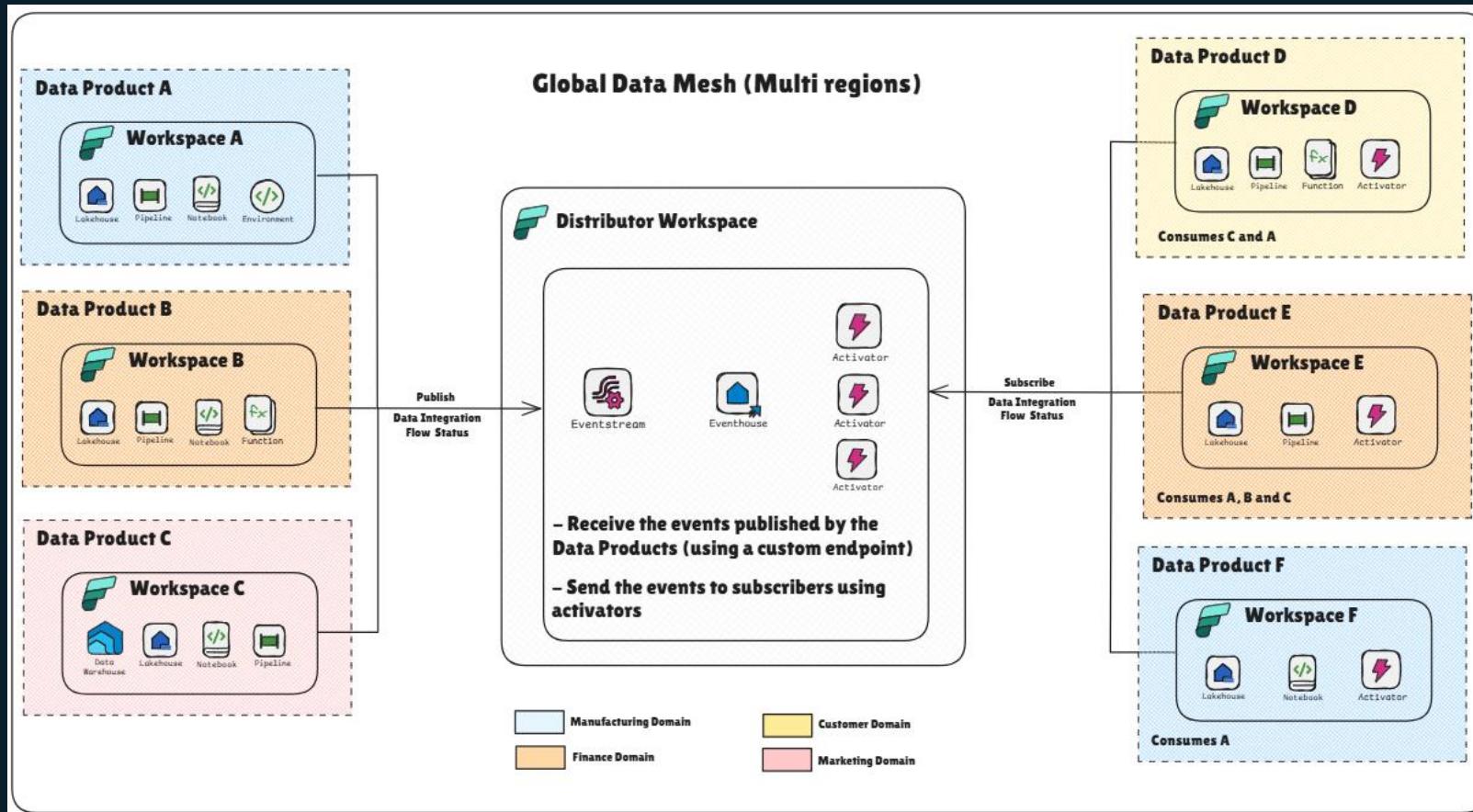
Pub-Sub Stream Processor



Database Change Data Capture Processing



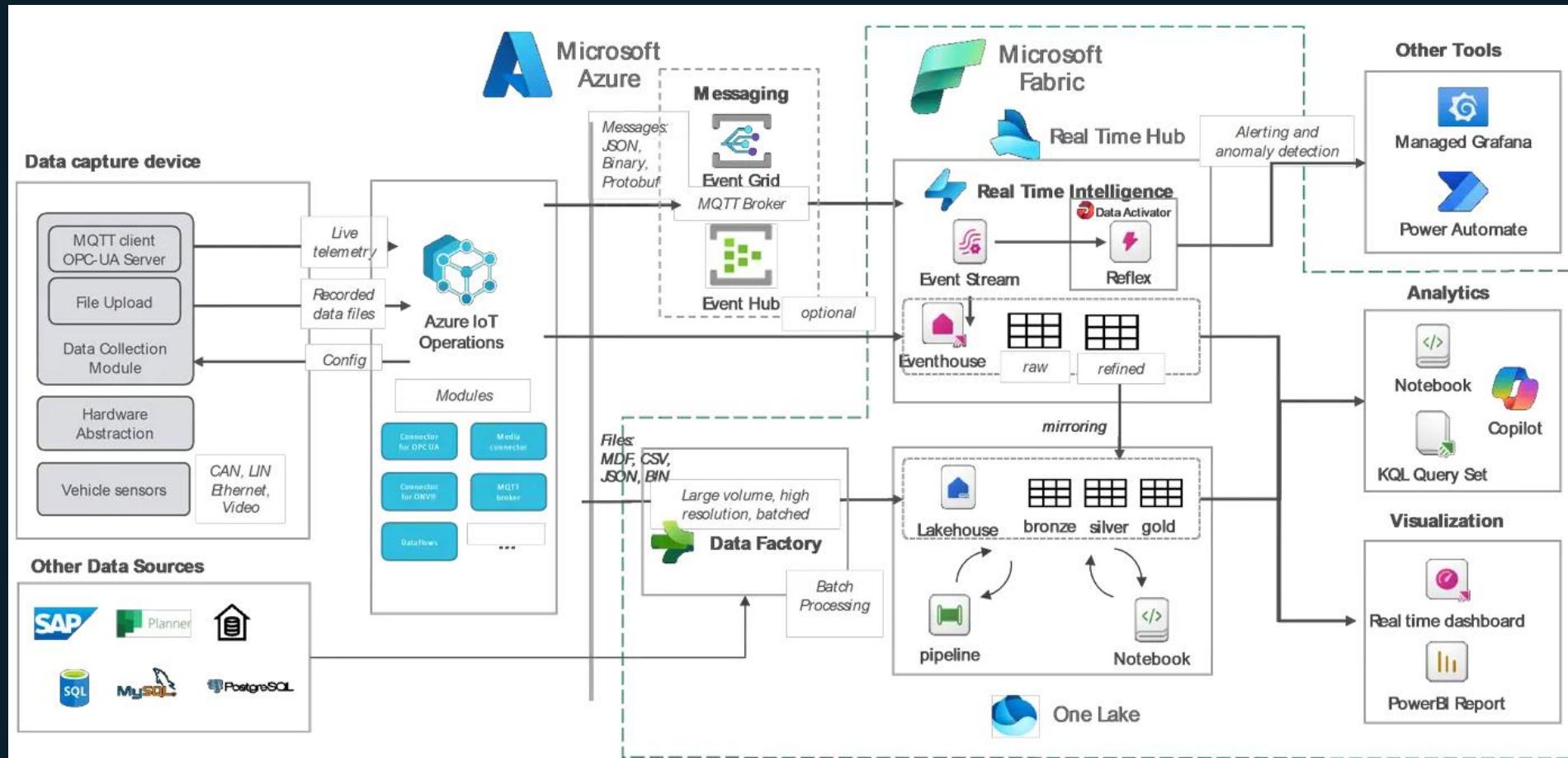
Data Product Synchronization Pattern



Credits: Stephane LUAP

(8) MS Fabric - Data Products dependency challenge | LinkedIn

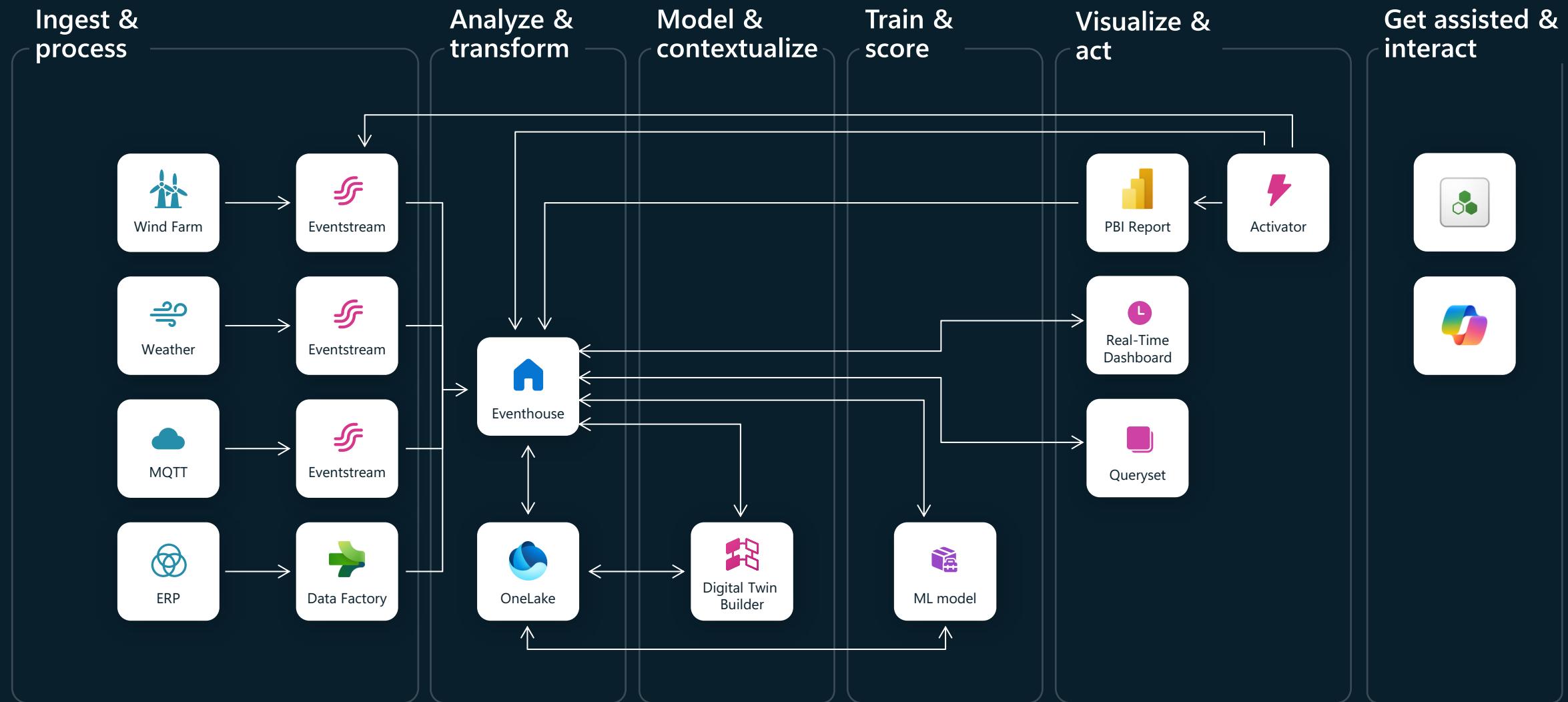
Smart Manufacturing



Credits: Florian Stein

Real-Time Intelligence With Azure IoT & Microsoft Fabric

Energy Management

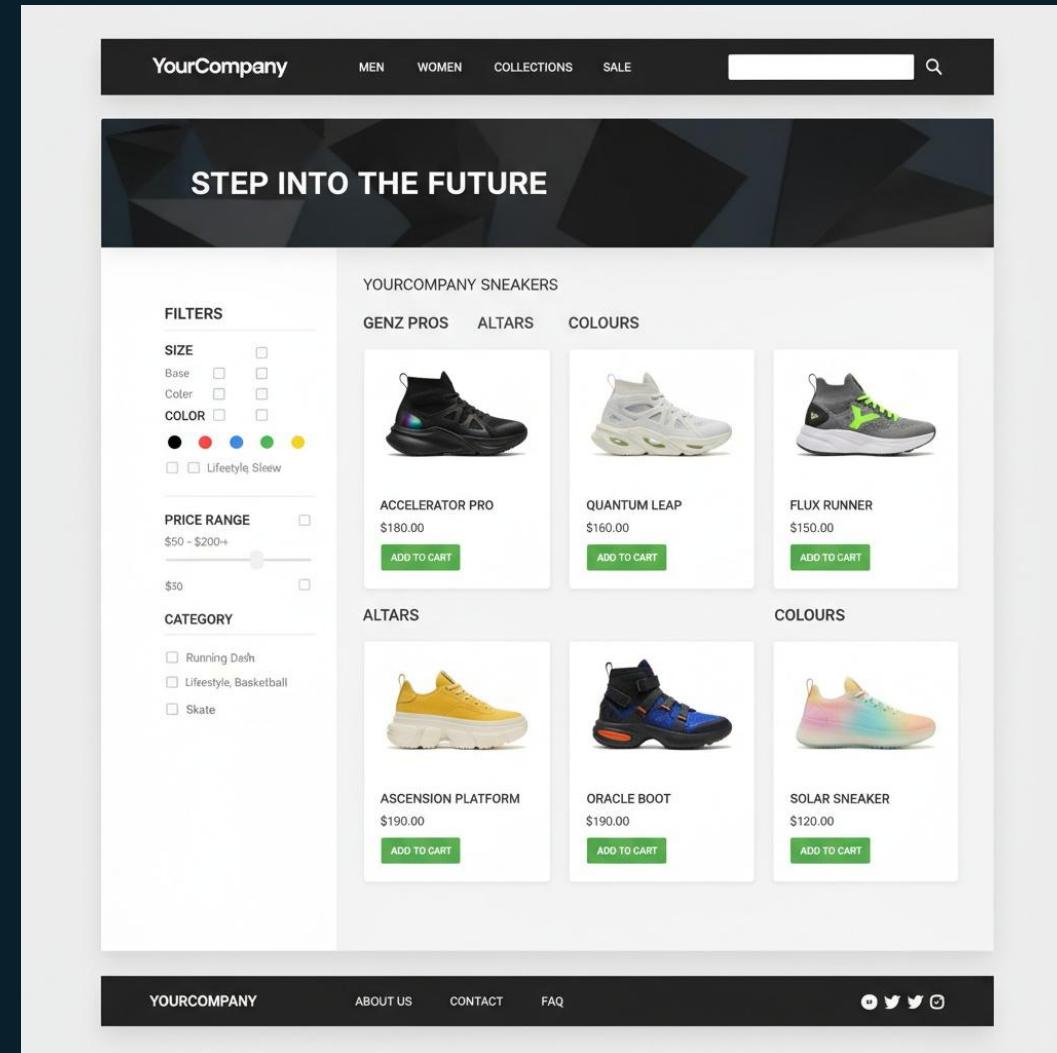




Setting up the lab

Scenario

- YourCompany is a Direct-to-Consumer (D2C) European sneaker manufacturer. YourCompany operates 3 manufacturing sites in Germany, Sweden and Estonia with multiple distribution centres, 10 retail brick and mortar stores and an e-commerce store.
- For this tutorial, we're going to focus on:
 - **Shipping events** in the form of XML files as the sneaker boxes move from the distribution center to customer's addresses
 - **Clickstream data** to monitor how consumers are interacting with the website
 - **Factory data** monitoring the pressure, temperature, vibrations of the cutting, bonding and stitching machines
 - **Weather data** to create test scenarios as per the different weather conditions that exist around the world



Today's labs

- Lab 1: Shipping Events
- Lab 2: Clickstream Events
- Lab 3: Factory Events
 - Lab 3.6 & Lab 3.7 are bonus
- Lab 4: OneLake Events

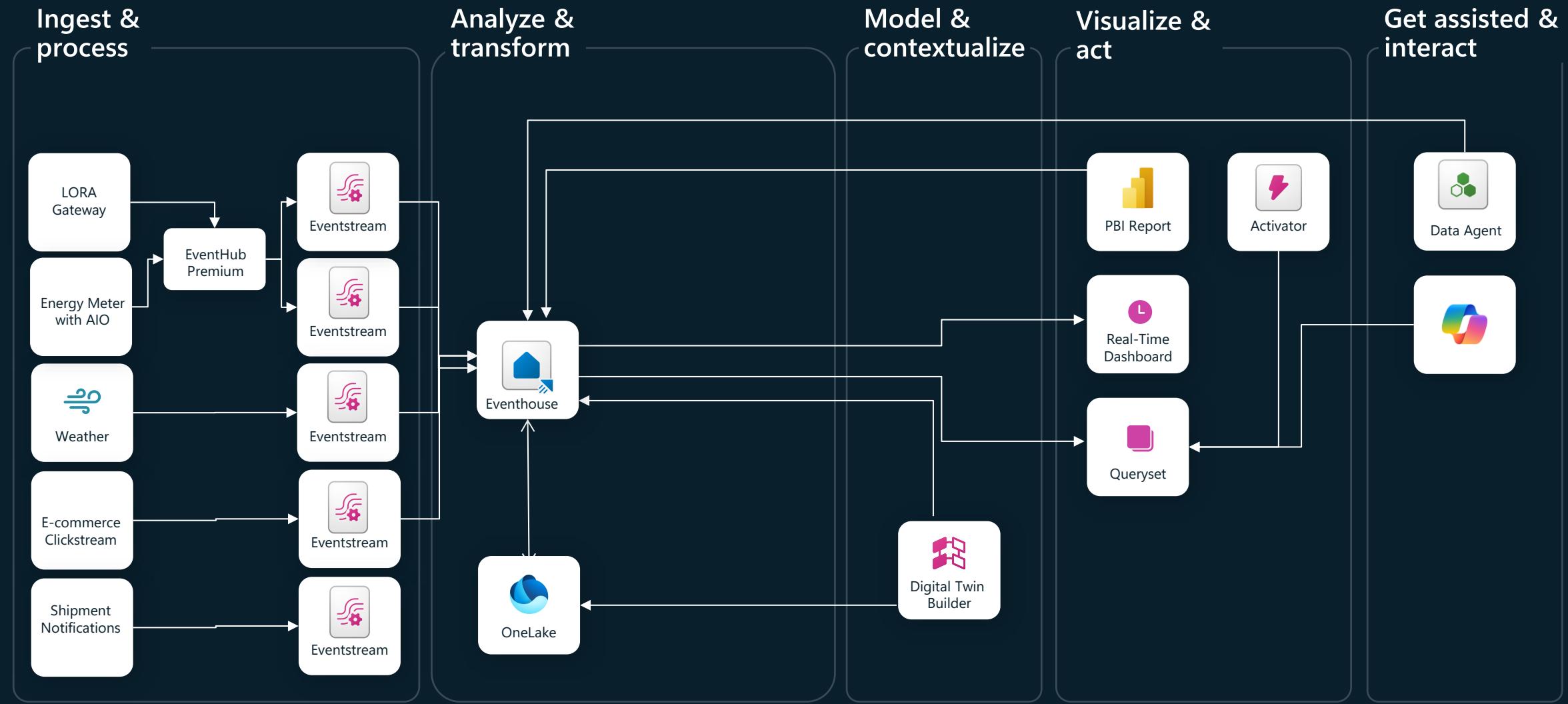
Instructions

- Use a different browser or private tab to avoid using your existing credentials
- Navigate to <https://app.fabric.Microsoft.com>
- Login with your username and password available on your desk
- Setting up MFA is mandatory

Login instructions

- app.fabric.Microsoft.com
- FabConUserXXX@mrtacat.onmicrosoft.com
- P: Workshop1234!

Workshop Architecture



→ To be built during the workshop.

→ Built using Fabric CLI (automated)

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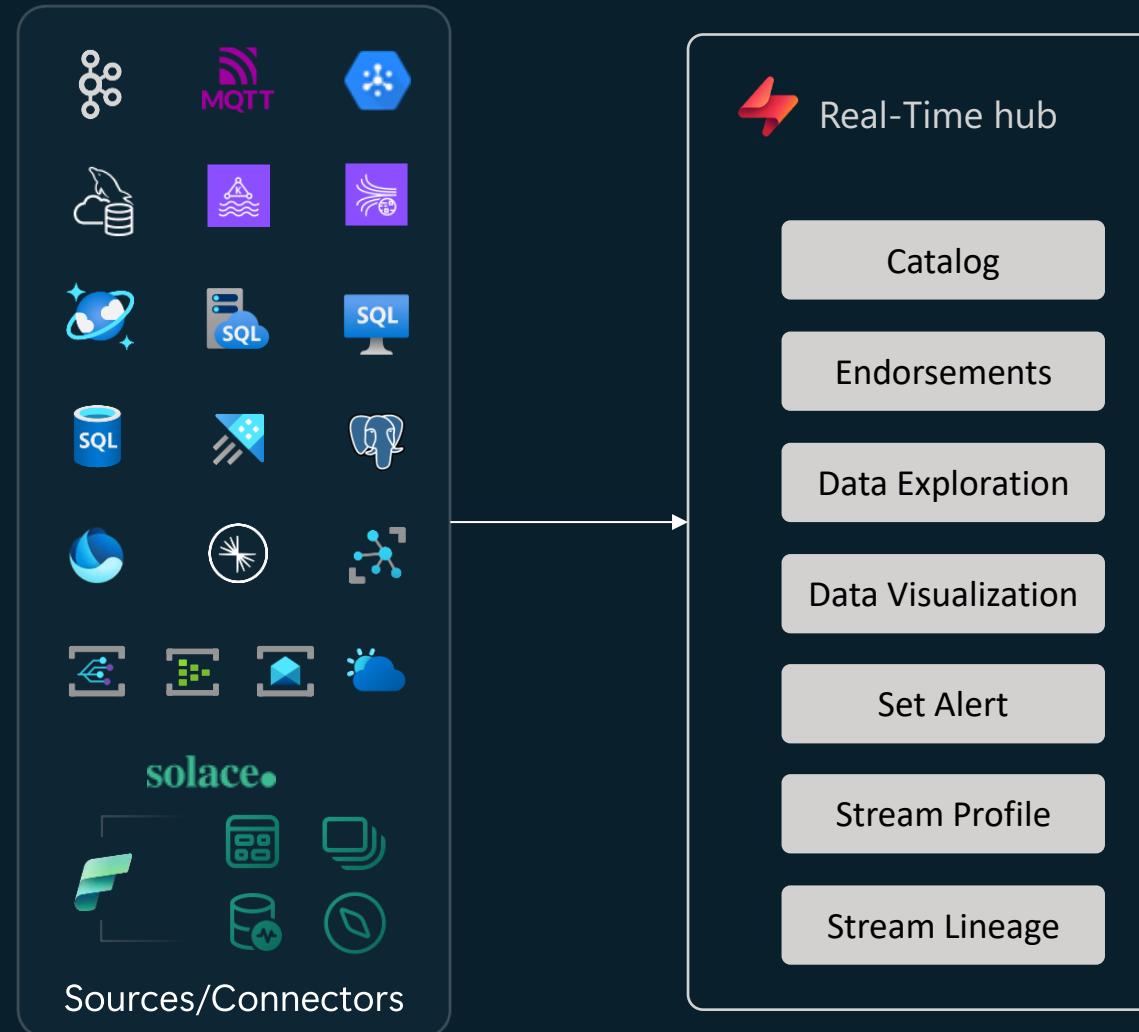
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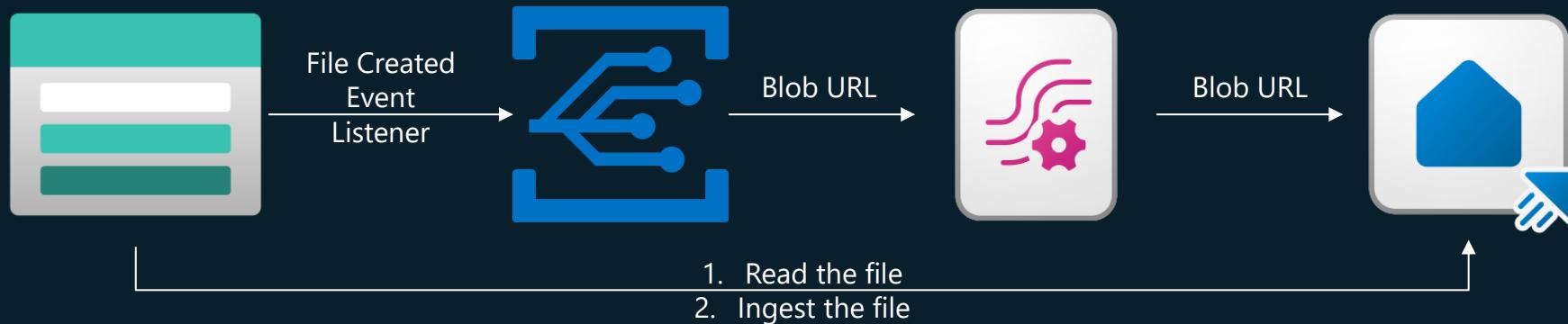
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Completing the lab
Recap, Demo & Q&A

Real-Time hub

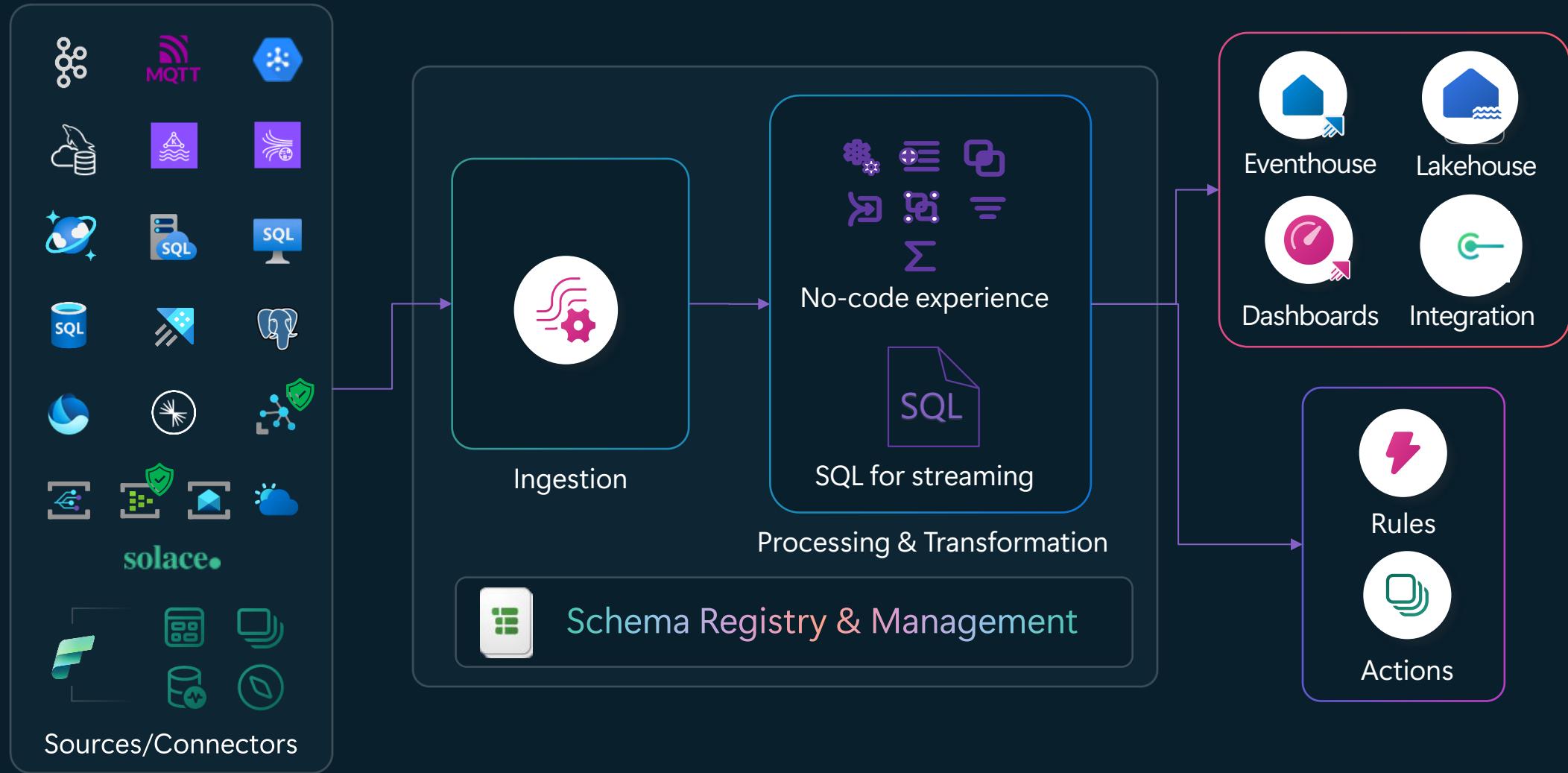


Lab 1: Processing XML files



- Instructions:
 - Navigate to the Eventhouse and then to its KQL Database
 - Click on Get Data
 - Choose Azure Storage
 - Choose RawShippingMsgs as the destination table
 - Choose Select a connected storage account
 - Rename the Eventstream

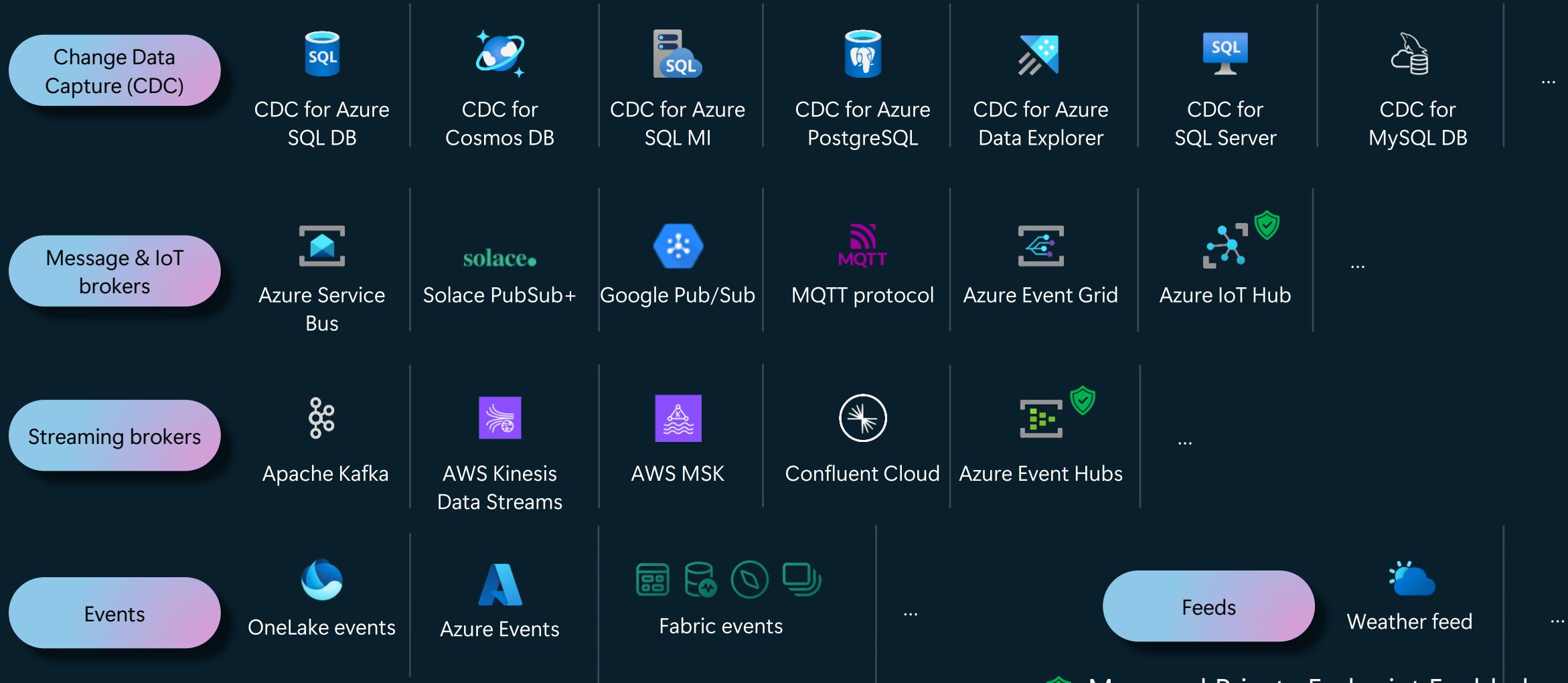
Ingest, process, and route events using Eventstream



🛡️ Managed Private Endpoint Enabled

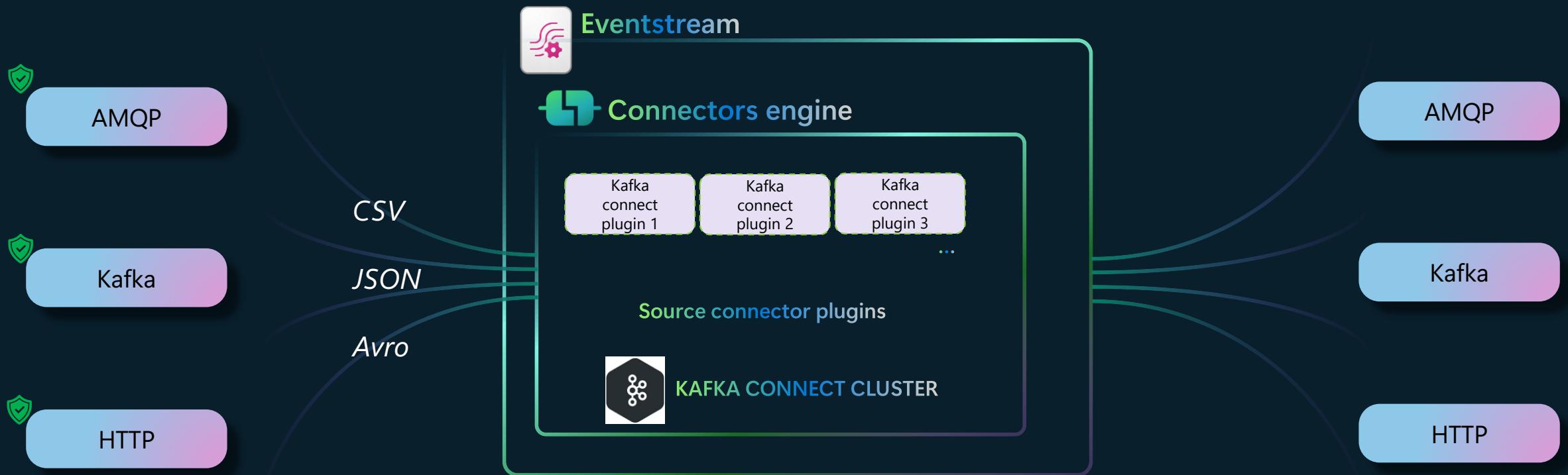
Connect events from many types of sources

Examples of connectors and sources



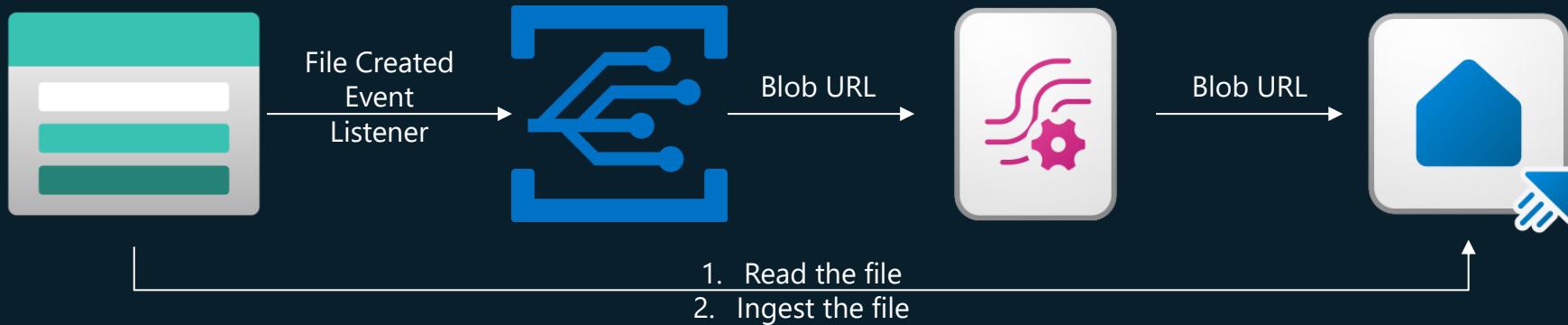
Managed Private Endpoint Enabled

Ingest and egress using open protocols and open source



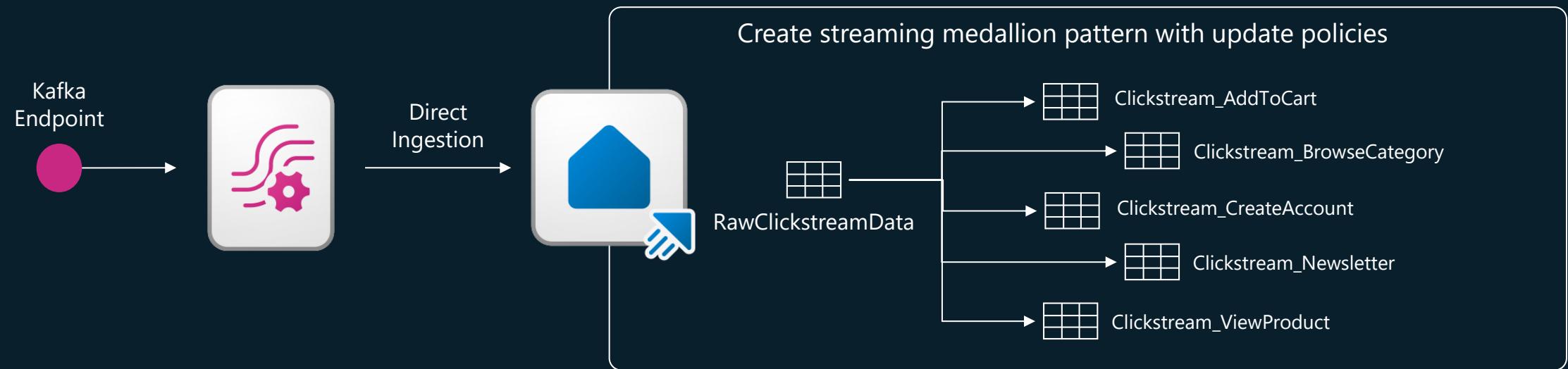
🛡️ Entra ID Authentication Supported

Lab 1: Processing XML files (continued...)



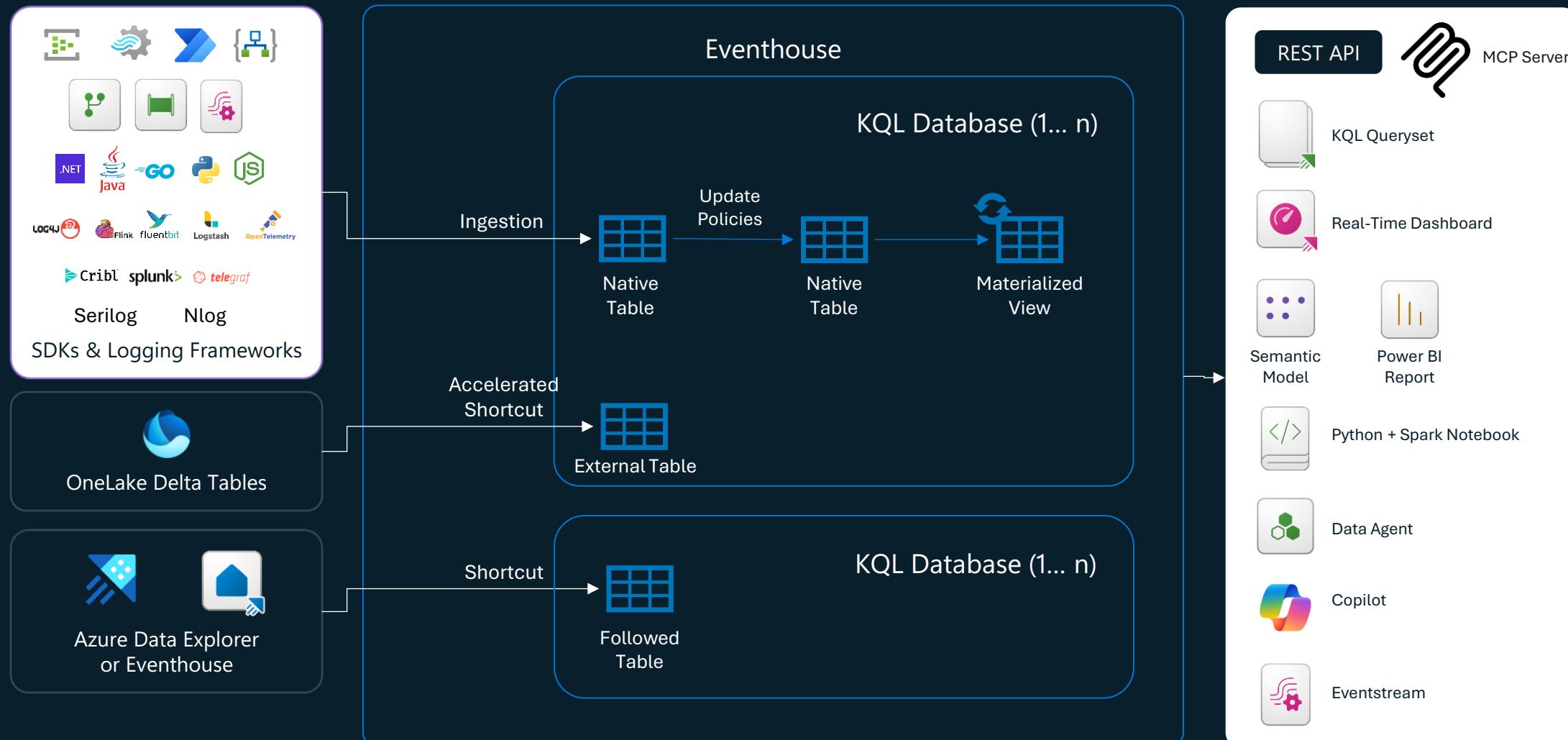
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 - Choose Azure Storage
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 - Choose Select a connected storage account
 - Rename the Eventstream

Lab 2: Listening to Clickstream events



- Instructions:
 - Navigate to your workspace
 - Open the python notebook
 - Start the python notebook
 - Run the KQL Script
 - Navigate to the Evenstream from your workspace
 - Edit the topology
 - Add destination as Eventhouse

Analyse and transform events using Eventhouse



Workspace Private Link Support,

Event (Real-Time) Medallion Architecture

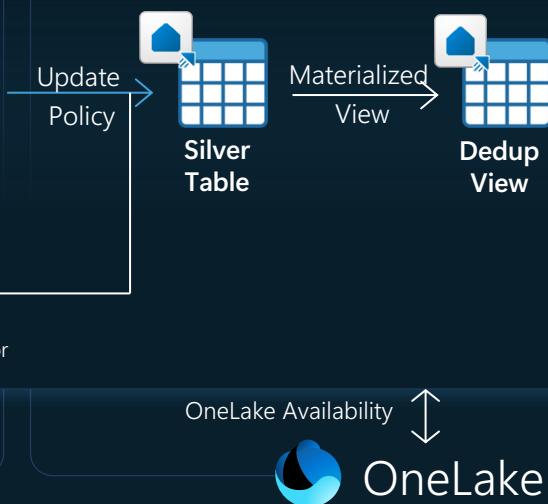
Bronze Layer

- Continuously ingest raw data to the raw landing table
- Source can be either streaming or batch ingestion
- Retains the full, unprocessed history



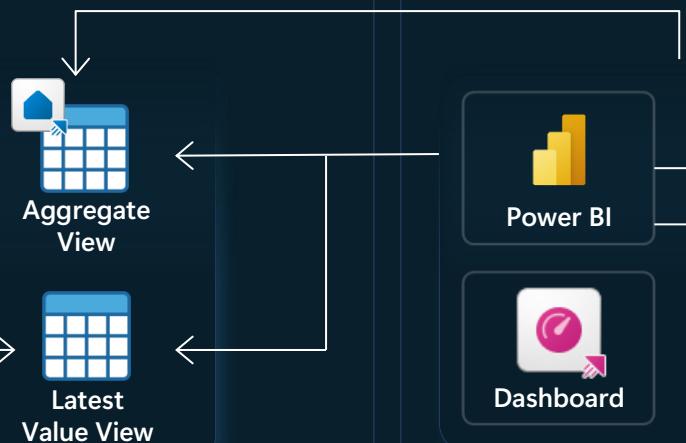
Silver Layer

- As data is ingested to the bronze layer it is processed by an update policy or Event Processing in Eventstream and lands into the silver table
- Update policies allow you to transform and enrich the data on a continuous basis
- After being transformed and enriched the data is continuously deduped via a materialized view



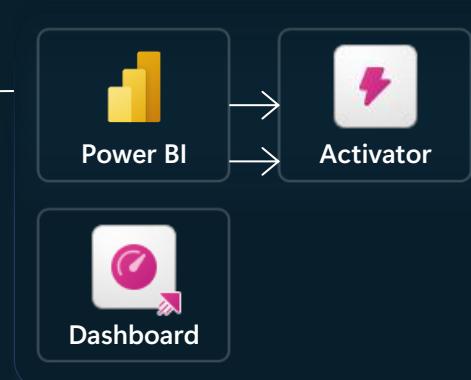
Gold Layer

- Continuously aggregate data as it arrives
- Automatically handles late arriving data
- Ability to build multiple gold layer views. For example, hourly aggregates and a latest value view



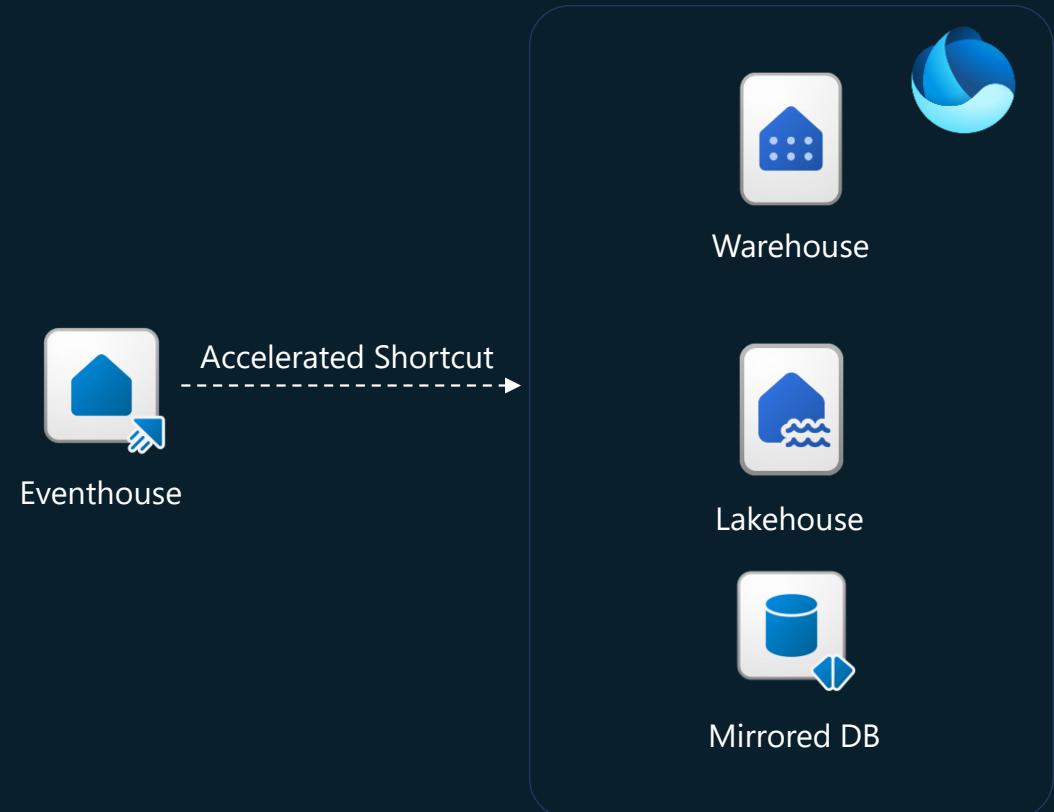
Visualize and activate

- Performance of Eventhouse allows utilize both the deduped view for granular queries and the aggregate view for broader queries
- Reflex allow you to react in real time as both the dedup and aggregation is happening immediately



Query Acceleration

- Query data in OneLake in-place with shortcuts
- Automatic on the fly indexing and caching
- At par performance with ingestion
- Supports Delta as well as Iceberg (with xtable)



Example:

KQL Command

```
1 .alter external table MyExternalTable policy query_acceleration  
2 '{".IsEnabled": true, "Hot": "1.00:00:00"}'
```

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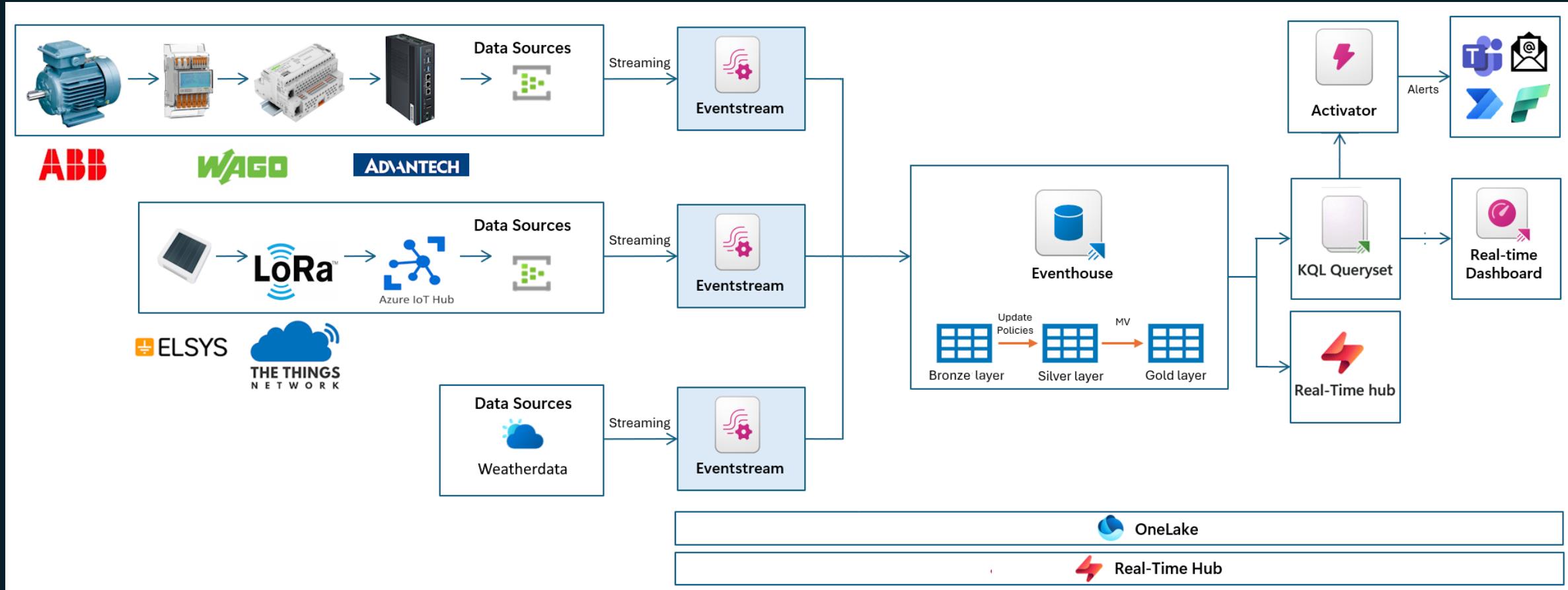
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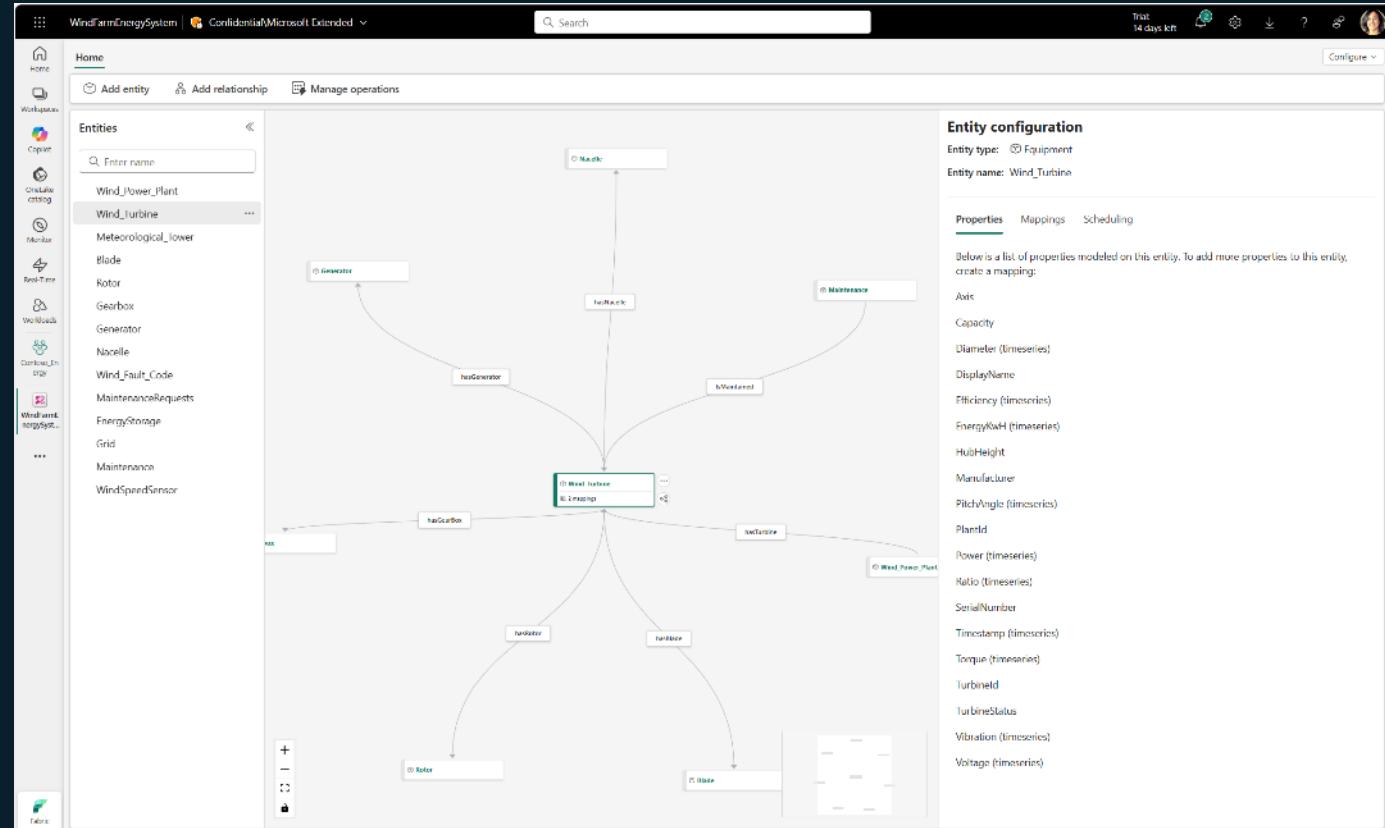
Lab 3: Connecting to Factory Events



- Instructions:
 - Continue the workshop

Digital twin builder

Public Preview



Simpler, faster way to build and manage digital twins with a **low-code/no-code** approach

Easily **create and manage ontologies** to contextualize data from assets, processes, and systems.

Ontology-powered exploration of complex relationships and uncover contextualized, high-value insights.

Unlock insights with digital twin data in Real-Time Dashboards, Power BI Copilot and Operational Agents

Digital Twin Builder Core Concepts

Namespace



A unique grouping to organize entity types, properties, and relationships.

Example:

Manufacturing Namespace distinguishes elements in a factory domain.

Entity Type



A category defining a concept.

Example:
Centrifugal Pump as a domain-specific entity type, rules are evaluated per event

Entity Instance



A specific object of an entity type.

Example:

Pump-001 is an instance of Centrifugal Pump.

Property



A characteristic of an entity type.

Example:

Operating Temperature for a machine

Relationship Type



Defines how entity types are connected.

Example:

hasPart links Pump to Bearing.

Relationship Instance

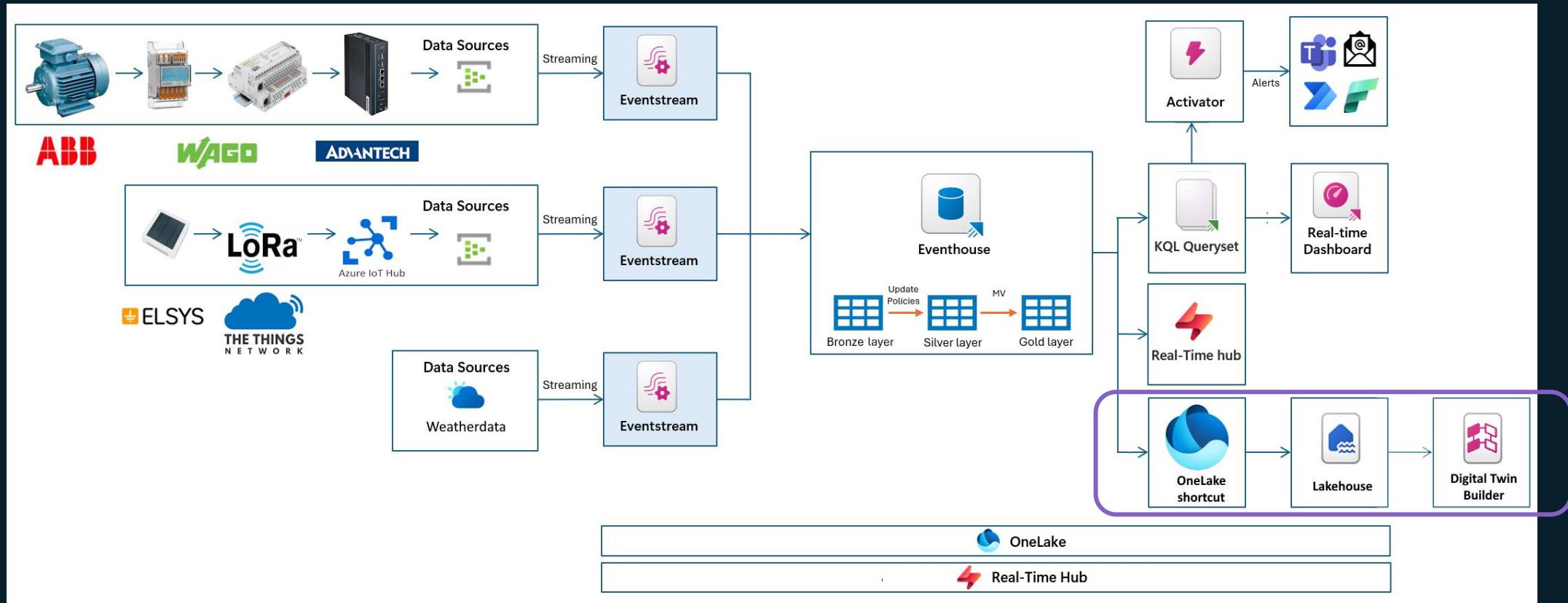


A specific occurrence of a relationship.

Example:

Pump-001 hasPart Bearing-001

Lab 3: Connecting to Factory Events (continued...)



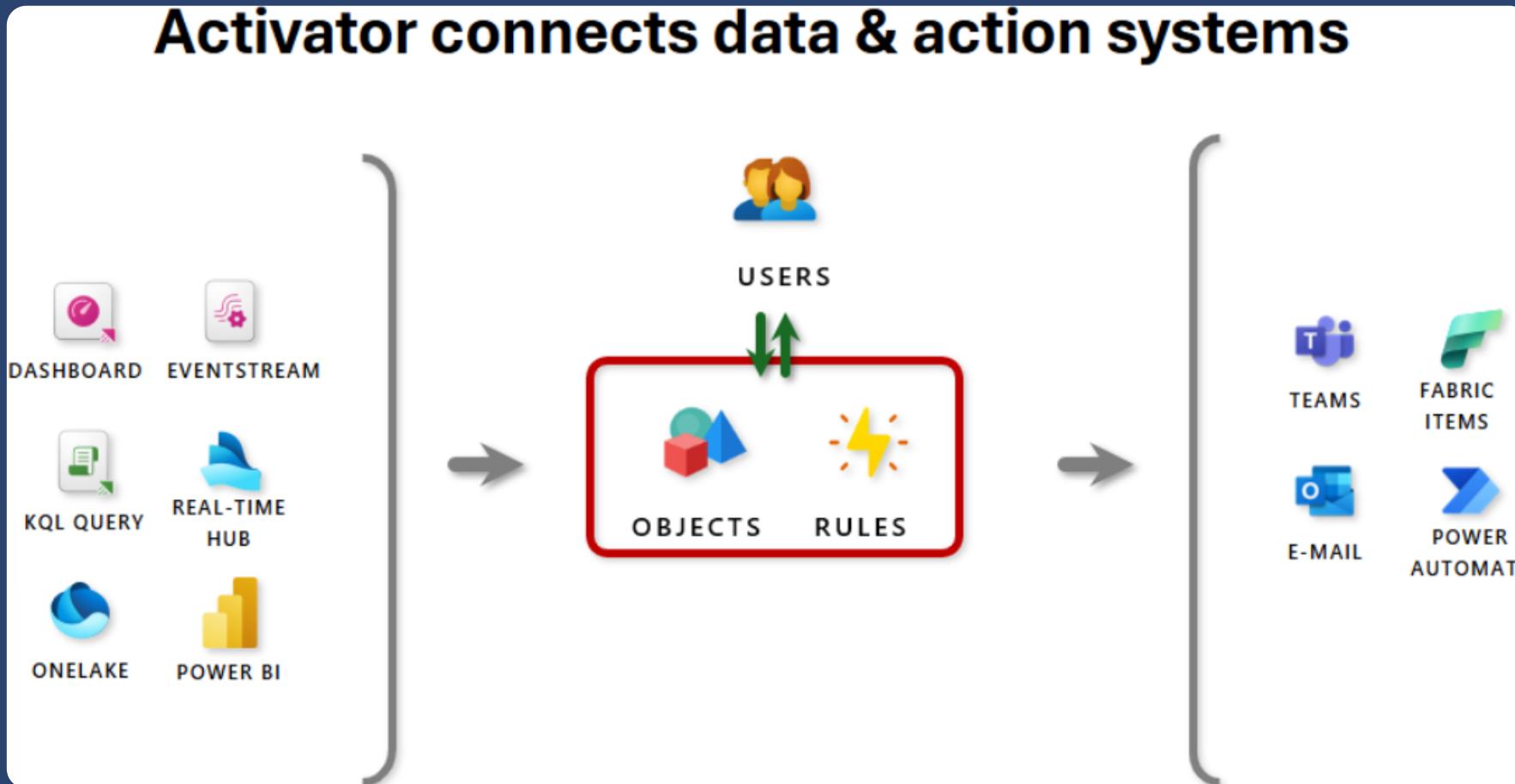
- Instructions:
 - Continue the workshop

Lab 4: Load history in OneLake



- Instructions:
 - Subscribe to OneLake events
 - Route OneLake events to Activator
 - Trigger Spark notebook to read CSVs and transform to Delta tables

Architectural Overview



Core Architectural Elements

Event Sources (Eventstream)



Direct connection to eventstream

Source of events

Subscribe to one or more eventstreams

Fabric events

Activator on Power BI Report or Real-Time Dashboard

Events and Objects



Events

Individual records, rules are evaluated per event

Objects

Events are grouped into objects based on shared identifier [Key].

Object states are monitored over time

Rules and Conditions



Activator has one or more rules; evaluated continuously

Actions



Can trigger: Data Pipelines, Power Automate Flows, Notebooks. Notify Emails & Teams

Alert Management and Rules Testing



You can see what might happen based on your current data stream so you can prevent too many actions that are triggered

Monitoring and Cost Control



Pricing only applies when rules are executed

Lab 4: Load history in OneLake (continued...)



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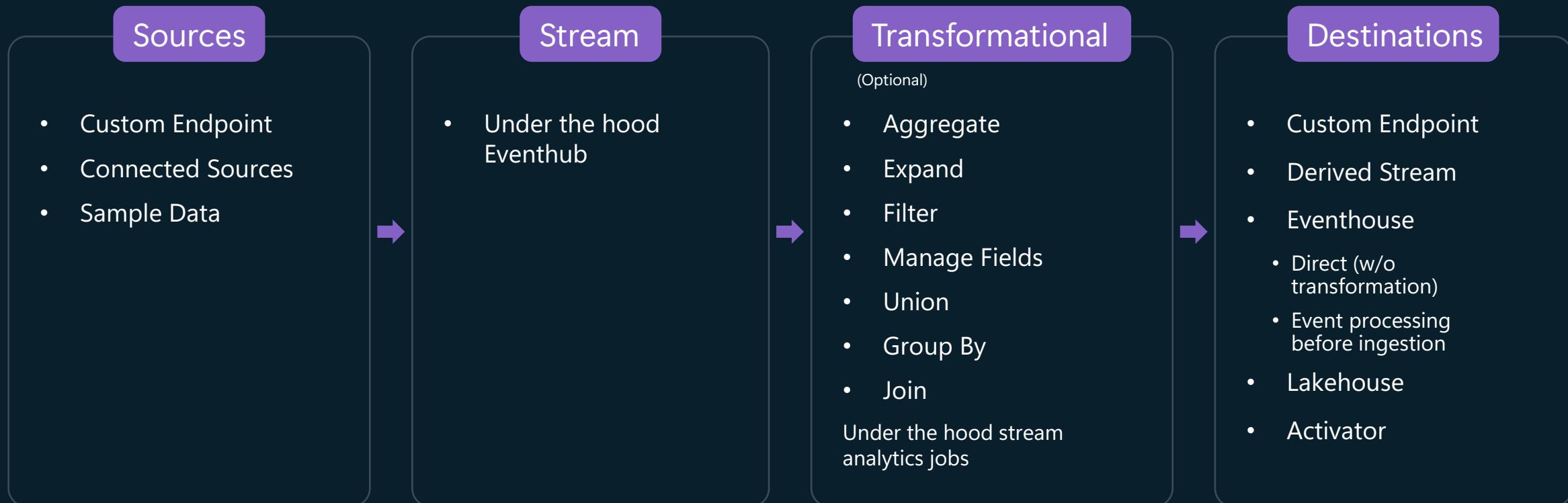
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Recap, Demo & Q&A



Costing

What's behind an Eventstream?



Eventstream Pricing Model

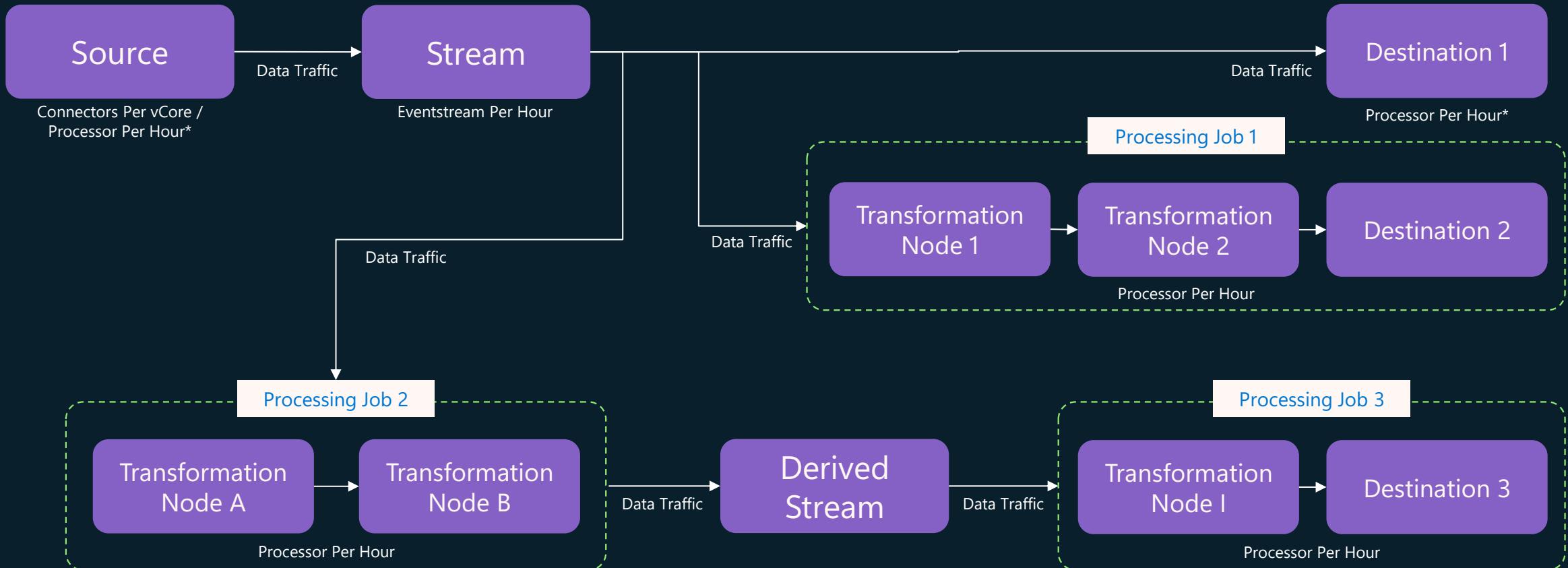
Operation types

Operation	Description
Eventstream Per Hour	A flat charge while the Eventstream is active (event's been flowing into the stream). If there's no traffic flowing in or out for the past two hours, no charges apply.
Eventstream Data Traffic per GB	Data ingress & egress volume in default and derived streams (Includes 24-hour retention)
Eventstream Processor Per Hour*	Computing resources consumed by the ASA Jobs needed for processing data.
Eventstream Connectors Per vCore Hour**	Computing resources consumed by the connectors.

*CU consumption of the Eventstream Processor Per Hour is designed to correlate with throughput, complexity of processing logic, and partition count of input data. The process autoscale accordingly.

**CU consumption of the Eventstream Connectors Per vCore Hour is designed to correlate with throughput. The process autoscale accordingly.

How does Eventstream treat CU with multiple routing and transformation paths?

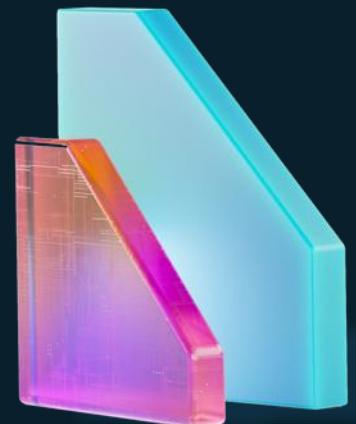


*Custom Endpoints and Eventhouse Direct Ingest don't contribute to CU consumption

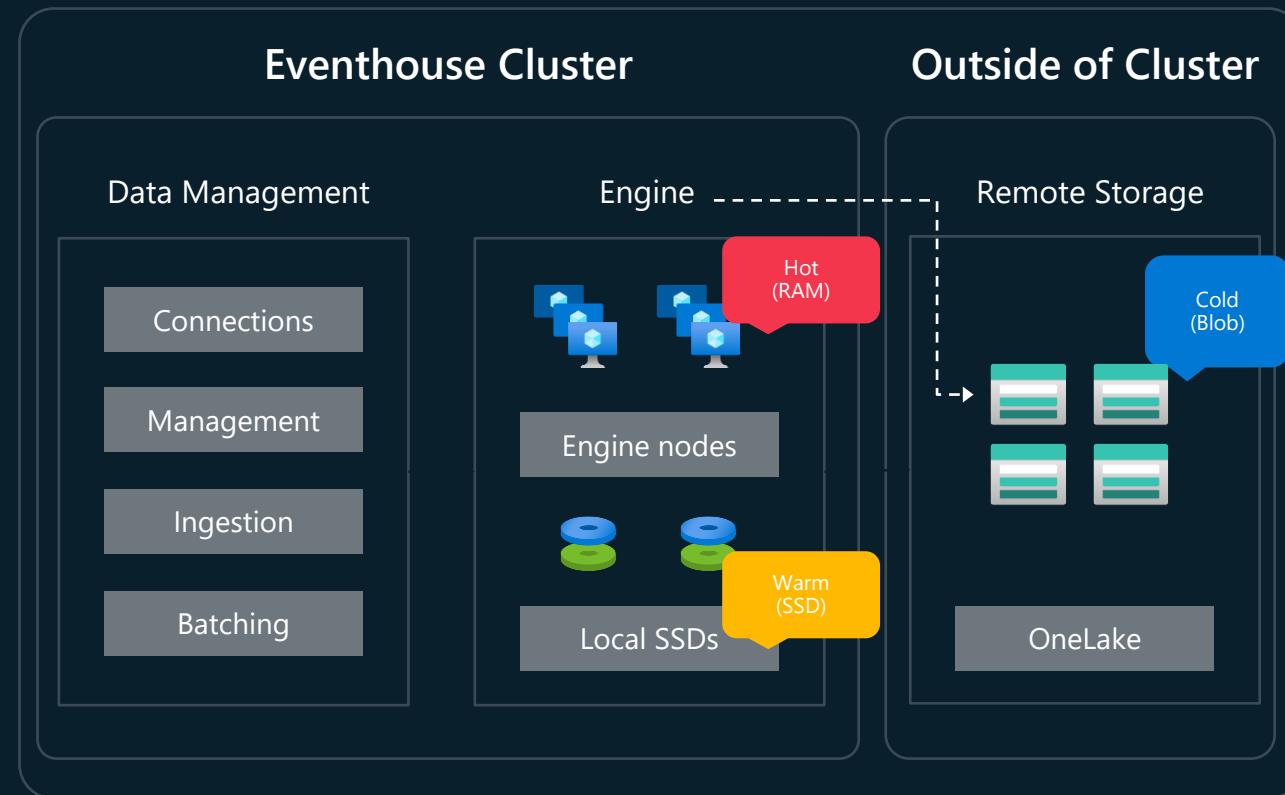
Eventstream Pricing Model

Storage billing

Pricing Principle	Description
OneLake Standard Storage	Standard storage that's used to persist and store all data. When you set the retention setting for more than 1 day (that is, 24 hours), you're charged as per OneLake Standard storage



What's behind an Eventhouse?



Eventhouse Pricing Model

Eventhouse uses a cluster model for the consumption of CU

Pricing	Description
Eventhouse UpTime	The number of seconds that your eventhouse is active in relation to the number of virtual cores used by your eventhouse. An autoscale mechanism is used to determine the size of your eventhouse. This mechanism ensures cost and performance optimization based on your usage pattern. An eventhouse with multiple KQL databases attached to it only shows Eventhouse UpTime for the eventhouse item.
OneLake Cache Storage*	Premium storage that is utilized to provide the fastest query response times. When you set the cache policy, you affect this storage tier.*
OneLake Standard Storage	Standard storage that is used to persist and store all queryable data. When you set the retention policy, you affect this storage tier.

*Enabling minimum consumption means that you aren't charged for OneLake Cache Storage. When minimum capacity is set, the eventhouse is always active resulting in 100% Eventhouse UpTime.



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Analytics Sessions at FabCon Vienna 2025

Monday, Sept 15

- 9:00-17:00 F Masterclass in building event-driven architectures using Microsoft Fabric (Hands-on) - Devang Shah, Microsoft, Sander van de Velde, MVP, SDG Group

Tuesday, Sept 16

- 12:00-13:00 T15 Eventhouse / KQL database security setup – Brian Bønk MVP
- 15:30-16:30 T33 CORENOTE: Taking AI-powered action at the speed of business with Real-Time Intelligence – Yitzhak Kesselman, Microsoft, Tessa Kloster, Microsoft
- 17:00-18:00 T46 Build end-to-end Real-Time Intelligence Solutions: From Development to Deployment – Tzvia Gitlin Troyna, Microsoft, Meital Taran-Gutman, Microsoft
- 17:00-18:00 T47 Seeing the Connections that Matter with Microsoft Fabric – Raja Ravipati, Microsoft

Wednesday, Sept 17

- 12:00-13:00 W16 Geospatial Insights for Everyone in Microsoft Fabric – Johannes Kebeck, Microsoft
- 14:15-15:15 W24 Discovering Unknown Unknowns with AI and Real-Time Intelligence – Will Thompson, Microsoft, Ravit Dennis, Microsoft
- 14:15-15:15 W30 Lessons Learned from Implementing End-to-End Real-Time Intelligence Solutions in Fabric – Josef Pinkr, Adastra, Martin Rys, Adastra
- 15:30-16:30 W36 Driving Insights with Real-Time Intelligence in Microsoft Fabric – William S. G. Olsen, Altro

Analytics Sessions at FabCon Vienna 2025

Thursday, Sept 18

9:15-10:15 AMA

Real-Time Intelligence: Ask Engineering Anything – Johannes Kebeck, Microsoft, Will Thompson, Microsoft, Tessa Kloster, Microsoft, Meital Taran-Gutman, Microsoft

10:30-11:30 TH4

Change Data Capture Made Easy With Microsoft Fabric – Abhinav Jayanty, Quorum

10:30-11:30 TH6

Unlock the power of Digital twin solutions with Real-Time Intelligence – Chafia Aouissi, Microsoft, Jomit Vaghela, Microsoft

12:00-13:00 TH19

Sharing Experiences with Real-Time Intelligence – Maurice Schurink, ABN-AMRO, Aazath Raj Paramasivam, Apollo Hospitals

12:00-13:00 TH20

Leveraging Real-Time Intelligence event-driven architectures to optimize and scale your data solution – Miquel Martin, Microsoft, Clemens Vasters, Microsoft

15:30-16:30 TH33

Building Real-Time Personalization API in Microsoft Fabric with Functions, Cosmos DB, Spark, and RTI – Gary Hope, Microsoft

15:30-16:30 TH35

Real-Time Data Processing in Fabric: Tracking a Cycle Ride, Grímur Sæmundsson, Crayon

Demo



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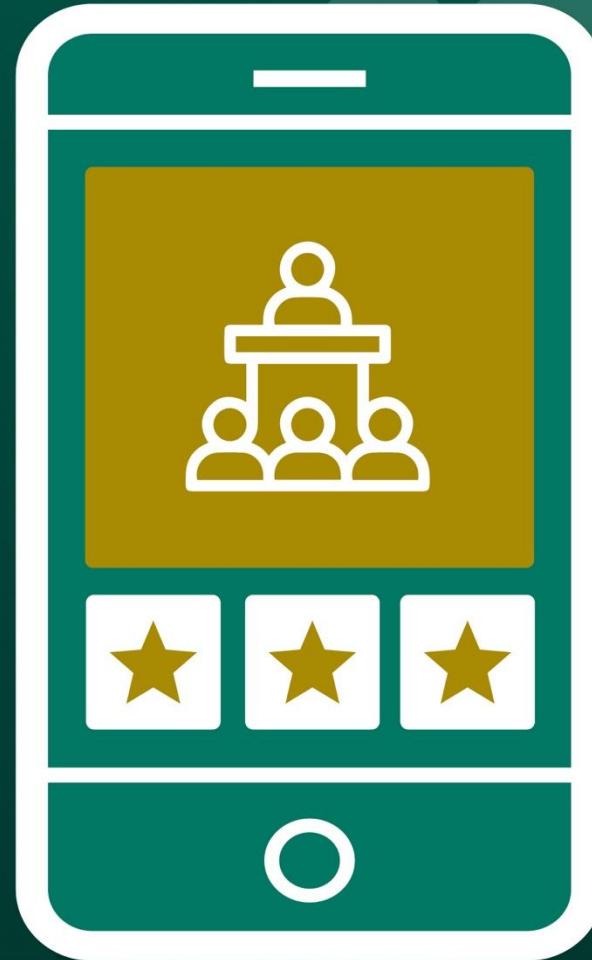
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