Gain Real(Time) Insights with Kusto and Power BI

Brian Bønk

Senior Principal, Microsoft MVP

INTELLISHORE

https://linkedin.com/in/brianbonk
https://dcode.bi
https://github.com/brianbonk

MVP Microsoft Most Valuable Professional

Microsoft
FastTrack Recognized
Solution Architect
Power BI
2022 >>

Microsoft
Certified Trainer
Data Platform
2018 >>

What are your expectations

https://forms.office.com/e/cenGhVZW7B

Agenda

- Introduction
- Overview of Fabric Real-Time Intelligence
- Eventstream & Real-Time hub
- Eventhouse
- Real-Time Dashboard
- Data Activator

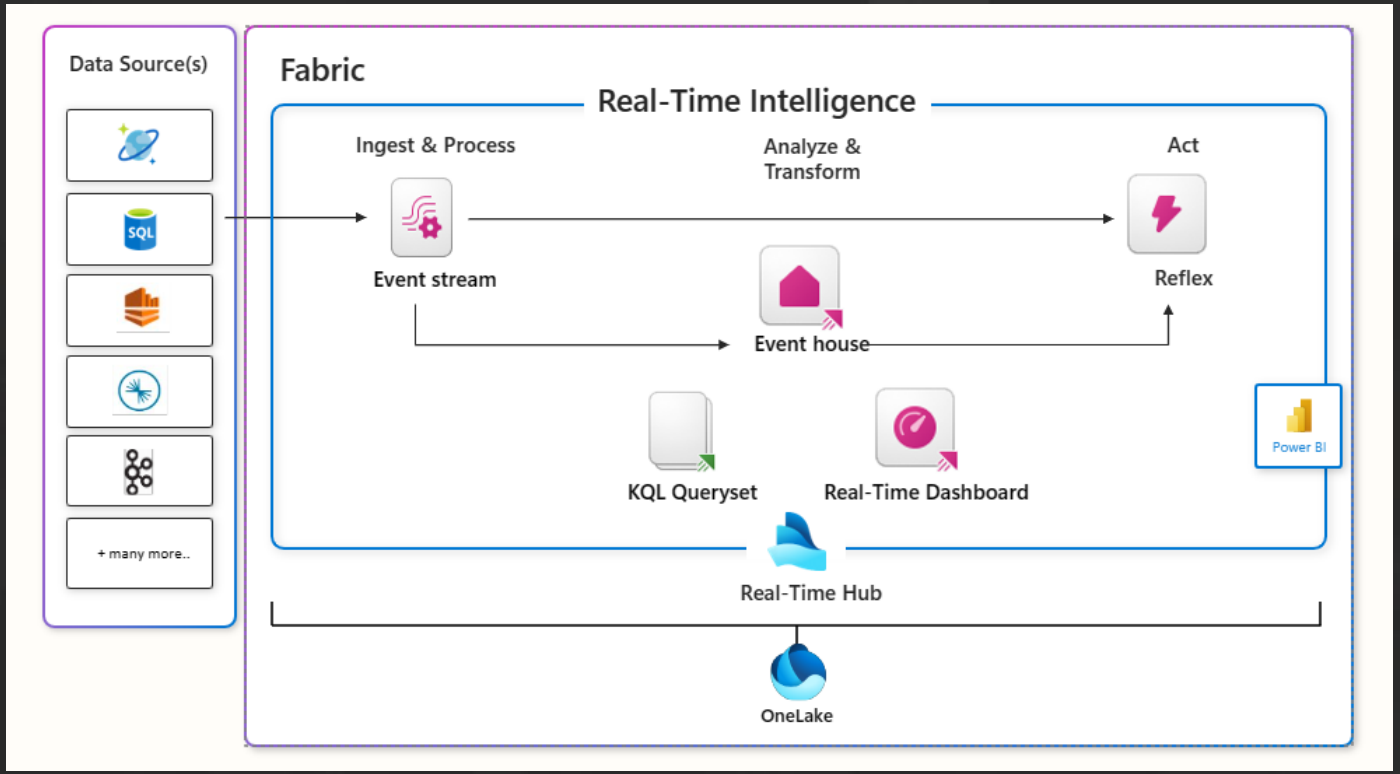
Agenda

- Introduction
- Overview of Fabric Real-Time Intelligence
- Eventstream & Real-Time hub
- Eventhouse
- Real-Time Dashboard
- Data Activator

Let's build a complete solution!

What is Fabric Real-Time Intelligence?

Powerful end to end solution for data in motion



There is a rapidly growing set of use cases that need ‘real-time’ speeds, generating decisions and actions at least **20 times faster** than the blink of an eye.”

Forbes, “Understanding AI and ML in the real-time economy,” February 2024


The world is exploding with high-granularity data…

Telemetry – a key data for digital transformation

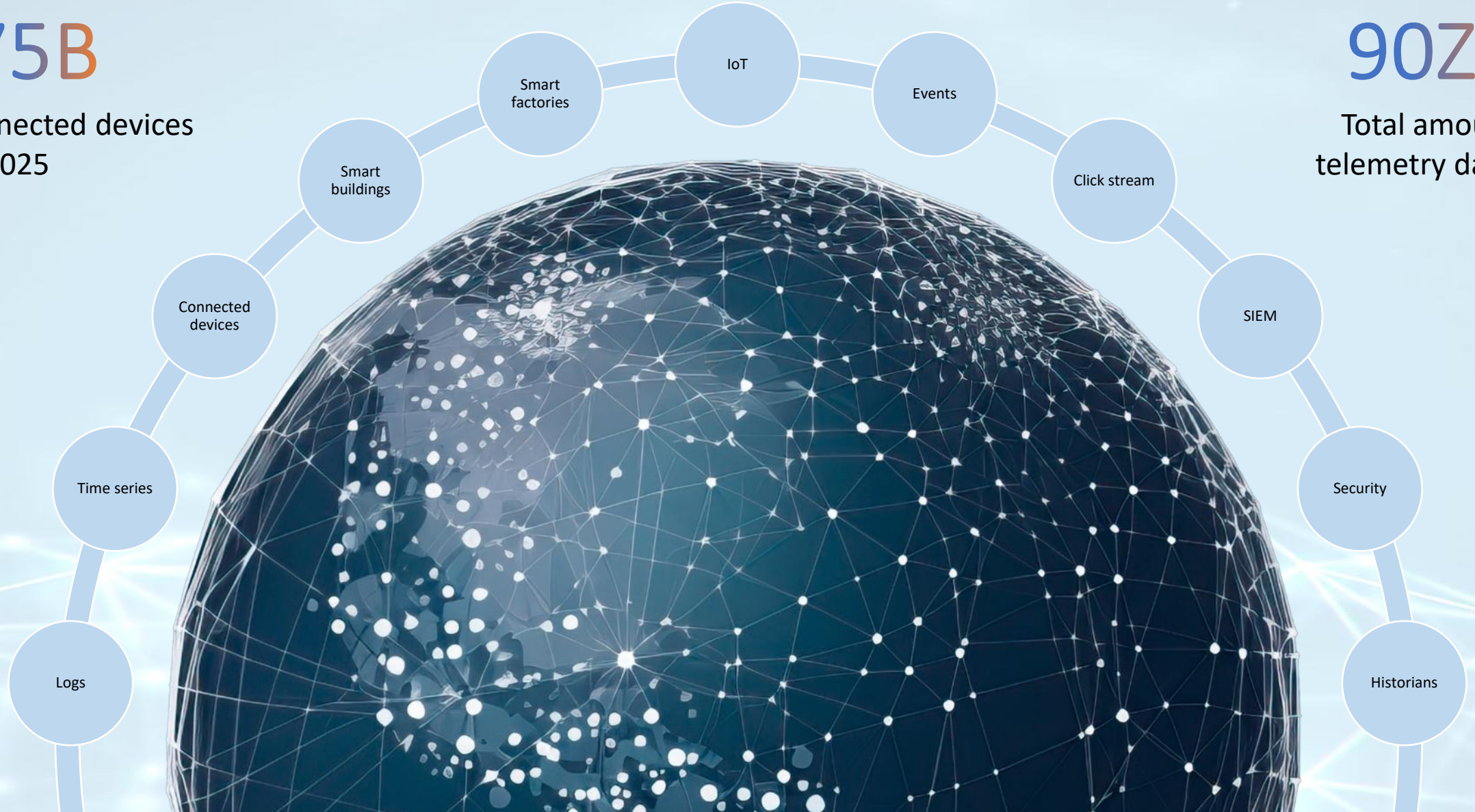
Telemetry – a key data for digital transformation

75B

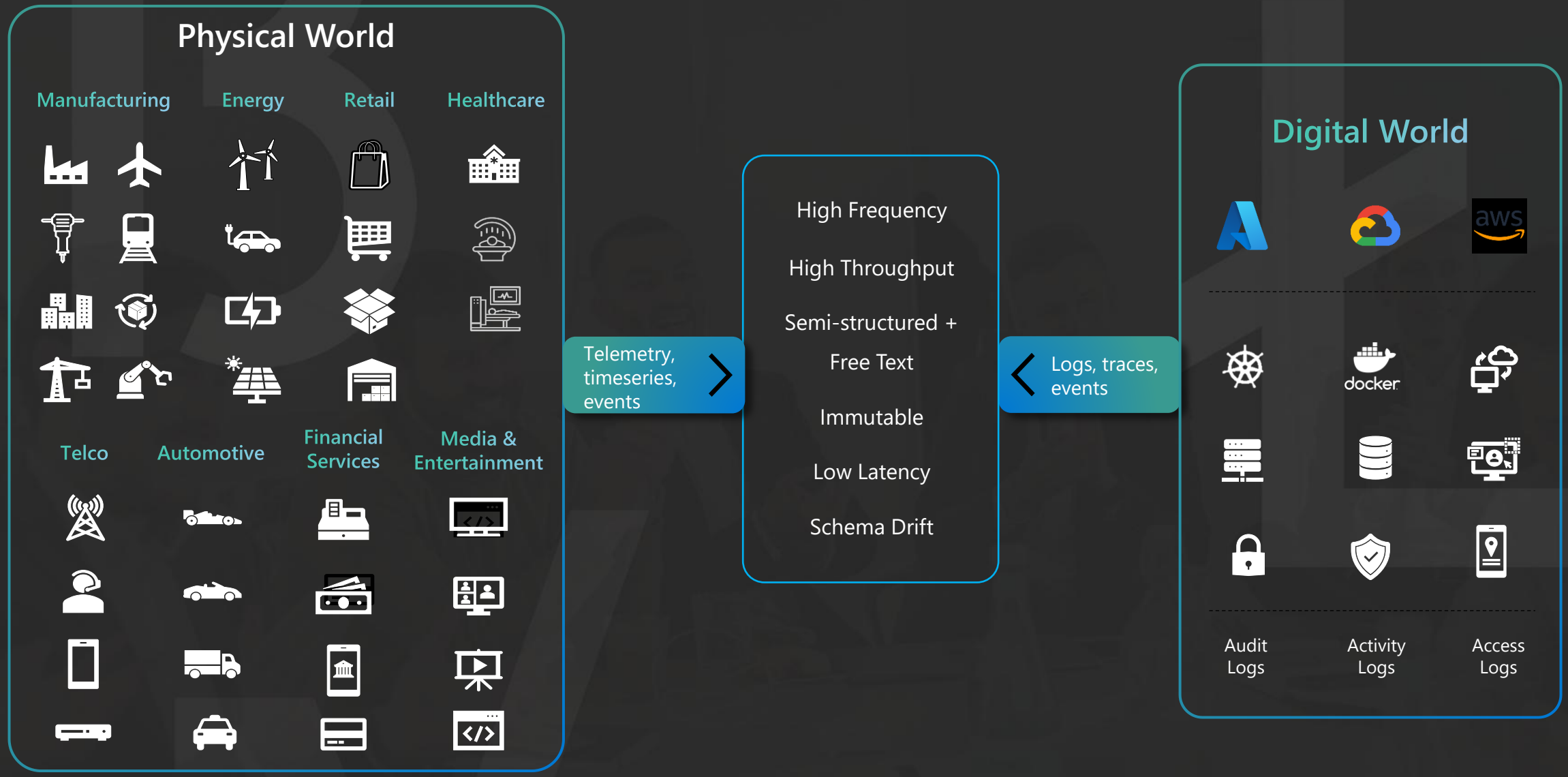
Connected devices by 2025

90ZB

Total amount of telemetry data by 2025

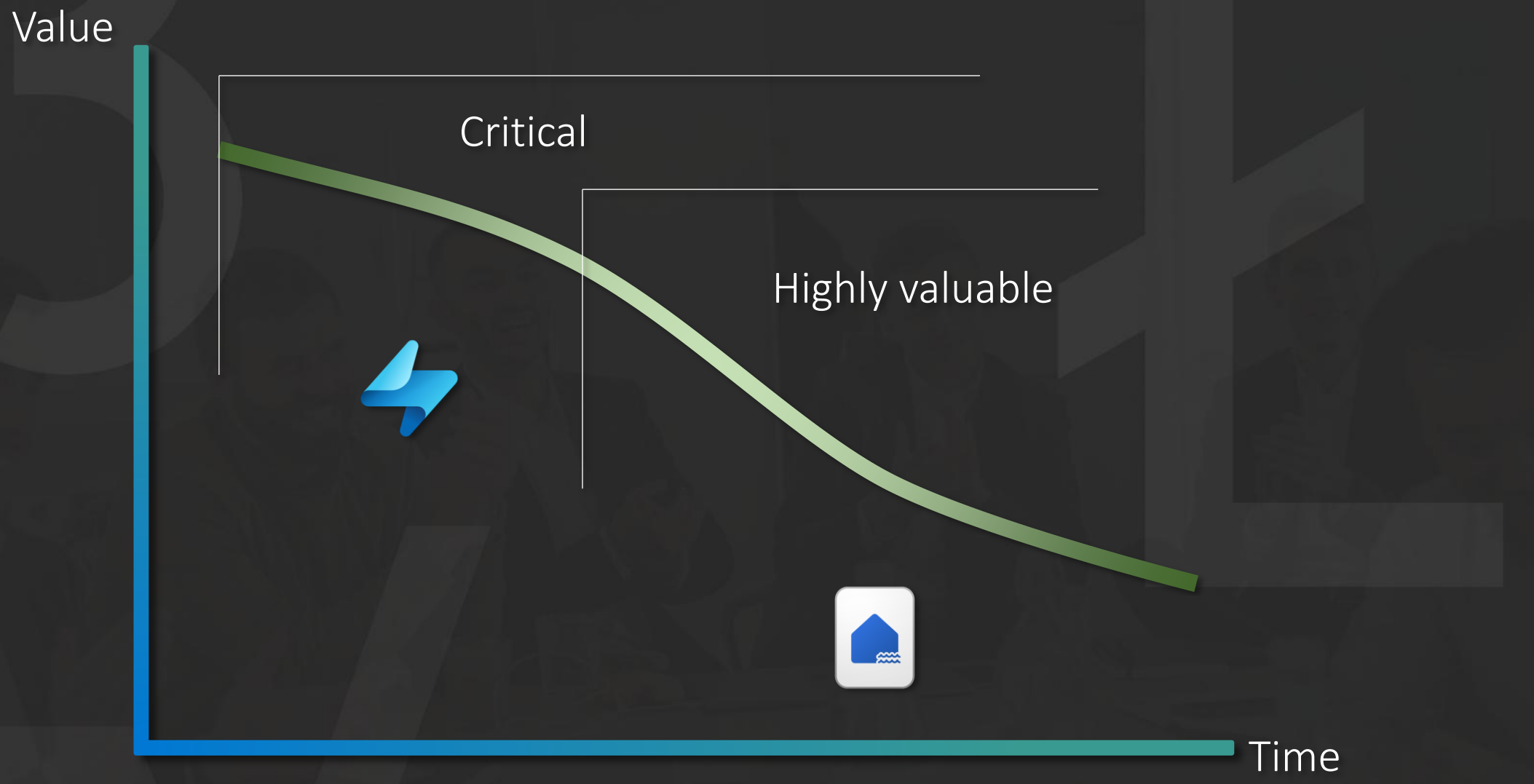


Time based data: difficult to manage, yet critical for success



INTELLISHORE

Time-series data: difficult to manage, yet critical for success



Microsoft Fabric

Enterprise real-time data platforms

Azure Event Hubs

Azure Event Grid

Azure Stream Analytics

Azure Data Explorer

+

Self-service reporting and activation

OneLake

Data Activator

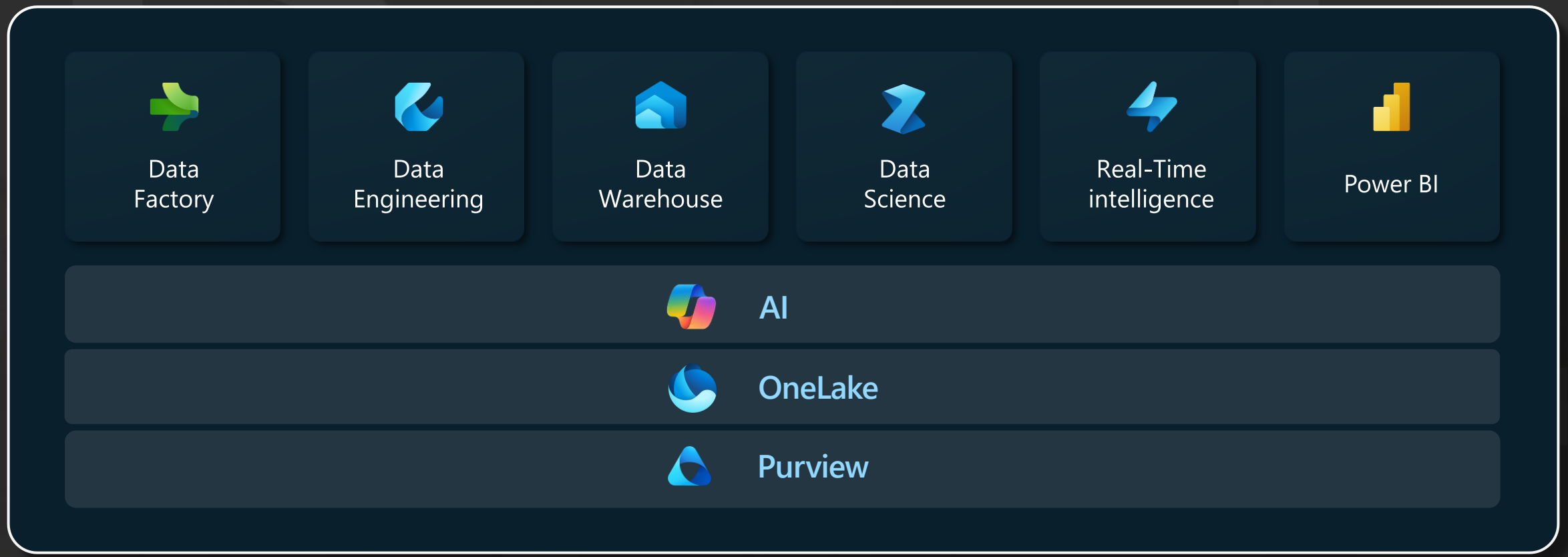
Power BI

=

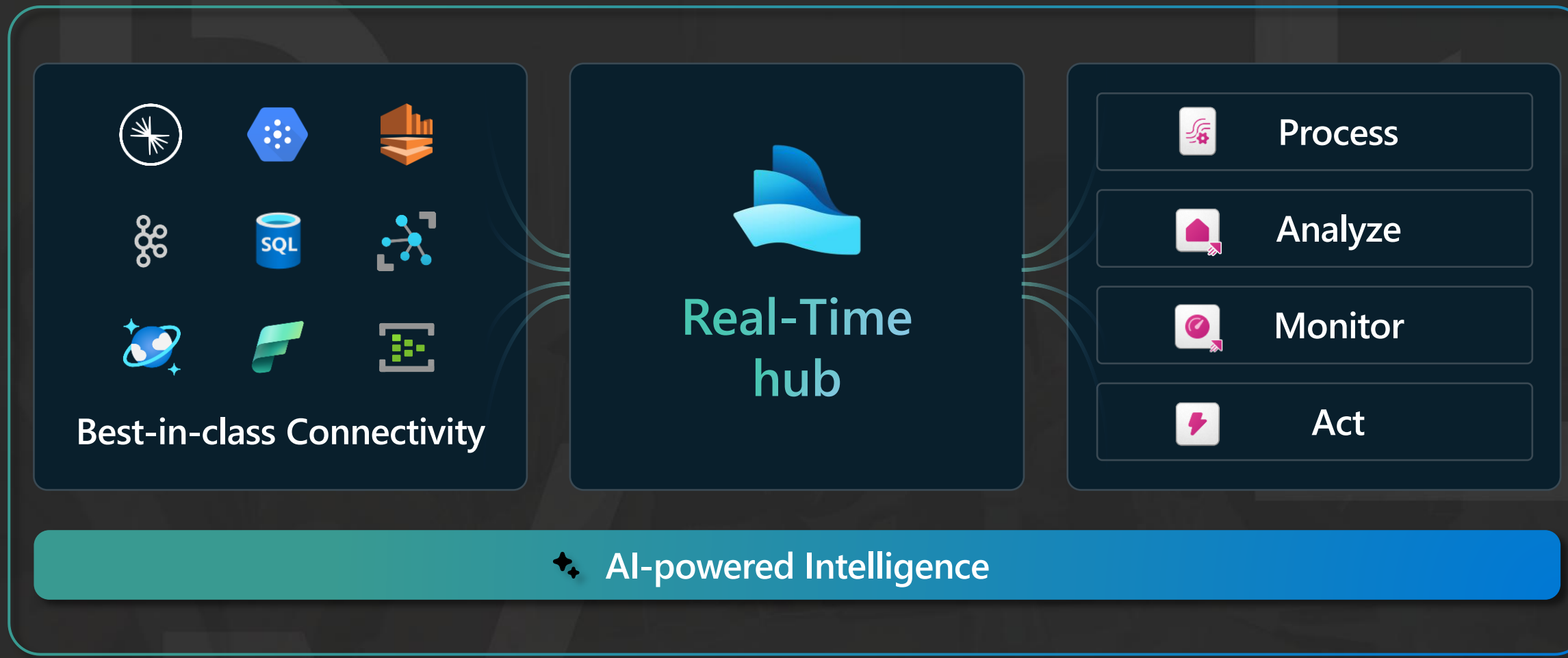
Real-Time Intelligence in Microsoft Fabric

Fully integrated, no/low-code real-time SaaS data platform

Microsoft Fabric



Microsoft Fabric




DIVE INTO HISTORY

No, Kusto – not Cousteau!

The Kusto Product Family

Solutions

Azure Monitor

Sentinel

Defender

Playfab

Product

Fabric Real-Time Intelligence (Eventhouse)

Azure Data Explorer

Kustainer

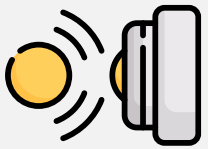
Tech Stack

Kusto engine

KQL database Key capabilities

Unlimited Scale (query, ingestion and storage)	Any data source	Any data format
Structured Semi-structured Free-text	Real-time transformation og complicated data structures	Streaming analytics in Near-Real-Time
High performance Low latency High freshness	Timeseries database	Everything is indexed and partitioned

Microsoft Fabric

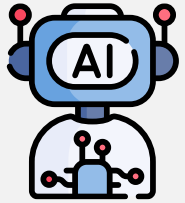


Event ingestion

Real-Time analytics

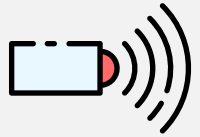
Real-Time dashboards

Real-Time triggers



Real-Time AI

Real-Time applications



Event driven actions

Real-Time Hub

Real-Time Intelligence

Power BI

Automotive

Connected fleet applications

Autonomous Driving

Manufacturing + R&D

Manufacturing

Improving Quality and Throughput

Predictive Maintenance

Inventory Prediction

Logistics

Delivery tracking and routing

Warehouse management

Supply & demand operations

Finance & Insurance

Finance Automation

Fraud Detection

Operational Efficiency

Energy & Utilities

Station monitoring, energy leakage detection

Equipment Maintenance & Monitoring

Failure Monitoring

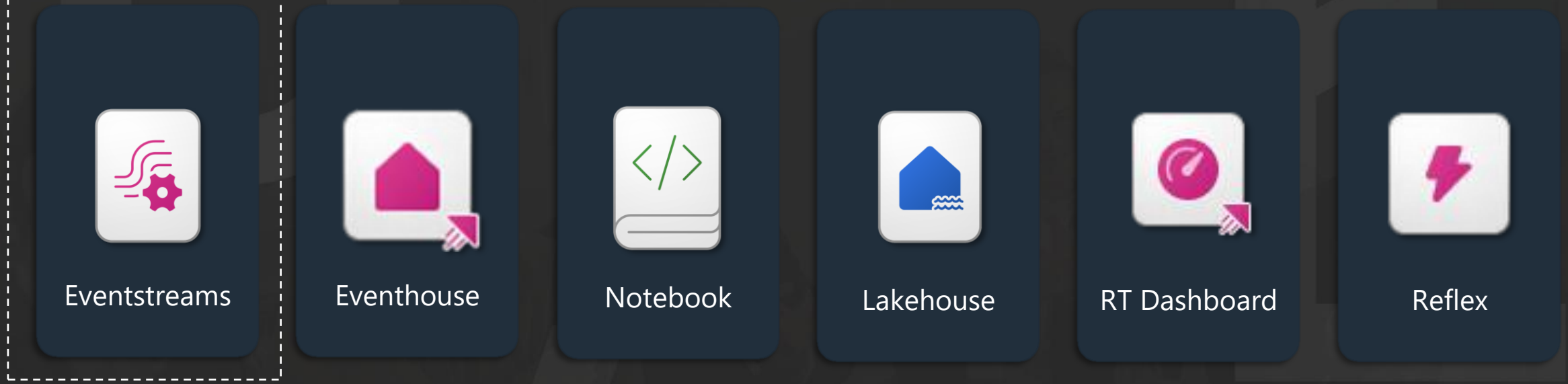
Retail

Inventory tracking

Promotions and buying experiences

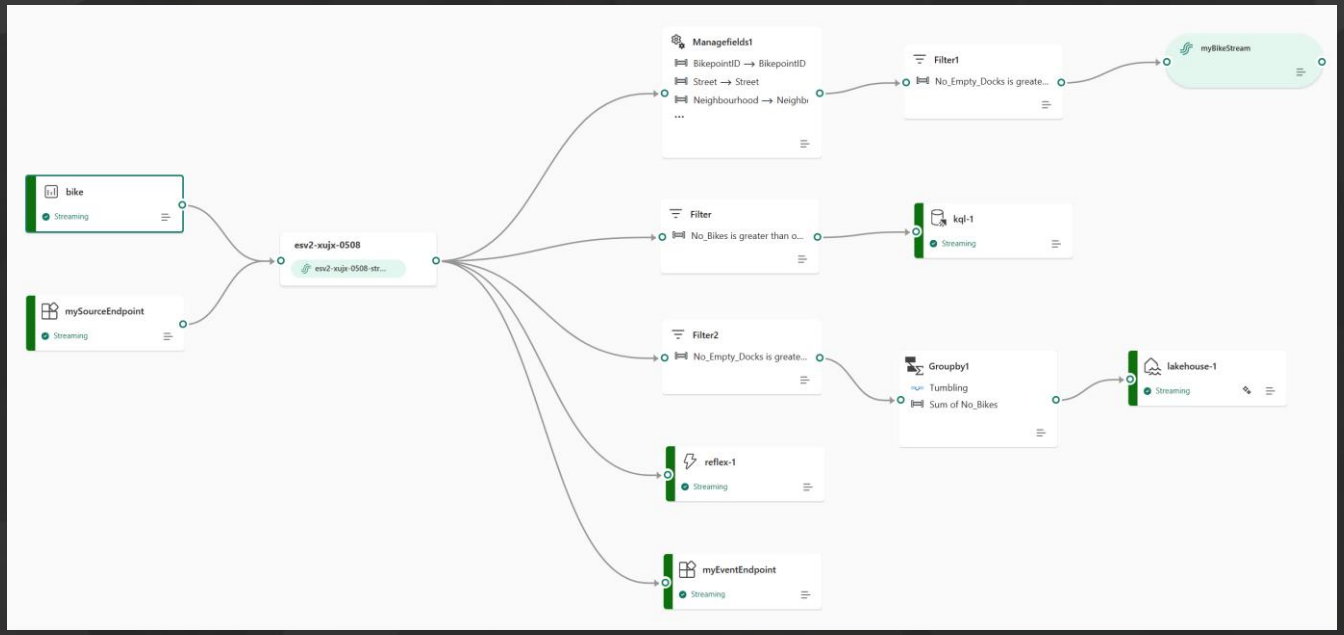
Supply chain management

Demo time


Eventstreams
Eventhouse
Notebook
Lakehouse
RT Dashboard
Reflex

Eventstream

- Low-code/No-code event transformation
- EventGrid & Stream Analytics bastard child
- Connect, Transform, Route



Eventstreams

Eventstream capacity

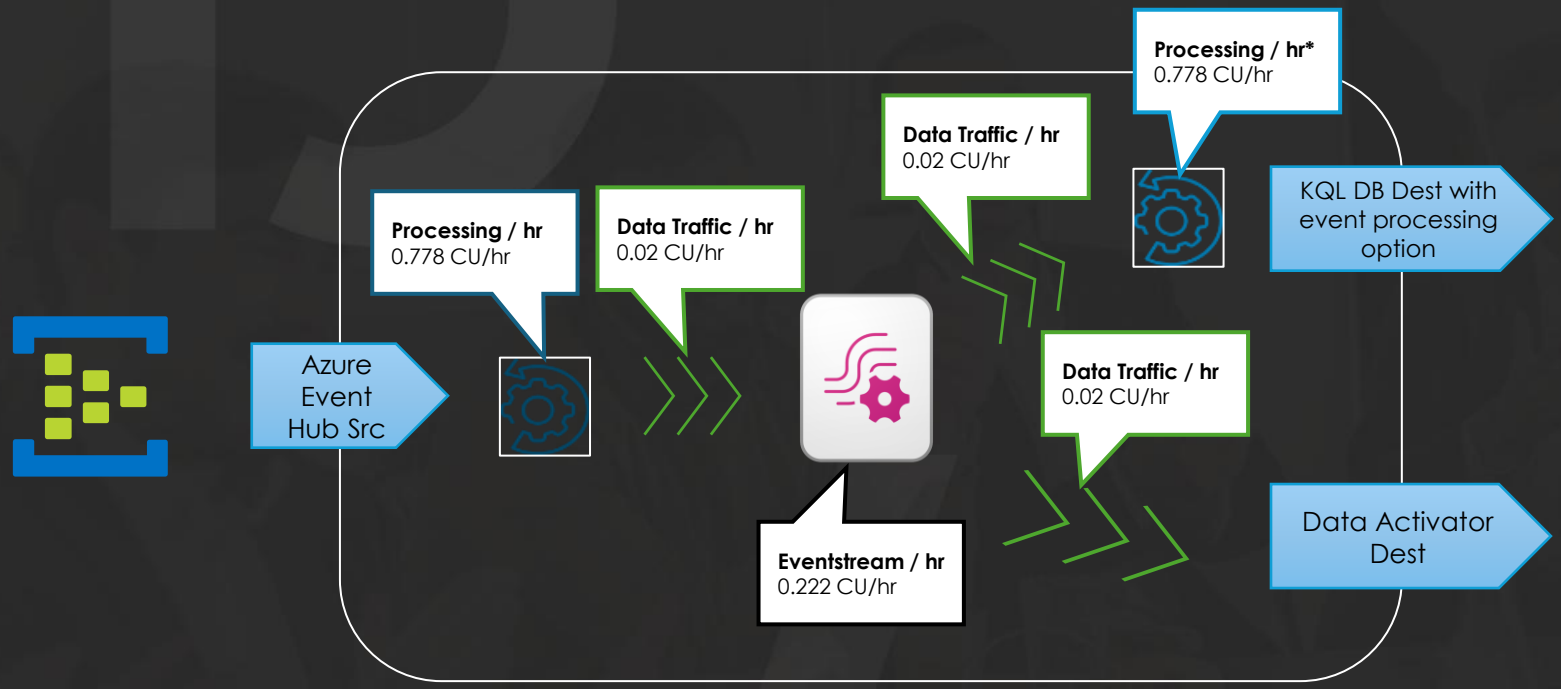
OPERATION IN CAPACITY METRICS APP	DESCRIPTION	OPERATION UNIT OF MEASURE	FABRIC CONSUMPTION RATE
Eventstream Per Hour	Flat charge* (per eventstream)	Per hour	0.222 CU per hour
Eventstream Data Traffic per GB	Data ingress & egress volume	Per GB	0.342 CU per hour per GB
Eventstream Processor Per Hour	Computing resources consumed by the processor	Per hour	0.778 CU per CPU hour**
OneLake Standard Storage	Used for extended retention (Includes 24-hour retention)	Per GB	$0.023 per GB***
Eventstream Connectors Per vCore hour	Computing resources consumed by the connector	Per hour	0.611 CU per vCore hour

*Eventstream is charged if Eventstream is not idle (i.e. data is not ingested or egressed for at least 2 hours)
**Processor base rate 2.333 CU per hour, starting at 1/3 CPU hour (0.778)
***Refer to OneLake Storage pricing for more detail - Microsoft Fabric - Pricing | Microsoft Azure

Monitor Microsoft Fabric event streams capacity consumption - Microsoft Fabric | Microsoft Learn

Eventstream usage scenario

An eventstream is ingesting from an Azure Event Hub source that is coming in at **1 MB/minute (0.059GB/hr)**. The data is transformed and filtered before sending to a KQL DB destination and also routed to a Data Activator destination.

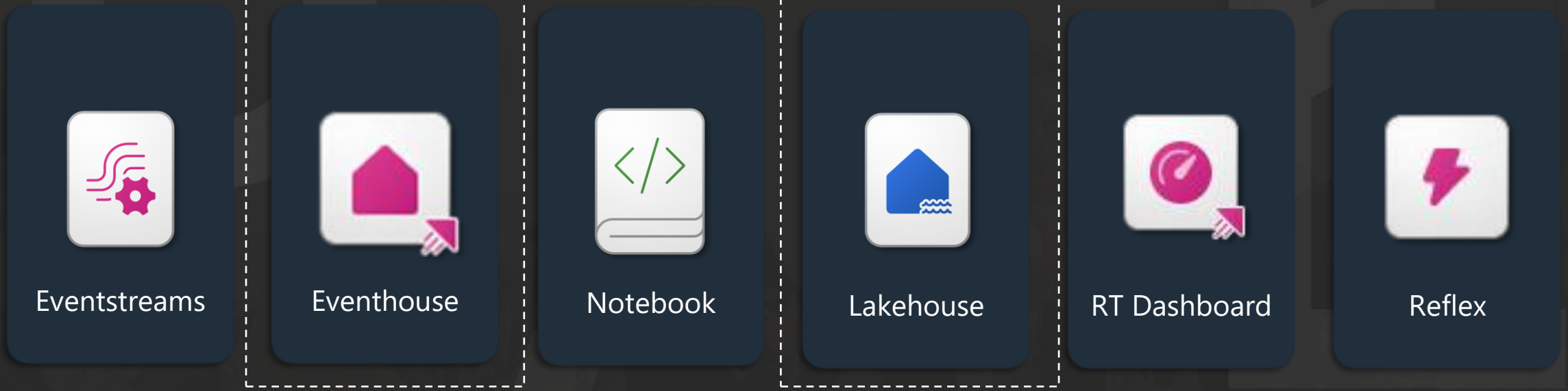


Total CU/hr: **1.838** CU

*Processing can cost more depending on transformation complexity (e.g. aggregation)

**Does not include downstream costs for KQL DB and Data Activator

Demo time


Eventstreams
Eventhouse
Notebook
Lakehouse
RT Dashboard
Reflex

Eventhouse capacity

Kusto UpTime

- The number of seconds your Eventhouse is active in relation to the number of virtual cores used
- After 5 minutes of inactivity the Eventhouse will no longer report Kusto UpTime
- Example: An active 8 core KQL DB will report 240 seconds of Kusto UpTime every 30 seconds

KQL Database Storage

One Lake Cache Storage

Premium storage is utilized to provide the fastest query response times.
Controlled via the cache policy
Comparable to the Azure ADLS (Azure Data Lake Storage) premium tier.

** Note: Using minimum capacity setting on Eventhouse results in 100% Kusto UpTime but no longer charges for OneLake Cache Storage

One Lake Standard Storage

Standard storage is used to persist and store all queryable data.
Controlled via the retention policy
Comparable to the Azure ADLS (Azure Data Lake Storage) hot tier.

Eventhouse usage scenario

Eventhouse
4 Cores
100 GB in Cache
500 GB Total Storage

Capacity via Activity
Queries or Command or Ingestion
80% active would need 3.4 CUs and require min 4 CUs

Storage

100 GB at Premium Storage (~$0.20/GB)

500 GB at Standard Storage (~$0.02/GB)

Demo time

Eventstreams

Eventhouse

Notebook

Lakehouse

RT Dashboard

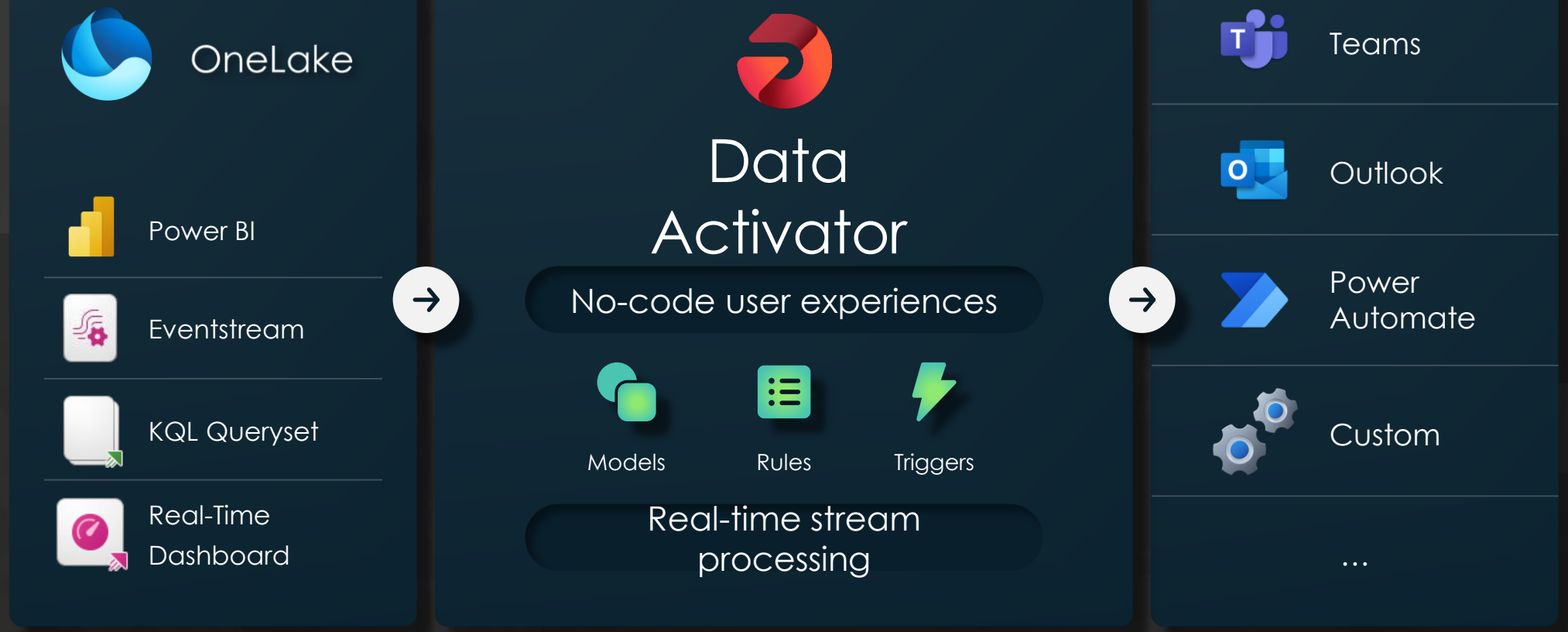
Reflex

Real-Time Dashboard

- Visualizations optimized for streaming, timeseries, event-based data
- Complimentary to Power BI
- Low-latency refresh
- Based on KQL
- Parameterized
- Cross-interactions and filters

Data Activator

Trigger actions on all your data, from one place

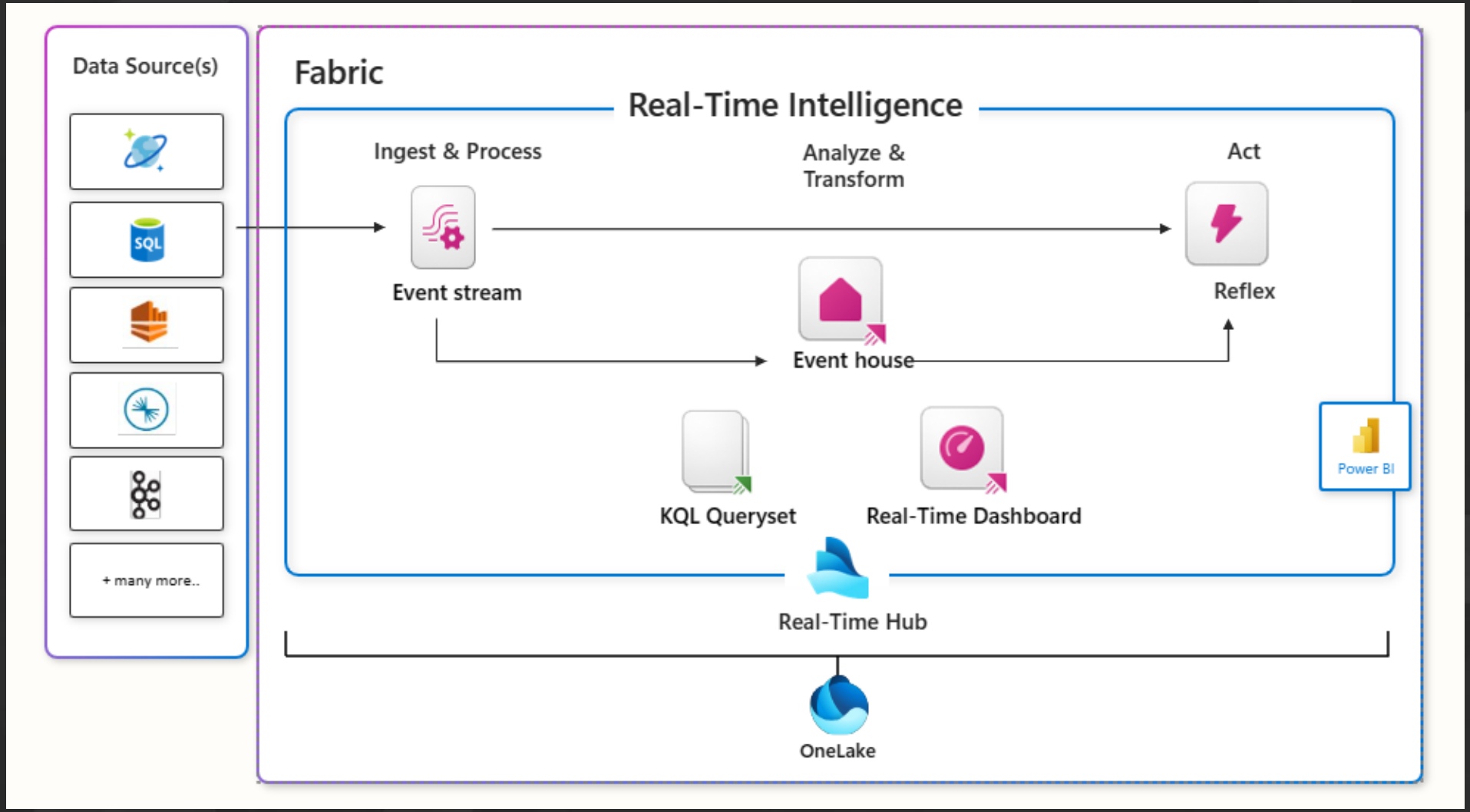


Data Activator consumption

BILLING METER	DESCRIPTION	OPERATION UNIT OF MEASURE	FABRIC CONSUMPTION RATE
Real-Time Intelligence – Event Listener & Alert	Flat charge per rule (trigger)	Per hour	0.0222 CU
Real-Time Intelligence – Event Operations	Data ingress	Per M events*	11.111 CU
Data Activator – Event Analytics	Events processed to evaluate rules, run queries etc.	Per M events	2.78 CU
Storage		Per GB/ month	1.333 CU

***Event size 0-1Kb = 1 event, 1-2Kb = 2 events, 2-3Kb = 3 events etc.**

Wrapping things up



Thank you

Feedback

Brian Bønk

Senior Principal, Microsoft MVP

SOCIAL?

https://linkedin.com/in/brianbonk

https://dcode.bi

https://github.com/brianbonk

Microsoft MVP

Microsoft FastTrack Recognized Solution Architect Power BI 2022 >>

Microsoft Certified Trainer Data Platform 2018 >>