

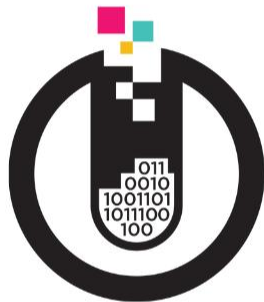
Real-Time Hub: Starting Point of Real-Time Intelligence in Fabric

Matt Gordon

Data:Scotland 2025

12 September 2025

DATA:Scotland 2025



**THE
DATA LAB**
value from data



DATAmasterminds



**ADVANCING
ANALYTICS**



redgate



Datahai



BROCH Solutions



DATA:Scotland

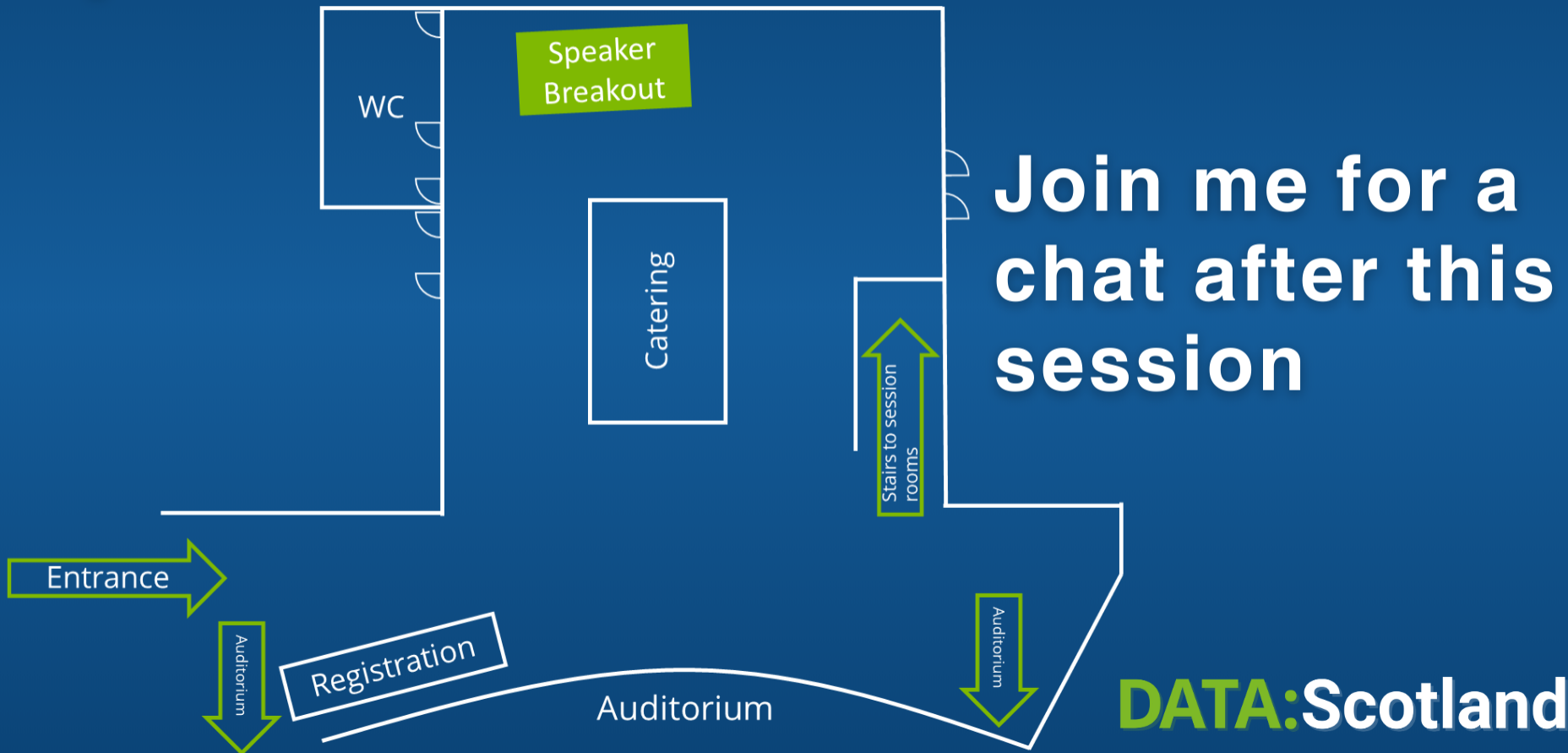


**ADVANCING
ANALYTICS**

After Party

Brewdog, Merchant City | 5pm till late

Speaker Breakout



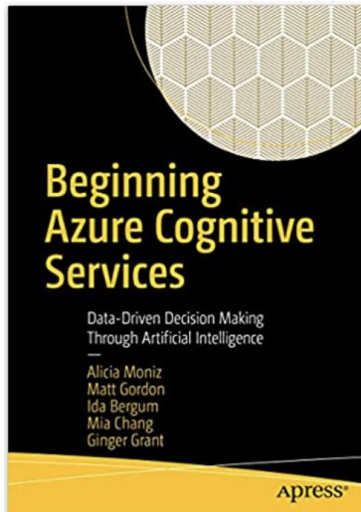
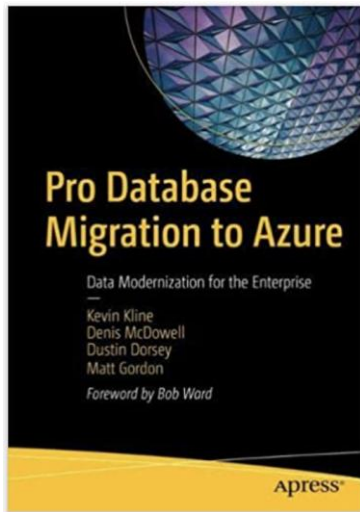
Session Feedback



Event Feedback

About Me

- Practice Director, Data & Analytics (Microsoft) for Apps Associates
- matt.gordon@appsassociates.com
- @sqlatspeed everywhere online



My Background

- 20+ years of on-prem/cloud SQL experience
- Microsoft Data Platform MVP
- Redgate Ambassador
- Led cloud migrations large and small
- Worked on Azure AI since 2017
- Leader of Lexington, KY (USA) Data Technology Group





Microsoft Fabric

The unified data platform for AI transformation



Data
Factory



Analytics



Databases



Real-Time
Intelligence



Power BI



Industry
Solutions



Partner
Workloads



AI



OneLake



Purview



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
OneLake



Intelligent insights and capabilities

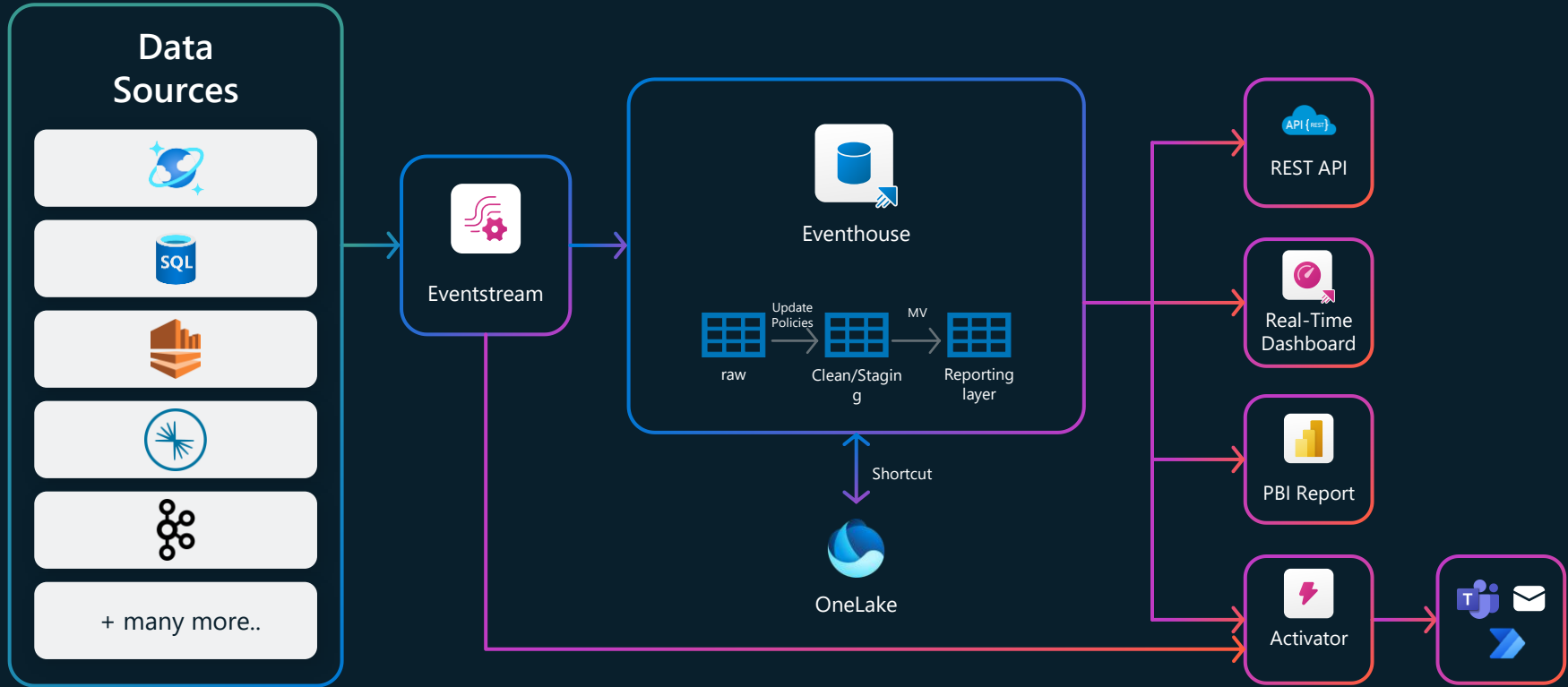
Data Agents
Anomaly detection



Real-Time Intelligence in Microsoft Fabric

Fully integrated
Real-time SaaS experiences
Unified data platform

Fabric Real-Time Intelligence – Processing architecture



Questions that users are asking



I want to know when something changes in my database



I want continuous, granular insights from my assets



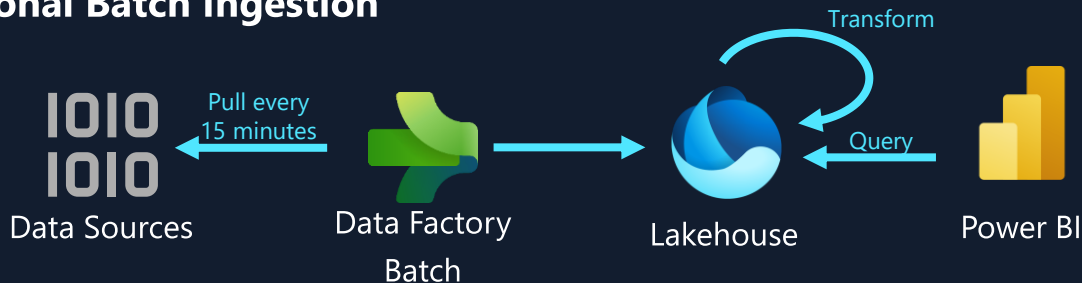
I want real-time reporting, ML scoring and GenAI apps



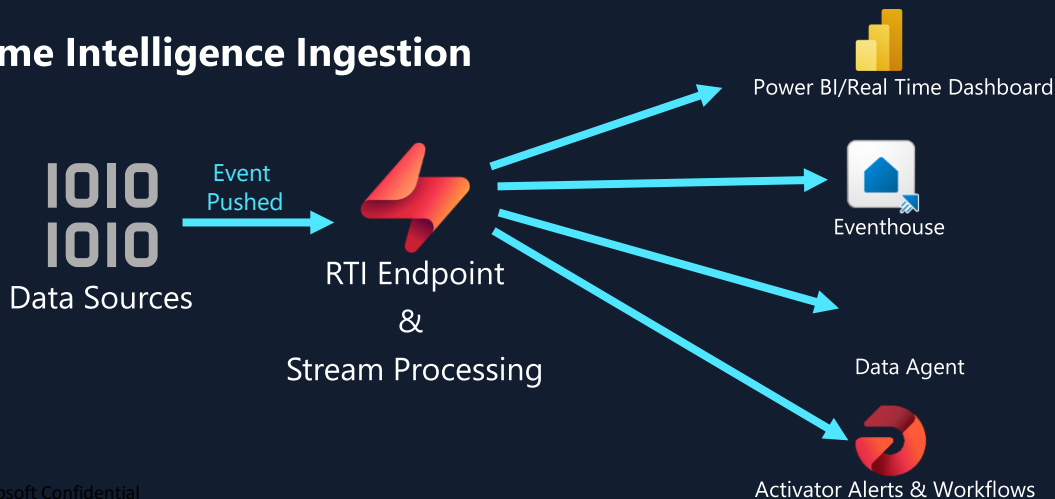
I want to act and react on events/facts/transactions as they occur

Event Driven Data Architecture

Traditional Batch Ingestion



Real-time Intelligence Ingestion



- Data is **available in seconds**, not minutes/hours
- Data can be **acted on immediately** (human or automated action)
- Support for **massive data volumes**
- Aligns with existing Lakehouse architecture

Architecture Overview and Data Flow

- Real-Time Hub
- Eventstream
- Eventhouse
- Real-time Dashboards
- Activator
- Power BI
- Data Agent

Component Flow and Roles

- Ingest
 - Real-Time Hub and Eventstream
- Store
 - Eventhouse
- Analyze/Visualize
 - Real-time Dashboards and Power BI
 - Activator and Data Agent(s)

Ingest – Real-Time Hub and Eventstream

- Real-Time Hub connects/subscribes to data sources and surfaces them to users
- Eventstream processes and transforms in near real-time
- Eventstream guides events downstream to consumers
 - Eventhouse
 - Real-time Dashboards
 - Activator

Store - Eventhouse

- Stores incoming events
 - Persistence required in all architectures
- “Traditional feel” of querying a database
- Uses tried and true Kusto engine
- Enables trend analysis and anomaly detection as history is stored

Conversation – Data Agent

- Natural language interface
- Queries Eventhouse (and other Fabric sources)
 - Interesting use case for developers unfamiliar with KQL
- AI-powered contextual responses
- Usual AI caveats apply here

Data Agent Use Cases

- “What happened in the last 5 minutes?”
- “Where are failure spikes occurring?”
- “Are there patterns to these anomalies?”

Visualize – Real-time Dashboards

- Dashboards update with live data
 - Refresh intervals govern how real-time the data is
- Can be created directly from KQL code
- Formatting and additional visual elements can be enhanced using Markdown

Visualize – Power BI

- Connection methods to Real-time Intelligence components
- Connector performance discussion
- Allows combination of other datasets with real-time data
 - Example scenarios

Action – Activator Overview

- Watch for defined patterns
 - Drops
 - Spikes
 - Abnormal data
- Take action on those scenarios
 - Teams alerts
 - Email messages
 - Power Platform and Logic Apps integration
 - Trigger workflows within Fabric

Action – Activator Real-World Scenarios

- Alert on temperature spike
- Notify operations team of breached SLA
- Restart Fabric workflow after data unavailability

What Is Real-Time Hub?

- Single place cataloging data-in-motion across your organization
- Built for managing, discovering, and connecting to data-in-motion within Fabric, outside of Fabric, and even from different clouds
- “Library” of data sources that can be handled using Real-Time Intelligence

Real-Time Hub - Sources

- Streaming data from other clouds
- Kafka clusters
- Change Data Capture feeds from relational databases
- Microsoft streaming sources
- Fabric events
- Azure storage events
- And so on...

Real-Time Hub Capabilities

- Auto-discovers connectable assets in your Fabric workspace
- Shows lineage and data flow between components
- Entry point to create new Real-Time Intelligence artifacts
 - Real-Time Hub gives you a complete view of what you already have

Real-Time Hub Capabilities and Connectivity

- Connectors to key real-time data sources:
 - Azure Event Hubs
 - Azure IoT Hub
 - Azure Blob Storage (for semi-streamed data)
 - Custom APIs and SDK integrations
 - Kafka (via Eventstream)
- Provides data preview and schema inference tools

Demo

Hands-on w/ Real-Time Intelligence Components

Continuous Ingestion from Azure Storage

Push/Load/Transform

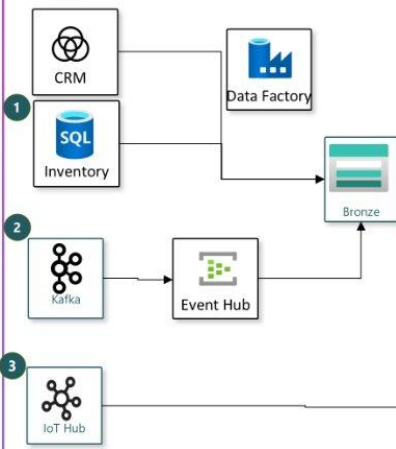
- Significant simplification of data ingestion process from Azure Storage to Eventhouse in Fabric Real-Time Intelligence
- Automates extraction and loading from Azure storage and facilitates near real-time updates to Eventhouse KQL DB tables
- Continuous Ingestion transforms the conventional data pipeline model, providing exceptional ease and scalability for contemporary data-driven environments.

Traditional ETL pipeline

Azure Analytics Solution

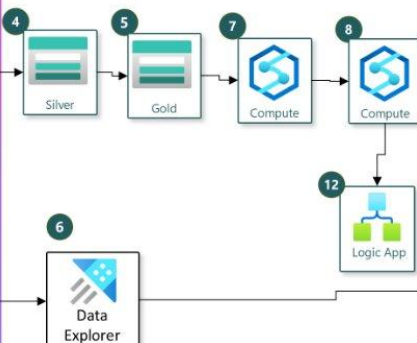
Ingest & process

1. Data Factory orchestrates extracting data out of CRM, SQL, and other databases to load data to a bronze layer in Azure Storage
2. Work Order data is sent via a Kafka topic to Azure, where it is dumped to an Azure Storage account
3. An IoT hub receives vehicle telemetry data from all vehicles in the fleet, and is sent to an Azure Data Explorer database due to the speed and velocity required for reporting, bypassing the data analytics layer



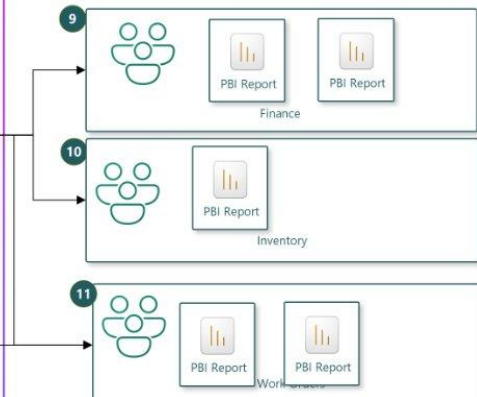
Analyze & transform

4. Data is processed into a silver layer in the medallion architecture
5. Data is processed again into a gold layer in the medallion architecture
6. Vehicle telemetry data is processed and transformed directly in Azure Data Explorer by leveraging contextual data brought in from the bronze layer
7. A SQL database is created on top of the gold data that stages the data.
8. Data in the SQL engine is transformed and loaded into tables for reporting specific scenarios



Visualize and Activate

9. The finance team gets a report in their workspace that shows all work orders created the previous day, as well as another report that shows monthly reconciliations
10. An inventory team has a report updated daily that shows current stock
11. The work order team gets a report updated hourly that shows which orders came in recently, manually reconciling that with another report showing vehicle locations
12. Specialized logic apps are built by engineering to take action on specific alerts for high-impact



Push/Load/Transform in Eventhouse

Azure Storage Continuous Ingestion

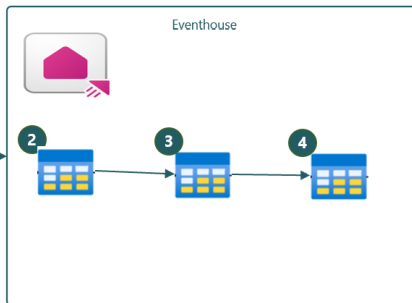
Ingest & process

1. Event and Time Series files are loaded to Azure Storage on a regular interval (seconds/minutes/hours)



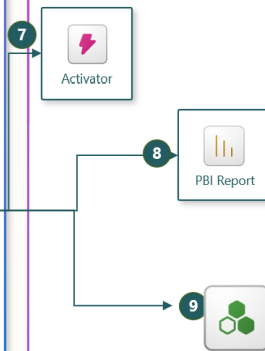
Analyze & transform

2. Continuous Ingestion loads the data into an Eventhouse
3. Data is transformed, and curated on arrival with Eventhouse Update Policies
4. Data is deduplicated for reporting with Materialized Views
5. Data is mirrored to OneLake for additional downstream applications
6. Contextualization data is loaded into Eventhouse via OneLake Shortcuts



Visualize and Activate

7. Alerts are created both from contextualized data and raw events to users around key metrics
8. Power BI reports provide historical and analytical insights
9. Data agents answer queries in natural language on the latest data



RESOURCES

Resources & Further Reading

- Real-Time Intelligence Learning Path: <https://aka.ms/learnrti>
- Kusto Detective Agency: <https://detective.kusto.io>
- Continuous Ingestion Details Blog: <https://blog.fabric.microsoft.com/en-US/blog/continuous-ingestion-from-azure-storage-to-eventhouse-preview/>
- Real-Time Hub Information: <https://learn.microsoft.com/en-us/fabric/real-time-hub/real-time-hub-overview>
- MCP Support for Real-Time Intelligence: <https://blog.fabric.microsoft.com/en-us/blog/introducing-mcp-support-for-real-time-intelligence-rti/>

Session Feedback



Event Feedback

