



Implement Real Time Intelligence with Microsoft Fabric



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Date

1

Course schedule

Early morning	• Get started with Real-Time Intelligence in Microsoft Fabric
Break	
Late morning	• Use real-time eventstreams in Microsoft Fabric
Lunch	
Early afternoon	• Work with real-time data in a Microsoft Fabric eventhouse
Break	
Late afternoon	• Create Real-Time Dashboards with Microsoft Fabric

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2

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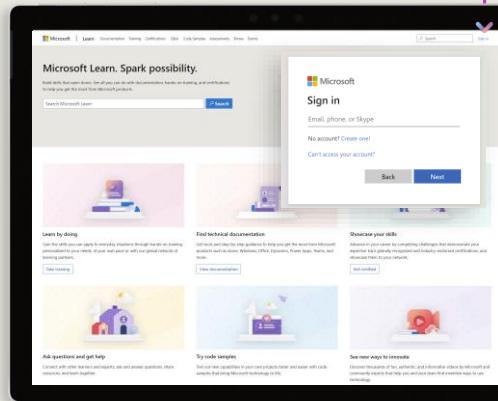
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3

Access your course material

All course content is available on Microsoft Learn

[Implement Real-Time Intelligence with Microsoft Fabric - Training | Microsoft Learn](https://learn.microsoft.com/training/fabric)

- We'll go through this content together and as the course progresses, I will advise you on which modules to review.
- You can provide feedback for modules on Microsoft Learn. Find how at the bottom of each page.

This course includes labs:

- Detailed lab instructions are included in your lab environment.

aka.ms/LabsLink

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4

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The screenshot shows the Microsoft Learn profile interface. On the left, there's a sidebar with links: Activity, Training, Challenges, Certifications, Q&A, Achievements (which is highlighted with a purple border and has a circled '1' above it), Collections, and Transcript. The main area is titled 'Achievements' and contains a button to 'Redeem your code now.' Below that is a navigation bar with 'Learning Paths' and 'Modules, Courses & More' (which is underlined). To the right of the navigation bar is a badge for 'Predict costs and optimize spending for Azure', which was completed on 11/13/2019. There are four small icons at the bottom right of the badge: a person icon, a gear icon, a download icon, and a print icon. A circled '2' is above the 'Redeem your code now.' button, a circled '3' is above the navigation bar, and a circled '4' is above the download/print icons.

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5



Implement Real-Time Intelligence with Microsoft Fabric



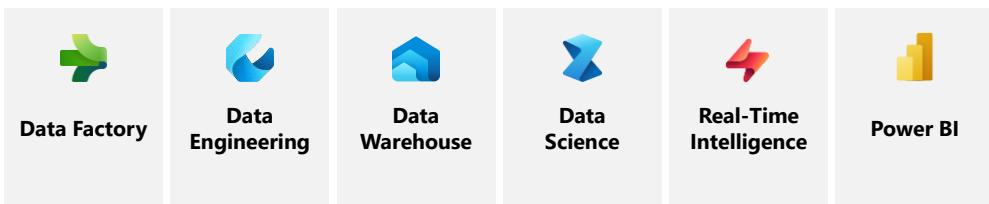
6

Explore end-to-end analytics with Microsoft Fabric



7

Microsoft Fabric



- **Data Factory:** Data integration combining Power Query with the scale of Azure Data Factory to move and transform data.
- **Data Engineering:** Data engineering with a Spark platform for data transformation at scale.
- **Data Warehouse:** Data warehousing with industry-leading SQL performance and scale to support data use.
- **Data Science:** Data science with Azure Machine Learning and Spark for model training and execution tracking in a scalable environment.
- **Real-Time Intelligence:** Real-time Intelligence to query and analyze large volumes of data in real-time.
- **Power BI:** Business intelligence for translating data to decisions.

8

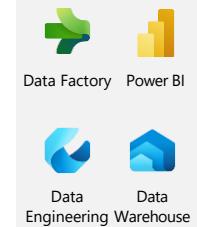
Data teams and Fabric

Fabric's unified management and governance make it easier for data professionals to work together.

Data Engineers



Analytics Engineers



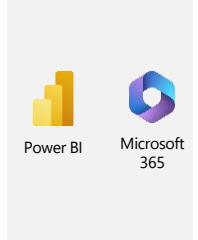
Data Scientists



Data Analysts



Decision Makers



Data Stewards

9

Enable and use Microsoft Fabric

Fabric must be enabled in your tenant by either:

- Fabric admin (formerly known as Power BI admin)
- Power Platform admin
- Microsoft 365 admin

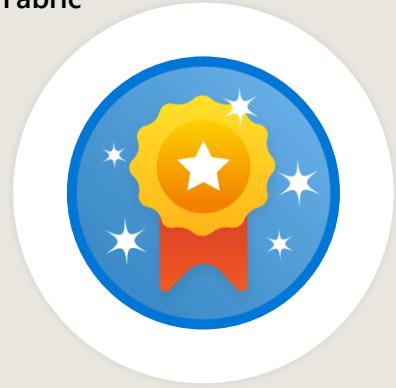
Workspaces must then be assigned to Premium per capacity or Fabric license mode.

10

Further reading

Introduction to end-to-end analytics using Microsoft Fabric

<https://aka.ms/fabric-intro>



11

Get started with Real-Time
Intelligence in Microsoft
Fabric



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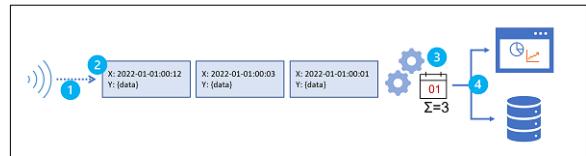
12

What is real-time analytics?

Ingestion and processing of a perpetual data stream

Common goals for real-time analytics include:

- Continuously analyzing data to report issues or trends
- Understanding component or system behavior under various conditions to help plan future enhancements
- Triggering specific actions or alerts when certain events occur or thresholds are exceeded

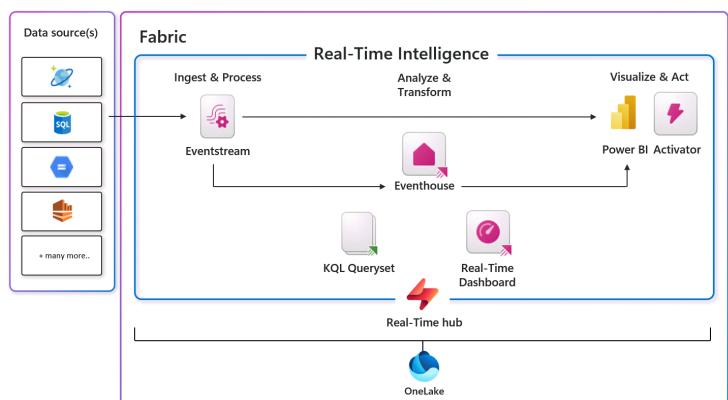


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13

Real-Time Intelligence in Microsoft Fabric

- **Eventstream:** Real-time data stream ingestion and transformation
- **Eventhouse:** Scalable storage and querying of real-time data
- **KQL Queryset:** A tool for creating and running queries in the KQL databases within an eventhouse
- **Real-Time Dashboard:** Interactive visualization and exploration of real-time data
- **Activator:** Automated actions triggered by real-time events



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14

Real-Time Hub

The screenshot shows the 'Real-Time hub' section of the Real-Time Intelligence interface. On the left, there's a sidebar with various navigation options like 'All data streams', 'Data sources', 'Microsoft sources', 'Fabric events', 'Azure events', etc. The main area is titled 'My data streams' and contains a table with one row:

Name	Item	Workspace	Endorsement	Sensitivity
stock-data-stream	stock-data	real-time-ws		

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15

Ingest and transform real-time data

Data Sources:

- External services
- Fabric events
- Sample data

Data Transformations:

- Filter and manage fields
- Aggregate and Group
- Union and Join

Data Destinations:

- Eventhouse
- Lakehouse
- Derived stream
- Fabric activator
- Custom endpoint

The screenshot shows the 'stock-stream' Real-Time Metabase interface. On the left, there's a sidebar with various options like 'Home', 'Create', 'Browse', 'Monitor', 'Workspaces', and 'Real-time intelligence'. The main area has a 'Transform events or add destination' section with a flow diagram. The flow starts with a 'stock' source node, followed by a transformation node labeled 'stock-stream', and finally a destination node labeled 'stock-stream-stream'. Below the diagram, the 'Test result' tab is active, showing a table of data:

Item	symbol	sector	securityType	lastPrice	bidSize
2024-12-03T18:52:04.341Z	BINOM	retailing	commonstock	2314.84	41
2024-12-03T18:52:04.341Z	NSFT	softwareservices	commonstock	2504.01	3
2024-12-03T18:52:04.341Z	HODI	mediaentertainment	commonstock	1255.28	31
2024-12-03T18:52:04.241Z	BINOM	retailing	commonstock	2306.84	123
2024-12-03T18:52:04.241Z	NSFT	softwareservices	commonstock	3704.01	23
2024-12-03T18:52:04.241Z	HODI	mediaentertainment	commonstock	1370.28	66
2024-12-03T18:52:04.241Z	BINOM	retailing	commonstock	2314.84	41
2024-12-03T18:52:04.241Z	NSFT	softwareservices	commonstock	2504.01	89
2024-12-03T18:52:04.241Z	HODI	mediaentertainment	commonstock	1330.28	163

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16

Store and query real-time data

The screenshot shows the Microsoft Fabric Real-Time Intelligence interface for the 'my_event_house' database. The left sidebar includes options like Home, Create, Databases, Monitoring, and Real-Time Intelligence. The main area displays 'System overview' with sections for Storage (Standard, Eventhouse size, Premium), Activity in minutes (1 Minutes, 1 Databases), and a timeline from 1H to 3D. A note says 'Coming soon' under Monitoring.

Eventhouse:

Scalable storage and querying for real-time data in:

- **KQL Databases:**
- Data stores built on the Kusto database engine, optimized for time-based data.
- Queried using Kusto Query Language (KQL), with queries managed in:
 - **KQL Querysets:**
 - Collections of KQL and SQL queries

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17

Visualize real-time data

The screenshot shows the Microsoft Fabric Real-Time Intelligence interface for the 'Stock Dashboard'. It features a bar chart titled 'Average Prices' comparing HODL, NFT, and BMX4. The dashboard also includes a 'Manage' section with options like Save, Refresh, New data source, Set alert, New file, New test file, Base queries, and Favorite. The sidebar includes Home, Create, Databases, Monitoring, and Real-Time Intelligence.

Real-Time Dashboard

- A component on Fabric Real-Time Intelligence
- Interactive data visualization tiles based on KQL queries

The screenshot shows the Microsoft Fabric Real-Time Intelligence interface for creating a Power BI report. It displays a bar chart titled 'Average Stock Price' and the Power BI report editor. The sidebar includes Home, Create, Databases, Monitoring, and Real-Time Intelligence.

Power BI

- A core component of the Fabric platform
- Create Power BI reports from a KQL Database

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18

Exercise



Explore Real-Time Intelligence in Fabric

30 minutes

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19

Further reading

Get started with Real-Time Intelligence in Microsoft Fabric

<https://aka.ms/fabric-real-time>



20

Use Real-Time Eventstreams in Microsoft Fabric

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21

Components of eventstreams

Sources:

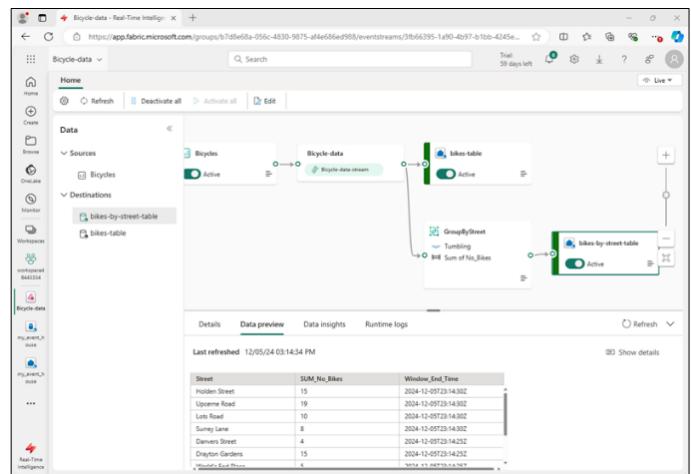
- Where the streaming data comes from
- Includes external sources, Fabric events, and sample data

Transformations:

- Operations that filter or aggregate the data as it is processed from the stream
- Includes temporal windowing functions that enable you to analyze data events within discrete time periods

Destinations:

- Where your transformed event data is sent
- Can include eventhouse, lakehouse, another eventstream, or an activator



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22

Eventstream sources and destinations

Sources	Destinations
Azure Event Hub	Eventhouse
Azure IoT Hub	Lakehouse
Azure SQL Database Change Data Capture (CDC)	Custom endpoint
PostgreSQL Database CDC:	Derived Stream
MySQL Database CDC	Fabric Activator
Azure Cosmos DB CDC	
Google Cloud Pub/Sub	
Amazon Kinesis Data Streams	
Confluent Cloud Kafka	
Fabric workspace events	
Azure blob storage events	
Custom endpoint	
Sample data	

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23

Eventstream transformations

Transformations

- Filter
- Aggregate
- Group by
- Union
- Expand
- Join

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Exercise

30 minutes



Ingest real-time data with Eventstreams in Microsoft Fabric

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Further reading

Use real-time eventstreams in Microsoft Fabric

<https://aka.ms/mslearn-eventstreams-fabric>



26

Work with real-time data in a Microsoft Fabric eventhouse

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27

Get started with an eventhouse

- An eventhouse contains one or more KQL Databases
- Import data into tables from static or streaming data sources
- Query tables using KQL:

```
Automotive
| where fare_amount > 20
| project trip_id, pickup_datetime, fare_amount
| sort by pickup_datetime desc
```

- Or SQL:

```
SELECT trip_id, pickup_datetime, fare_amount
FROM Automotive
WHERE fare_amount > 20
ORDER BY pickup_datetime DESC
```

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28

Use KQL effectively

Filter columns

```
Automotive
| project trip_id, vendor_id, pickup_datetime, fare_amount
```

Filter rows

```
Automotive
| where pickup_datetime > ago(30min)
| project trip_id, vendor_id, pickup_datetime, fare_amount
```

Summarize data

```
Automotive
| where ingestion_time() > ago(1d)
| summarize average_fare = avg(fare_amount) by vendor_id, pickup_hour = hourOfDay(pickup_datetime)
| project pickup_hour, vendor_id, average_fare
| sort by pickup_hour
```

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29

Materialized views and stored functions

Materialized views

```
.create async materialized-view with (backfill=true) TripsByVendor on table Automotive
{
    Automotive
    | summarize trips = count() by vendor_id, pickup_date = format_datetime(pickup_datetime, "yyyy-MM-dd")
}
```

```
TripsByVendor
| project pickup_date, vendor_id, trips
| sort by pickup_date desc
```

Stored functions

```
.create-or-alter function trips_by_min_passenger_count(num_passengers:long)
{
    Automotive
    | where passenger_count >= num_passengers
    | project trip_id, pickup_datetime
}
```

```
trips_by_min_passenger_count(3)
| take 10
```

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30

Exercise

30 minutes



Work with data in a Microsoft Fabric eventhouse

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31

Further reading

Work with real-time data in a Microsoft Fabric eventhouse

<https://aka.ms/mslearn-eventhouse-fabric>



32

Create real-time dashboards with Microsoft Fabric

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33

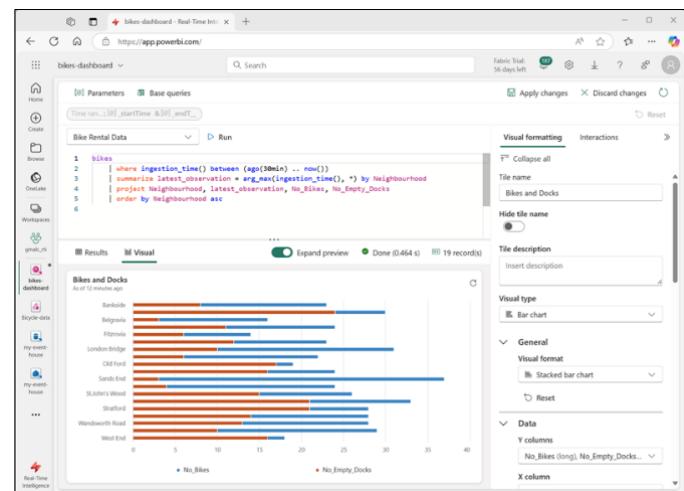
Get started with real-time dashboards

A real-time dashboard is based on a streaming ***data source***

- Two options for data access permissions:
 - Pass-through identity
 - Dashboard editor's identity.

Data is visualized in ***tiles*** based on ***KQL queries***

- Write and test the KQL query in the tile editor
- Choose from a wide range of data visuals



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34

Advanced features

Base queries

- Create a base query to retrieve general data that can be used in multiple tiles
- Use the base query as a source table for tile-specific queries

Pages

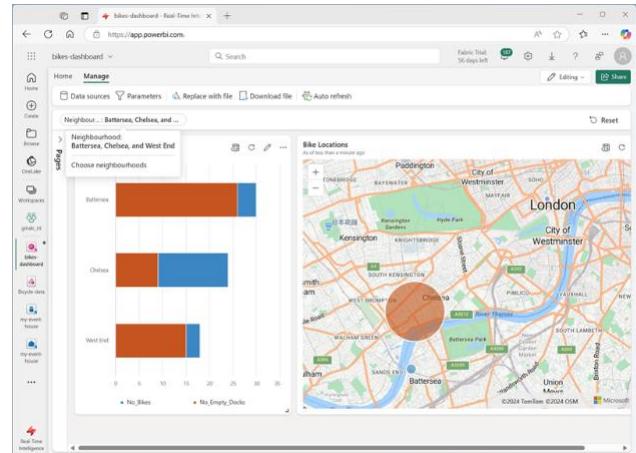
- Add multiple pages to a dashboard to create a more comprehensive view of the data

Parameters

- Define parameters to enable users to filter dashboards interactively

Auto refresh

- Configure auto refresh to ensure the dashboard displays fresh data



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35

Exercise



30 minutes

Get started with Real-Time Dashboards in Microsoft Fabric

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Further reading

Create Real-Time Dashboards with Microsoft Fabric

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37



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38