

AZ-305

Designing Microsoft Azure Infrastructure Solutions



AZ-305 Agenda

Module 01 Design a governance solution

Module 02 Design a compute solution

Module 03 Design a non-relational data storage solution

Module 04 Design a data storage solution for relational data

Module 05 Design a data integration solution 

Module 06 Design an application architecture solution

Module 07 Design Authentication and Authorization Solutions

Module 08 Design a solution to log and monitor Azure resources

Module 09 Design a network infrastructure solution

Module 10 Design a business continuity solution

Module 11 Design a migration solution

Design a data integration solution

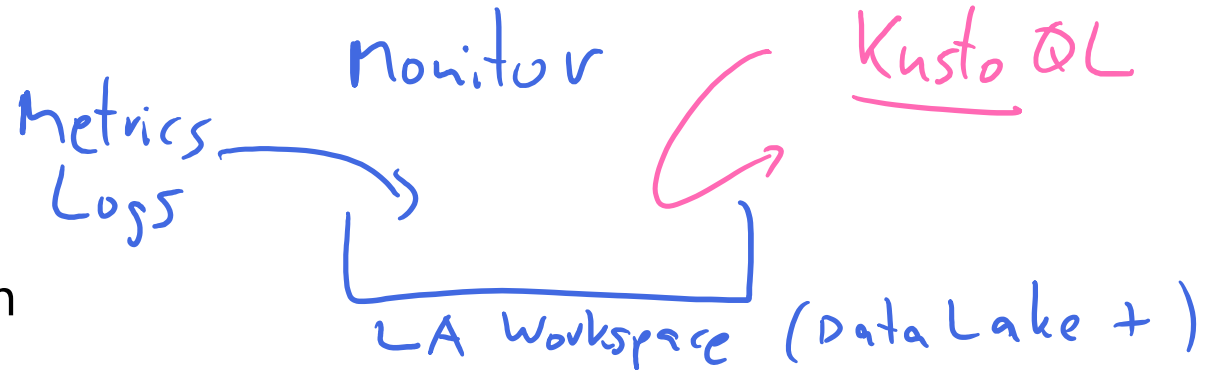


Data Factory
Data Pipelines

Big Data
Data Engineering

Introduction

- Design a data integration solution with Azure Data Factory **ETL**
- Design a data integration solution with Azure Data Lake
- Design a data integration and analytics solution with Azure Databricks
- Design a data integration and analytics solution with Azure Synapse Analytics
- Design Azure Stream Analytics solution for Data Analysis
- Design a strategy for hot/warm/cold data path

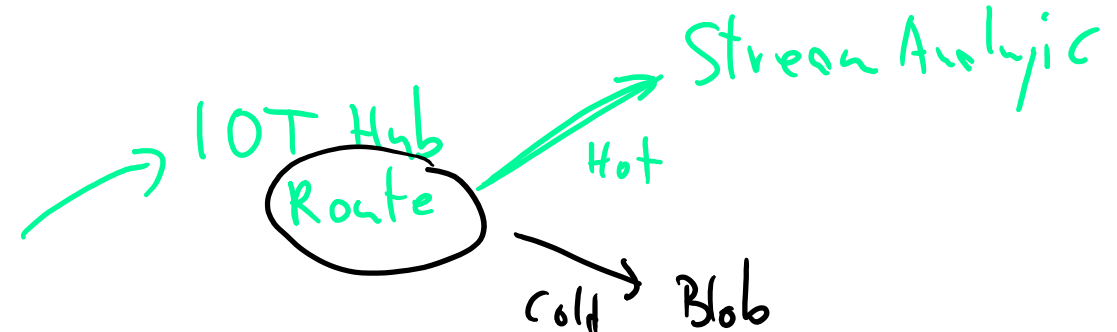


AZ-305: Design Data Storage Solutions (25-30%)

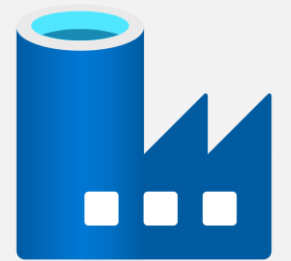
Design Data Integration

- Recommend a solution for data integration
- Recommend a solution for data analysis

Cost!
Data Warehouse



Design a data integration solution with Azure Data Factory

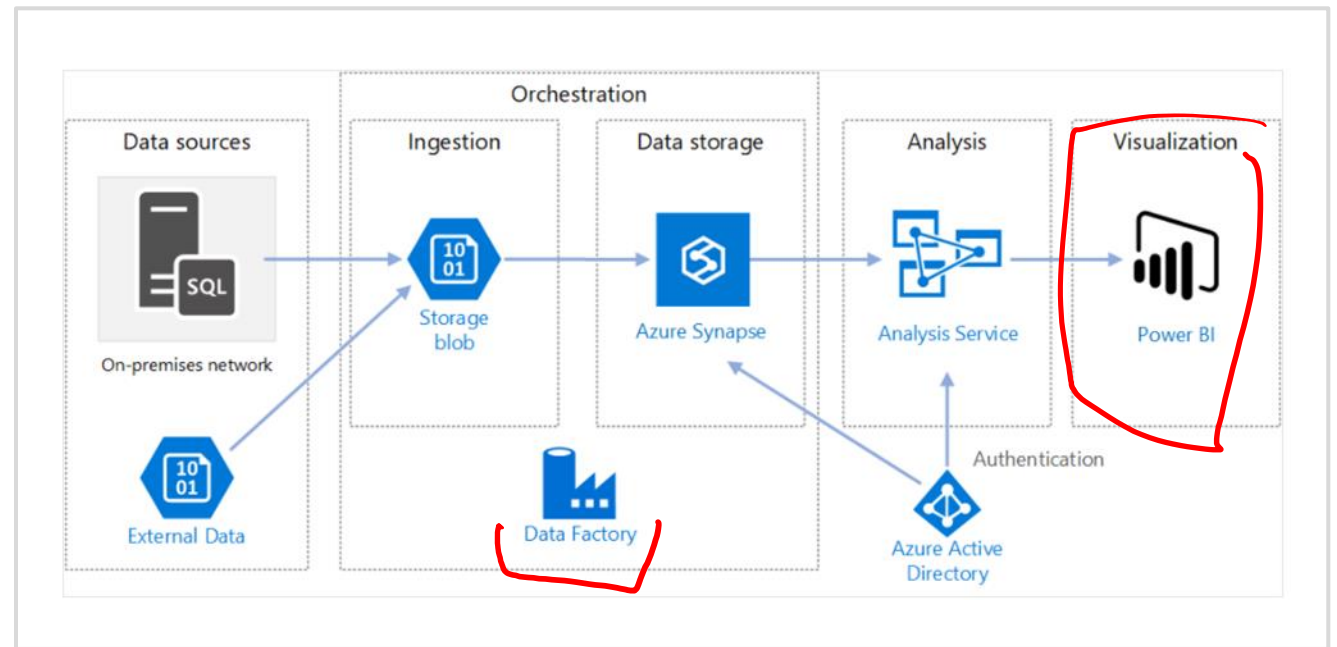


Data-driven workflows

Azure Data Factory is a cloud-based **ETL** and data integration service that can help you create and schedule data-driven workflows (called pipelines) that can ingest data from disparate data stores.

You can use Azure Data Factory to:

1. Orchestrate data movement.
2. Transform data at scale.



Design a data integration solution with Azure Data Lake

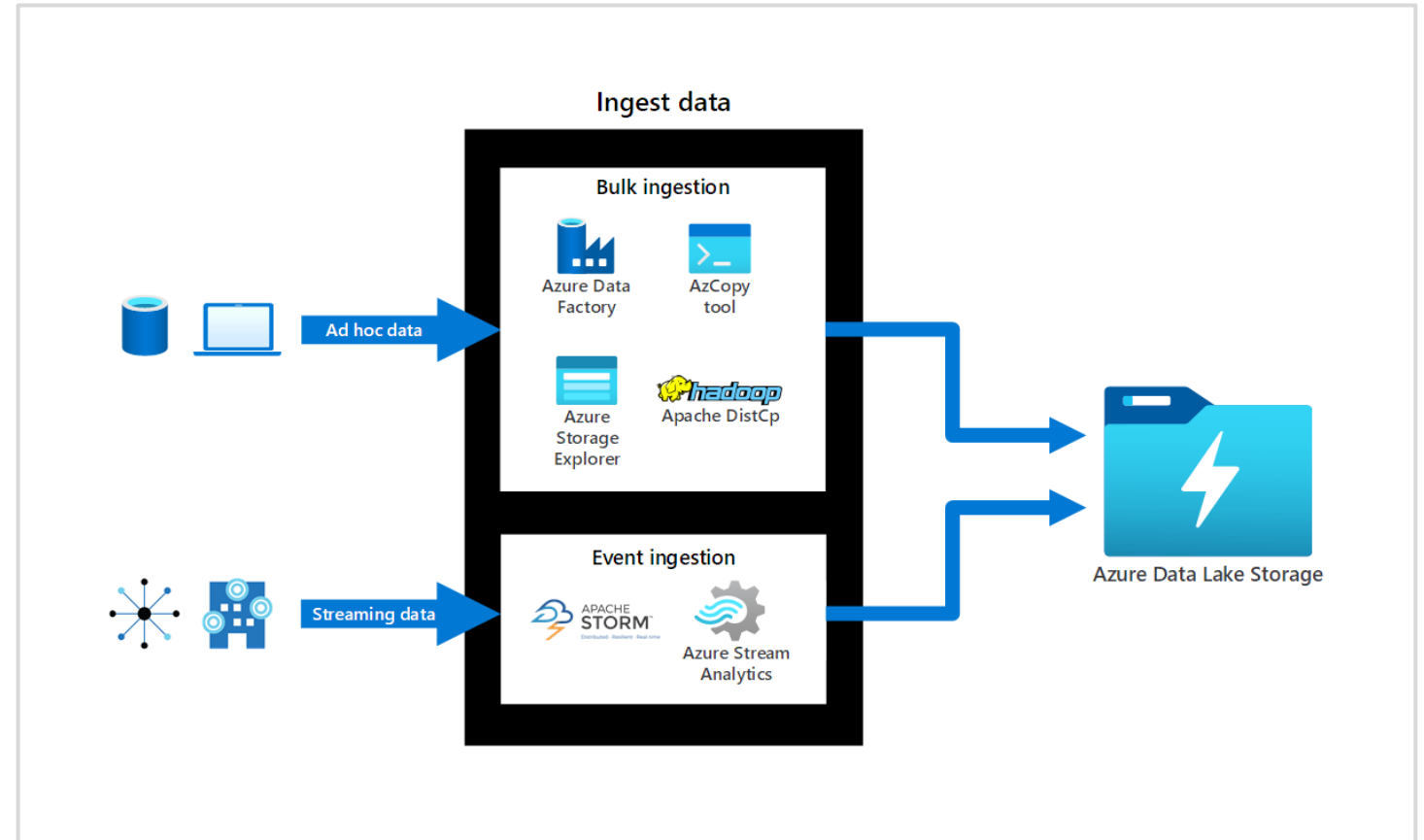


Azure Data Lake

Azure Data Lake Storage is a comprehensive, scalable, and cost-effective data lake solution for big data analytics built into Azure.

Use Azure Data Lake when you need:

- a data repository on the cloud for managing large volumes of data
- To manage a diverse collection of data types such as JSON files, CSV, log files or other diverse formats
- Real-time data ingestion and storage



Compare Azure Data Lake to Azure Blob storage

Criteria	Azure Data Lake ←	→ Azure Blob Storage
Data type	Good for storing large volumes of text data	Good for storing unstructured non-text-based data such as photos, videos, backup etc.
Namespace support	Supports hierarchical namespaces ✓	Supports flat namespaces
Hadoop compatibility	Optimized for big data, like Hadoop	Is not Hadoop compatible
Security	Access Control Lists (ACLs), shared keys, SAS and RBAC	Shared keys, SAS, and RBAC OA4+42

[Blob Storage feature support in Azure storage accounts | Microsoft Docs](#)

Design a data integration and analytics solution with Azure Databricks



Azure Databricks

| Data Factory

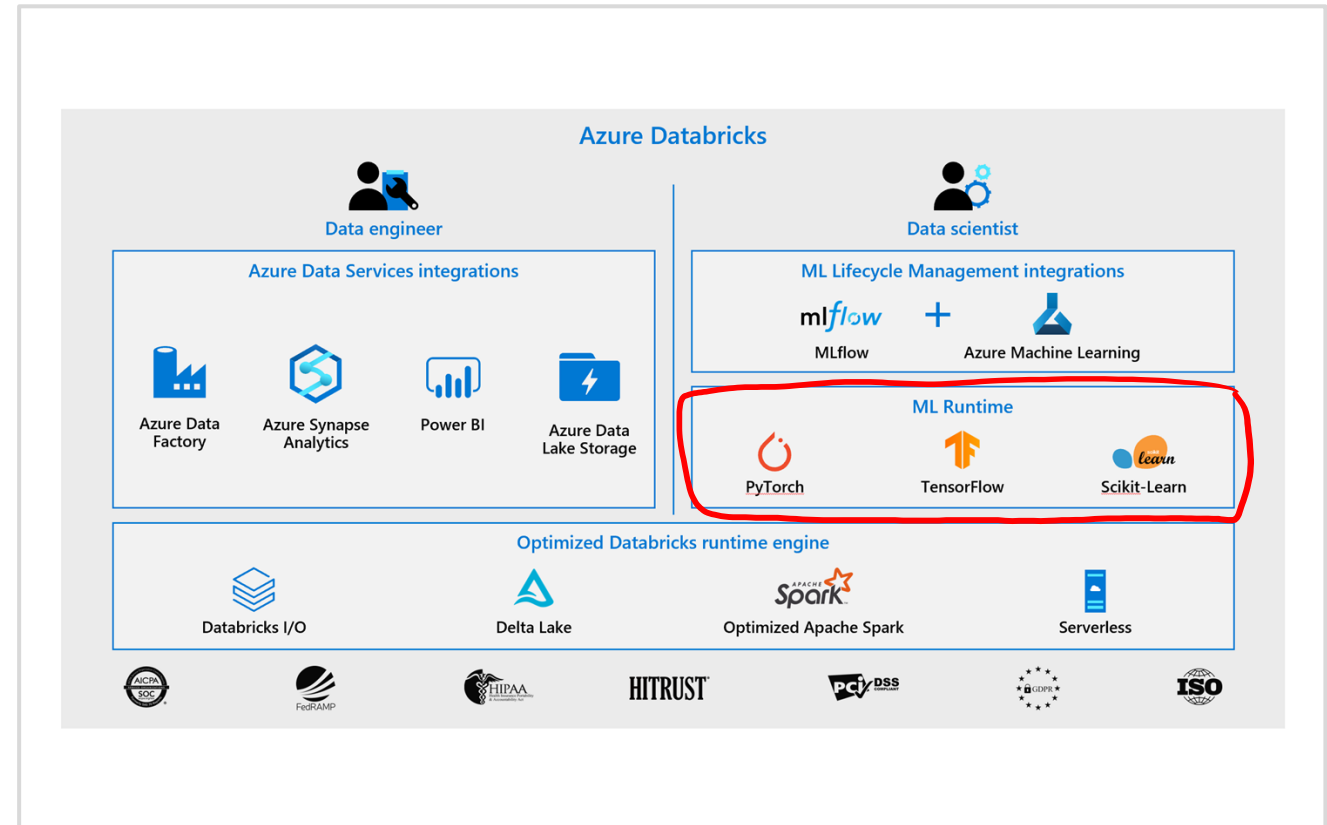
Kubernetes | SF

Azure Databricks is a fully managed, cloud-based Big Data and Machine Learning platform, which empowers developers to accelerate AI and innovation.

Provides data science and engineering teams with a single platform for Big Data processing and Machine Learning.

Offers three environments for developing data intensive applications:

- Databricks SQL
- Databricks Data Science & Engineering
- Databricks Machine Learning.



Data Lake | Data Warehouse
(Synapse)

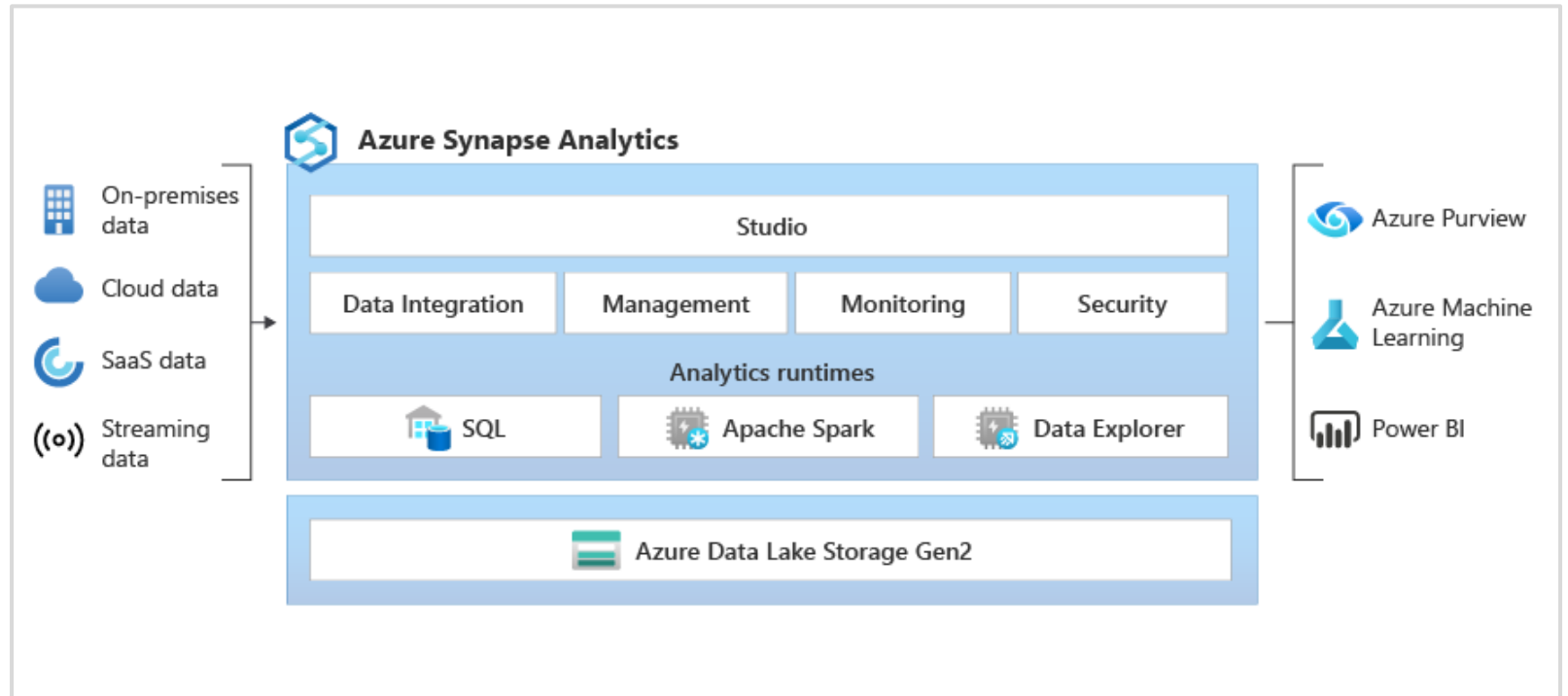
Design a data integration and analytics solution with Azure Synapse Analytics



Azure Synapse Analytics

Azure Synapse Analytics is an integrated analytics platform that brings together data integration, enterprise data warehousing, big data analytics and visualization into a single service. Azure Synapse Analytics is an evolution of Azure SQL Data Warehouse.

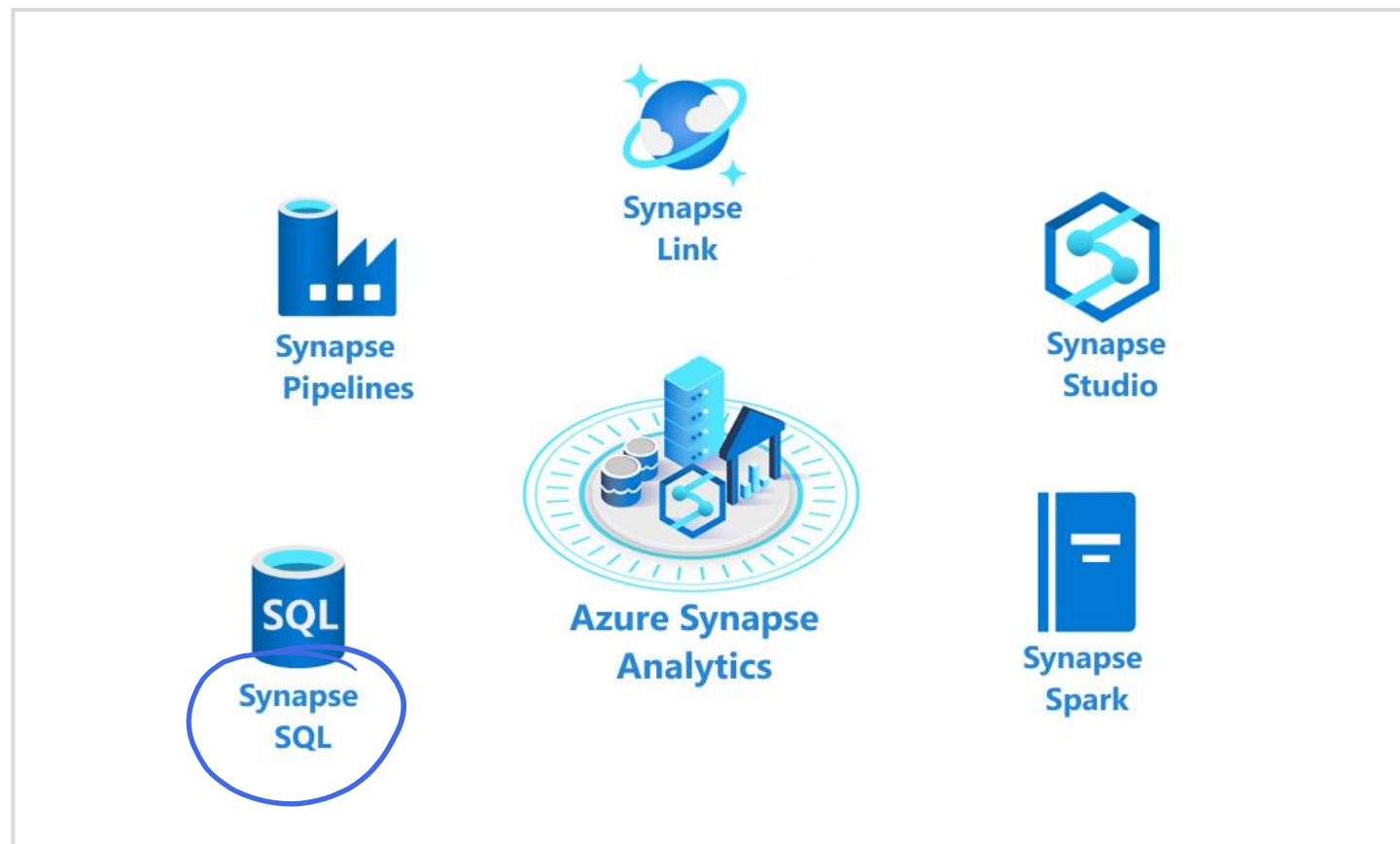
- Modern data warehousing
- Advanced analytics
- Data exploration and discovery
- Real time analytics
- Data integration
- Integrated analytics
- Machine Learning



Components of Azure Synapse Analytics

Elements

- Synapse SQL pool
- Synapse Spark pool
- Synapse Pipelines
- Synapse Link
- Synapse Studio



What kind of analytics can you do with Azure Synapse Analytics?



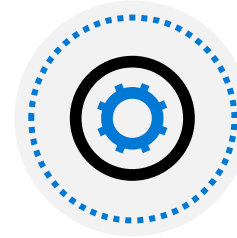
Descriptive analytics - "What is happening?"

Azure Synapse Analytics leverages the dedicated SQL pool capability that enables you to create a persisted data warehouse to perform this type of analysis.



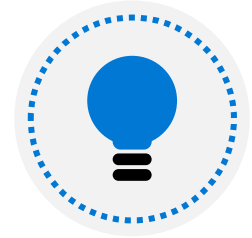
Diagnostic analytics - "Why is it happening?"

You can use the serverless SQL pool capability within Azure Synapse Analytics that enables you to interactively explore data within a data lake.



Predictive analytics - "What is likely to happen?"

Azure Synapse Analytics uses its integrated Apache Spark engine and Azure Synapse Spark pools for predictive analytics with other services such as Azure Machine Learning Services, or Azure Databricks.



Prescriptive analytics - "What needs to be done?"

This type of analytics looks at executing actions based on real-time or near real-time analysis of data, using predictive analytics.

Compare Azure Data Factory to Azure Synapse Analytics

Criteria	Azure Data Factory	Azure Synapse Analytics
Integration runtime sharing	Can be shared across different data factories	No sharing
Solution templates	Provided with Azure Data Factory template gallery	Provided with Synapse Workspace Knowledge center
Integration Runtime cross region support	Support Cross region data flows	Does not support cross region data flows
Monitoring of Spark Jobs for Data Flow	Not supported	Supported by the Synapse Spark pools

Compare Synapse to Databricks

Azure Synapse Analytics and Azure Databricks offer different capabilities which may be combined if required

Capabilities	Databricks	Synapse
Machine Learning	<ul style="list-style-type: none">Optimized runtimes with support for TensorFlow, PyTorch, and Keras.GPU support	<ul style="list-style-type: none">Built-in support Azure MLTrain models using SparkML, MLlib and other open-source librariesGPU-accelerated pools
Feature Set	<ul style="list-style-type: none">Optimized Apache Spark environment	<ul style="list-style-type: none">Distributed T-SQL systemSpark environmentData IntegrationUnified experience with Synapse Studio
Reporting	<ul style="list-style-type: none">Azure Databricks connection available in PowerBI	<ul style="list-style-type: none">PowerBI available directly from Synapse Studio

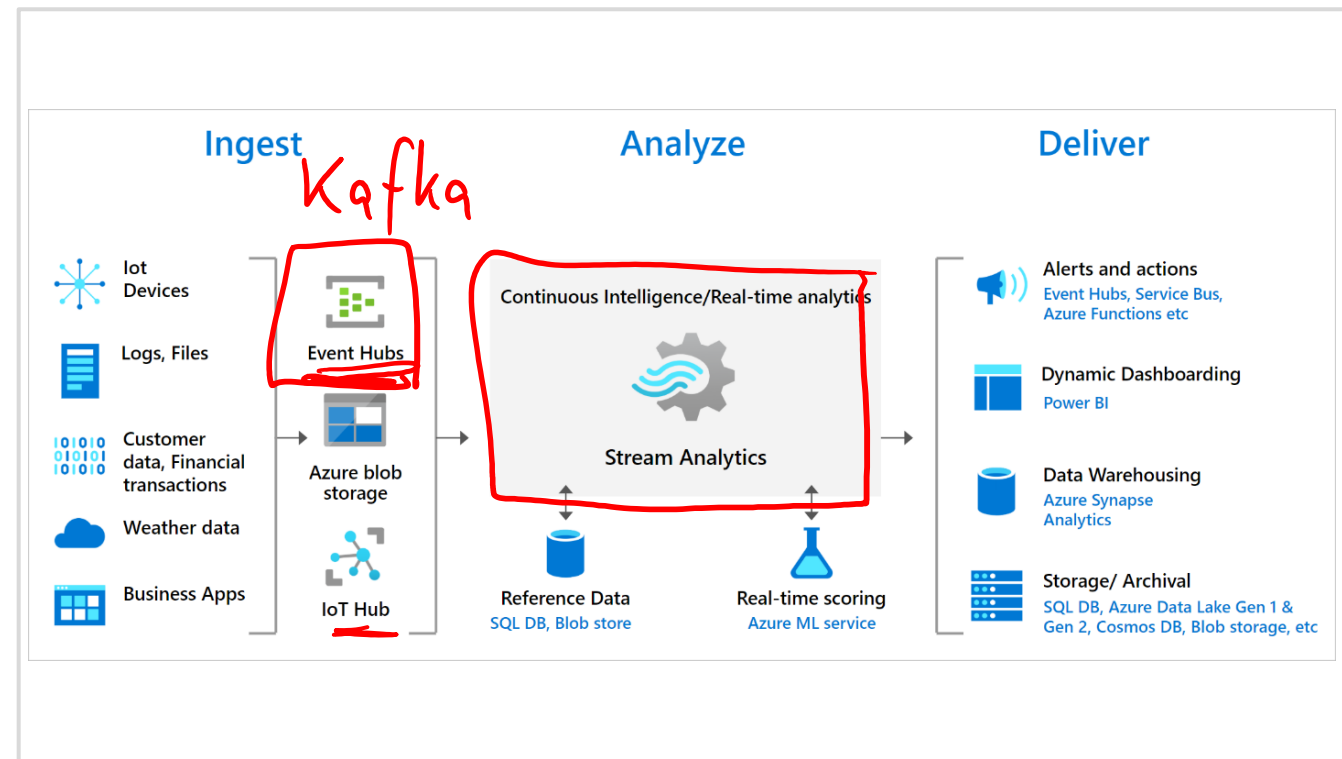
Design Azure Stream Analytics solution for Data Analysis



Azure Stream Analytics

Azure Stream Analytics is a real-time analytics and complex event-processing engine that is designed to analyze and process high volumes of fast streaming data from multiple sources simultaneously.

- Analyze real-time telemetry streams from IoT devices
- Web logs/clickstream analytics
- Geospatial analytics for fleet management and driverless vehicles
- Remote monitoring and predictive maintenance of high value assets
- Real-time analytics on point-of-sale data for inventory control and anomaly detection



Design a strategy for hot/warm/cold data path

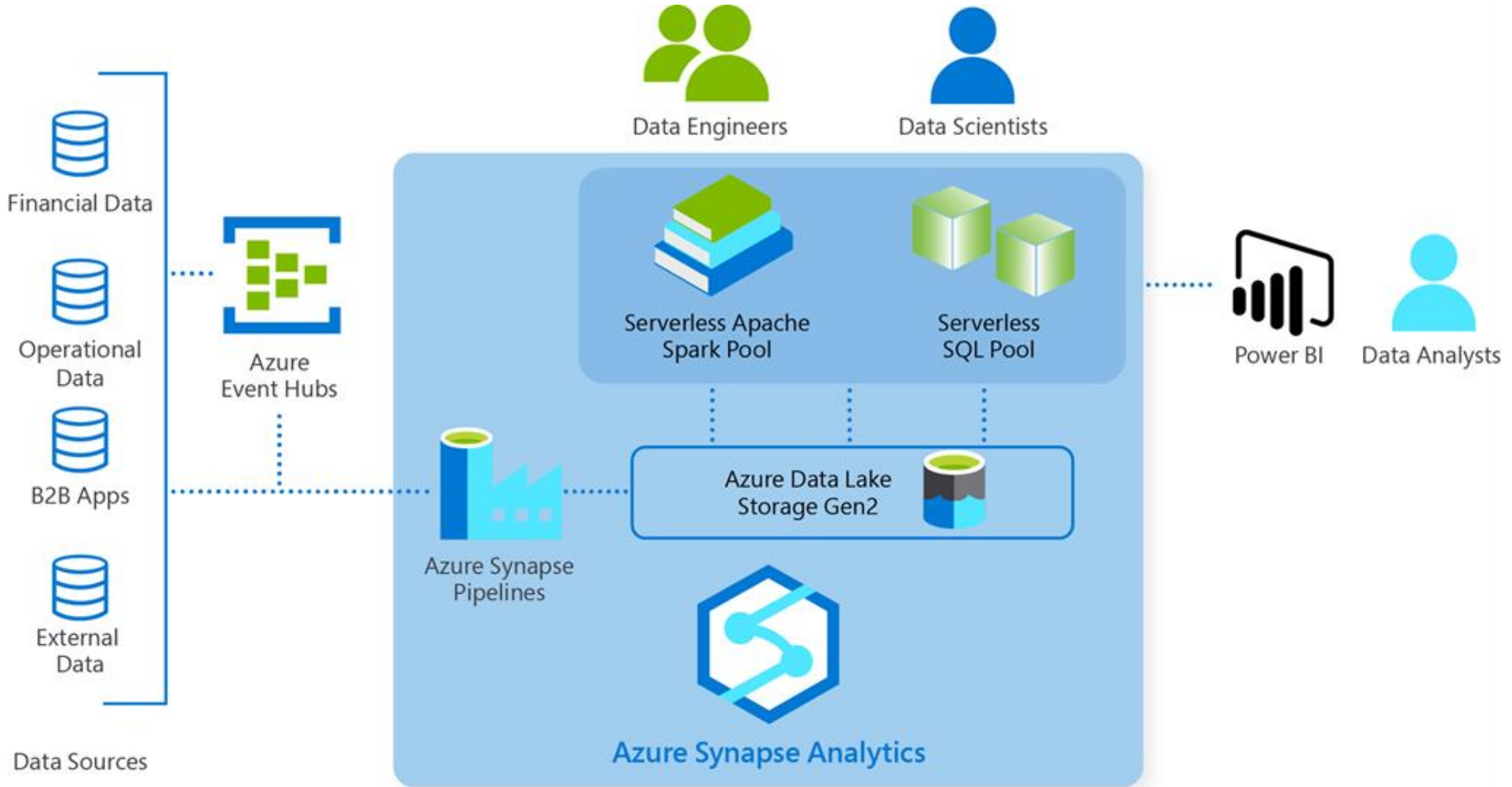


When to use Hot/Warm/Cold data path

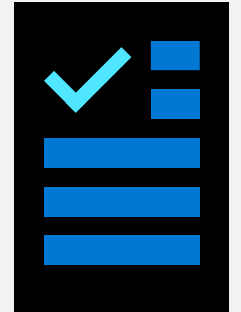
Path	Requirement
Hot data path	<ul style="list-style-type: none">• When data requirements are known to change frequently• When processing or displaying data in real time
Warm data path	<ul style="list-style-type: none">• When you need to store or display a recent subset of data• Used for data that is consumed for small analytical and batch processing
Cold data path	<ul style="list-style-type: none">• When data is rarely used. The data might be stored for compliance or legal reasons• Used for data that is consumed for long term analytics and batch processing

Blob

Use Case: Just-in-time inventory



Review



Summary and resources

Check your knowledge



Microsoft Learn Modules (docs.microsoft.com/Learn)

[Explore concepts of data analytics - Learn | Microsoft Docs](#)

[Explore Azure database and analytics services - Learn | Microsoft Docs](#)

[Data integration at scale Azure Data Factory - Learn | Microsoft Docs](#)

End of presentation

