Azure Machine Learning and Azure Databricks

Machine Learning on Azure

Domain specific pretrained models
To reduce time to market

Vision	Speech	Language	Search

Familiar Data Science tools
To simplify model development

PyCharm	Jupyter	Visual Studio Code	Command line

Popular frameworks
To build advanced deep learning solutions

Pytorch	TensorFlow	Scikit-Learn	Onnx

Productive services
To empower data science and development teams

Azure Databricks	Azure Machine Learning	Machine Learning VMs

Powerful infrastructure
To accelerate deep learning

CPU	GPU	FPGA

From the Intelligent Cloud to the Intelligent Edge

Productive Services

Empower data science and development teams

Integrated data science & data engineering teams

Desktop solutions not adequate

Need a unified big data & machine learning solution

Individual data scientists

Desktop solutions adequate

Need cloud for sporadic compute needs

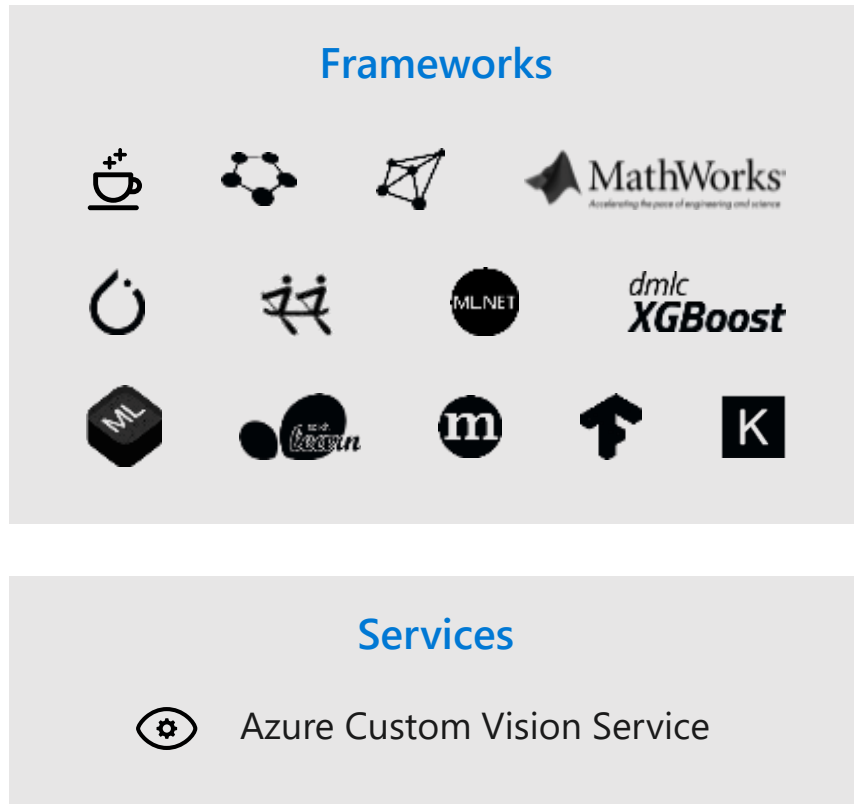**Azure Databricks** + **Azure Machine Learning service**

Machine Learning VMs

ML Pipeline: Steps to Train and Deploy Your Own ML Model
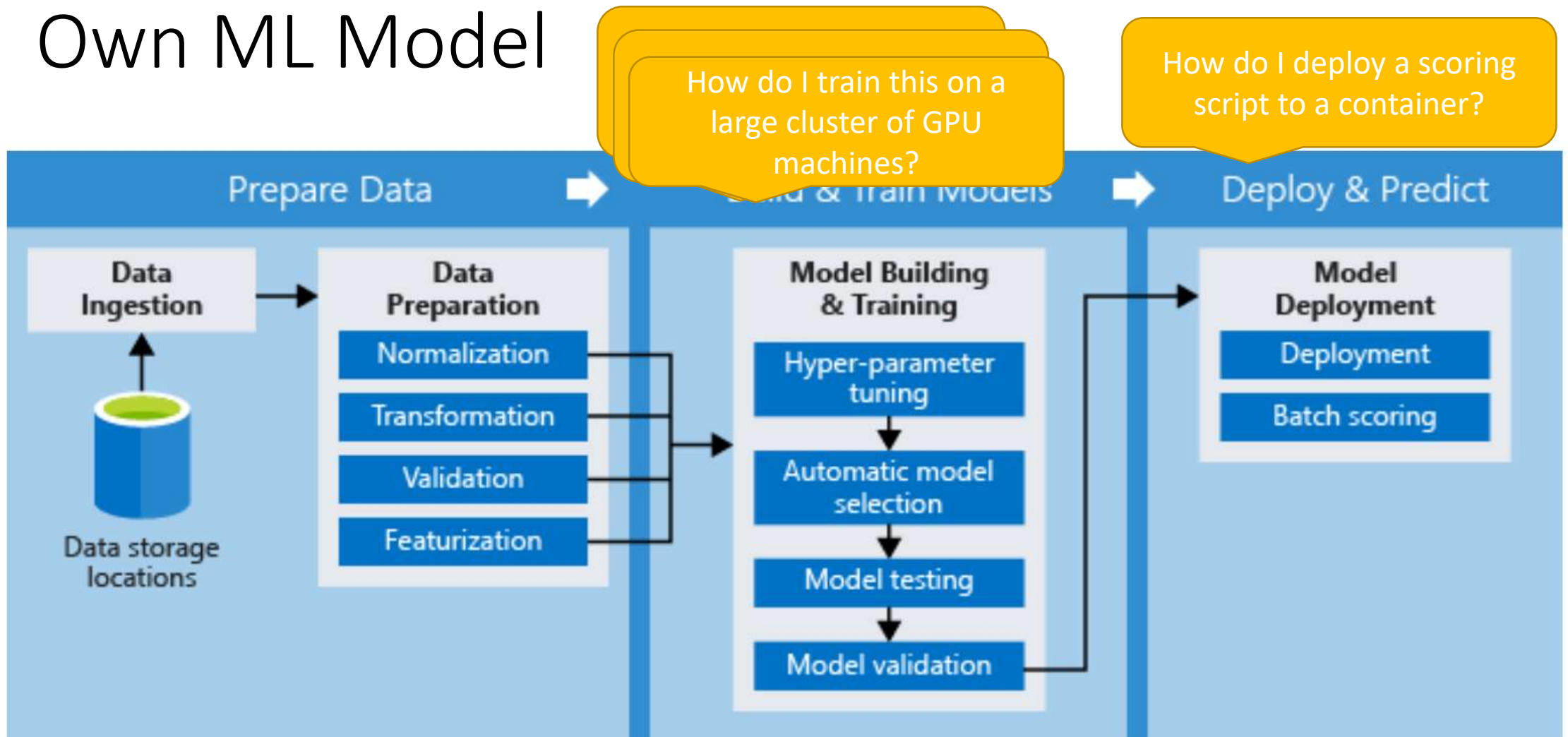
ONNX is the New Open Ecosystem for AI Models

Create

Deploy

Frameworks

Services

Azure Custom Vision Service

ONNX Model

Azure

Azure Machine Learning services

Ubuntu VM

Windows Server 2019 VM

Devices

Windows devices

Other devices (iOS, etc.)
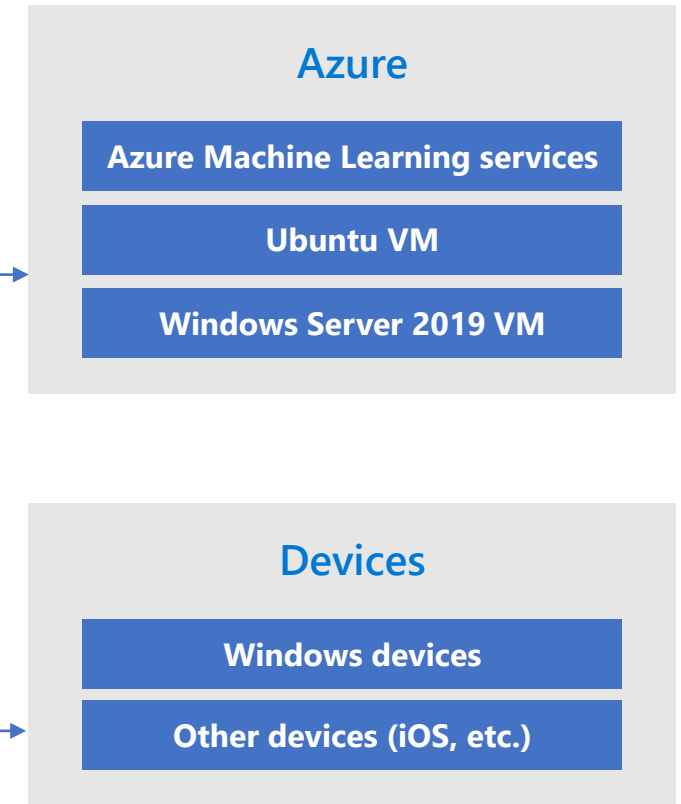
Productive Services

To empower data science and development teams
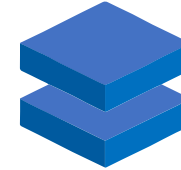
Azure Machine Learning
Python-based machine learning service

Develop models faster with automated machine learning

Tool agnostic Python SDK. Use any Python environment and ML frameworks

Deploy models across the cloud and the edge.

Increase productivity with DevOps with ML

Azure Databricks
Apache Spark-based big-data service

Prepare data clean data at massive scale

Enable collaboration between data scientists and data engineers

Access machine learning optimized spark clusters

Compute Options for Training and Deployment

| Compute target	Training	Deployment
Your local computer	✓	
Azure Machine Learning compute	✓	
A Linux VM in Azure (such as the Data Science Virtual Machine)	✓	
Azure Databricks	✓	
Azure Data Lake Analytics	✓	
Apache Spark for HDInsight	✓	
Azure Container Instances		✓
Azure Kubernetes Service		✓
Azure IoT Edge		✓

Azure Machine Learning Service

Bring AI to everyone with an end-to-end, scalable, trusted platform

Boost your data science productivity
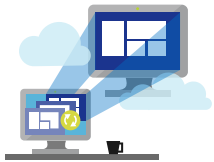
Increase your rate of experimentation

Deploy and manage your models everywhere

Built with your needs in mind

- Automated machine learning
- Managed compute
- DevOps for machine learning
- Simple deployment
- Tool agnostic Python SDK
- Support for open source frameworks

Seamlessly integrated with the Azure Portfolio

Azure Databricks

Fast, easy, and collaborative Apache Spark™-based analytics platform

Increase productivity

Build on a secure, trusted cloud
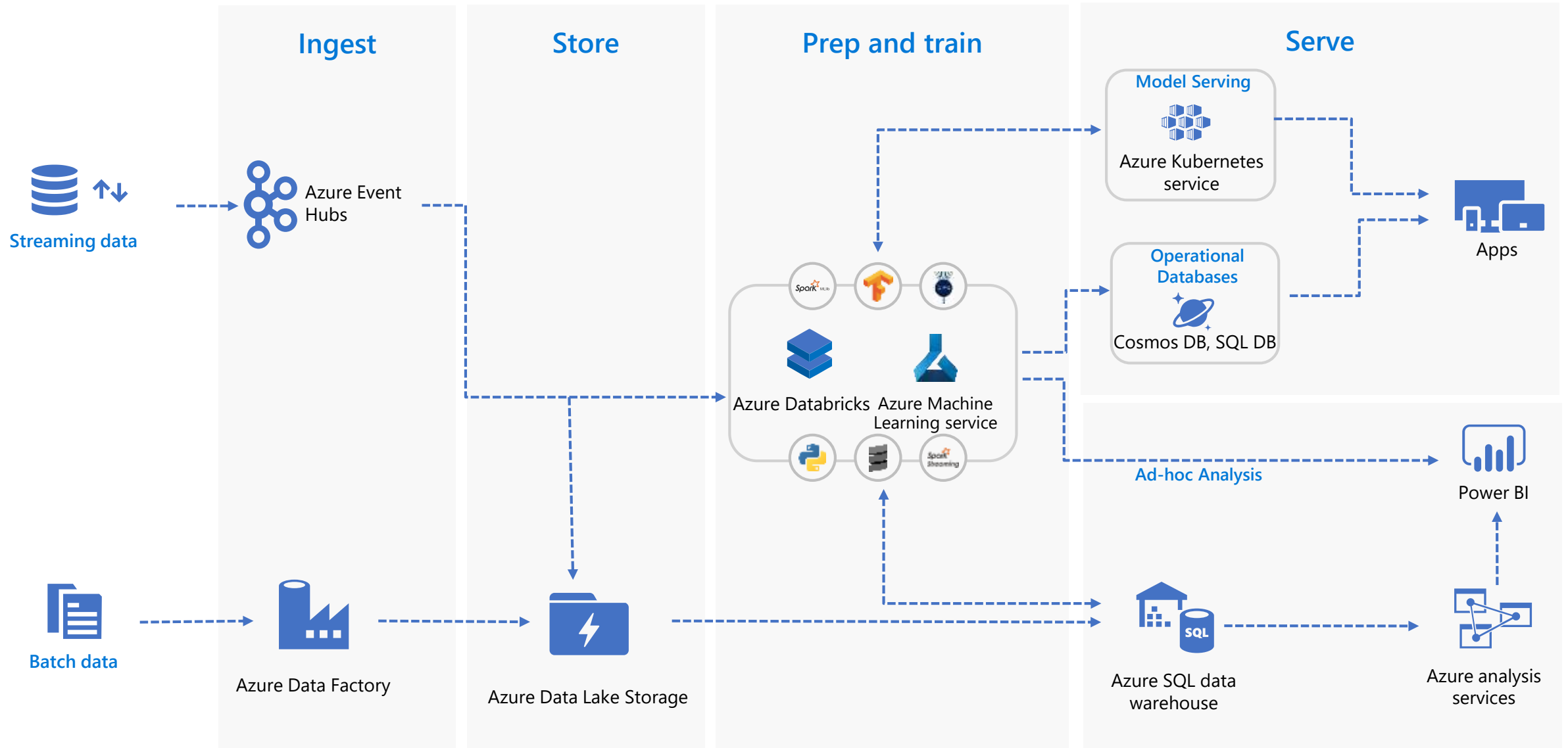
Scale without limits

Built with your needs in mind

- Optimized Apache Spark environmnet
- Collaborative workspace
- Integration with Azure data services
- Autoscale and autoterminate
- Optimized for distributed processing
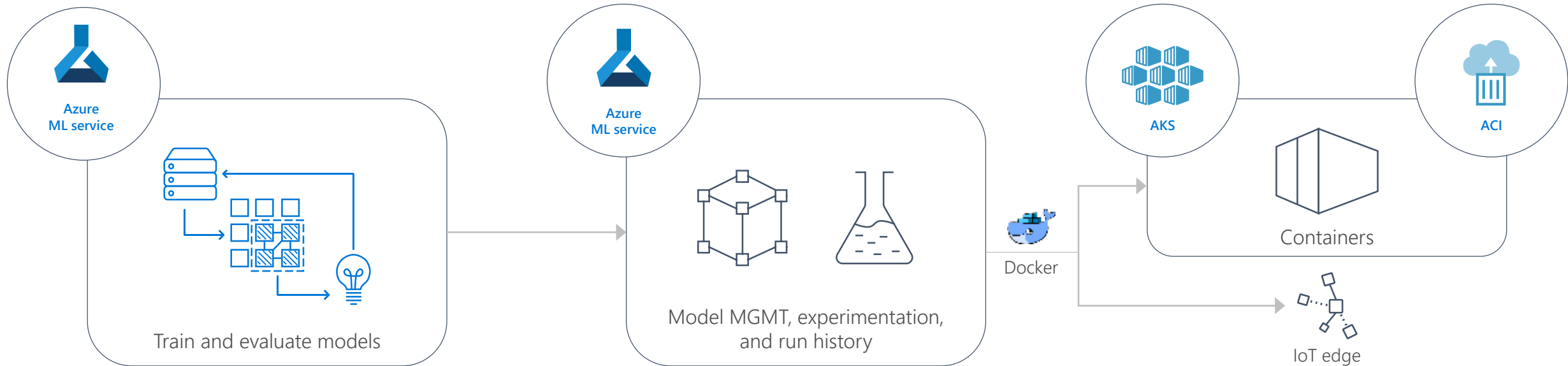- Support for multiple languages and libraries

Seamlessly integrated with the Azure Portfolio

Understanding the Data Science Process on Azure

E2E ML Solution Architecture

Ingest

Store

Prep and train

Serve

Streaming data

Azure Event Hubs

Batch data

Azure Data Factory

Azure Data Lake Storage

Azure Databricks

Azure Machine Learning service

Model Serving

Azure Kubernetes service

Operational Databases

Cosmos DB, SQL DB

Apps

Ad-hoc Analysis

Power BI

Azure SQL data warehouse

Azure analysis services

Operationalize and Manage Models with Ease

Azure ML service

Train and evaluate models

Azure ML service

Model MGMT, experimentation, and run history

Docker

AKS

Containers

ACI

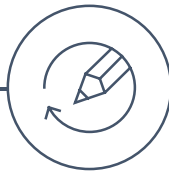IoT edge

Bring models to life quickly

- Build and deploy models in minutes
- Iterate quickly on serverless infrastructure
- Easily change environments

Proactively manage model performance

- Identify and promote your best models
- Capture model telemetry
- Retrain models with APIs

Deploy models closer to your data

- Deploy models anywhere
- Scale out to containers
- Infuse intelligence into the IoT edge

Lab1: AML Walkthrough

Lab2: Databricks Walkthrough