

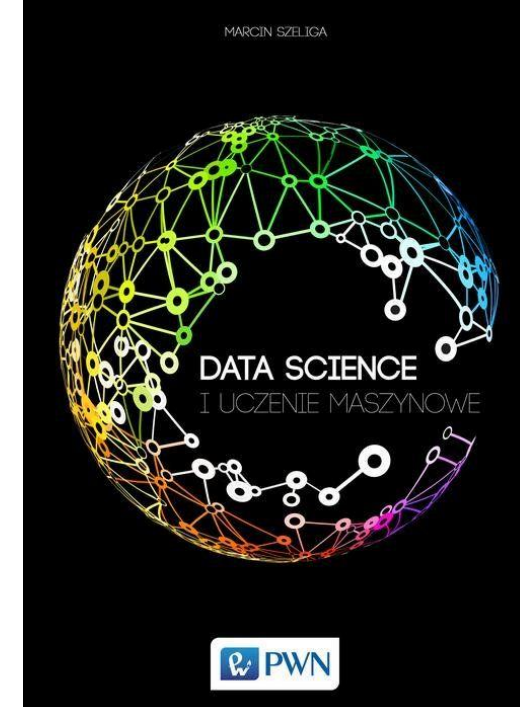
# Azure Machine Learning

## An overview

Marcin Szeliga

# About me

- Machine Learning practitioner
- Over 25 years of professional experience
- Artificial Intelligence MVP & MCT
- Microsoft Certified Solutions Expert
  - Data Management and Analytics
  - Cloud Platform and Infrastructure
  - Business Intelligence
- Microsoft Certified Solutions Developer
  - Azure Solution Architect



# Agenda

- Azure Data Services
- Azure Machine Learning

# Azure Data Services



# Azure regions: 54 regions worldwide

## Available in 140 countries





# Your Data Lives Here (Amsterdam NL)





# Your Data Lives Here (Cheyenne WY)





# Your Data Lives Here (Quincy WY)





# What it Looks Inside






***Data platform:*** An integrated group of technologies that lets us work with all kinds of data in useful ways




# Azure Products


## Networking




Virtual Network




Load Balancer




Application Gateway




VPN Gateway




Azure DNS




Content Delivery Network



Traffic Manager




ExpressRoute




Azure DDoS Protection


## Storage




Storage




Blob Storage




Queue Storage




File Storage




Disk Storage




Data Lake Store



StorSimple




Backup




Site Recovery


## Web + Mobile




App Service




Web Apps




Web Apps for Containers




Mobile Apps




API Apps



Content Delivery Network




Media Services




Azure Search


## Containers




Container Service




Container Instances




Container Registry



Service Fabric




App Service




Batch


## Databases




SQL Database




Azure Database for MySQL




Azure Database for PostgreSQL



SQL Data Warehouse



SQL Server Stretch Database



Azure Cosmos DB






Table Storage




Redis Cache


## Data + Analytics




HDInsight




Stream Analytics




Event Hubs




Data Lake Analytics




Data Lake Store



Data Factory




Azure Analysis Services




SQL Data Warehouse


## AI + Cognitive Services




Machine Learning




Azure Bot Service




Cognitive Services




Bing Web Search API




Text Analytics API



Face API




Computer Vision API




Custom Vision Service


## Internet of Things




IoT Hub




IoT Edge




Stream Analytics




Time Series Insights



Azure Cosmos DB



Event Grid



Logic Apps

# Categorizing Data

By how we work with it

## Operational data

Read/write data used by applications to keep current state

*Examples:* Order info in an ecommerce application, customer info in a CRM application

## Analytical data

Read-only historical data used for analysis

*Examples:* Data warehouses, machine learning data

## Streaming data

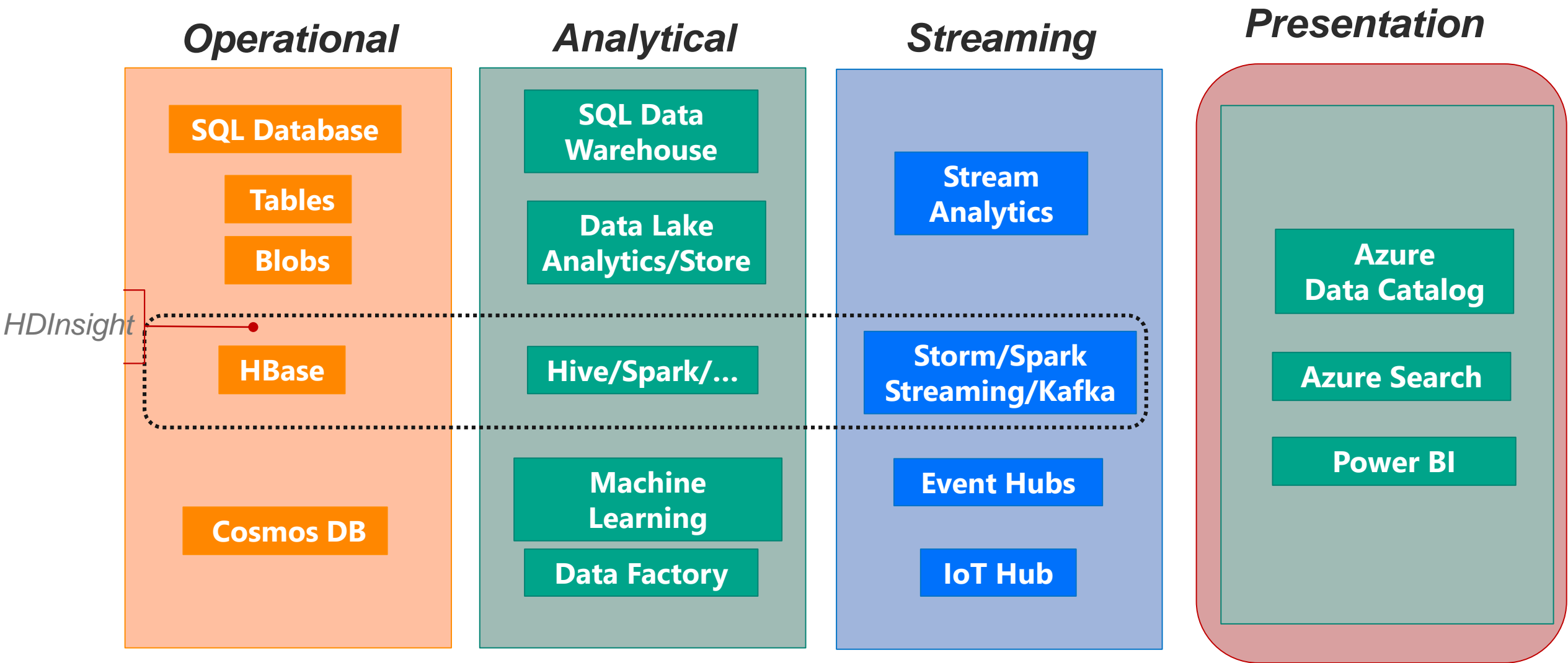
Data produced and processed in real time

*Examples:* Internet of Things (IoT), e.g., sensor data








# The Azure Data Platform

## High level overview

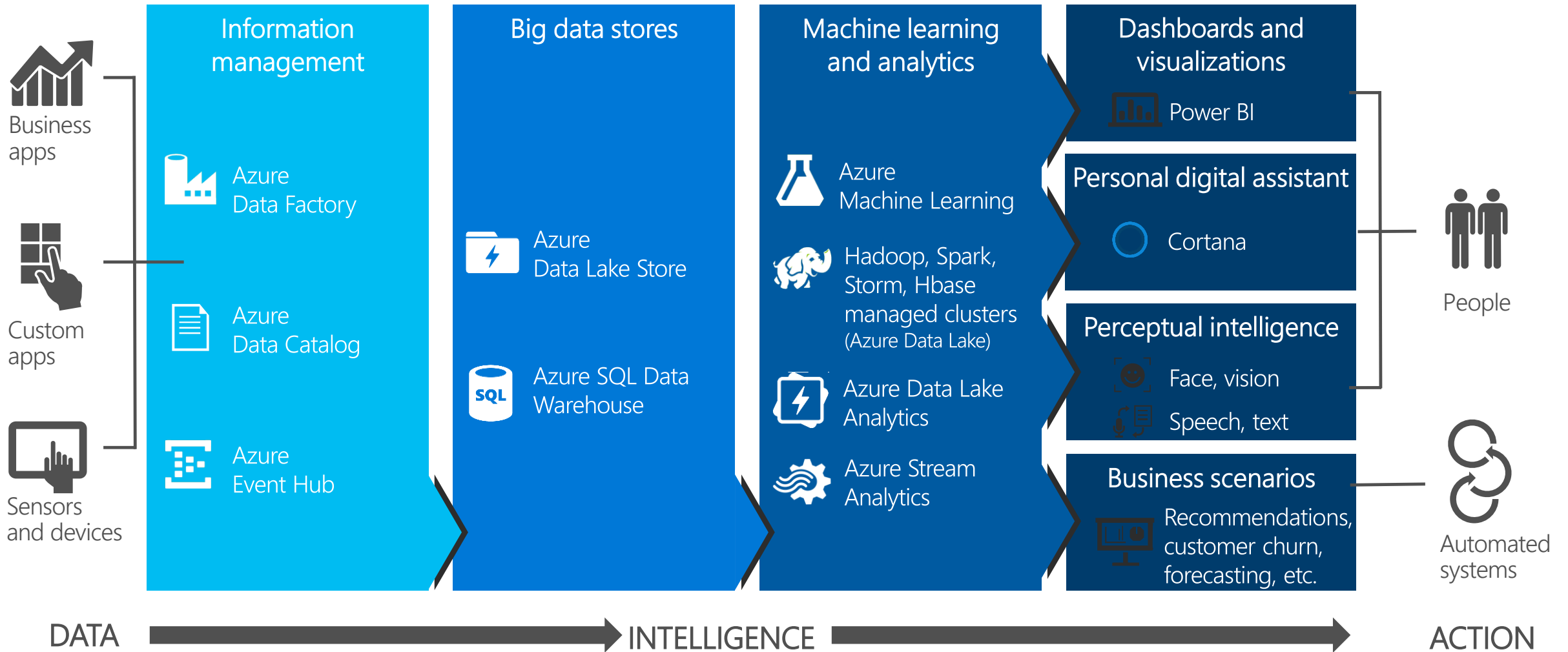


# Operational Data Services

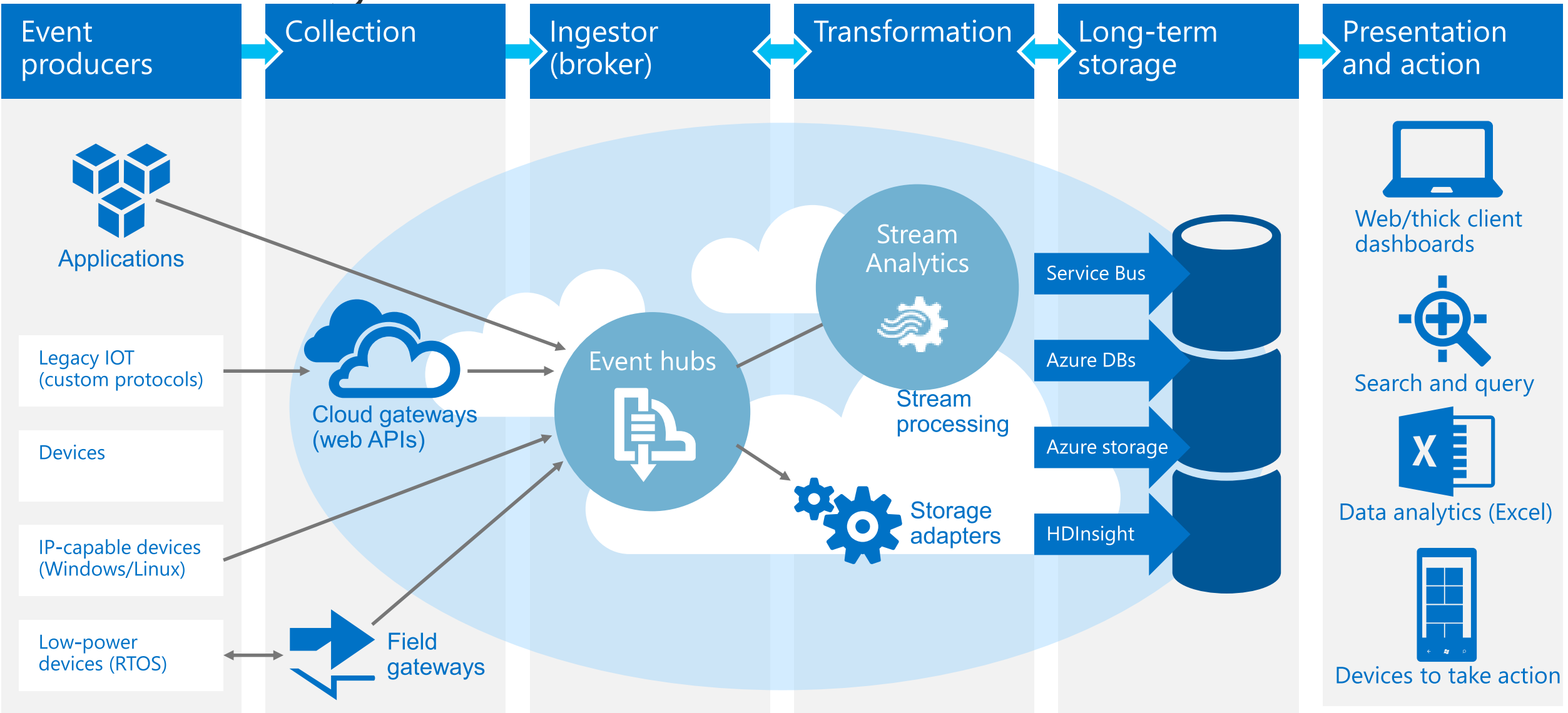
SQL Server in a VM	SQL Database	Cosmos DB	Tables	Blobs
				
fully featured RDBMS				
transactional processing				
rich query				
	managed as a service			
	elastic scale			
		schema-free data model		
		Internet accessible http/rest		
			arbitrary data formats	



# Analytical Data Services



# Streaming Data Services



# Network Security

Securing your network from attacks and unauthorized access is an important part of any architecture.

## Internet Protection

Assess the resources that are internet-facing, and to only allow inbound and outbound communication where necessary. Make sure you identify all resources that are allowing inbound network traffic of any type.

## Firewalls

To provide inbound protection at the perimeter, there are several choices:

- Azure Firewall
- Azure Application Gateway
- Azure Storage Firewall

## DDoS Protection

The Azure DDoS Protection service protects your Azure applications by scrubbing traffic at the Azure network edge before it can impact your service's availability.

## Network Security Groups

Network Security Groups allow you to filter network traffic to and from Azure resources in an Azure virtual network. An NSG can contain multiple inbound and outbound security rules.



# Identity and Access

## Authentication

This is the process of establishing the identity of a person or service looking to access a resource. Azure Active Directory is a cloud-based identity service that provide this capability.

## Authorization

This is the process of establishing what level of access an authenticated person or service has. It specifies what data they're allowed to access and what they can do with it. Azure Active Directory also provides this capability.

## Azure Active Directory Features

### Single Sign-On

Enables users to remember only one ID and one password to access multiple applications.

### Apps & Device Management

You can manage your cloud and on-premises apps and devices and the access to your organizations resources

### Identity Services

Manage Business to business (B2B) identity services and Business-to-Customer (B2C) identity services.

# Encryption

## Encryption at rest

Data at rest is the data that has been stored on a physical medium. This could be data stored on the disk of a server, data stored in a database, or data stored in a storage account.

## Encryption in transit

Data in transit is the data actively moving from one location to another, such as across the internet or through a private network. Secure transfer can be handled by several different layers.

## Encryption on Azure

### Raw Encryption

Enables the encryption of:

- Azure Storage
- V.M. Disks
- Disk Encryption

### Database Encryption

Enables the encryption of databases using:

- Transparent Data Encryption

### Encrypting Secrets

Azure Key Vault is a centralized cloud service for storing your application secrets.

# Azure Machine Learning





# Machine Learning on Azure

## Sophisticated pretrained models

To simplify solution development



## Popular frameworks

To build advanced deep learning solutions



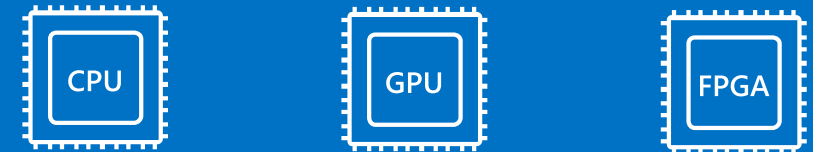
## Productive services

To empower data science and development teams



## Powerful infrastructure

To accelerate deep learning



## Flexible deployment

To deploy and manage models on intelligent cloud and edge



# Microsoft Cognitive Services

Give your apps a human side



## Vision

From faces to feelings, allow your apps to understand images and video



## Speech

Hear and speak to your users by filtering noise, identifying speakers, and understanding intent



## Language

Process text and learn how to recognize what users want



## Knowledge

Map complex information and data in order to solve specific tasks



## Search

Access billions of web pages, images, videos, and news with the power of Bing



## Labs

An early look at emerging Cognitive Services technologies: discover, try, and give feedback on new technologies before general availability

# Lab Cognitive Services

- Try out the Cognitive Services using the website demo options
- Set up your Azure Account
- Provision Cognitive Services keys
- Text Analytics via REST



# What is serverless?



## **Full abstraction of servers**

Developers can just focus on their code—there are no distractions around server management, capacity planning, or availability



## **Instant, event-driven scalability**

Application components react to events and triggers in near real-time with virtually unlimited scalability; compute resources are used as needed



## **Pay-per-use**

Only pay for what you use: billing is typically calculated on the number of function calls, code execution time, and memory used

# Azure Serverless Ecosystem

## Development

 IDE support

 Integrated DevOps

 Local development

 Monitoring

 Visual debug history

## Platform

 Event Grid

Manage all events that can trigger code or logic

 Functions

Execute your code based on events you specify

 Logic Apps

Design workflows and orchestrate processes

Database



Storage



Analytics



Intelligence



Security



IoT



# Lab Custom Vision and Logic Apps

- Provision resources
- Create Custom Vision project
- Build Custom AI into an Application using Azure Logic Apps



# Questions

- Machine Learning practitioner
- Over 25 years of professional experience
- Artificial Intelligence MVP & MCT
- Microsoft Certified Solutions Expert
  - Data Management and Analytics
  - Cloud Platform and Infrastructure
  - Business Intelligence
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  - Azure Solution Architect

