• FREE INDUSTRY TECH SESSION •

Microsoft Azure Data for Energy Sector Organizations



André M.D. Melancia | **20 May 10-12pm.**

"I have a ton of case studies and industry applicable technology demo's to share with you."

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Microsoft Data for Energy Sector Organisations

Date: 2022-05-20
Time: 09:00 – 11:00 CET
Trainer: André Melancia

Agenda
Quick intro
Architectures
Technologies/Services and demos
Final Q&A

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Target Audience

- Management, Developers, IoT Engineers, Data Engineers, Technical
- Introductory level

You are welcome to ask questions in the chat!

Captions in PowerPoint powered by Azure Cognitive Services

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Steps to cloud success

- Cloud services are usually cheaper to maintain
  - Plus Scalability, Performance, ease of Automation, by design Security, etc.
- Hybrid (with on-premises) and multi-cloud scenario viable
- Not all services can be in the cloud
  - GDPR / Compliance requirements, etc.
  - Technically impossible or difficult (e.g. some IoT scenarios)
  - Real-time and/or life threatening situations, requiring immediate action
  - "I just don't want to" (resistance to change)
- Migrate gradually
- Rearrange cloud architecture as needed
  - Doesn't need to be perfect or fully defined from the beginning

Why Azure?

- "Why not?"
  - Compare with other cloud offerings (pricing, services, etc.)
- 60+ Azure regions (16+ in Europe)
- IaaS, PaaS and SaaS services
- Most services are built on top of proven open source technologies and industry standards
- Microsoft's typical "everything works with everything"
- Fully integrated with Microsoft 365 (Office 365, Dynamics, etc.)

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More information

- Microsoft Azure for the Energy Sector
  - https://www.microsoft.com/industry/energy

- Case study:
  - https://azure.microsoft.com/en-us/solutions/high-performance-computing/energy

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Responsible AI

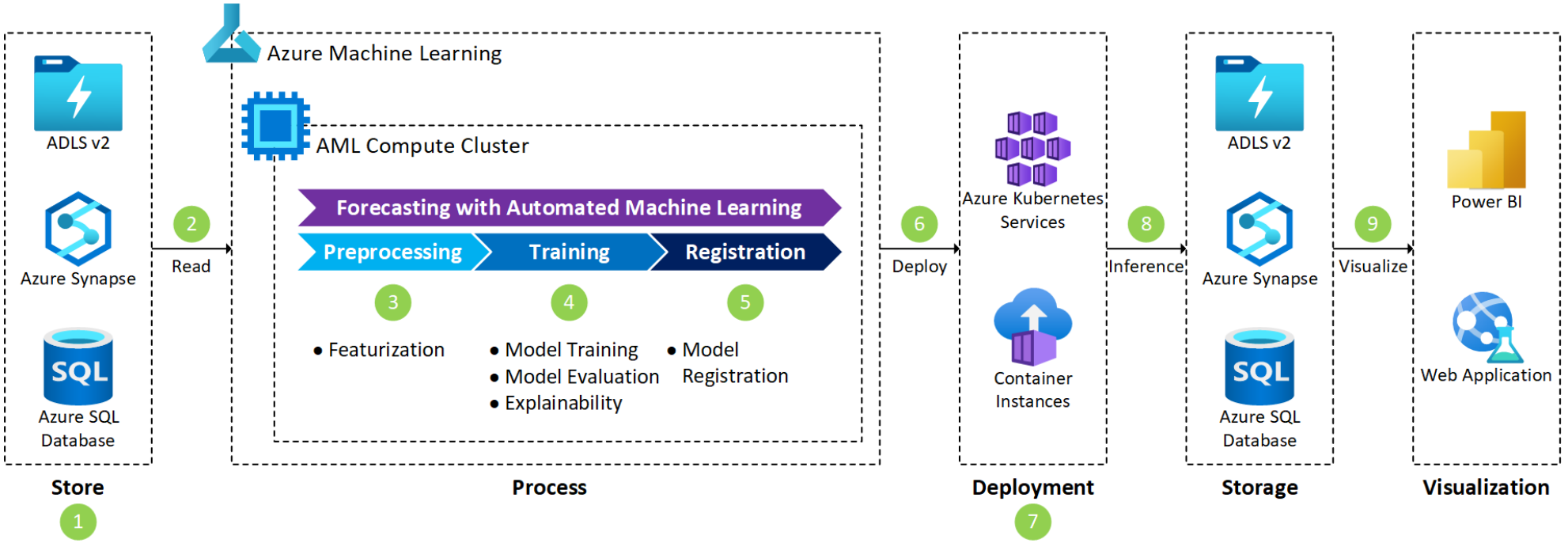
- Fairness
  - AI systems should treat all people fairly
- Reliability & Safety
  - AI systems should perform reliably and safely
- Privacy & Security
  - AI systems should be secure and respect privacy
- Inclusiveness
  - AI systems should empower everyone and engage people
- Transparency
  - AI systems should be understandable
- Accountability
  - People should be accountable for AI systems

See details: https://www.microsoft.com/ai/responsible-ai

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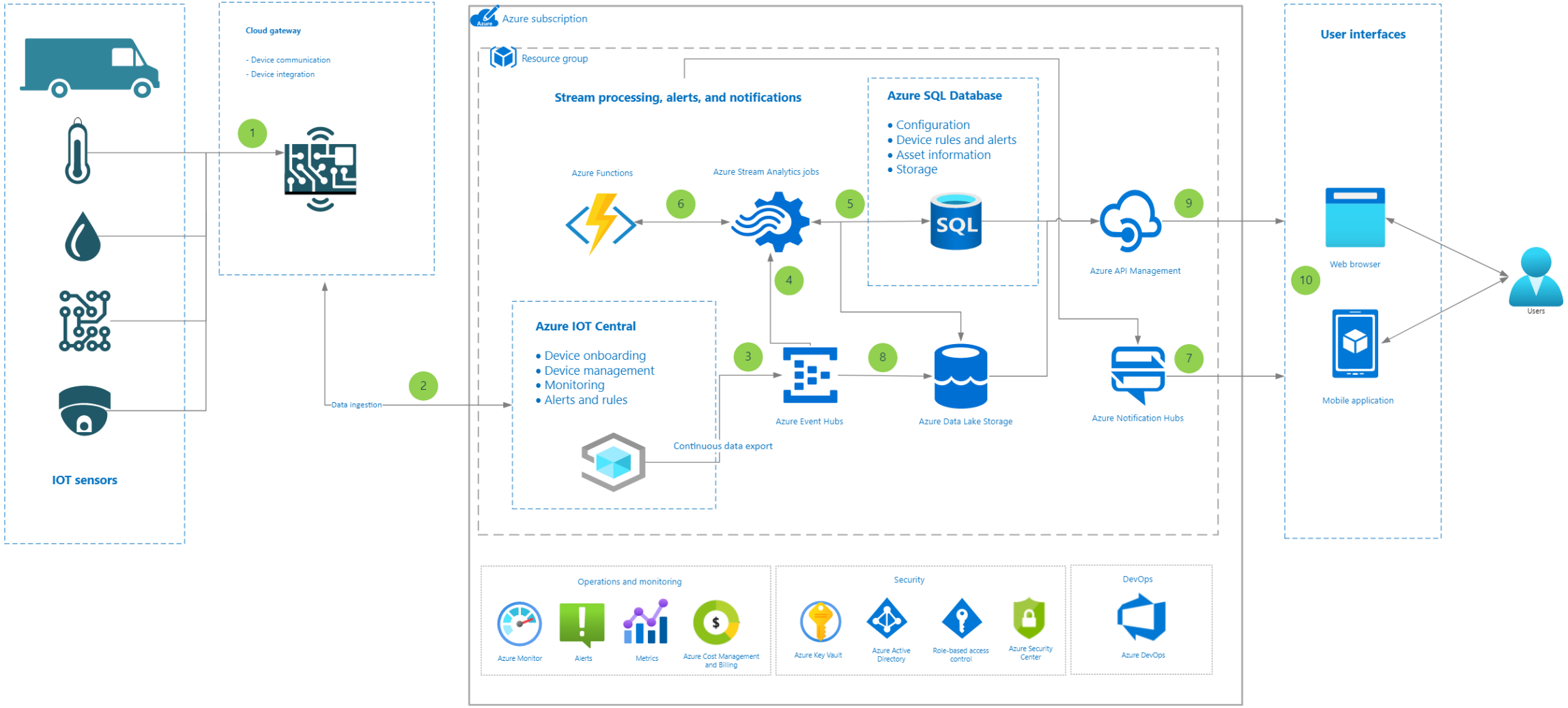
Architectures

- Many searchable case studies and scenarios
  - https://docs.microsoft.com/azure/architecture



Example above: https://docs.microsoft.com/en-us/azure/architecture/solution-ideas/articles/forecast-energy-power-demand

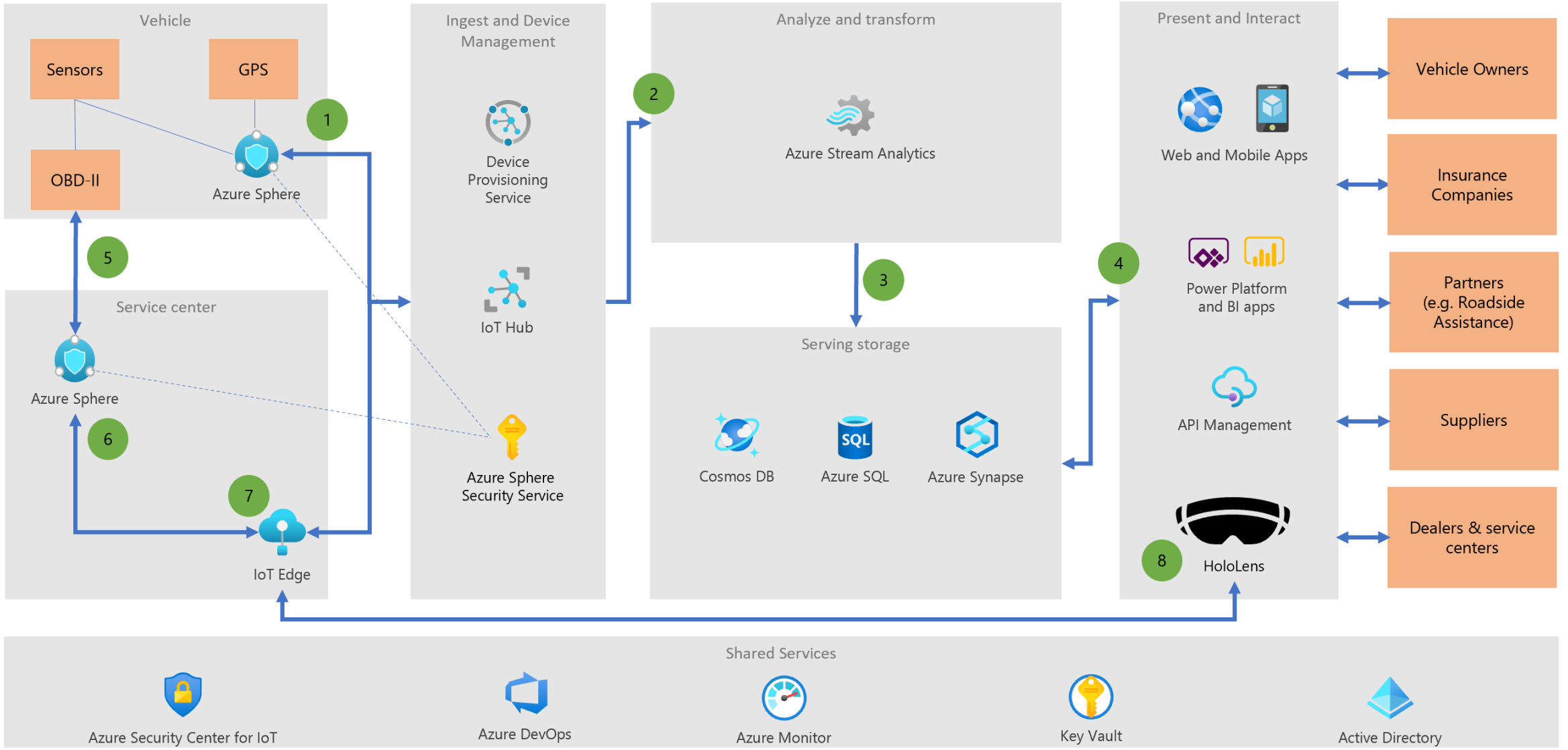
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Architectures – Azure IoT

Example above: https://docs.microsoft.com/azure/architecture/solution-ideas/articles/real-time-asset-tracking-mgmt-iot-central

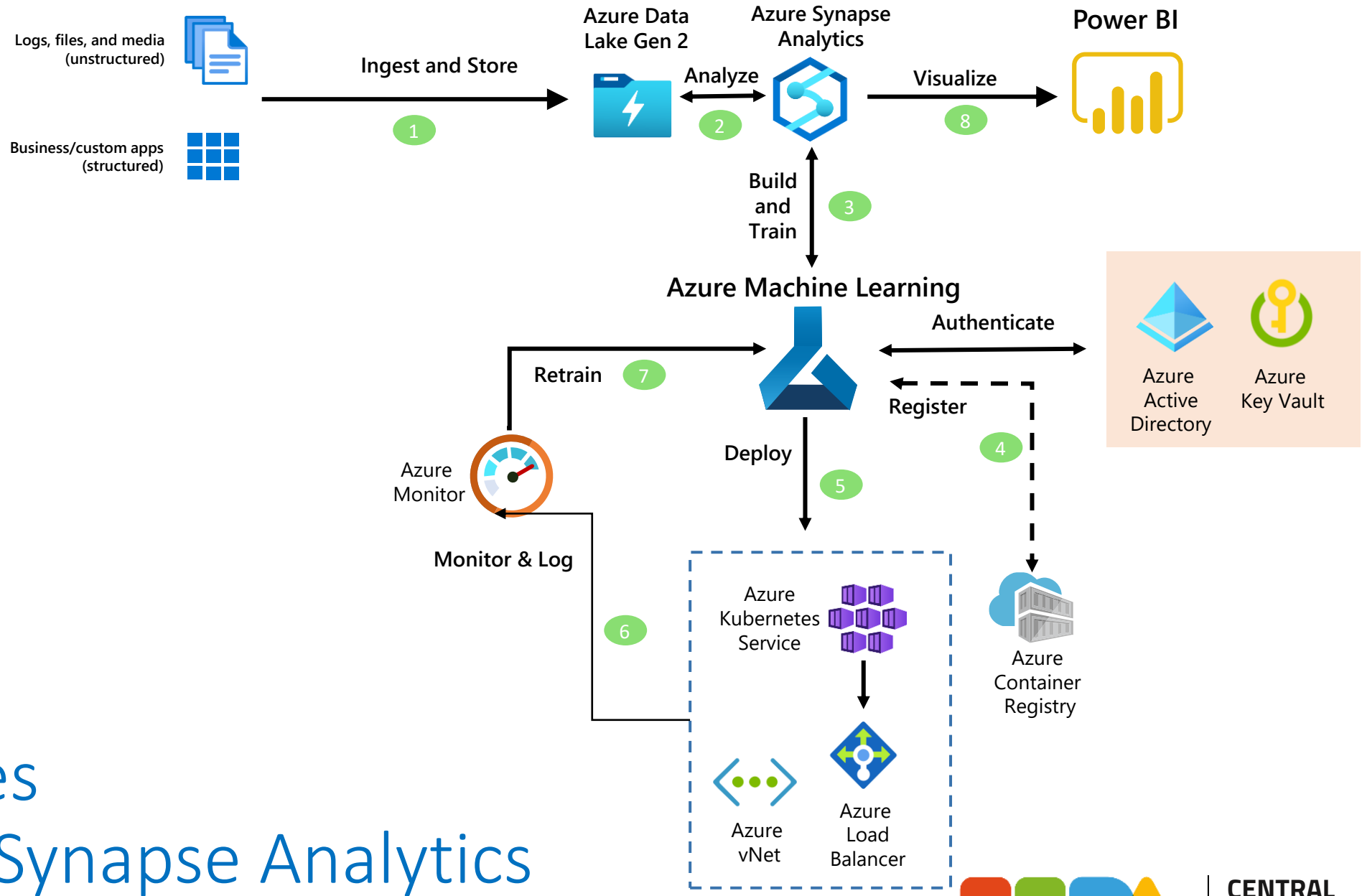
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Architectures – Azure IoT

Example above: https://docs.microsoft.com/azure/architecture/example-scenario/data/realtime-analytics-vehicle-iot

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Architectures
Azure ML + Synapse Analytics

Example above: https://docs.microsoft.com/azure/architecture/solution-ideas/articles/azure-machine-learning-solution-architecture

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Service	Usage/Focus	Info
Azure Cognitive Services	Pretrained ML, Simplified interface ML	Multiple categories: Vision, Speech, Language, Decision, etc. Almost all are REST HTTPS, all have SDKs
Azure Applied AI Services	…	Multiple services: Bot Service, Forms Recognizer, Video Analyzer, Cognitive Search, etc. And also Azure Health Bot, etc.
Bing Services	…	Multiple services for searching, spellchecking and autocomplete, etc.
M365 Power Virtual Agents	SaaS Bot	Service similar to Bot Service (but fully managed)
M365 Power Platform	(etc.)	Multiple services: Power Apps, Power Automate, PVA, Power BI, including using AI Builder (Power Apps and Power Automate), etc.
Data Explorer	Analyse/view data	Query and understand data
Time Series Insights	Analyse/view data	Process data based on time series
Azure IoT Hub + DPS	Queue with device auth (…)	Allows millions of devices to connect and send messages to/from IoT Hub.
Azure IoT Device Azure IoT Edge Device	Software Stack for devices	Manage devices using the same SDK centrally even if different hardware, Have containers (Moby) to run ML Predictions, ETL, Cognitive Services and custom code
Azure Stream Analytics	Real time event processor	Various inputs and outputs, "looks like SQL" processing
Azure IoT Central	SaaS solution	Built on Azure IoT technologies above, can be customized by an end user.
Azure Digital Twins	Map infrastructures and data	A digital twin is an object that contains the same data as the real world object (e.g. obtained via an IoT device) that can be centrally queried.

The table above doesn't list all the Microsoft Data and AI offering

Service	Usage/Focus	Info
Azure Machine Learning (Azure ML)	ML (also possible to do ETL)	Manages ML in machines on Azure, other clouds and on premises (Python and R), Orchestrate containers for deploying inference/prediction webservices (AKS, ACI)
Azure Databricks	ML, ETL	Manages Spark Clusters (Python, Scala, R, SparkSQL, etc.)
Azure Synapse Analytics	ETL, orchestration, ML, data storage, reporting	Manages Spark Clusters (Python, Scala, .Net, SparkSQL, etc.), MS SQL serverless and dedicated pools (SQL DW), orchestration (same as ADF, including DataFlow), Power BI reports integration, Synapse link to Cosmos DB, etc.
Azure Data Factory	ETL, orchestration	Runs pipelines (with activities such as DataFlow, PowerQuery, etc.)
Azure HDInsight	ETL, ML, data storage	Single cluster of type: Hadoop, Spark, Kafka, Storm, HBase, R Services, etc.
Azure SQL Database, SQL Managed Instance, SQL Server on VM	SQL data storage	SQL Server can include: Big Data Clusters, Python and R Services, etc.
Azure Cosmos DB	NoSQL data storage	Multiple APIs: Core/SQL (JSON), MongoDB, Cassandra, Gremlin, Azure Tables
Azure Storage/DataLake	File / NoSQL data storage	Blob (REST HTTPS), File share (SMB), Tables (REST HTTPS), Queues (REST HTTPS)

The table above doesn't list all the Microsoft Data and AI offering

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Code	Certification / Role	Info
AZ-900	Azure Fundamentals	Introduction to Azure
DP-900	Data Fundamentals	Introduction to Data services in Azure
AI-900	AI Fundamentals	Introduction to Responsible AI, Azure ML, Cognitive Services, Azure Bots, etc.
AI-102	AI Engineer	Cognitive Services, Azure Bots
DP-100	Data Science	Azure Machine Learning
DP-090	ML with Databricks	
DP-203	Data Engineer	ETL with Databricks and Synapse Analytics, CosmosDB, storage, etc.
DP-300	Relational Databases	SQL Database, SQL Managed Instance, SQL Server, etc.
DP-420	Cosmos DB	Cosmos DB
AZ-220	IoT Developer	Azure IoT technologies
DA-100/PL-300	Data Analyst	Power BI
AZ-xxx	…	Other Azure courses
PL-xxx	…	Power Platform courses
SC-xxx	…	Security and Compliance courses

See current list: https://docs.microsoft.com/learn/certifications
See also: https://thellpa.com/microsoft-certification-pathways

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The LLPA Industry Tech Session Feedback Evaluation

Your feedback is important to us and will help us improve our training deliveries. This survey will take 5 minutes to complete.

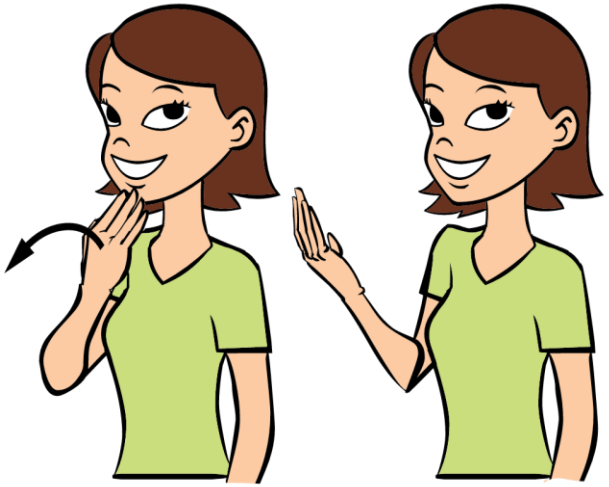
https://forms.office.com/r/26RTjS6yEk

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Thank you!



Sign language for "thank you" in 25+ languages

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