


The image features the GlobalLogic logo in white text, centered over a blurred background of an office interior. The background shows people sitting at desks with computers, and a glass partition with a repeating circular logo pattern is visible in the foreground. The overall color palette is dark and muted, with a blue tint.

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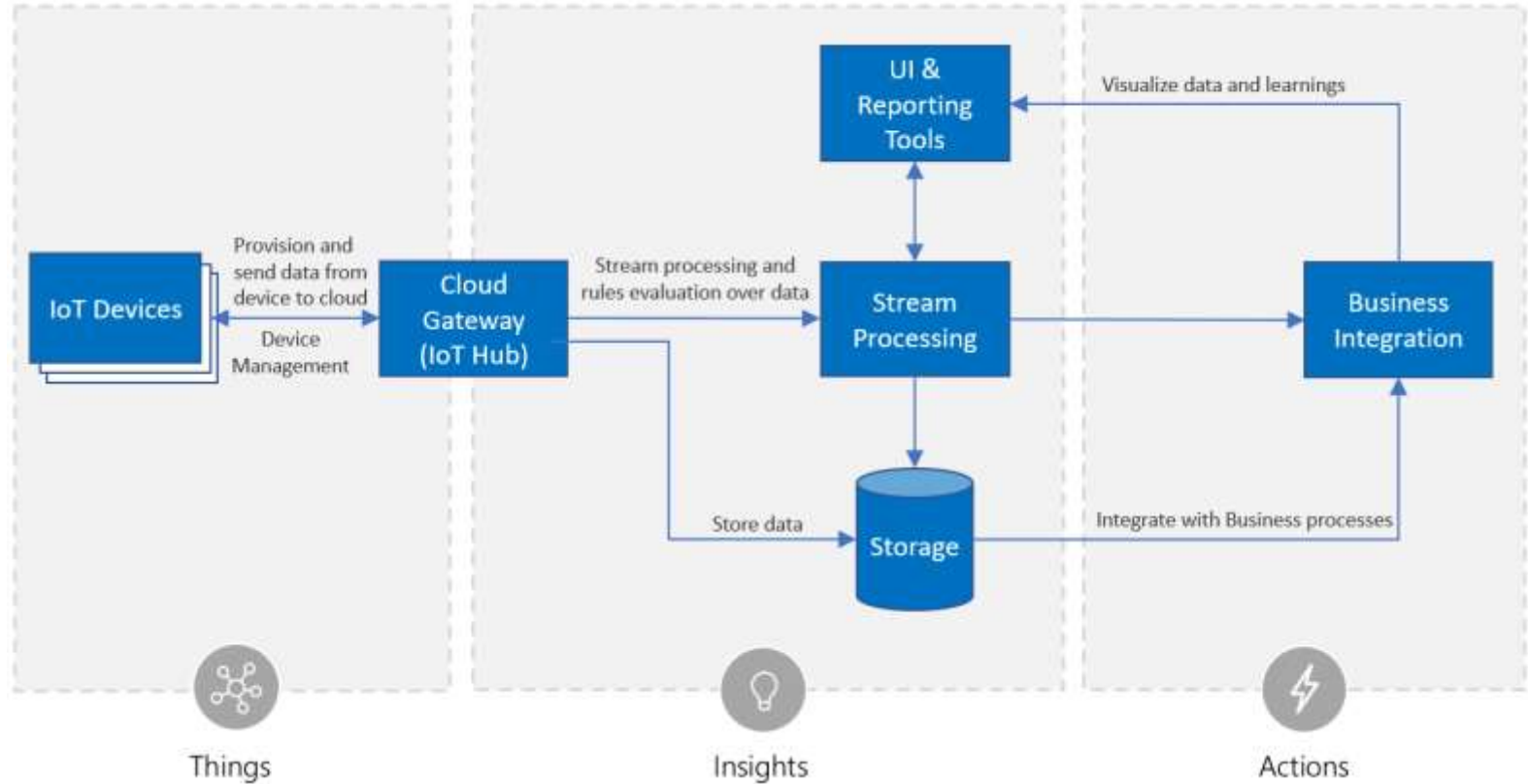
# GlobalLogic<sup>®</sup>

## Architecting Azure IoT Solutions

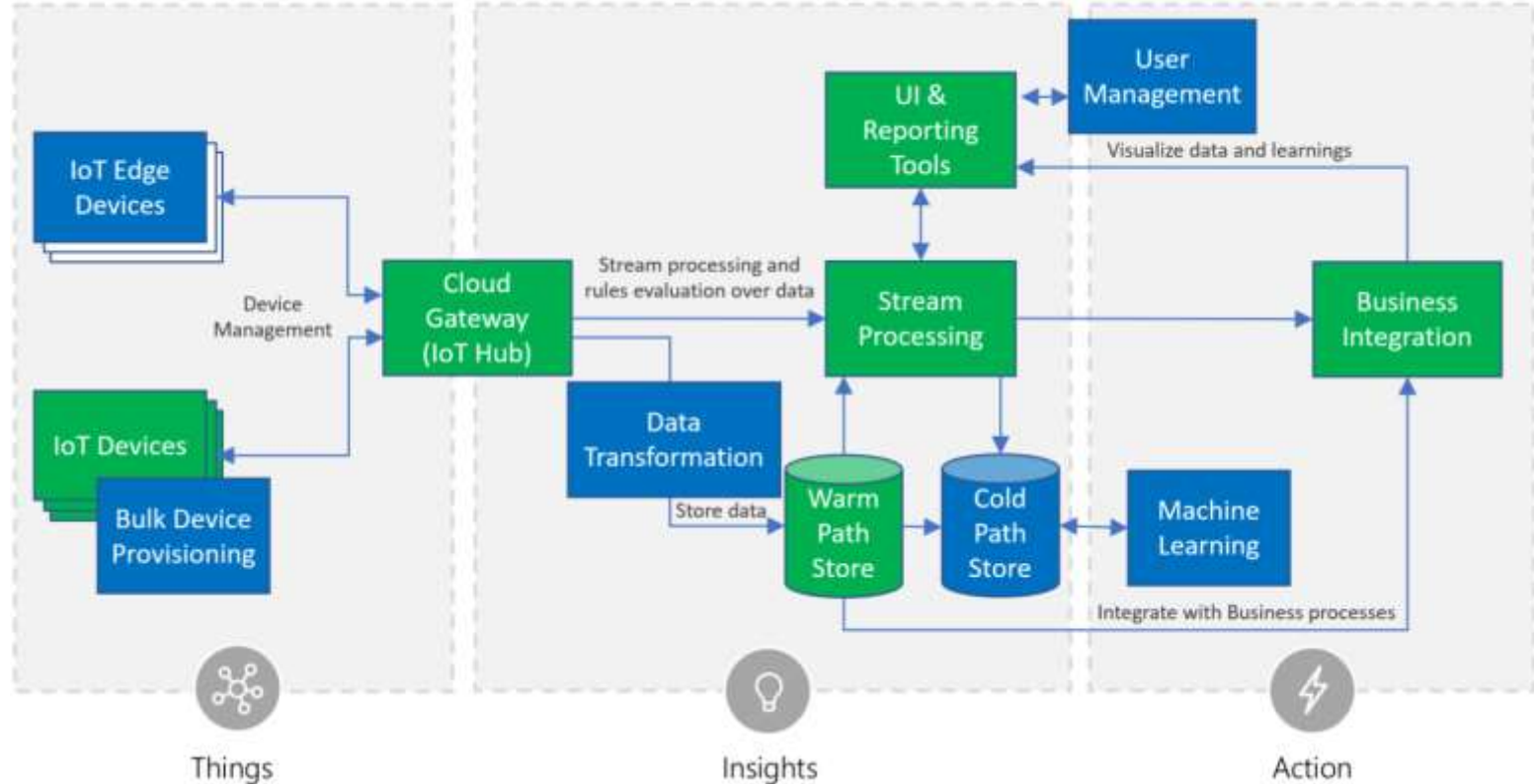
Andrii Antilikatorov

Solution Architect | Engineering Consultant

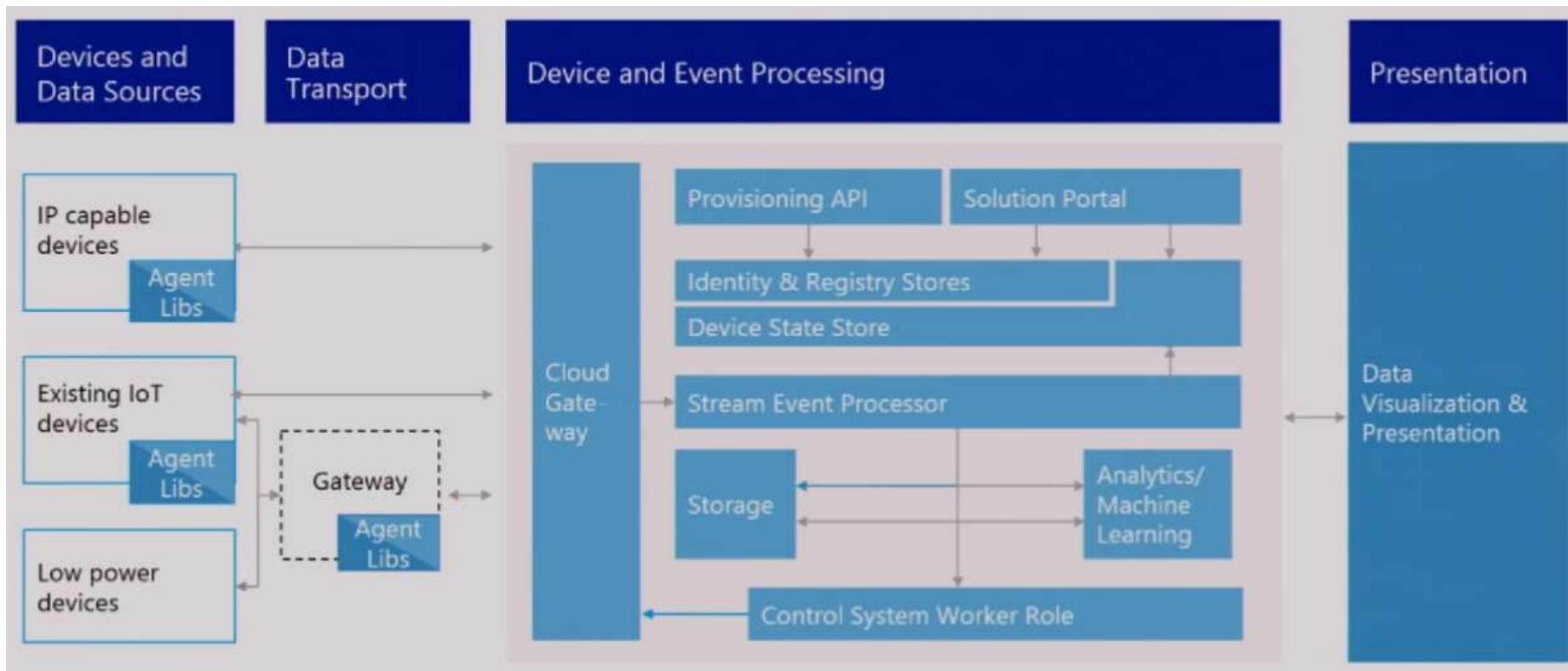
# IoT Reference Architecture



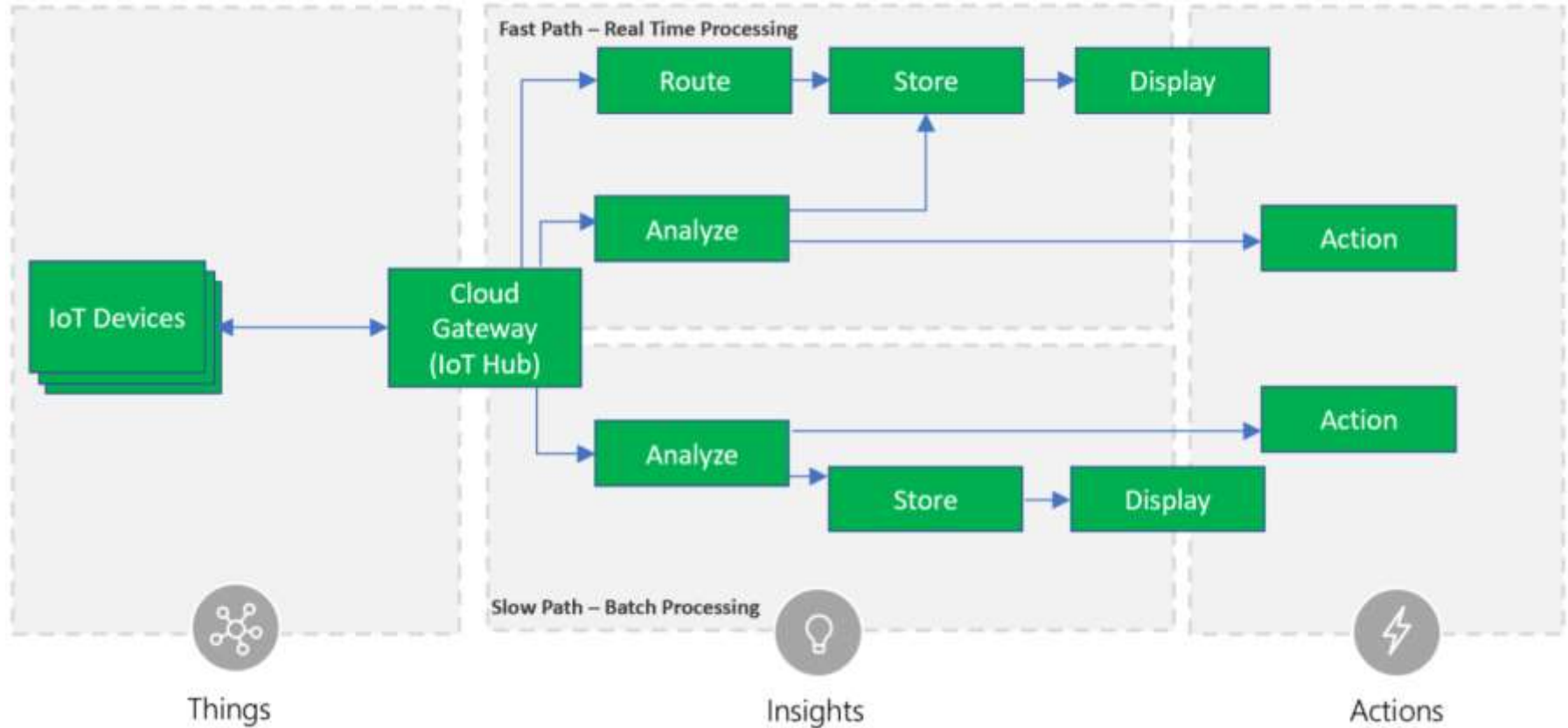
# IoT Reference Architecture (with Optional Subsystems)



# Detailed IoT Reference Architecture

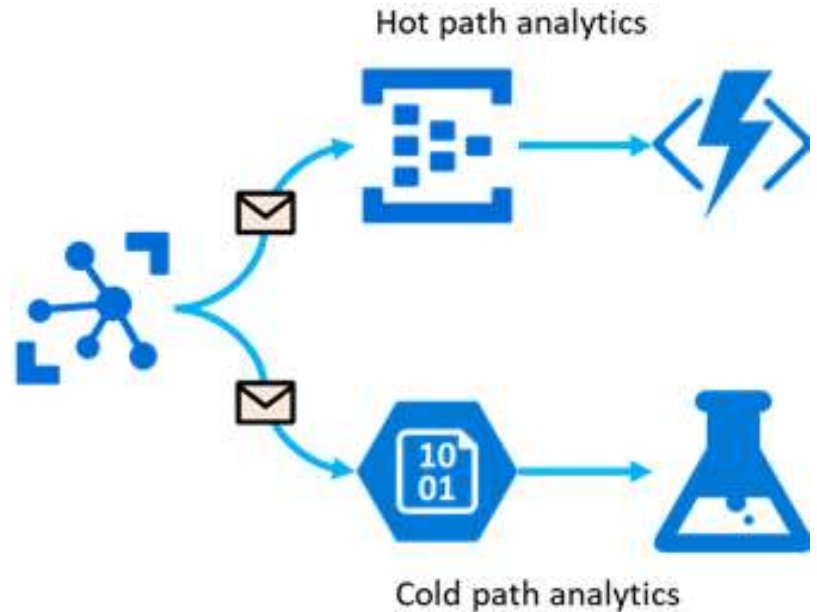


# Lambda Architecture :: Recommended Data Flow






















# IoT Solutions :: Few More Aspects

- Stateless VS Stateful
- Static VS Dynamic Rules



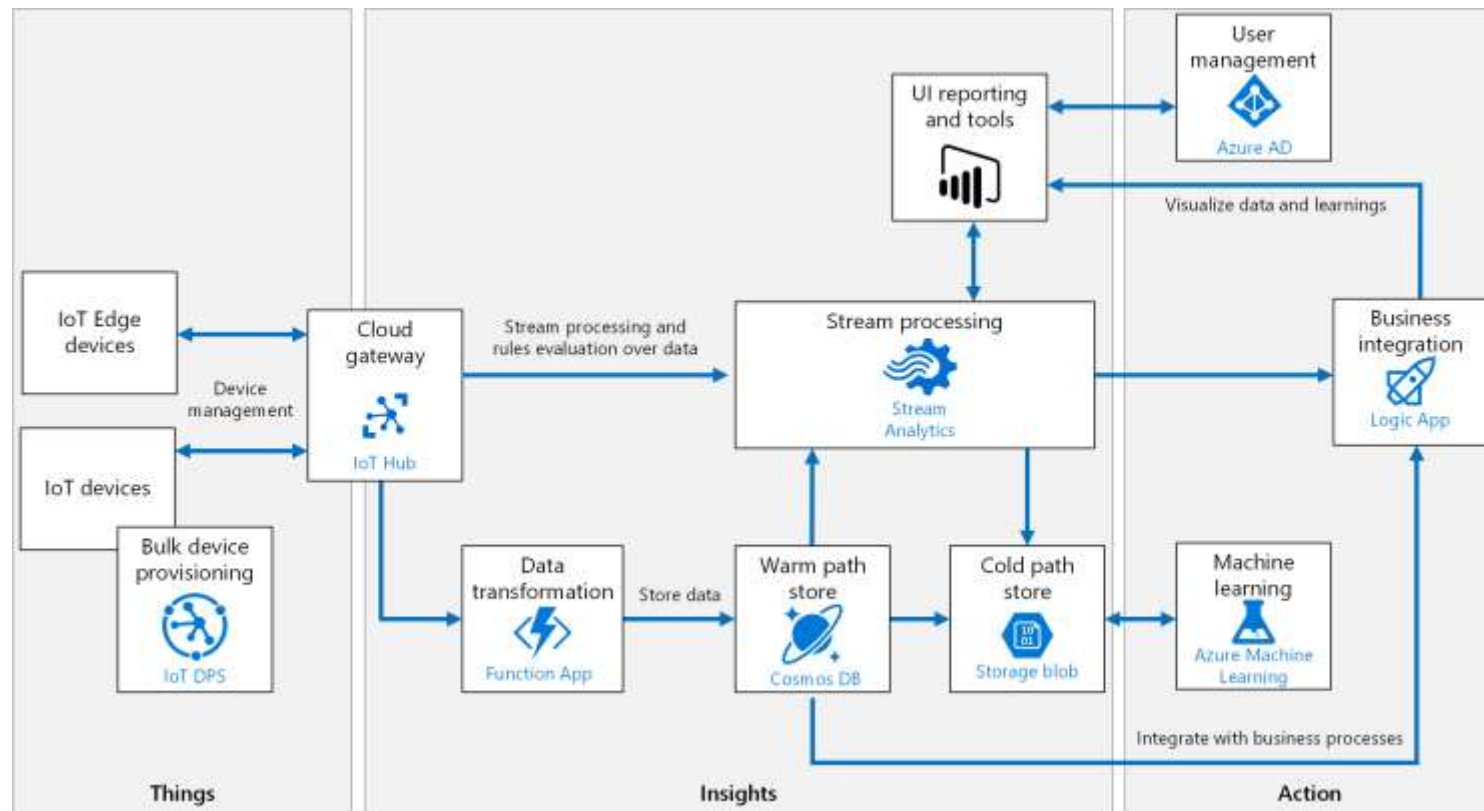


# Microsoft Azure IoT Services

Devices	Device Connectivity	Storage	Analytics	Presentation & Action
	 Event Hubs	 SQL Database	 Machine Learning	 App Service
	 Service Bus	 Table/Blob Storage	 Stream Analytics	 Power BI
	 External Data Sources	 DocumentDB	 HDInsight	 Notification Hubs
		 External Data Sources	 Data Factory	 Mobile Services
				 BizTalk Services



# Azure IoT Services in Action



# Azure IoT Solution Accelerators



Remote Monitoring



Connected Factory

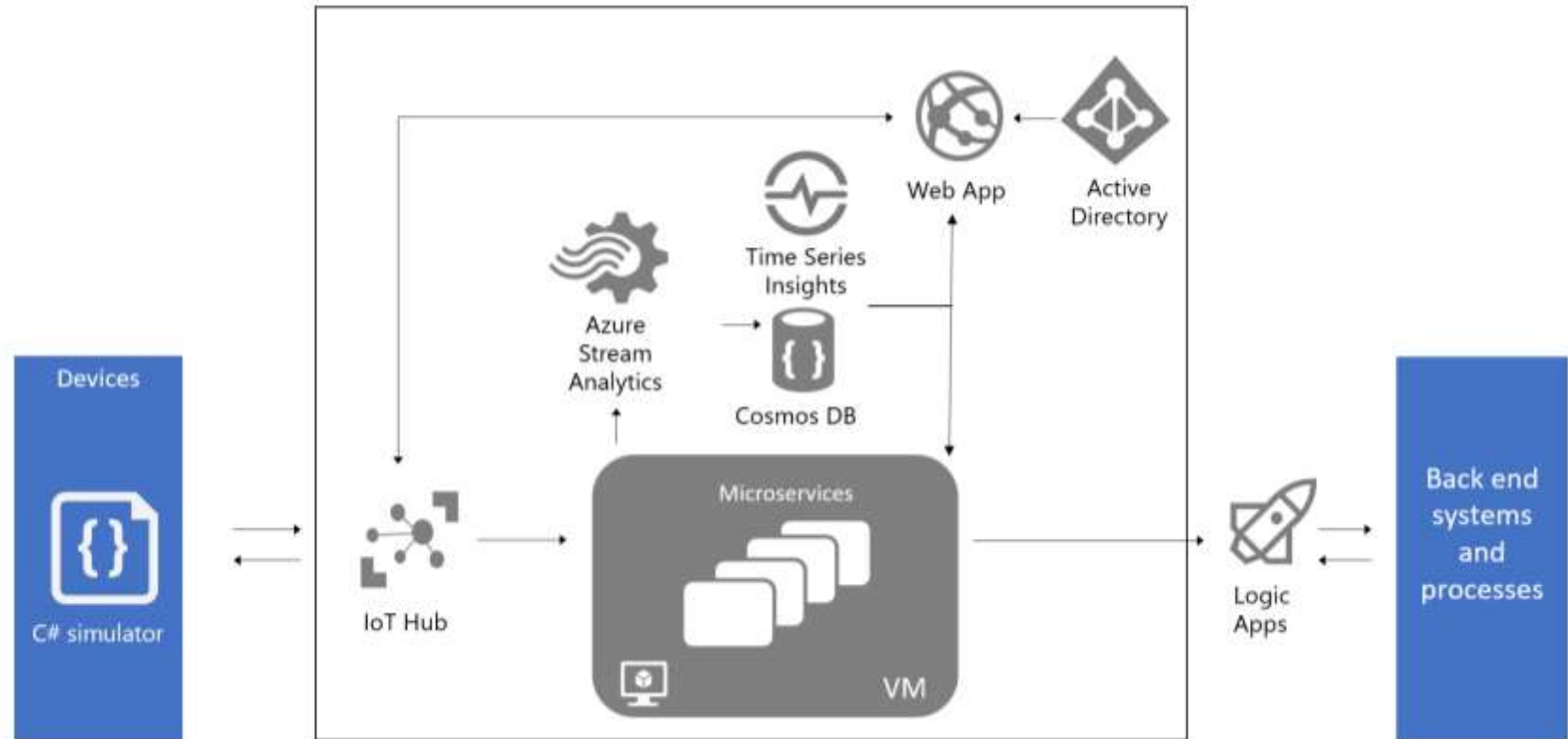


Predictive  
Maintenance



Device Simulation

# Azure IoT Solution Accelerators :: Remote Monitoring



## Best Practice :: Think Big. Start Small.

- Build to an architecture that will scale, but start prototyping with a small number of devices.
- Sometimes it's hard to predict which processing framework will be the most suitable for you.
- It's much easier to work through device identity, management/update and security at small scale.

The image shows the words "LITTLE BIG" in a very bold, stylized, blocky font. The letters are thick and have a slightly irregular, hand-drawn appearance. The word "LITTLE" is on the top line and "BIG" is on the bottom line, with the letters of "BIG" being significantly larger than those of "LITTLE".

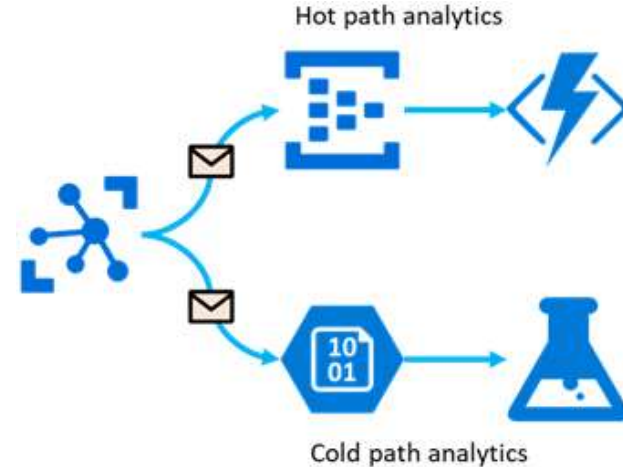
## Best Practice :: Telemetry First

- Data might be not in the format you expect.
- Often it's hard to predict which data provides value until you build something.
- Think about not only device telemetry but also diagnostics telemetry.



## Best Practice :: Don't Interrupt Fast Path

- Don't process between high-scale components unless you know what you're doing.
- Pass only valuable data which really needs to be processed in real-time.



## Best Practice :: Security as a Culture

- Think about security, identity and management from the very beginning.
- Security is a shared responsibility between Azure and the customer.
- Think about security on the device, at the field gateway (if exists) and in the cloud.



Physical Security,  
Tamper Detection

Hardware &  
firmware  
security,  
secure boot

Network  
protocol &  
application  
security

Identity  
management  
for devices  
and users

Data Privacy  
Protection  
and Controls

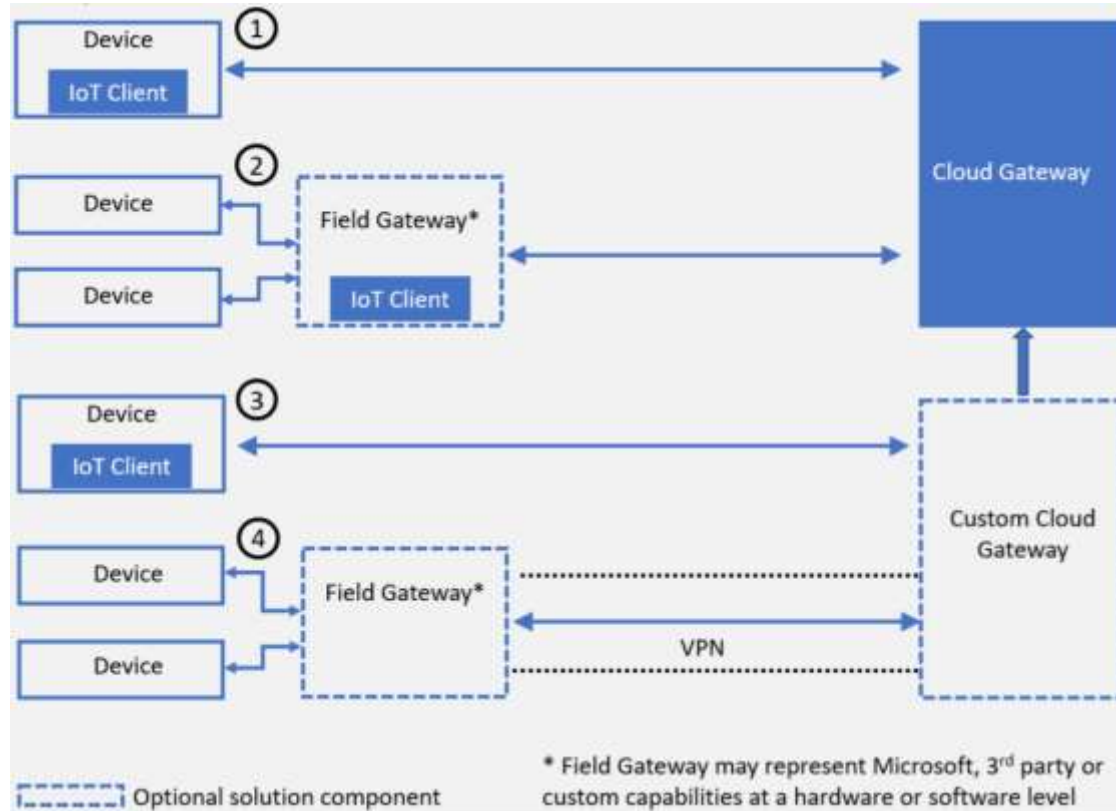


# Best Practice :: Understand Customer's Business Model

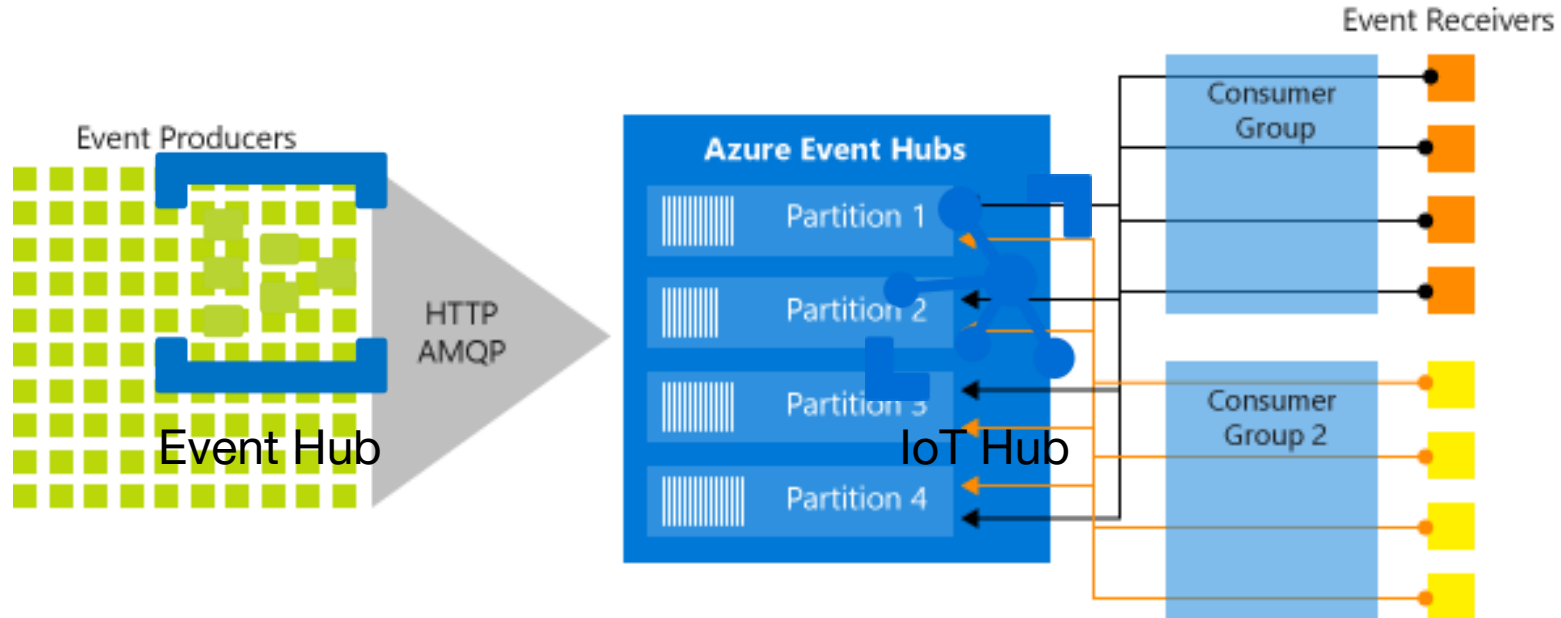
- Data architecture more important than solution architecture
- Plan and budget appropriately through simple predictable scenarios
- Remember that you need to support millions of assets



# Device Connection :: Conceptual Model



# Event Hubs :: Under the Hood



## Event/IoT Hubs :: Overview

- Cloud-scale telemetry ingestion
- Compatible with 1M+ publishers (HTTP, AMQP, MQTT)
- Handles 1M+ events per second
- SAS based security, with unique token per publisher
- Configurable data retention (1 - 30 days)
- Low latency (<10ms for volatile data)
- Pluggable with other Azure services (like Stream Analytics)
- Mission critical reliability, performance, and predictable results
- Doesn't support multi-tenancy



# Data Ingestion :: What if I Need Custom Solution?

Device registry

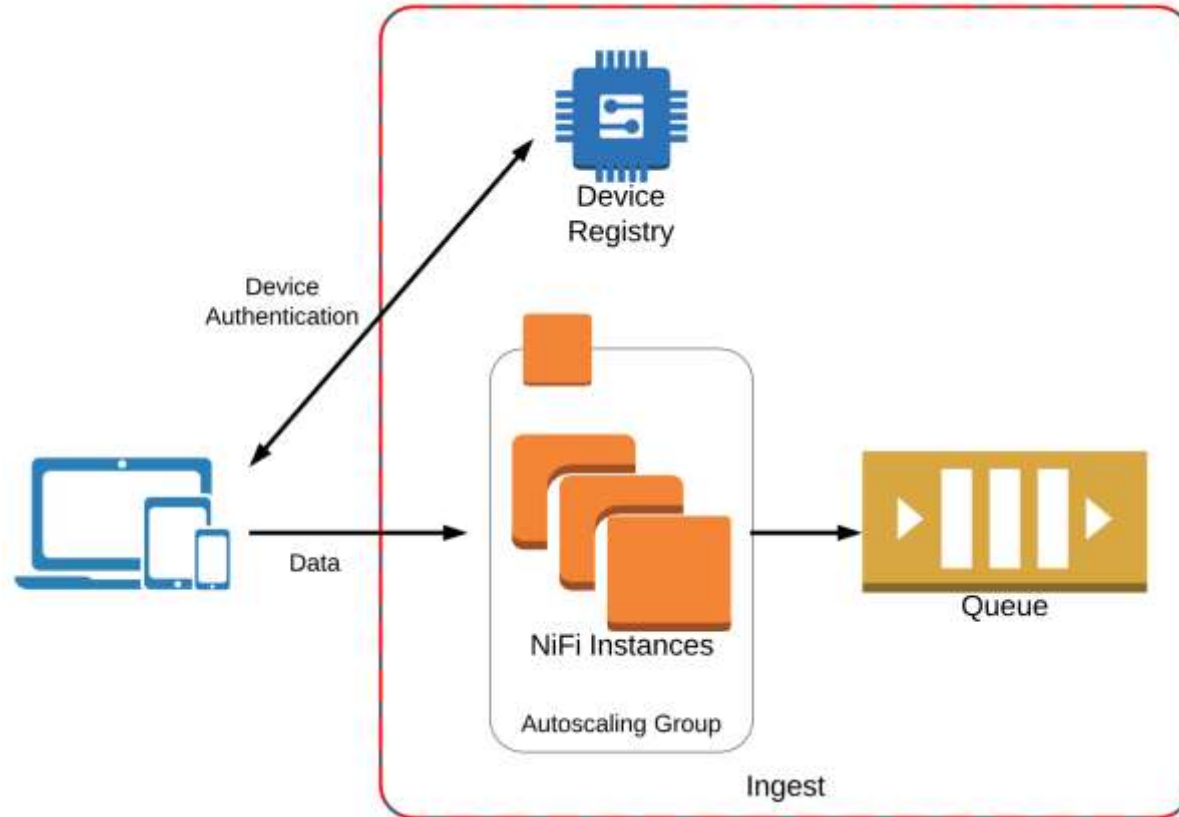
Queue



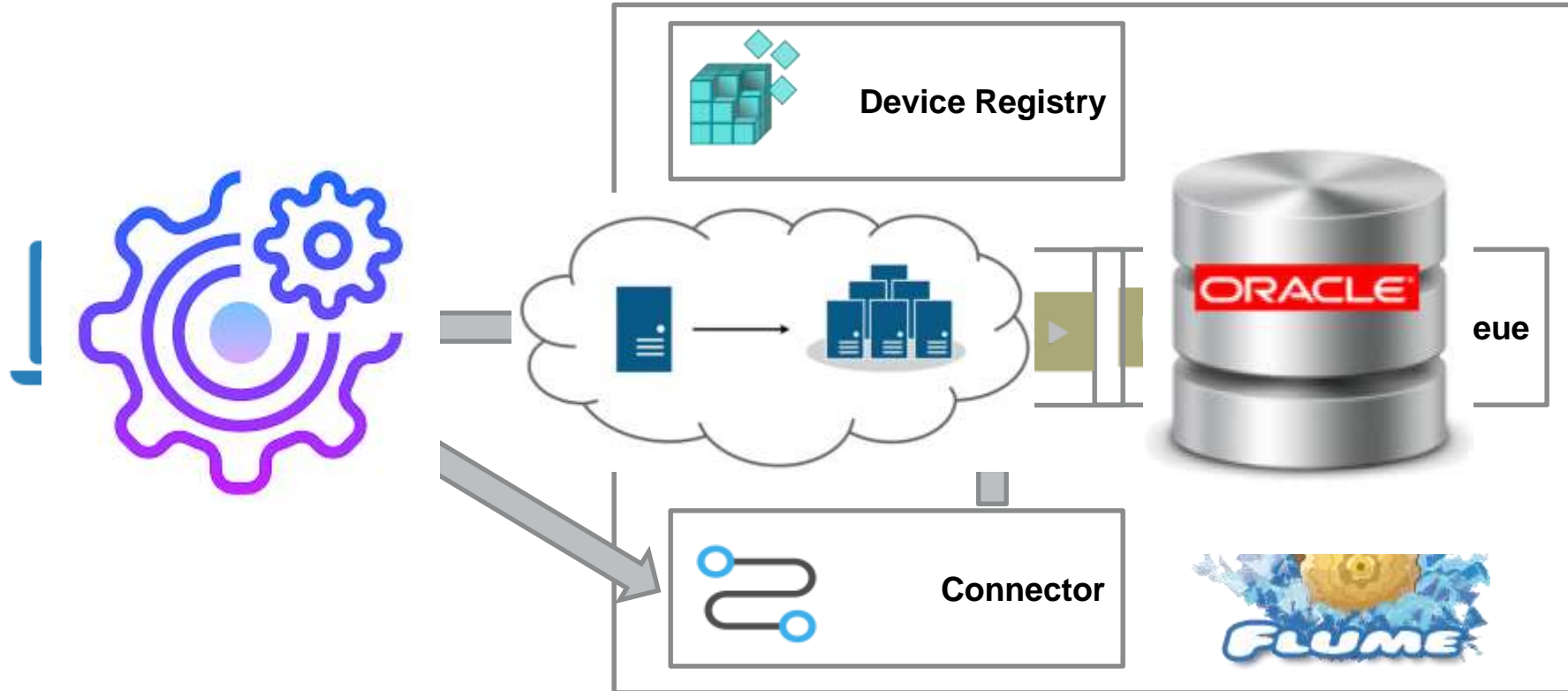
Data Connector



# Data Ingestion :: Custom Solution :: Connector

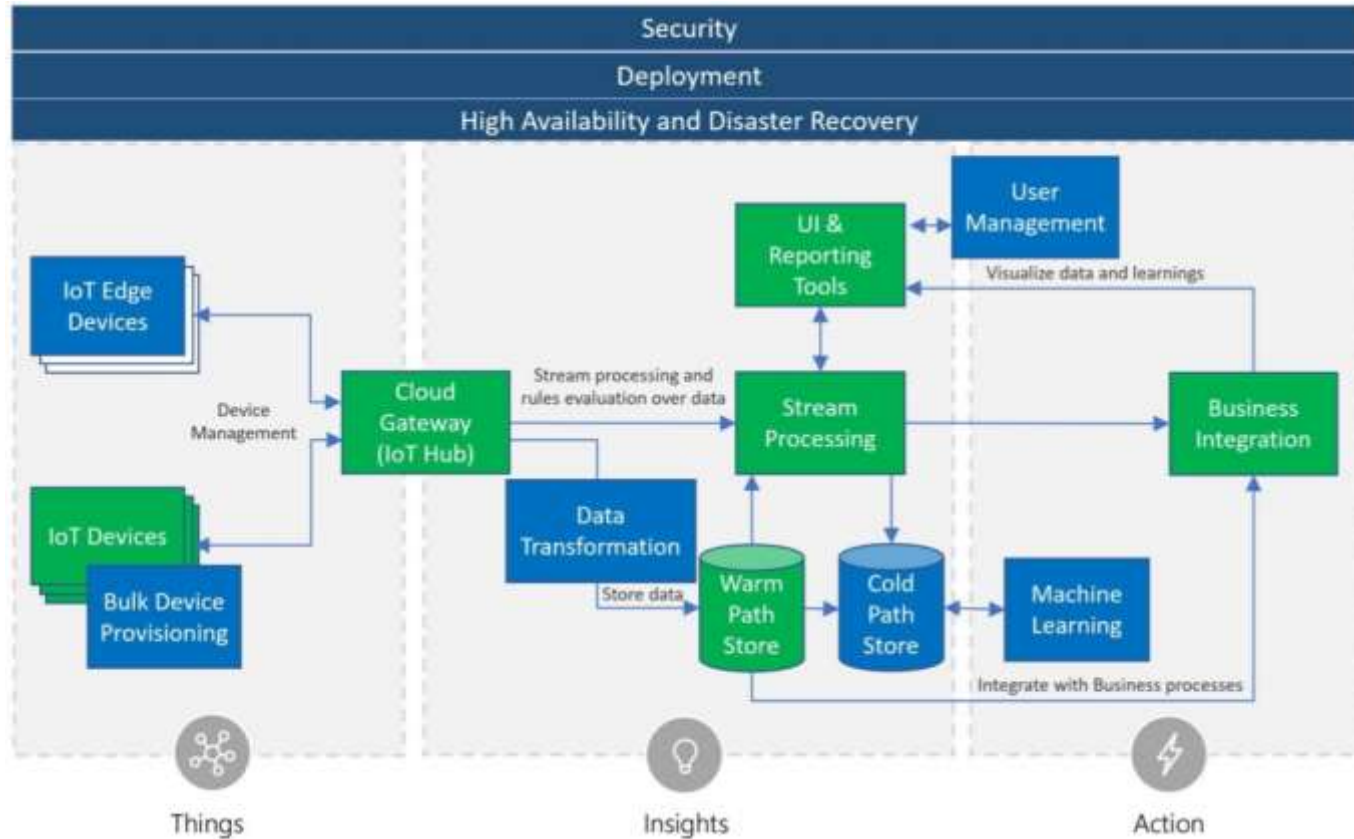


## Data Ingestion :: Connector & Queue





# IoT Solutions :: Cross-Cutting Concerns



## Cross-Cutting Concerns :: Logging

- Serilog
- Application Insights
- log4Net
- ELK



# Cross-Cutting Concerns :: Monitoring

- Operations Management Suite
- ELK
- Splunk



Thank you

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