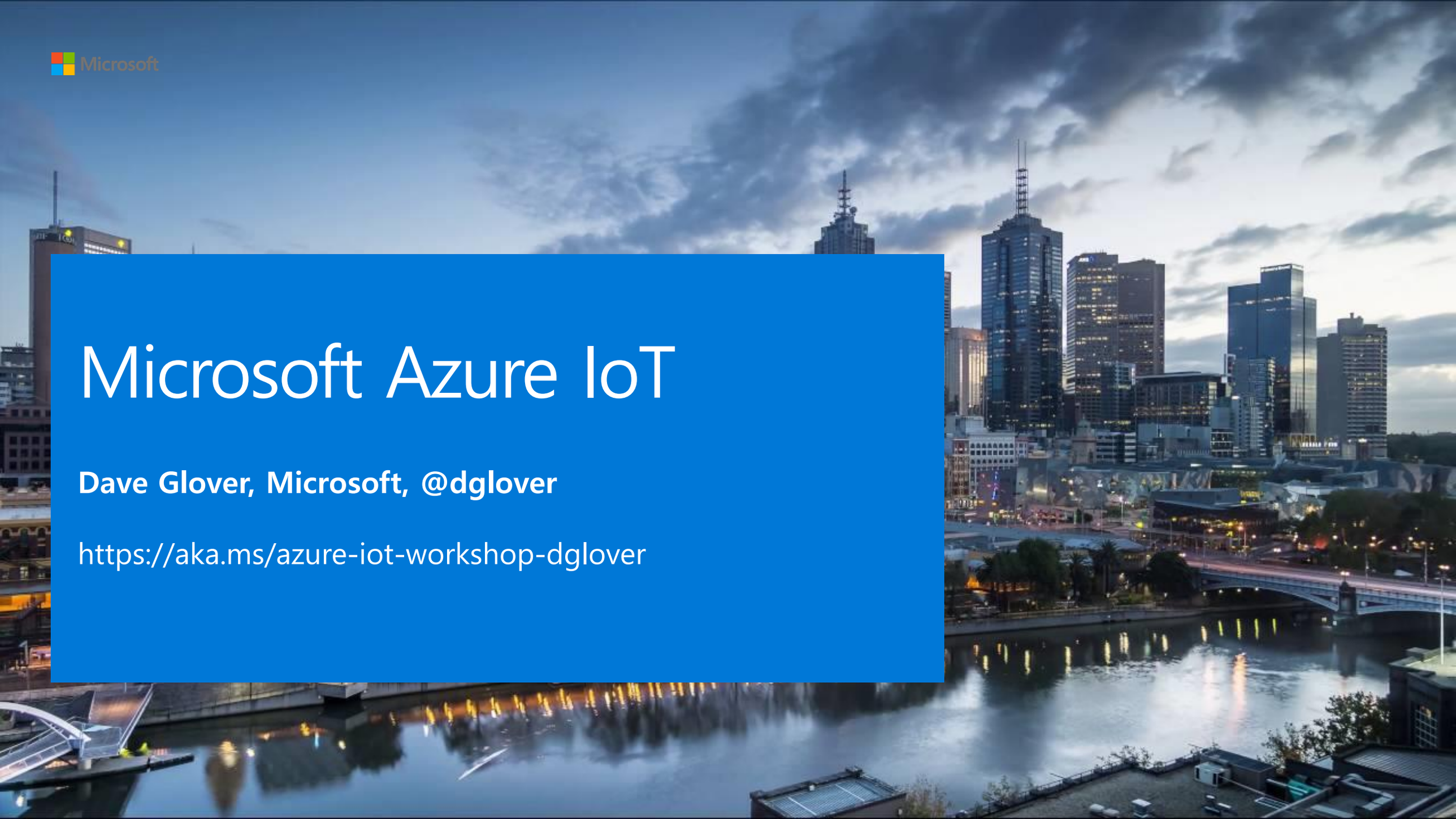
Setup

- Test Audio and Video
- Open
  - Azure IoT Hub – Open for IoT Edge, Rpi4
  - Custom Vision AI
  - Open Certified Devices
  - IoT Central
  - Youtube https://www.youtube.com/watch?v=Hm-wsqXaj_g
- Visual Studio
  - Open Lab 5 demo, run and set breakpoints
- Connect
  - Azure Sphere
  - Raspberry Pi Intelligent Edge



Microsoft Azure IoT

Dave Glover, Microsoft, @dglover

https://aka.ms/azure-iot-workshop-dglover

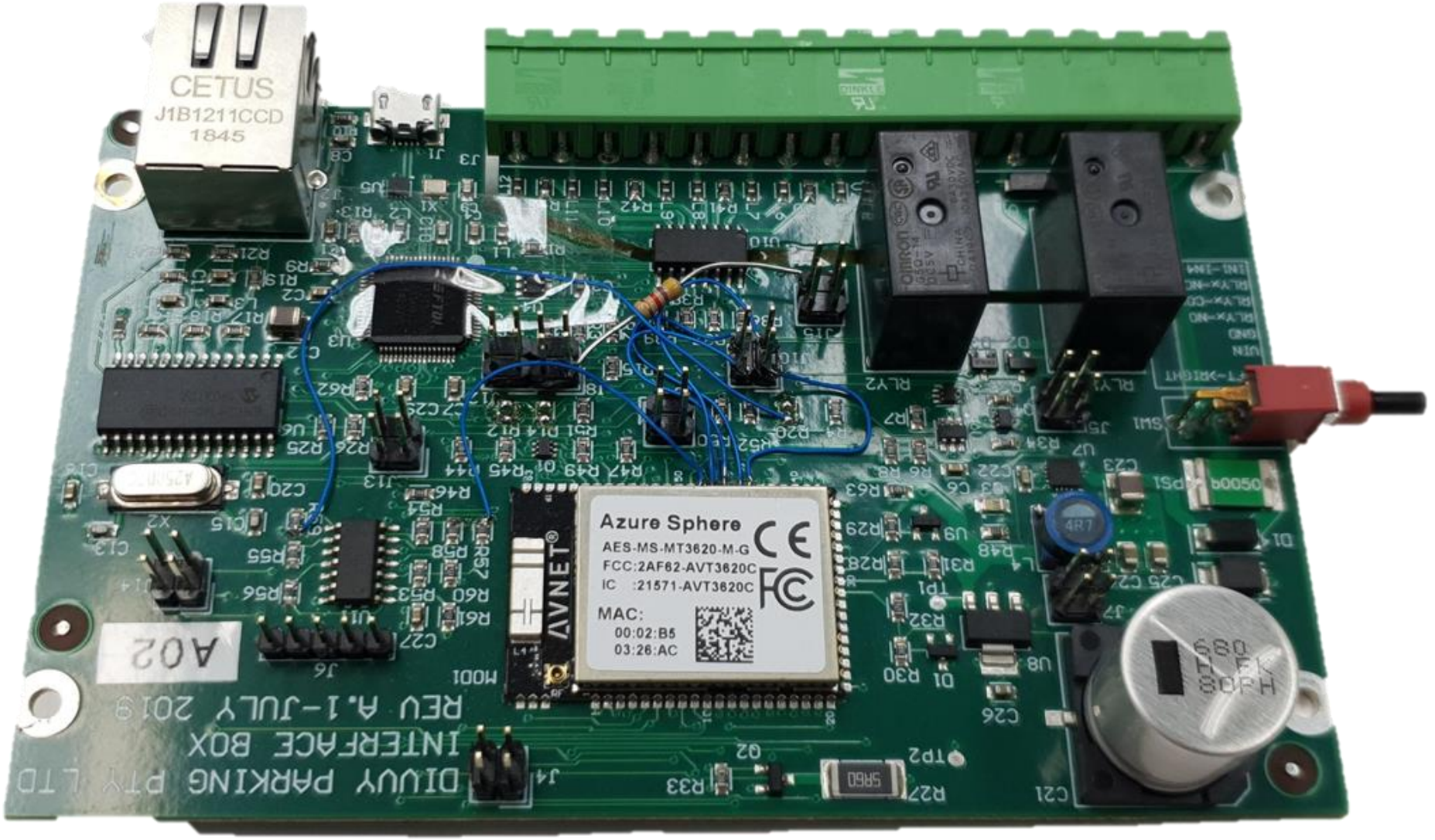
Agenda

- Azure IoT Hub
- Azure Device Provisioning Service
- Azure IoT Central

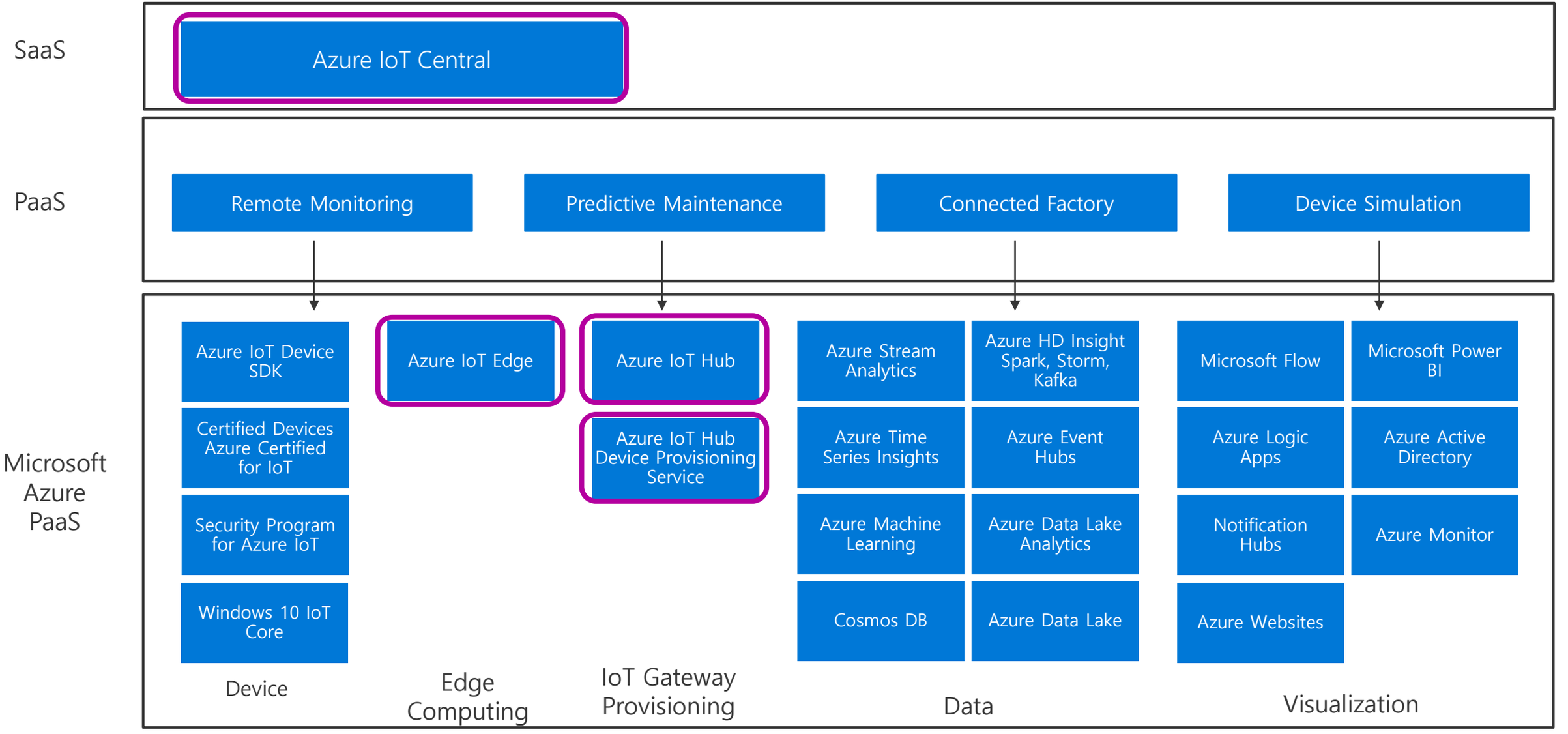
IoT in Australia

- Agriculture
- Mining
- Retail
- Transport
- Smart Cities & Buildings
- Aged care
- Green

Divvy Secure Parking Solution (Sydney)



Azure IoT Solutions



Azure IoT Hub

Azure IoT Hub

Bi-directional communication

Millions of Devices

Multi-language, open source SDKs

HTTPS/AMQPS/MQTTS

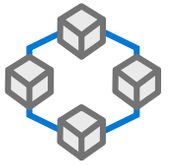
Send Telemetry

Receive Commands

Device Management

Device Twins

Queries & Jobs



Enterprise scale & integration

Billions of messages

Scale up and down

Declarative Message Routes

File Upload

WebSockets & Multiplexing

Azure Monitor

Azure Resource Health

Configuration Management

Failover

Message Enrichments

End-to-End Security

Per Device Certificates

Per Device Enable/Disable

TLS Security

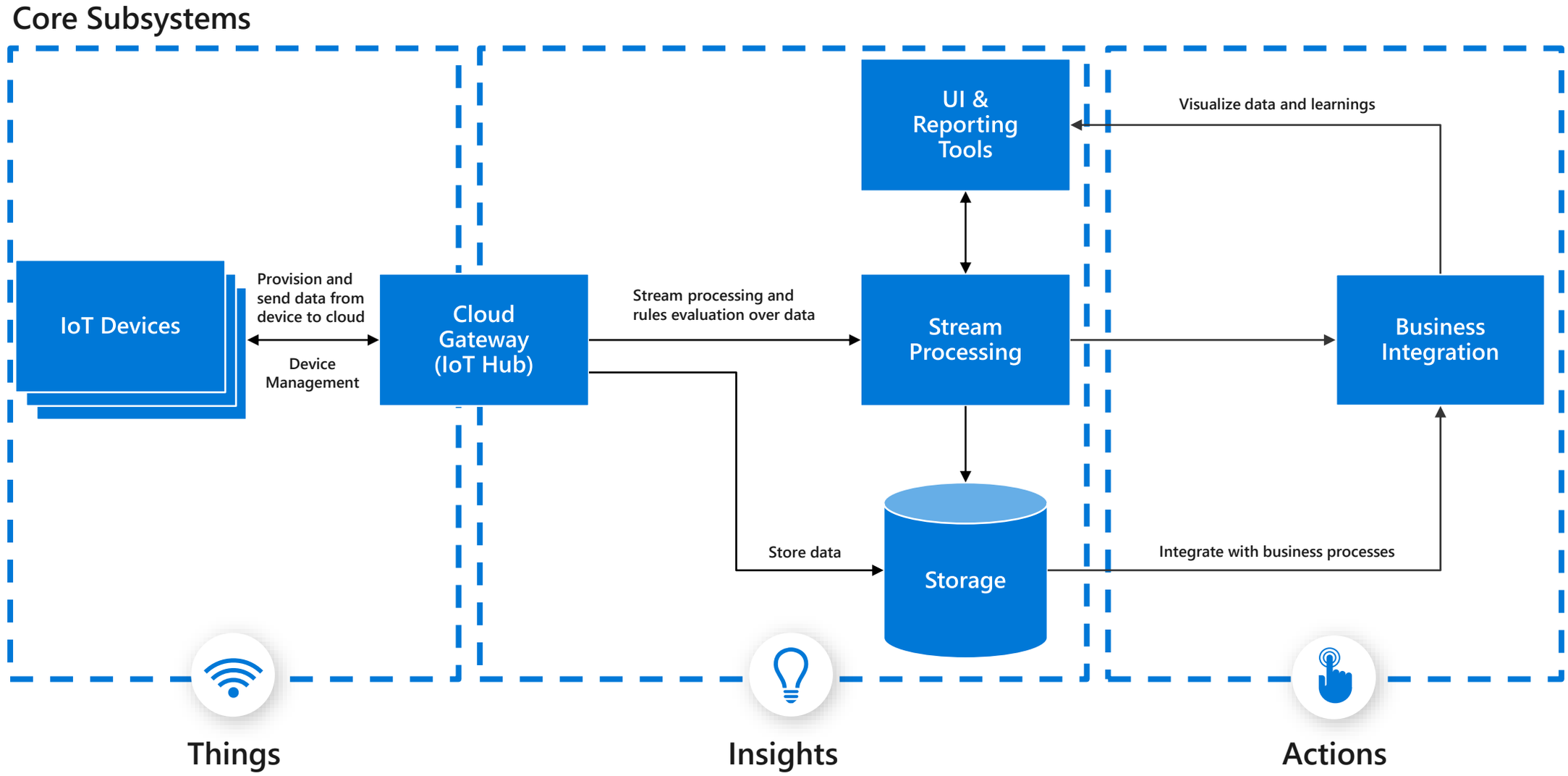
X.509 Support

IP Whitelisting/Blacklisting

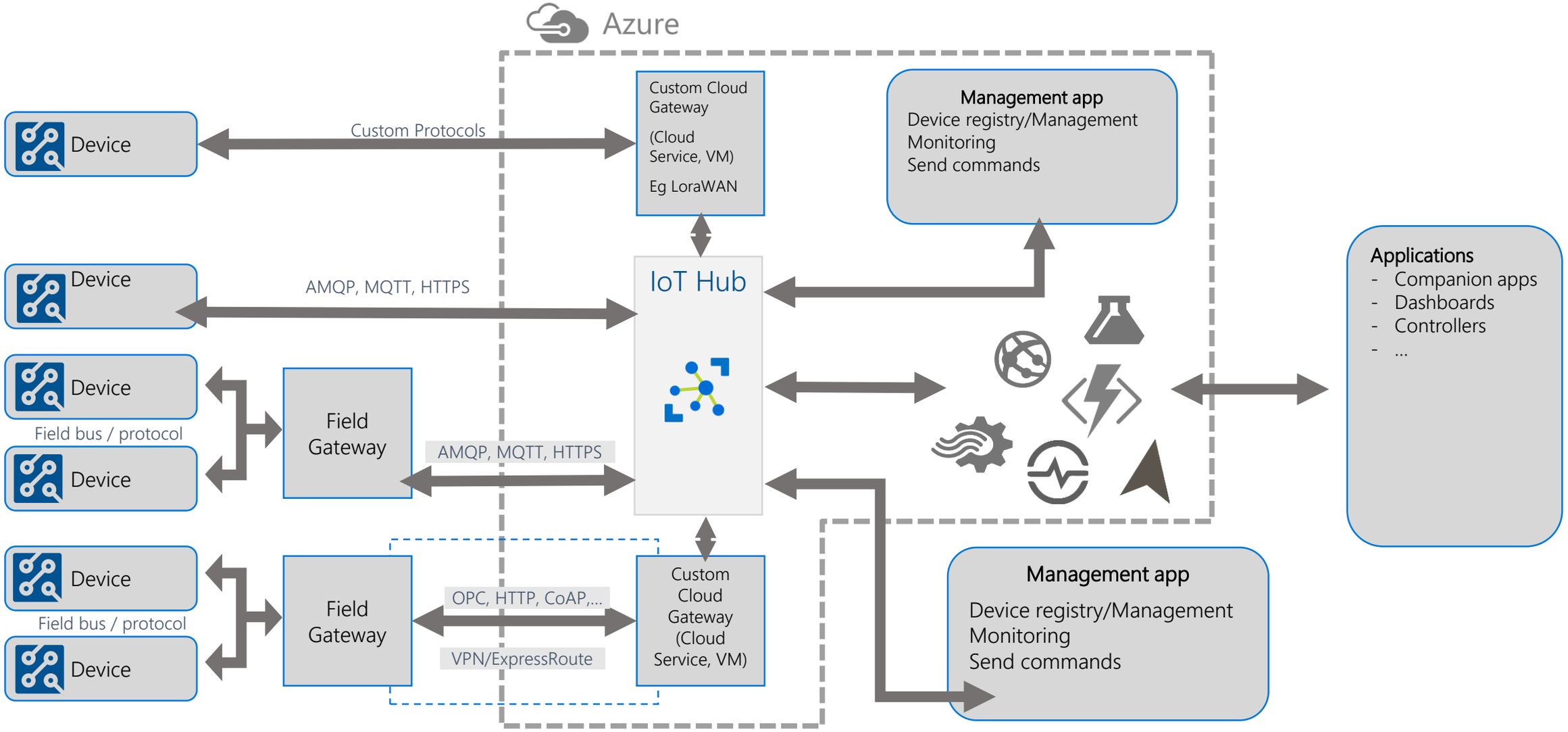
Shared Access Polices

Firmware/Software Updates

Azure IoT reference architecture

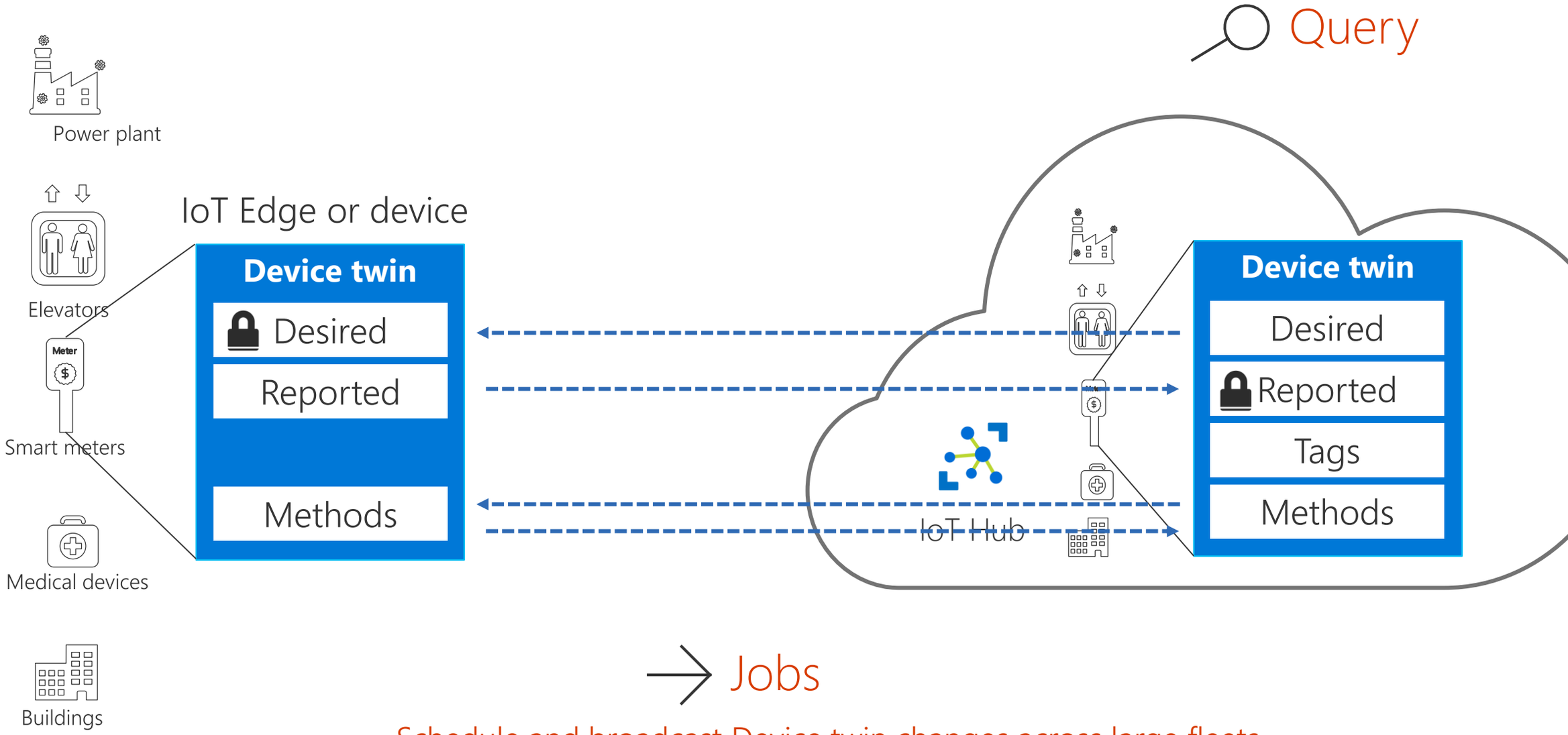


Reality: Things are a little more complicated



Azure IoT Hub Device Management

Device Twins and Direct Methods



Azure IoT & Azure Sphere

Device Twins Direct Methods

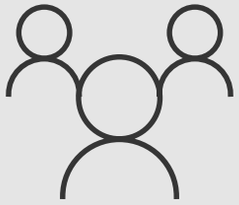
Azure IoT Hub Device Provisioning Service (DPS)

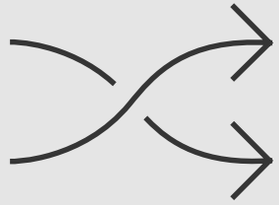
Device Provisioning is Hard

- Solutions need per-device revocable access
- Provisioning is a manual process
- Initial configuration can rot between manufacturing and deployment
- Device supply chains are complex

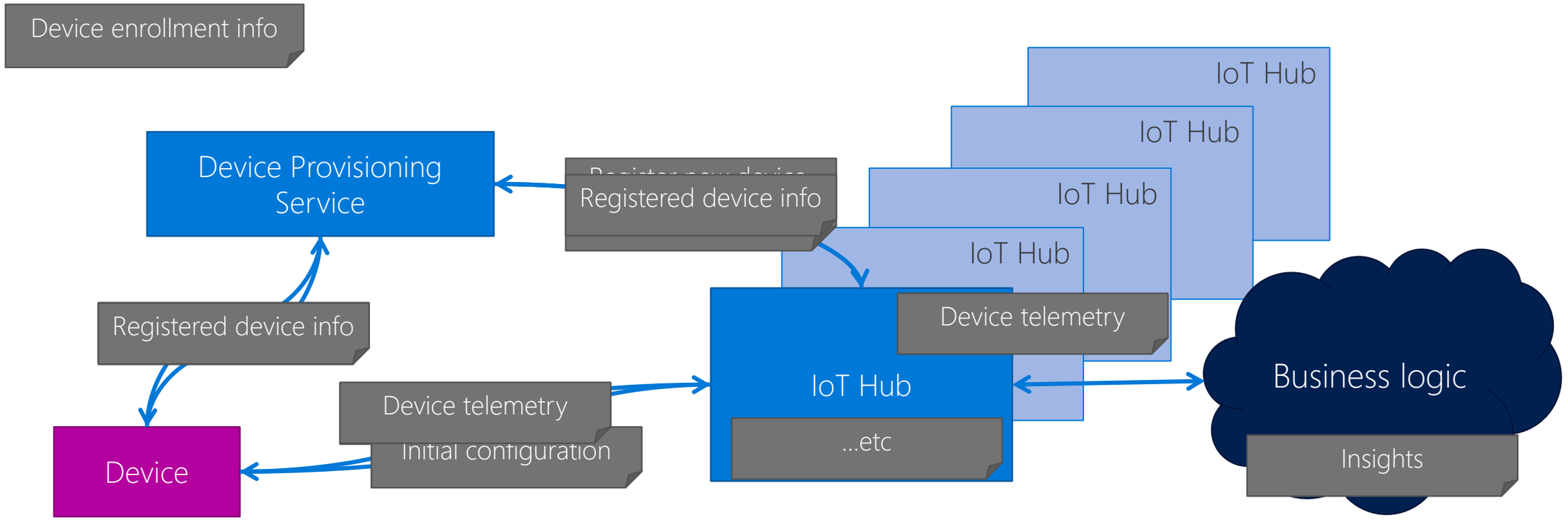
Scenarios Include

Initial connection	Load balancing	Ownership based	Location based	Re-provisioning
Zero-touch provisioning to a single IoT solution	Across multiple hubs	Connecting devices to their owner's IoT solution based on sales transaction data	Connecting a device to the IoT hub with the lowest latency	Based on a change in the device, e.g. change of ownership





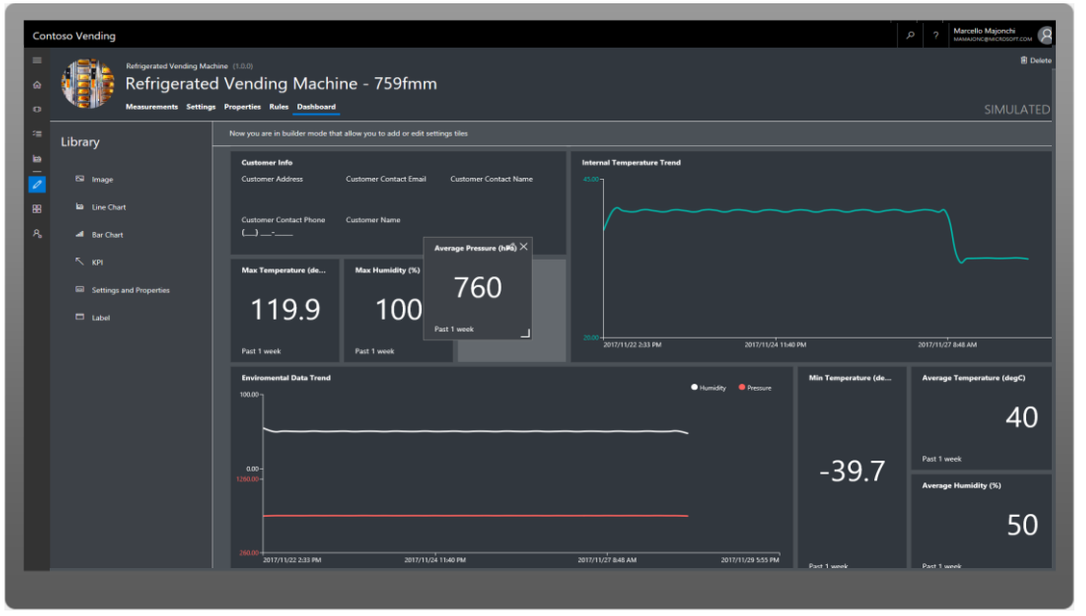
Provisioning with DPS



Azure **IoT Central**

- Fully hosted and managed by Microsoft
- No cloud development expertise required
- Device connectivity and management
- Monitoring rules and triggered actions
- Extensibilities (Flow, Dynamics, Webhooks, etc.)
- Analytics, dashboards and visualization
- Risk-free trial with simplified pricing

Builder

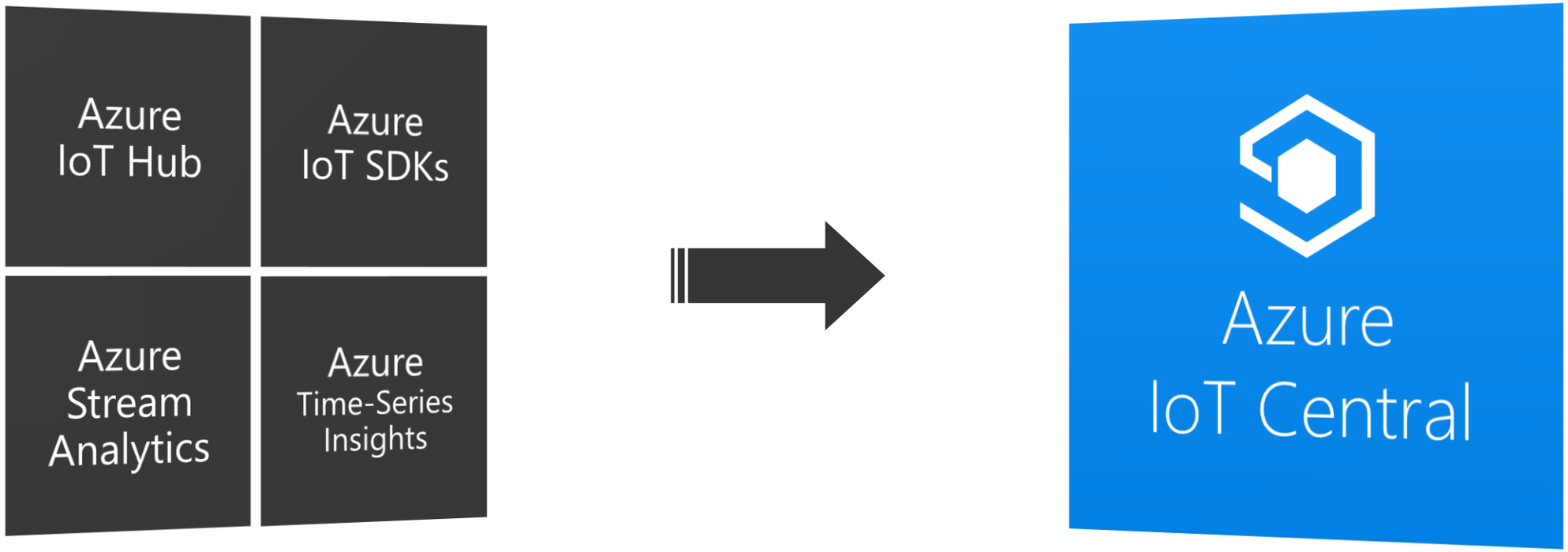


- Product Modeler
- Device settings
- Template Management
- Rules Workflows
- User and identity management

Operator

- Device management
- Analytics & dashboards
- Time-series Insights
- Alerts and actions

Azure IoT Central Building Blocks



What are the Azure IoT Central use cases?

Primary use cases

EQUIPMENT MONITORING

CONNECTED FIELD SERVICE

PRODUCT-AS-A-SERVICE

Other use cases

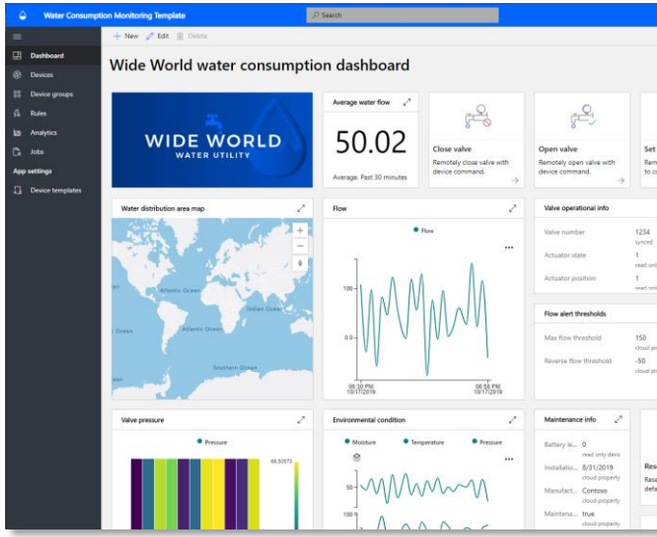
- Asset tracking
- Predictive maintenance
- Product design/R&D

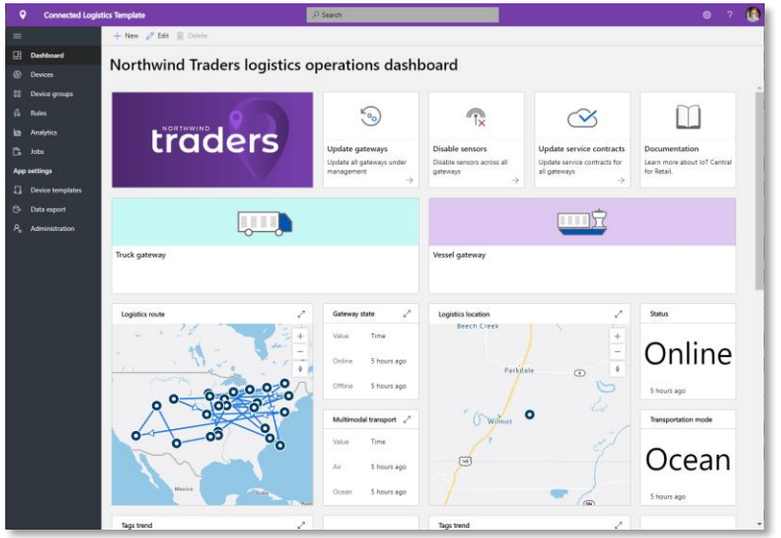
Azure IoT Central Templates

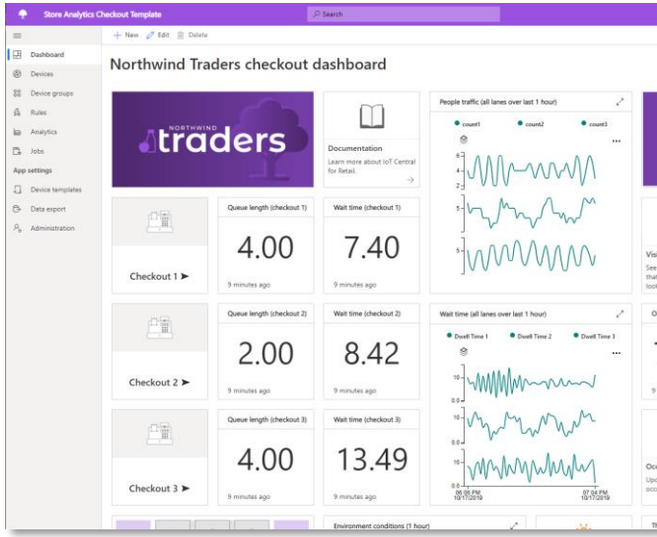
Kickstart IoT Solutions

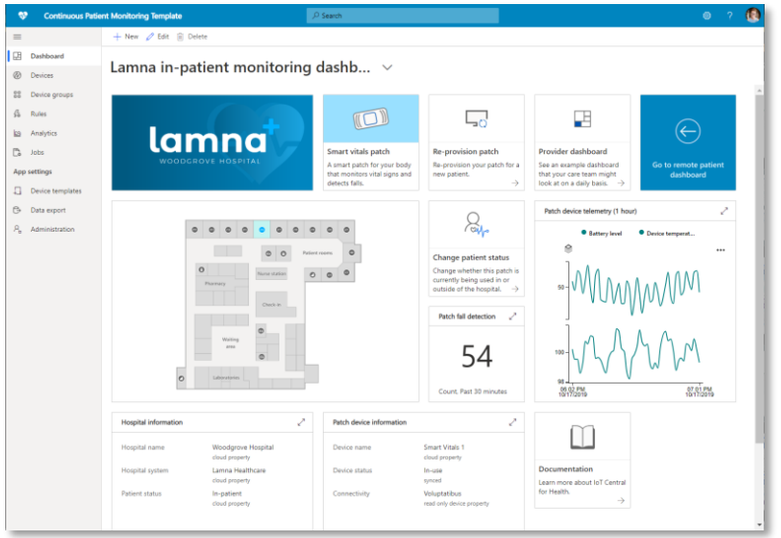
- Sample operator dashboards
- Sample device templates
- Simulated devices
- Pre-configured rules and jobs
- Rich documentation including tutorials

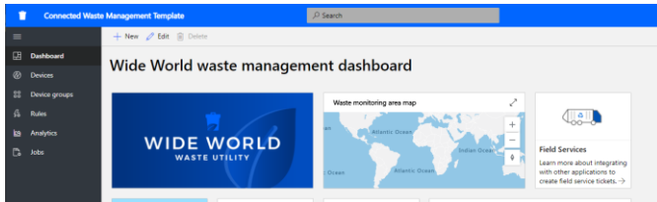
White Label Branded Templates

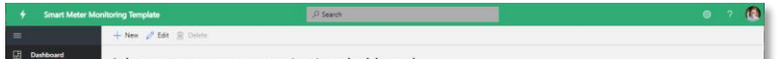




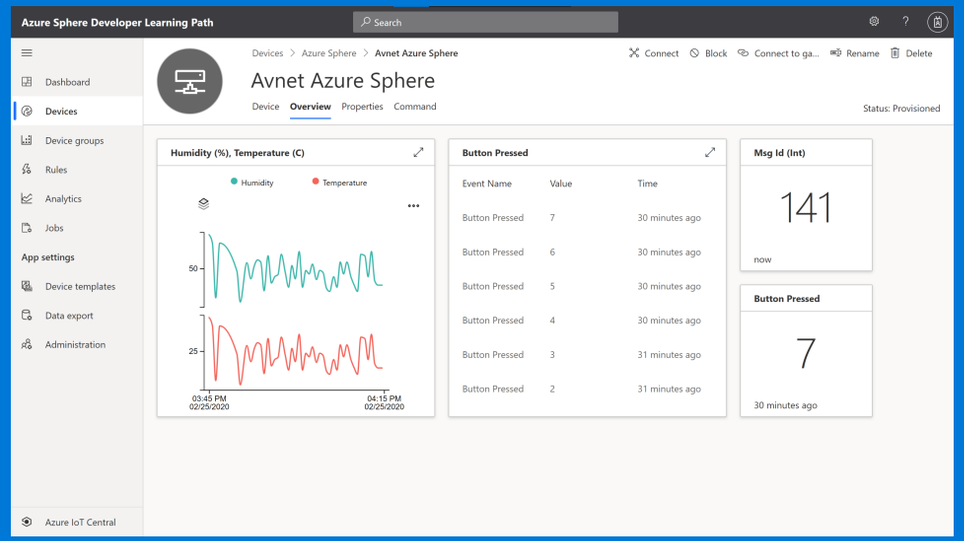








Azure IoT Central Demo



Summary

- Azure IoT Hub
- Azure Device Provisioning Service
- Azure IoT Central

Session Resources

https://aka.ms/azure-iot-workshop-dglover

Thank You

Azure IoT Solution Accelerators

Azure IoT Solutions Accelerator

Use common, templates to accelerate your IoT projects and jump ahead of the competition.

Remote Monitoring

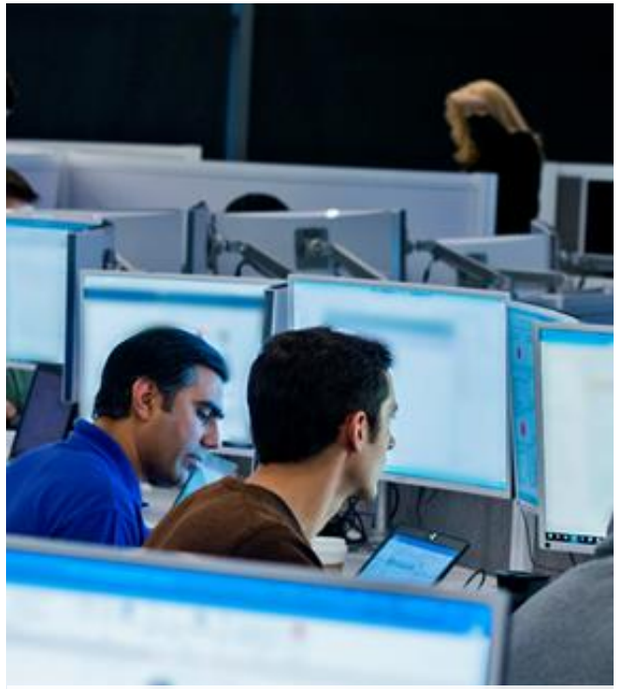
address asset management scenarios with visualization

Device Simulation

scale test your IoT solution before deploying it at scale

Connected Factory

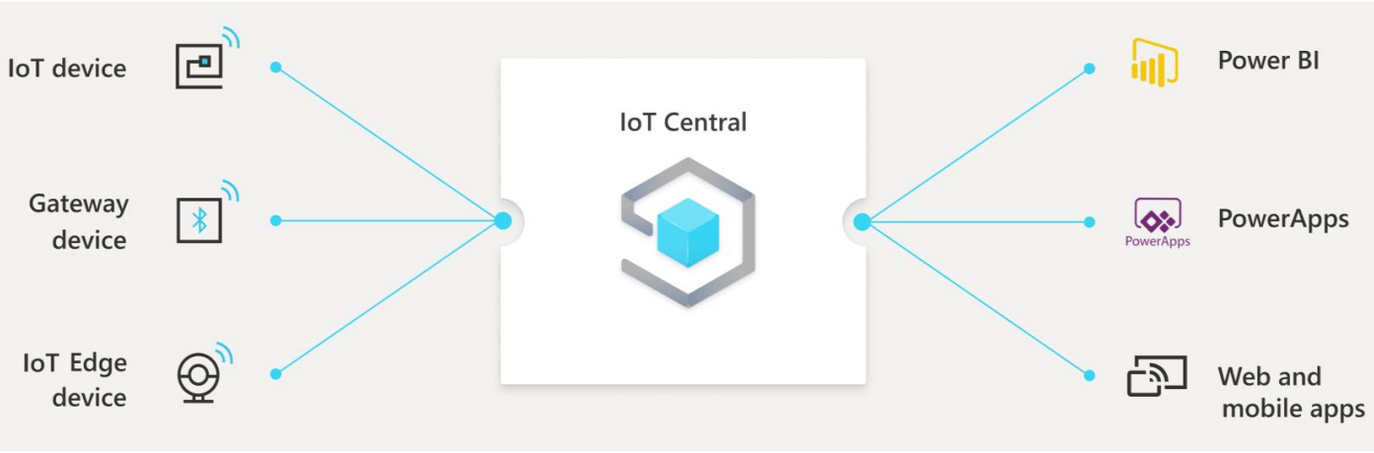
manage an Industry 4.0 factory floor connecting manufacturing devices to the cloud.



Predictive Maintenance

learn how to optimize your systems with a real optimization example.

How do I build with IoT Central?



Take Action

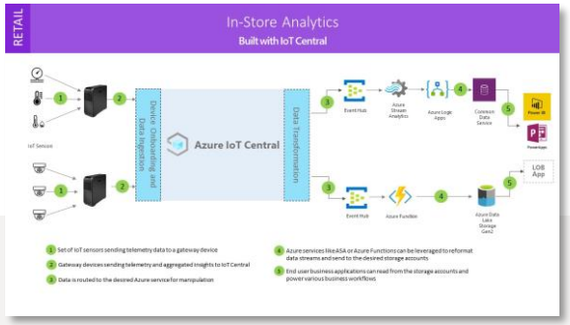
- No-code/Low-code actions with Microsoft Flow and Logic Apps

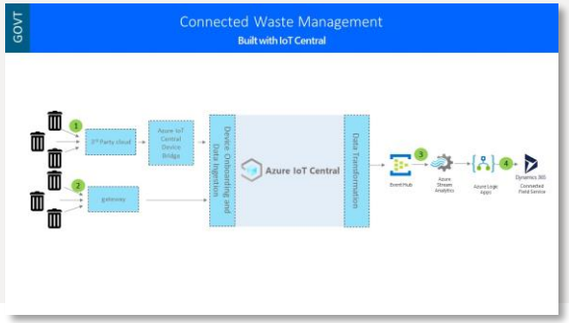
Integrate IoT Insights

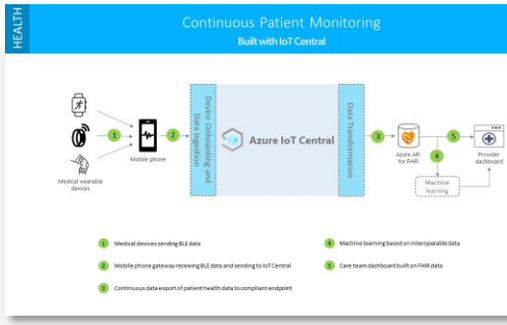
- Continuous IoT data routing through Event Hub and Service Bus
  - Build data pipelines using the breadth of Azure Services

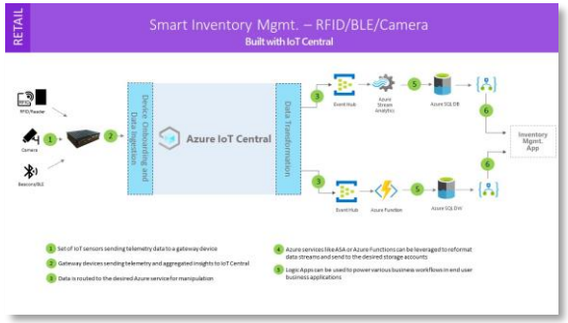
Build Solutions

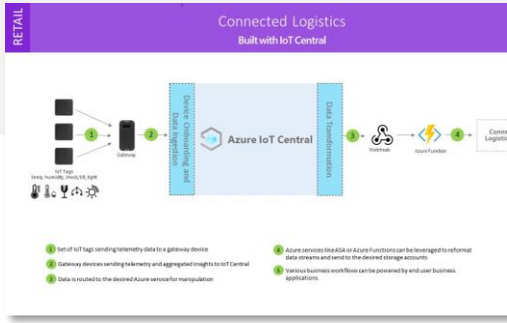
- IoT Central public APIs for device modeling, provisioning, lifecycle management, operations (updating/commanding), and data querying

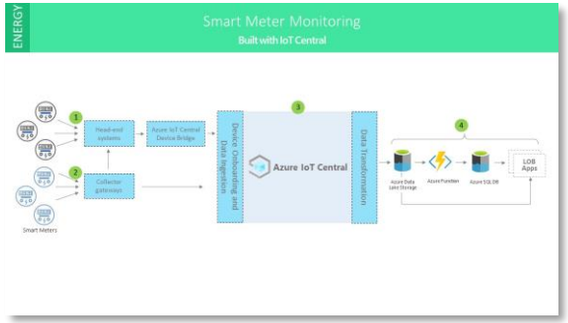


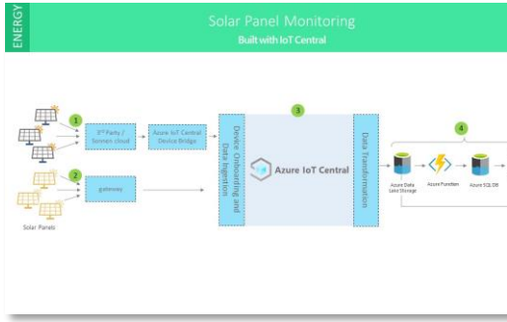


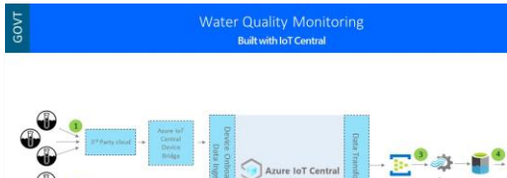






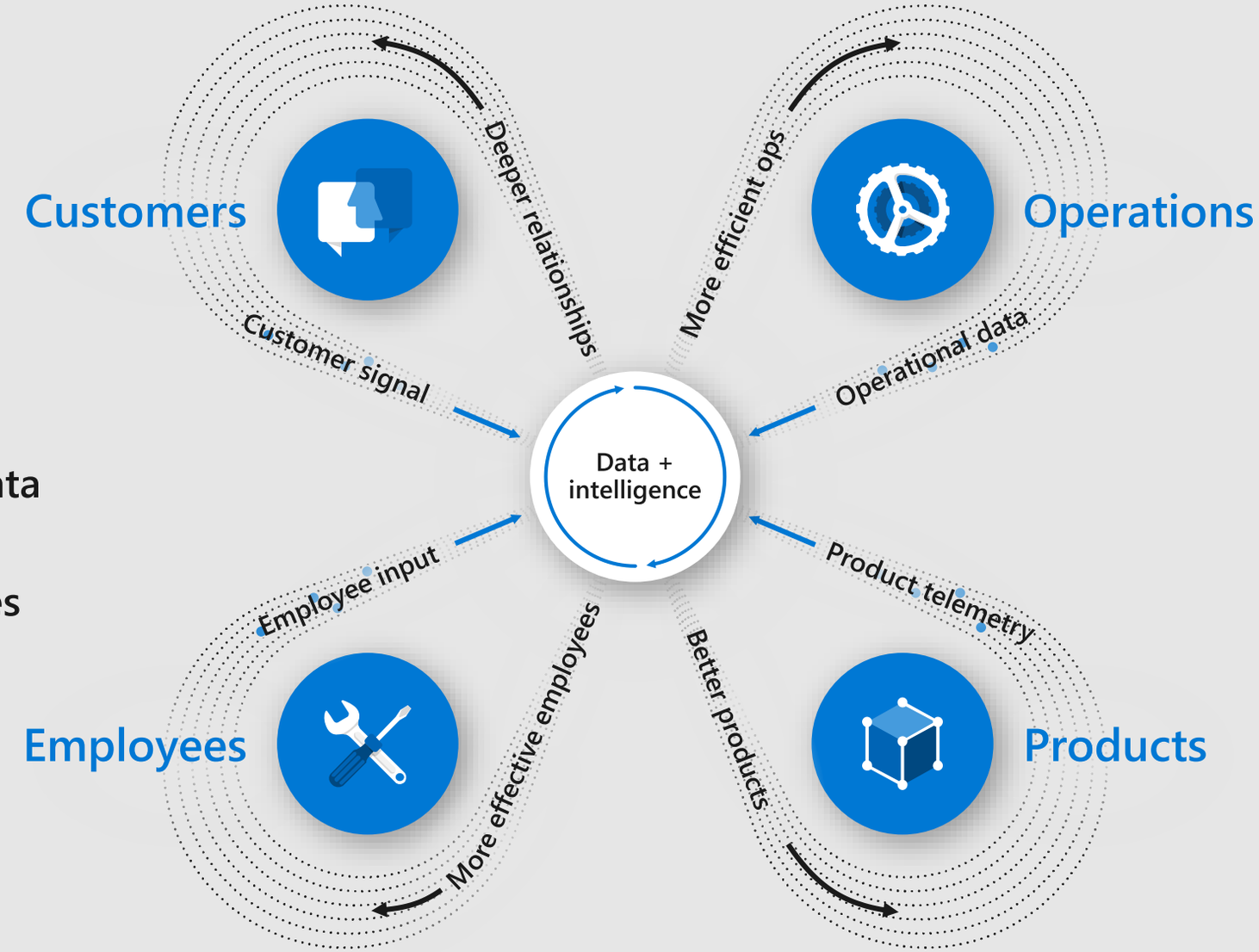




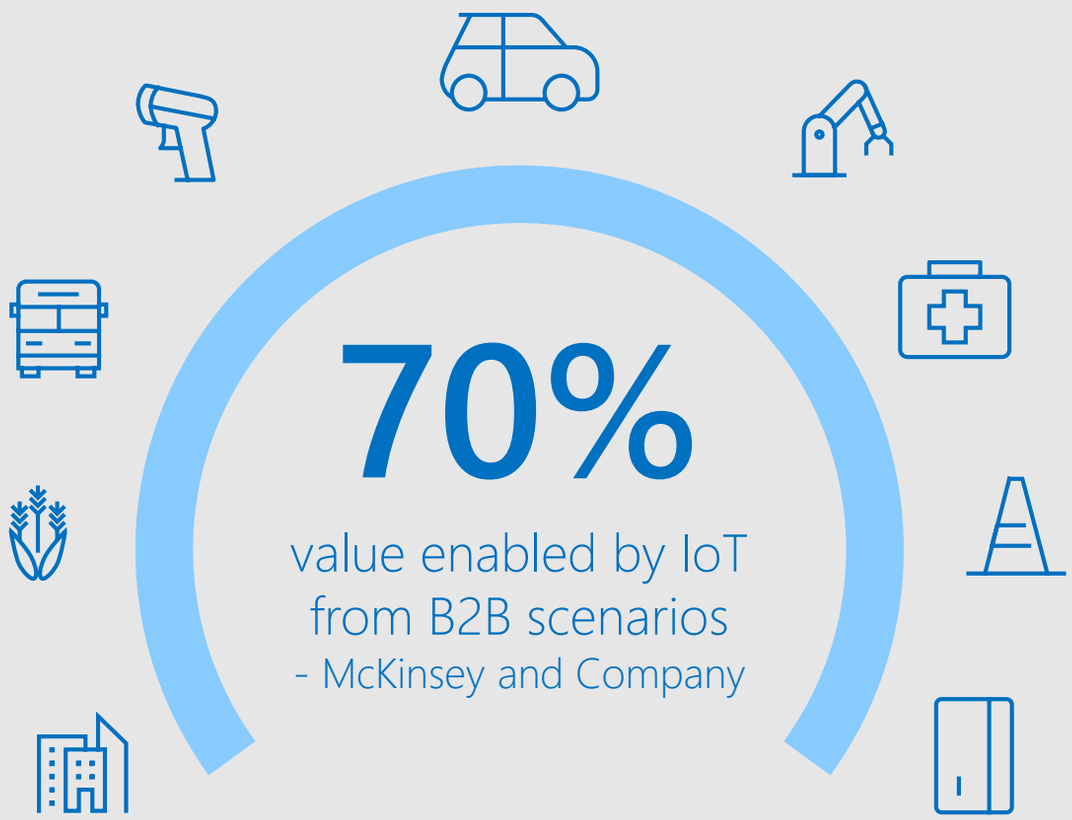


Why Business is Excited: The digital feedback loop

1. Data: Capture digital signal across business
2. Insight: Connect and synthesize data
3. Action: Improve business outcomes



The Internet of Things opportunity



80 billion
connected “things” by 2025 - IDC

180 zettabytes
digital data by 2025 - IDC

$457 billion
global IoT market by 2020 - Gartner

Azure IoT Hub

- Establish bi-directional communication with billions of IoT devices
- Enhance security with per device authentication
- Provision devices at scale w/ IoT Hub Device Provisioning Service
- Manage devices at scale with device management
- Multi-language and open source SDKs

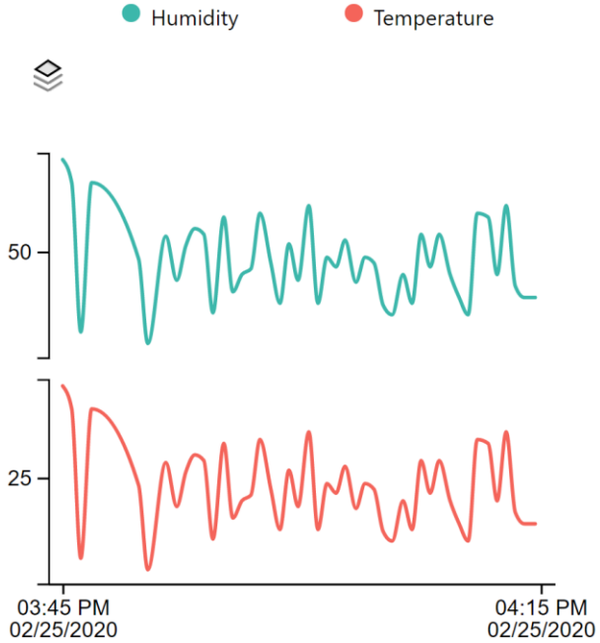
Dashboard
Devices
Device groups
Rules
Analytics
Jobs
App settings
Device templates
Data export
Administration
Azure IoT Central

Avnet Azure Sphere

Device Overview Properties Command

Status: Provisioned

Humidity (%), Temperature (C)



Button Pressed

Event Name	Value	Time
Button Pressed	7	30 minutes ago
Button Pressed	6	30 minutes ago
Button Pressed	5	30 minutes ago
Button Pressed	4	30 minutes ago
Button Pressed	3	31 minutes ago
Button Pressed	2	31 minutes ago

Msg Id (Int)

141

now

Button Pressed

7

30 minutes ago