

# IoT Central

connect any sensor with i.e.  
node-red, SigFox and CloudRAIL (IO-Link)

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<http://blog.denninger.at>



@stefandenninger

## Security & Management

- Security Center
- Portal
- Azure Active Directory
- Azure AD B2C
- Multi-Factor Authentication
- Automation
- Scheduler
- Key Vault
- Store/ Marketplace
- VM Image Gallery & VM Depot

## Media & CDN



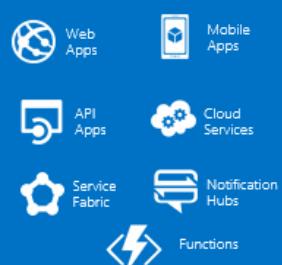
## Integration



## Compute Services



## Application Platform



## Data



## Intelligence



## Analytics & IoT



## Hybrid Cloud



## Infrastructure Services

### Compute



### Storage



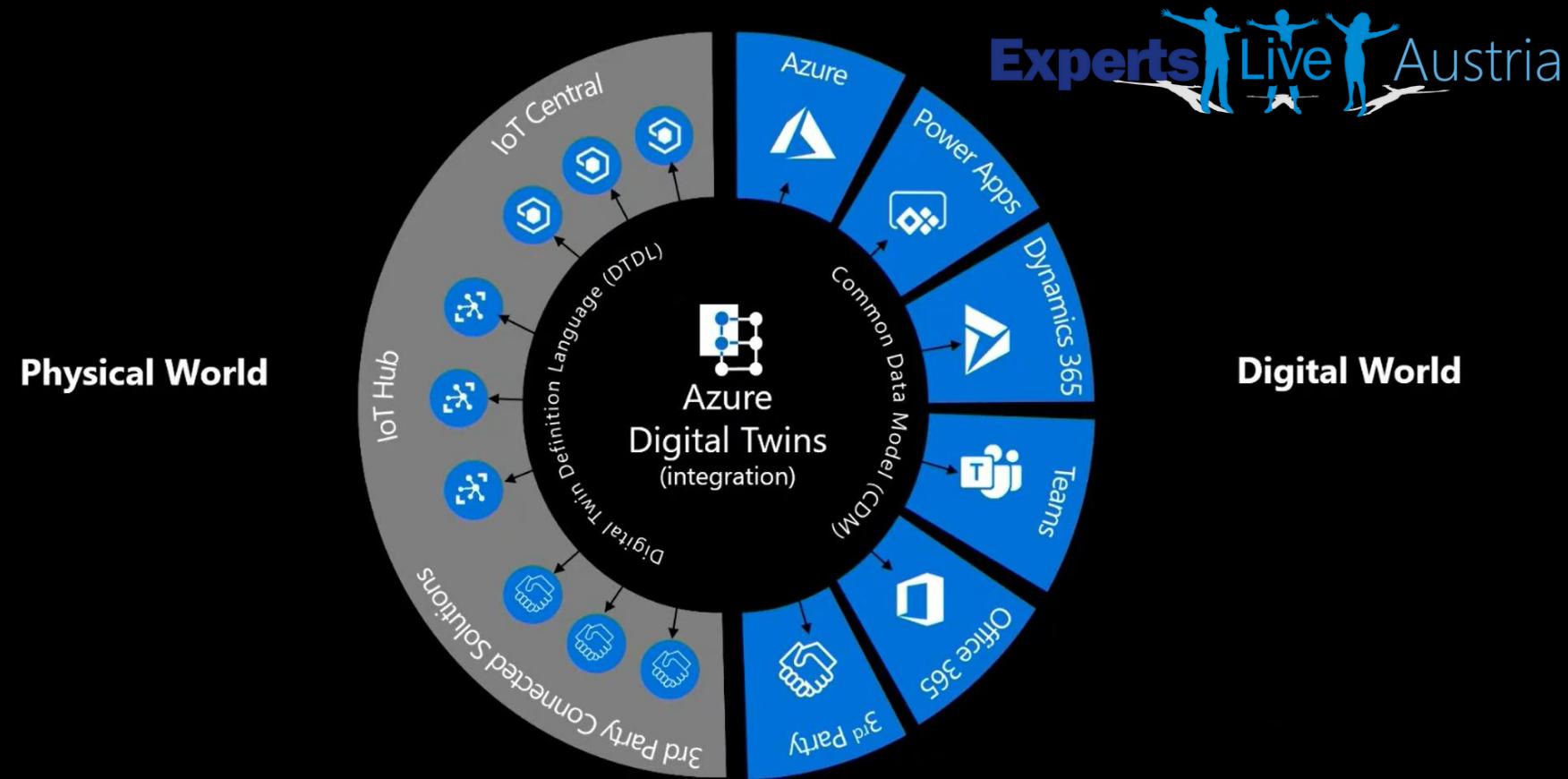
### Networking



Datacenter Infrastructure (42 Regions Announced, 36 Online)



# Connected Environments That Reflect the Physical and Digital

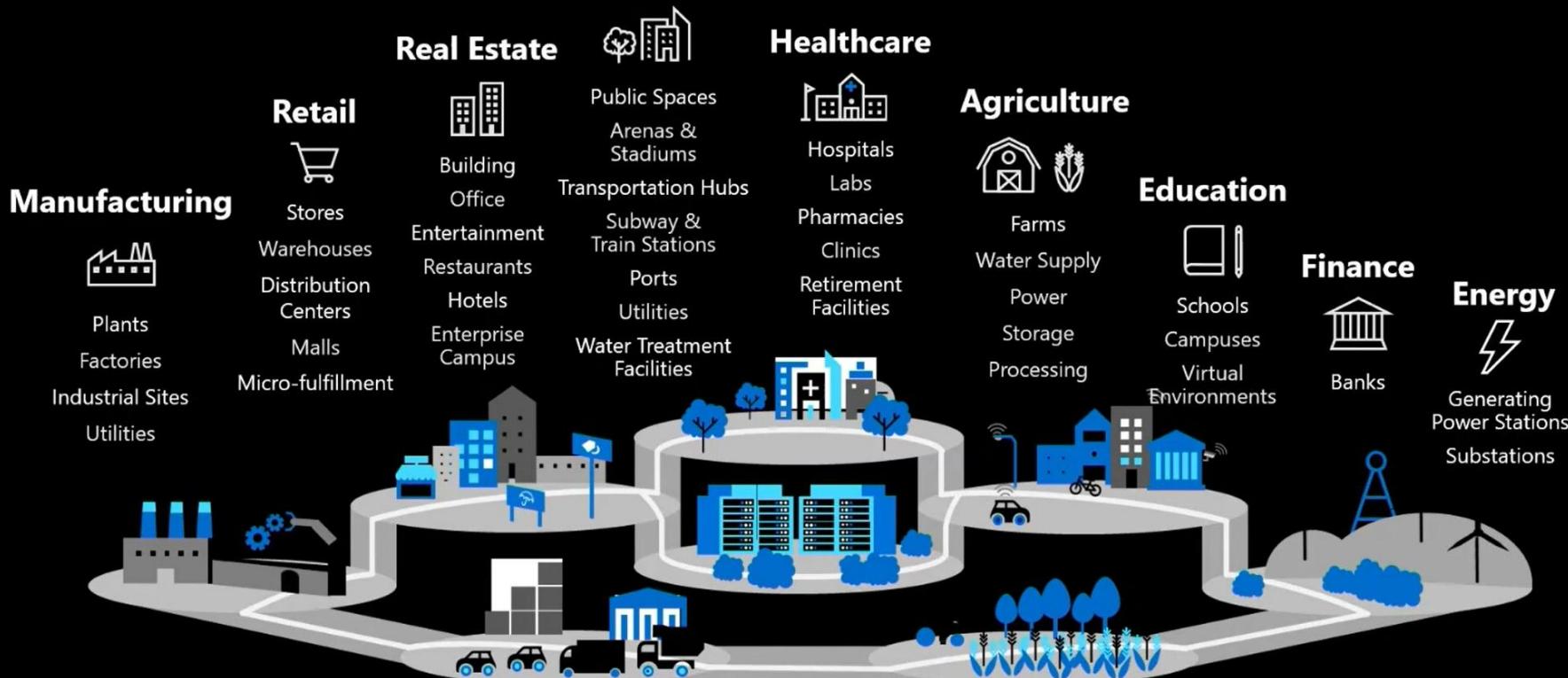


Experts Live Austria

# Connected Environments



## Cities & Government



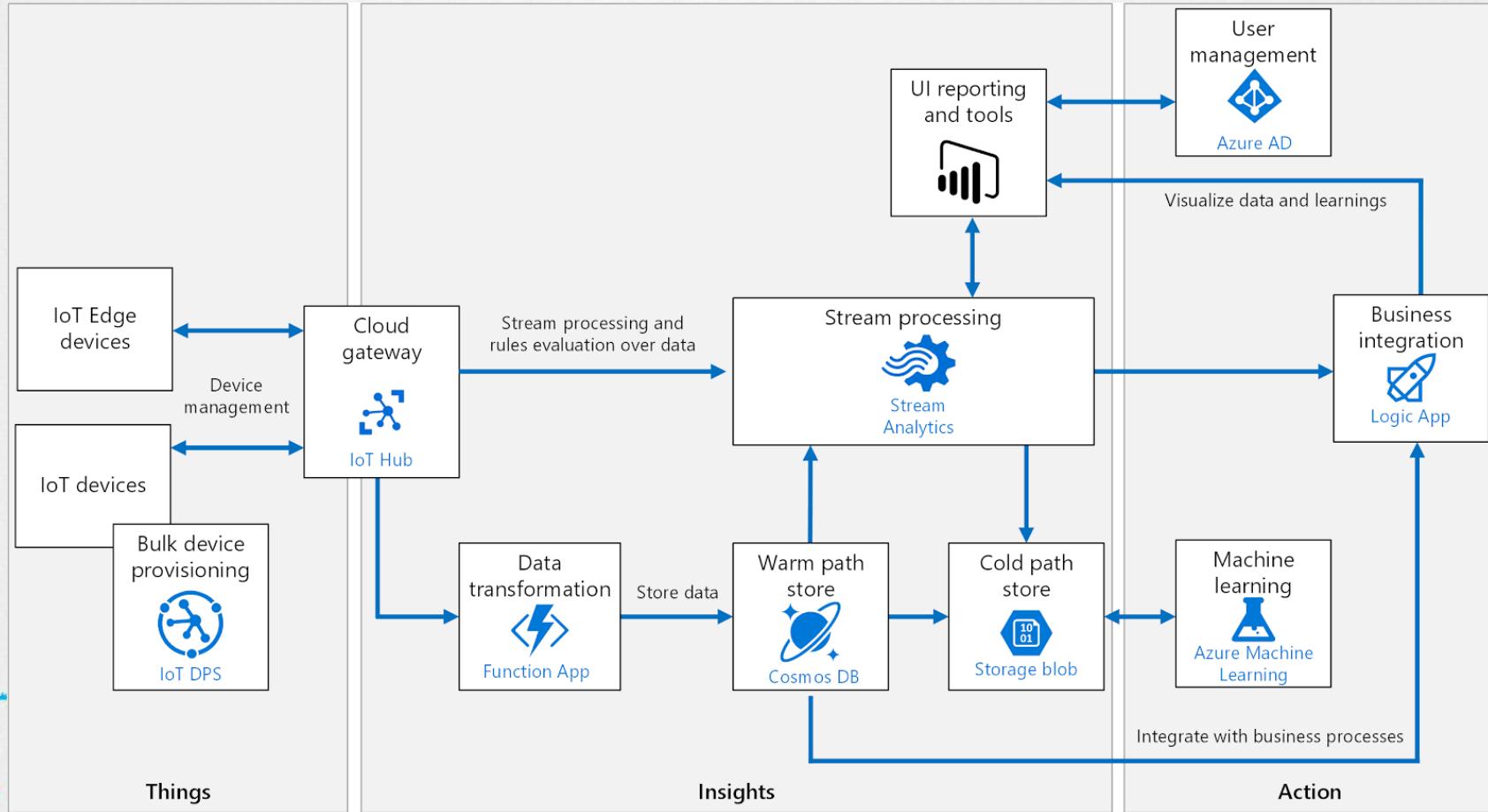


# IoT and Industrial Analytics

- Condition Monitoring for HomeOffice
- Last year showed us, machines must be online
- Collecting data
- Showing data at Dashboards i.e. OEE
- Base for analytics and predictive scenarios
- No data, no prediction
- Connect what ever you get, but the right data
- Finally with Video Motion Analytics

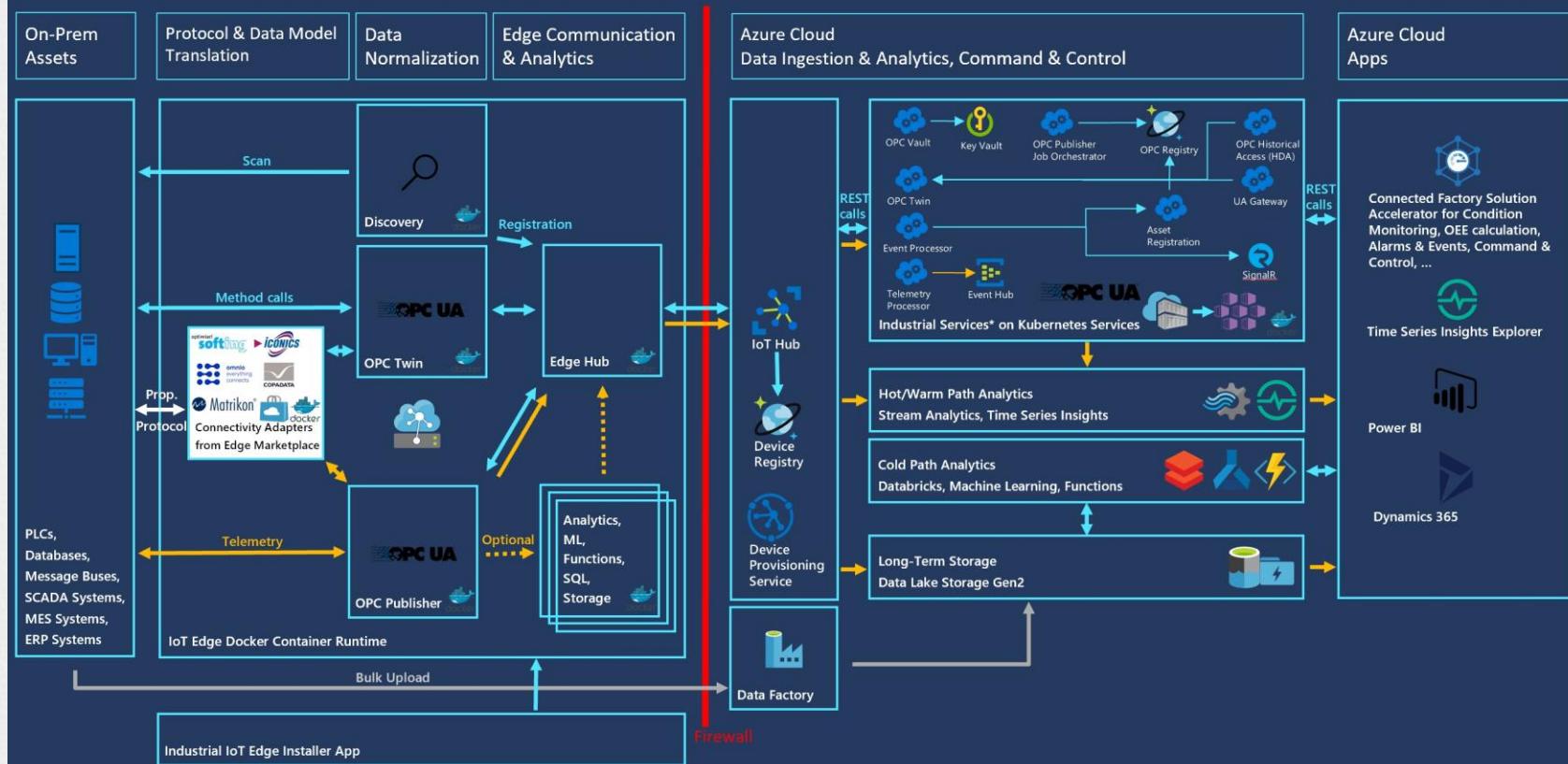


# Microsoft IoT Reference Architecture

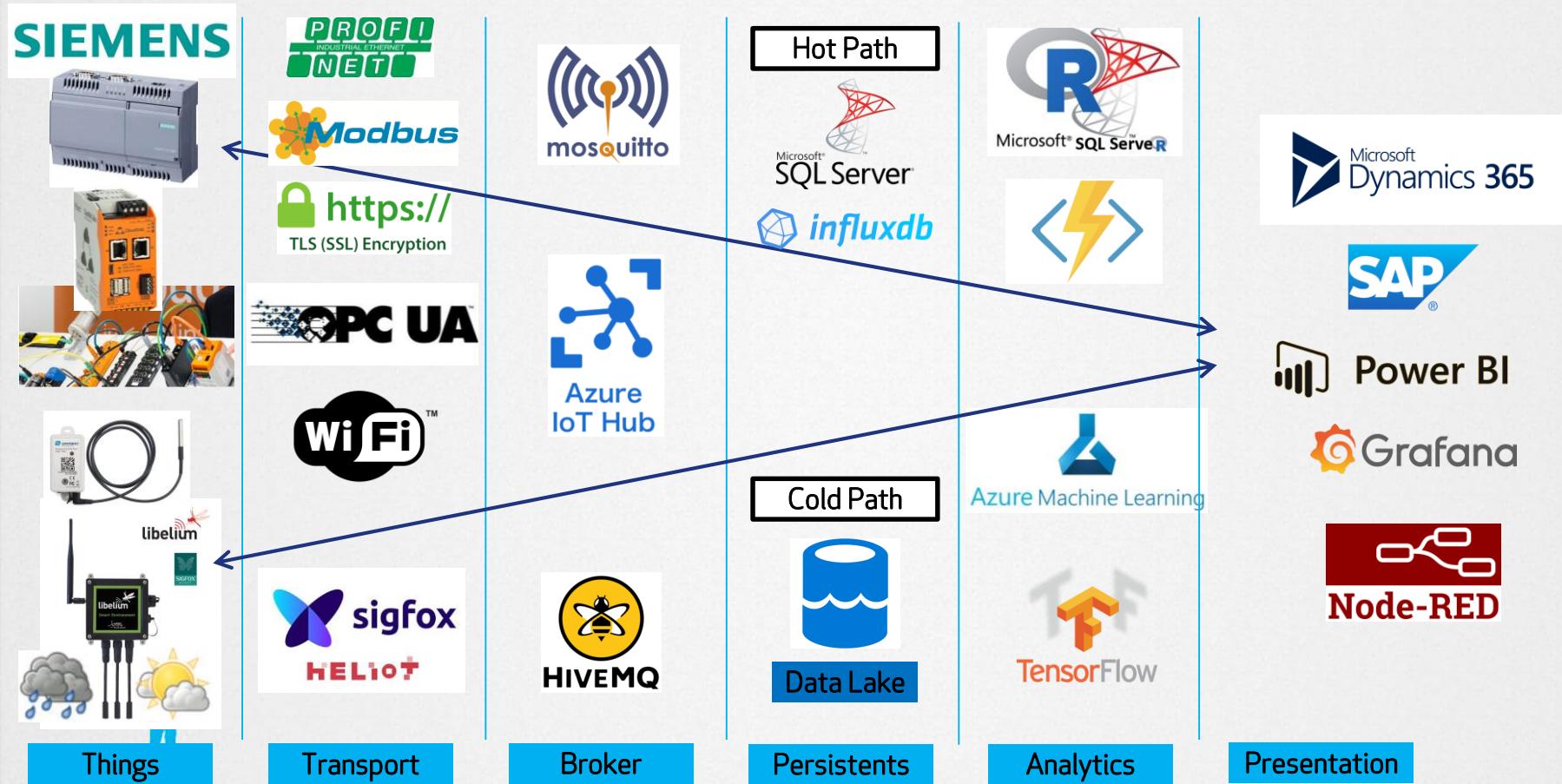


# Microsoft IIoT Reference Architecture

## Azure Industrial IoT Platform Architecture



# Typical IoT Stack





# IoT Central vs. IoT Hub

- IoT Central as SaaS Solution from Microsoft
- IoT Dashboard in minutes  
(when sensors are online ;) – I will show you!
- IoT Hub as Message Bus in Backend
- Bring data to an centralized place
- Show data where ever you need them
- AAD Integration with cross-tenant Login
- Easy pay per use model (per Sensor)
- Export/Import from whole Application (Template)



# Microsoft's comprehensive IoT product portfolio

→ <https://aka.ms/mslearniot>



Azure  
Defender  
for IoT

Azure IoT  
priority verticals



Manufacturing



Retail



Agriculture



Energy



Smart Cities



Healthcare



Transportation

Azure IoT  
Solutions

Azure IoT Central  
(SaaS)

Azure IoT Reference  
Architecture & Accelerators  
(PaaS)

Dynamics Connected  
Field Service  
(SaaS)

Azure  
Services for IoT

Azure IoT Hub  
Azure IoT Hub Device  
Provisioning Service  
Azure Digital Twins  
Azure Time Series Insights  
Azure Maps

Azure Stream Analytics  
Azure Cosmos DB  
Azure AI  
Azure Cognitive Services  
Azure ML  
Azure Logic Apps

Azure Active Directory  
Azure Monitor  
Azure DevOps  
Power BI  
Azure Data Share  
Azure Spatial Anchors

IoT & Edge  
Device Support

Azure RTOS  
Azure Sphere  
Azure IoT Device SDK  
Azure IoT Edge  
Azure Stack Edge

Windows IoT  
Azure Certified for IoT—Device  
Catalog  
Azure Stream Analytics  
Azure Storage

Azure ML  
Azure SQL  
Azure Functions  
Azure Cognitive Services

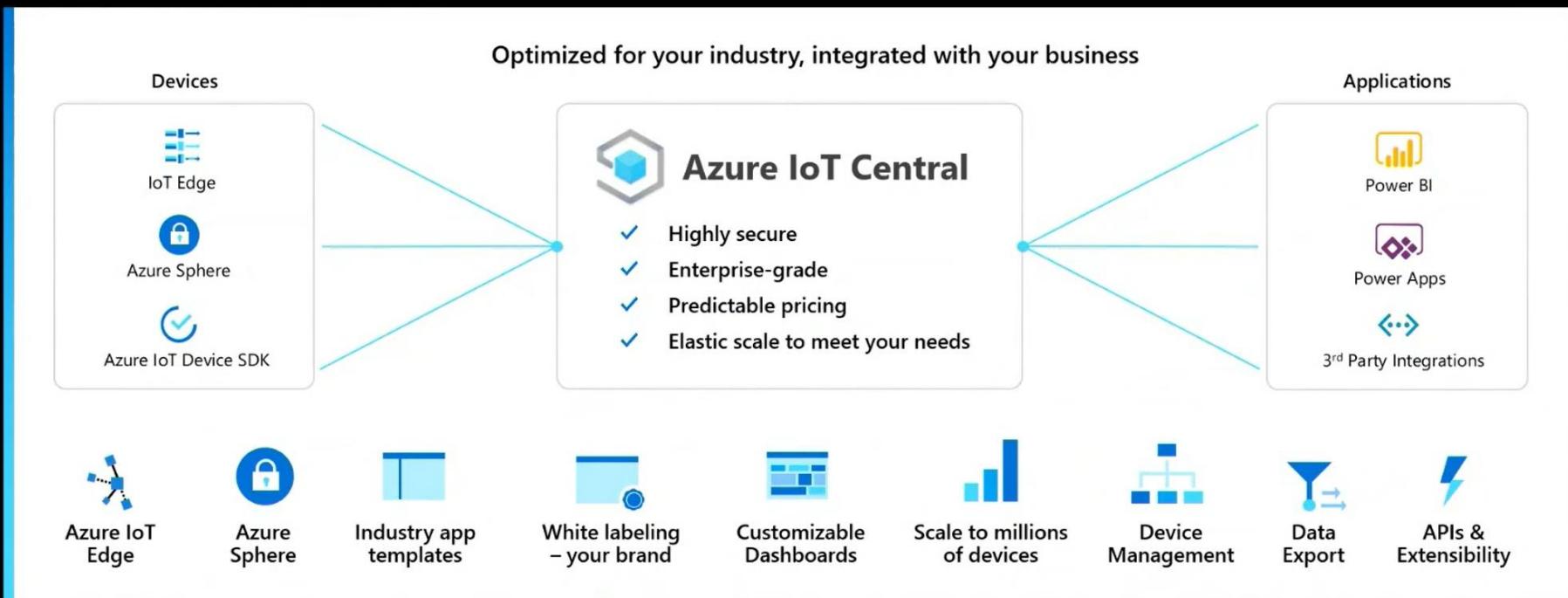
# IoT Central

A fully managed IoT app platform

MONTHLY UPDATES

Monthly updates bringing to life the breadth of Azure and Azure IoT

<https://aka.ms/iotcupdates>



# IoT Central

A fully managed IoT app platform

**NEW** Export – Filter and enrich data as it's exported into your business applications

Continuous Data Export

Execute Jobs at Scale

Live Data & Telemetry

File Upload from your Devices

Object and Motion Detection Template

## Continuous Data Export

Save  Cancel  Rename

Exports > Export overfill data

Export overfill data

Enabled

**Data**

All of your devices will export data unless you add filters to narrow things down. [Learn more](#)

Type of data to export:

Name: Conn... / Bin weight alert threshold Operator: Is greater than Value: 300

Select a property  Select an operator  Select or enter a value

+ Capability filter + Message property filter

**Enrichments**

Add additional information to your export. This will appear as a key value pair in exported messages. [Learn more](#)

Key: Manufacturer Value: Connected Waste Bin / Manufacturer

Export telemetry and data continuously to various destinations for additional processing and analysis



Webhook



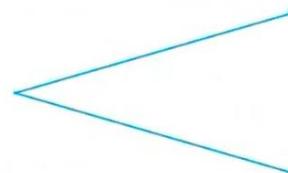
Blob Storage



Service Bus



Event Hub



# IoT Central

A fully managed IoT app platform

NEW

## Jobs at Scale – Interact with your fleet of devices using managed jobs

Continuous Data Export

Execute Jobs at Scale

Live Data & Telemetry

File Upload from your Devices

Object and Motion Detection Template

### Job Configuration

The screenshot shows the 'Job Configuration' page for a 'Bin type update' job. At the top, there are links for 'Job details' and 'Results log'. Below that, the job name 'Bin type update' is displayed. The results section shows a green circle with '100% Completed' and counts of 6 completed, 0 failed, and 0 pending tasks. The duration is listed as 01 seconds, with a start time of 9/3/2020, 2:36:13 PM and an end time of 9/3/2020, 2:36:14 PM. A table below lists device details:

Name	Device ID	Status	End Time
Connected Waste Bin 4	1jj212wo4ov	Completed	9/3/2020, 2:36:13 PM
1kr1avaaaSw9	1kr1avaaaSw9	Completed	9/3/2020, 2:36:13 PM
Connected Waste Bin 3	2cvjxcro6ou	Completed	9/3/2020, 2:36:13 PM
Sensor	fsdzquif49	Completed	9/3/2020, 2:36:13 PM

Run bulk updates and commands across your entire fleet of devices

- ✓ Property updates
- ✓ Filters
- ✓ Job schedules (coming soon)
- ✓ Rerun on failure
- ✓ Live updates
- ✓ Batching
- ✓ Completion thresholds

# IoT Central

A fully managed IoT app platform

NEW

Raw Data – See the raw data directly in the UI or through Azure CLI

Continuous Data Export

Execute Jobs at Scale

Live Data & Telemetry

File Upload from your Devices

Object and Motion Detection Template

## IoT Central Web UI

The screenshot shows the IoT Central Web UI for a 'Sensor' device under the 'Connected Waste Bin' connected device. The 'Raw data' tab is selected. The table displays timestamped data entries:

Timestamp	Message type	Bin state	Fill level
9/4/2020, 1:49:44 PM	Telemetry	1	27
9/4/2020, 1:48:30 PM	Telemetry	0	23

Below the table, detailed event properties are shown for the second entry:

```
_timestamp: "2020-09-04T20:48:30.087Z"  
_eventtype: "Telemetry"  
BinState: 0  
FillLevel: 23  
OdorMeter: 69  
TiltSensor: 208.89466684509793  
Weight: 55.29017742475435
```

Other entries in the table include a 'Property' row and another 'Telemetry' row at 1:47:15 PM.

## Azure CLI

The screenshot shows the Azure CLI command prompt output for monitoring events:

```
C:\Users\abjork>az iot central diagnostics monitor-events --app-id 0e64285f-1f2c-4f35-bc39-d863b72415e5  
Command group 'iot central diagnostics' is in preview. It may be changed/removed in a future release.  
Monitoring telemetry
```

```
{  
  "event": {  
    "origin": "fsdzquif49",  
    "module": "",  
    "interface": "",  
    "component": "",  
    "payload": {  
      "filllevel": 69,  
      "weight": 6.3078932666624985,  
      "odormeter": 15,  
      "binstate": 0,  
      "tiltSensor": 74.22234870571506  
    }  
  },  
  "event": {  
    "origin": "ijij212wo4ov",  
    "module": "",  
    "interface": "",  
    "component": "",  
    "payload": {  
      "filllevel": 21,  
      "weight": 86.53017721872331,  
      "odormeter": 49,  
      "binstate": 1,  
      "tiltSensor": 250.7450541994948  
    }  
  }  
}
```

# IoT Central

A fully managed IoT app platform

**NEW** File Upload – send media and other files from connected devices to cloud storage

Continuous Data Export

Execute Jobs at Scale

Live Data & Telemetry

File Upload from your Devices

Object and Motion Detection Template

## File Upload Configuration

Administration	<input type="button" value="Save"/> <input type="button" value="Delete"/>
Your application	
Users	
Roles	
Pricing	
Device connection	
Device file upload	<input checked="" type="checkbox"/> Configured
API tokens	
Customize your application	

**Device file upload**  
Choose the storage container that your devices will upload files to. [Learn more](#)

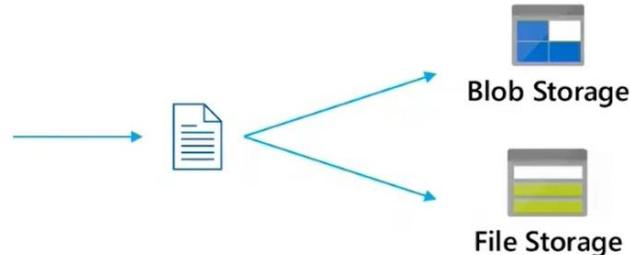
Configured

Storage account \*  
tgscjs

Container \*  
azure-webjobs-hosts

Request timeout (hours) \*  
1

Configure the file upload capability in your app and then execute file uploads from your device code.



# IoT Central

A fully managed IoT app platform

NEW

## Object and Motion Detection – Use intelligent edge cameras to detect objects and motion

Continuous Data Export

Execute Jobs at Scale

Live Data & Telemetry

File Upload from your Devices

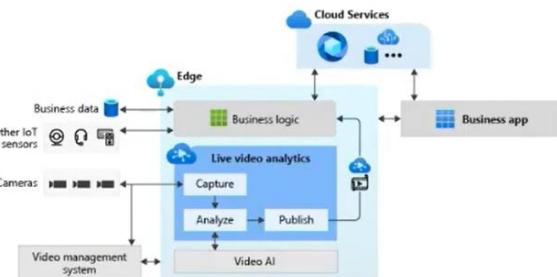
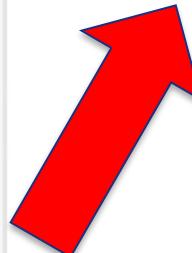
Object and Motion Detection Template

The screenshot shows the IoT Central interface with the following components:

- Azure IoT Edge:** Cloud intelligence deployed locally on IoT edge devices.
- ONVIF:** Camera Device Mgmt. Effective manage of IP cameras from cloud using ONVIF IoT Edge Module.
- Confidence %:** 92 (1 minute ago)
- Store Object Detection:** A pie chart showing object counts for Cell Phone (red), Laptop (blue), Person (black), and TV Monitor (yellow).
- Vehicle Motion Detection:** A bar chart showing vehicle counts for Bus (now: ~15), Car (now: ~50), and Truck (now: ~40).

### Object and Motion Detection with Live Video Analytics

- A [Live Video Analytics \(LVA\)](#) module running in IoT Edge.
- A platform for you to build intelligent video applications that span the edge and the cloud.
- Enhance your IoT solutions with object and motion detection.



# Azure Digital Twins

Model any environment, connect sensors and business systems to the model.

Control the present, track the past and predict the future



Open Modeling Language



Live Execution Environment



Input from IoT & Business Systems



Output to TSI, Storage & Analytics



Digital Twin Partnerships

- Create custom domain models using "Digital Twins Definition Language" (DTDL)
- Models describe twins in terms of
  - Telemetry
  - Properties
  - Commands
  - Relationships
  - Components
- Models define semantic relationships to connect twins into a knowledge graph
- Models can specialize other twins using inheritance
- Digital Twins Definition Language is aligned with
  - IoT Plug and Play
  - Time Series Insights data model
- <https://github.com/Azure/opendigitalsignature-dtdl>

```
{  
  "@id": "dtmi:example:Station;1",  
  "@type": "Interface",  
  "extends": "dtmi:example:Room;1",  
  "contents": [  
    {  
      "@type": "Property",  
      "name": "isOccupied",  
      "schema": "boolean"  
    },  
    {  
      "@type": "Property",  
      "name": "hasAVSystem",  
      "schema": "boolean"  
    },  
    {  
      "@type": "Property",  
      "name": "capacity",  
      "schema": "integer"  
    }  
  "@context": "dtmi:dtdl:context;2"  
}
```

# IoT Central

A fully managed IoT app platform

Available  
December 2020

~~COMING SOON~~

A SKU designed specifically for low volume devices

2  
devices



Free

400  
messages  
/month  
/device



\$0.08

\$1 per year

5,000  
messages  
/month  
/device



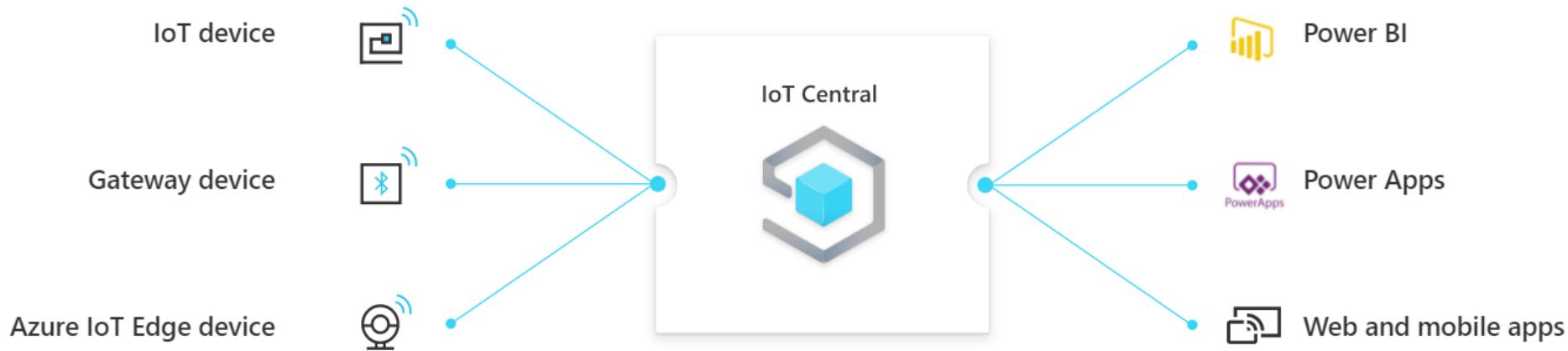
\$0.40

30,000  
messages  
/month  
/device



\$0.70

# IoT Central - Architecture



Optimized for your industry, integrated with your business



<https://apps.azureiotcentral.com/>

# IoT Central - Dashboard

IoT Central Denninger

Search

Dashboard

New Edit Delete

Dashboard

Devices Device sets Analytics Jobs App settings Device Templates Data export (legacy) Administration

Azure IoT Central

Temp Offizin

Temperatur (°C)

21,1

21.12.2020, 14:51:58

Temp Terasse (°C)

6,6

21.12.2020, 14:52:49

Sensor

Feuchtigkeit Helligkeit Luftdruck Temperatur

100.0  
236  
1100  
900  
40.0  
-15.0

2:23:24 PM 254:00 PM

2:40 AM 2:55 PM

Create Device Templates

Device templates are blueprints that describe your devices.

Quick Start Demo

Learn how to use Azure IoT Central in minutes.

View all your devices

View all your devices and device templates.

Documentation

Create new IoT business opportunities for your organization.

Devices in Seattle

Sample Device Set with devices located in Seattle.

Tutorials

Take easy steps to achieve your connected product vision.

Azure IoT Central

# IoT Central - Dashboard

iotcentral-denninger.azureiotcentral.com/dashboards

Apps PartnerCenter Azure Portal Azure Stack UniFi Network FortiGate IoT Banking ACP XenApp IoT ACPdigital Apo-EDV Quarantine - Securi... ACPdigital

IoT Central Denninger Search + New Edit Delete

Dashboard Devices Device sets Analytics Jobs App settings Device Templates Data export (legacy) Administration

mein Haus

Temperatur aktuell (°C) Luftfeuchtigkeit aktuell ... Helligkeit (lux) Luftdruck aktuell (hPa)

6,6 77,3 64 1,0...

21.12.2020, 14:54:08 21.12.2020, 14:54:08 21.12.2020, 14:54:08 21.12.2020, 14:54:08

Helligkeit Temperatur Luftdruck

236 40.0 1100

0 -15.0

2:40 AM 2:55 PM 2020/12/20 2:26 PM 2020/12/21 2:55 PM 2020/12/14 2:26 PM 2020/12/21 5:48 PM

Azure IoT Central

The screenshot shows the Azure IoT Central interface for a dashboard named 'mein Haus'. On the left, a sidebar navigation includes 'Dashboard', 'Devices', 'Device sets', 'Analytics', 'Jobs', 'App settings', 'Device Templates', 'Data export (legacy)', and 'Administration'. A small blue silhouette icon is at the bottom left. The main area has a search bar and buttons for '+ New', 'Edit', and 'Delete'. The dashboard displays four real-time data cards: 'Temperatur aktuell (°C)' (6,6), 'Luftfeuchtigkeit aktuell ...' (77,3), 'Helligkeit (lux)' (64), and 'Luftdruck aktuell (hPa)' (1,0...). Below these are three line charts: 'Helligkeit' (light) with a teal line peaking around 236 lux; 'Temperatur' (temperature) with a red line showing a slight upward trend from ~18°C to ~20°C; and 'Luftdruck' (air pressure) with a blue line showing a steady increase from ~980 hPa to ~1100 hPa. The charts have time axes ranging from 2:40 AM to 2020/12/21 5:48 PM.

# IoT Central - Dashboard

IoT Central Denninger

Search

Dashboard Devices Device sets Analytics Jobs New Edit Delete

Salvator Apotheke - Überwachung

Salvator Apotheke, Kittsee

Offizin (°C) Feuchtigkeit (%) Kühlshrank (°C) Temperatur (°C) KPI Temp last week (°C) Arzneischrank (°C)

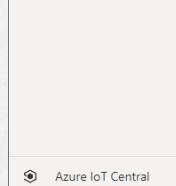
21,0	36,9	4,8	5,3	5,2	20,1
21.12.2020, 14:59:58	21.12.2020, 14:59:58	21.12.2020, 15:00:43	Past 12 hours	Past 1 week	21.12.2020, 15:00:46

Offizin Temperatur ● Feuchtigk. ● Temperat.

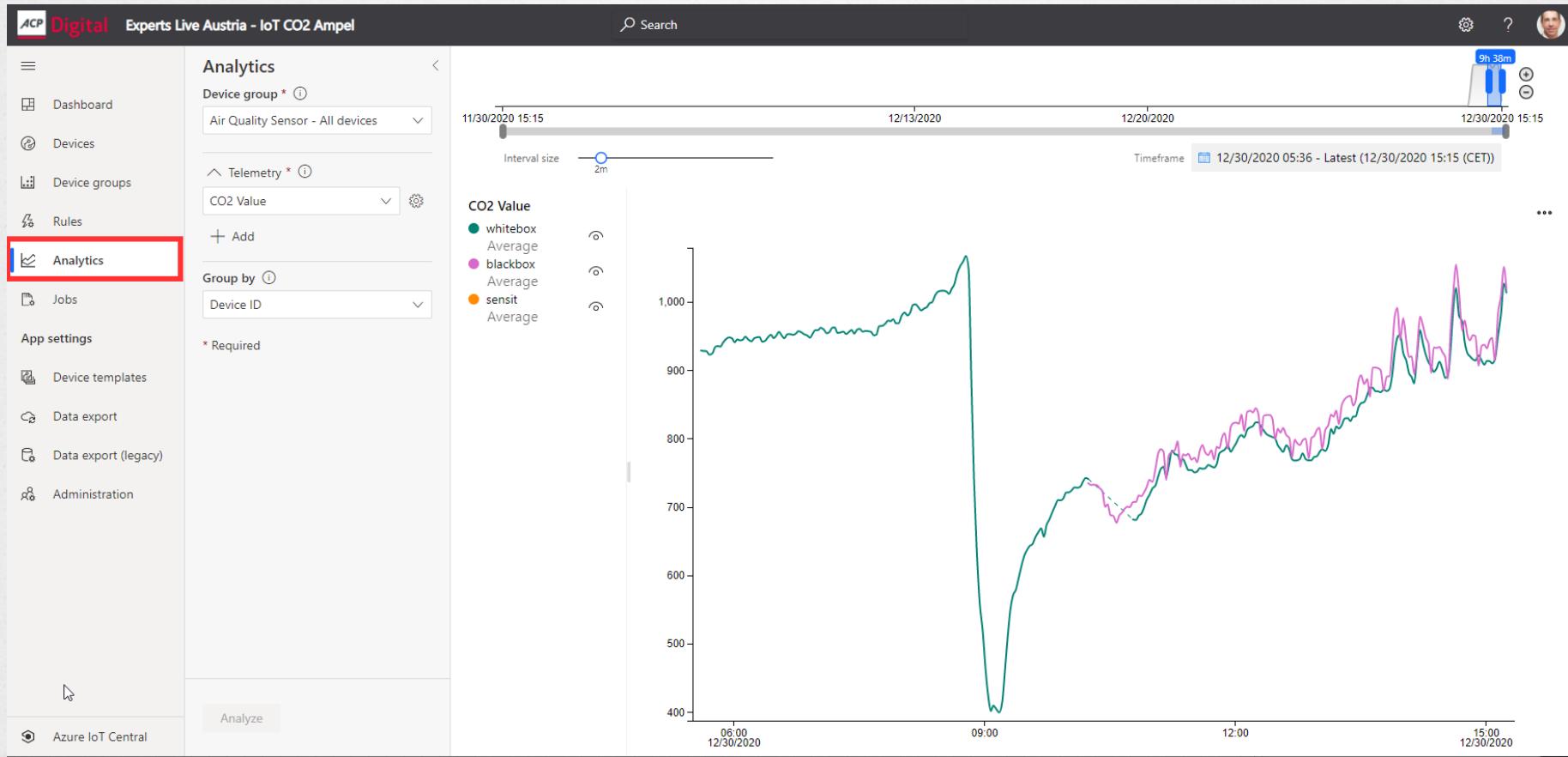
Kühlshrank Temperatur ● Temperat.

Arzneischrank Temperatur ● Temperat.

Azure IoT Central



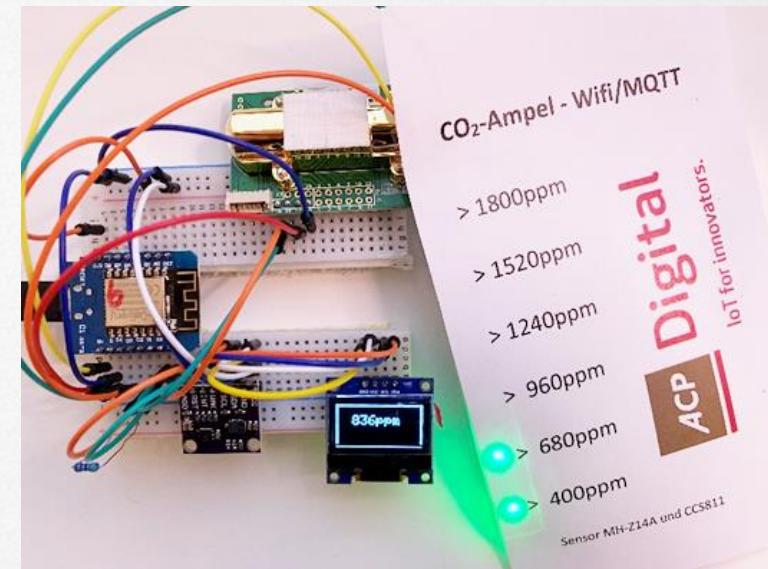
# IoT Central - Analyse



# #1 Create an new IoT Central app

# How to built a new IoT Central App

- Start in Azure Portal
- give a name
- very easy to integrate
- Connect devices
- Wemos ESP8266 Mini D1
- CO2 Sensor MH-Z14A
- OLED 0,96" Display
- Bosch BME280 (temp/hum/press)



**IoT Central Application**

IoT Central Application

Resource name \*

iot-co2ampel

Application URL \*

iot-co2ampel

.azureiotcentral.com

Subscription \*

VS Enterprise mit MSDN stefan.dennin...

Resource group \*

IOTC

Create new

Pricing plan \*

Standard 2

Learn more about pricing

Template \*

Select a template

Custom application

In-store Analytics – Condition Monitoring

Water Consumption Monitoring

Digital Distribution Center

Smart Inventory Management

Connected Logistics

Smart Meter Analytics

Micro-fulfillment Center

Continuous Patient Monitoring

Solar Power Monitoring

Water Quality Monitoring

In-store Analytics – Checkout

Video analytics - object and motion detection

Connected Waste Management

# How to connect

**Microsoft Azure**

Create a resource

Home

Dashboard

All services

FAVORITES

All resources

Subscriptions

Azure AD Privileged Identit...

Azure Active Directory

Resource groups

Dashboard &gt;

## IoT Central Applications

Azure Stack Community

[Add](#) [Manage view](#) [Refresh](#) [Export to CSV](#) [Open query](#) [Assign tags](#)

Showing 1 to 2 of 2 records.

<input type="checkbox"/> Name ↑	Type ↑
<input type="checkbox"/> <a href="#">iot-busy-light</a>	IoT Central Applicat
<input type="checkbox"/> <a href="#">iotcentral-denninger</a>	IoT Central Applicat

**Template \***

Custom application

Custom application

In-store Analytics – Condition Monitoring

Water Consumption Monitoring

Digital Distribution Center

Smart Inventory Management

Connected Logistics

Smart Meter Analytics

Micro-fulfillment Center

Continuous Patient Monitoring

Solar Power Monitoring

Water Quality Monitoring

In-store Analytics – Checkout

Video analytics - object and motion detection

Connected Waste Management

[Create](#)[Automation options](#)

# ACP Digital Experts Live Austria - IoT CO2 Ampel

New Edit Delete

## Dashboard

 Device templates Get started by adding your first device.

 Quick start demo Learn how to use Azure IoT Central in minutes.

 Tutorials Step-by-step articles teach you how to create apps and devices.

 Documentation Comprehensive help articles and links to more support.



# #1 Node-Red and IoT Central

<https://azure.microsoft.com/blog/connecting-node-red-to-azure-iot-central/>



# You know Node-Red?

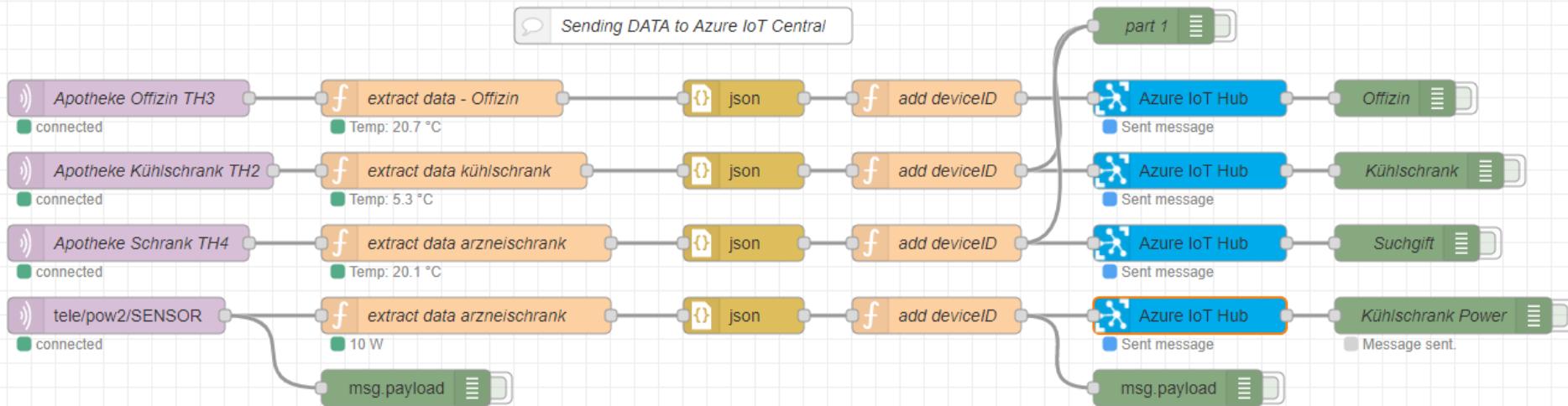
- a Node.js Plattform
- Open Source
- Originally developed by IBM Employees
- Runs at industrial routers (Advantech), as docker container, even on raspberrys...
- Centralized or at the shop floor
- Many connectors to industrial protocols
- modbus RTU+TCP/UPC-UA/S7/MQTT/http/...
- very easy to integrate
- just easy Authentication (Basic Auth)



# How to connect - old

```
az iot central device compute-device-key  
--primary-key <enrollment group primkey>  
--device-id <device ID>
```

```
dps-keygen -di:dev1 -dk:devicekeyhere -si:scopeidhere
```



# <https://github.com/Azure/iotc-device-bridge>



The screenshot shows a GitHub repository page for the Azure IoT Central Device Bridge. The URL in the address bar is <https://github.com/Azure/iotc-device-bridge>. The page title is "Azure IoT Central Device Bridge". The README.md file contains a brief description of the repository, listing requirements for an Azure account and an IoT Central application, and a "Deploy to Azure" button. Below the README, there is a section titled "Instructions" with steps for deploying an Azure Function and setting up the device bridge. A screenshot of the Azure Portal's "Device connection" settings page is shown, where the "ID scope" field is highlighted.

github.com/Azure/iotc-device-bridge

ICP XenApp PartnerCenter Azure Portal Azure Stack UniFi Network Apo-EDV FortiGate IoT Banking IoT ACdigital ACPdigital Quarantine -

## README.md

### Azure IoT Central Device Bridge

This repository contains everything you need to create a device bridge to connect other IoT clouds such as Sigfox, Particle, and The Things Network (TTN) to IoT Central. The device bridge forwards the messages your devices send to other clouds to your IoT Central app. In your IoT Central app, you can build rules and run analytics on that data, create workflows in Microsoft Flow and Azure Logic apps, export that data, and much more. This solution will provision several Azure resources into your Azure subscription that work together to transform and forward device messages through a webhook integration in Azure Functions.

To use the device bridge solution, you will need the following:

- an Azure account. You can create a free Azure account from [here](#)
- an Azure IoT Central application to connect the devices. Create a free app by following [these instructions](#)

 Deploy to Azure

## Instructions

Take the following steps to deploy an Azure Function into your subscription and set up the device bridge.

- Click the `Deploy to Azure` button above. This opens up a custom ARM template in the Azure Portal to deploy the Azure Function.
- Go to your IoT Central application, and navigate to the `Administration > Device Connection` area.
  - Copy the `ID Scope` and paste it into the `Scope ID` field the custom template.
  - In the same page, under `Enrollment groups`, open the `SAS-IOT-Devices` group. In the group page, copy either the `Primary key` or the `Secondary key` and paste it into the `Iot Central SAS Key` field. (this key will be stored in a Key Vault provisioned with the function).

Administration

Device connection

Your application

Users

Roles

Pricing

Device connection

ID scope

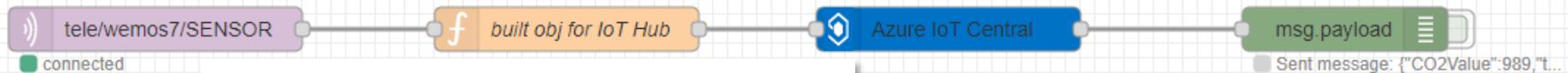
ID scopes

Auto-approve new devices

On

# How to connect

CO2 Ampel - MH-Z14A+Licht Sensor -> Apotheke (weiße box closed)



```
1 /*  
2  Time: "1970-01-01T23:35:20"  
3  BH1750: object  
4  Illuminance: 139  
5  MHZ19B: object  
6  Model: "B"  
7  CarbonDioxide: 977  
8  Temperature: 26  
9  TempUnit: "C"*/  
10  
11 msg.payload = {  
12     CO2Value : msg.payload.MHZ19B.CarbonDioxide,  
13     temperature: msg.payload.MHZ19B.Temperature  
14 }  
15  
16  
17 return msg;
```

The screenshot shows the "Edit Azure IoT Central node" dialog. It includes fields for Transport (set to HTTPS), Authentication (set to SAS), Scope ID (set to One001E12F7), Device ID (set to whitebox), and Primary Key (set to ImmPU3L6/gE9YBPTohsgm/F+PTcULuh5YEJsFV). The "Authentication", "Scope ID", and "Primary Key" fields are highlighted with a red border.

Properties	
Transport	HTTPS
Authentication	SAS
Scope ID	One001E12F7
Device ID	whitebox
Primary Key	ImmPU3L6/gE9YBPTohsgm/F+PTcULuh5YEJsFV



# Use Case – Condition Monitoring Refrigerator

IoT Central Denninger

Salvator Apotheke - Überwachung

Search

New Edit Delete

Dashboard Devices Device sets Analytics Jobs

App settings Device Templates Data export (legacy) Administration

Salvator Apotheke, Kittsee

Offizin (°C) Feuchtigkeit (%) Kühlshrank (°C) Temperatur (°C) KPI Temp last week (°C) Arzneischrank (°C)

21,0	36,9	4,8	5,3	5,2	20,1
21.12.2020, 14:59:58	21.12.2020, 14:59:58	21.12.2020, 15:00:43	Past 12 hours	Past 1 week	21.12.2020, 15:00:46

Offizin Temperatur ● Feuchtigk. ● Temperat.

Kühlshrank Temperatur ● Temperat.

Arzneischrank Temperatur ● Temperat.

Azure IoT Central

The screenshot shows the Azure IoT Central interface for monitoring a refrigerator at Salvator Apotheke, Kittsee. The left sidebar contains navigation links for Dashboard, Devices, Device sets, Analytics, Jobs, App settings, Device Templates, Data export (legacy), and Administration. The main area features a logo for Salvator Apotheke, Kittsee, and six data cards: Offizin (21.0 °C), Feuchtigkeit (36.9 %), Kühlshrank (4.8 °C), Temperatur (5.3 °C), KPI Temp last week (5.2 °C), and Arzneischrank (20.1 °C). Below these are three line charts showing temperature and humidity over time for the Offizin, Kühlshrank, and Arzneischrank. The charts include legends for Feuchtigkeit (grey line) and Temperatur (red line). The Arzneischrank chart shows a sharp drop in temperature around December 21st. The footer indicates the use of Azure IoT Central.

## #2

# SigFOX and IoT Central



# You know Sigfox?

- You might know LoraWAN?
- Sending in 868MHz in Europe (RZ1), all continents available and covered
- Centralized Backend – Sigfox Backend
- Business SLA for B2B and B2C UseCases
- Good network coverage in more than 70 countries
- Perfect for logistics and location services
- Many UseCases





# My UseCases

- GPS Tracker
- IoT Button
- Air Quality Sensor (Temp/Hum/CO<sub>2</sub> Sensor)
- Vehicle Tracker (operating hours counter)
- Location Tracking with Wifi Sensor



# IoT Central - Dashboard

ACP Digital Experts Live Austria - IoT CO2 Ampel

Search

New Edit Delete

Dashboard Devices Device groups Rules Analytics Jobs App settings Device templates Data export Data export (legacy) Administration

### Air Quality Station - SigFox / node-red data

**Experts Live Austria**

**CO2 Value (ppm) - Connected AirWit2 - cubido Leonding**

● CO2 Value ● Temperature

1,000  
800  
600  
400  
200  
0 08:00 AM 01/07/2021 09:00 AM 12:00 PM 03:00 PM 01/07/2021

**CO2 Value (ppm) - Connected AirWit2**

898

5 minutes ago

**CI Airwit CO2**

**sigfox**

**Temperature AirWit2**

24,0

5 minutes ago

**Location from SimpleHWButton**

Viedenska C  
Chicago  
Blaue-Kreuz-Gasse  
Schulstraße  
Hauptplatz  
Landstraße  
Gärtner-  
Ri...  
Zadun...  
Policia Petrzalka Sever  
Policia Petrzalka Sever  
Kitt  
TomTom Improve this map

**Temperature sens'it**

25,0

14 minutes ago

**Humidity sens'it**

44

14 minutes ago

**alert thresholds - CO2 Level**

max alert threshold CO2 Level 1k ppm  
cloud property

min alert threshold CO2 Level 600 ppm  
cloud property

**Location, Location**

**Latitude** 48,10

**Longitude** 17,06

**Location of sensit**

**Latitude**

**Longitude**

**Location**

**ButtonState**

**Timestamp**

14 minutes ago

**State**

**Button**



# IoT Central

live



# #3

## CloudRAIL and IoT Central



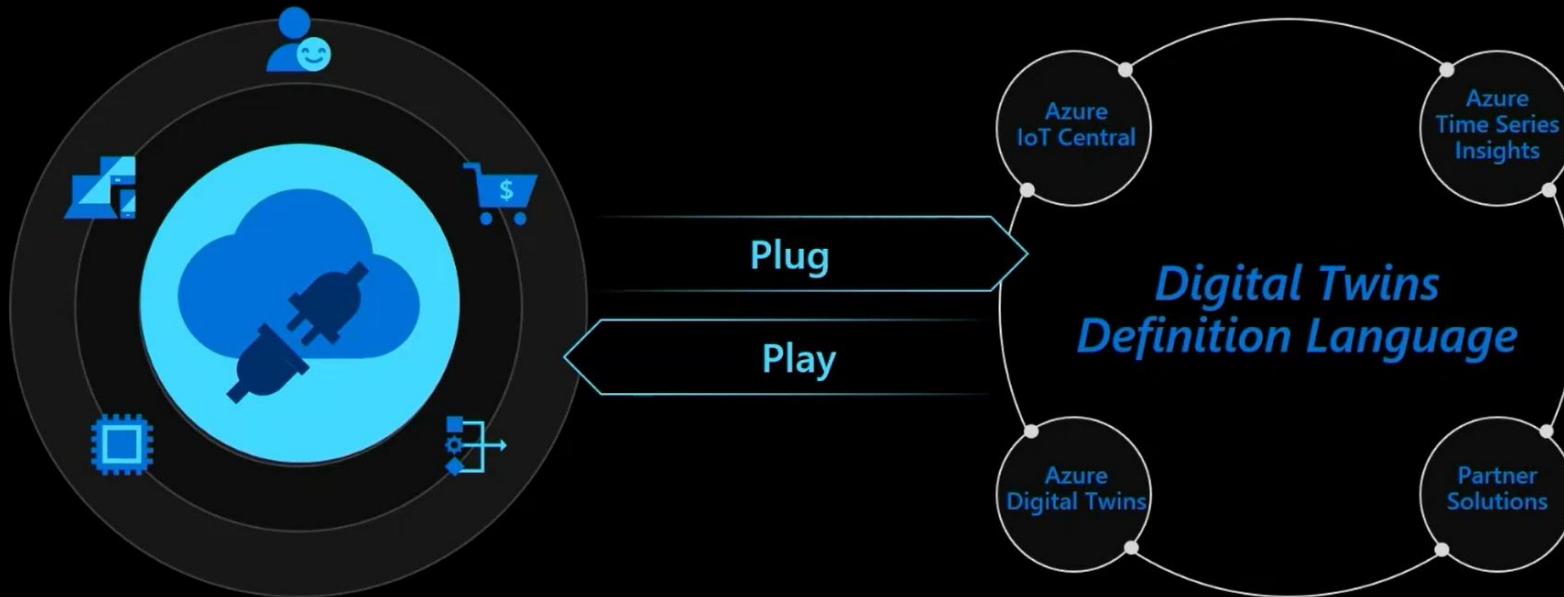
# You know CloudRAIL?

- Plug and play integration with IoT Central
- Easy integration for IO-Link Sensors
- >10000 supported ifm and sick Sensors!
- PnP for IO-Link to IoT Hub/Central
- integration for OPC-UA



# Interoperability and easy onboarding through IoT Plug and Play

Certify your devices for IoT Plug and Play today



# IoT Central + CloudRAIL

Plug&Play from Sensor to  
Microsoft Azure IoT Central



<https://blog.cloudrail.com/azure-iot-central-sensors/>

# IoT Central + CloudRAIL



# IoT Central + CloudRAIL



# IoT Central + CloudRAIL

Plug&Play from Sensor to  
Microsoft Azure IoT Central



# DEMO

<https://blog.cloudrail.com/azure-iot-central-sensors/>

# IoT Central + CloudRAIL

ACP Digital Experts Live Austria - IoT CO2 Ampel

Search

New Edit Delete

Dashboard Devices Device groups Rules Analytics Jobs App settings Device templates Data export Data export (legacy) Administration

CloudRAIL IO-Link & OPC-UA data

Temperature\_C

Temperature °C

24,7

this minute

CloudRAIL

CloudRAIL Box

Hand connecting wires to a CloudRAIL device

CloudRAIL device connected to sensors and a power source

Blue silhouette of a person with arms raised

The screenshot displays the Microsoft IoT Central platform interface. On the left, a sidebar menu lists various features: Dashboard, Devices, Device groups, Rules, Analytics, Jobs, App settings, Device templates, Data export, Data export (legacy), and Administration. The main content area is titled "CloudRAIL IO-Link & OPC-UA data". It includes a line chart titled "Temperature\_C" showing a step-down from approximately 25.5°C to 24.7°C between 05:32 PM and 05:35 PM on 01/07/2021. To the right of the chart are several cards: a large digital display card showing "24,7" with the subtitle "this minute"; a logo card for "CloudRAIL" featuring three orange clouds connected by lines; a product image card for the "CloudRAIL Box" (an orange industrial device); and two photograph cards showing hands connecting wires to a device and a close-up of a CloudRAIL device connected to various sensors and cables. A blue silhouette of a person with arms raised is visible at the bottom left.

# Experts Live Café – InPerson(!)

## IoT Central in detail - asap

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 @stefandenninger



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# DANKE!

## IoT Central

connect some sensors  
Node-Red, SigFox and CloudRAIL

Stefan Denninger

Senior Consultant IoT, Azure MVP

<http://blog.denninger.at>



@stefandenninger