Microsoft

IoT Plug and Play Overview

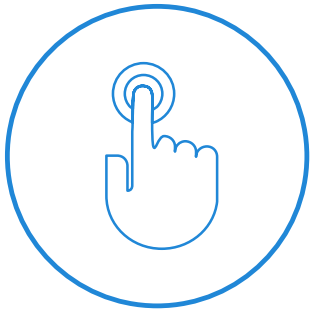
WE Together

Architecture of an IoT solution

A More Realistic View…

Things

Insights



Actions

Enterprise integration

Device recovery

Updating devices

Device lifecycle

Drivers

Device updates

On device analytics

HW certification

Cloud-to-device commands

Solution scale

Internationalization

Transport protocols

Disaster recovery

Manufacturing scale

Device commercialization

Securing data

Data storage

Fault tolerance

Deployment

Cold path analytics

Operations monitoring

Cost management

High availability

Warm path analytics

Hot path analytics

Business process integration

Provisioning devices

Data ownership

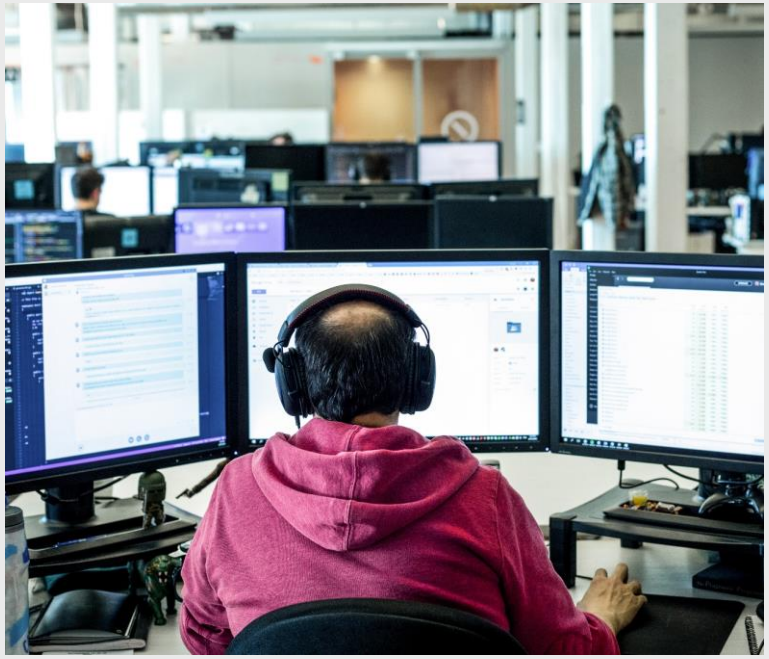
Data visualization

Industry and government compliance

< ---- End-to-End Security ---- >

… and why IoT needs simplifying

Plug and Play Overview - IoT device challenges for solution developers today



In-depth knowledge of embedded development is required to connect to the cloud, send telemetry, and apply configuration changes

Extremely difficult for solution developers to transform low-level device messages into meaningful data, events, and workflows

Hardware sourcing, integration, and ramping to production can take months or even years for most of our customers.

Azure IoT must simplify how IoT devices integrate with solutions built on the Azure platform

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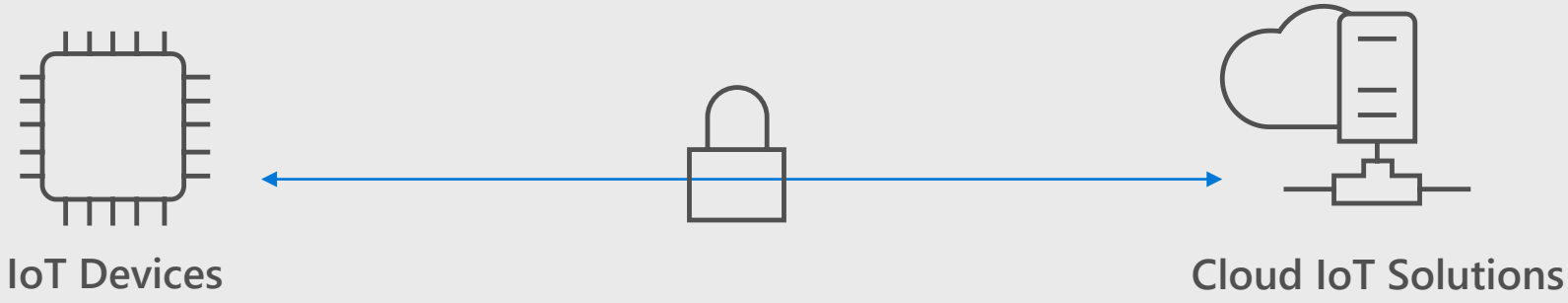
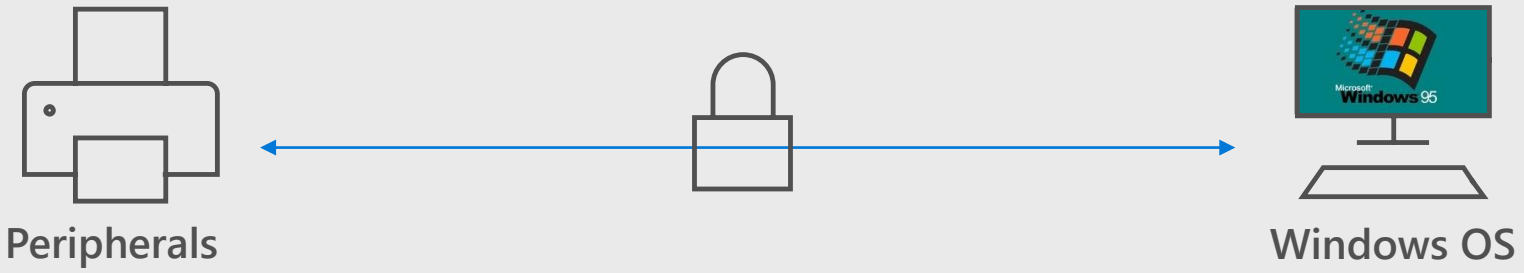
IoT Today



Tight coupling between software on device and IoT solution in the cloud

We had a similar challenge in the past…



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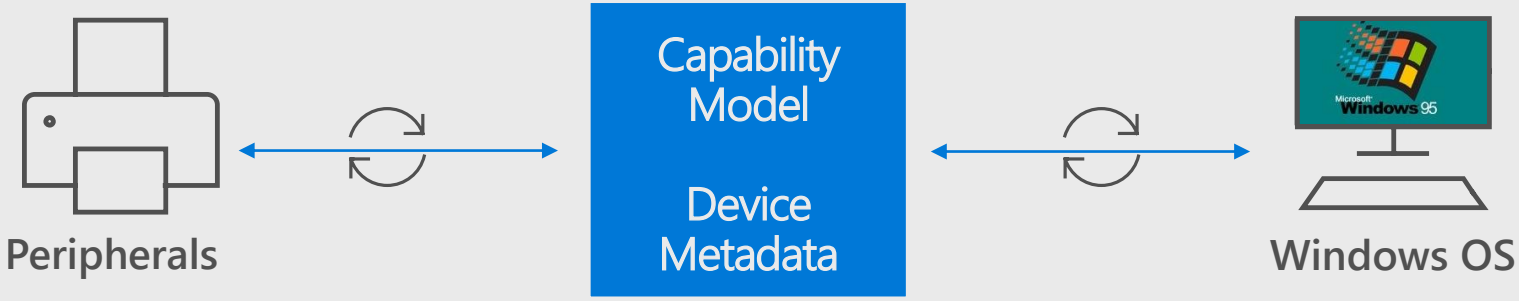
That was solved with Windows “Plug and Play”



Devices published their capability models and adhered to them
Windows used the capability model to know how to interact with them

Microsoft

Azure IoT Plug and Play Vision

For solution developers & customers

Plug and Play simplifies IoT by allowing solution developers to integrate devices **without writing any code on the device.**

IoT solution developers can quickly prototype, pilot, and ramp up to production using Azure IoT certified devices.

Plug and Play devices **just work** with Azure IoT.

For device builders

By using Plug and Play, device builders will provide a model of their device to cloud developers to be integrated quickly into IoT Central or any solution built on the Azure IoT platform.

Devices **work out of the box** with Azure IoT services.

Device builders leverage cloud momentum by building products that are **Azure ready.**

Device builders see **greater sales volumes** and **alternate revenue streams.**

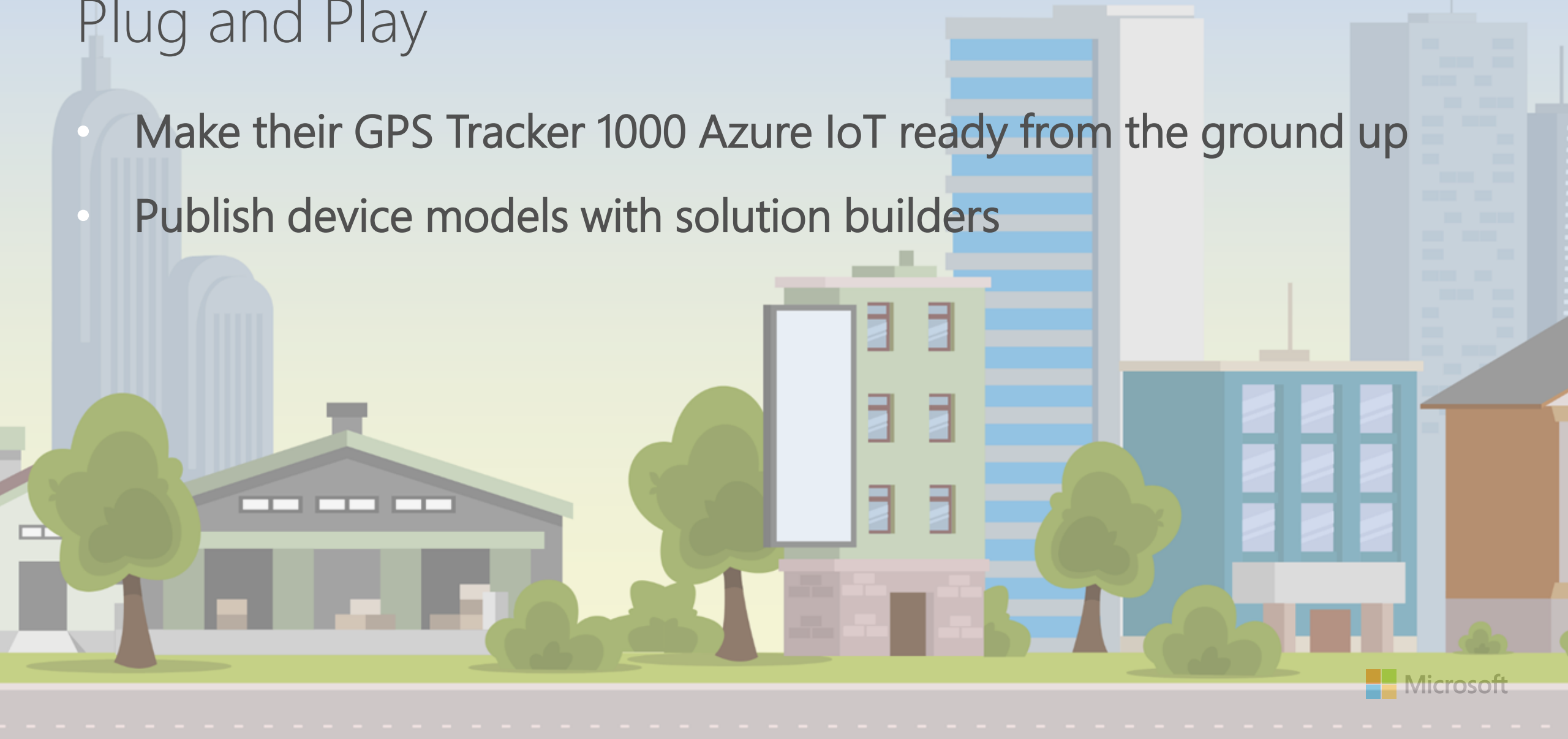
Fabrikam is a manufacturer of GPS devices

Fabrikam: current state of slowness

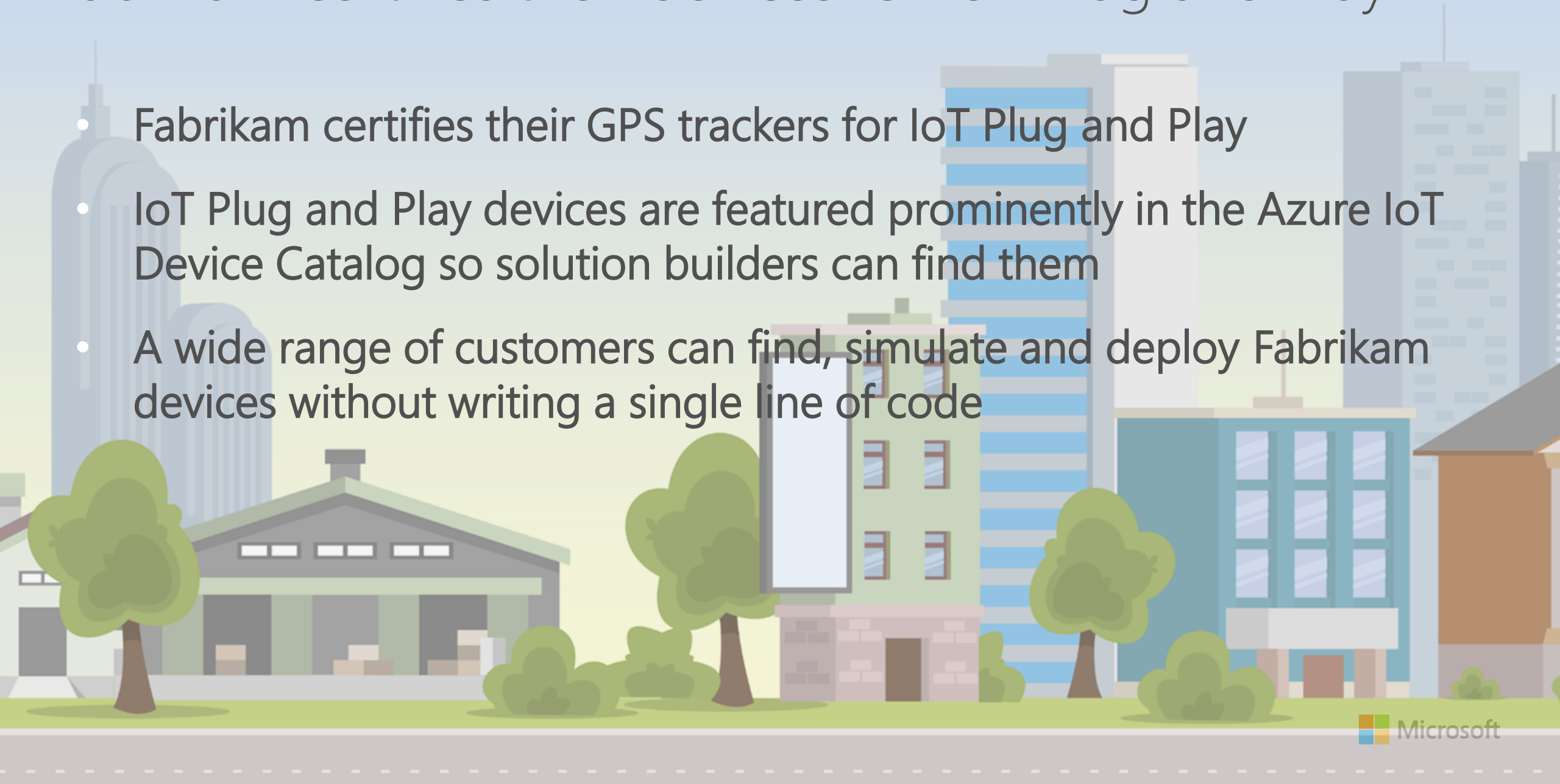
- Nothing works with the cloud off the shelf
- Multi-year product development cycle
- Complex, inconsistent, fragmented

Fabrikam: New world making hardware enable by IoT Plug and Play

- Make their GPS Tracker 1000 Azure IoT ready from the ground up
- Publish device models with solution builders



Fabrikam certifies their devices for IoT Plug and Play



- Fabrikam certifies their GPS trackers for IoT Plug and Play
- IoT Plug and Play devices are featured prominently in the Azure IoT Device Catalog so solution builders can find them
- A wide range of customers can find, simulate and deploy Fabrikam devices without writing a single line of code

Device specifications

Get started

Manufacturer Website

Fabrikam GPS Tkr. GPS Tracker 1000

Published: 10/12/2017

Buy | Try simulated device | Request demo

Tag(s): #GPS #GSM #Tracker #Industrial

Tweet | Linkedin | Email

Summary

Super low-power, GSM-enabled device emits GPS signal for up to 2 years without a recharge. This device is capable of transmitting data without a GPS signalthanks to its dual GSM antenna. You can choose to obtain this device with a pre-loaded SIM card, or you can install your own. Learn More

Industries
Multiple Industries

Operating Systems
Windows

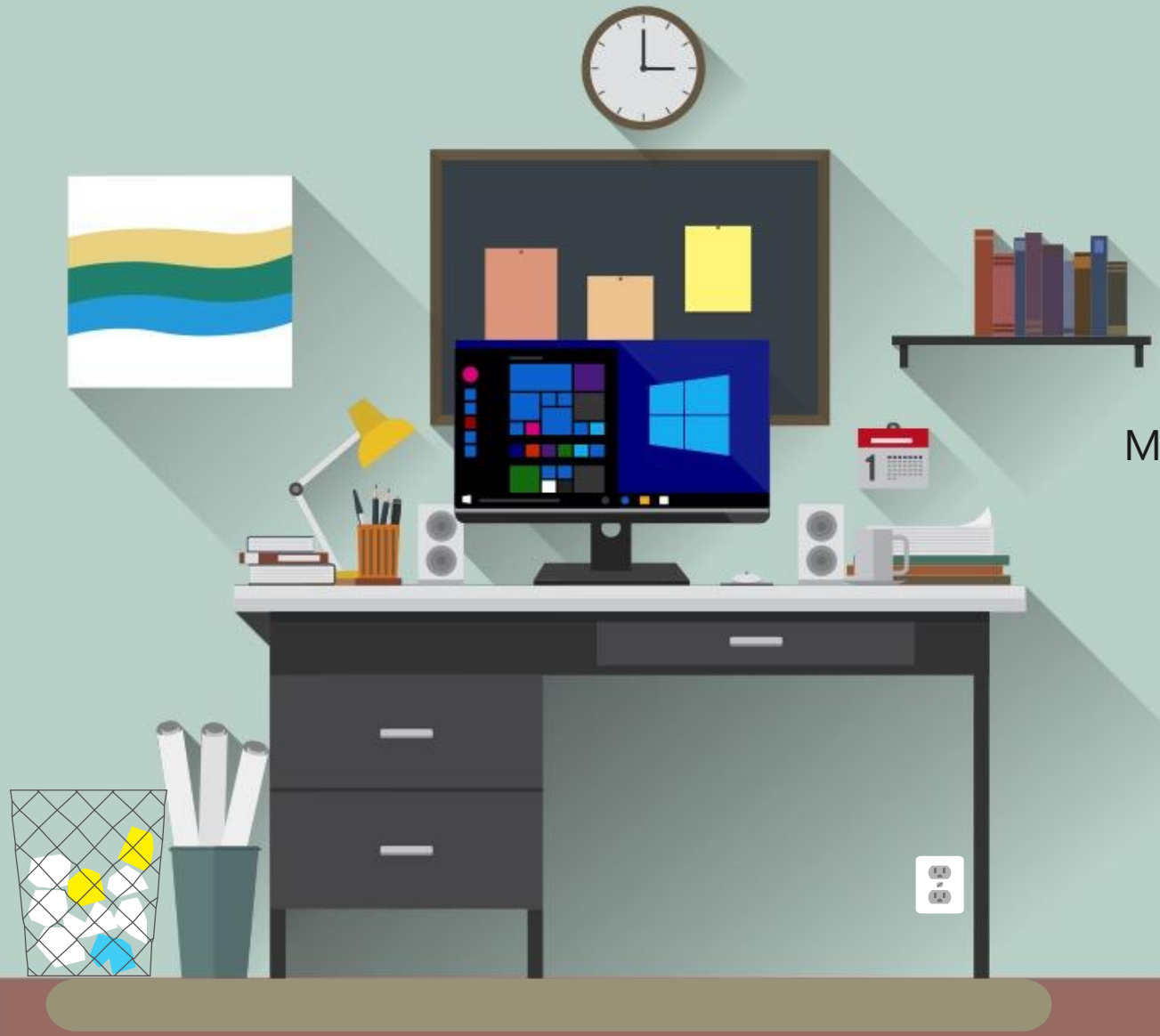
Device Type
Prototyping device, Gateway

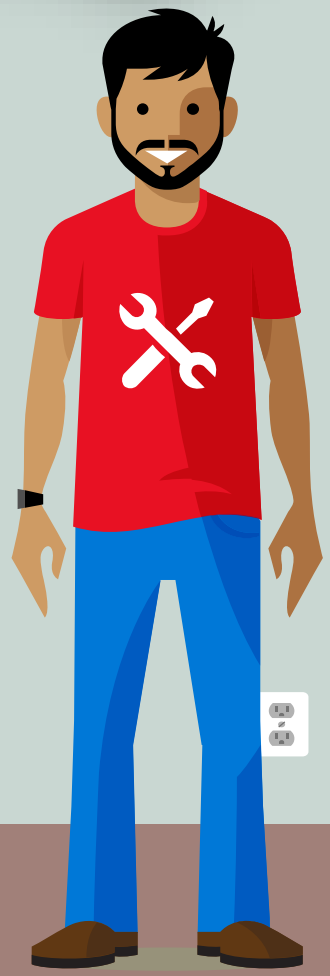
Languages
C, C++

Contoso is a logistics and shipping company

They want to track their shipping containers as they move around the world.

Mike is a solutions developer for Contoso





Mike wants to…

Create a solution to track shipping containers.

Build the solution on Azure IoT.

Use devices with GPS-based location information in real time.

…without writing a single line of device code


Let’s see what devices are available from Azure IoT Device Catalog

Azure Certified for IoT Devices

Partner Dashboard

Tell us what you are looking for

Return

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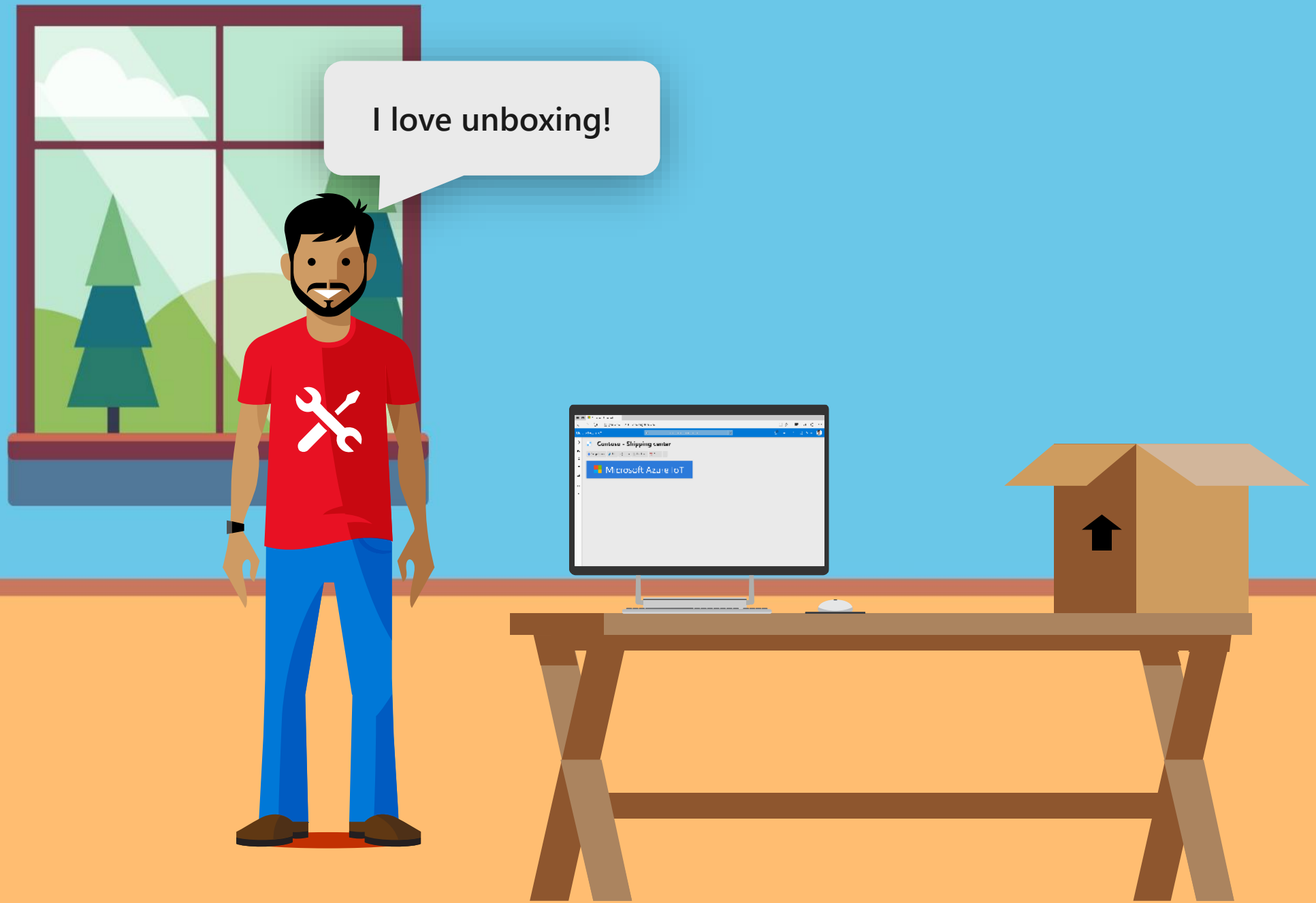
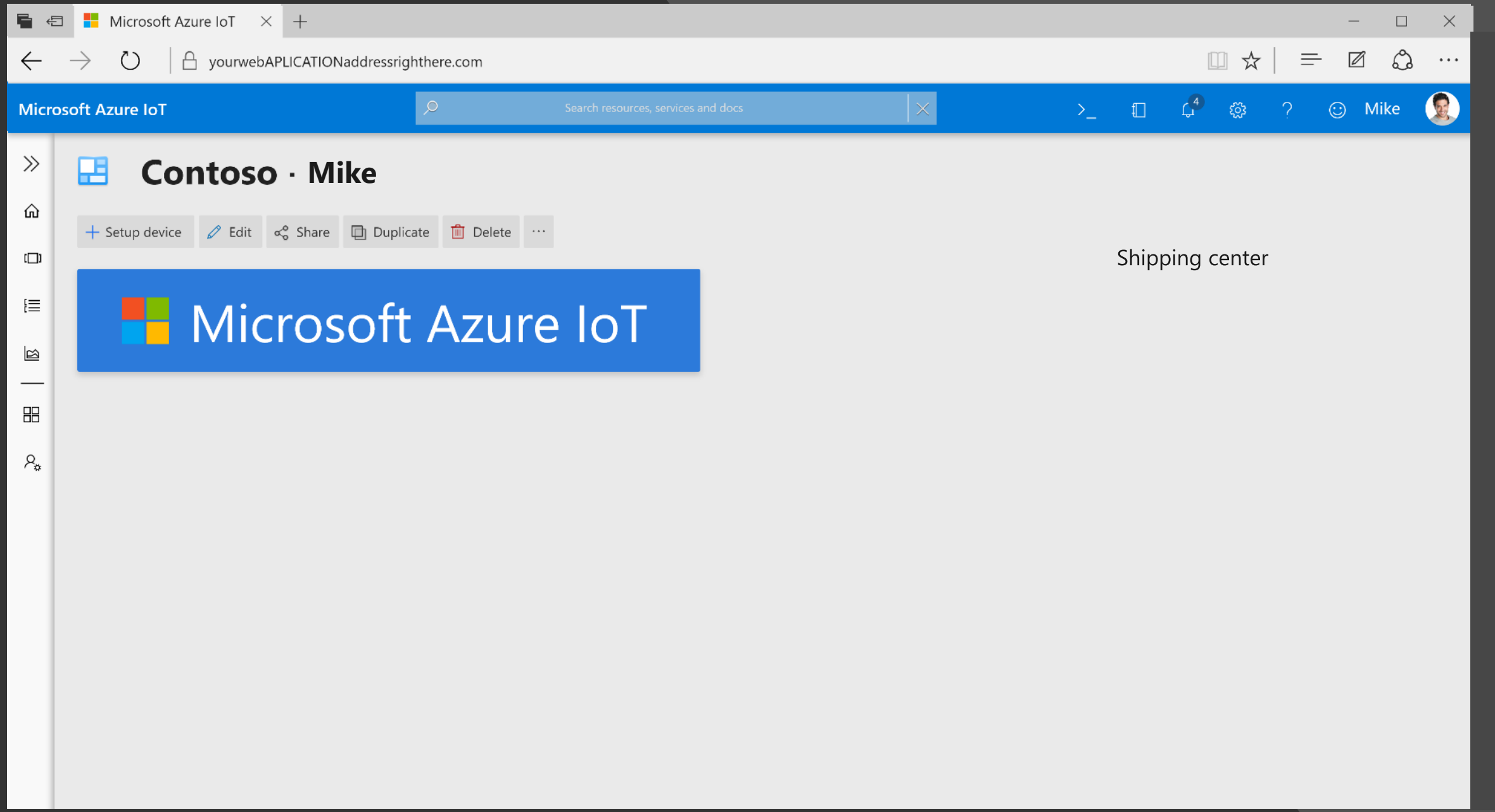
Feedback


I love unboxing!
Contoso - Shipping center
Microsoft Azure IoT


Microsoft Azure IoT
yourwebAPLICATIONaddressrighthere.com
Microsoft Azure IoT
Search resources, services and docs
Mike
Contoso · Mike
Setup device
Edit
Share
Duplicate
Delete
Microsoft Azure IoT
Shipping center


Microsoft Azure IoT
Contoso - Shipping center
Setup device
Edit
Share
Duplicate
Delete
Microsoft Azure IoT
Geo map tracker location
United States
Average Temperature Fan Processor
0:00
6:00
12:00
34%
62%
31%
78%
Operations Last 12 hours
49.2%
16.4%
12.9%
Condensator Temperature
25
Condensator Humidity
76%
52
TrackerTron 1000

Contoso deploys the GPS Tracker 1000 company wide


Azure IoT
GPS Tracker 2000
Contoso - Shipping container
All devices
Setup device
Edit
Share
Duplicate
Delete
Contoso
GPS location
Average temperature fan truck
34
62
31
78
Temperature
55
0
100
Condesator Vol.
31%
Operations last 12 hours
49.2
16.4
12.9
Condesator Tempe...
25
0
100
Condesator Vol.
20%

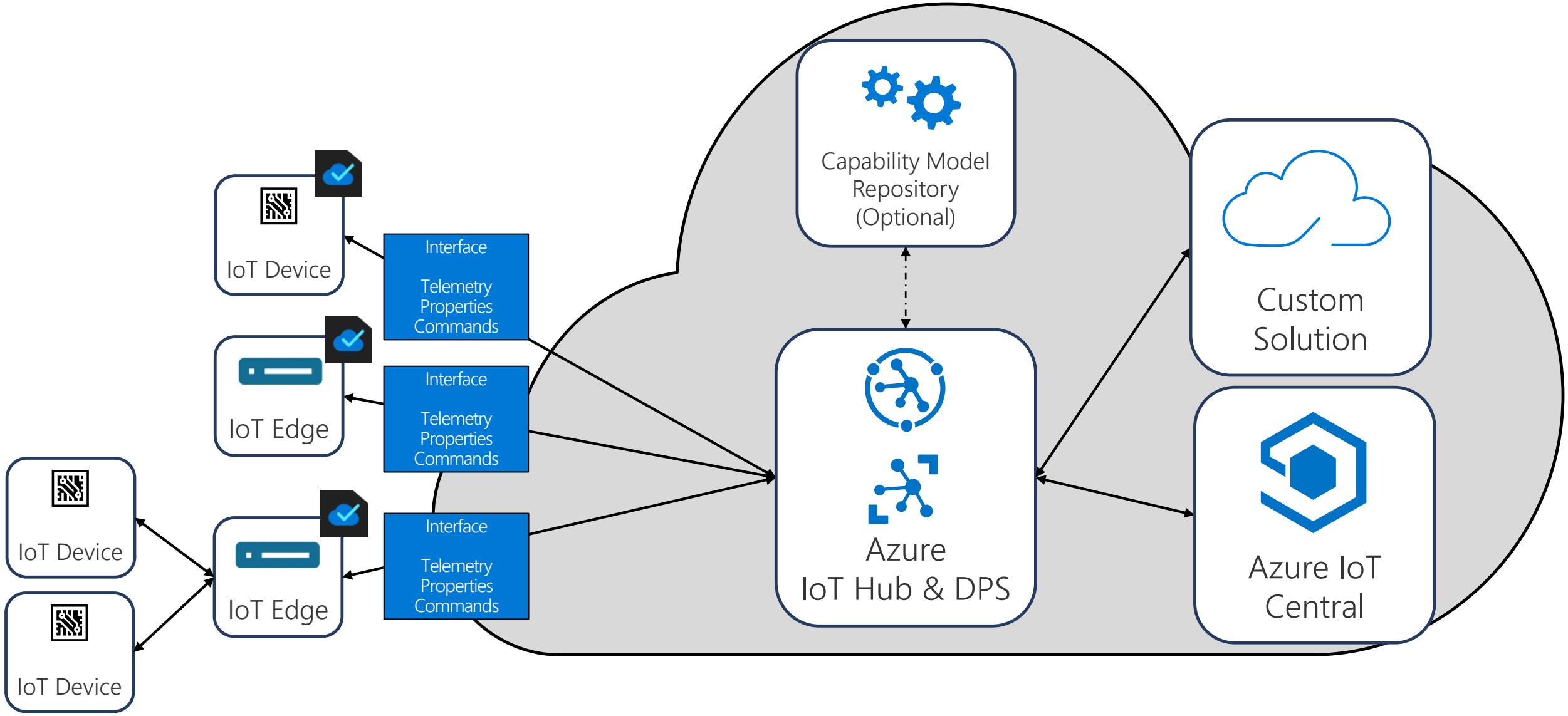
What is Plug and Play?

- **A definition language** based on the JSON-LD standard
  - A language for describing capability models and interfaces for devices and other entities that participate in IoT solutions.
    - Interface: A shared contract that uniquely identify the capabilities (expressed as Properties, Events, and Commands) exposed by a device
    - Device Capable Model: A collection of Interfaces representing a thing or entity

- **Azure IoT PnP SDK**
  - Plug and Play SDK enables solution developers to interact with device capabilities while being agnostic to the underlying Azure IoT platform.

- **Set of tools and pre-requisites**
  - VS Code plugin for authoring PnP interfaces and Capability models
  - Azure IoT PnP CLI to upload them to the Model Repository
  - VS or VS code for writing device code
  - Azure IoT Hub (+DPS for certification)

IoT Plug and Play in Platform Context



Capability Model Developer Tooling

Azure IoT Device & Service SDKs

- Updated with IoT Plug and Play support for all languages

Azure IoT Device Workbench extension for Visual Studio Code

- IntelliSense and validation for authoring models
- Generate skeleton device code from capability models
- Works with Microsoft model repository

Azure IoT CLI extension

- Author / retrieve capability models & interfaces
- Test device and service code

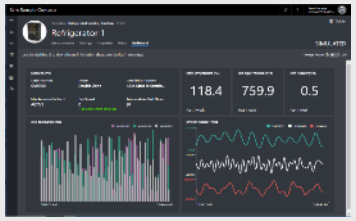
Azure IoT Device Explorer

- Updated to allow discovery and examination of IoT Plug and Play devices

IoT Plug and Play

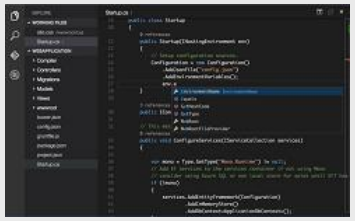
Devices that just work out of the box with no code required

Partner Solutions & Azure IoT Central



Azure IoT Device Simulation

VS Code



Easy to model device capabilities, easy to generate device software skeleton

Device Capability Model

JSON-LD Schema

Easy to certify plug and play devices

Easy for customers and partners to find plug and play devices that just work

Azure IoT Device Catalog IoT Plug & Play Certified

IoT Plug and Play Device Software

- Generated Device Agent
- Azure IoT Device SDK

Easy to develop device software and ensure it just works with IoT solutions

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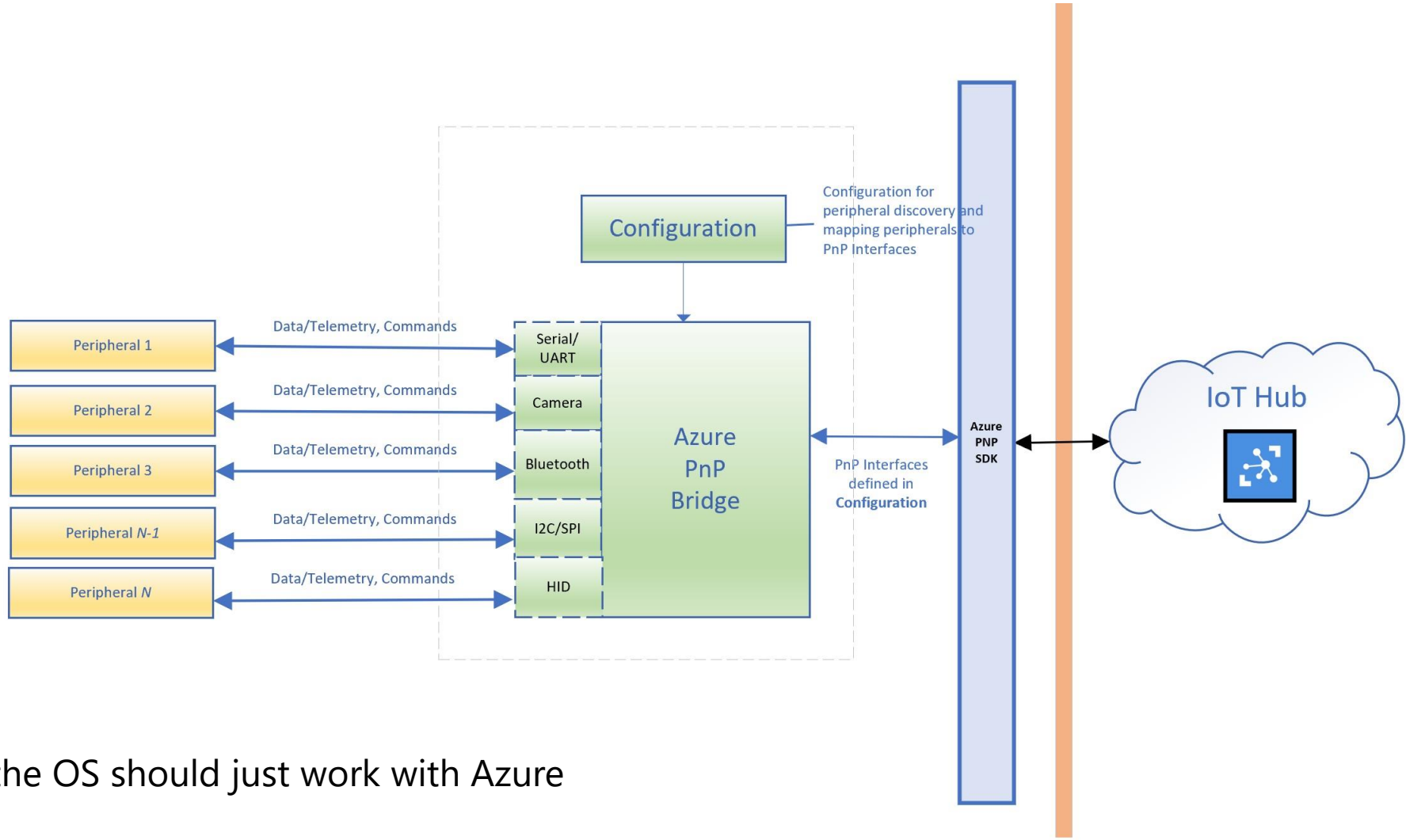
IoT PnP Bridge



Sensors already supported by the OS should just work with Azure

https://github.com/Azure/AzurePnPBridgePreview

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