Microsoft

Azure IoT
Complete Cloud Offerings for the IoT Revolution

Presenter Name
Title
Contact Info

Topics Covered

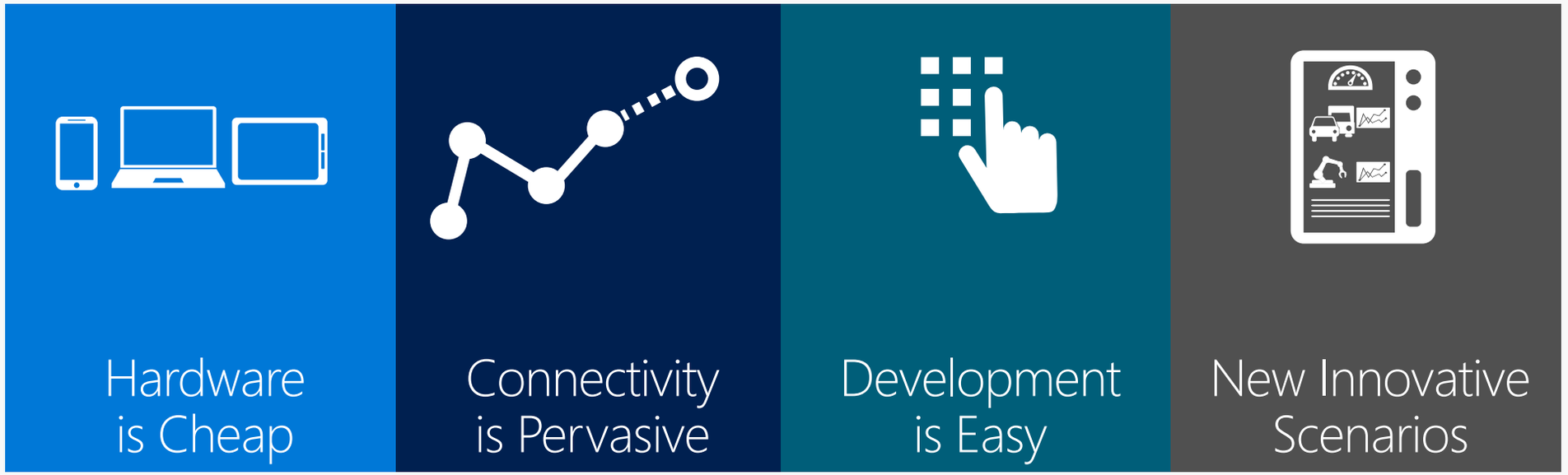
The IoT Revolution

Our Industry Leading IoT Offerings

New Offering Announcements

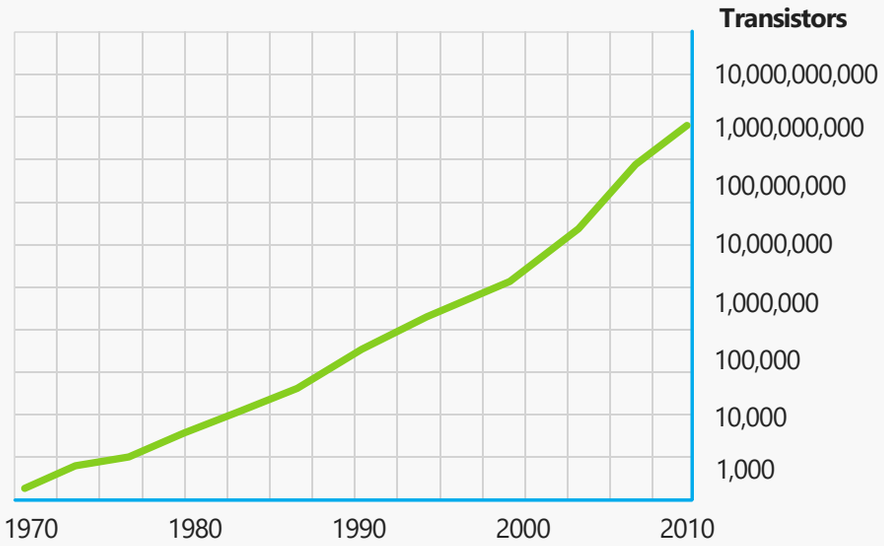
The IoT Revolution

IoT is the Next Revolution

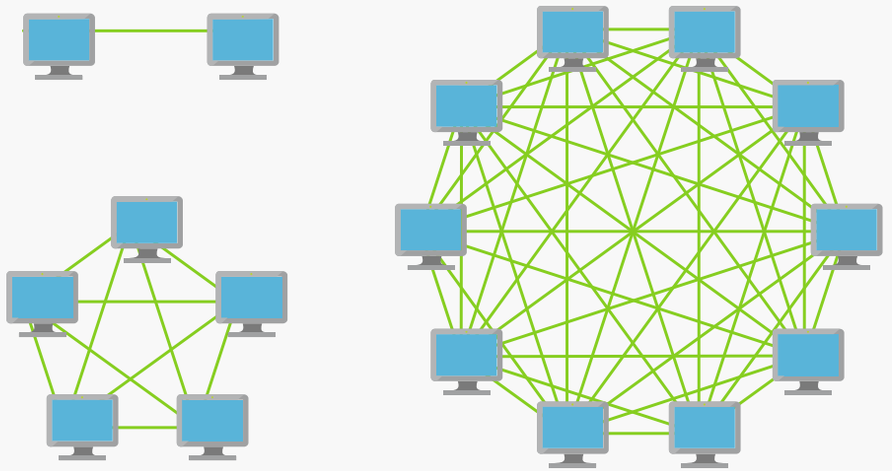


The IoT Revolution

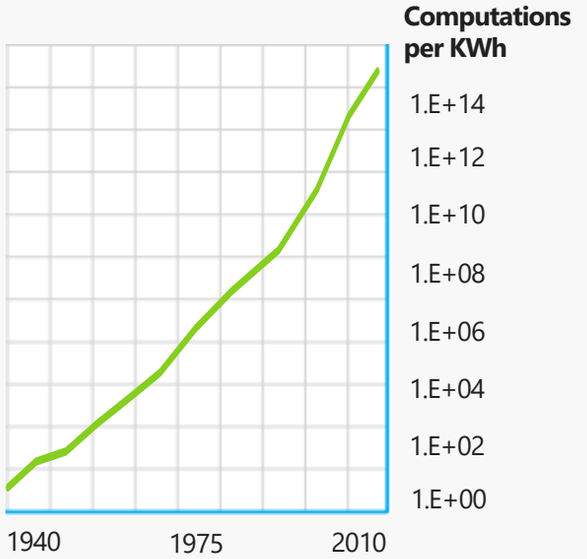
Moore's Law



Metcalf's Law



Koomey's Law



And more importantly:

What can you do by combining and analyzing signals from all of these IoT devices?

Harnessing the IoT Revolution

What if my things could tell me when they go someplace they shouldn't?

What if I could use device telemetry to improve next generation devices?

It all starts with a great idea…

What if I knew when my things were going to break before they did?

What insights could I find from *all* of my devices?

What if I simply knew where my things were?

What if I could tell when it's the best time for my things to _____ ?

Harnessing the IoT Revolution

Next comes a device…

Harnessing the IoT Revolution

And data from that device…

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Harnessing the IoT Revolution

And securing the device…

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Harnessing the IoT Revolution

And insights from that data…

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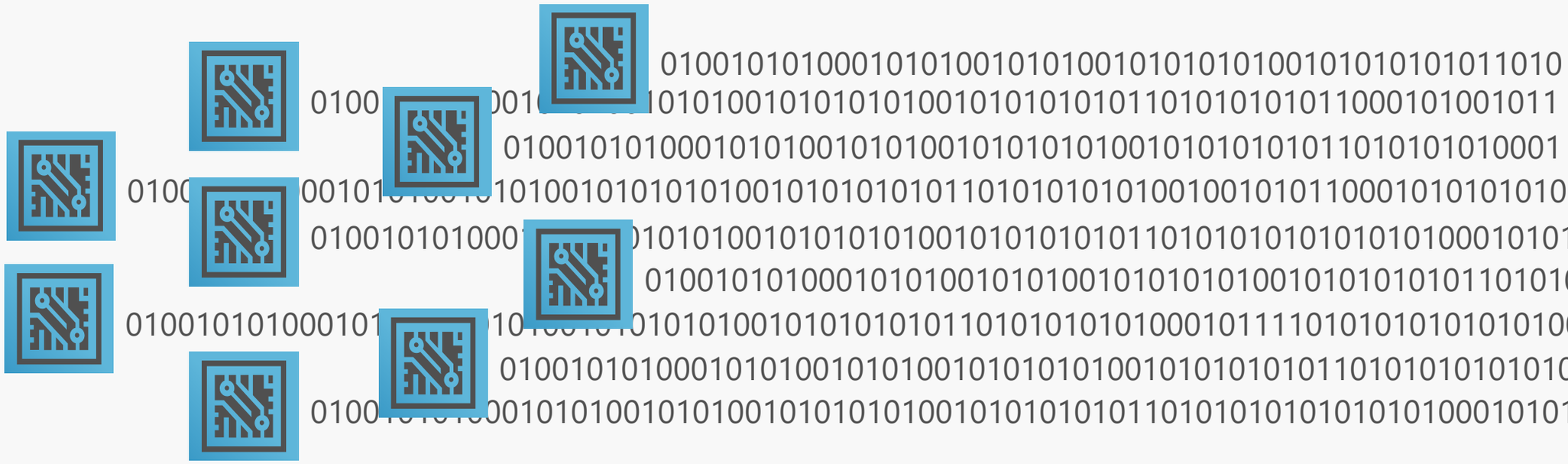
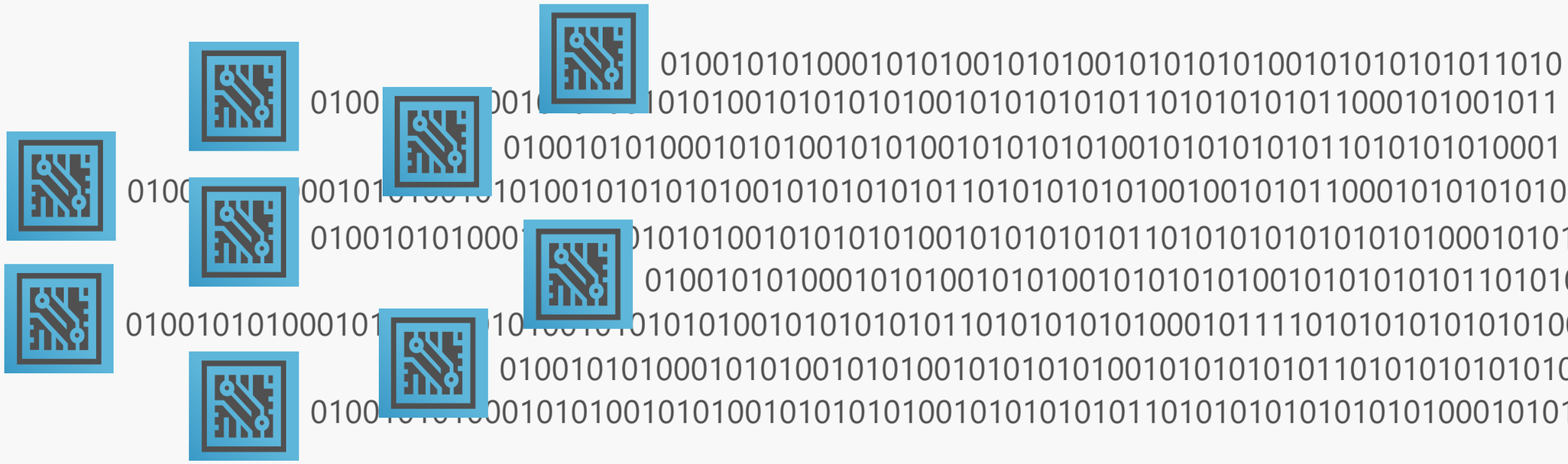
Harnessing the IoT Revolution

Then lots of devices and data…



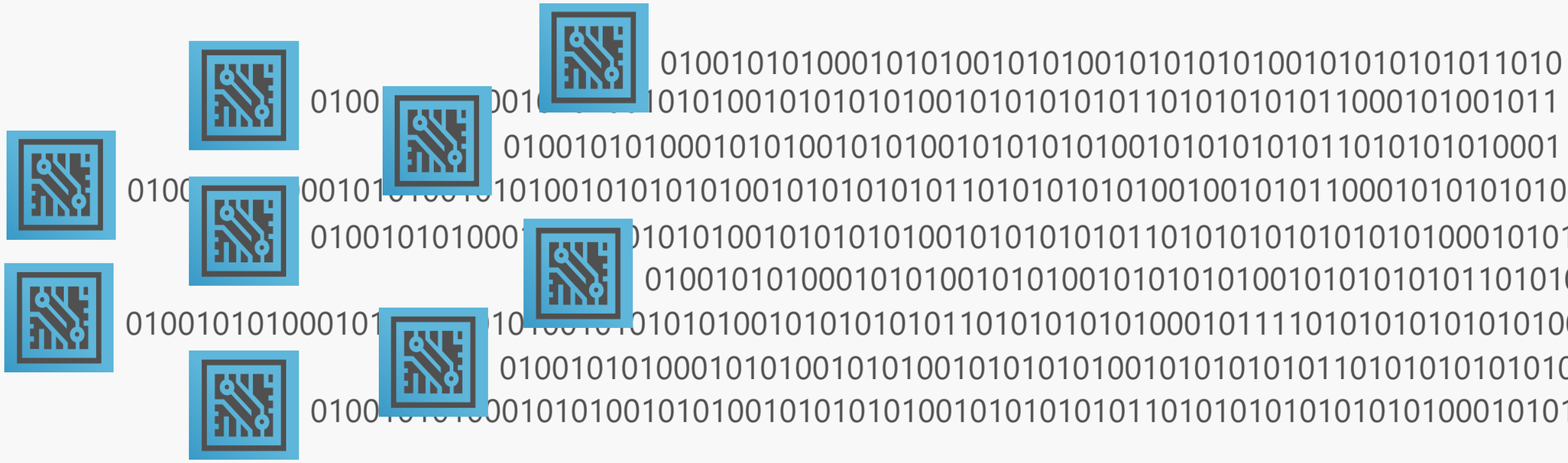
Harnessing the IoT Revolution

Then lots of devices and data…



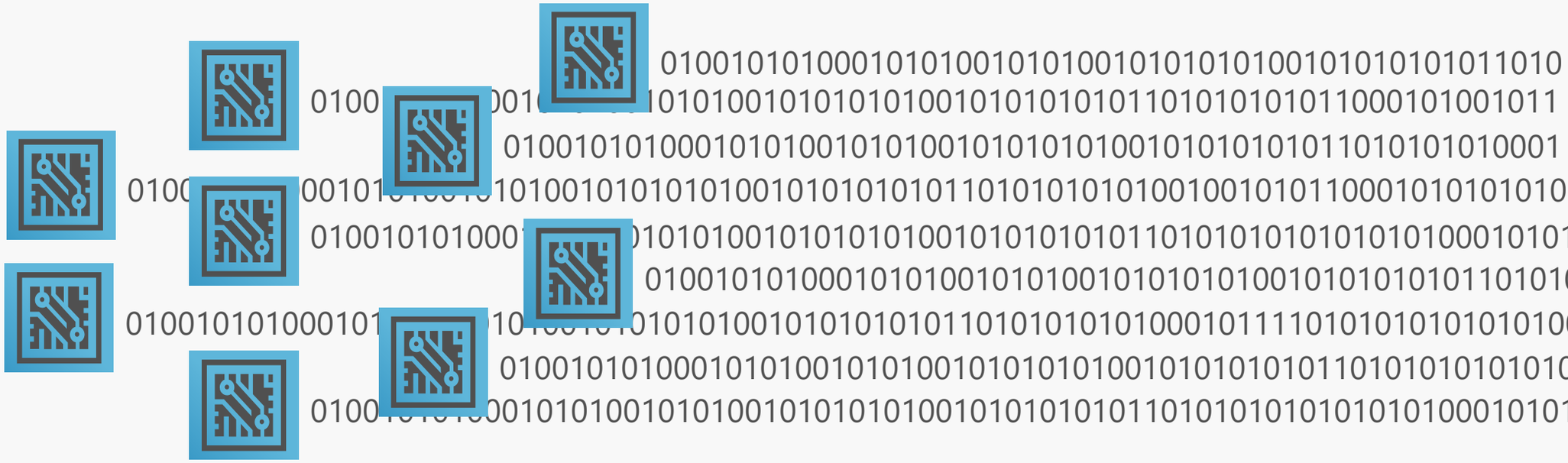
Harnessing the IoT Revolution

Then monitoring their data in real time…



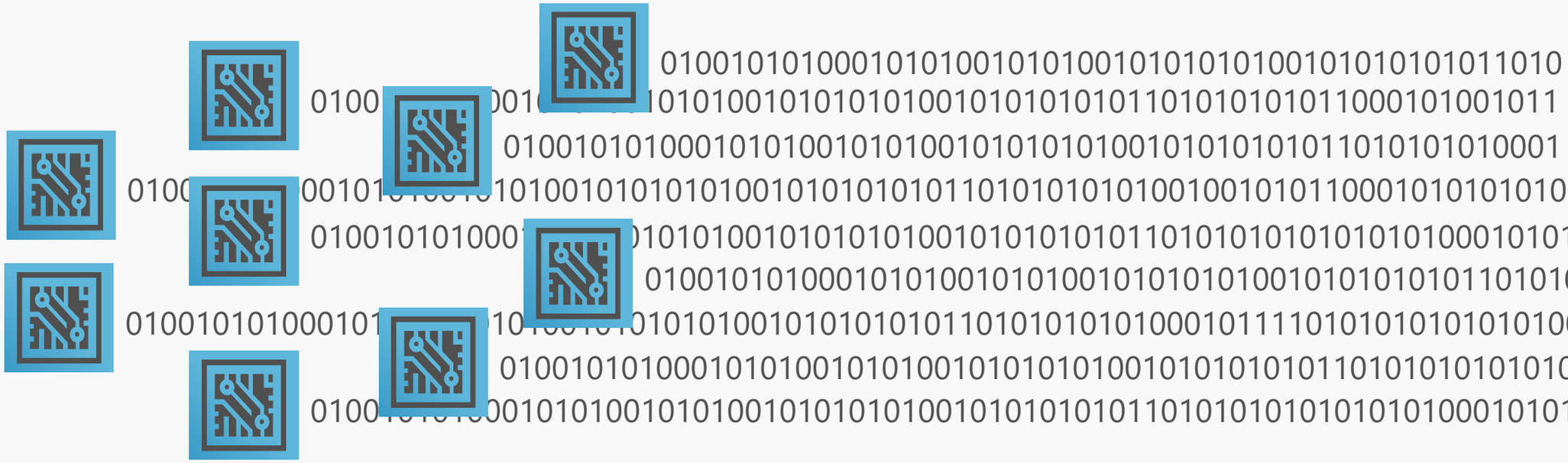
Harnessing the IoT Revolution

Then looking for patterns and insights in the data over time…



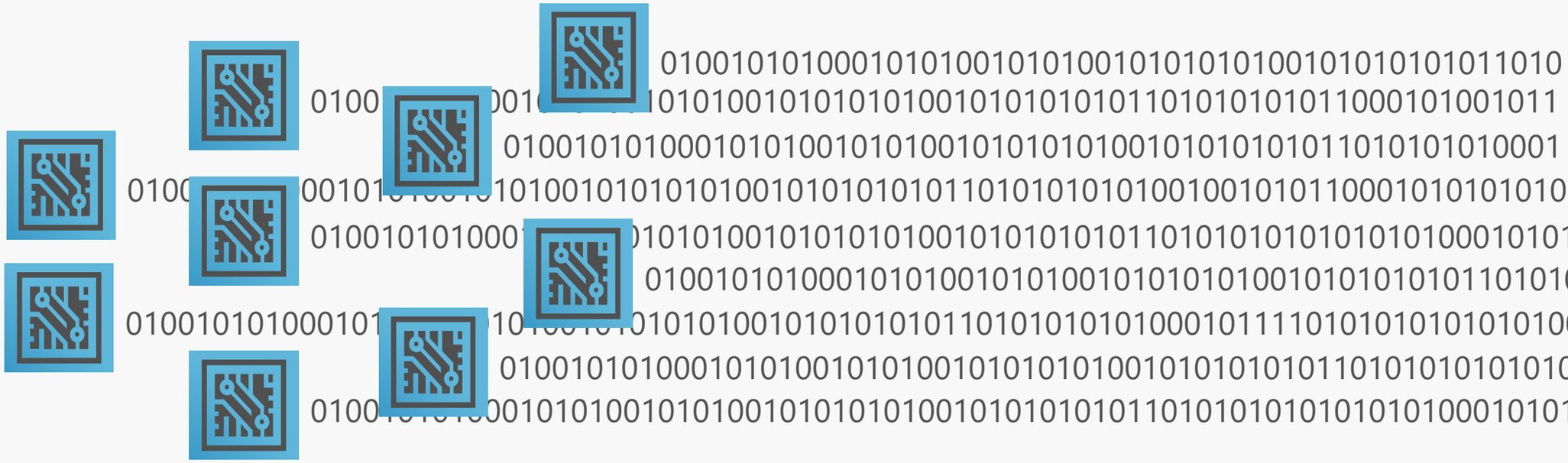
Harnessing the IoT Revolution

Then managing and updating the software on these devices…



Harnessing the IoT Revolution

And visualizing and managing all of these services…



Harnessing the IoT Revolution

IoT can get complicated quickly

And that's where Azure comes in

Our Industry Leading IoT Offerings

Azure Services for IoT

Azure IoT Hub

Connect, secure, communicate, monitor and manage billions of devices

Azure Stream Analytics

Real time stream processing for billions of IoT devices

Azure Storage

Blob, SQL, DocumentDB, Data Lake. Storage to meet every need at the scale of IoT

Azure App Service

Web and mobile apps for any platform on any device

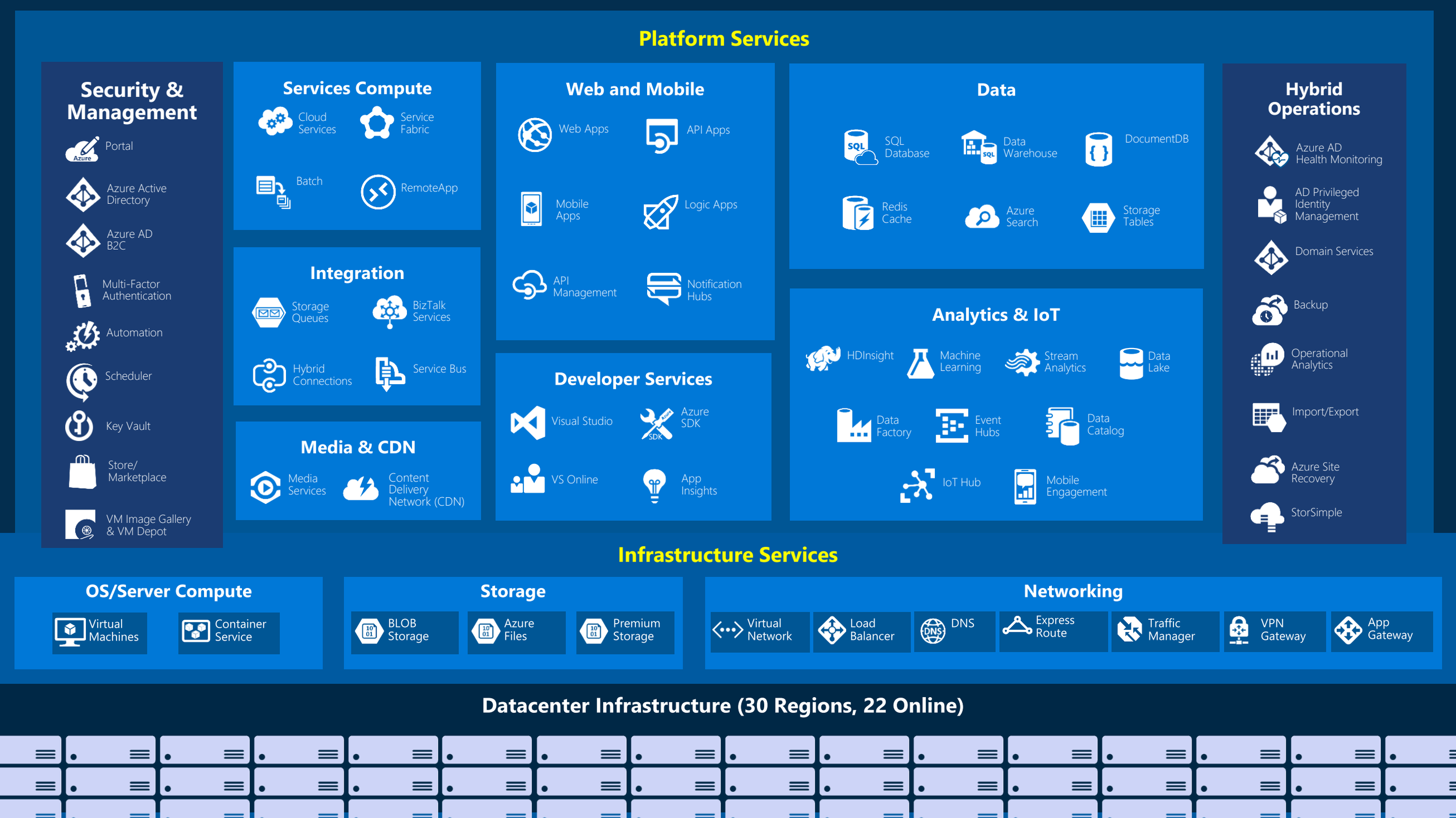
Power BI

Dashboards and data connectors to visualize any data

Logic Apps

Powerful workflows to automate business processes

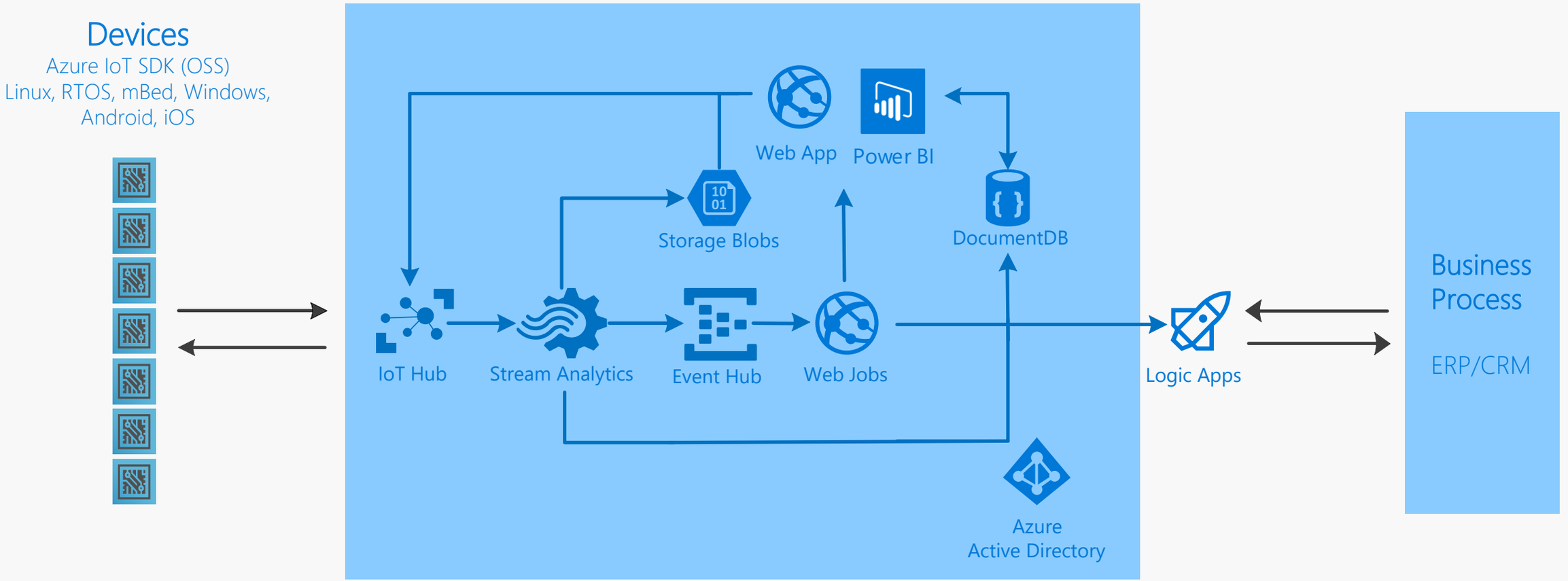
And More…


Platform Services
Security & Management
Portal
Azure Active Directory
Azure AD B2C
Multi-Factor Authentication
Automation
Scheduler
Key Vault
Store/ Marketplace
VM Image Gallery & VM Depot
Services Compute
Cloud Services
Service Fabric
Batch
RemoteApp
Integration
Storage Queues
BizTalk Services
Hybrid Connections
Service Bus
Media & CDN
Media Services
Content Delivery Network (CDN)
Web and Mobile
Web Apps
API Apps
Mobile Apps
Logic Apps
API Management
Notification Hubs
Developer Services
Visual Studio
Azure SDK
VS Online
App Insights
Data
SQL Database
Data Warehouse
DocumentDB
Redis Cache
Azure Search
Storage Tables
Analytics & IoT
HDInsight
Machine Learning
Stream Analytics
Data Lake
Data Factory
Event Hubs
Data Catalog
IoT Hub
Mobile Engagement
Hybrid Operations
Azure AD Health Monitoring
AD Privileged Identity Management
Domain Services
Backup
Operational Analytics
Import/Export
Azure Site Recovery
StorSimple
Infrastructure Services
OS/Server Compute
Virtual Machines
Container Service
Storage
BLOB Storage
Azure Files
Premium Storage
Networking
Virtual Network
Load Balancer
DNS
Express Route
Traffic Manager
VPN Gateway
App Gateway
Datacenter Infrastructure (30 Regions, 22 Online)

Wouldn’t it be great if someone assembled this for you?

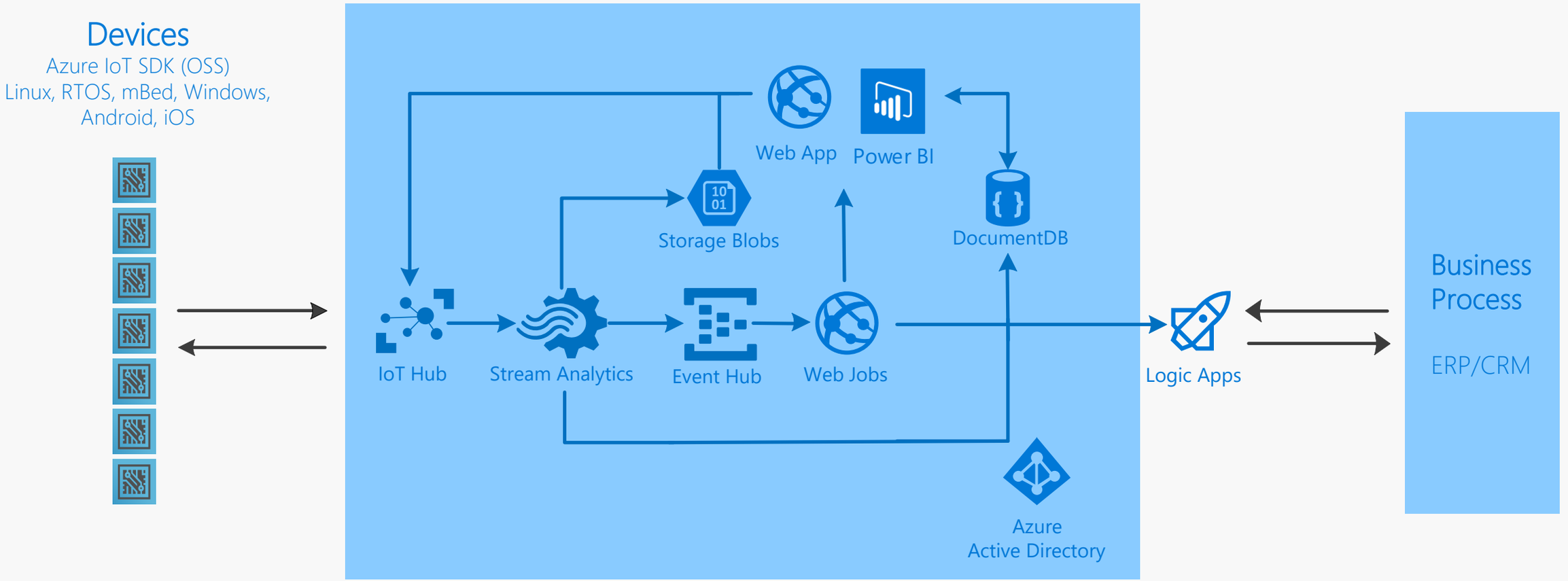
Azure IoT Suite

Get started in minutes & customize to meet your needs



Azure IoT Suite

Remote Monitoring Service Architecture



Azure IoT Hub

Designed for IoT
Connectivity, Security & Management for billions of devices

Per-Device Authentication
Individual device identities and credentials

Service Assisted Communications
Devices are not servers
Use IoT Hub to enable secure bi-directional communications

Connection Multiplexing
Single device-cloud connection for all communications
(device-to-cloud, cloud-to-device)

Cloud Scale Messaging
Device-to-cloud and Cloud-to-device
Durable message inbox/outbox per device

Multi-Protocol
Natively supports AMQPS, HTTPS, MQTT
Extensible protocol support for custom protocol needs

Monitor Devices
Delivery receipts, expired messages
Device communication errors

Multi-Platform
Device SDKs available for multiple platforms
    RTOS, Linux, Windows, iOS, Android
Service SDK supports multiple languages (Node, Java, C#)

Azure IoT Device SDK

Open Source

Everything is on GitHub, open source under MIT license

Cross-Platform Support

RTOS, Linux, Windows, iOS, Android

Multi-Language Support

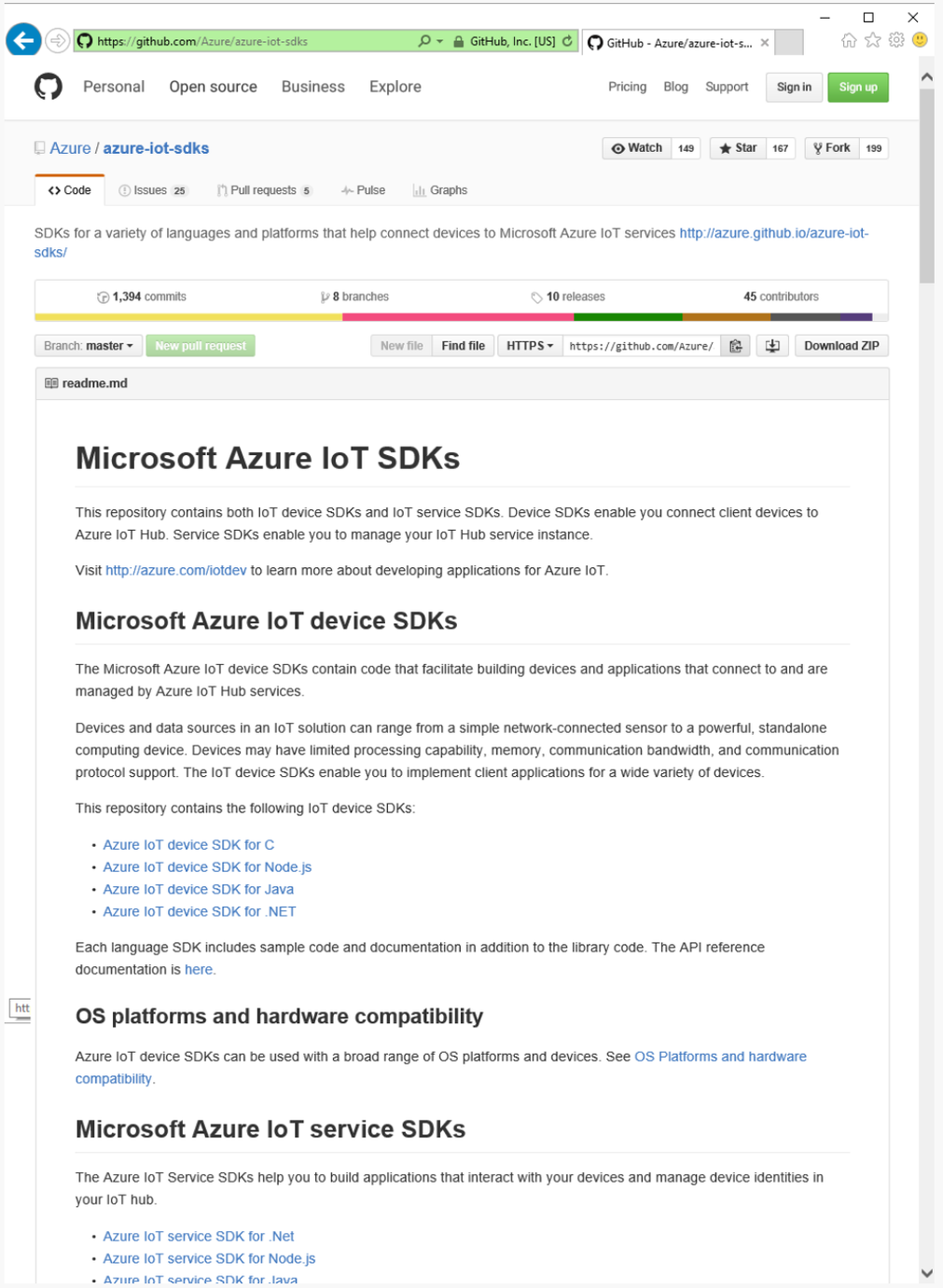
C, Node.js, Java, C#, Python

Xamarin Compatible

Includes Xamarin compatible libraries

Easy To Get Started

Samples, walkthroughs to get you started quickly



Azure Certified for IoT

Certified to Work Great with Azure IoT

Operating systems & devices

Over 50 Partners & Growing

Azure IoT Device SDK Supports Even More!

Azure IoT Device SDK supports more than Azure Certified for IoT and is easy to adapt to new devices and operating systems

New Offering Announcements

New Offering Announcements

Azure IoT Hub Device Management

Update firmware, software, configuration on *any* device running *any* operating system
Organize and update devices based on hierarchical topologies

Azure IoT Gateway SDK

Cross platform middleware for field gateways
Connect, manage and monitor multiple devices
Protocol translation & data normalization

Azure IoT Starter Kits

5 new kits to get started quickly

New Region Availability

Azure IoT Hub Device Management

Update Software, Firmware, Configuration

Going beyond simple ‘Create, Remove, Update and Delete’ for devices
Fully extensile - works on any device running any operating system or firmware

Standards Based

Based on OMA LWM2M

Manage Devices The Way You Want

Group devices into custom topologies
Update devices based on sub-sections of that topology
Role based access control

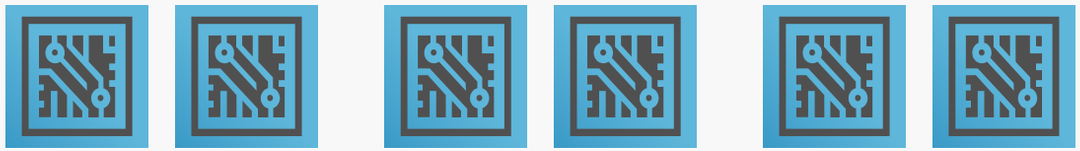
Enables IT/OT Coordination

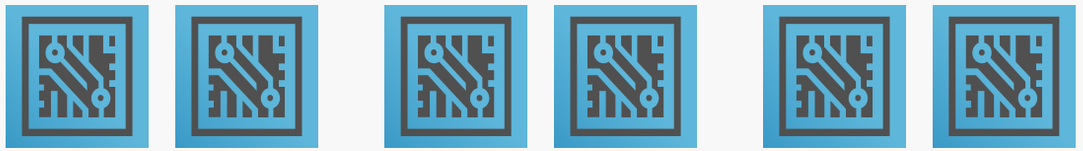
OT is responsible for keeping things running, IT is responsible for keeping things secure
IoT requires IT/OT coordination

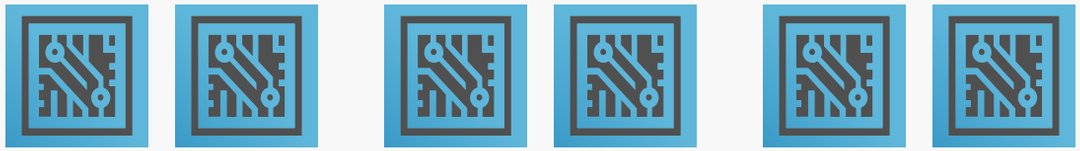
Azure IoT Hub – Device Topology Support

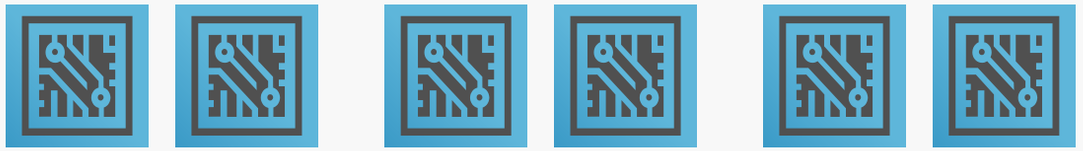
Group & Manage Devices Based On Your Scenario

Example: Building Management



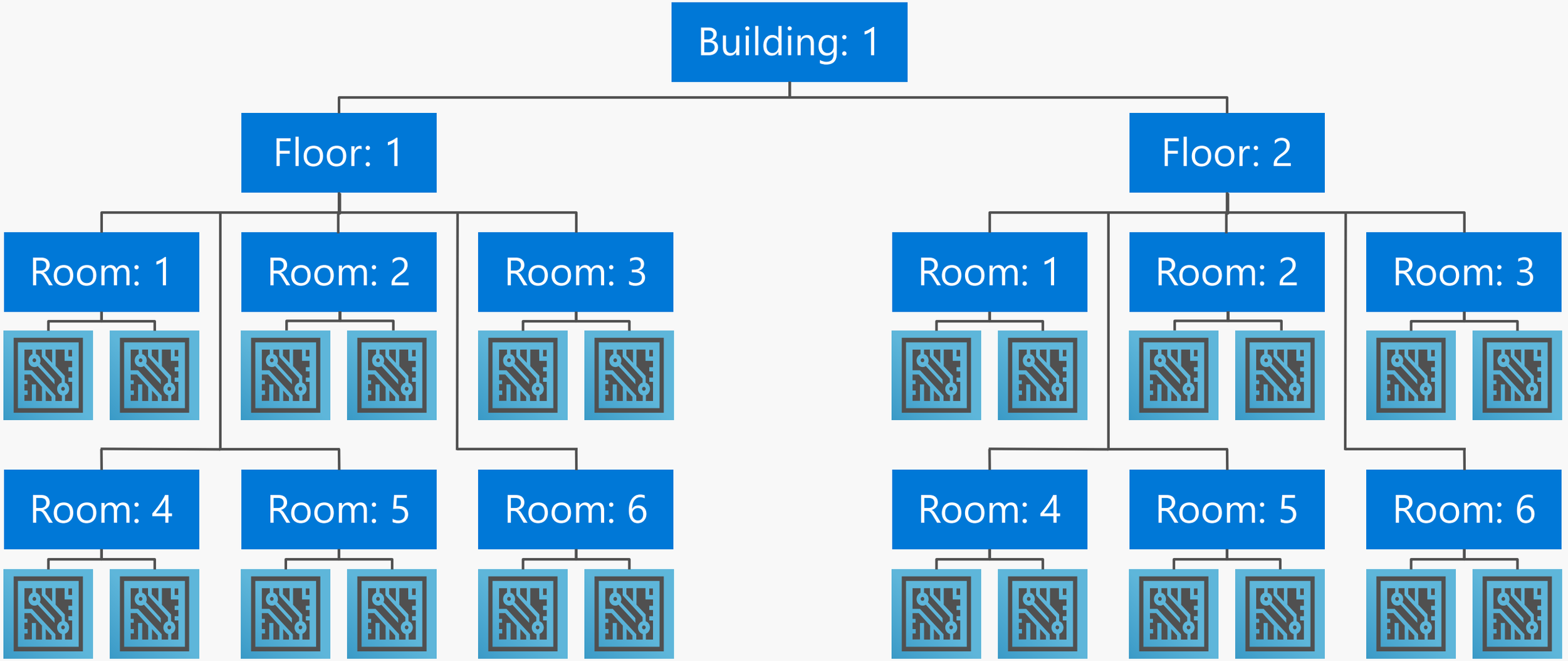






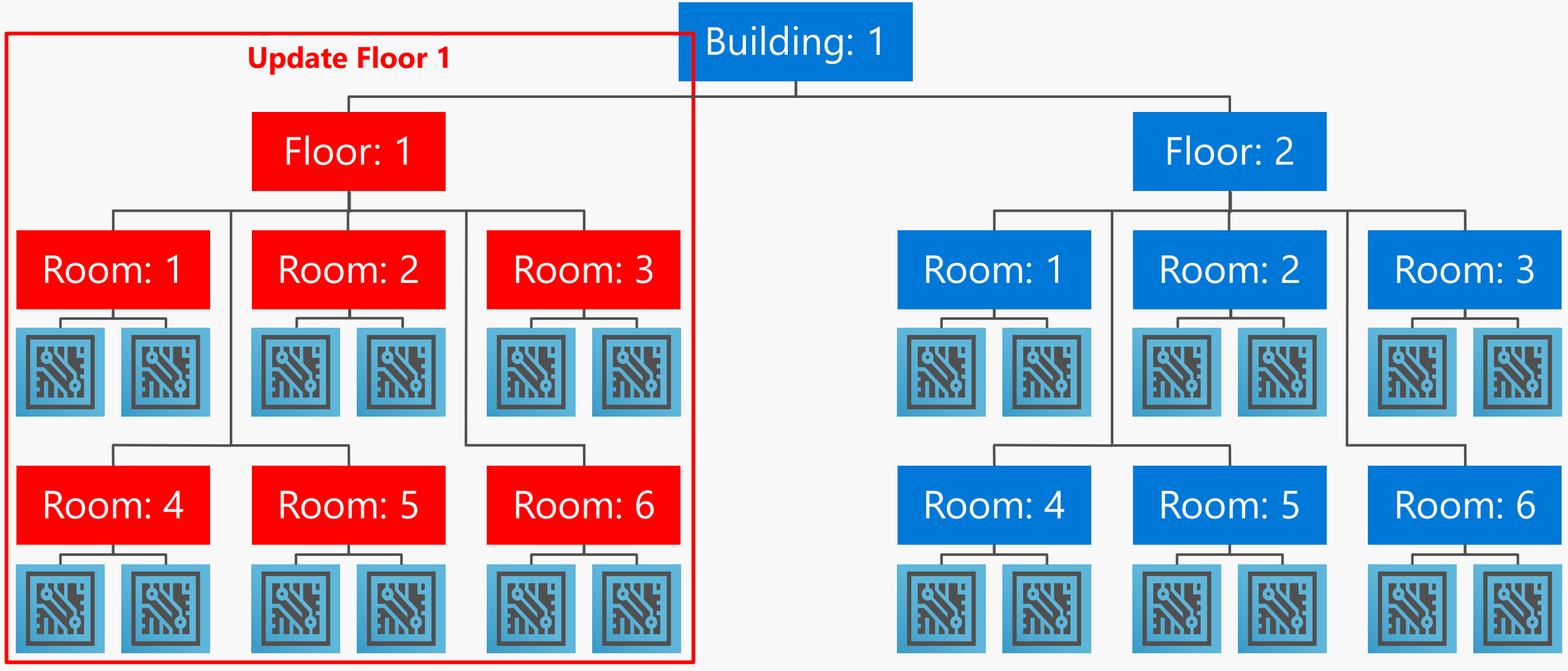
Azure IoT Hub – Device Topology Support

Group & Manage Devices Based On Your Scenario



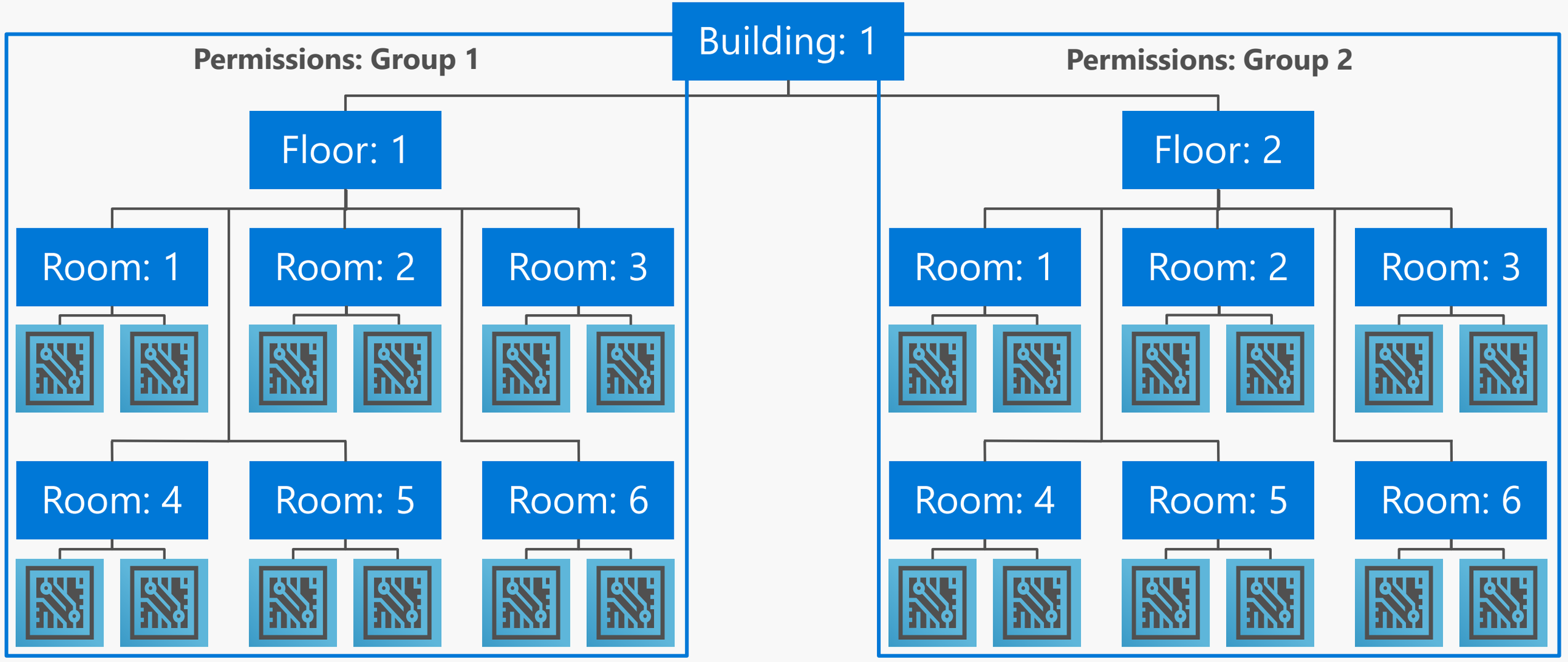
Azure IoT Hub – Device Topology Support

Update Devices Based on Sub-Topologies



Azure IoT Hub – Device Topology Support

Create Permissions Groups Based on Device Topology



Azure IoT Hub Device Management

Enroll Devices

Enroll devices and determine properties and available operations

Organize Devices

Group & manage based on your scenario

Role based access to sub-groups

Maintain Devices

Update software, firmware, configuration using “device jobs”

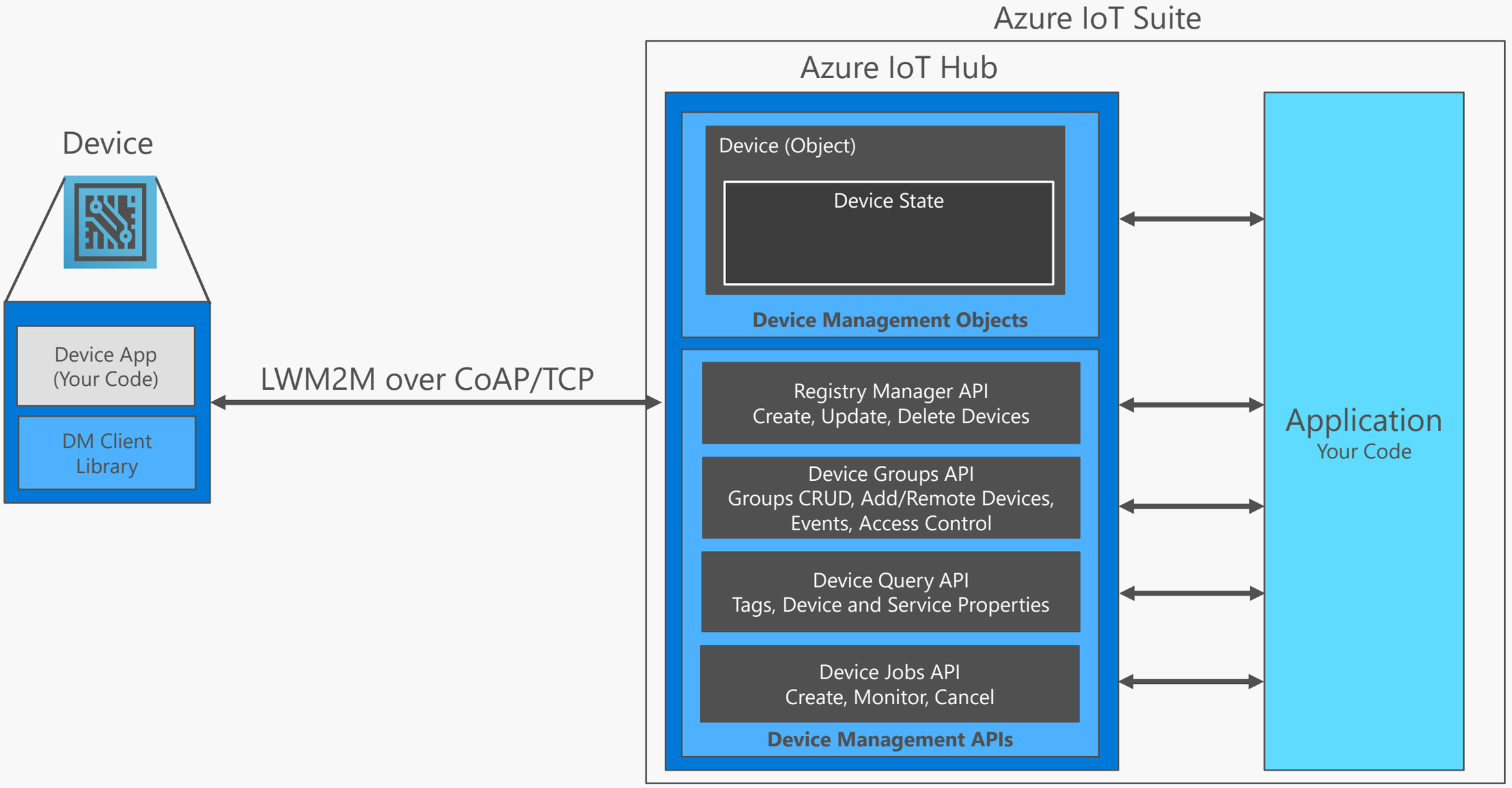
Operators can monitor device health and signal when it is safe to update devices

IT can update and rollback during maintenance windows

Decommission Devices

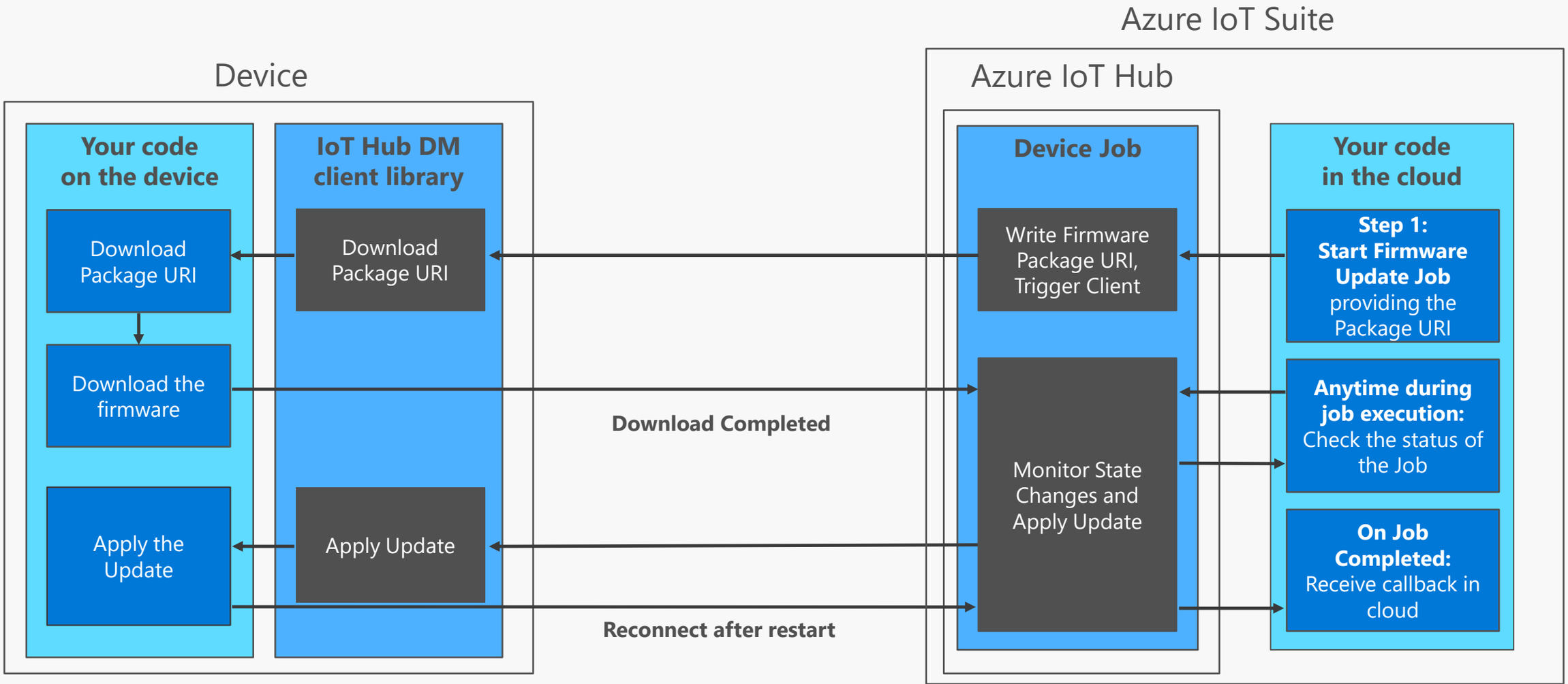
Decommission and replace devices after service lifetime

Azure IoT Hub Device Management



Device Job - Firmware Update Example

A Device Job is a multi-step device orchestration on a set of devices managed by Azure IoT Hub



Azure IoT Gateway SDK

Open source IoT gateway middleware that enables:

- Cloud connectivity for devices that don't speak TCP/IP
- Security Isolation for devices can't be updated/secured
- Protocol translation for existing and new protocols
- Data transformation compression, annotation, filtering
- Local intelligence local processing for low latency needs

Azure IoT Starter Kits

Get started quickly

Raspberry Pi 2 Kit

Windows 10 and Raspbian

Samples in C and C#

Feather M0 Wi-Fi Kit

RTOS

Samples in Arduino IDE and C

Feather Huzzah ESP8266 Kit

RTOS

Samples in Arduino IDE and C

Intel Edison Kit

Linux Yocto

Samples in JavaScript (Node.js)

ThingDev Kit

RTOS

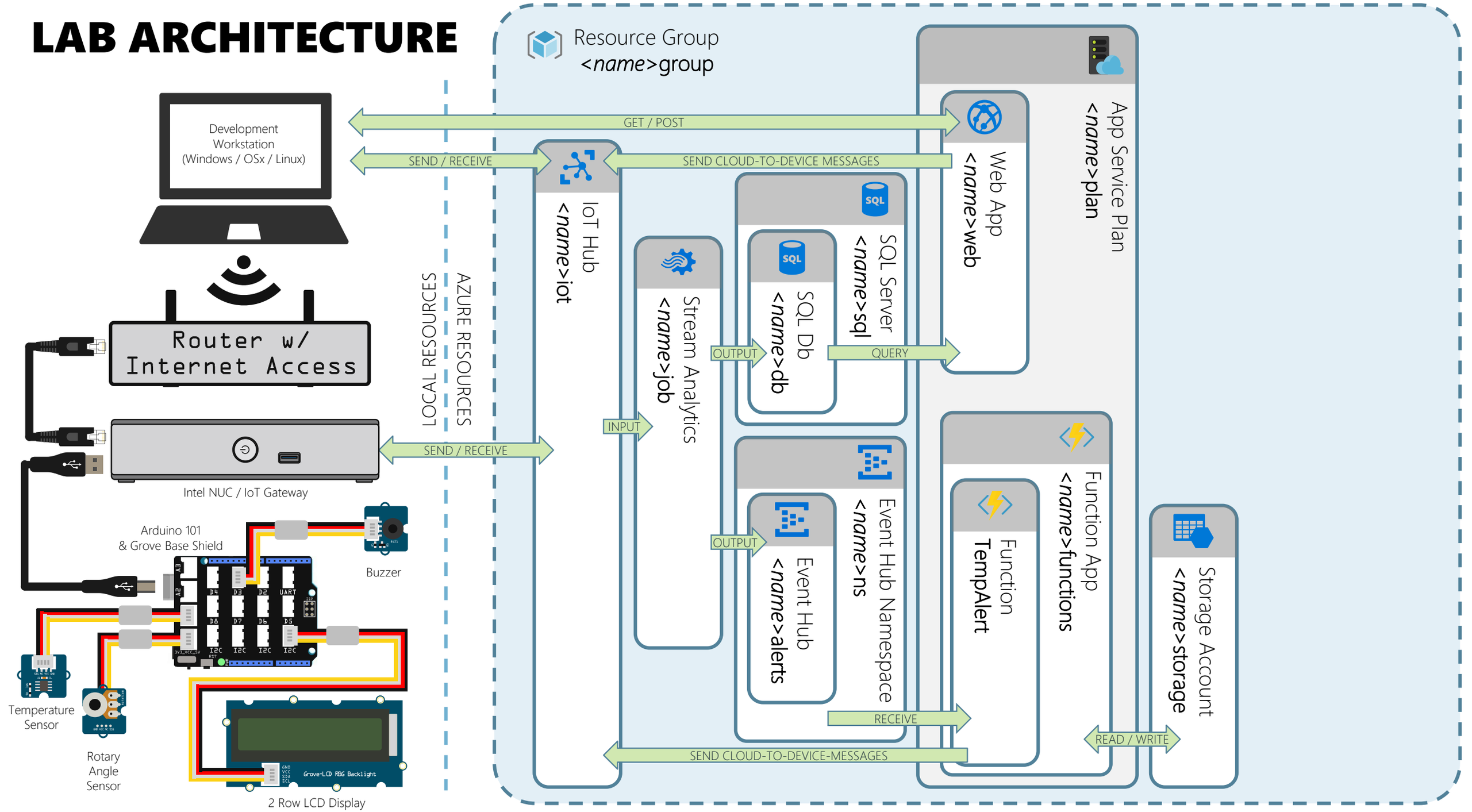
Samples in Arduino and C

Start today: http://azure.com/iotstarterkits

LAB OVERVIEW

Microsoft

LAB ARCHITECTURE



PREREQUISITES

Now is a great time to setup or install these if you don't have them already.
There are copies of the software on the yellow USB drives…

- An active **Microsoft Azure Subscription**.
- **Node.js 4.x or later**. You can install Node.js from nodejs.org
- **Visual Studio Code**. You can install it from code.visualstudio.com
- **Git** installed and in your system path. Install it from:
  - git-scm.com/downloads or if you prefer GitHub…
  - desktop.github.com
  - Make sure your git global config is setup:

```
git config --global user.name "Your Name“
git config --global user.email "Your Email"
```

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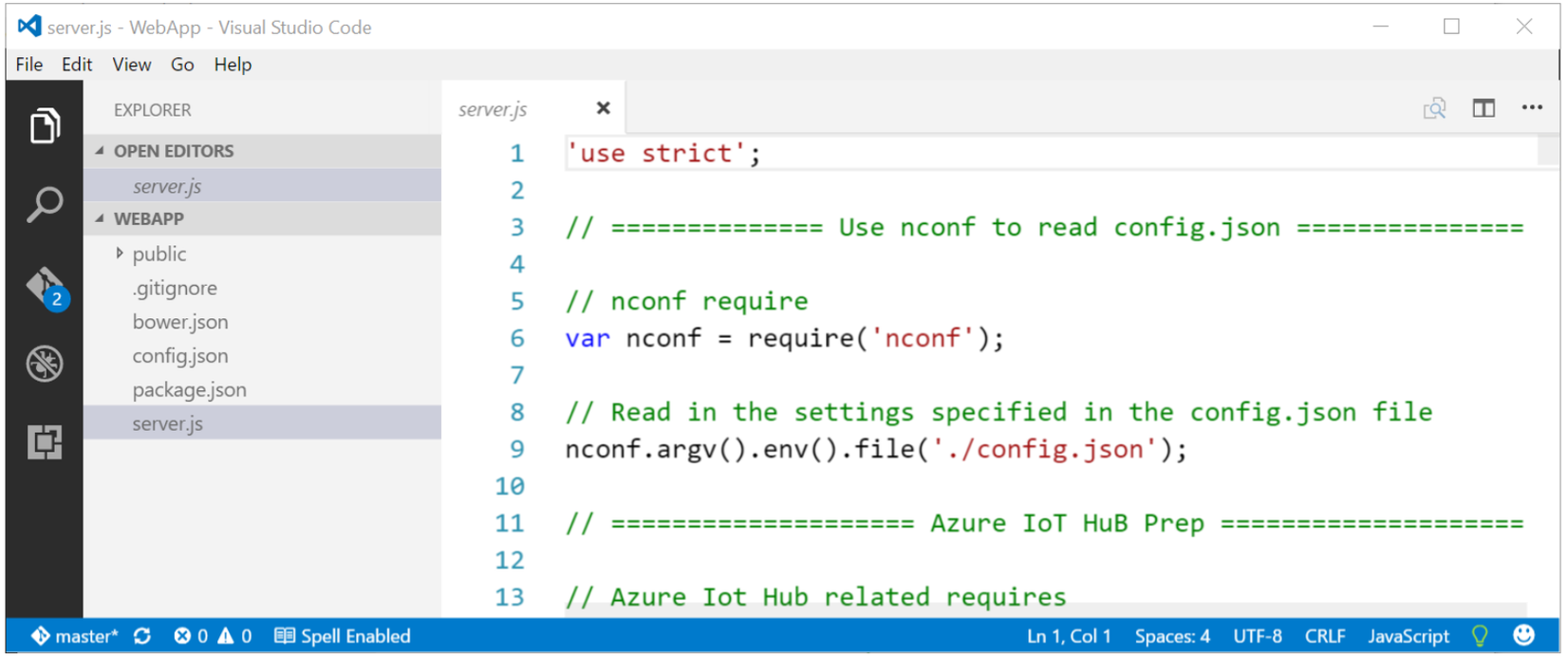
VISUAL STUDIO CODE

We'll be using Visual Studio Code as development environment in this lab. It is a light weight, free, open source, cross-platform development tool, and we think you'll love it!



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GIVE THE INTEL NUC TIME! SERIOUSLY!

The Intel IoT Gateway "NUC" is an Atom Based computer with a "Wind River" Yocto Based Linux Image on it.

It's running an nginx web server instance that hosts the "Intel IoT Gateway Developer Hub" (Dev Hub) and Node-RED, plus it's going to do all the sending and receiving of messages to Azure!

Most laptops don't boot up seconds, so don't expect the NUC to either. Give it time to boot, load, and be awesome!

Microsoft

BEST PRACTICES FOR A FUN LAB…

- Use the *<name>xyz* naming convention. It helps!
- Put all of your Azure resources in a single, new "Resource Group" created just for this lab. This will make it super easy to clean up!
- Put all of your Azure resources in a single "Region" that is near you. That will help keep things fast and low cost.
- Work with you neighbors! You'll learn more!
- We are here to help, but try thinking about how to solve your issue before you ask for help!

Microsoft