Microsoft

IoT Jump-start Workshop

For Remote Monitoring

IoT Innovation Center
Walker Lin/ Andy Li

Welcome

IoT Innovation Center

Microsoft

關於Walker

- 微軟擔任軟體開發工程師
- 喜愛拆解硬體，從韌體開始軟體之路
- 熟悉Embedded Linux/ Android / Windows BSP開發
- 也開發SaaS應用的Android APP
- 微軟之前, 待過ODM/OEM/運營SaaS服務的公司
- 目前專注於Azure IoT相關應用服務

關於你

- 讓大家互相認識與交流
- 名字
- 公司與你的職掌
- 此次Workshop想聽到的內容是什麼?

Introduction

上課時間

- 9:30 A.M. to 5:30 P.M.

午餐

- 12:30 ~ 1:30 P.M. – 自行用餐

其他

- Wi-Fi:
  - SSID: IoTWorkShopTW
  - PW: iotlab520
- 訓練教室為 IoT Open Lab (1901)
- 男廁靠近門口，女廁在對面
- 講義: https://aka.ms/iot-workshop-aug2017



Agenda

Workshop Goals
Opportunities & Challenges
Devices & Cloud Patterns
IoT Related Azure Offerings
Hands On Lab

Workshop Goals

- Jump start for your IoT remote monitoring solution
- Gain an overview of Azure IoT Services
- Provide architectural overview of key components
- Get attendees hands on quickly to make it 'real'

Time Table – Day 1

9:00	9:30	Registration
9:30	10:20	Azure IoT Services
10:30	12:30	Connecting the Device to Cloud - part 1 • 01-HOL-Ubuntu Virtual Machine • 02-HOL-Azure IoT Hub and SDK
12:30	1:30	Lunch
1:30	3:00	Connecting the Device to Cloud - part 2 • Azure Certified for IoT Program • 03-HOL-Simulated Linux and Windows Wind Turbines
3:10	4:40	Data Processing and Device Alert - part 1 • 04-HOL-Historic Data Processing in Stream Analytics
4:50	5:30	Data Processing and Device Alert - part 2 • 05-HOL-Cloud to Device Alarm with Service Bus
5:30	5:40	Recap

Time Table – Day 2

9:00	9:30	Registration
9:30	12:30	Remote Monitoring – Power BI • 06-HOL-Power BI Desktop • 07-HOL-Power BI Embedded
12:30	1:30	Lunch
1:30	2:20	Remote Monitoring – Azure App Service • 08-HOL-Web App • 09-HOL-Power BI Embedded Web App Customization
2:30	3:30	Remote Monitoring – Signal R & Event Processor Host • 10-HOL-SignalR and Event Processor Host
3:40	4:30	Remote Monitoring – Device Remote Control • 11-HOL-Device Rules and Command Control in Web App
4:40	5:10	WebJob and deployment • 12-HOL-WebJob and Deployment
5:10	5:30	Recap

Opportunities & Challenges

The Internet of Things is the key to digital transformation

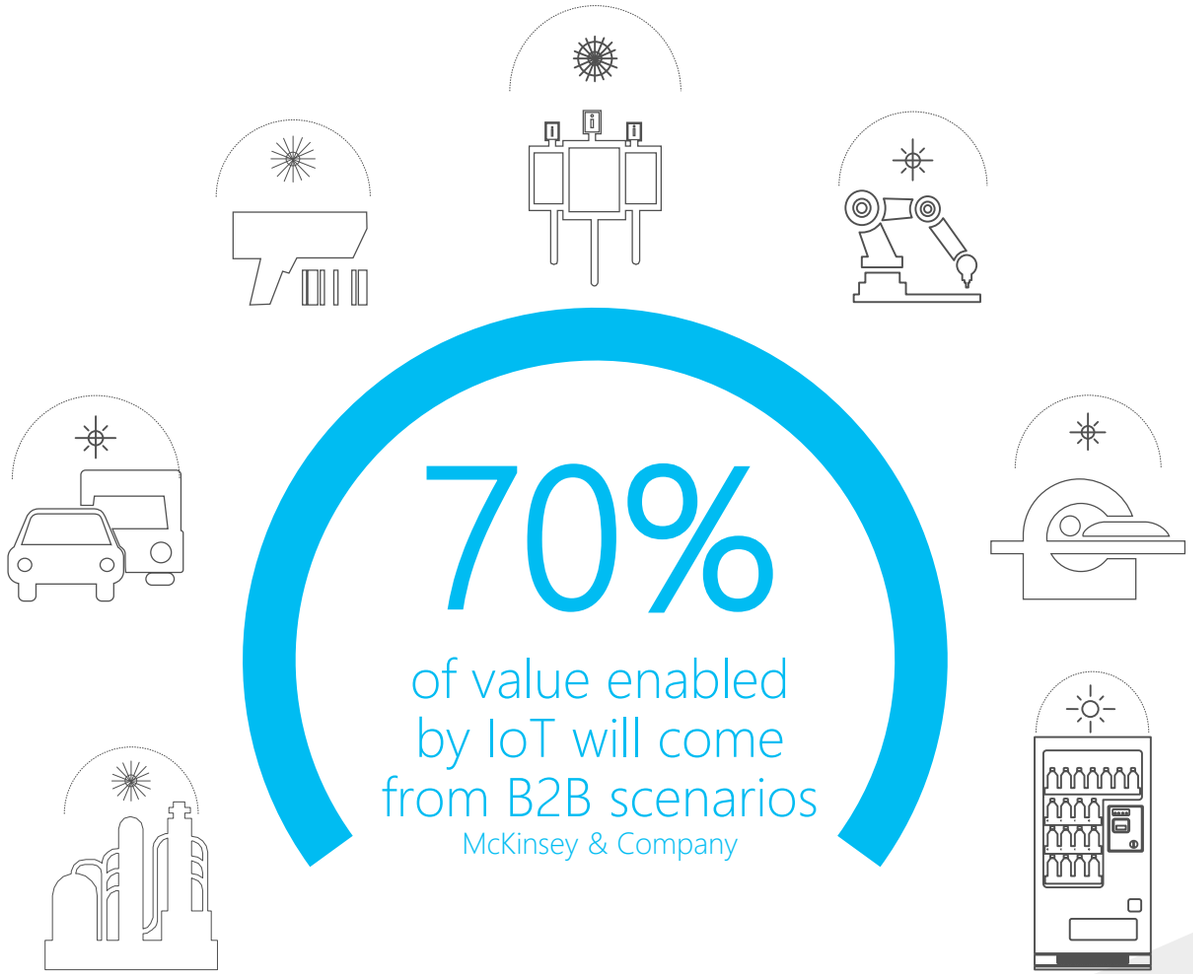
According to a recent IoT survey…

73%	Of the companies surveyed are currently active in IoT
60%	Of those working on IoT are aiming to grow revenue and profits
50%	Reduction in downtime with predictive maintenance

Source: *Redefining the Connected Conversation*, IoT Trends, Challenges & Experience Survey. James Brehm & Associates, 2016.

Defining Internet of Things

Internet of Things opportunity



25 billion

Connected “things” by 2020

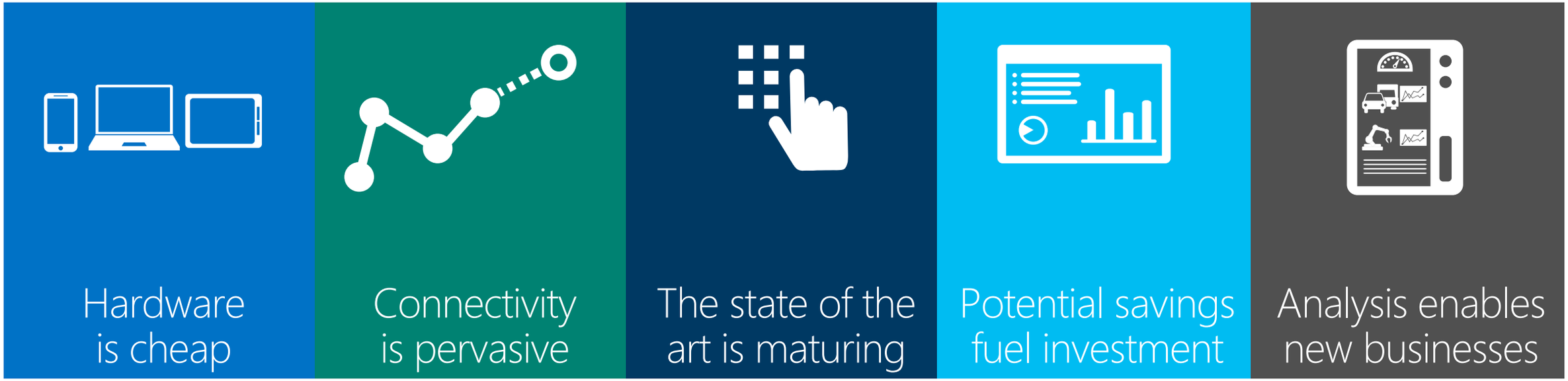
—Gartner

$1.7 trillion

Market for IoT by 2020

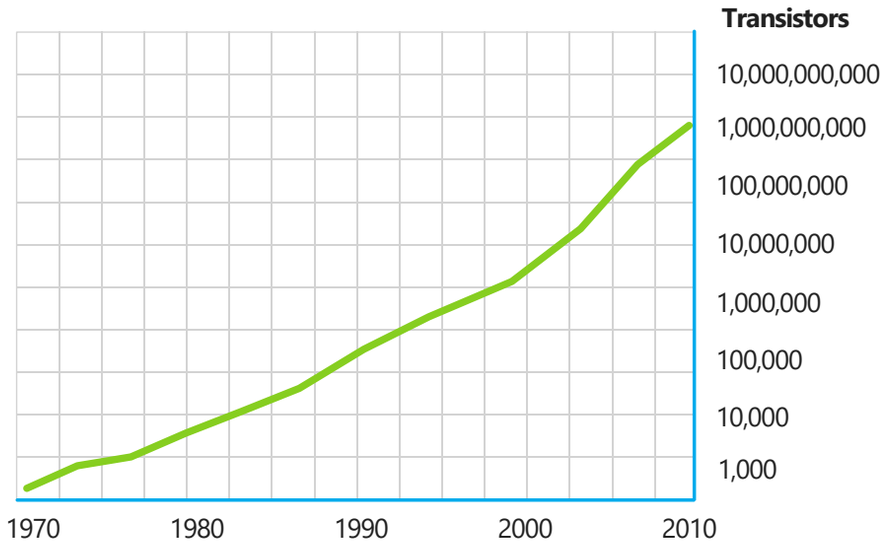
—IDC

IoT is reaching an inflection point

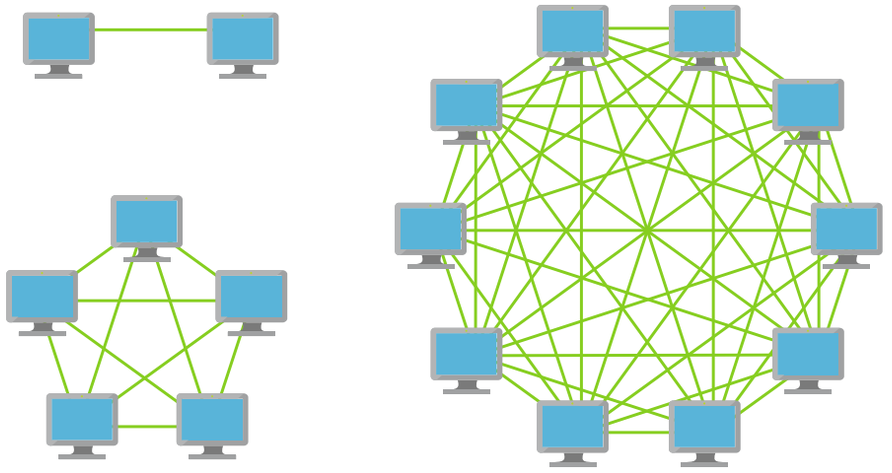


Theory driving this change…

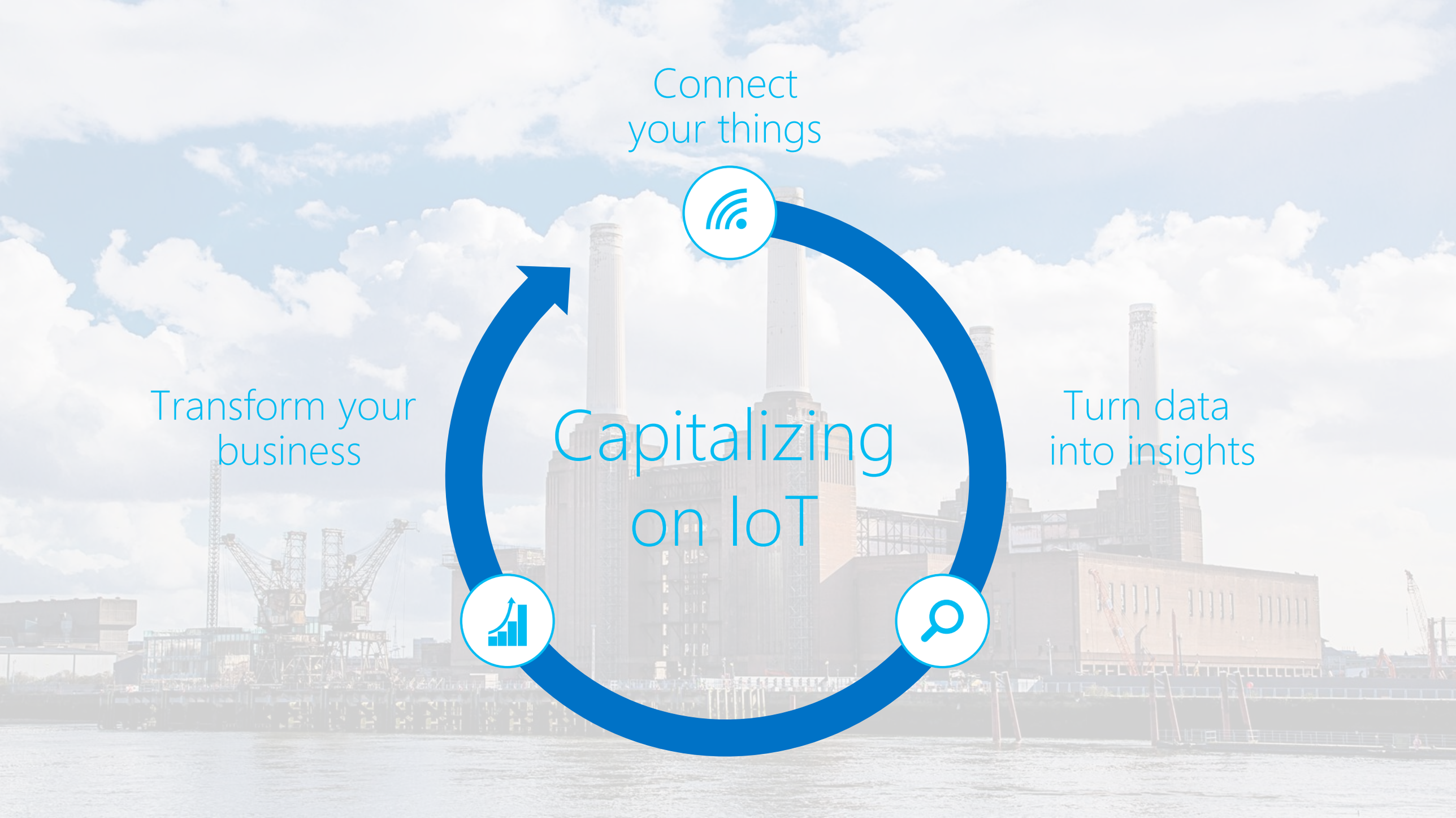
Moore's Law



Metcalfe's Law



what can 25 billion connected things do?


Connect
your things
Turn data
into insights
Transform your
business
Capitalizing
on IoT

Connect your things

Objective

Increase efficiency by reducing costs and eliminating bottlenecks

Organizational readiness

This is a great place to start if you have:

- An identified business process you want to gain visibility into
- An understanding of the kind of data you need in order to support your business objective
- Devices capable of providing the type of data required

Turn data into insights

Objective

Drive innovation and increase revenue using your existing assets

Organizational readiness

This is a great place to start if you have :

- The ability to interpret incoming data from devices
- An understanding of the impacted business groups and processes
- A plan for using data to drive business process improvements

Transform your business

Objective

Create new lines of business and new business models

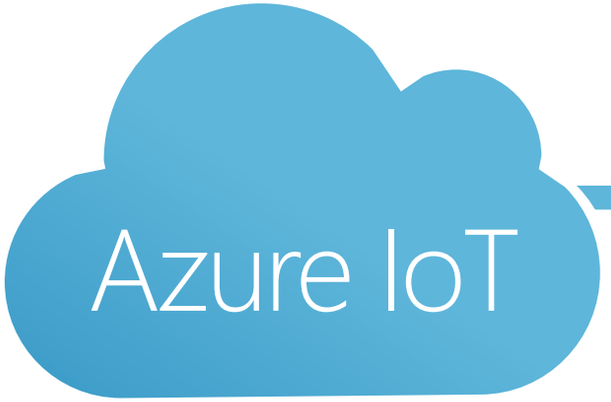
Organizational readiness

This is a great place to start if you have :

- A strong baseline of historical device data (e.g. usage trends, repair records)
- Visibility into real-time operational status
- Predictive capability from advanced analytics
- Stakeholder commitment to support change efforts

IoT Devices & Cloud Patterns

Cloud Based IoT Solutions

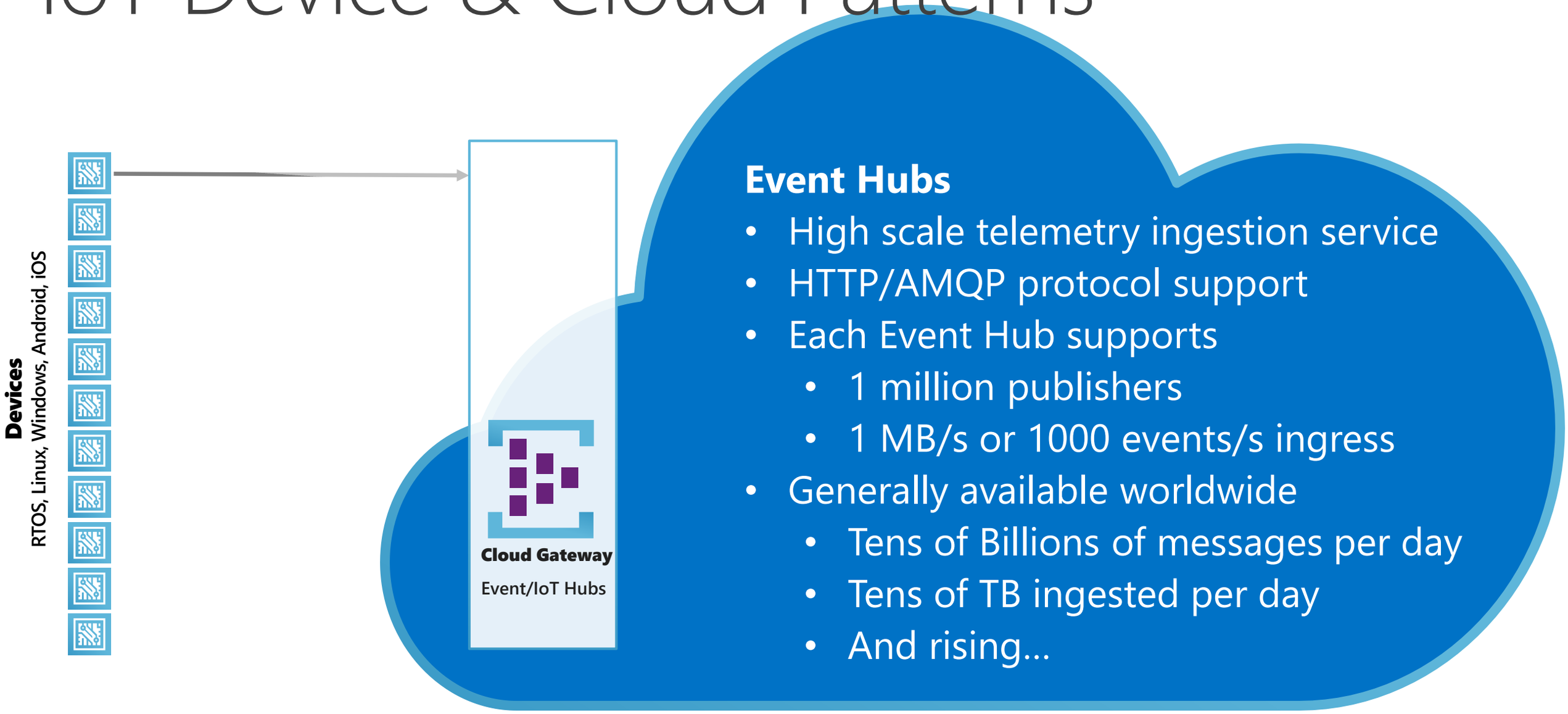


- Easy to provision, use and manage
- Pay as you go, scale as you need
- Global reach, hyper scale
- End to end security & privacy

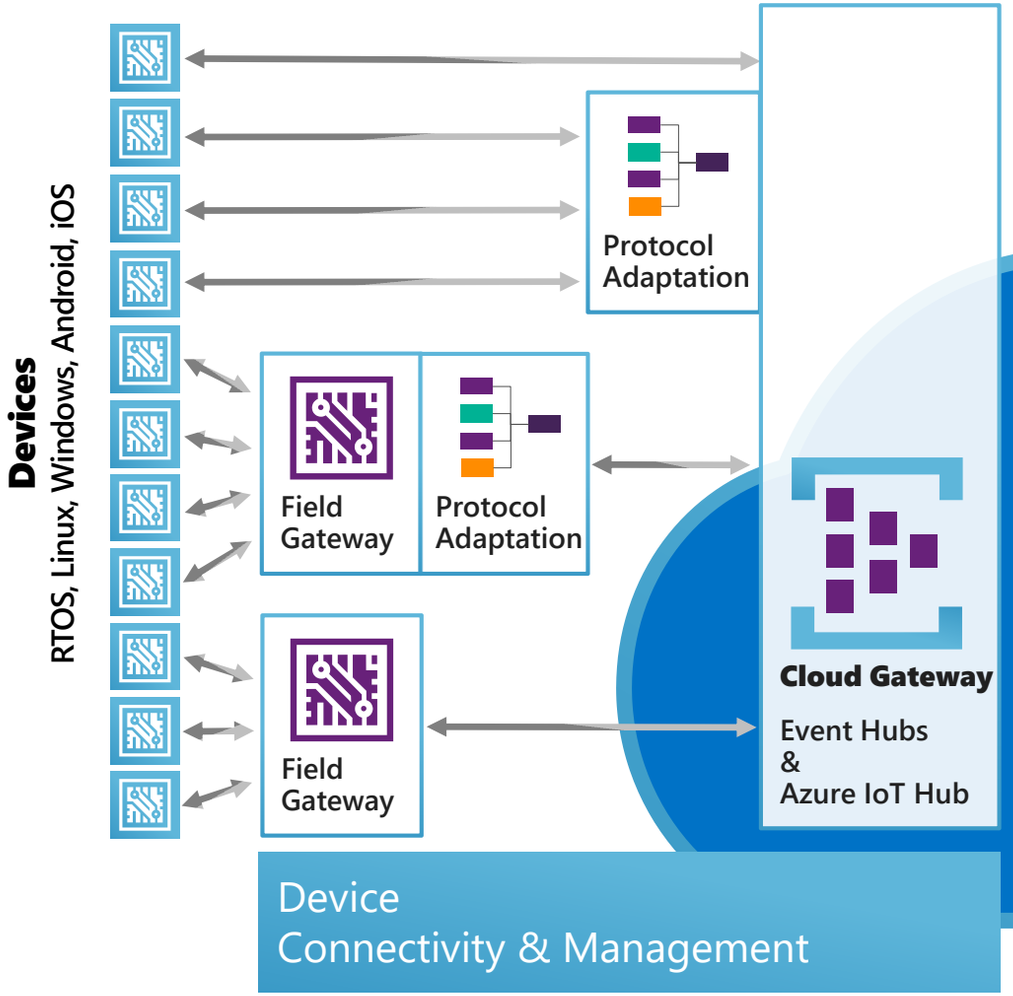
Three parts of an IoT solution

1. Device connectivity & management
2. Analytics & operationalized insights
3. Presentation & business connectivity

IoT Device & Cloud Patterns



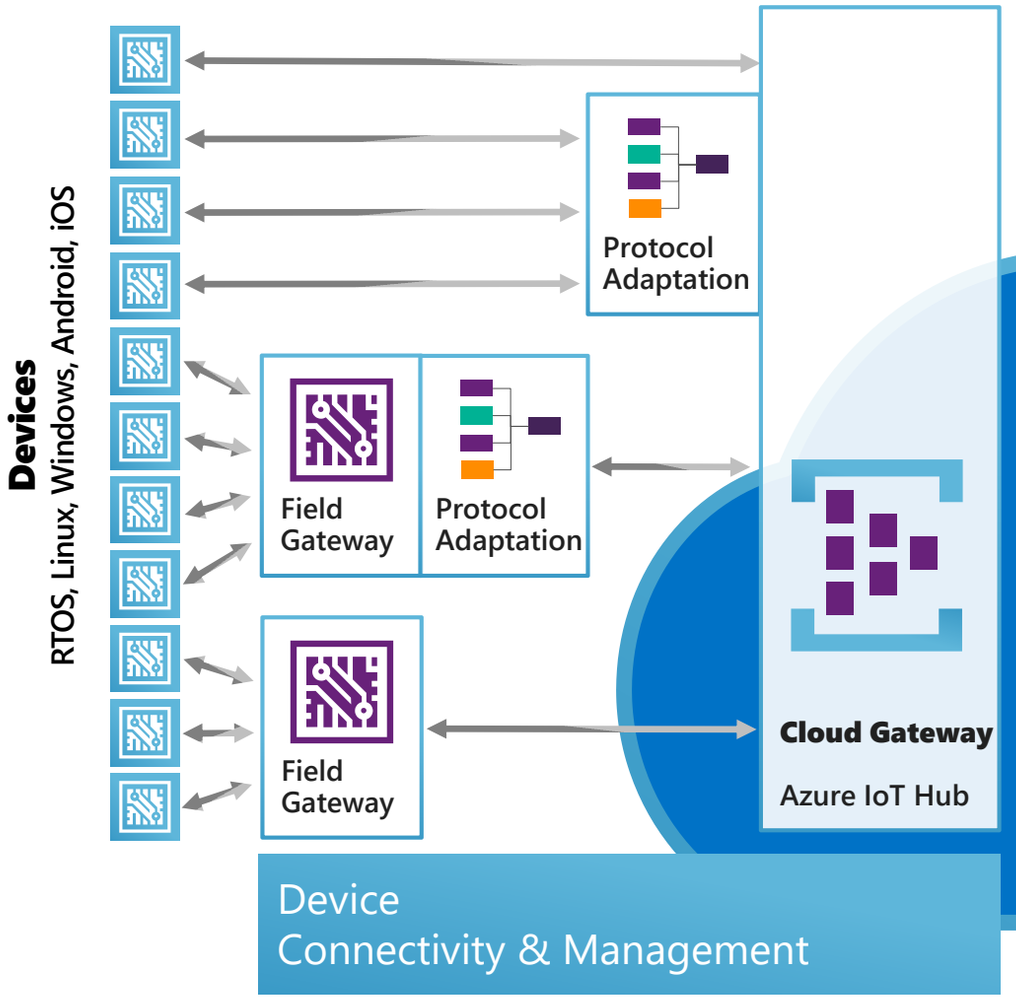
IoT Device & Cloud Patterns



Additional IoT Needs

- Command & control
- Device identity
- Device registry
- Device and State management
- Protocol translation and gateways

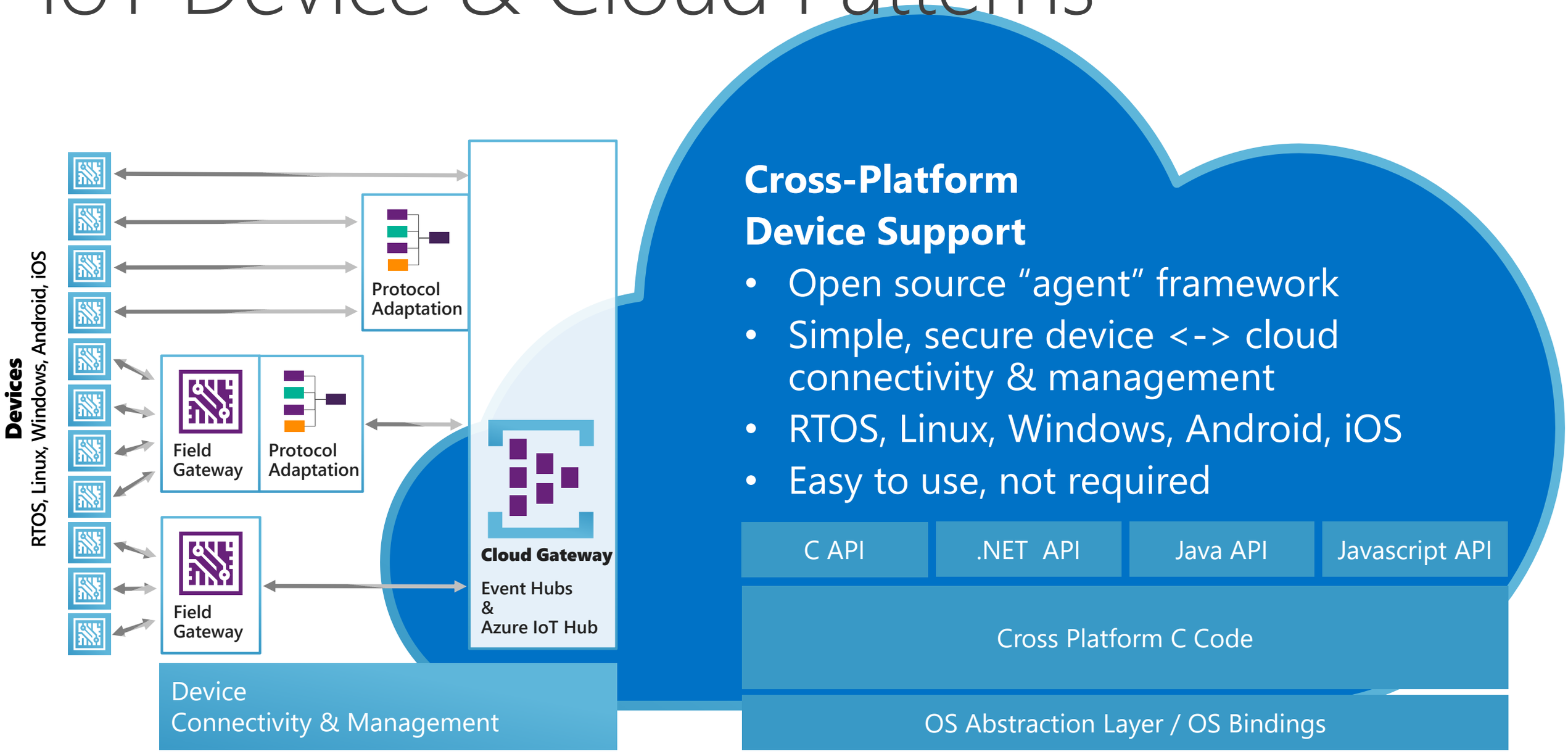
IoT Device & Cloud Patterns



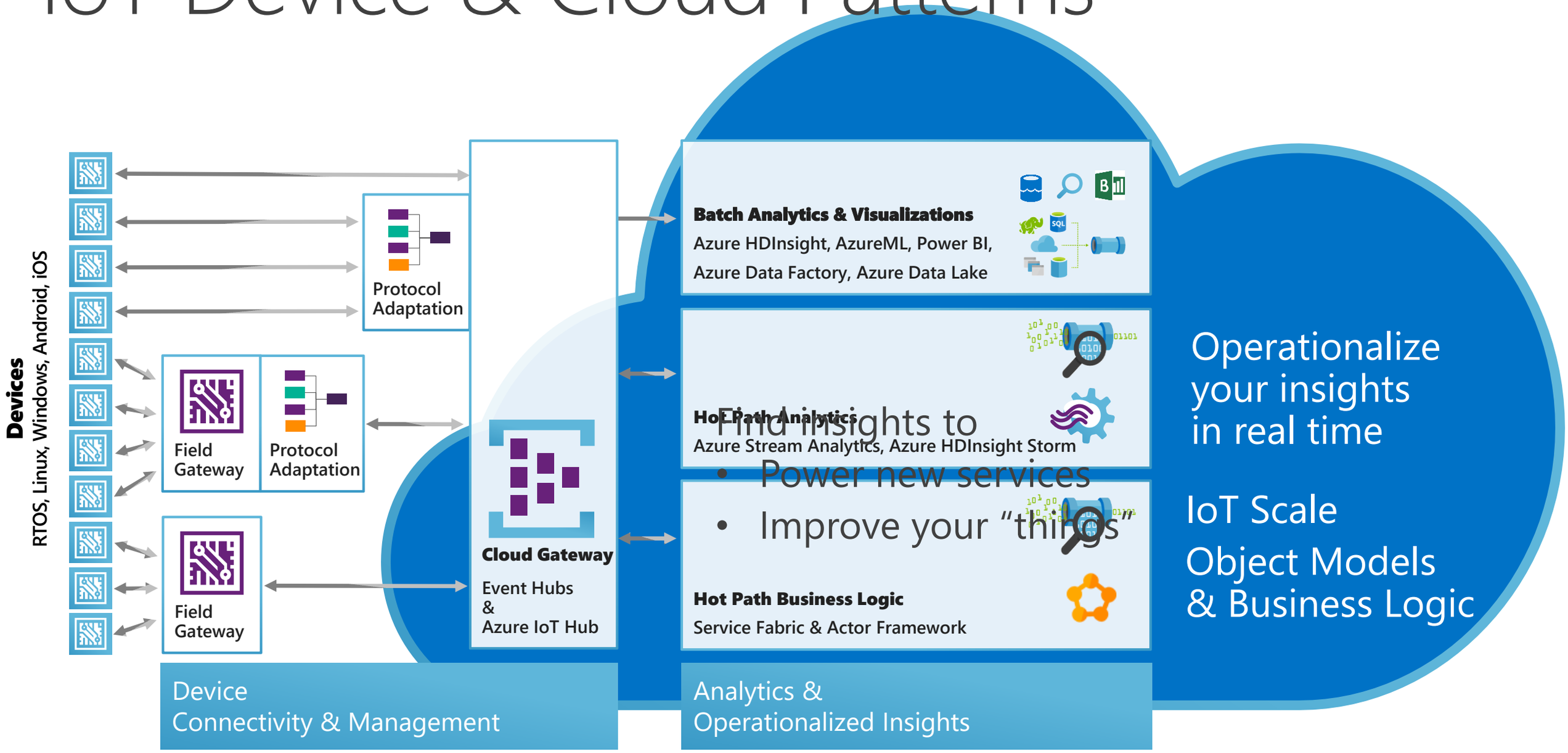
Azure IoT Hub

- Bi-directional device <-> cloud
- Up to 10 million devices
- Telemetry ingestion
- Command & control
- Device registry & identity
- Bulk import/export of device identities
- Device Management
- HTTP/AMQP/AMQP-WS/MQTT
- Extensible protocol support
- Operations Monitoring

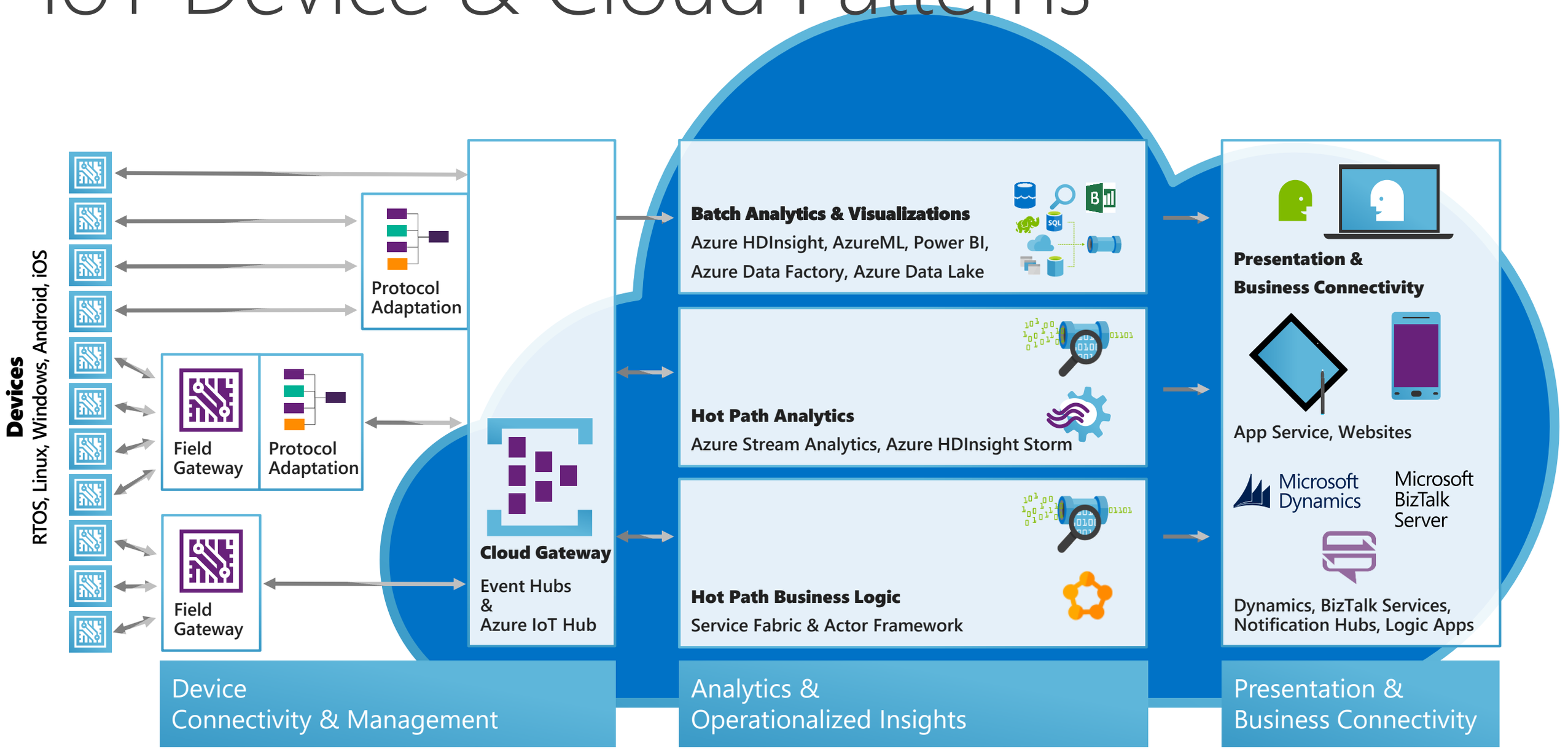
IoT Device & Cloud Patterns



IoT Device & Cloud Patterns

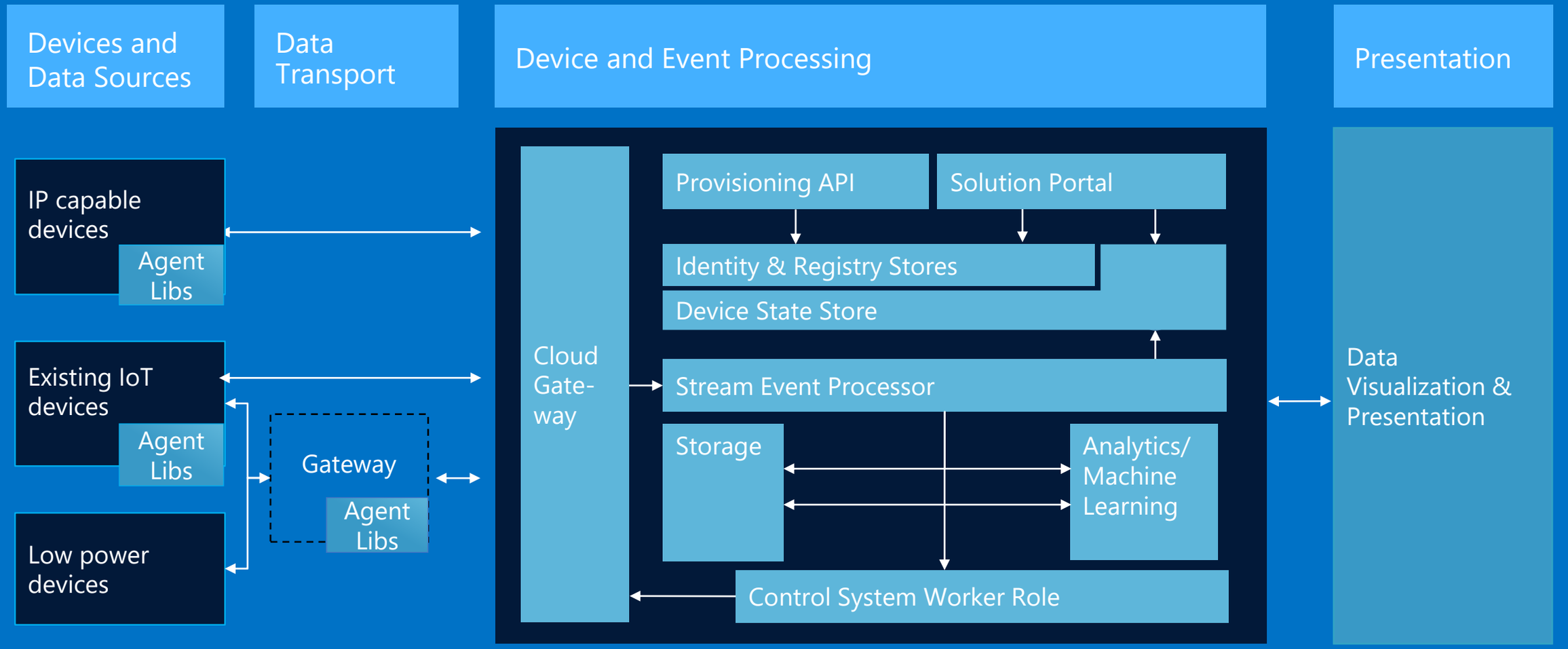


IoT Device & Cloud Patterns



IoT Related Azure Offerings

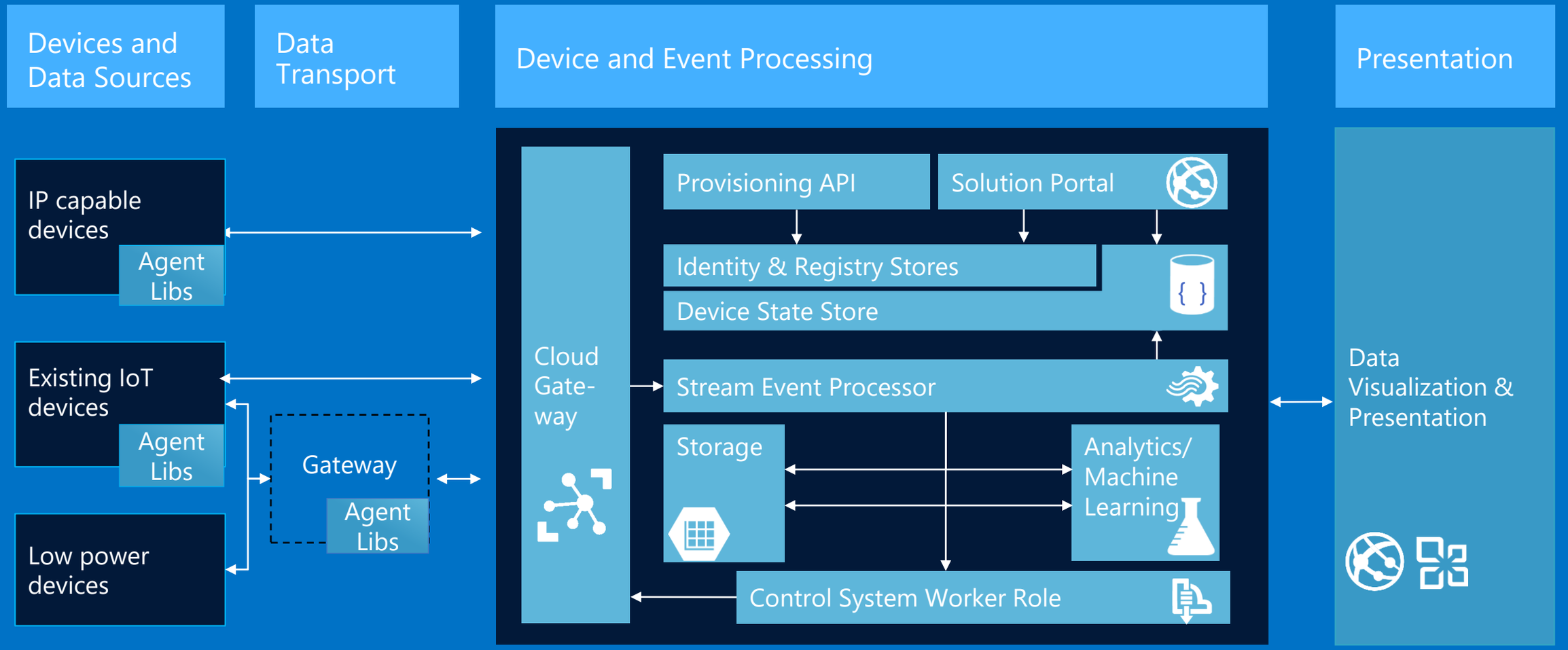
IoT Reference Architecture

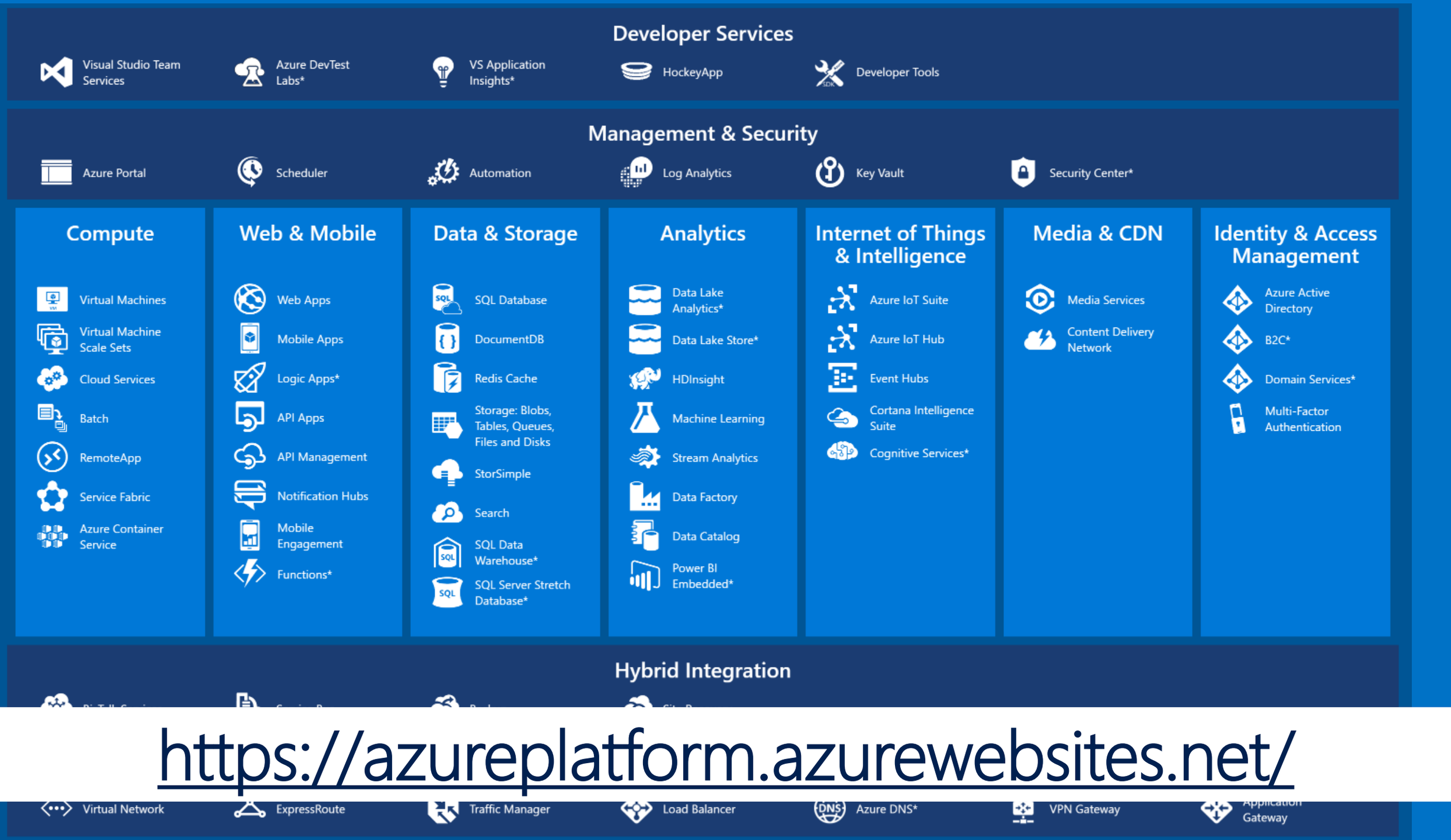


Microsoft Azure IoT services

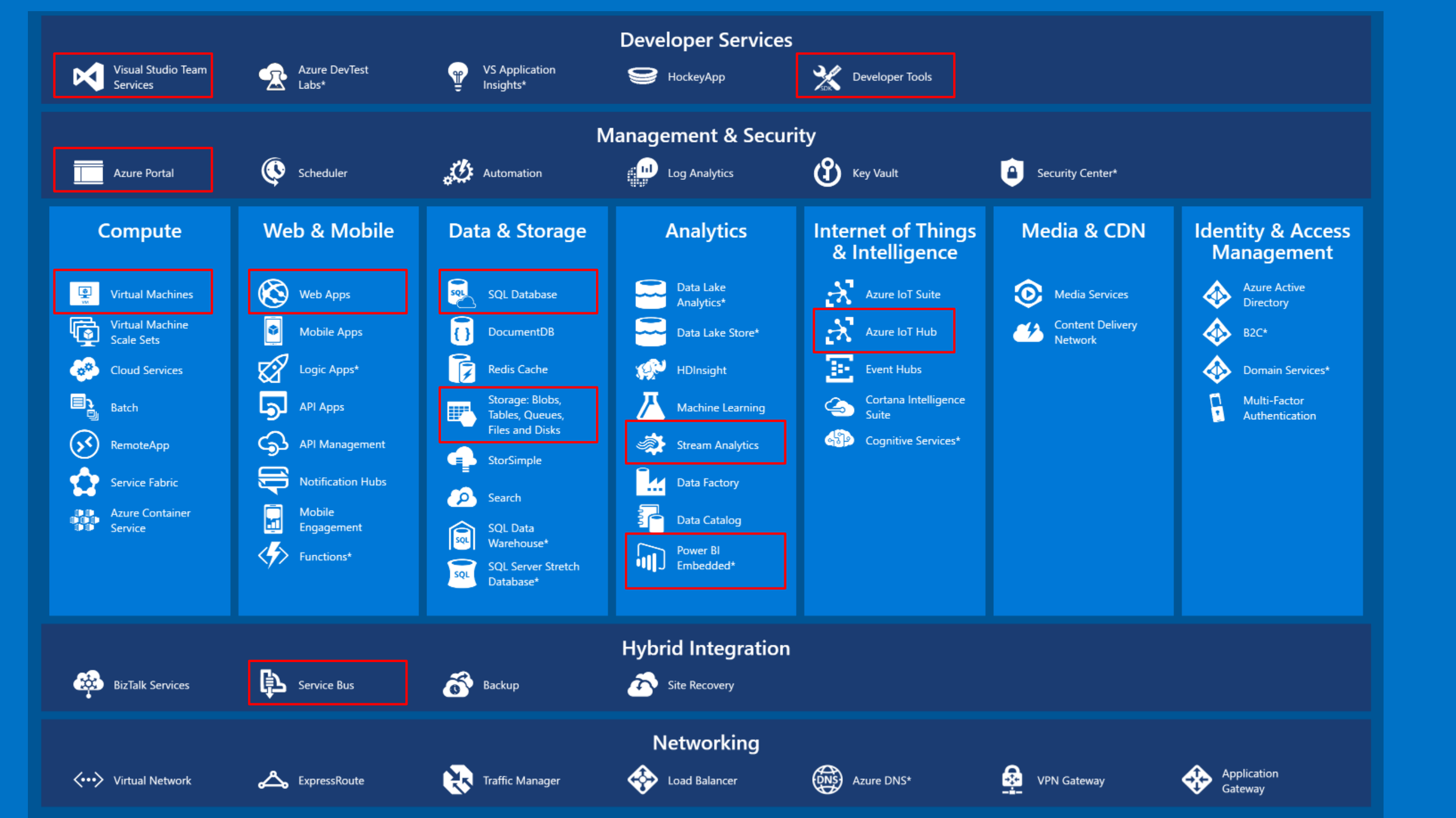
Devices	Device Connectivity	Storage	Analytics	Presentation & Action
	Event Hubs	SQL Database	Machine Learning	App Service
	IoT Hubs	Table/Blob Storage	Stream Analytics	Power BI
	Service Bus	DocumentDB	HDInsight	Notification Hubs
	External Data Sources	External Data Sources	Data Factory	Mobile Services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

Azure IoT Reference Architecture





https://azureplatform.azurewebsites.net/


Developer Services
Visual Studio Team Services
Azure DevTest Labs*
VS Application Insights*
HockeyApp
Developer Tools
Management & Security
Azure Portal
Scheduler
Automation
Log Analytics
Key Vault
Security Center*
Compute
Virtual Machines
Virtual Machine Scale Sets
Cloud Services
Batch
RemoteApp
Service Fabric
Azure Container Service
Web & Mobile
Web Apps
Mobile Apps
Logic Apps*
API Apps
API Management
Notification Hubs
Mobile Engagement
Functions*
Data & Storage
SQL Database
DocumentDB
Redis Cache
Storage: Blobs, Tables, Queues, Files and Disks
StorSimple
Search
SQL Data Warehouse*
SQL Server Stretch Database*
Analytics
Data Lake Analytics*
Data Lake Store*
HDInsight
Machine Learning
Stream Analytics
Data Factory
Data Catalog
Power BI Embedded*
Internet of Things & Intelligence
Azure IoT Suite
Azure IoT Hub
Event Hubs
Cortana Intelligence Suite
Cognitive Services*
Media & CDN
Media Services
Content Delivery Network
Identity & Access Management
Azure Active Directory
B2C*
Domain Services*
Multi-Factor Authentication
Hybrid Integration
BizTalk Services
Service Bus
Backup
Site Recovery
Networking
Virtual Network
ExpressRoute
Traffic Manager
Load Balancer
Azure DNS*
VPN Gateway
Application Gateway