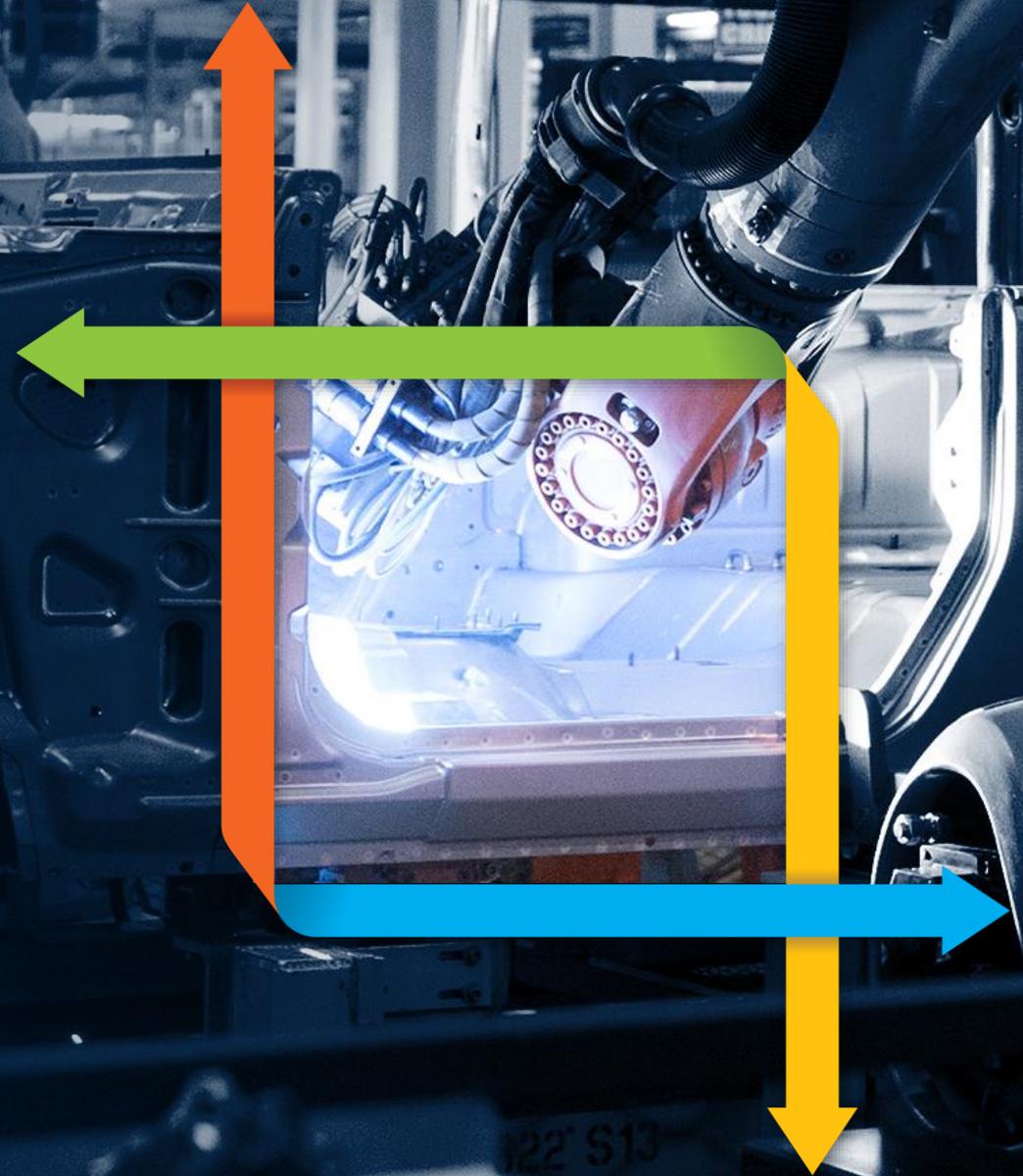


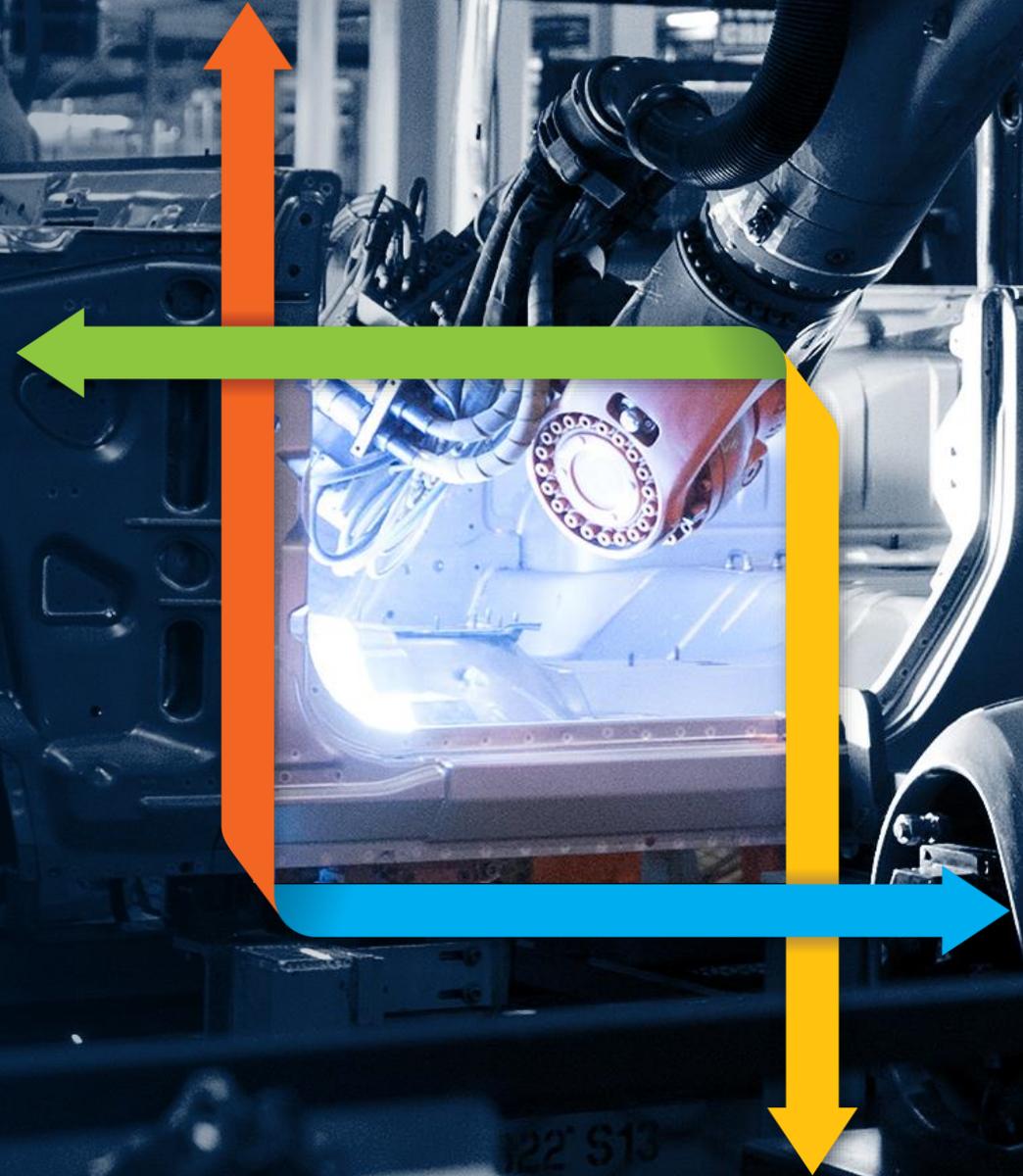


# Enabling Manufacturing Transformation in a Connected World

John Shewchuk  
Technical Fellow  
DX



# Internet of Things





# What are "your things"?

You have THINGS...



Plant Floor Things

Back Office Things

Supply Chain Things



Cloud & Network Enabled Infrastructure



Analytic & Business Intelligence Tools

You have DATA...



Transactional Data



ERP Data



CRM Data



PLC Data



Social Data



Public Data

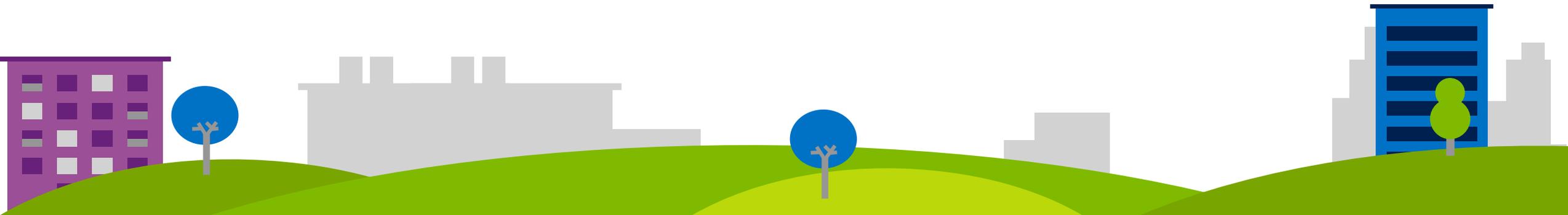
These are things that empower and enable your people



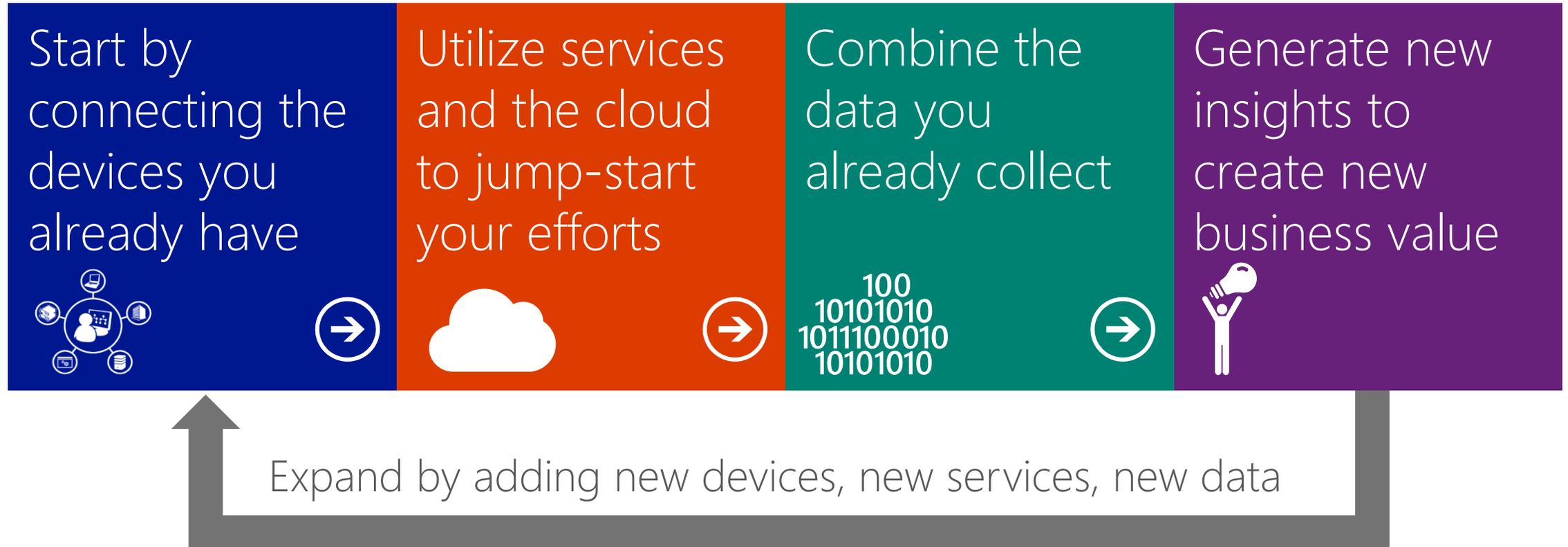
They allow you to connect with customers and business partners



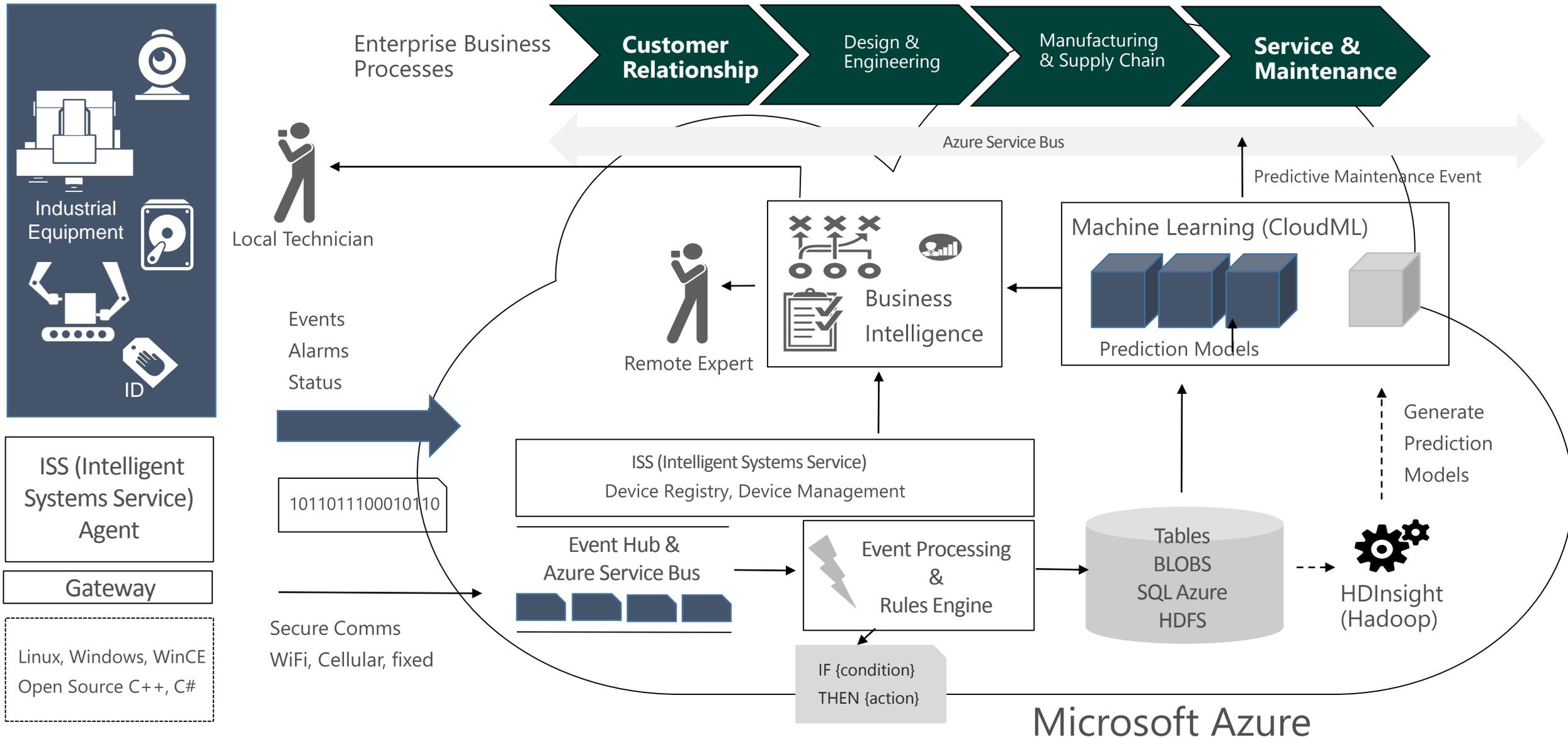
They are critical components that help power your business



# The right strategy



# IoT Services Architecture & Platform Components



# Krones Industrie 4.0: *"Building a Machine-Cloud for the Beverage Industry"*

 KRONES

# CeBIT Show Case: Production of the Future

**KRONES AG** is the market leader in the fields of process, filling and packaging technology. *Every fourth bottle world-wide is processed by a KRONES machine.*



**KRONES presented Industrie 4.0 production and service scenarios on the Microsoft IoT platform at CeBIT 2014**

# Building a Machine-Cloud for the Beverage Industry



Intelligent Systems in **Manufacturing**



Krones - a manufacturer of industrial equipment for the beverage industry - presented together with Microsoft how M2M real-time communication between Enduser and OEM could look like.

KRONES AG

## CHALLENGE

- No direct connection with majority of installed base which leads to a reactive customer service from the OEM with relatively inefficient resolution processes
- Equipment Maintenance schedules are based on defined time-intervals which is the reason that services are performed too often, too early or too late.
- Service costs grow linear to the number of installed machines. Similar learning curves like in production for service operation necessary.

## SOLUTIONS

- Monitoring – visualizing real time data
- Reporting – Analysing and visualizing historical data
- Prediction – ... predicted events
- Alarming – sending information to people
- Guidance – realtime communication
- Repair/Parametrisierung – sending controls to the machine
- Portal – information & collaboration platform
- Mobility – mobile access from anywhere
- Integration – Integration with other Enterprise IT Systems

## BENEFITS

- Optimise cost structure for service organization through new capabilities like e.g. Remote Monitoring and Reporting, Remote Support and Diagnostic
- Provide new consulting services or business process outsourcing
- Deepen customer relationship management and improve customer loyalty
- Improve overall equipment, machine and device performance and safety



# Showcase Overview



KRONES – Global Machine Cloud



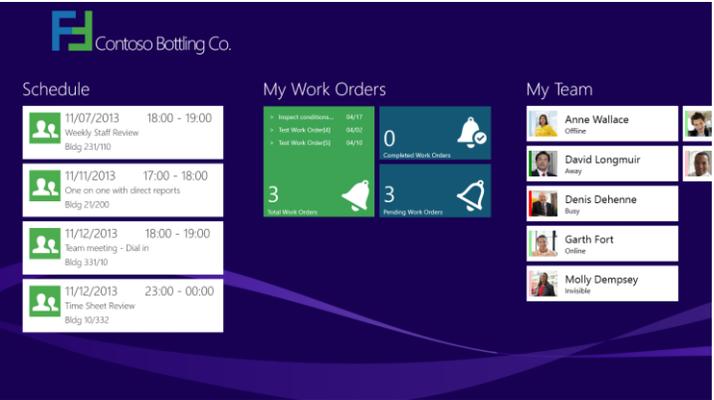
KRONES – Local Machine Emulator



Customer - Global Operations Dashboard



Customer - Plant Supervisor Cockpit



Customer - Mobile Maintenance Dashboard

# MESHSYSTEMS™

Deliver solutions to Energy, Commercial/Retail, and Environmental verticals.

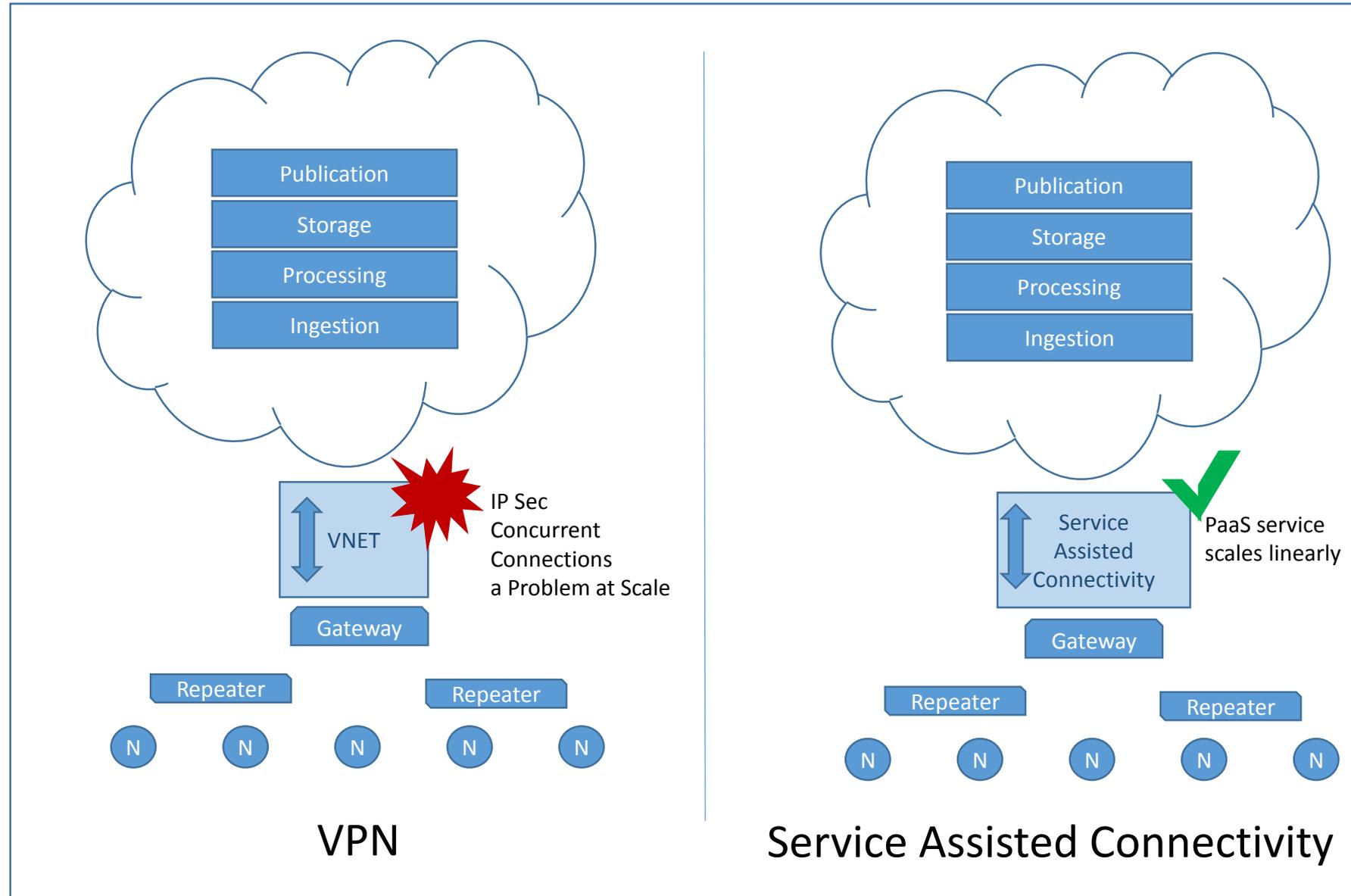
Scenarios include

- Smart Energy
- Interactive Merchandise
- Agriculture and Pest Monitoring
- Asset Monitoring

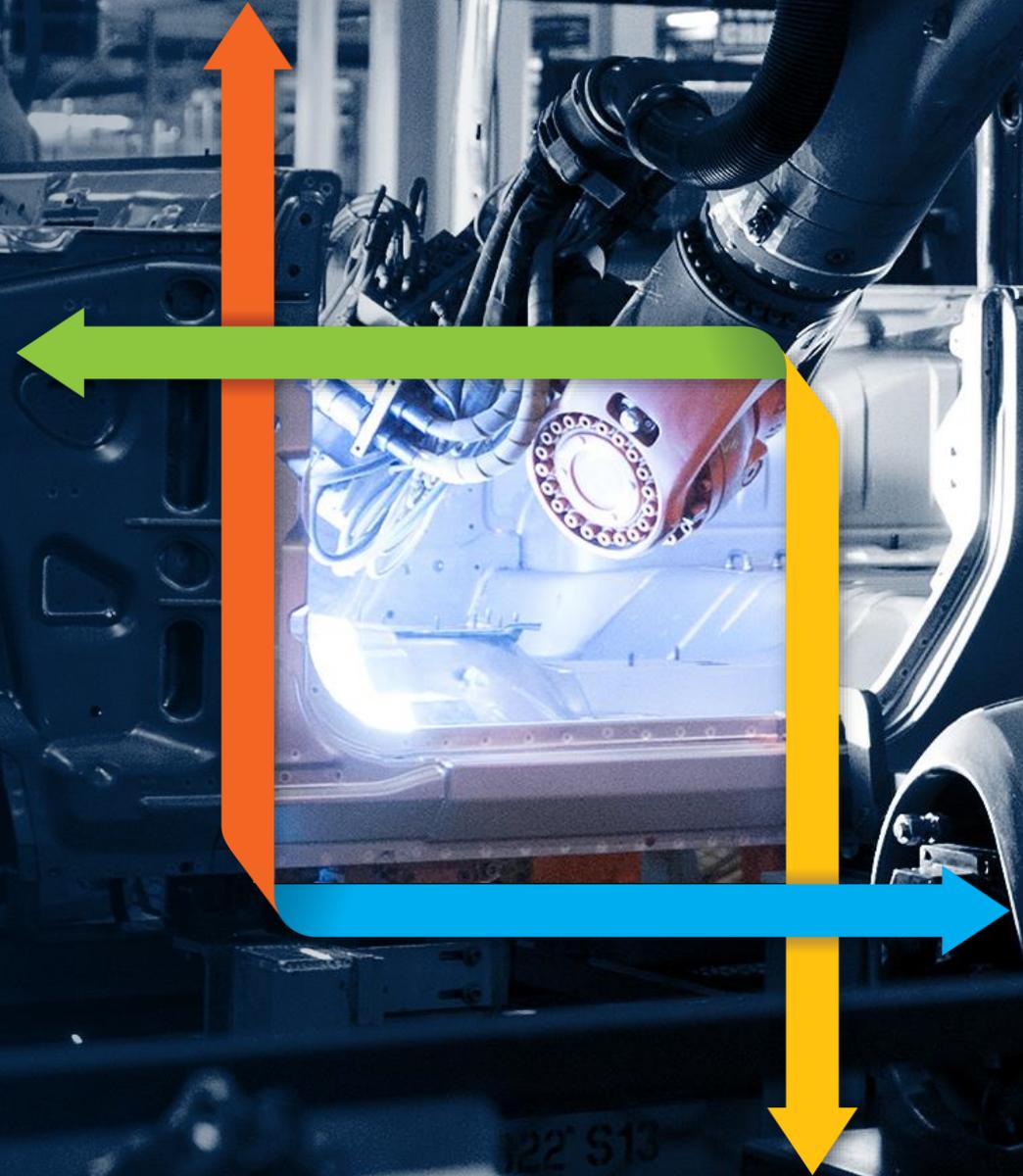
Scale to 2M+ devices/year

Concurrent connections with IP Sec a challenge

Service Assisted Gateway helps them scale linearly.



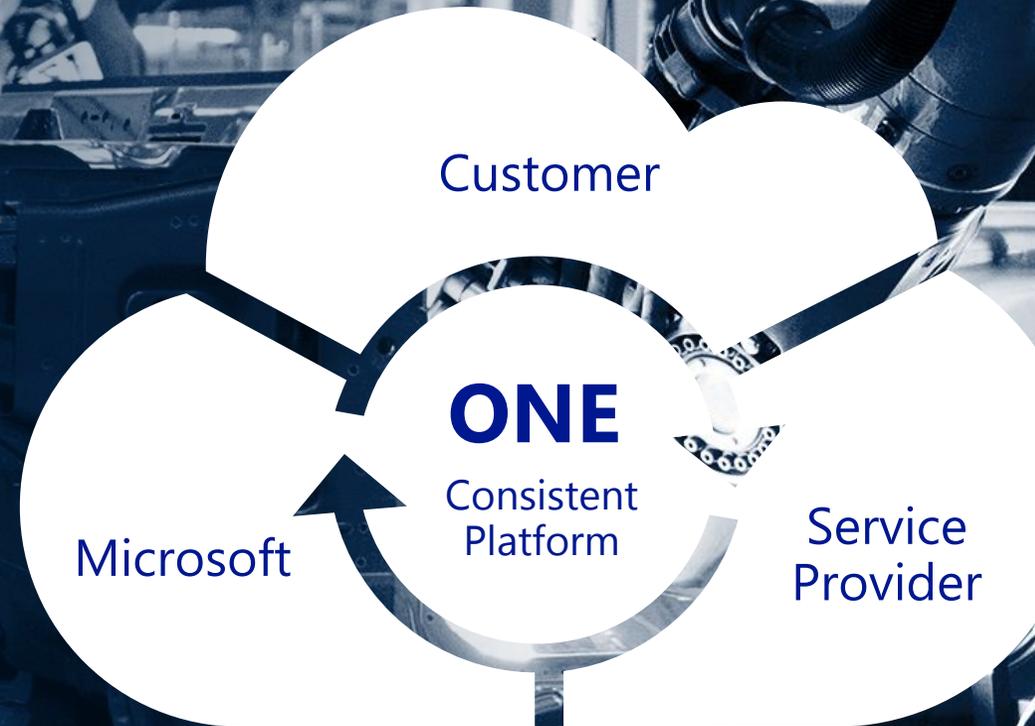
Cloud OS



# Cloud OS Vision

Microsoft's vision of the unified platform for modern business

- transform the datacenter
- unlock insights on any data
- empower people-centric IT
- enable modern business apps
- create the Internet of Your Things



Development

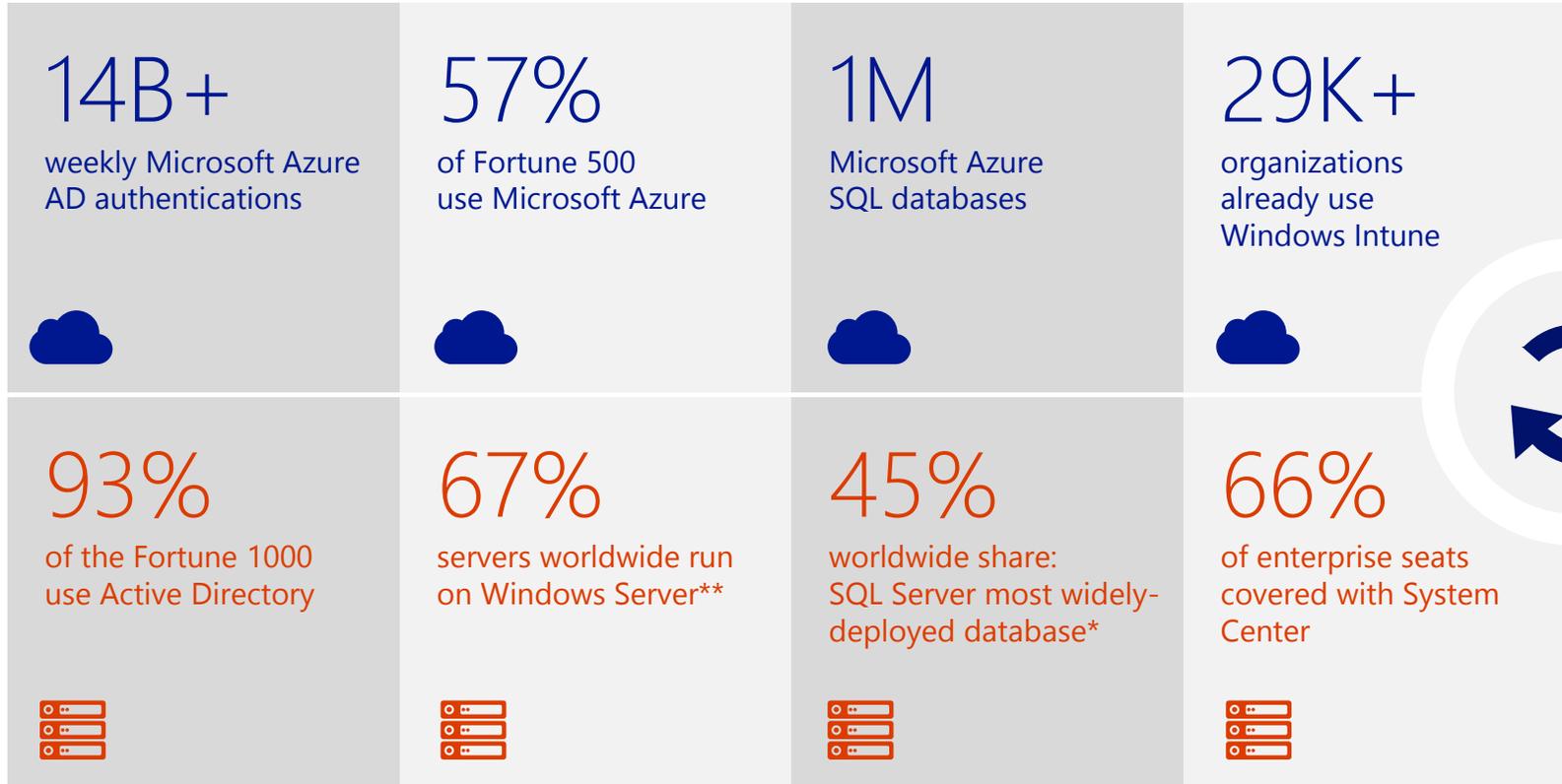
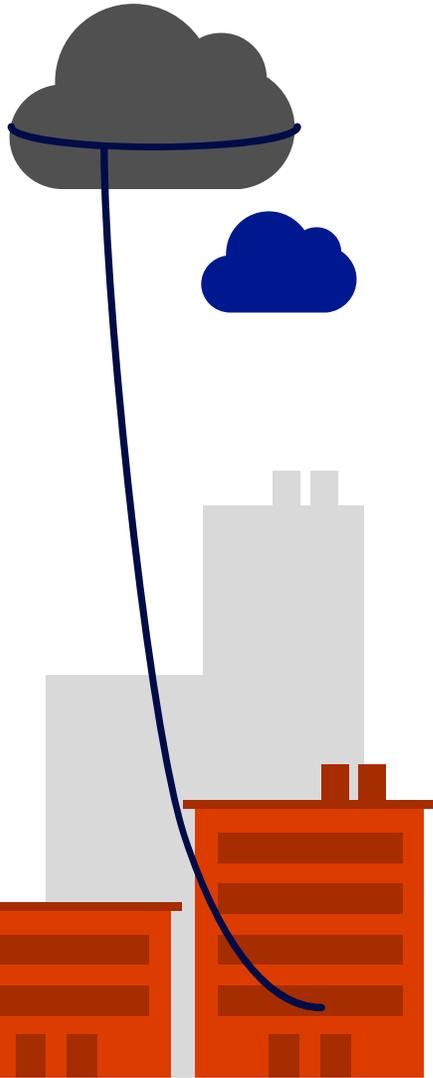
Management

Identity

Data

Virtualization

# Innovation at global scale



Microsoft has one of the two largest cloud infrastructures on earth

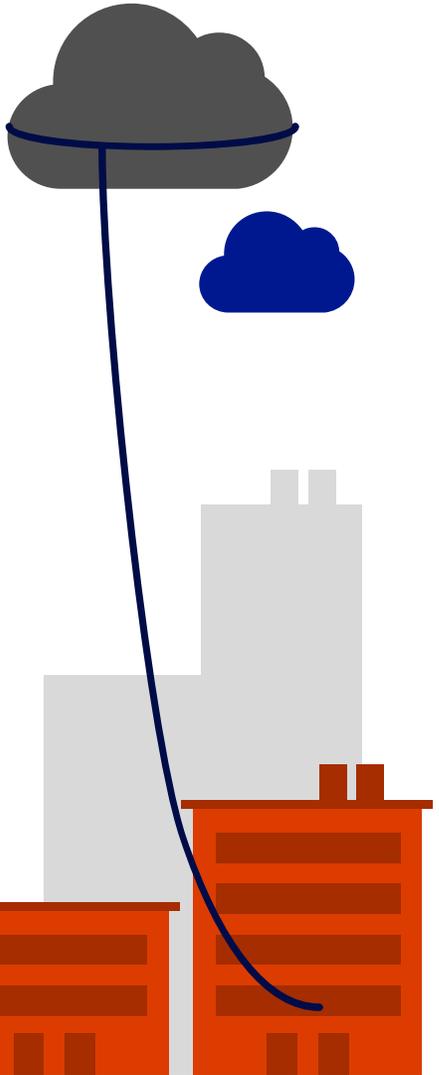
20T objects stored in Microsoft Azure, which runs on Windows Server Hyper-V

Bing runs on Windows Server 7B+ global queries per month

1B+ Office users, Office 365 is our fastest-growing commercial product ever

\* IDC Server Workloads Study 2013 \*\* IDC 2013 WW Server Tracker

# Trusted, open, and flexible



## Trusted

- ➔ Security at the core
- ➔ Privacy by design
- ➔ Compliance and reliability commitments

1B+

customers use Microsoft Cloud in 20M businesses from 89+ countries

200+

online services delivered 24x7x365

\$15B+

investment in building Microsoft cloud infrastructure

## Open & Flexible

- ➔ Consistence experiences across devices

Support for Windows, iOS and Android

Single sign-on to 1,400+ SaaS applications

- ➔ All data, any size, anywhere

Process big data on the platform you choose

Store, access, combine, and analyze data on-premises to cloud, relational & non-relational

- ➔ Extensible app development

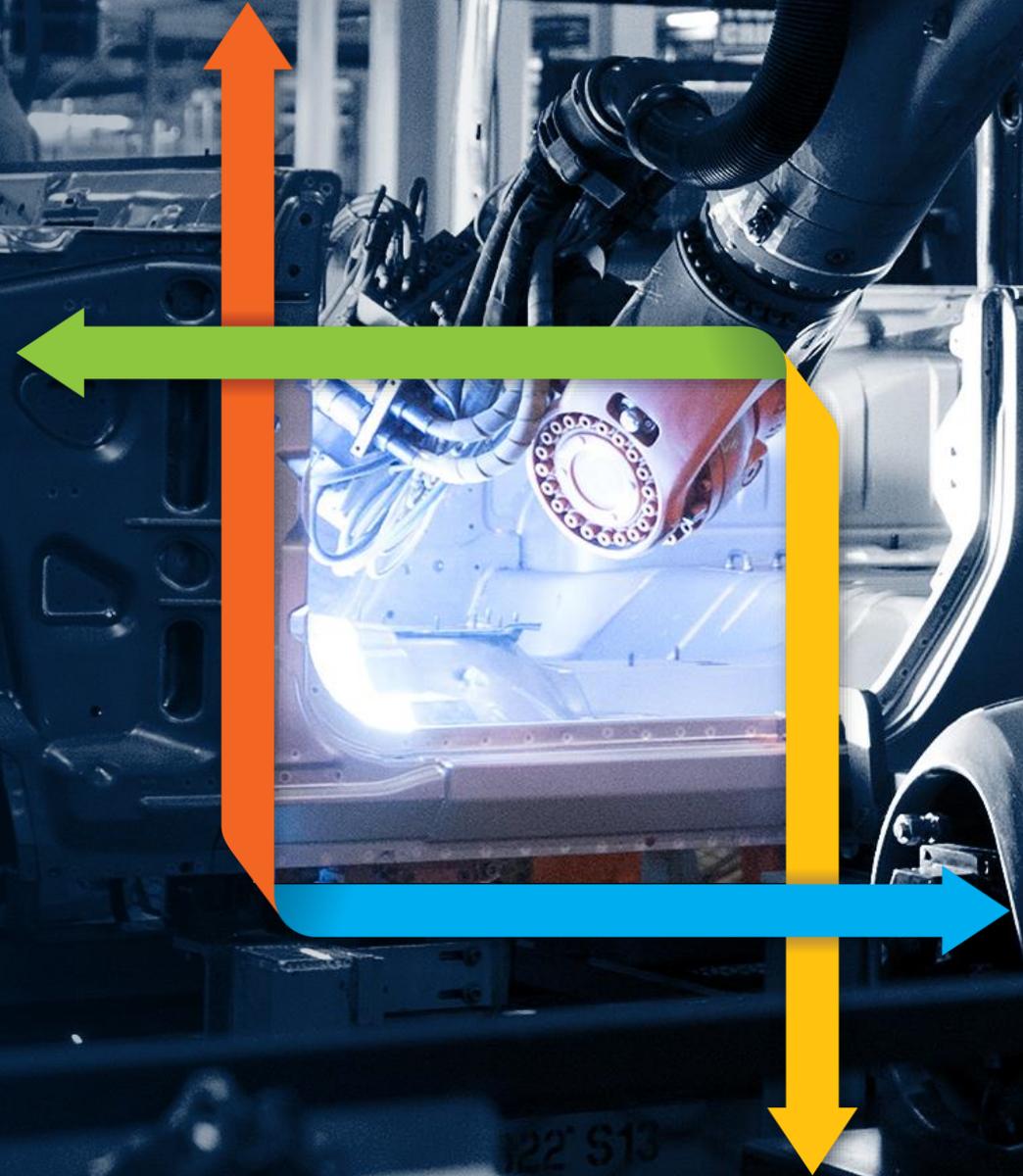
Use language, cloud services, and framework you prefer

Collaborate, plan, develop, test, deploy, and monitor apps across environments and devices

- ➔ Flexible infrastructure

Run, manage, and monitor heterogeneous IT environment

# Azure IoT Services



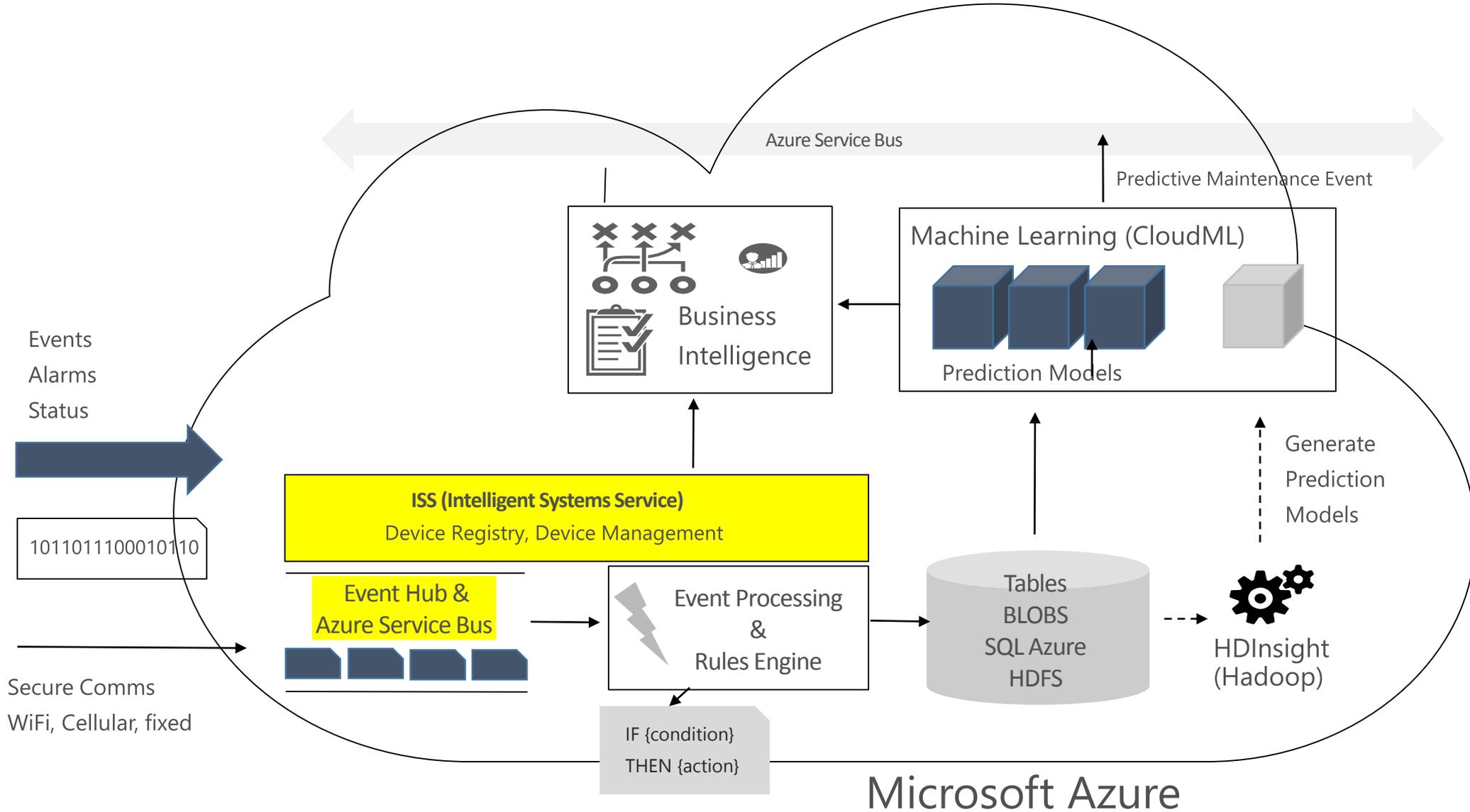
# IoT Services



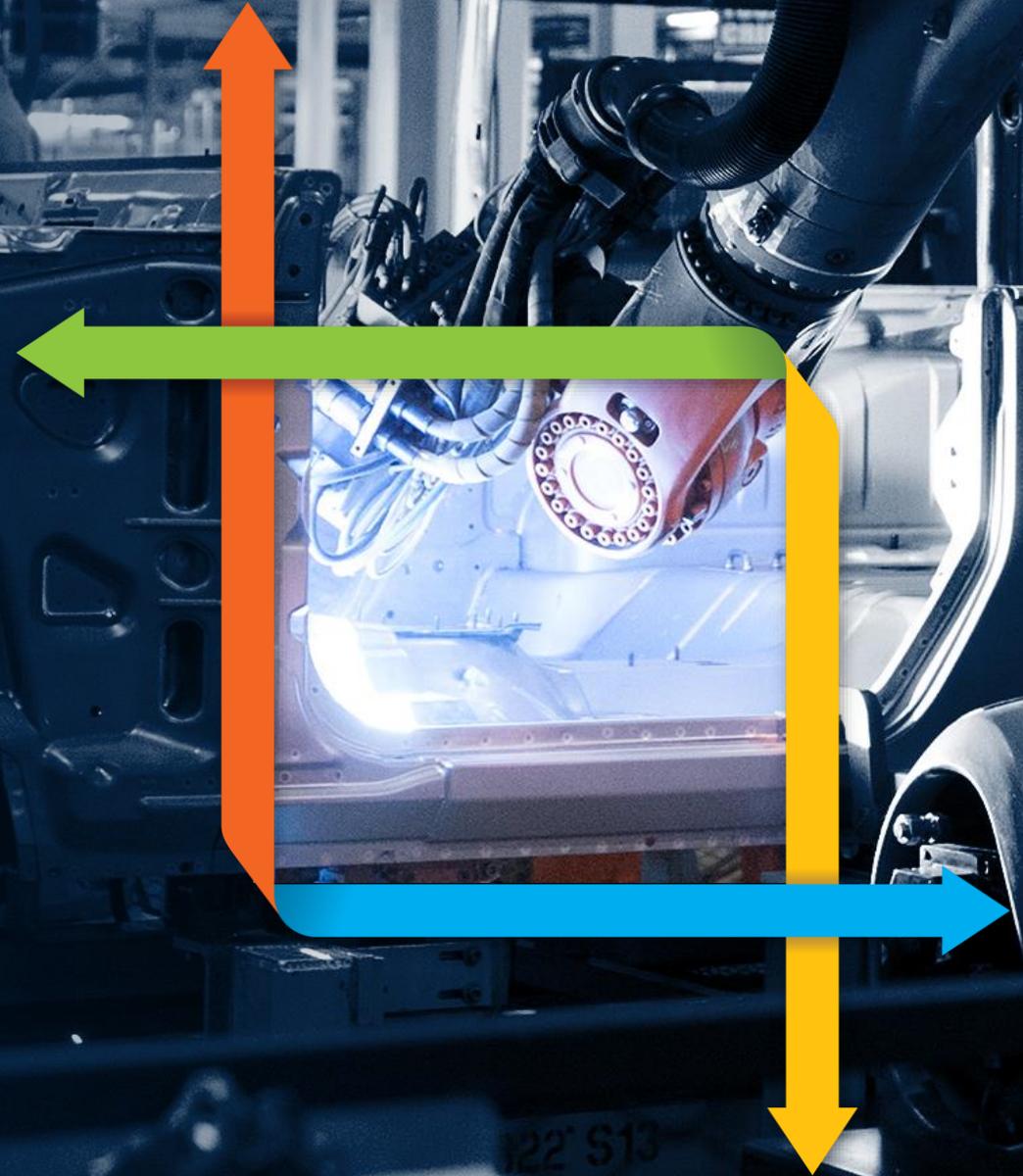
ISS (Intelligent Systems Service) Agent

Gateway

Linux, Windows, WinCE  
Open Source C++, C#



# Azure Machine Learning



# Data Analytics

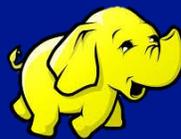
3Vs: Volume, Variety, Velocity

Structured



- SQL Server
- SQL Database

Semi structured



- HDInsight
- Map&Reduce

Data Streams

- Azure NRT

Azure Machine Learning

- Predictive Maintenance, Early-Fault-Detection, Idle Prediction

# What is Machine Learning?

Computing systems that  
improve with experience

*“Delivering on one of the old dreams  
of Microsoft co-founder Bill Gates:  
Computers that can see, hear  
and understand.”*

**John Platt**

Distinguished scientist at  
Microsoft Research

# Predictive Analytics

Predicting future performance from historical data

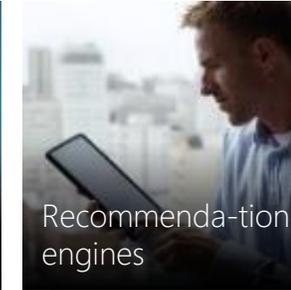
Predictive analytics should address the likelihood of something happening in the future, even if it is just an instant later...



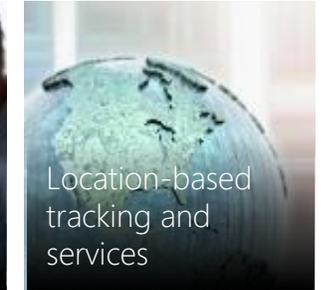
Churn analysis



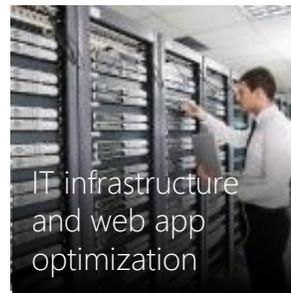
Social network analysis



Recommendation engines



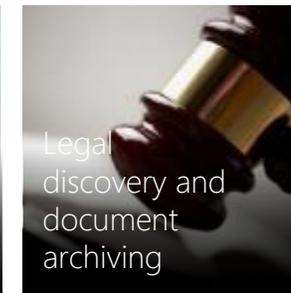
Location-based tracking and services



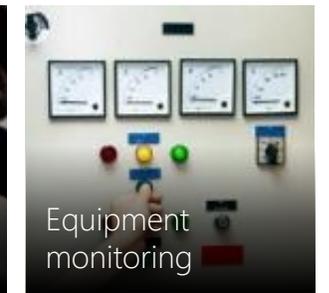
IT infrastructure and web app optimization



Weather forecasting for business planning



Legal discovery and document archiving



Equipment monitoring



Advertising analysis



Pricing analysis



Fraud detection



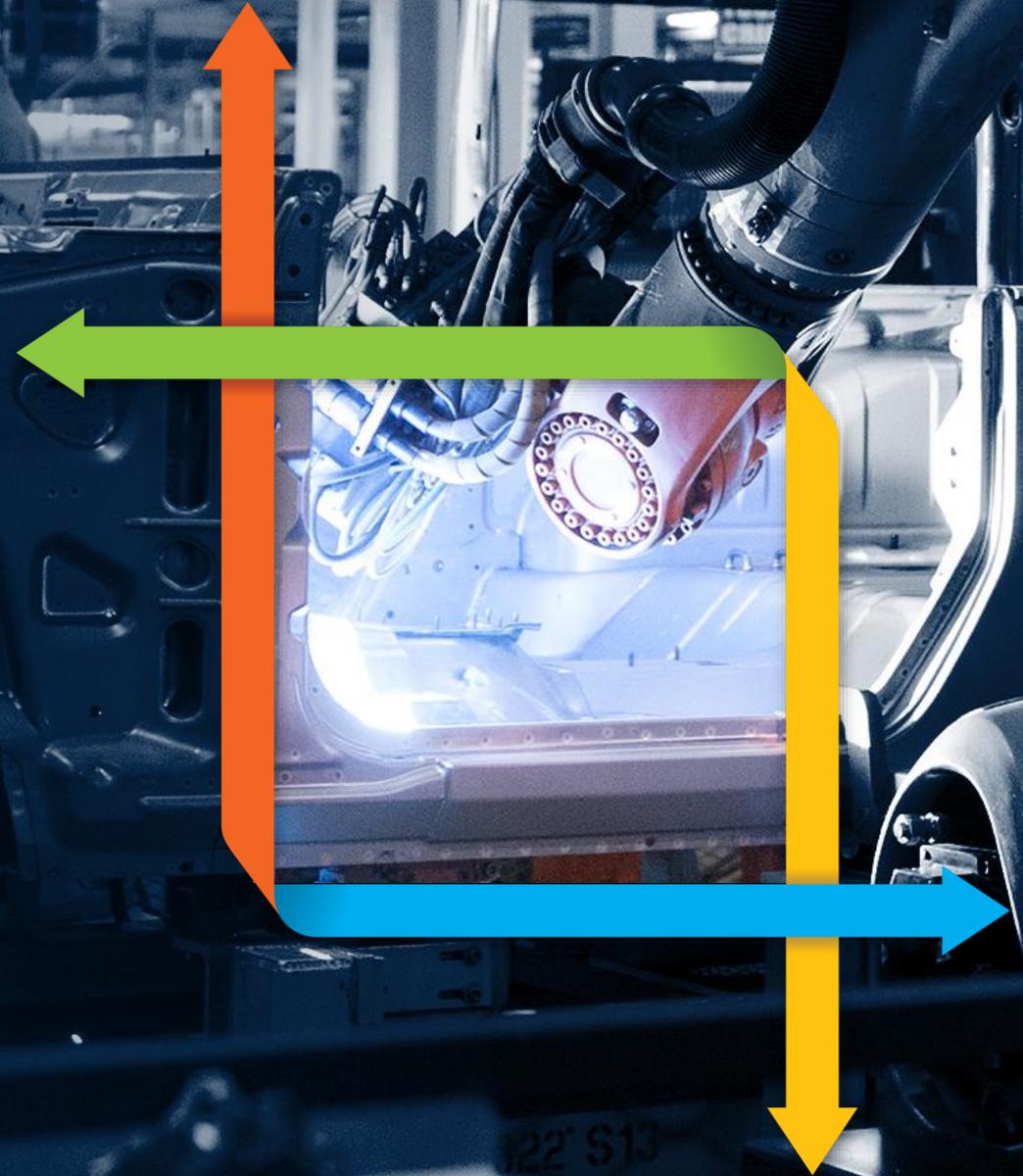
Personalized Insurance

# Predictive Analytics is key Big Data capability

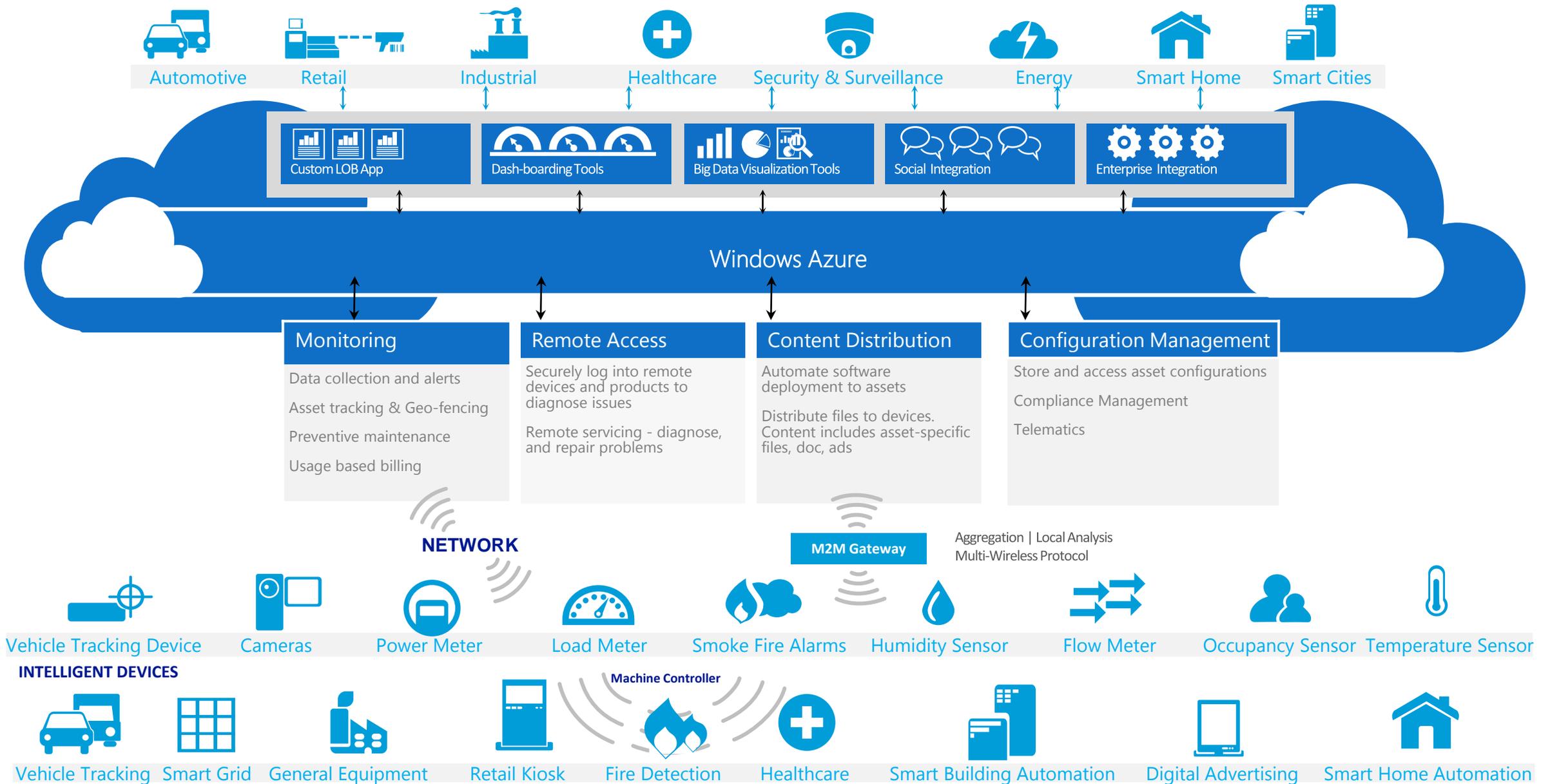
delivered  
on-premises, in  
cloud, or both  
(hybrid)



Wrap up



# Microsoft IoT





[www.InternetofYourThings.com](http://www.InternetofYourThings.com)

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