

# **THE OPEN RETAIL INITIATIVE**

## **Partner Roadshow | Chicago**

**June 24, 2019**

# Agenda

- Welcome
- The Reality Discussion and Why this Initiative
- Guest Presenters
  - Jason Shephard – Dell
  - Kennedy Pereira – AT&T
  - Keith Steele - IOTech
- General Panel
- Wrap-up

# How do I keep my stores relevant?

Pillars of the in-store experience:



**IMMERSIVE AND  
ENGAGING**



**CURATED AND  
STOCKED**



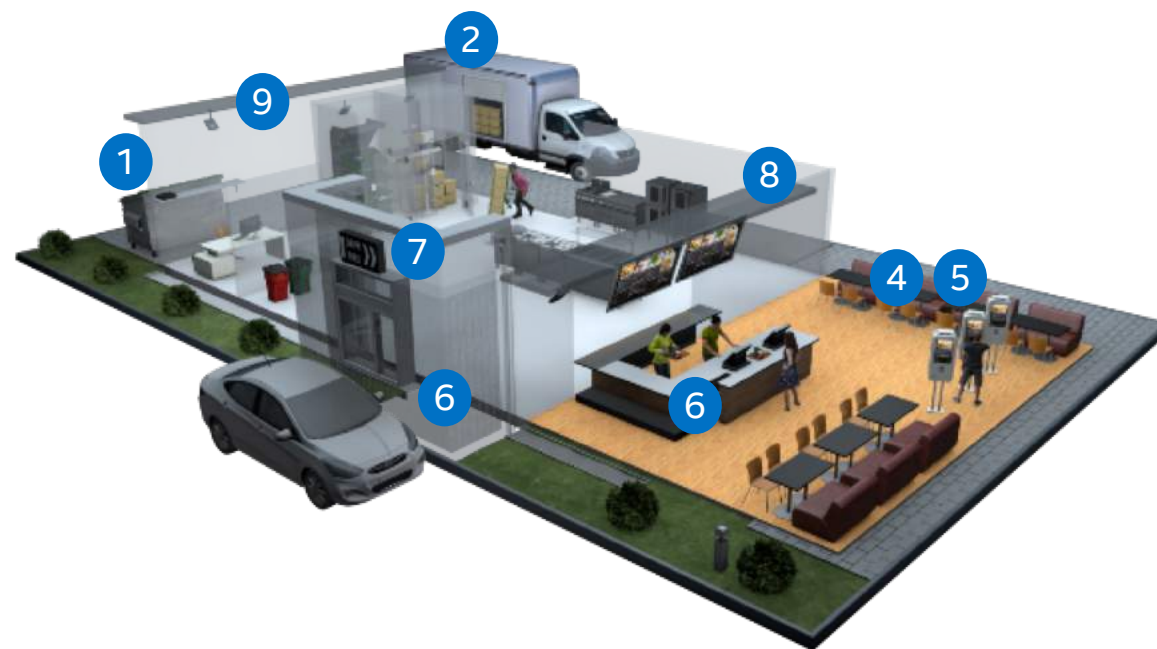
**CONVENIENT AND  
FRICTIONLESS**



**TIMELY AND  
INSIGHTFUL SERVICE**

# Modern Retailing

Retailers want to leverage technologies such as artificial intelligence to improve the experience with data.



- 1 RFID Real Time Inventory Management
- 2 Algorithmic Merchandise Optimization
- 3 Electronic Shelf Labels

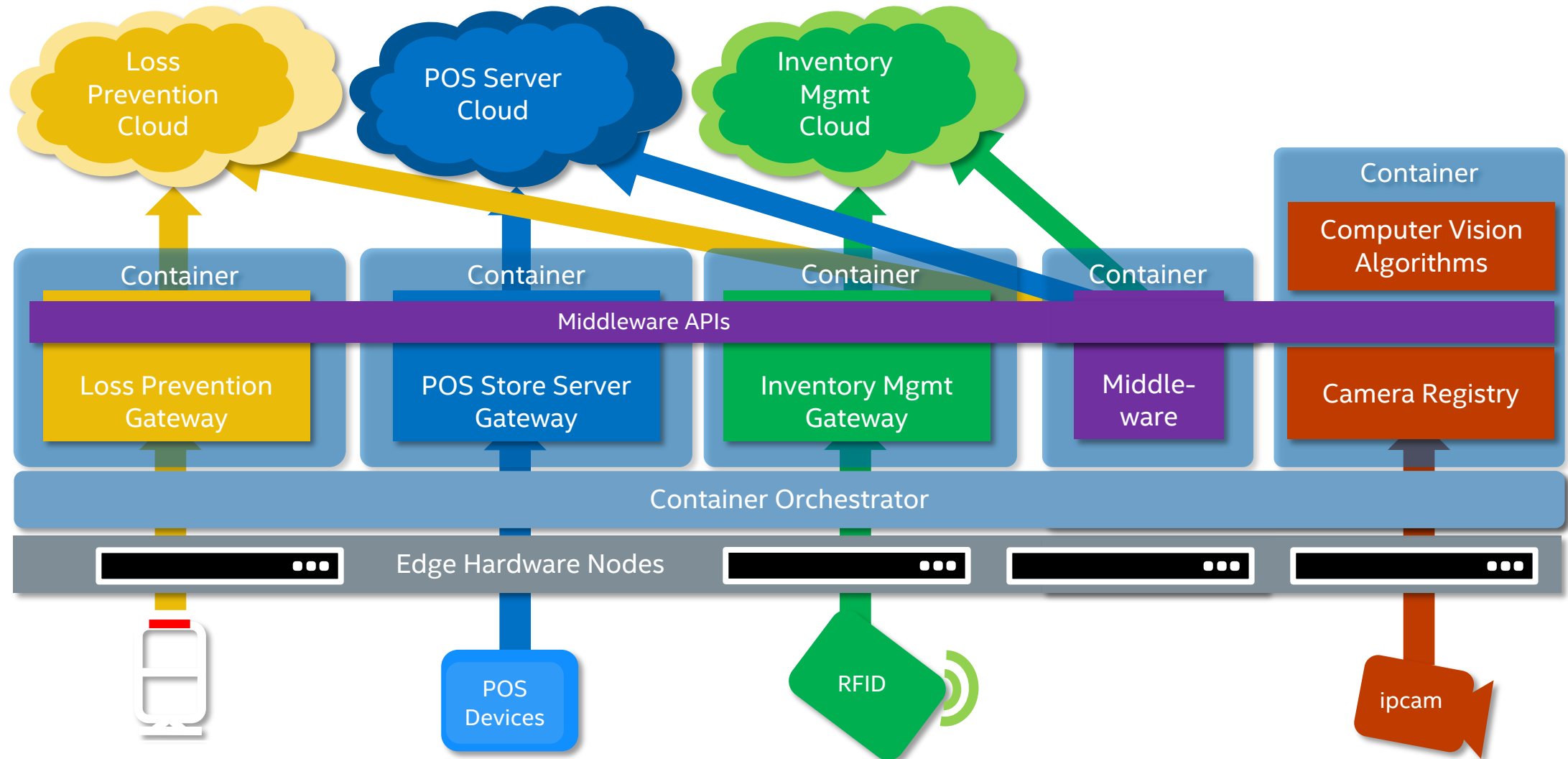
- 4 Personalized Product Content
- 5 Interactive Kiosk w/CV Sentiment Analysis
- 6 Mobile Checkout/Self Checkout, Voice-Enabled Ordering and Mobile Payment

- 7 Store Traffic Analysis
- 8 Loss Prevention Video Analytics
- 9 Workforce Analytics



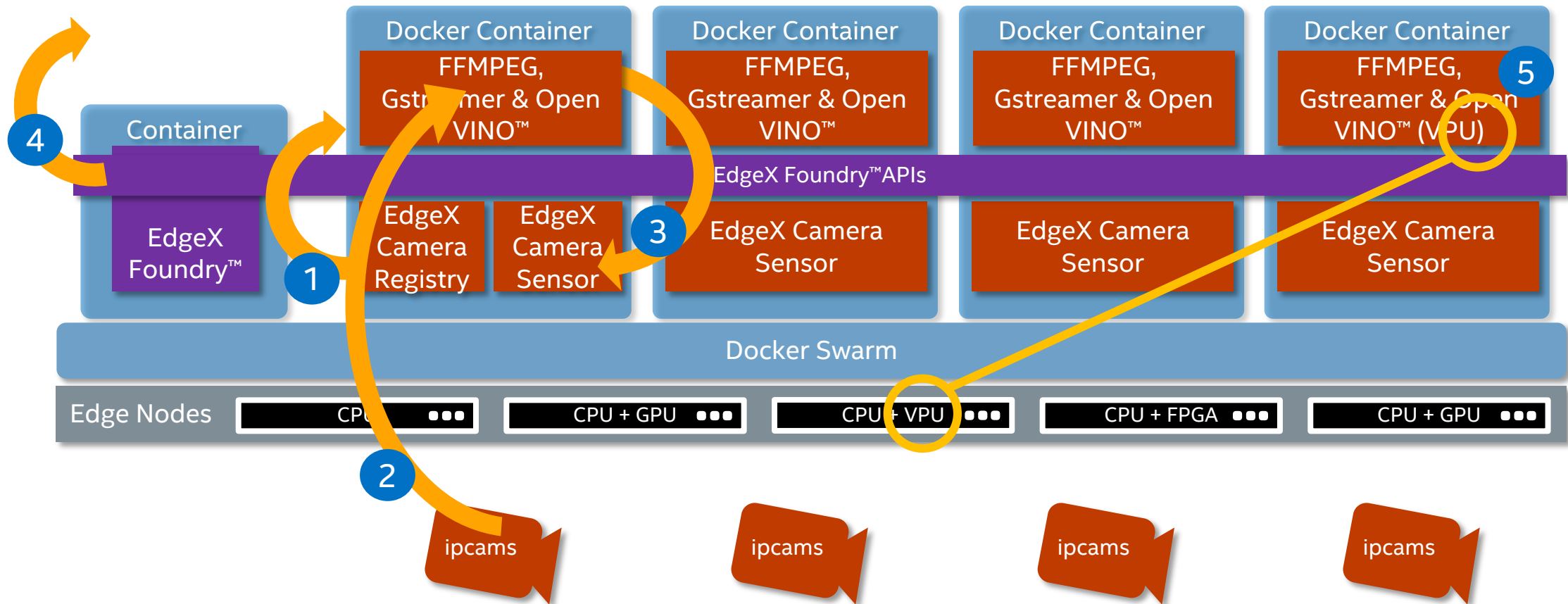


# Past Present and Future



# Use Case 1: Computer Vision Based Vending

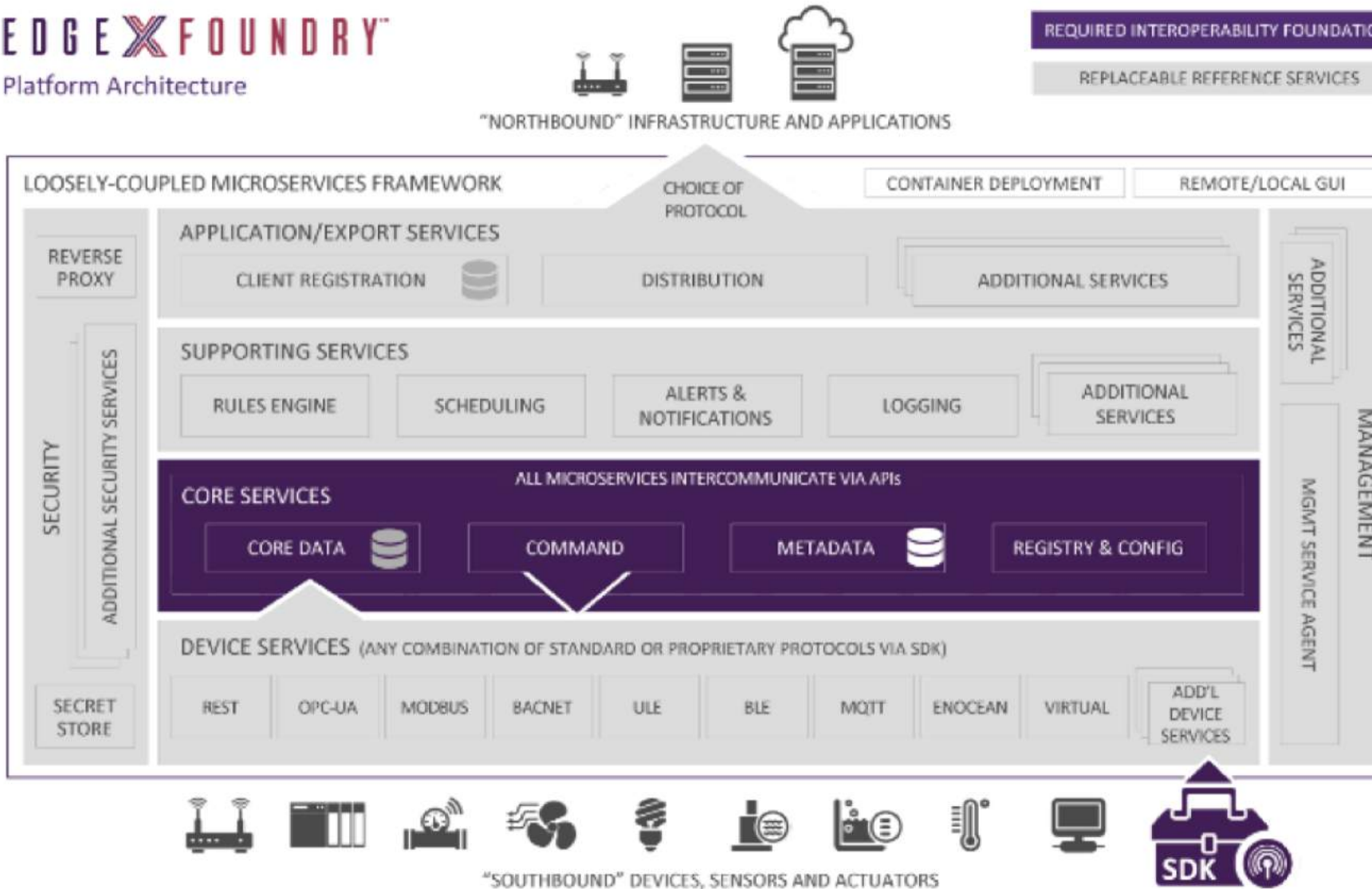
- 1 Gstreamer pipelines are spun up based on camera tags
- 2 IP cameras stream data to Gstreamer pipelines
- 3 Inference events are published to EdgeX Foundry™
- 4 EdgeX makes inference available for apps and export
- 5 Containers utilize accelerators when available



# Basics of EdgeX Foundry™

EDGE X FOUNDRY™

Platform Architecture

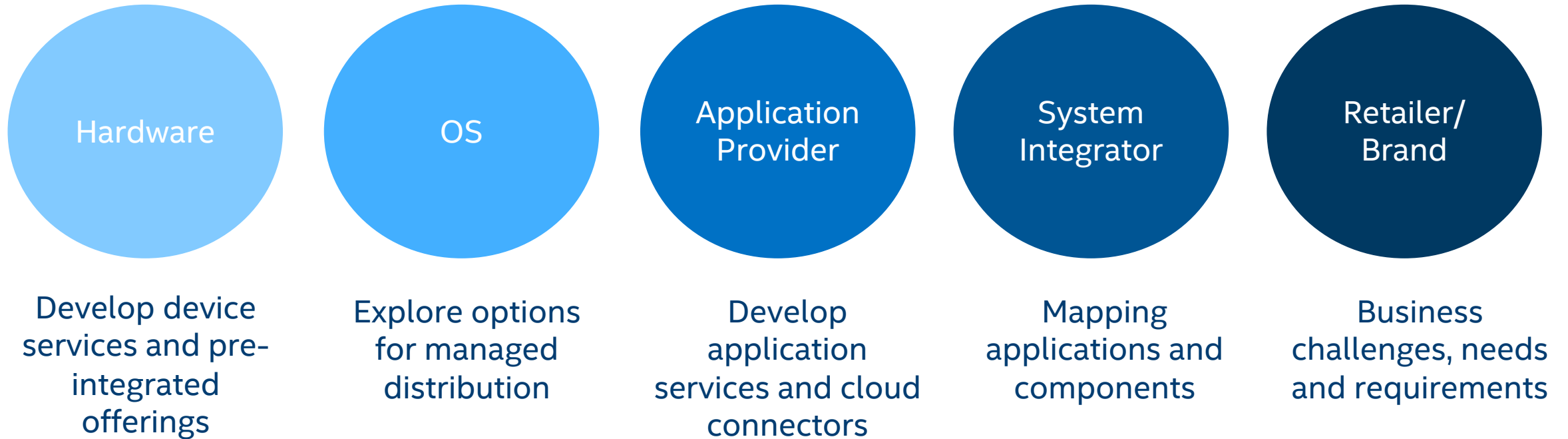


- ~80 sponsoring companies & contributors from around the world
- Favorably licensed for integrations with proprietary software
- More than pub/sub: manage device configurations, caching, protocol adapters (southbound and northbound)
- We see it as a crucial element to bind diverse edge workloads
- Upgrading from IOT Gateway to edge integration platform

# Why EdgeX Foundry?

- **Truly open, full transparency**
- **Long-term durability** to address scale and growth needs
- **EdgeX Foundry momentum continues** for IoT interoperability across multiple industries
- **Linux Foundation mindshare and infrastructure** – largest and most pervasive open source software project
- **Marathon vs. Short Sprint** – learn, leverage and lead

# Everyone in the Ecosystem is Valuable



# How We Make An Impact

## Commit

to the initiative

- Join and follow the progress
- Promote to your networks

## Collaborate

on the Commerce Project

- Attend Commerce Project meetings
- Collaborate on project deliverables
- Promote to your networks

1. Code for the greater good
2. Use cases, components (and code)

## Contribute

to EdgeX Foundry & LF Edge

- Become an EdgeX Foundry member and vote to shape standards
- On behalf of your company, contribute code and/or developer resources
- Promote to your networks

1. Code for the greater good
2. Use cases, components (and code)
3. Influence industry standards aligned to EdgeX

Reference Ready Kits (RRK) and Market Ready Solutions (MRS)

# NEXT STEPS FOR THE COMMERCE PROJECT

- 1) Sign up for a free Linux Foundation account
  - Create an account at the Linux Foundation
- 2) Subscribe to the Commerce Project mailing list
  - Enroll for the mailing list and calendar subscriptions
- 3) Join the conversation

We'll send a follow up email with instructions and links for the above actions



# Enable Retail Optimization with EdgeX and ORI Collaboration

*... and Scale to the Grail*

**Jason Shepherd**

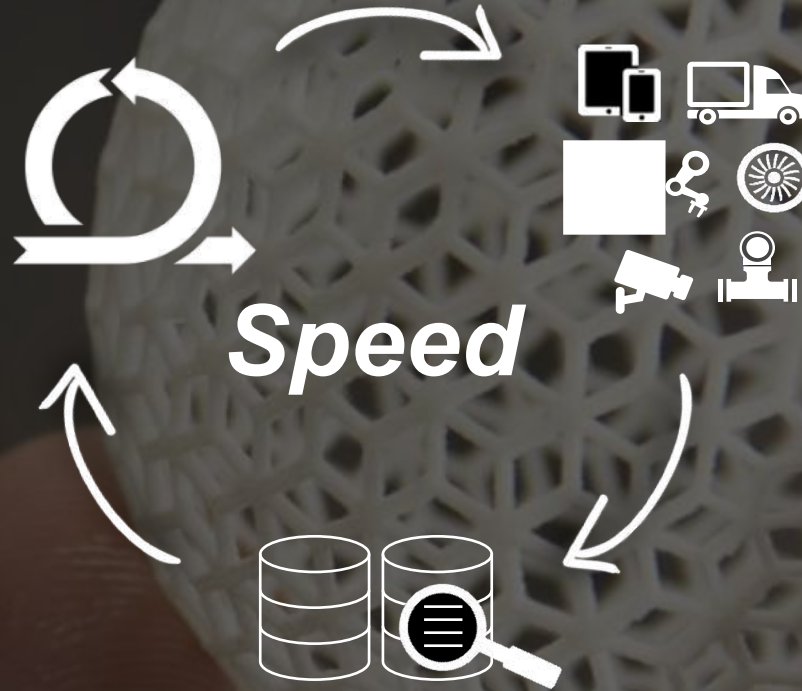
CTO, IoT and Edge, Dell Technologies

@defshepherd

**DELL**Technologies

# Digital transformation requires an iterative model of development

**Agile Development With  
Continuous Delivery**  
Improve Service &  
Experience



**Deploy New Apps  
& Smart Devices**  
Drive Customer  
Engagement

**Data Analytics**  
Deliver New Insights





It's about outcomes.

Engine  
Thrust

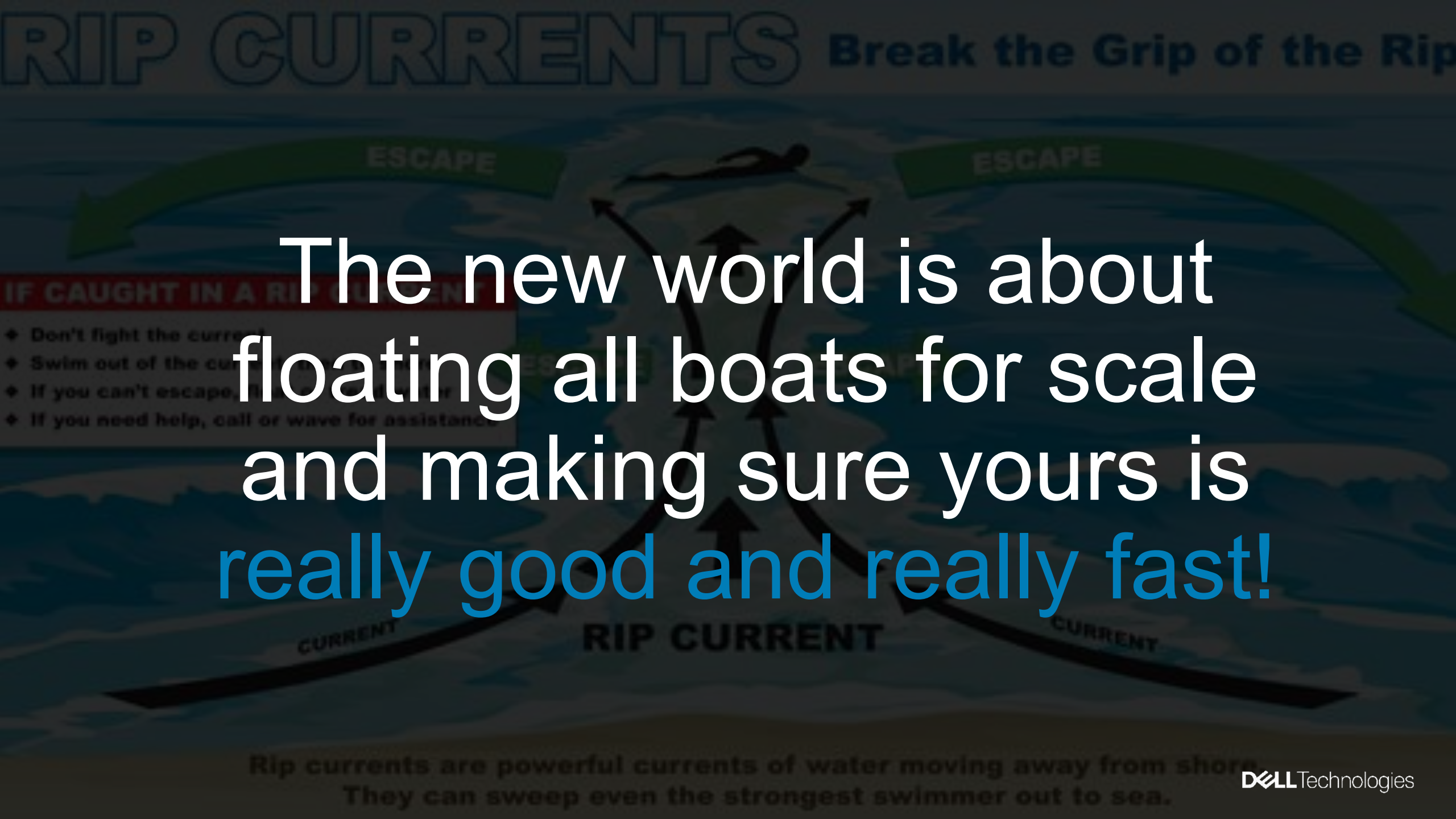


Thermostat  
Comfort

# It's about a new mindset.







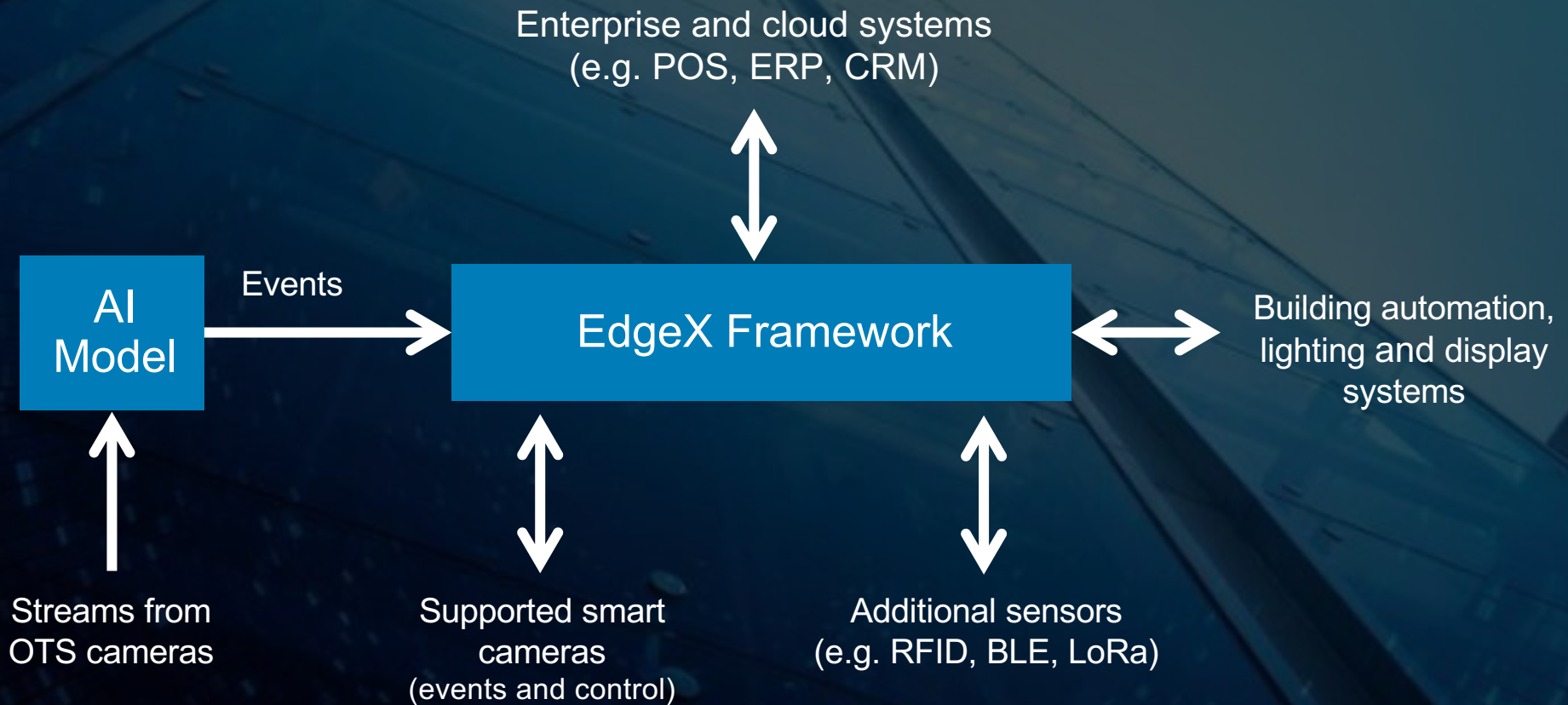
The new world is about  
floating all boats for scale  
and making sure yours is  
really good and really fast!

- IF CAUGHT IN A RIP CURRENT
- ◆ Don't fight the current.
  - ◆ Swim out of the current.
  - ◆ If you can't escape, float with the current.
  - ◆ If you need help, call or wave for assistance.

Rip currents are powerful currents of water moving away from shore.  
They can sweep even the strongest swimmer out to sea.

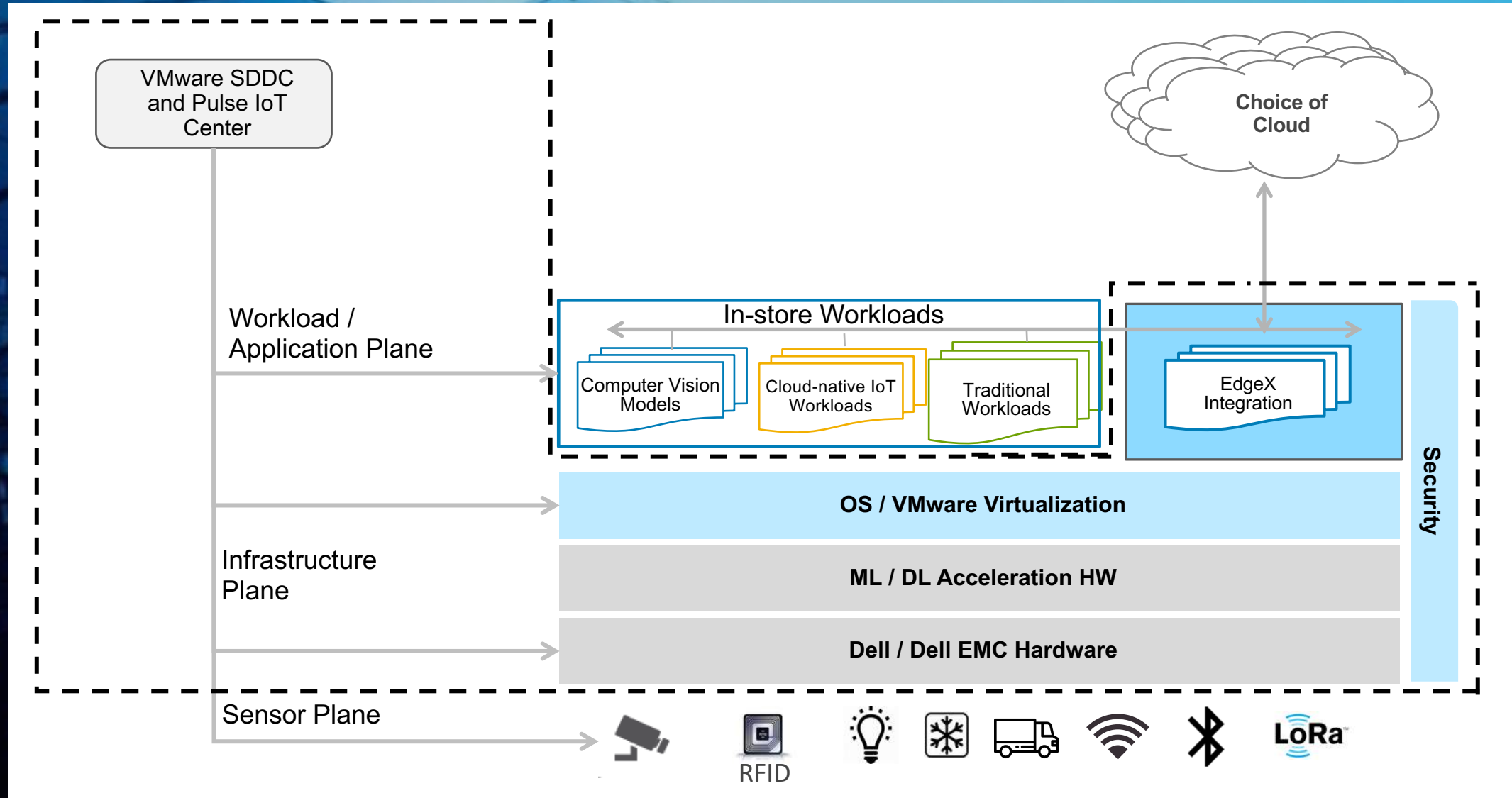
# Leveraging EdgeX as baseline for data integration

*Coordinating through direct partnership and Open Retail Initiative*





# Dell Technologies Retail Edge Foundation



# Features and benefits

## Right-sized Infrastructure

Modular and scalable compute, storage and networking; T-shirt sizing

## Workload Consolidation

Traditional, virtualized and container-based

## Sensor Data Processing Ready

Capable of processing multi-modal sensor data using open EdgeX framework

## Analytics Ready

- Support for Traditional and Computer vision-based analytics

## Integration Ready

Easy to integrate with IoT Frameworks, in-store, enterprise and cloud based systems

## Secured and Managed at Scale

Remote management of store infrastructure, workloads and sensors and cameras from both on-prem and cloud consoles



A close-up, low-angle shot of a person's face, blindfolded with a white cloth. The person's eyes are closed, and their face is partially obscured by the blindfold. The background is dark with warm, out-of-focus bokeh lights in shades of orange and yellow, creating a dramatic and somewhat mysterious atmosphere. The lighting is soft, highlighting the contours of the face and the texture of the blindfold.

IT'S MIDNIGHT...

DO YOU KNOW **WHERE YOUR DATA IS?**

# THREE RULES FOR IOT SCALE

1

Decouple infrastructure from applications

2

Untether the edge from backend platforms, as close as possible to the point of data creation

3

Decouple domain knowledge from all underlying technology



# DID YOU SAY

Our open approach is the only path that will help customers achieve the 'Holy Grail of Digital':

**Sharing and monetizing data, resources and services on your terms via total strangers.**

# HOLY GRAIL?



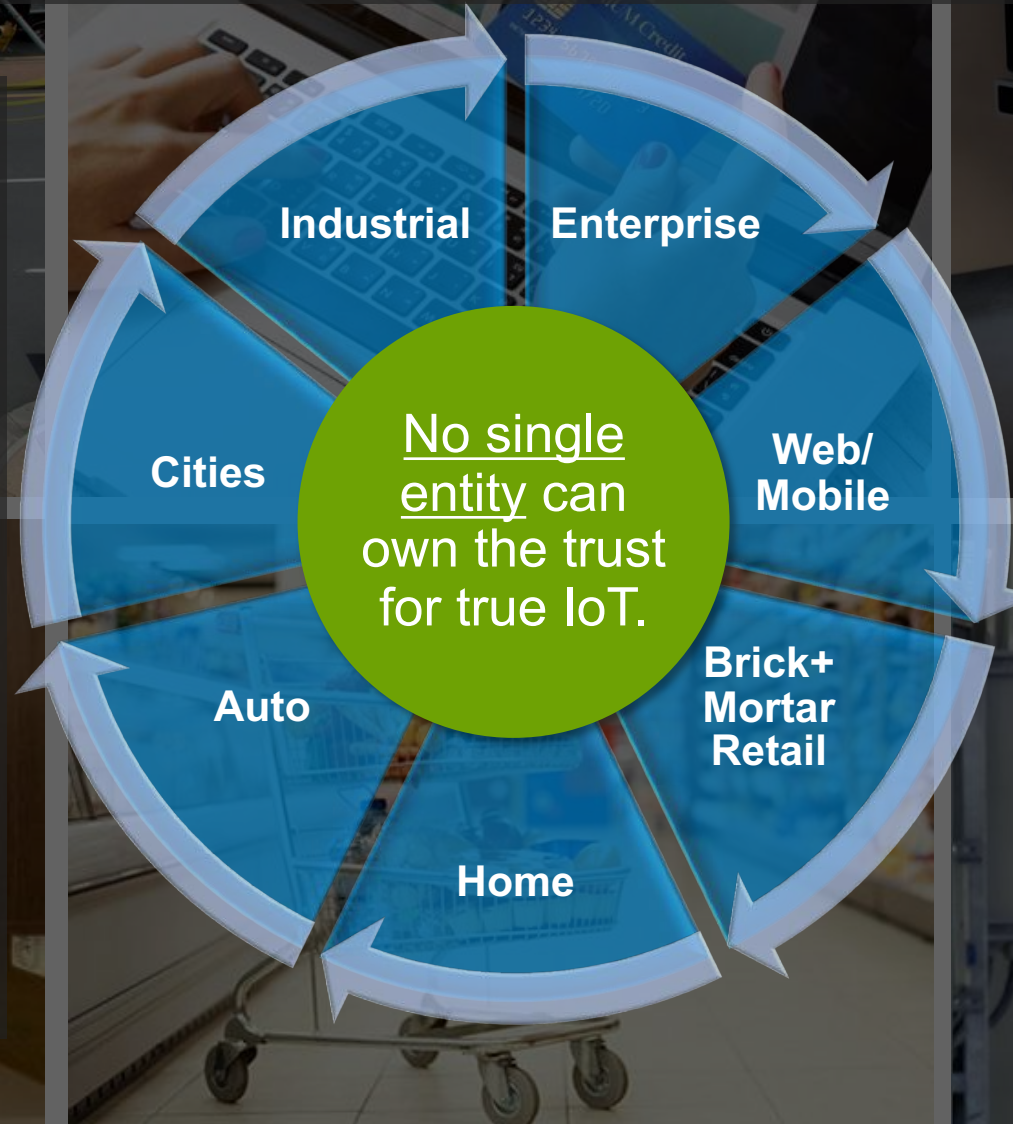
**NO SINGLE  
ENTITY CAN  
OWN THE **TRUST****



# Achieving scalable, intrinsic trust to realize the Holy Grail spanning public and private entities

## Key Requirements:

- AI for context awareness
- Distributed ledger
- Open APIs
- Trusted ZTP in the channel
- Silicon-based root of trust





# AN OPEN EDGE IS REQUIRED TO SCALE TO THE GRAIL



Example implementation



# Thank You!



# Retail Store of the Future

## AT&T Retail Industry Solutions

Kennedy Pereira, Director, Technical Sales

Engineering, Innovation & Strategy

June 25<sup>th</sup>, 2019

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## AT&T Retail Stores

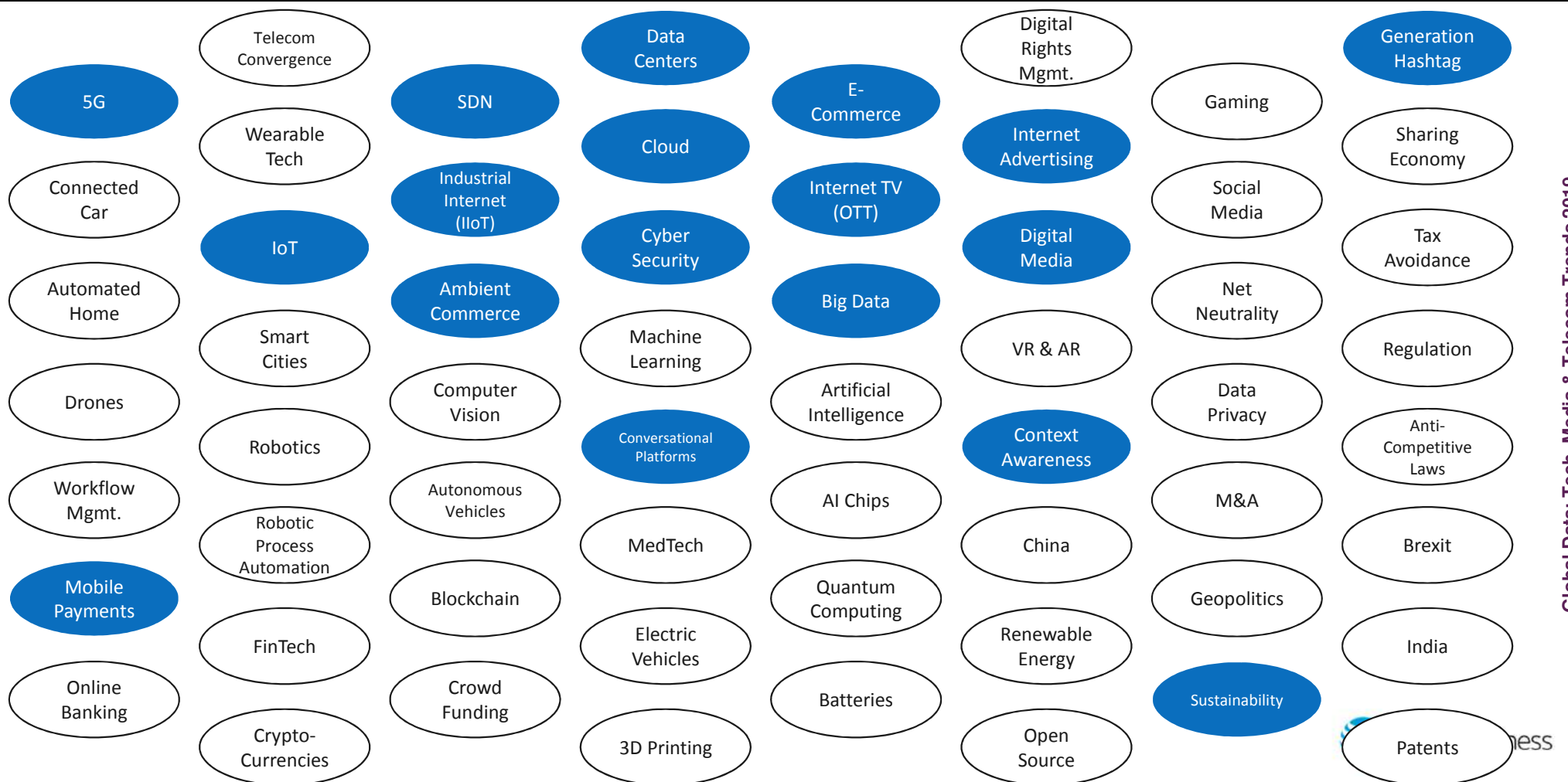
4 million people per month

Technology powers the customer experience, increases revenues and guides our business transformation

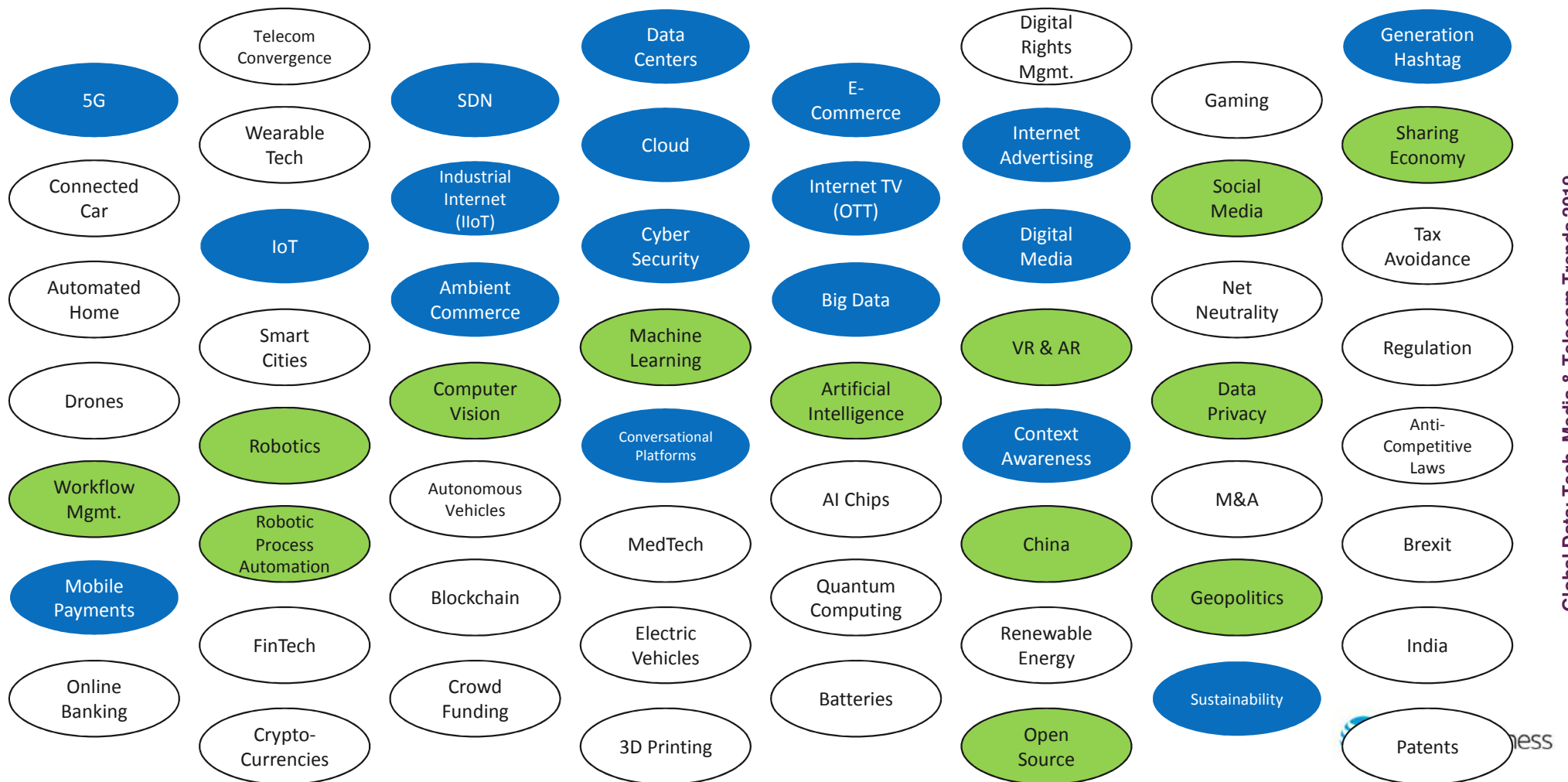
- In-Depth insight into consumer behavior across the shopping journey
- Anonymized and aggregated by demographic sub-sets
- Opt-in consent
- Real-time decisioning
- Insights from moment of interest to in-store conversion
- Rinse & Repeat

5,300 stores

# The 60 biggest themes driving growth in Tech, Media and Telecom in 2019



# Key Initiatives for Retailers through 2020



# Retailer Challenges



Redefining Legacy business models

Executing Brand vision

Frictionless Customer Experience

Implementing at scale

Competitive Differentiation

Platform vs. Telco Model



# The store 2019: **New expectations** create greater sophistication

As stores' role evolves, retailers add functionality through technology and improved operations.



# The value of technology in retail: AT&T brings it all together



## Operational efficiency

Orchestrated and responsive to real-time demands



## Augmented & virtual reality

Immerse the customer in “new” brand reality and add to customer experience



## Curated product management

Product assortment, development and sourcing



## Responsive supply chain

Real-time, one-click in stream of operation AND customer stream of life



## Internet of Things

Use of NFC, beacons, Wi-Fi, LTE technologies improve experience and automate operations



## Robotics

Task automation, inventory automation, redirects associate productivity toward revenue generation



## Customer 360

Care & marketing. Deep visibility, actionable customer insights and execution





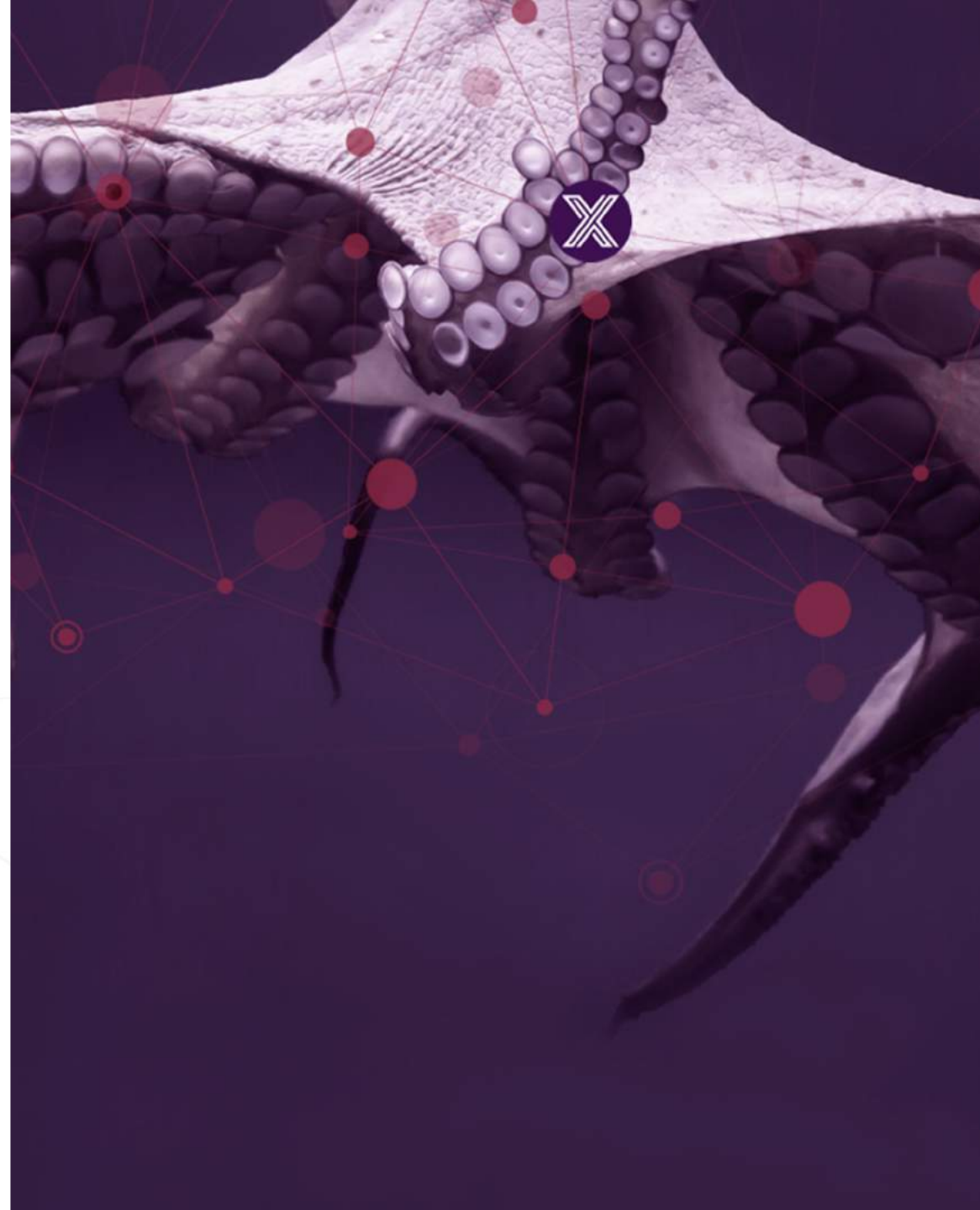


# Introducing EdgeX

Keith Steele

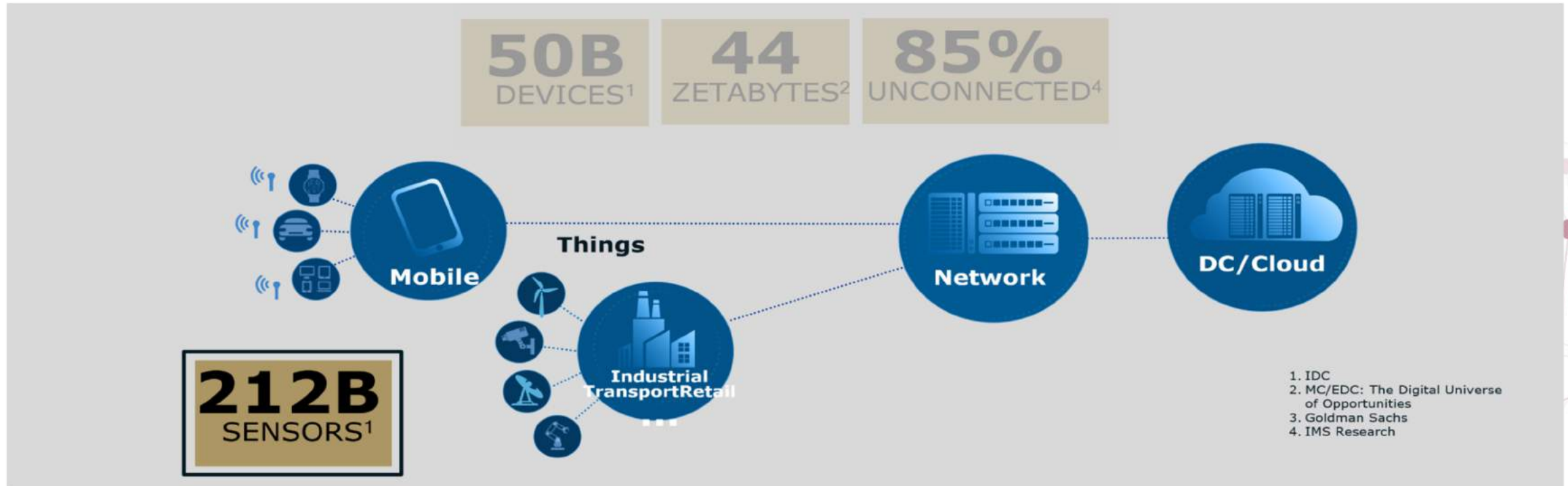
EdgeX TSC Chair and CEO IOTech

June 2019





# IoT is moving to the Edge



Many IoT deployments face challenges related to latency, network bandwidth, reliability and security, which cannot be addressed in cloud-only models<sup>3</sup>

# Why is IoT at the Edge hard to do?

- Heterogeneity of platforms
  - Diverse collection of OS and OS variants
    - Linux, Unix, Windows, VxWorks, embedded and RTOS, ...
  - Various Hardware (Intel, AMD, ARM,...)
  - Cloud, gateway, smart thing (the “Fog continuum”)
- Thing protocol soup
  - Industrial: BACNet, Modbus, OPC-UA,...
  - Wireless: BLE, Z-Wave, Zigbee,...
  - Message: MQTT, AMQP, DDS, ...
- Variety of cloud platforms
  - Azure IoT Hub, AWS IoT Platform, Google IoT Core, IBM Watson IoT Platform, ...
- Add your favorite selection of...
  - Applications, edge analytics/intelligence, security, system management, ...
- Difficulties in determining where to start

IoT is a post doctorate in all we know and have done in computing for the last 30-40 years

- Networks/protocols
- Mobile computing
- Distributed compute
- Cloud compute
- AI/Machine learning
- ...

# Introducing EdgeX Foundry

- The World's first plug and play Ecosystem enabled Open platform for the IOT Edge
- EdgeX delivers a highly flexible software framework that facilitates interoperability between heterogeneous devices and applications at the IoT Edge, along with a consistent foundation for security and manageability regardless of use case.
- The open, vendor-neutral platform speeds time to market by providing replaceable reference services for device-data ingestion, normalization, analysis and sharing in support of new IoT data services and advanced edge computing applications.
- Developers, technology providers and end users can realize business-value faster at a lower cost and risk level through the skills, resource sharing and economies of scale of the EdgeX ecosystem, either for their own implementations or offering commercial "EdgeX-ready" offerings to others.
- EdgeX is unique in its scope, broad industry support, credibility, investment and vendor-neutral Apache 2.0 open source licensing model under the Linux Foundation. As such, EdgeX is a key enabler of digital transformation for IoT use cases and businesses in all vertical markets. An open source, vendor neutral project (and ecosystem)

# EdgeX Foundry Goals

- To build and deploy the pervasive open source Edge platform for the Internet of Things that helps drive innovation, global market adoption, velocity and scale
- Build and promote EdgeX as the common open platform unifying edge computing
- Enable and encourage a rapidly growing global ecosystem of IoT solutions providers to create a rich set of interoperable plug-and-play components
- Certify EdgeX components to ensure interoperability and compatibility
- Provide tools to quickly create EdgeX-based IoT edge solutions
- Collaborate with relevant open source projects, standards groups, and industry alliances to ensure consistency and interoperability across the IoT

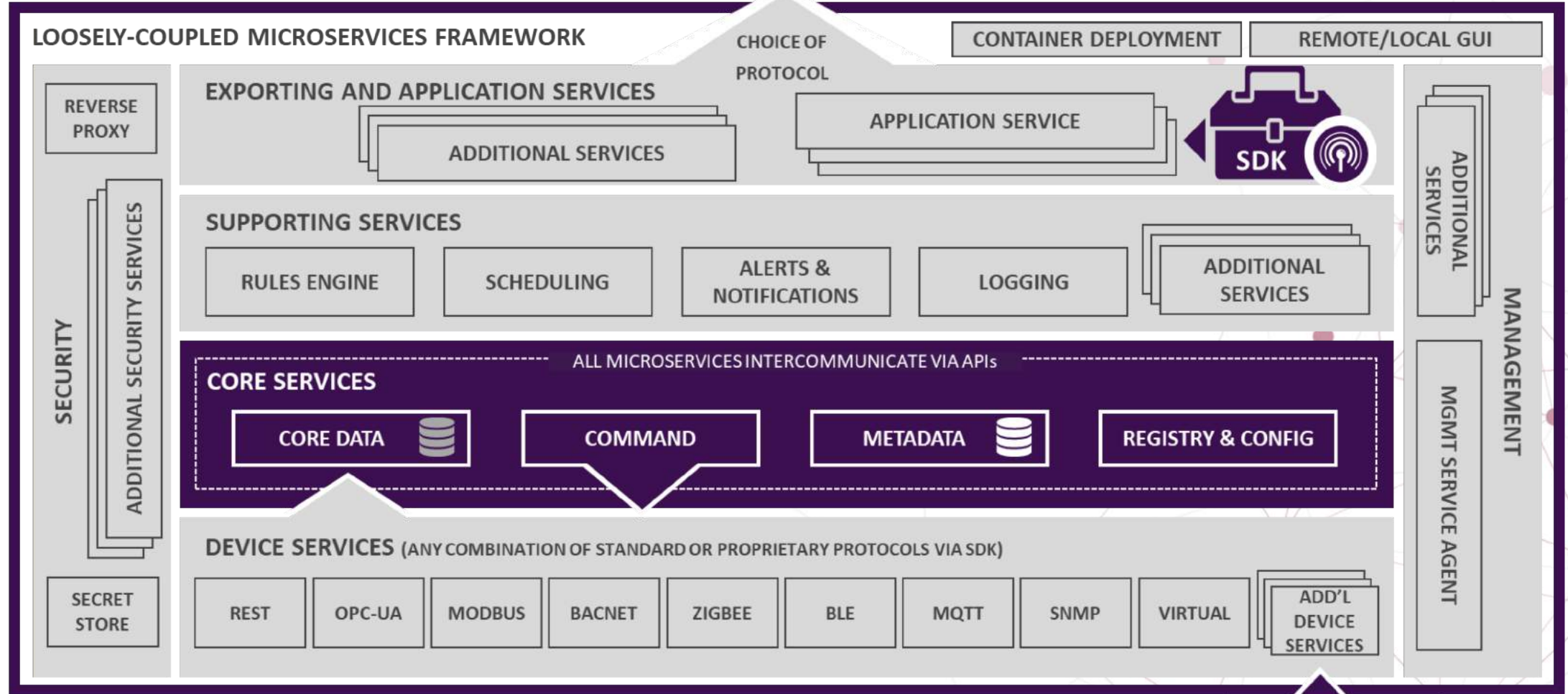
# A Global Partner Ecosystem







"NORTHBOUND" INFRASTRUCTURE AND APPLICATIONS



"SOUTHBOUND" DEVICES, SENSORS AND ACTUATORS



**PIXEOM**  
Leading Edge Computing



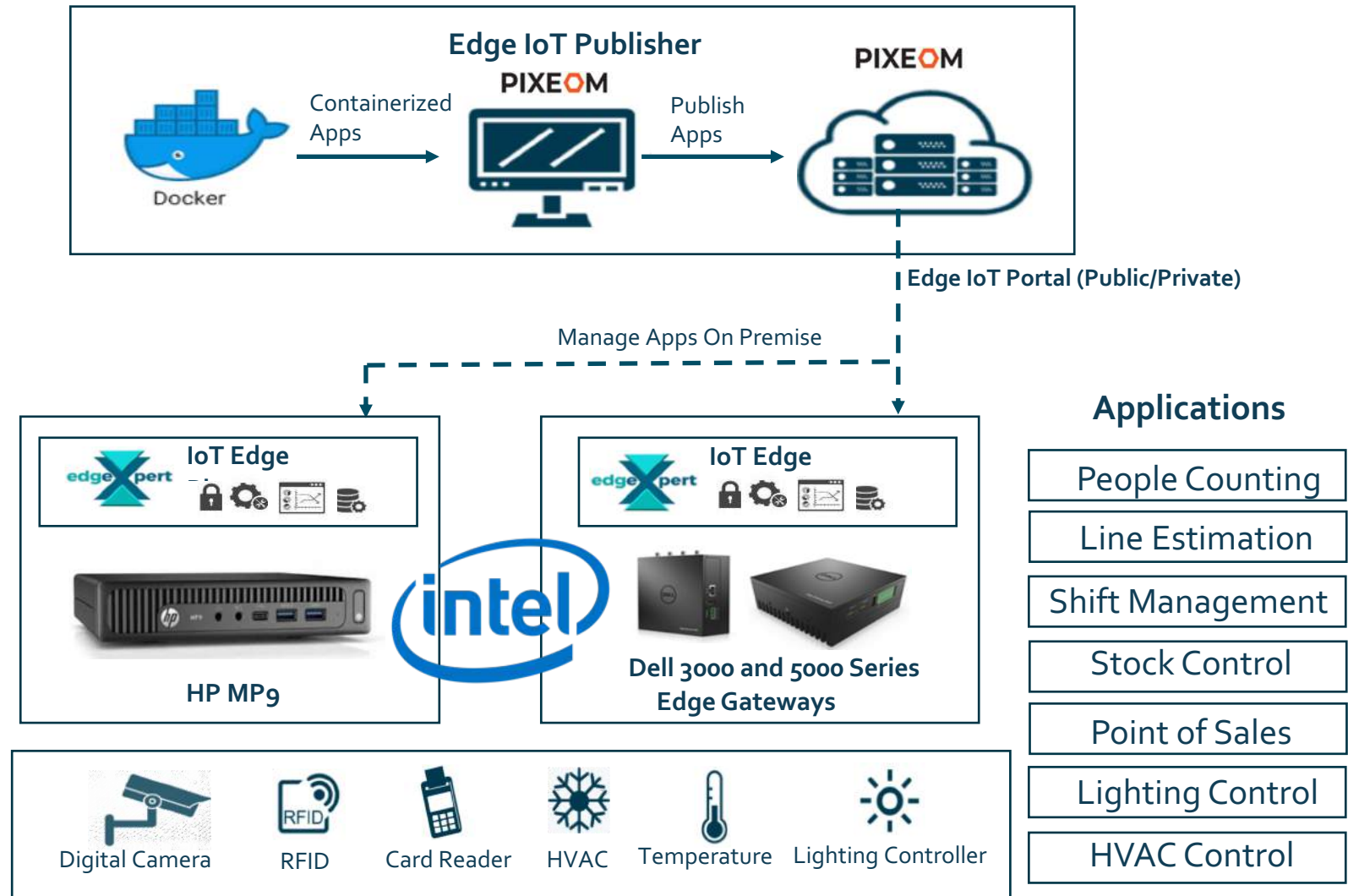


R R K

**INTEL® IOT RFP READY KIT SOLUTIONS**

# RRK description

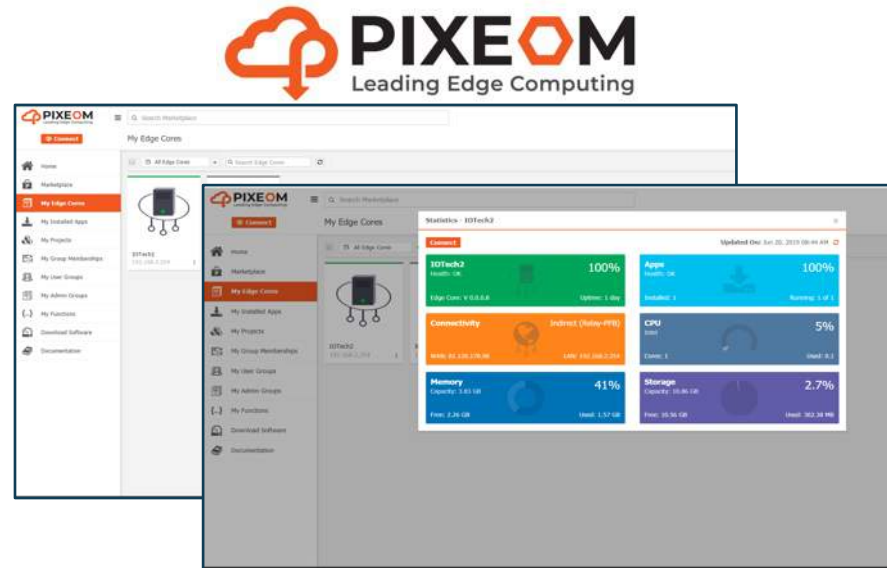
- Integrated retail-focused support
- IOtech Edge Xpert Platform
- Pixeom Cloud based application
- Intel OpenVINO framework
- Intel-based hardware



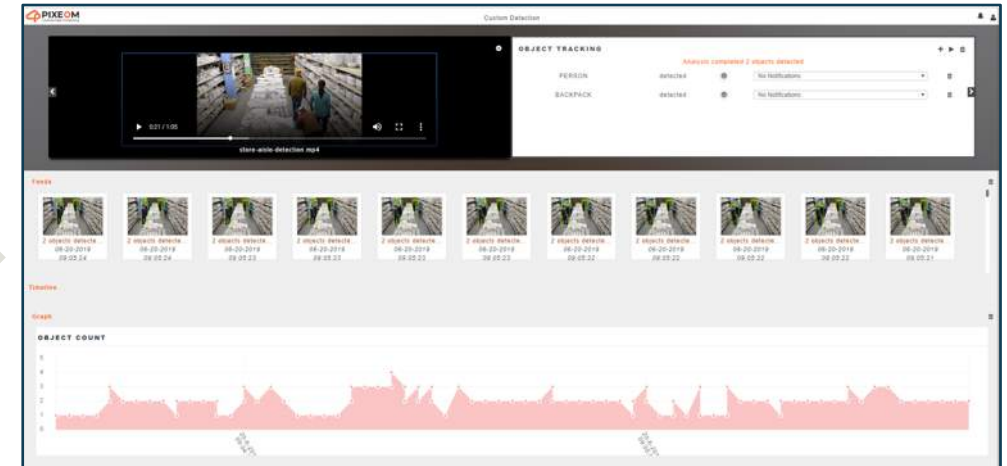
## The key components of the solution include

- IOTech's Edge Xpert Edge IoT platform that simplifies IoT device integration and enables local analytics and decision making
- Out-of-the-box support for a range of retail focused use-cases including people counting, line estimation and shift management, stock control and point of sales, HVAC and lighting control
- Latest high-performance Intel-based edge computing hardware
- Pixeom's Cloud based application provisioning and orchestration which simplifies application life-cycle management in retail

# Demo Overview



## Computer Vision Analytics



## Occupancy Counting



EdgeXpert IoT platform:  
Building Automation Analytics



