



Say hello  
to the future.

## Cisco Connect 2019

Singapore . 16 April 2019

#CiscoConnectSG



# Unlock the Value of Data with Cisco Kinetic (IoT)

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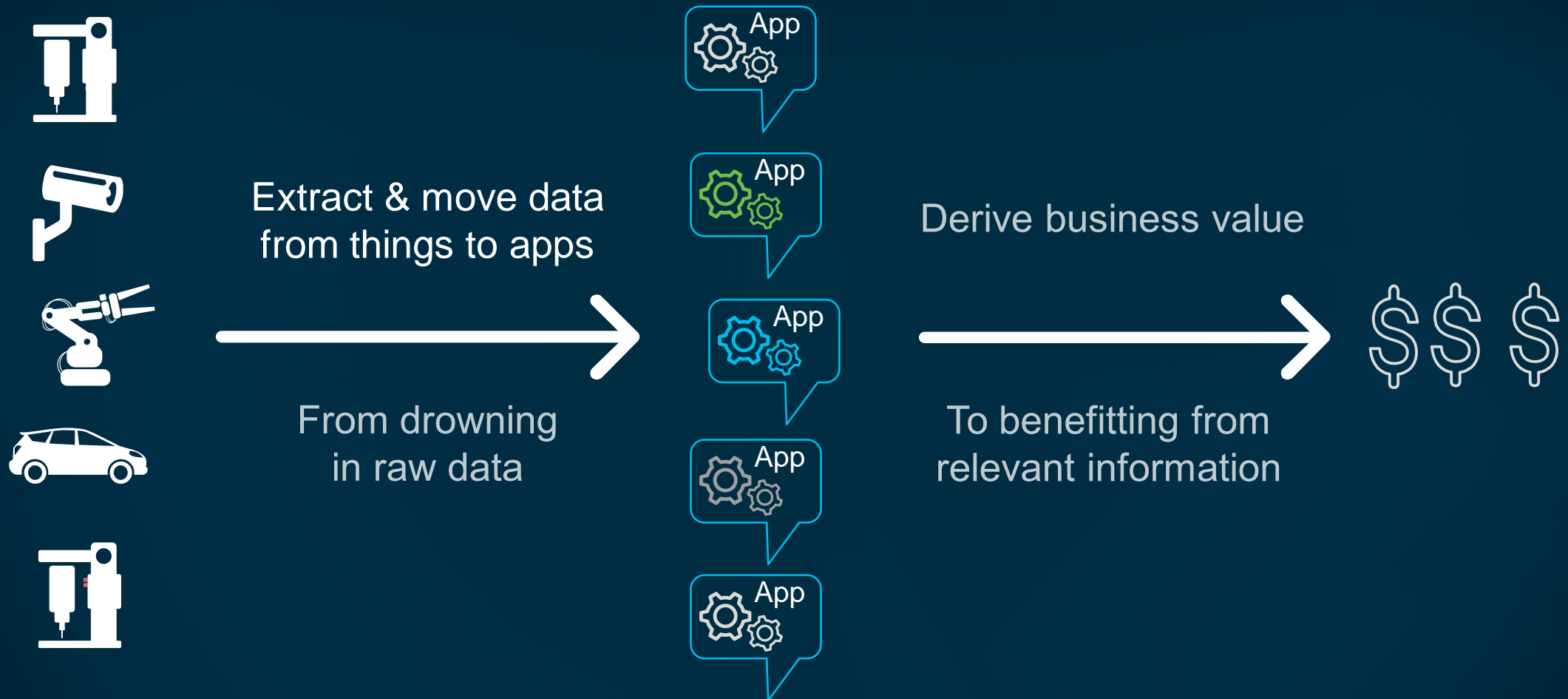
Voice of the customer

“We want business value  
from data”

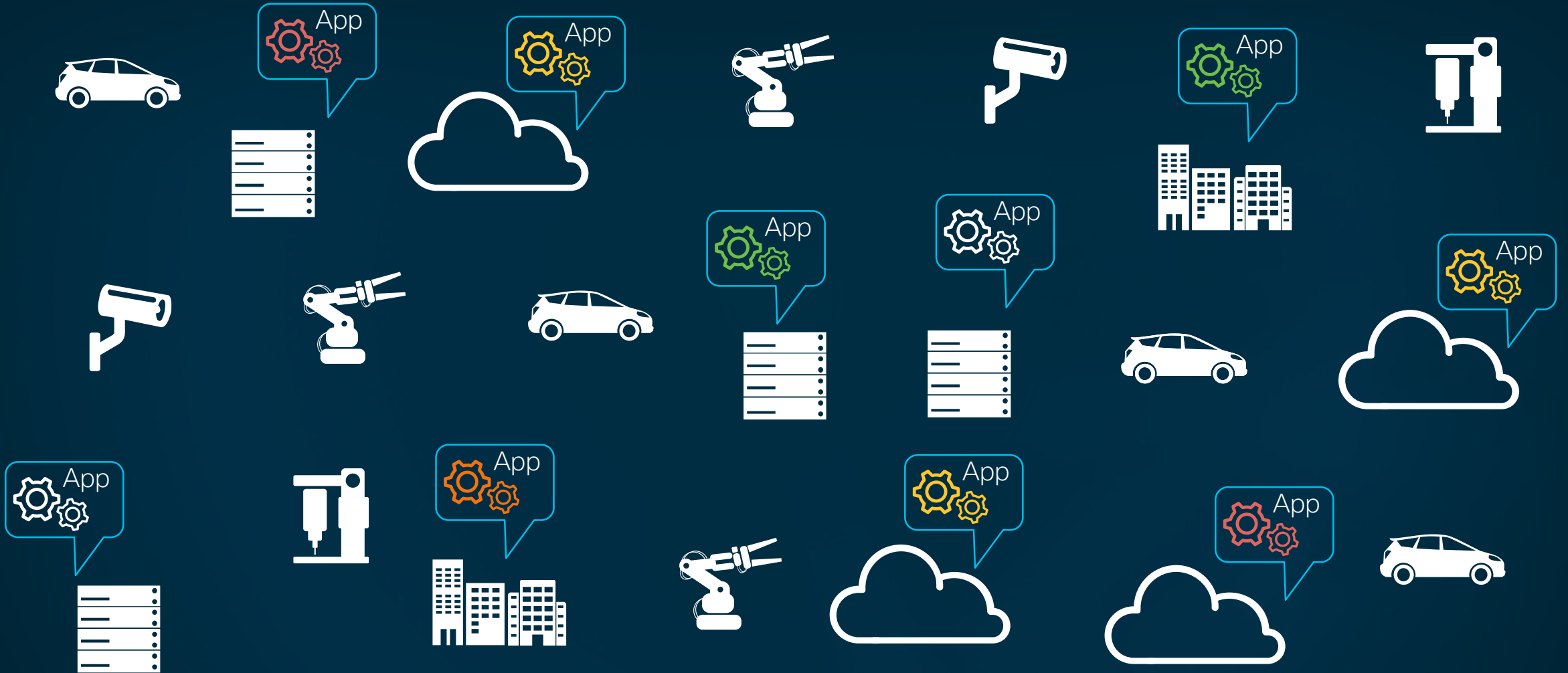
“We want ownership,  
privacy and security  
of our data”

“We want fast start,  
and grow over  
time”

# To get value from data



# And these things and apps are distributed



# The obstacles to getting value from data



Complexity of connecting, securing devices



Need to get usable data from diverse devices



Highly distributed environments



On prem, public/private/multi cloud, hybrid, tiered or star topology



Dynamic and evolving needs



New data sources, new use cases, new opportunities



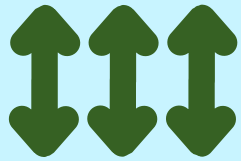
Need complete visibility and control



Ensure the right data is in the right place at the right time

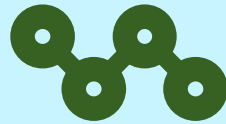
# Cisco helps you get more value from IoT data

Complexity of connecting, securing devices



Securely connect of IoT devices;  
Extract and normalize data

Highly distributed environments



Enables compute at all network levels through edge and fog processing

Dynamic and specific use cases



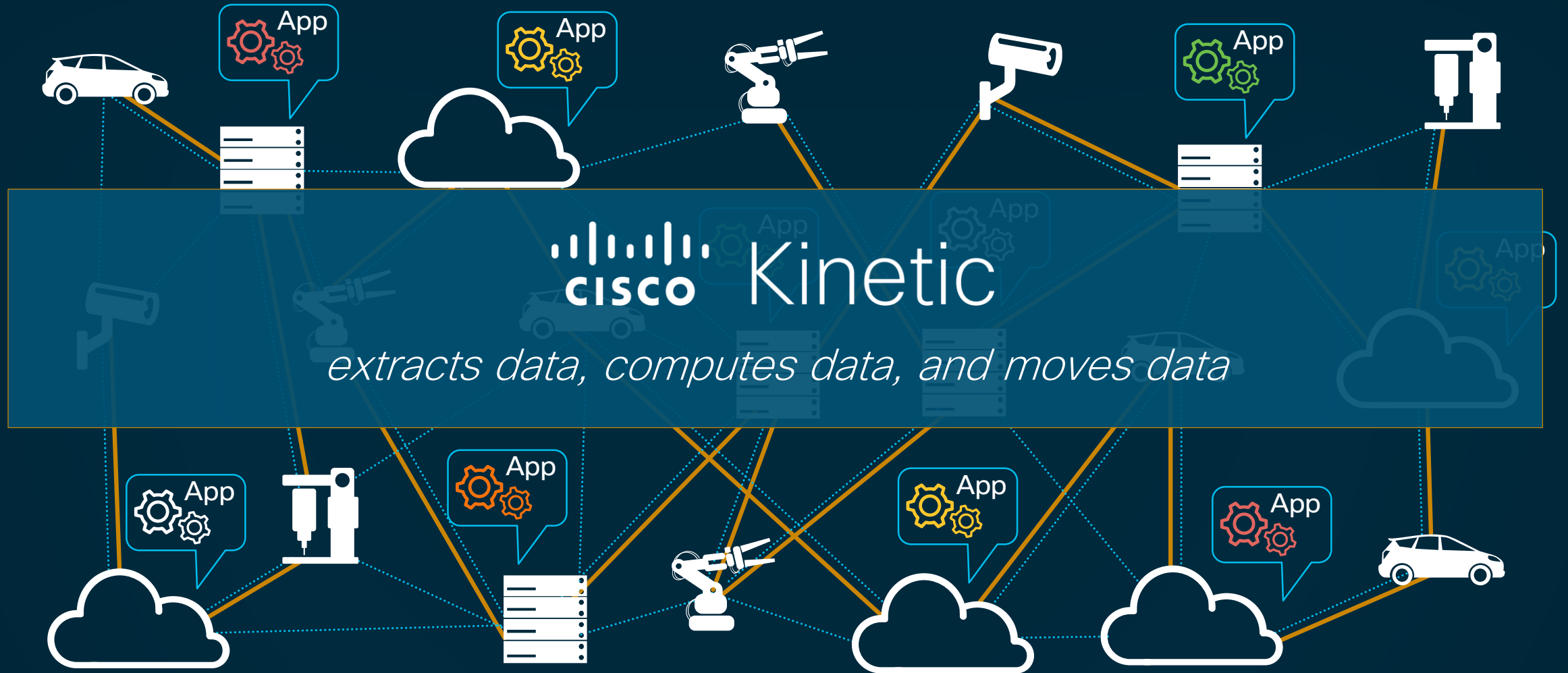
Flexible and extensible functionality serves current and future needs

Need complete visibility and control



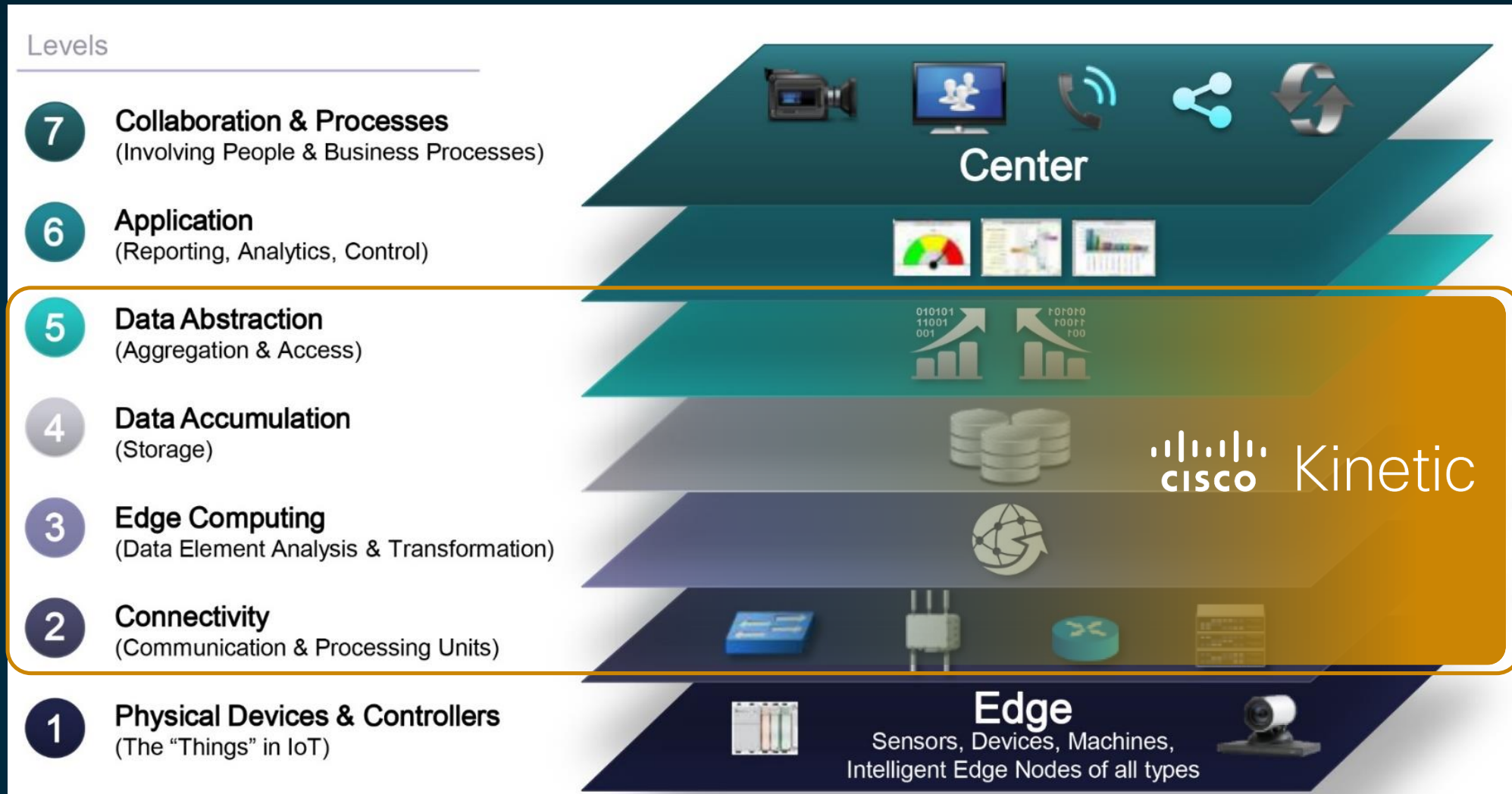
Provides full visibility and granular control of which data goes where

# An IoT data fabric is needed





# IoT World Forum reference model



# Edge Computing

# To Unlock the Value of IoT Data You need to...

Manage  
Connections

9.1B IoT devices by 2021, doubling today's numbers.

Secure  
Everything

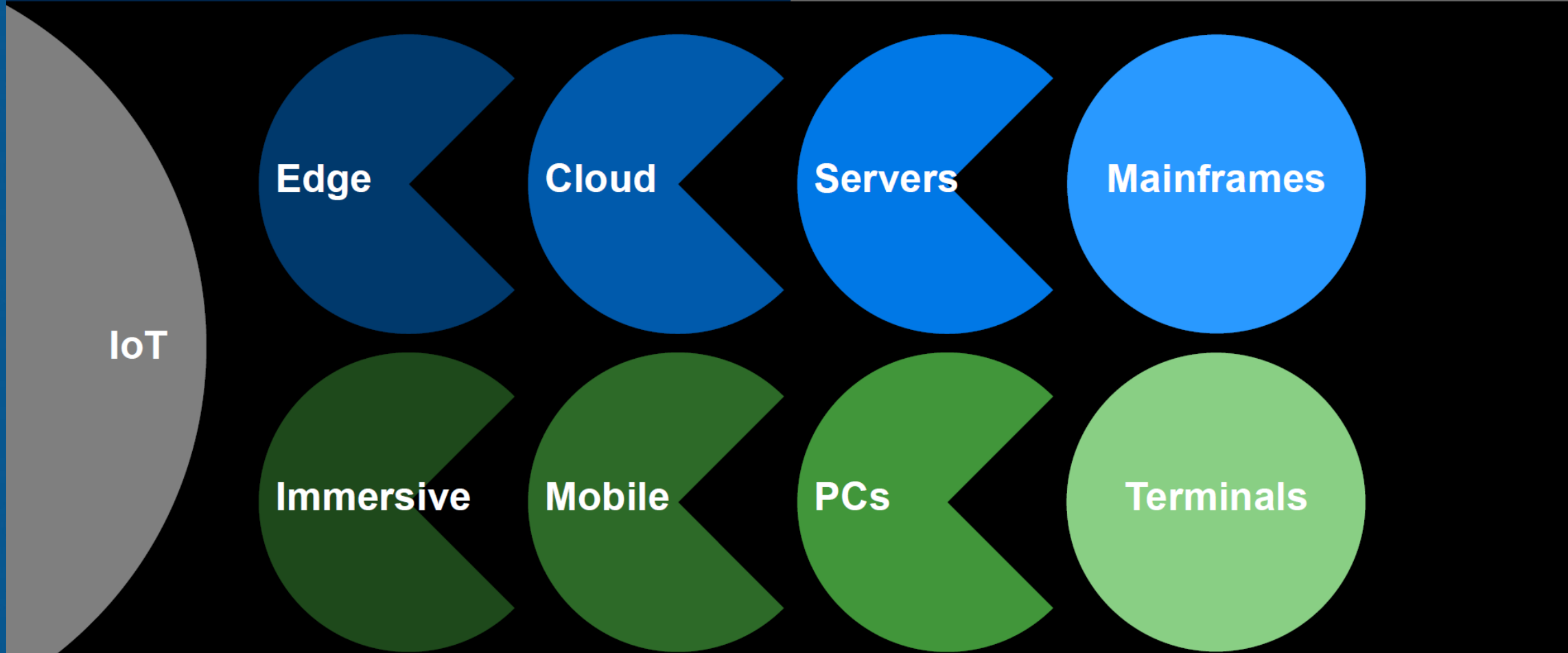
61% of businesses who have deployed IoT have dealt with an IoT security event in the past year.

Optimize  
Data

IoT devices produce 2.5M terabytes of data each day, and less than 1% of all unstructured data is used.

# The Next Thing

# The Edge Will Eat the Cloud



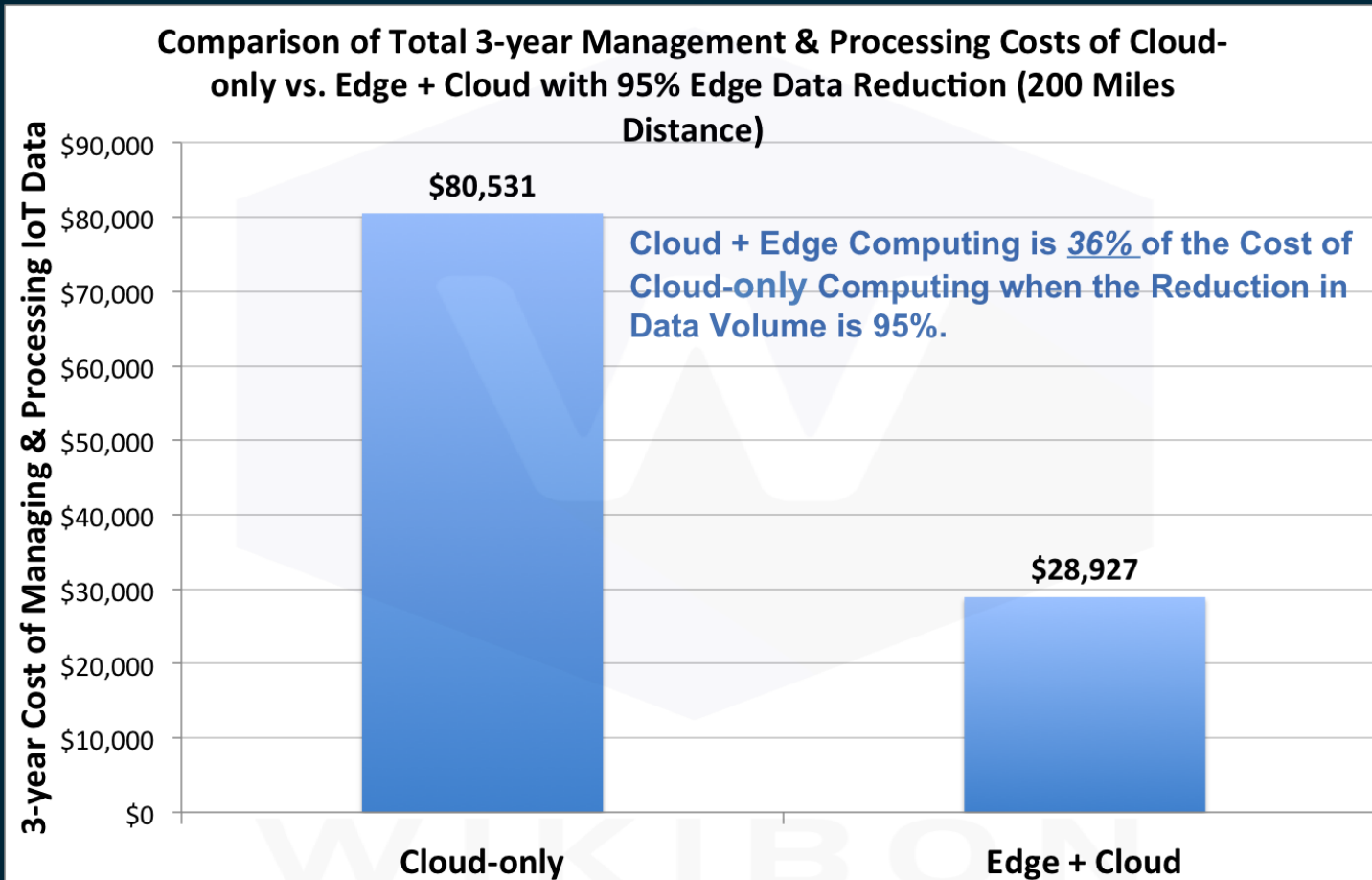
#GartnerSYM

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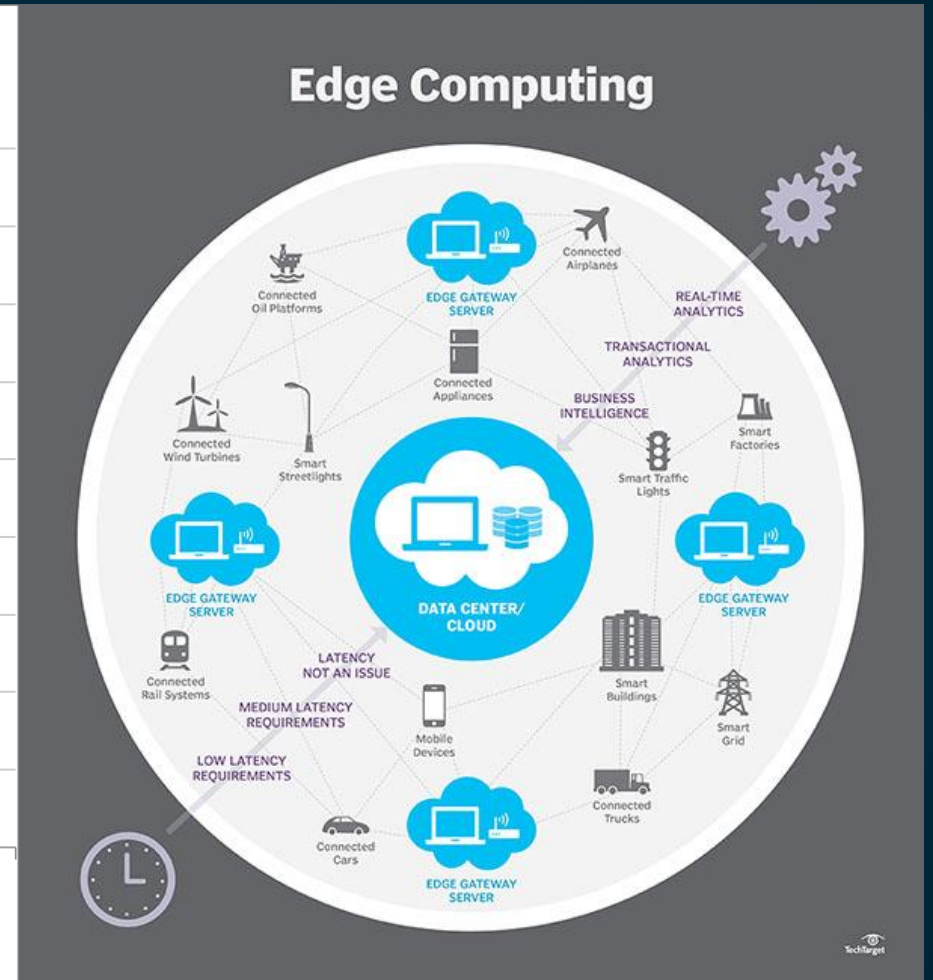
**Gartner**

# Cloud vs Edge

## Enables Real-Time Decisions, Reduces Cost & Complexity



Source: © Wikibon IoT Project. Reference Models AWS IoT Service & Pivot3 Server SAN. Assumption Edge reduces IoT Traffic by 95%. See Table 1 for Detailed Assumptions & Calculations



# Why Compute at the Edge?

There may not be enough network bandwidth

 **Data Reduction**

Most of the data is not interesting

 **Filtering**

The use of data may be at the edge

 **Latency Optimization**

Computation can be optimized for some purposes

 **Partitioning**

Data normalization & hardware interfacing

 **Application Simplification**

Data redirection based on the content of the data

 **Dynamic Changes**

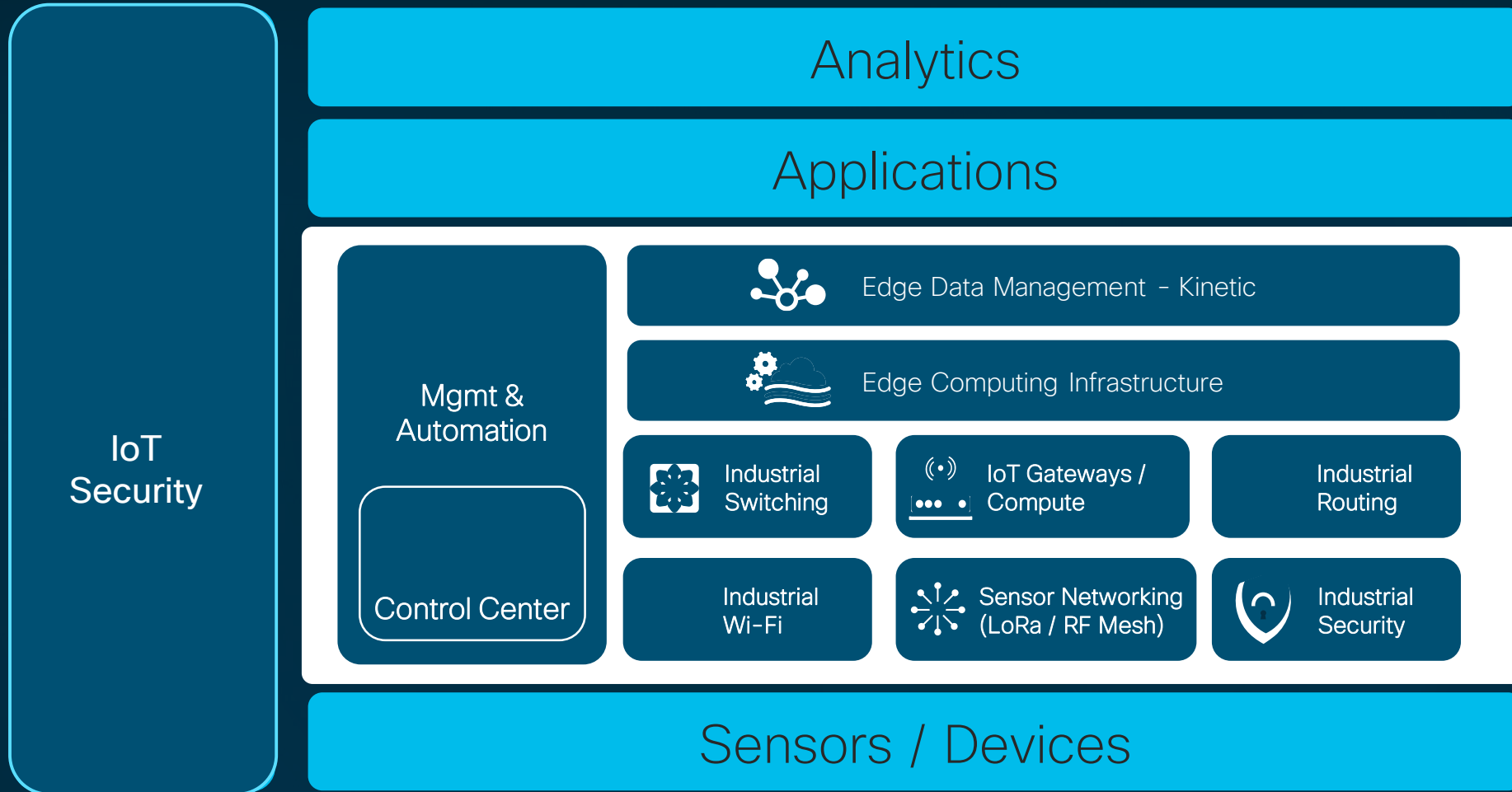
Data time stamping, algorithmic ownership

 **Analytic Support**

# Kinetic Overview

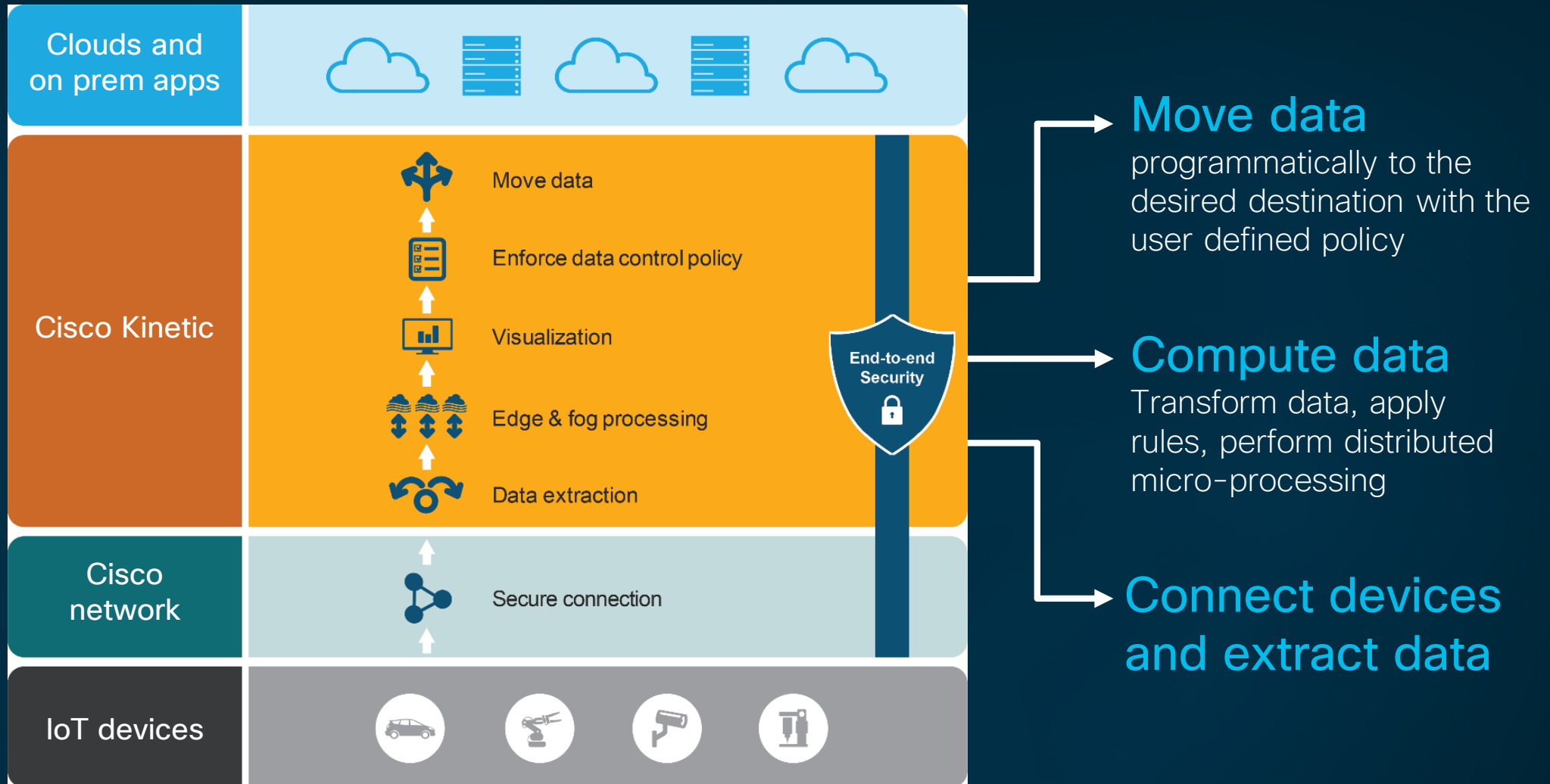
# Cisco's IoT focus

Security  
across the  
stack





# Cisco Kinetic – the IoT data management platform





Kinetic  
IoT Data Fabric

3 Modules



Edge & Fog Processing  
Module

An open, modular On-premise IoT platform for **Edge Computing**



Data Control  
Module

Moving the data to **any Cloud** according to pre-set **policies**

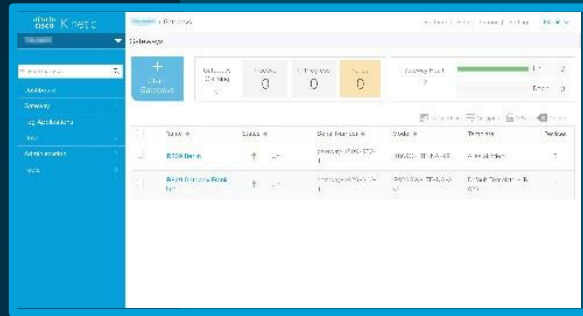


Gateway Management  
Module

Cloud-based **Management Tool** for Cisco Gateways



# Gateway Management Module (GMM)



Real-time Device-Status  
Low-Touch Provisioning  
Configure Gateways remotely

Cloud Environment



IR809



IR829

Management  
Traffic only!

Cisco Kinetic IoT  
Fabric



Devices connected  
through DS-Links



# EFM: Hardware & Software



Data Center

Linux

IOS

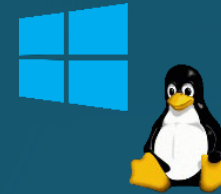
Router/Switch



IR809/829, IE4000,  
CGR Compute Module



ISR4000, ASR1000,  
Catalyst 9000



Any Windows or  
Linux device/VM

Cisco Kinetic IoT  
Fabric

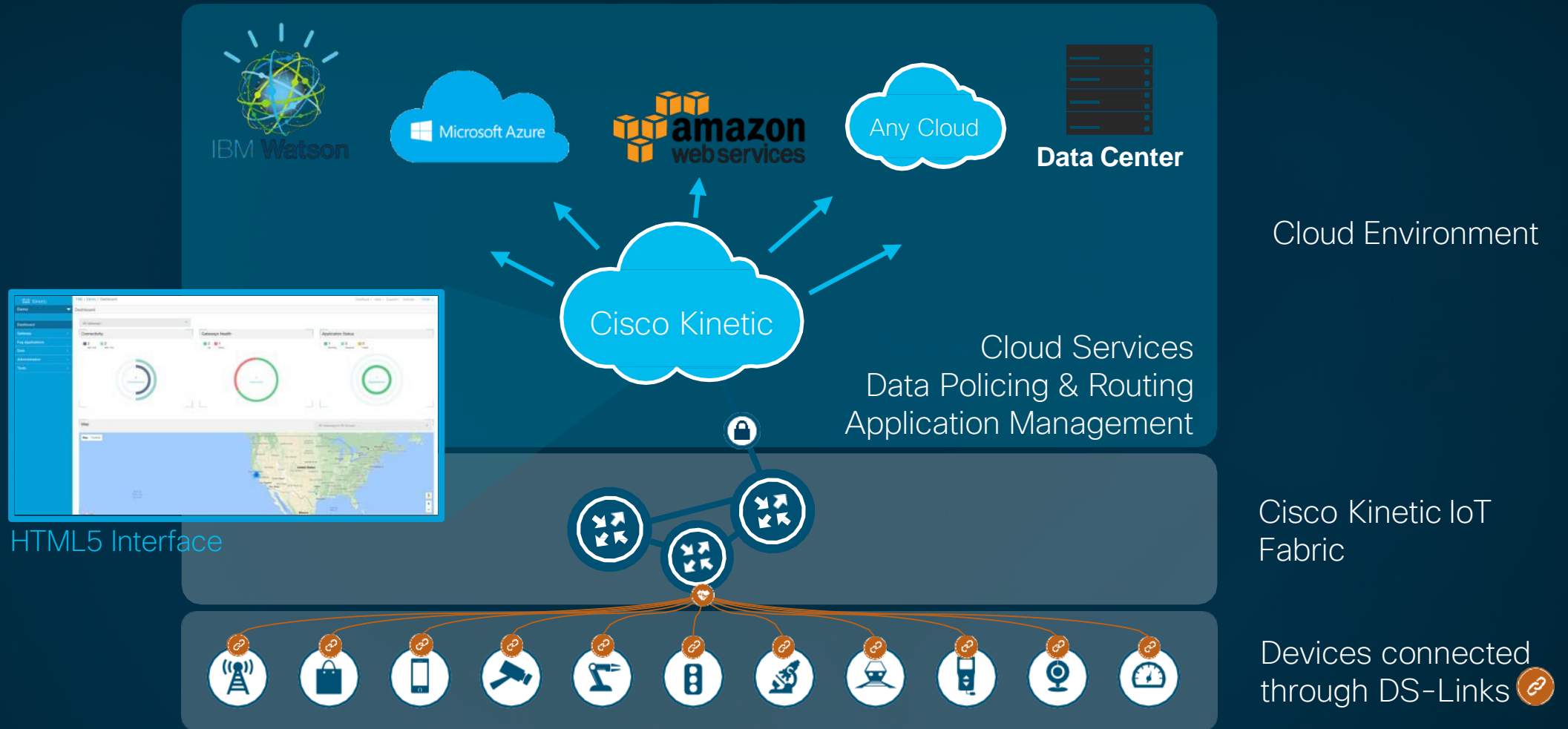


Devices  
connected  
through DS-  
Links





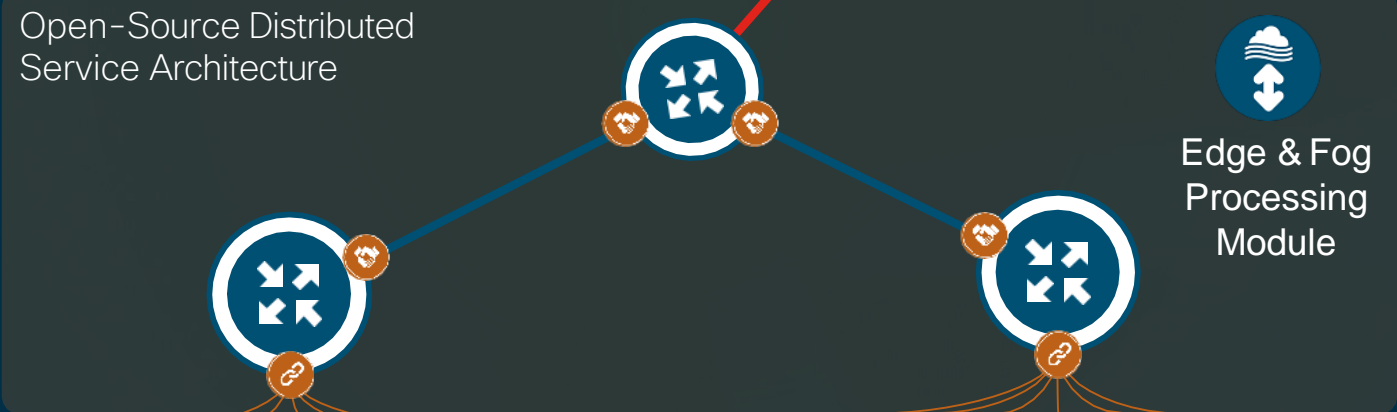
# Data Control Module (DCM)



Route Data to any end-point using policies



Manage Cisco Gateways remotely



Connect anything to the IoT-Fabric with DS-Links!

Connect, process, and analyze distributed data at the Edge



# IoT Networking Portfolio

## Industrial Switching



IE 1K,2K,3K,4K,5K, CGS

## IoT Gateways



819-MNA, IR807, IR809,  
IR829,IR11101

## Industrial Routing



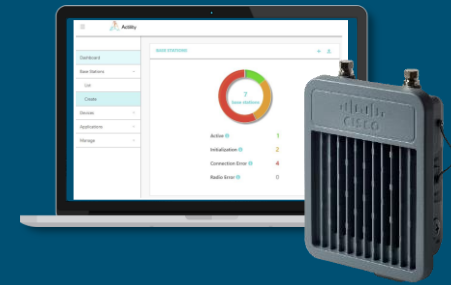
ASR 902U/903U/920U,  
CGR 1000, CGR 2000

## Cisco Resilient Mesh



IR500, DevNet

## Low Power Wide Area Wireless



LoRaWAN  
IXM Gateway

## Industrial Wireless



AP1552, IW3702

## Industrial Security



ISA 3000

## Embedded IoT



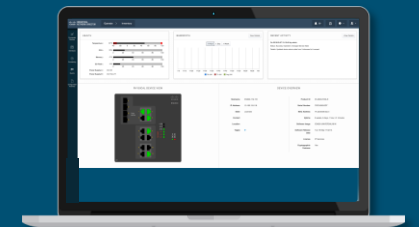
ESS, ESR

## Edge Computing



IOx  
IC 3000

## Management & Automation



Field Network Director  
Industrial Network Director

# No compromise industry-leading Cisco **Security**

## Secure the device

Mechanical & Electronics



*Accelerometer & Gyroscope*



*Input Alarm for Digital Sensors*



*GPS Asset Tracking & Geo Fencing*



*Sim Card Locking Plate*



*Trust Anchor Module (ACT2 Chipset)*



*Secure Boot*



*Cisco Process (CSDL, Vulnerability Testing, PSIRT, TALOS Group)*

## Securing network communications

Hardware and Software



*Fast Hardware Based Encryption*



*Secure Network Protocols*



*Secure defaults*



*Full Visibility with NetFlow for analytics with Stealthwatch®*



*One set of security policies across the entire network*



*Traffic Copy*

## Securing applications



*Application Level Firewall*



*Hosted App lifecycle security with Cisco IOx*



*Digital Signage Validation*



*Code Signage*



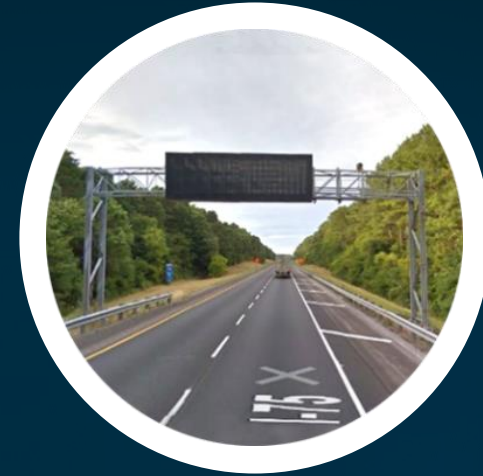
# Use Cases

# Customer requirements



## Oil & Gas

- Thousands of drilling platforms
- Low uplink speed (satellite)
- Require local data evaluation



## Roadways

- Thousands of road signs
- Widely distributed
- Require local data evaluation

# Customer requirements



## Fleet

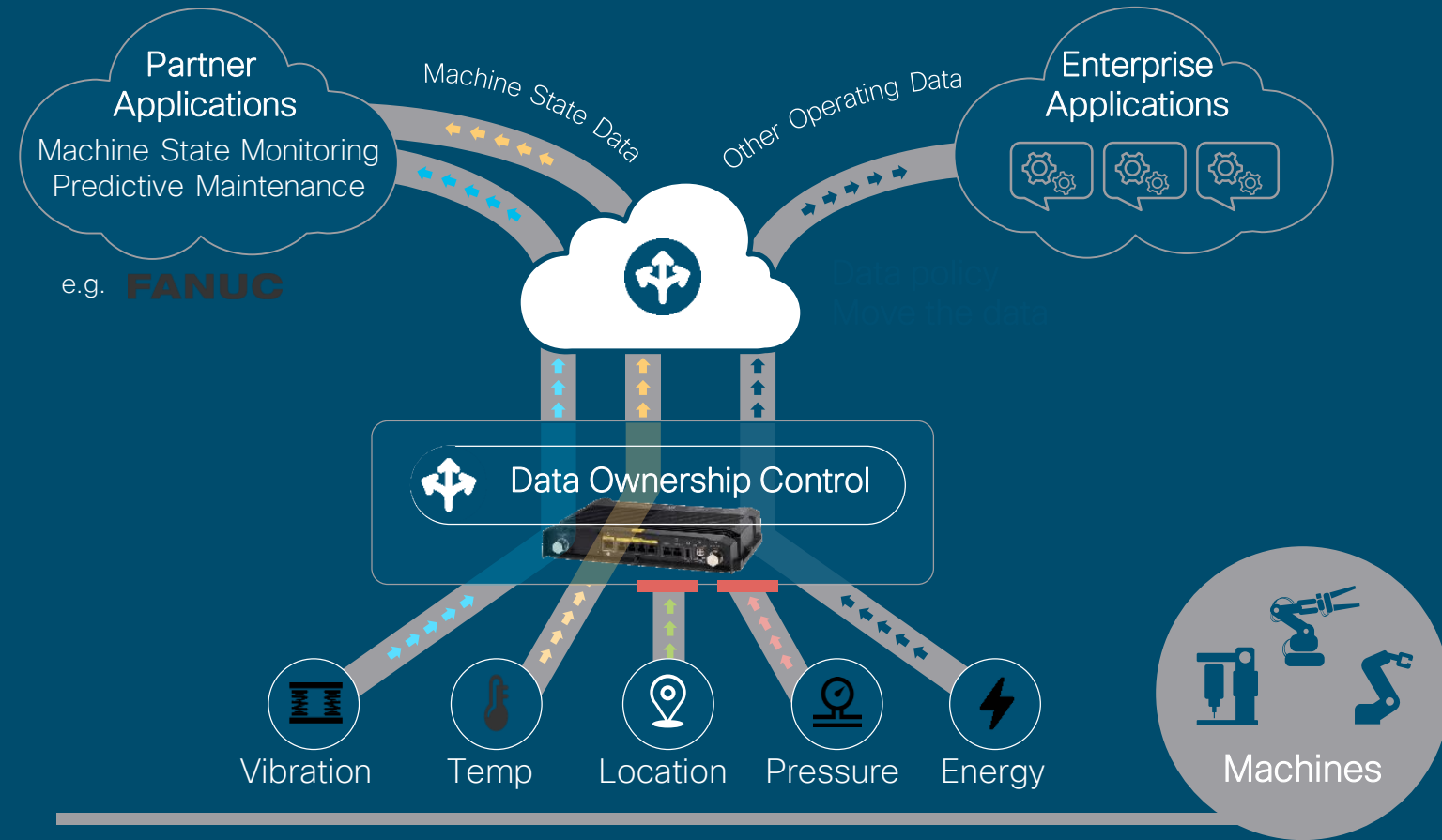
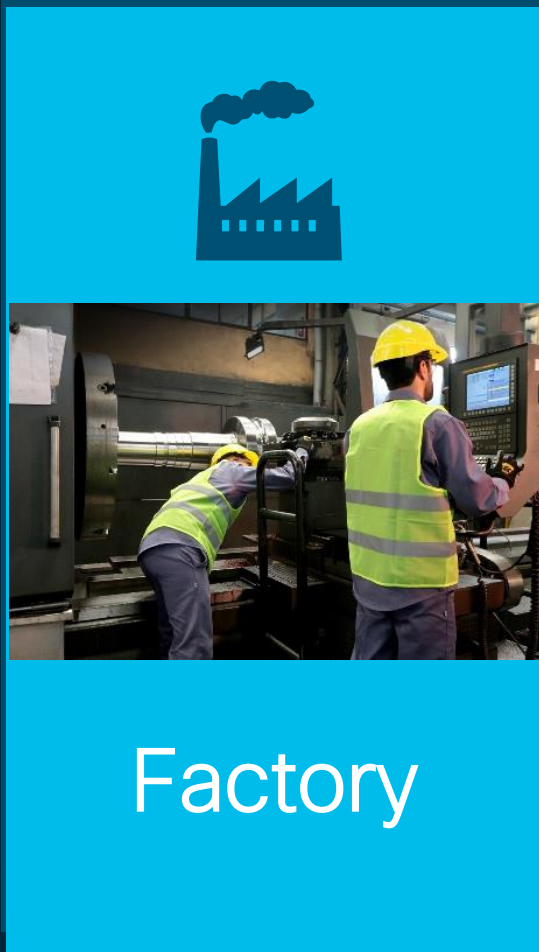
- Thousands of vehicles
- Mobile and ruggedized
- Requires geo tracking, mobile uplink and Wi-Fi offload
- Location and Status monitoring



## Factories

- Thousands of machines
- Heterogeneous sensors
- Requires data extraction, normalization, storage and visualization

# Kinetic Data Control Module – Factory Scenario



# Digital Harbor



## Port of Rotterdam



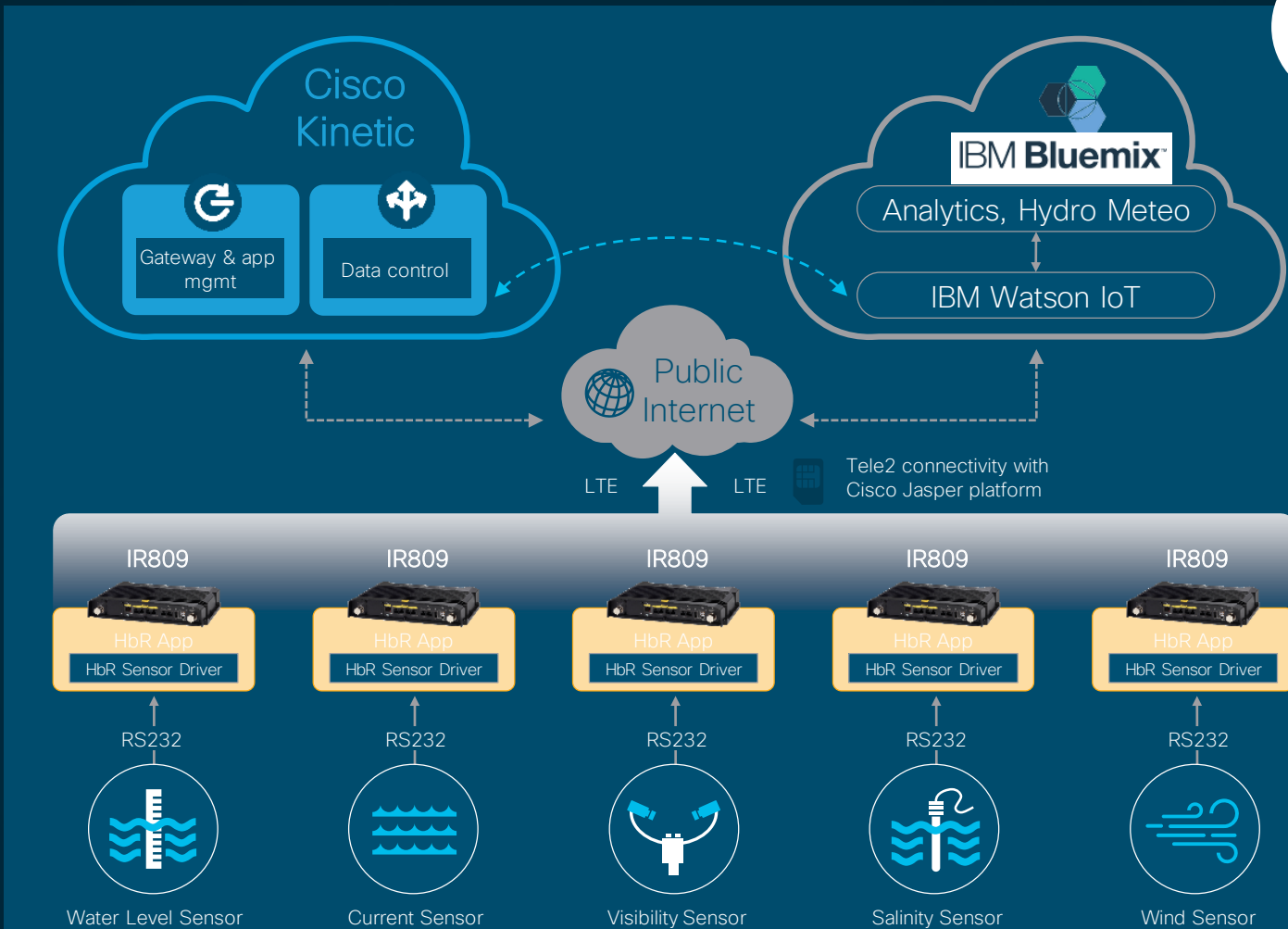
- Europe's largest sea port
- Traffic includes  
~30K sea-going vessels / ~105K inland vessels / yr
- 90,000 employees
- Lifeline for Dutch industry
- Autonomous ship by 2030

## Use Case

Reduce risk, increase profit for shipper and port:

- Collect and analyze data from various sensors throughout the waterway
- Visualize health and condition of waterway via port's Hydro/Meteo app
- Use advanced predictive analytics to predict future state and optimize port operations (logistics, load handling times, and demand planning)
- Share data with 3<sup>rd</sup> party systems such as ground transportation, container handling, and logistics firms to improve efficiency and turn around times

# Solution Architecture



## Solution Components

- Scalable, distributed edge connectivity/compute design with Cisco IR809 IoT gateway
- Kinetic -- automated cloud IoT GW management & fog app lifecycle management
- Kinetic provides cloud data delivery and data policy
- IBM Watson provides data analytics and application logic that influence business outcomes

# Kinetic works across industries, many use cases







## Cisco Kinetic for Cities

-  Lighting
-  Parking
-  Urban Mobility (Traffic, Crowd Analytics)
-  Environment
-  Safety and Security
-  Waste Management



## Cisco Kinetic for Manufacturing

-  Connected Machine (OEM, factory owner)
-  Equipment Health Monitoring
-  Energy Monitoring
-  Track & Trace (RTLS)



## Cisco Kinetic for Energy

-  Connected Rig
-  Connected Oil Well
-  Connected Refinery



## Cisco Kinetic for Transportation

-  Connected Fleet (Technical services, first responder)
-  Connected Roadway



## Cisco Kinetic for Retail

-  Retail Site Monitoring

These are examples where customers can use Kinetic.

# Kinetic Demo



# Transportation

## Customer Situation

- Accident during very heavy fog conditions Delhi Yamuna expressway Highway Nov – 2017

- 99 cars and trucks collided
- Foggy stretch of Interstate 75 near Calhoun, Tenn.
- 12 people were killed
- 42 were injured in the chain-reaction accident. (Julie Elman-Roche/News Sentinel)



### Fog in 1990 sparks Tennessee's deadliest car wreck

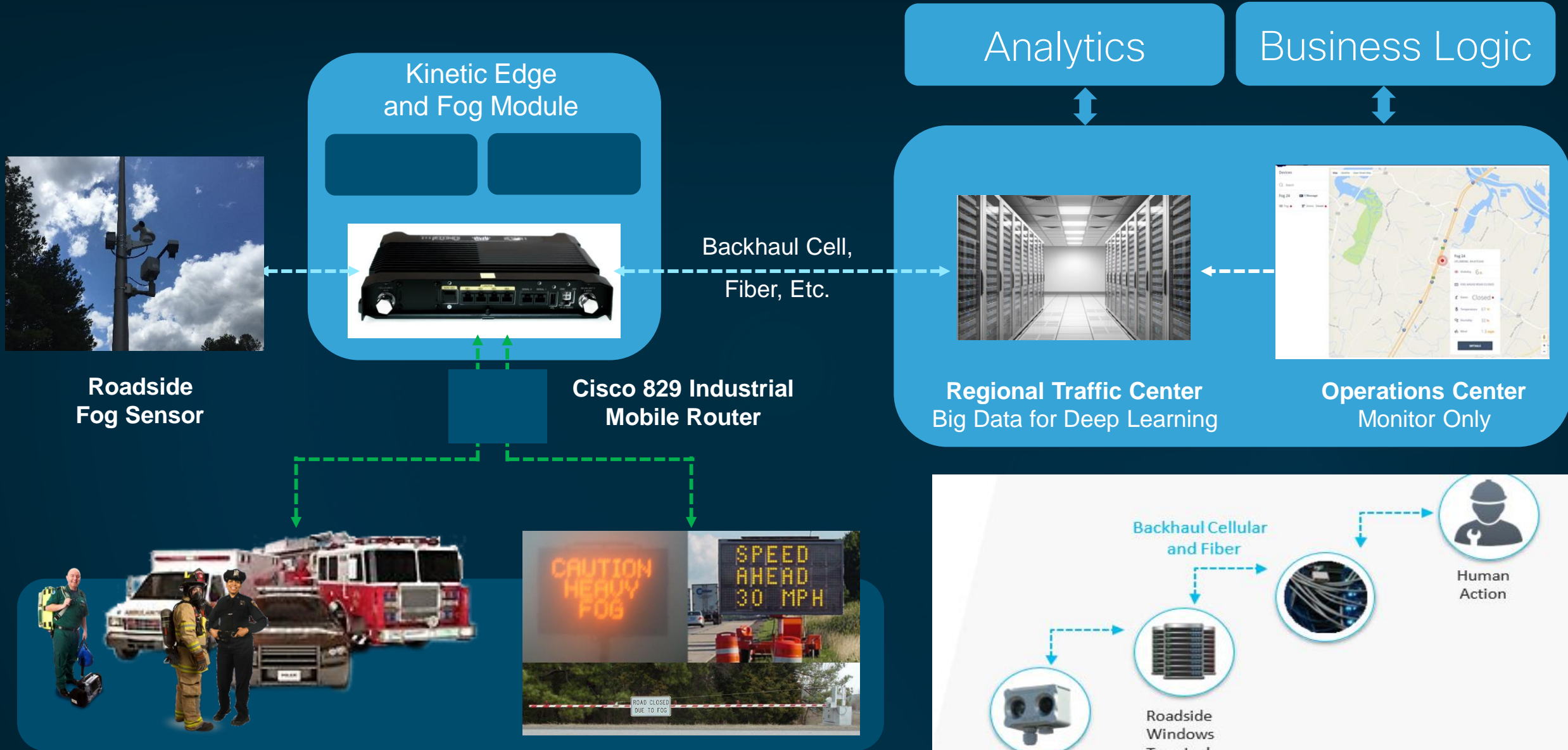


This was the scene on Dec. 11, 1990, after 99 cars and trucks collided on a foggy stretch of Interstate 75 near Calhoun, Tenn. Twelve people were killed and 42 were injured in the chain-reaction accident. (Julie Elman-Roche/News Sentinel)

NEWS T  
Local  
State  
2016 E  
Strange  
News C  
Sam Ve  
Georgia  
Frank M  
Greg J  
Send A

LATI

# Transportation - Real-time Weather Sensing



# Key Takeaways



Identify key  
requirements/use cases



Start your IoT  
Conversation with Cisco  
Rep



Let us work together to solve  
your business challenge

<http://go2.cisco.com/CiscoIoT>



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