Fog Computing on the Plant Floor

Ivan Zoratti - Chief Product Officer - Dianomic Systems

Who Are We?

We are Dianomic Systems - *Our mission: Simplify IoT Data*

DIANOMIC

Dianomí *greek* = Distribution *english*

The distribution of IoT data networking, processing, security and storage makes managing it complicated. Simplifying IoT application and system development with an ubiquitous open source platform, standards and community is Dianomic's mission.

Conference Theme & Keywords

Conference Theme & Keywords

IoT and IIoT?

cisco the network
Cisco's Technology News Site

Home | Digitization | Innovation | People & Culture | Press Releases | Corporate | Regions

Home

Cisco Survey Reveals Close to Three-Fourths of IoT Projects Are Failing

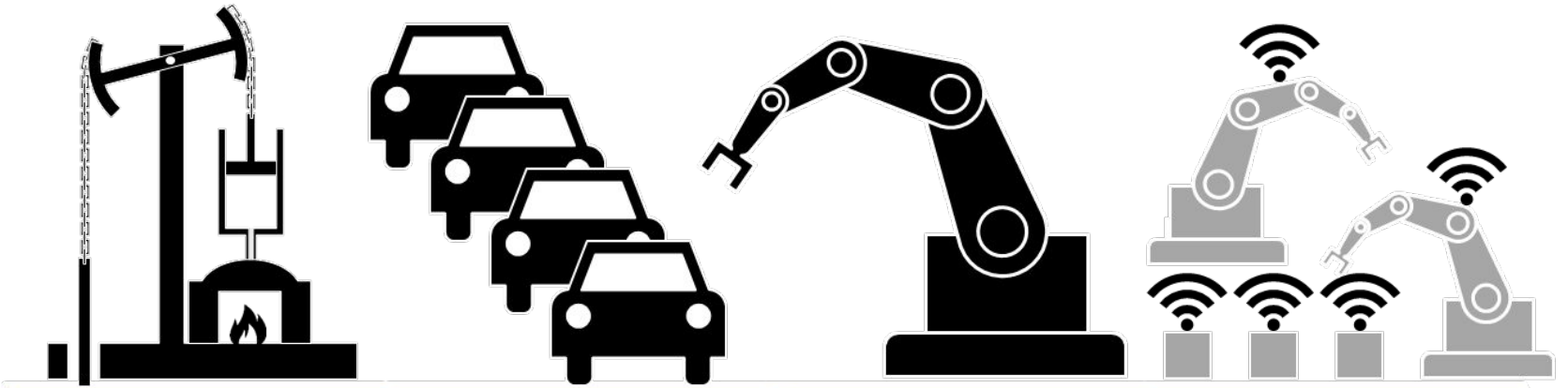
Released at marquee industry event IoT World Forum, the survey data also reveals keys to IoT success

MAY 23, 2017

LONDON - The Internet of Things World Forum (IoTWF), May 23, 2017 – IDC predicts that the worldwide installed base of Internet of Things (IoT) endpoints will grow from 14.9 billion at the end of 2016 to more than 82 billion in 2025[1]. At this rate, the Internet of Things may soon be as indispensable as the Internet itself.

https://newsroom.cisco.com/press-release-content?articleId=1847422

A Fragmented World



1st	2nd	3rd	4th
Mechanization, water power, steam power	Mass production, assembly line, electricity	Computer and automation	Cyber Physical Systems

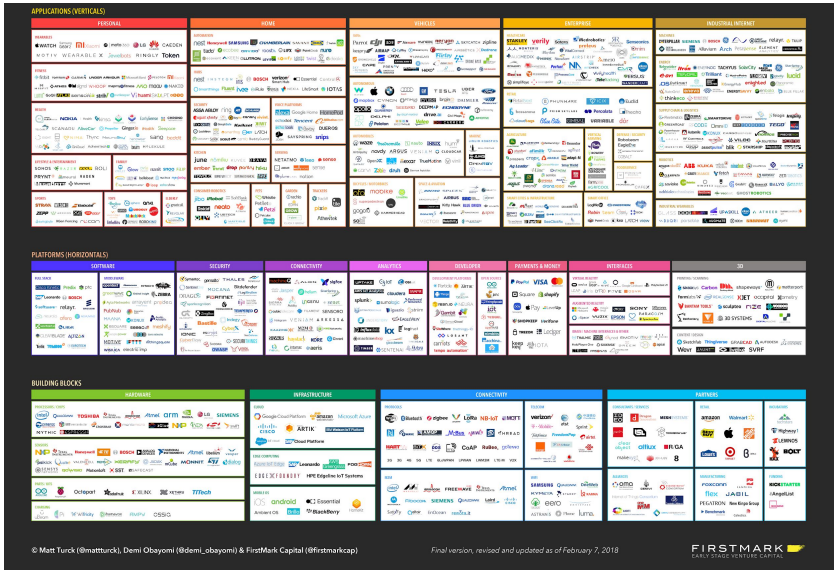
IIoT Challenge: It Is a Brown Field

- Fragmentation
  - Sensor Protocols (CAN bus, Modbus, OPC-UA, Bluetooth, BLE, DECT, ZigBee, Z-Wave …)
  - Industrial Systems (Actuators, HMI, SCADA, PLCs, Historians)
  - Hardware (ARM, Intel, Qualcomm)
  - Protocols to Cloud (MQTT, LWM2M, CoAP, AllSeen, HTTP, HTTPS)
  - Standards (oneM2M, Thread, AllSeen, Industrial Internet Consortium, OpenFog Consortium/IEEE)
- Complexity
  - Security (Sensors, Data, Network, Cloud, Control, PKI, SKI, Blockchain)
  - Reliability (Store & Forward, Best Effort, Guaranteed)
  - Network (LAN, WAN, Cell)
  - Lifecycle Management (Provisioning, Configuration, Update, Upgrade)
  - Integration (OT/IT, Sensor, Edge, Fog, Historian, Cloud)

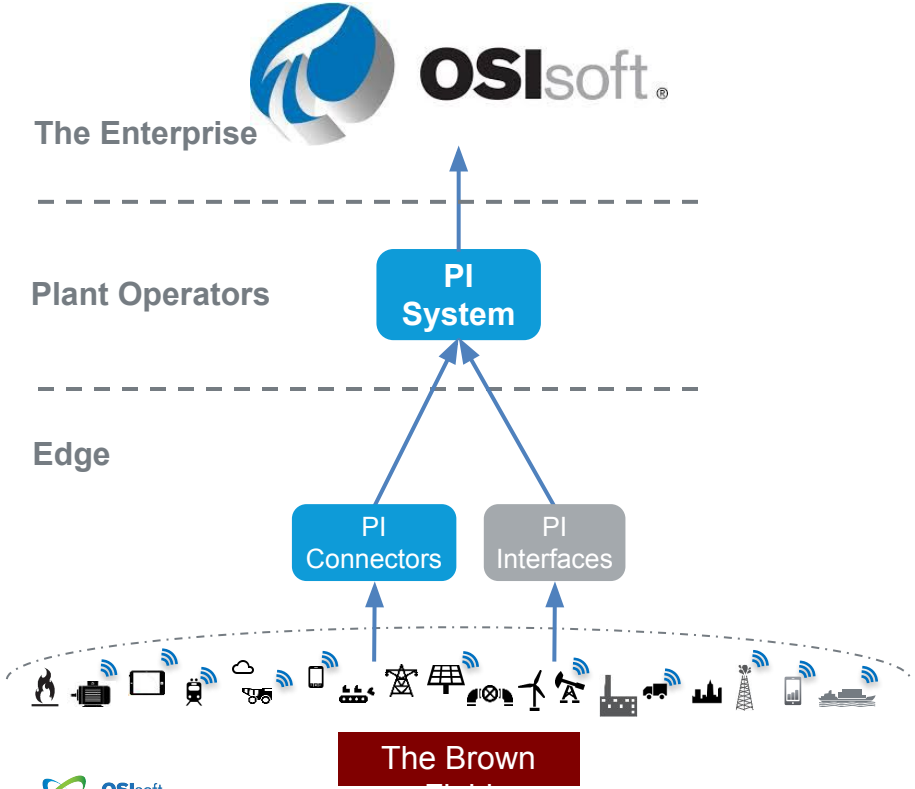
IIoT Challenge: the Upcoming Green Field

- **Estimation:** in 2017 IoT devices surpassed mobile phones
- **IDC:** forecast $800bn spending in IoT in 2017
- **Matt Turk and First Mark Capital:**
  - 971 companies, several verticals
  - AI-powered
  - Increase Connectivity
  - More Edge Computing

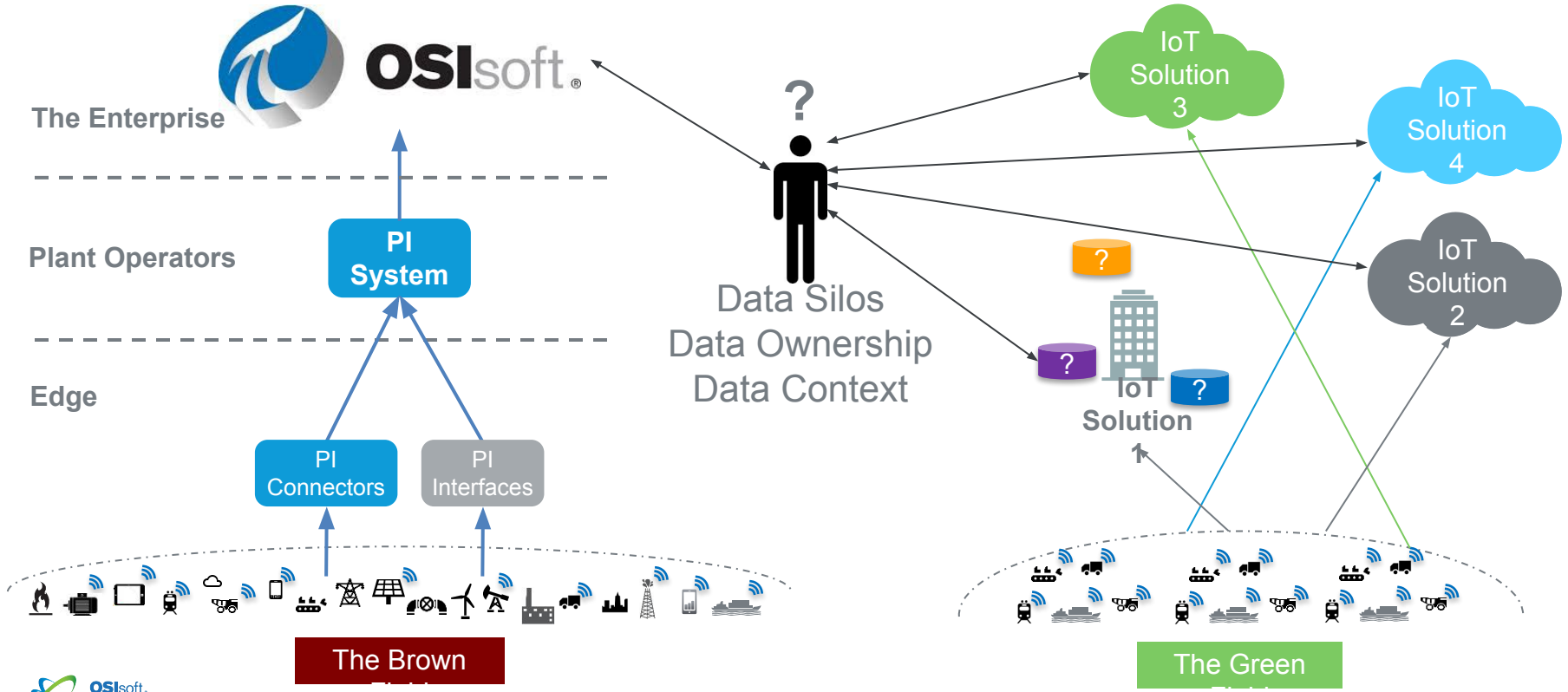
http://mattturck.com/iot2018



Sensors On Everything

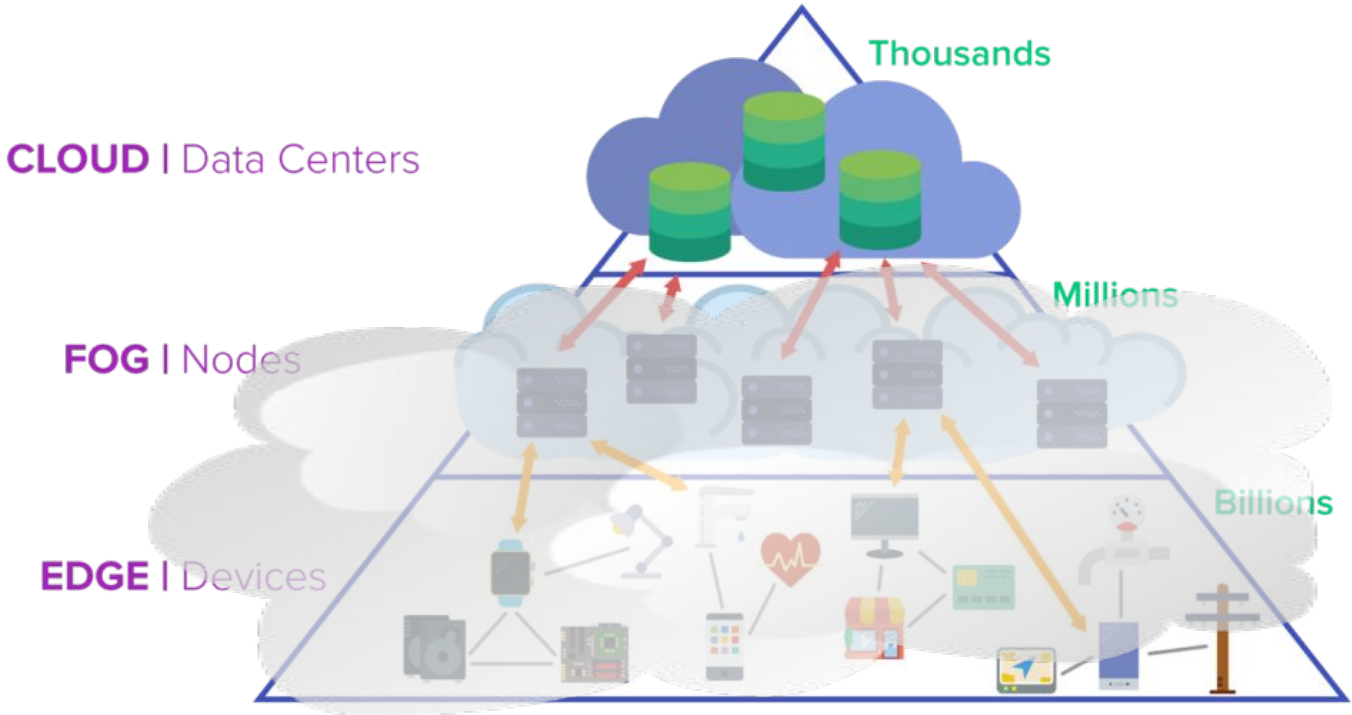


Sensors On Everything – New Silos Of Data



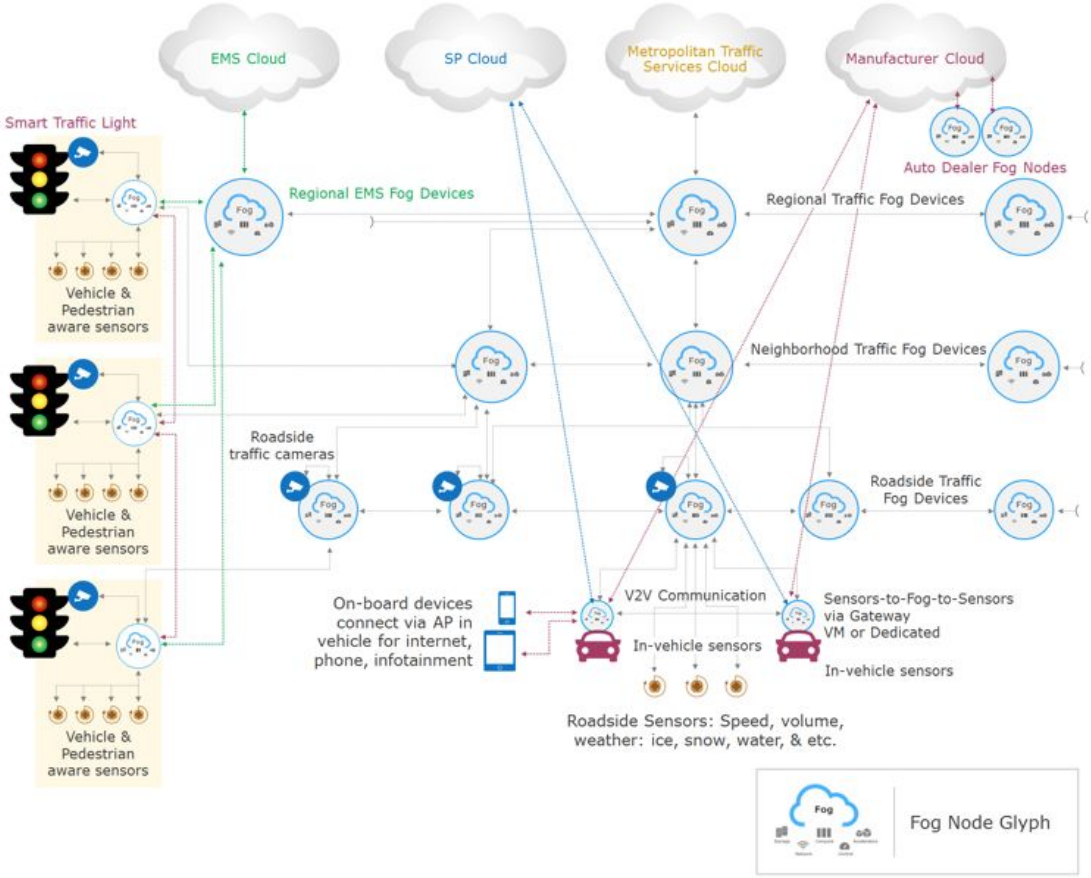
What Is Fog Computing?

"A decentralized computing infrastructure in which data, compute, storage and applications are distributed in the most logical, efficient place between the data source and the cloud."
http://internetofthingsagenda.techtarget.com/definition/fog-computing-fogging



Why Fog Computing?

Use Cases:
Smart Roads

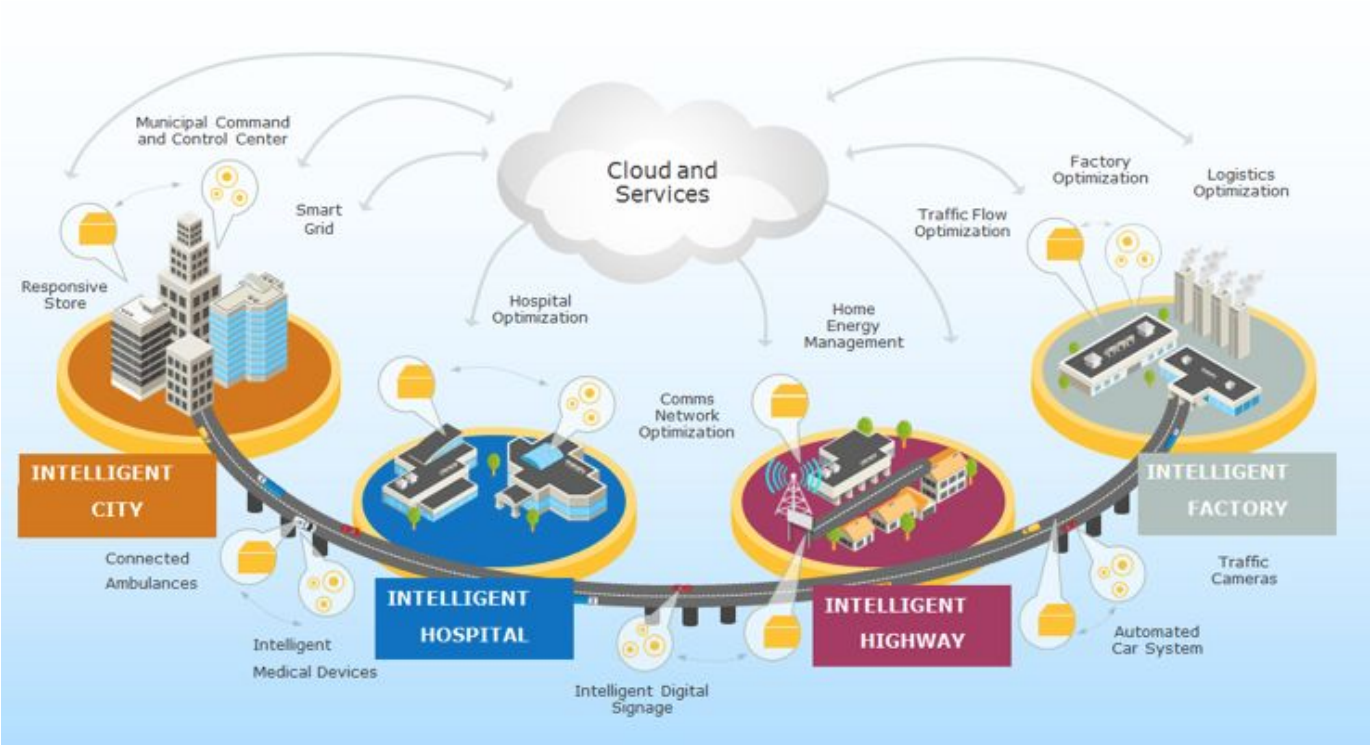


Why Fog Computing?

Use Cases:
Smart Buildings

Why Fog Computing?

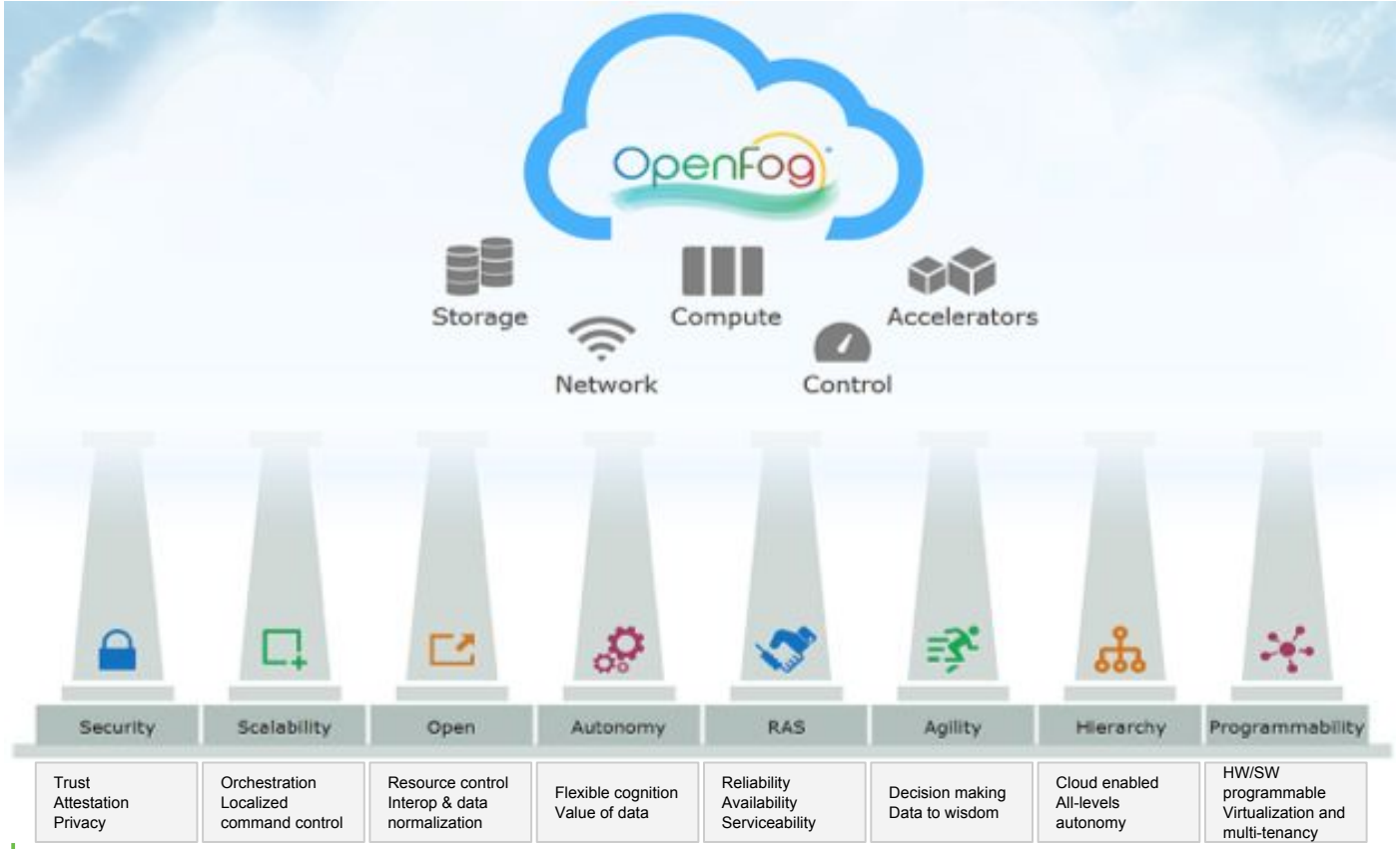
Use Cases:
Smart Cities



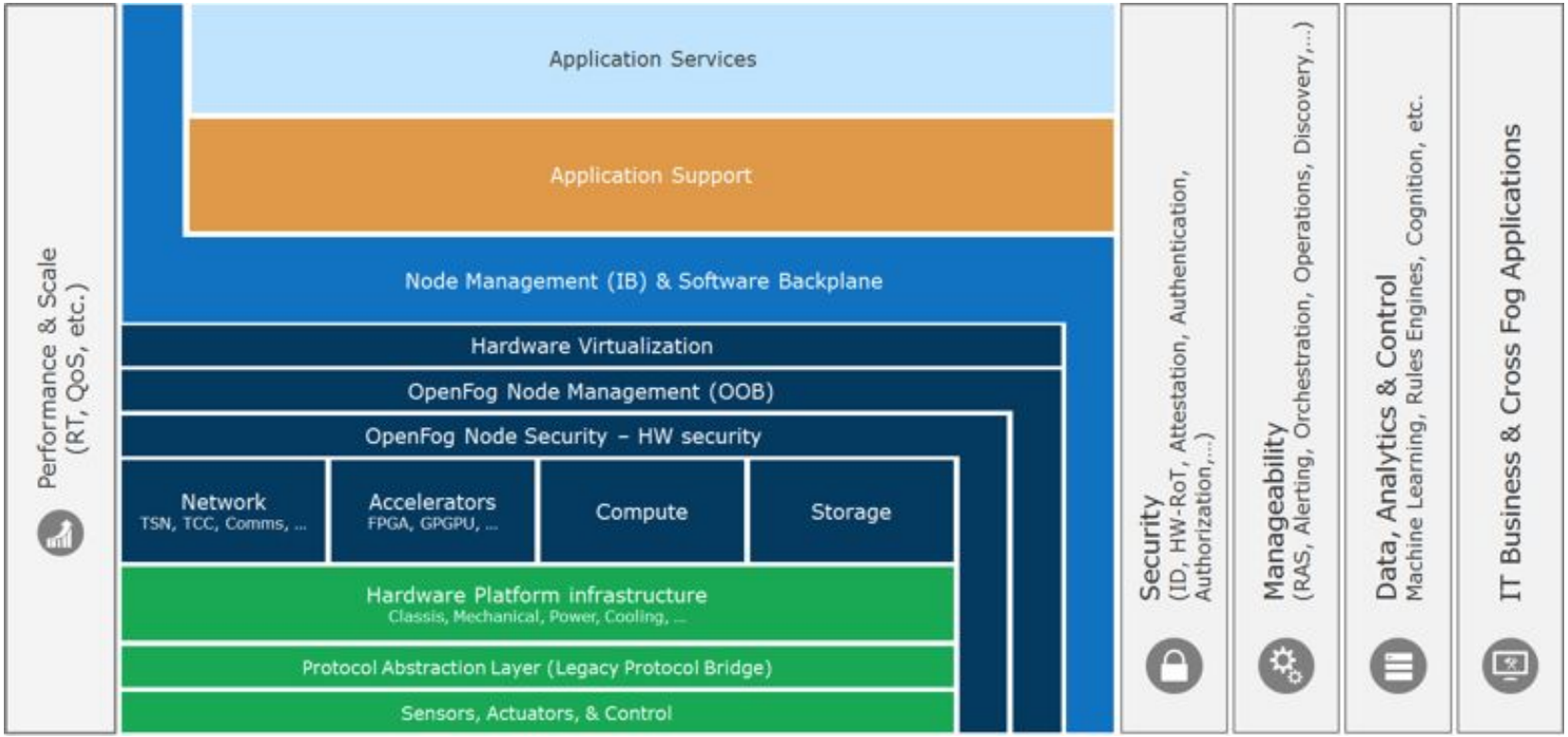
The OpenFog Consortium

"A growing, global ecosystem of Fog experts."
65 members strong, headquartered in 18 countries as of February 2018

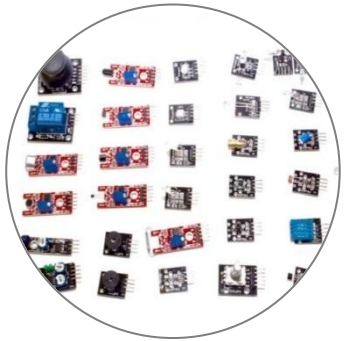
Eight Pillars of an OpenFog Reference Architecture



OpenFog Reference Architecture



What Is Driving the Interest in IIoT?



Cheap, and tiny sensors

Decreasing compute and storage costs

New abilities to process and analyze data

Ubiquitous connectivity

Sensors on the Entire Supply Chain Will Automate and Transform Business

The OSIsoft Message Format

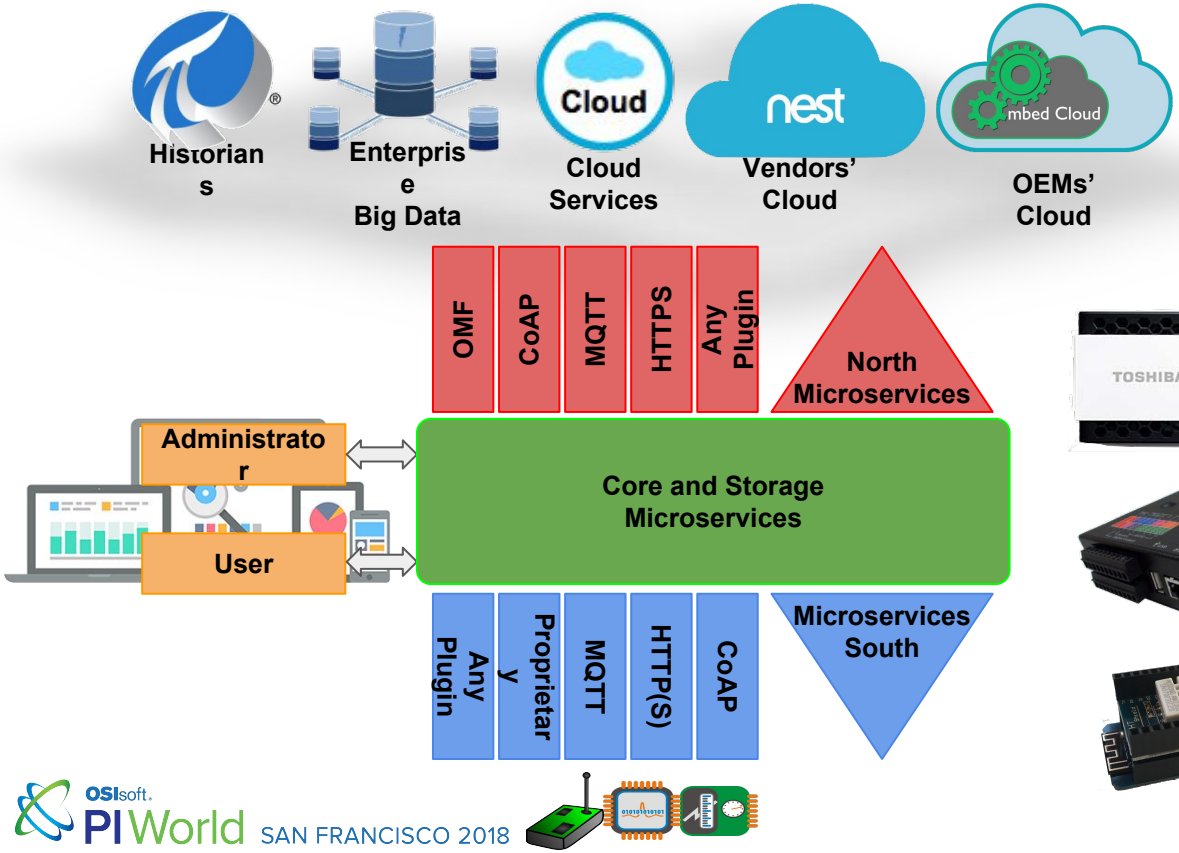
- Message header and body definition
- Used to develop data acquisition applications
- JSON schema specification and message format
- Supports Create/Update/Delete
- Secured/unsecured communication (using a security token for authentication)
- Optionally compressable

http://omf-docs.osisoft.com

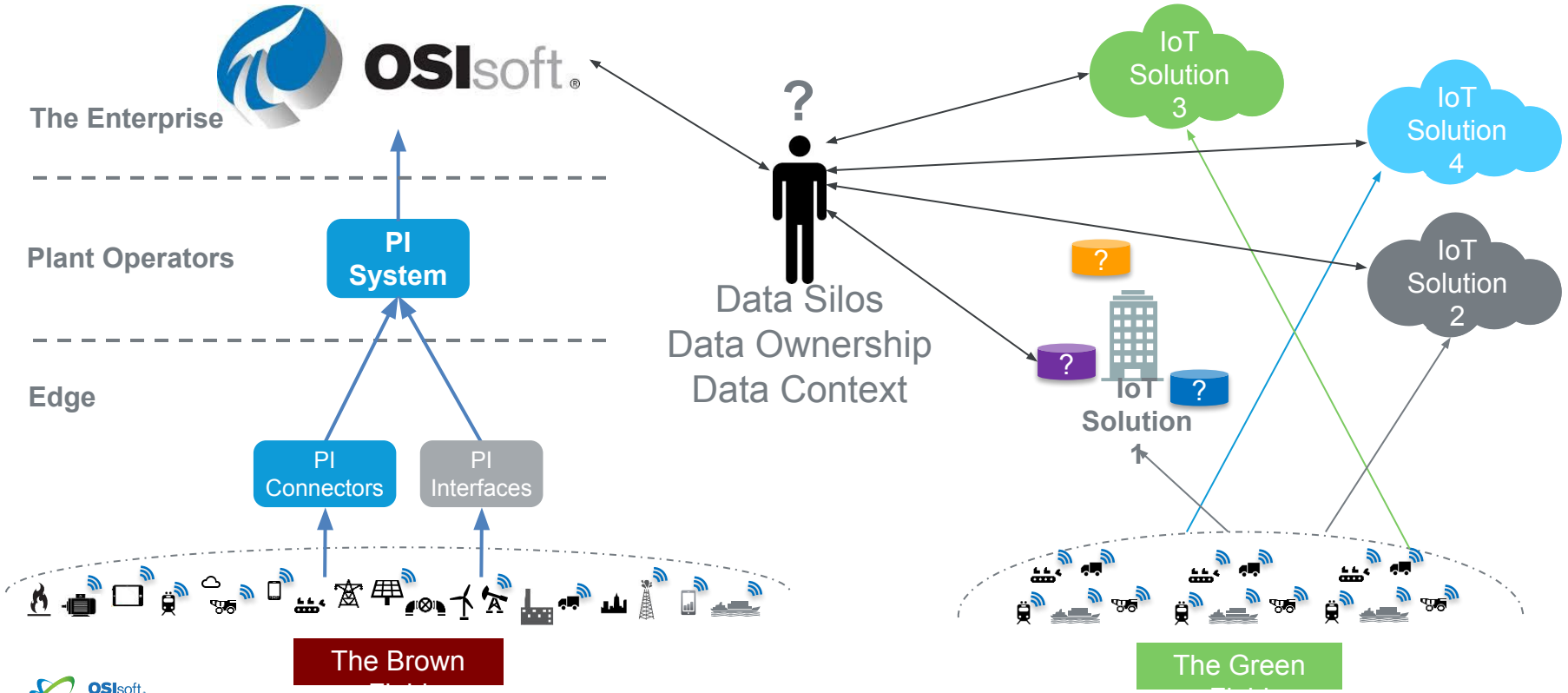
FogLAMP

- A platform for the **Internet of Things** and an essential component in **Fog Computing**.
- It uses a modular **microservices architecture** including sensor data collection, storage, processing and forwarding to historians, Enterprise systems and Cloud-based services.
- It can run in highly available, stand alone, unattended environments that assume unreliable network connectivity.
- **Target**: smart sensors, smart devices, embedded systems, data and network appliances and gateways, open source systems

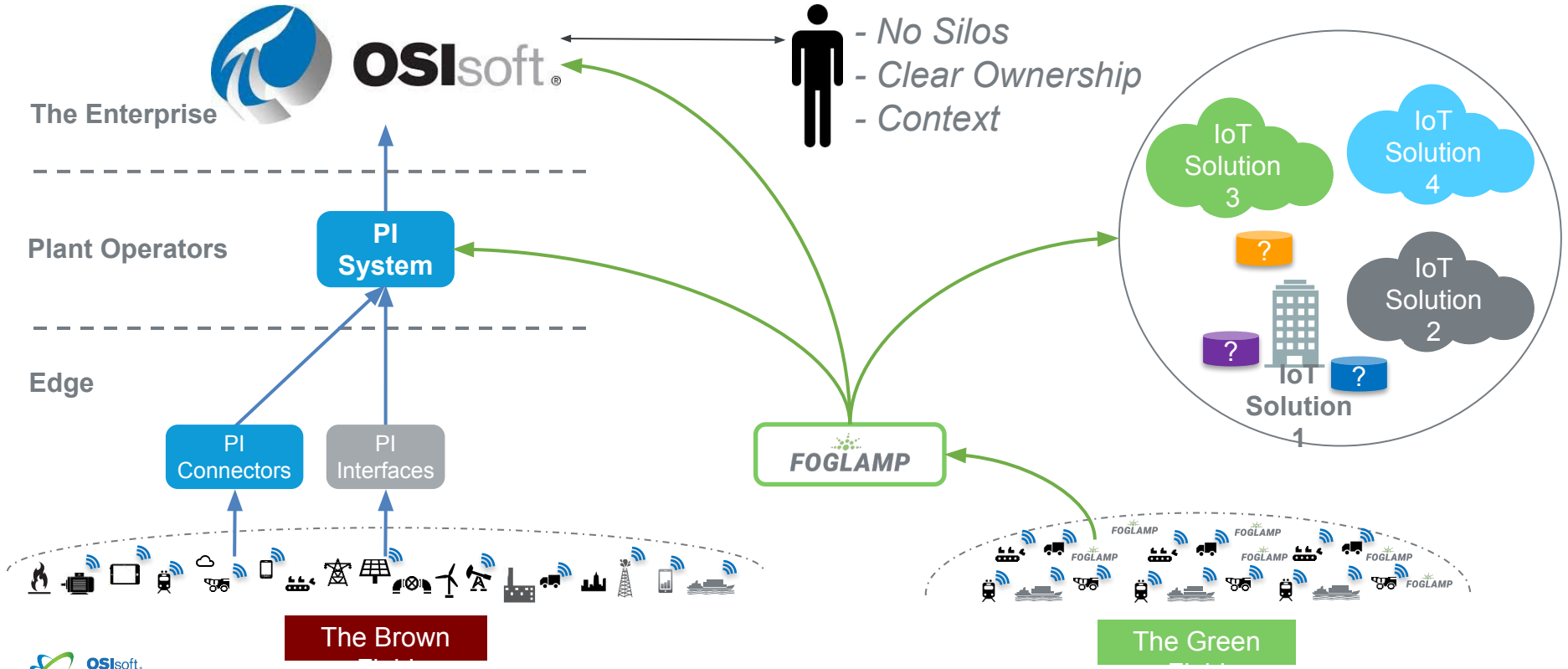
FogLAMP



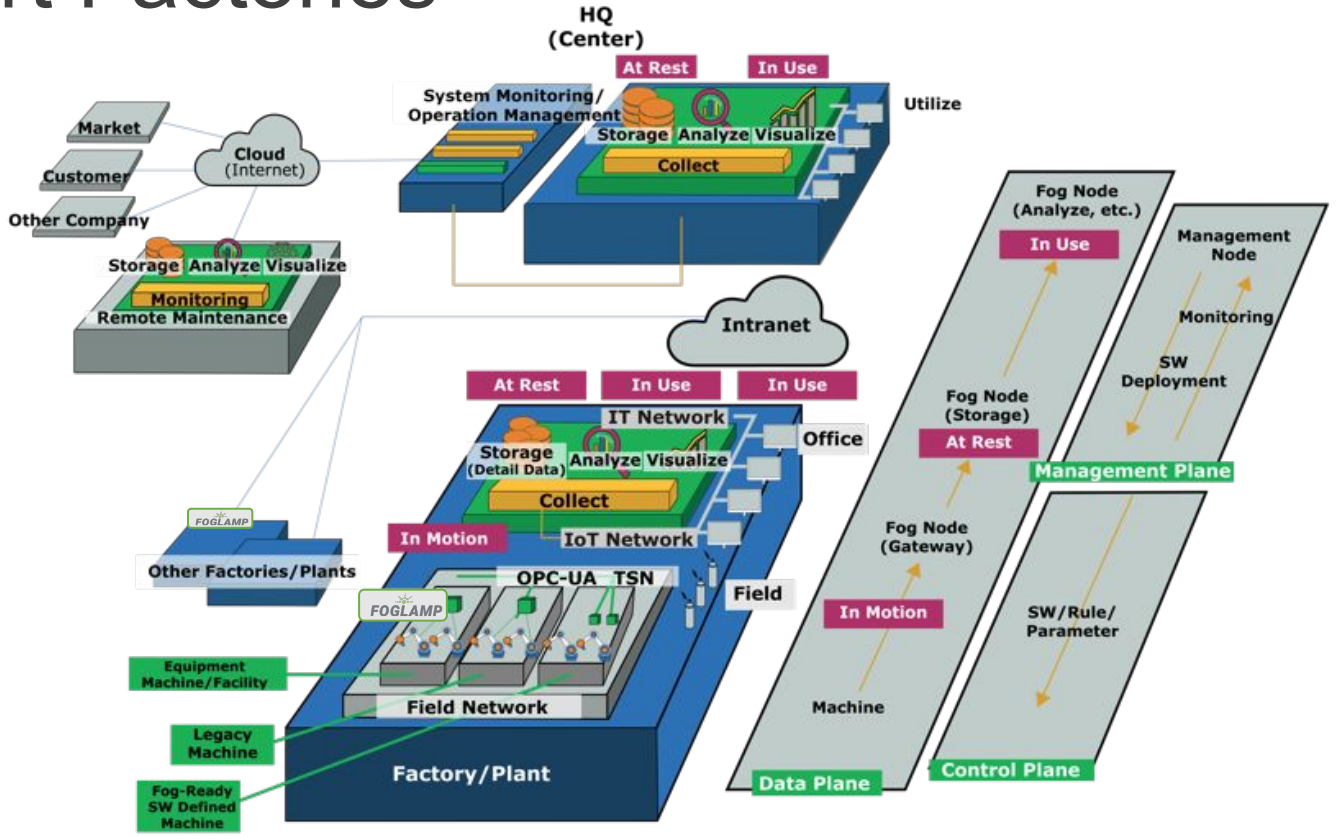
Embrace and Extend with Open Source and Standards



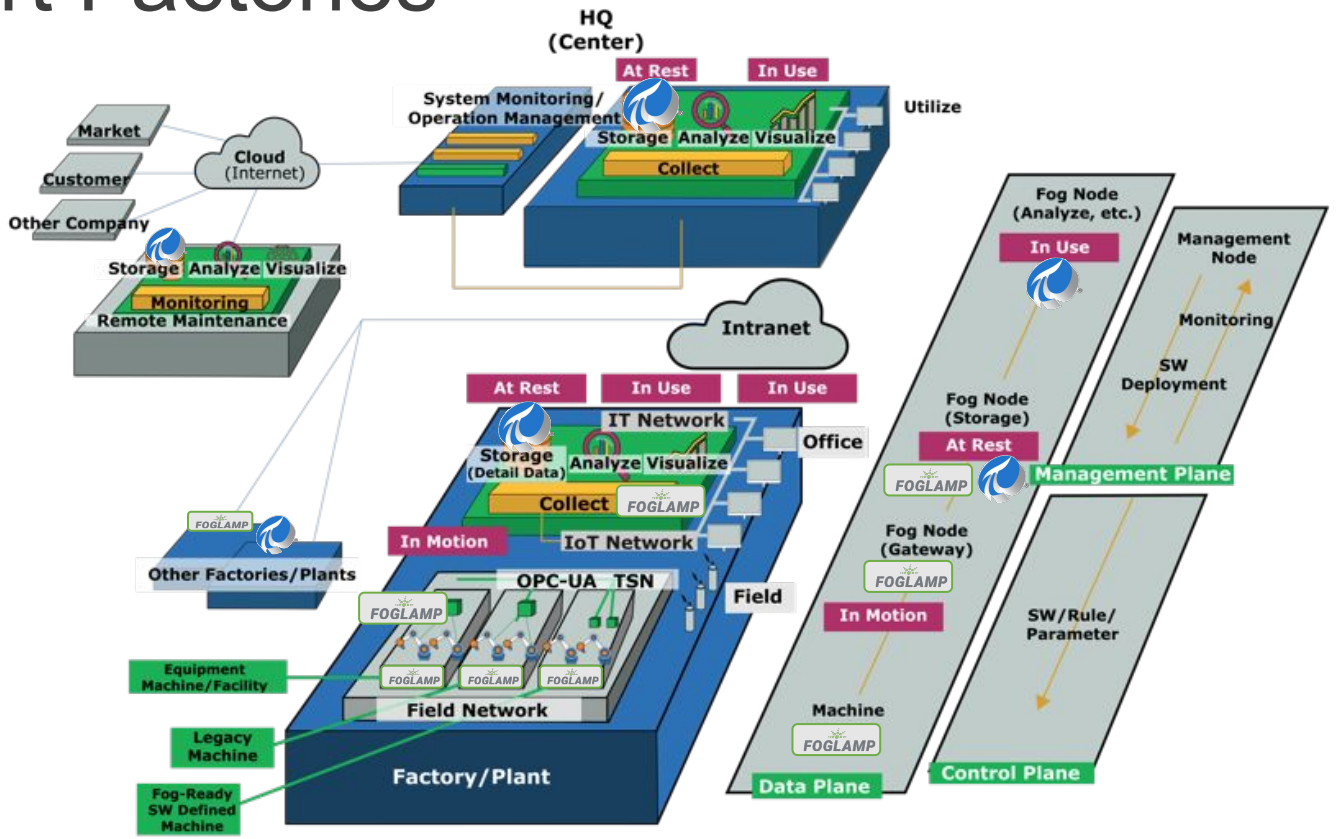
Embrace and Extend with Open Source and Standards



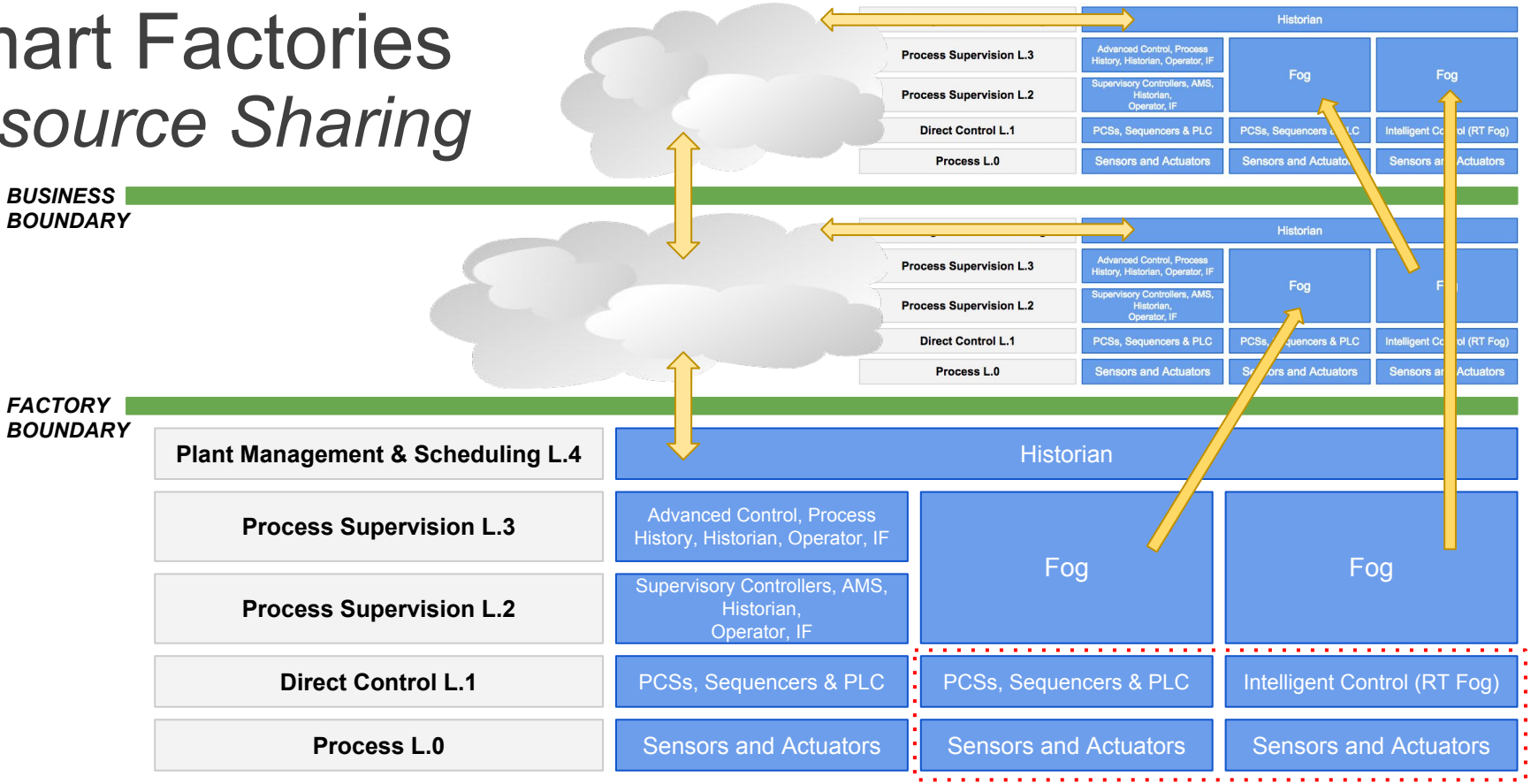
Smart Factories



Smart Factories

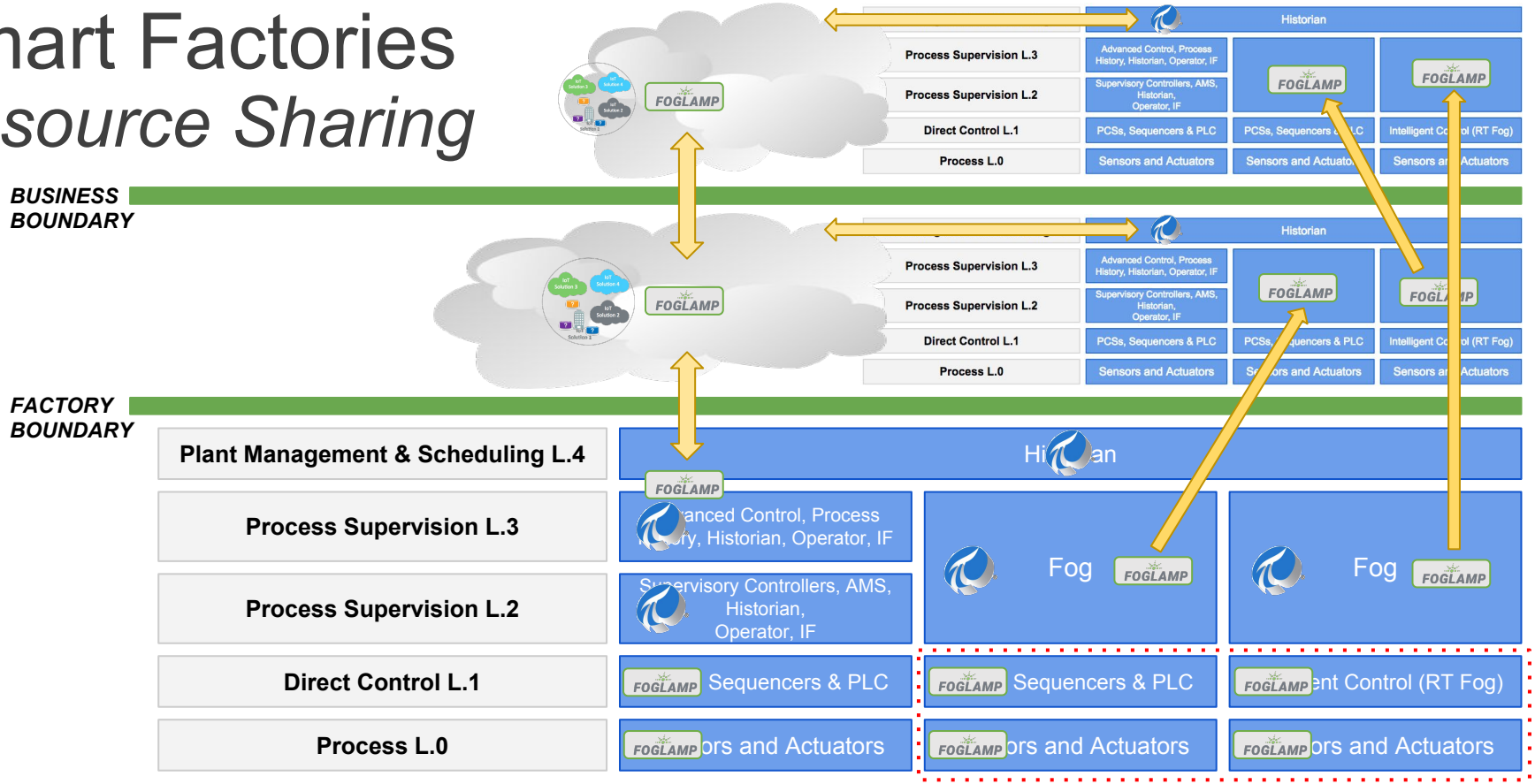


Smart Factories
Resource Sharing



Virtualized Production Resources consisting of the virtual production platform across the boundaries

Smart Factories
Resource Sharing



Virtualized Production Resources consisting of the virtual production platform across the boundaries

Join the FogLAMP Community!

OSIsoft.

arm

TOSHIBA

PANDUIT®

ARROW ELECTRONICS, INC.

Beyond The Edge Networks

DIANOMIC

Sprint

FogLAMP on GitHub: *https://github.com/foglamp/FogLAMP*
FogLAMP Discussion Group: *https://groups.google.com/forum/#!forum/foglamp*

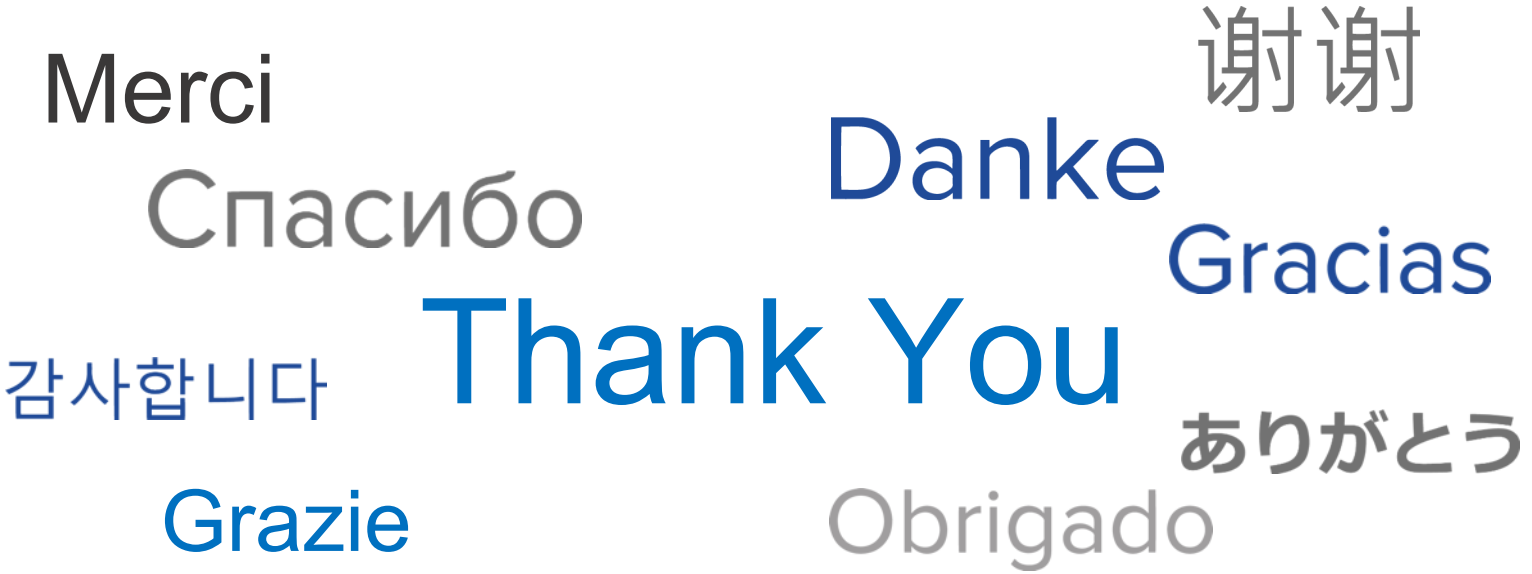
Questions

Please wait for the **microphone** before asking your questions

State your **name & company**

Please remember to…

Complete the Online Survey for this session



Visit us at the FogLAMP Community Booth!

More content and presentations you might be interested in:

Tue 24 3:15PM	Managing and Accelerating Innovation with Open Source at the Edge
Thu 26 10:30AM	Introduction to FogLAMP
Thu 26 1:30PM	LAB: IoT and Fog Computing - Develop Data Ingress Applications from Edge to Cloud
Thu 26 2:30PM	Fog Computing on the Plant Floor

Join the FogLAMP Community!

OSIsoft.

arm

TOSHIBA

PANDUIT®

ARROW ELECTRONICS, INC.

Beyond The Edge Networks

DIANOMIC

Sprint

FogLAMP on GitHub: *https://github.com/foglamp/FogLAMP*
FogLAMP Discussion Group: *https://groups.google.com/forum/#!forum/foglamp*