

The background of the image is a dark blue gradient with a faint, stylized map of the San Francisco Bay Area. The Golden Gate Bridge is visible on the left side, and the San Francisco skyline, including the Transamerica Pyramid, is on the right. The text is overlaid on this background.

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USERS CONFERENCE 2016

April 4-8, 2016 | San Francisco

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Getting Started with IIoT and the PI System

Presented by **Chris Felts, Sr. Product Manager**
Dan Noonan, Team Lead



Agenda

- IIoT Overview
- OSIsoft Connector Technologies
- IIoT Architecture
- IIoT Deployment examples
- Getting started

IIoT Overview

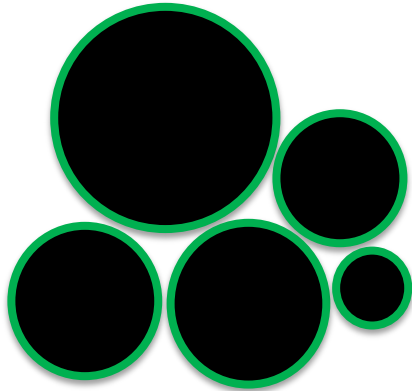
OSIsoft and IIoT

- The Industrial Internet of Things (IIoT) familiar concepts to operations technology (OT) and OSIsoft
- The PI System has been collecting sensor data and creating actionable information for over 30 years
- OSIsoft is extending the PI System capabilities to meet the IIoT / edge data patterns:
 - Data Ingress (via PI Connectors)
 - Data Egress (via PI Integrators)

If We've Been Doing This For So Long, What is Different?

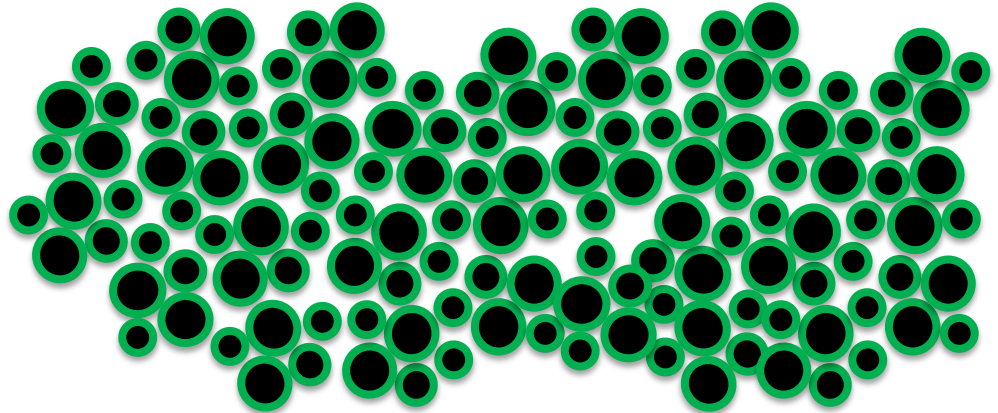
Traditional data pattern

A few large “pipes”



IIoT data pattern

Many, many small “pipes”



Typical IIoT Data Patterns

- Adding new sensors to existing assets
- Incorporating remote, mobile, and/or geo-dispersed sensors and assets
- Increasing OEM and package equipment sensor density
- Connected enterprises

Industry Challenges of IIoT

- **Many, many sensors**
- **New communication protocols**
- **Various operating systems**
- Network bandwidth
- Data quality
- Software updates
- **Security**
- Data privacy
- **Data silos**
- **Evolving landscape**
- **Too much data**

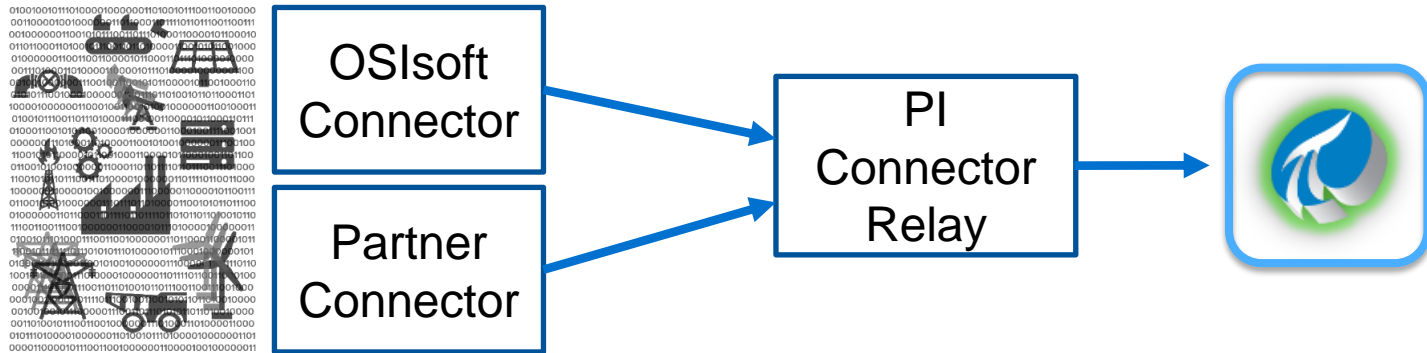
How to Address the IIoT Industry Challenges

- Sensors aggregated in a gateway
- Embedded PI connectors and the OSIsoft Message Format (OMF)
- PI System data infrastructure
- PI integrators

OSIsoft Connector Technologies

What Specifically Is OSIsoft Doing?

- Building platform agnostic Connectors that can be deployed on both Windows and Linux
- Enabling partner development of Connectors via our OMF Specification



OSIsoft and Cisco IOx

- DNP3 and Modbus Connectors
- Targeting Cisco's Industrial Integrated Services Router



PI
Connector
Relay



DNP3 Network

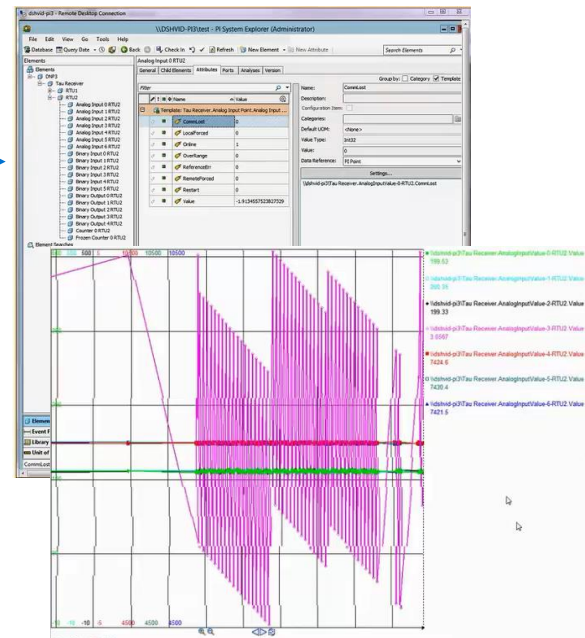
DNP3 Connector Running on Cisco's ISR 829 Device

PI System

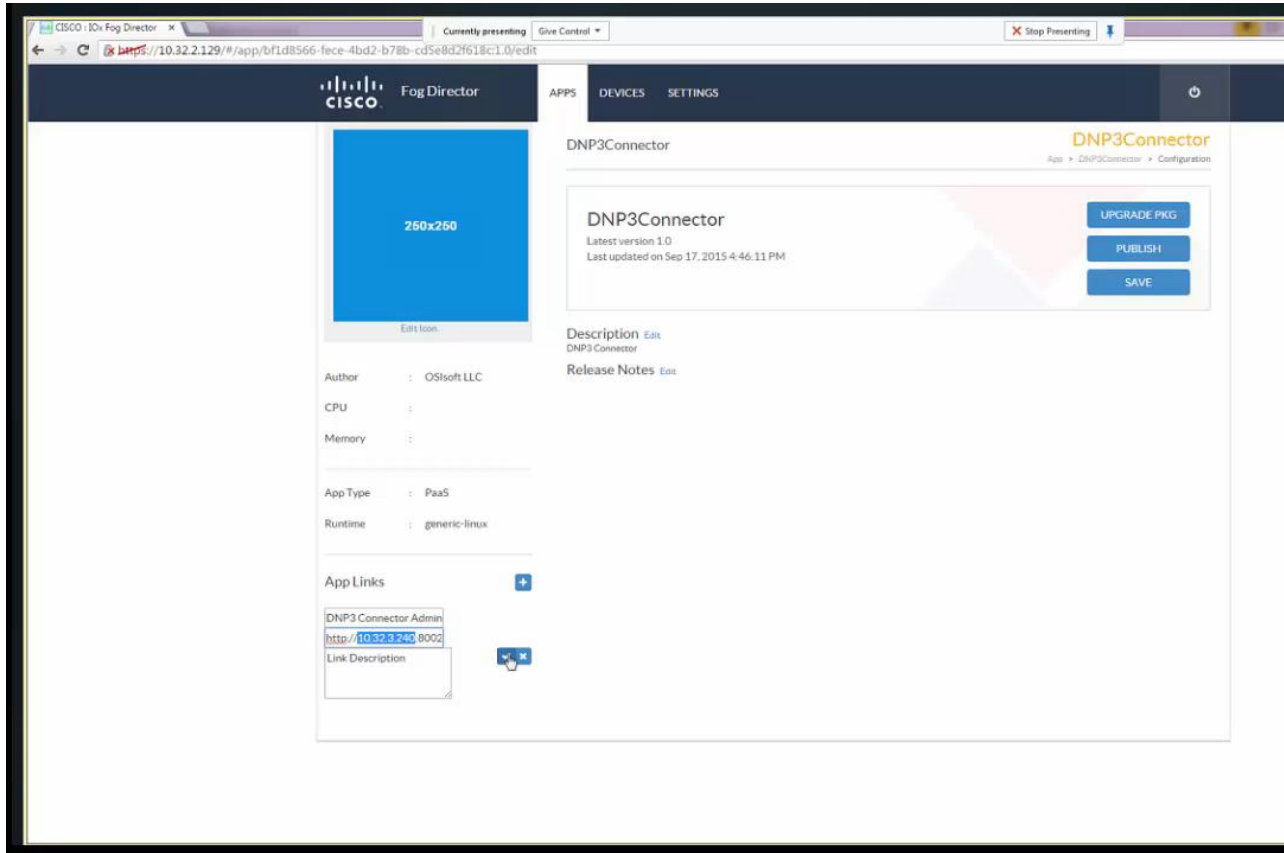


```
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Value = 198
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Restart = 0
CommLost = 0
RemoteForced = 0
LocalForced = 0
OverRange = 0
ReferenceErr = 0
Mode = Create

TraceStream :: OnNext
Timestamp = 9/17/2015 12:46:43 PM
Value = 199
Online = 1
Restart = 0
CommLost = 0
RemoteForced = 0
LocalForced = 0
OverRange = 0
ReferenceErr = 0
Mode = Create
```



Deploy & Upgrading a PI Connector on Cisco IOx



The screenshot displays the Cisco Fog Director web interface. The browser address bar shows the URL: `http://10.32.2.129/#/app/bf1d8566-fece-4bd2-b78b-cd5e8d2f618c1.0/edit`. The interface has a dark blue header with the Cisco logo and "Fog Director" text. Below the header, there are tabs for "APPS", "DEVICES", and "SETTINGS". The main content area is titled "DNP3Connector" and includes a "DNP3Connector" section with a "260x260" icon placeholder. To the right of this section are buttons for "UPGRADE PKG", "PUBLISH", and "SAVE". Below the icon placeholder, there is a list of attributes: Author (OSIsoft LLC), CPU, Memory, App Type (PaaS), and Runtime (generic-linux). At the bottom, there is an "App Links" section with a table containing a link to "DNP3 Connector Admin" with the URL `http://10.32.3.240:8000` and a "Link Description" field.

Administer the PI Connector on Cisco Device

DNP3 Connector Administration User Interface

PI Connector for DNP3

Overview

Data Source List

Server List

Diagnostics

Overview

Connector details
Version 1.0.0.0

Status of the connector
Connector running as OSIdhnoen
● Connector is stopped - Start connector

Data sources
● Port20500 Connected
[Add or modify data sources](#)

Servers configured to receive data from the connector
● PI Relay server dhnoen7600 Disconnected
[Add or modify servers](#)

OSIsoft

DNP3 Connector Running on Cisco's ISR 829 Device

TraceStream :: OnNext
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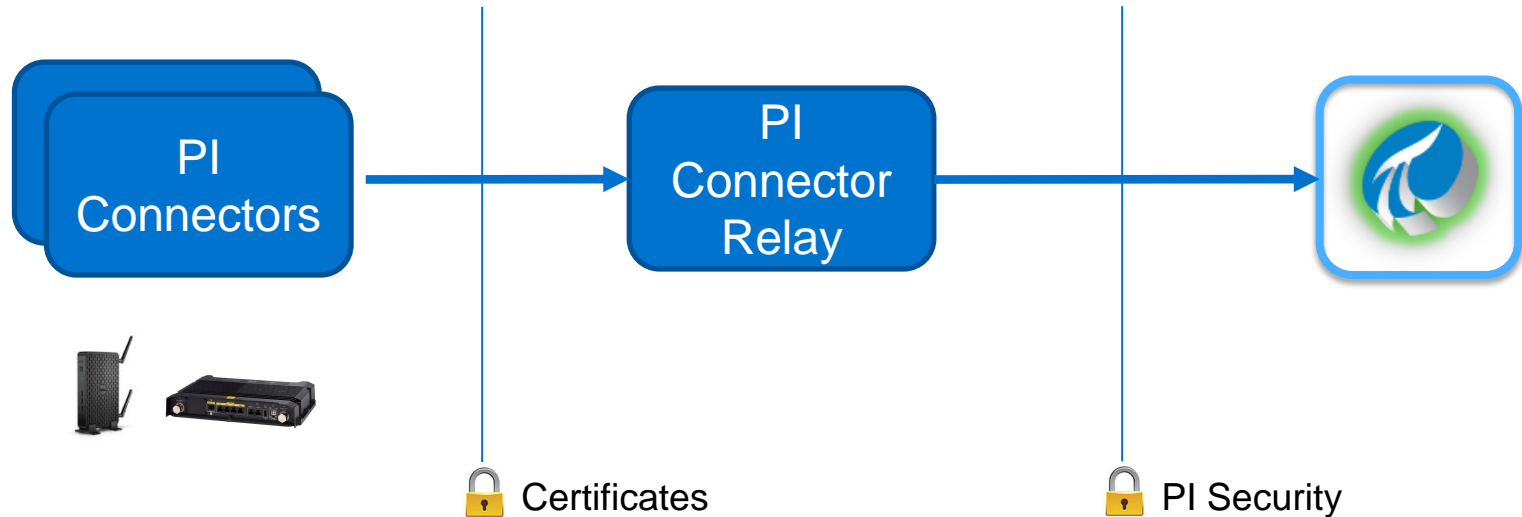
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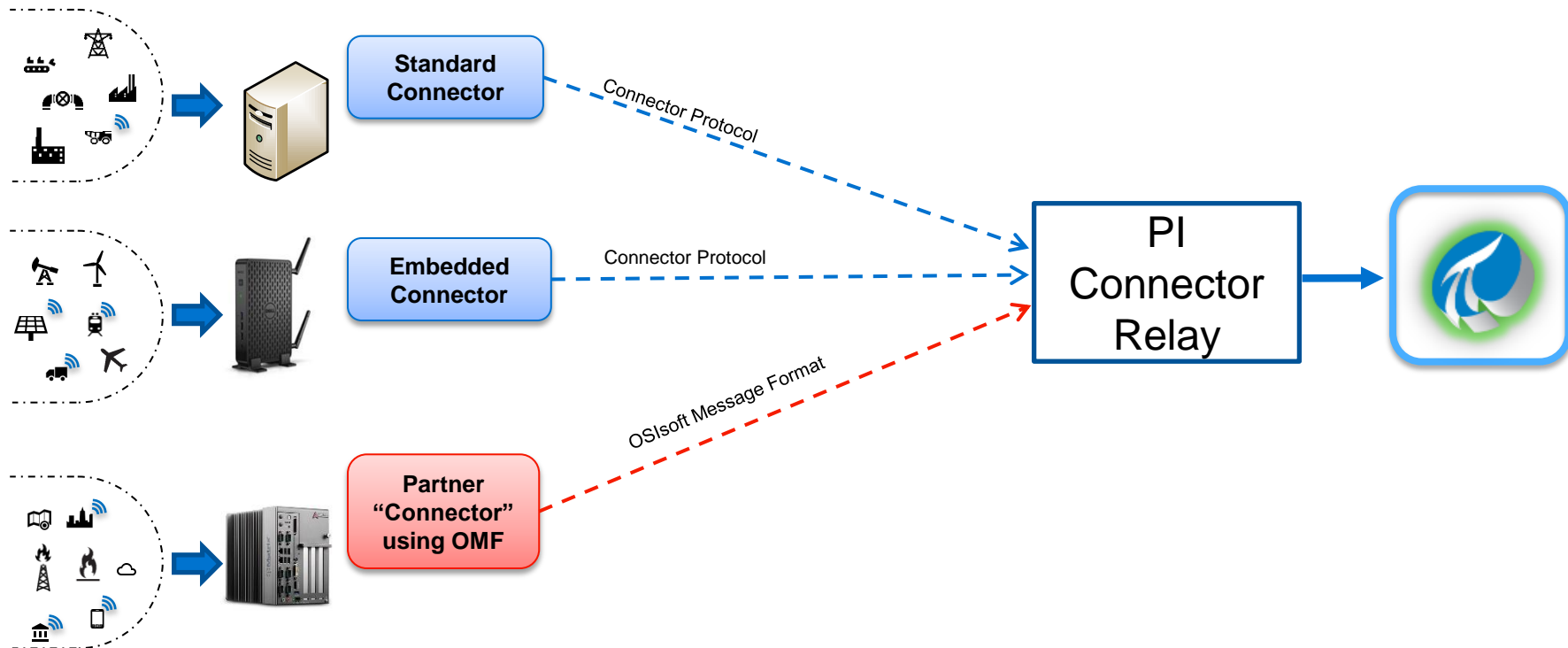
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Security

- Connector serves administration pages via HTTPS
- User requesting access to administration is authenticated
- Encrypted communications between Connector and PI System

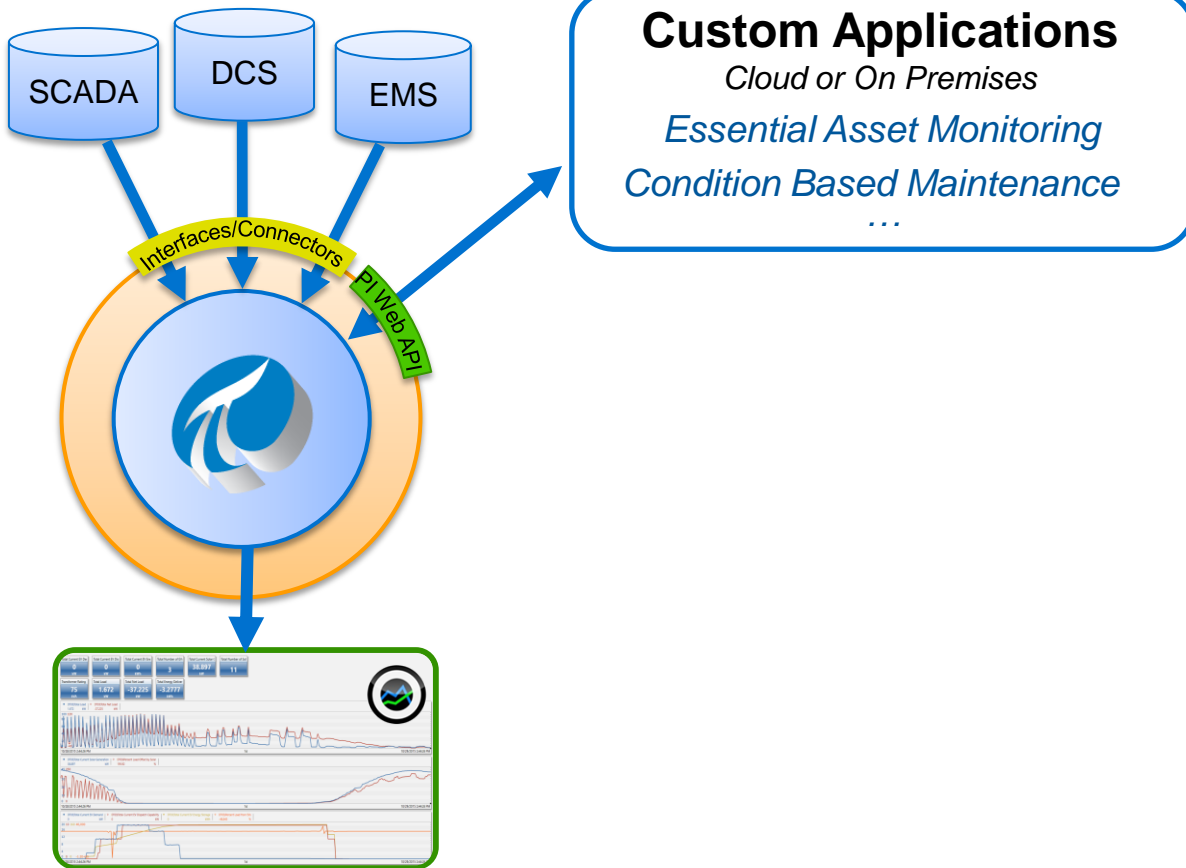


Enabling Partner Developed Connectors

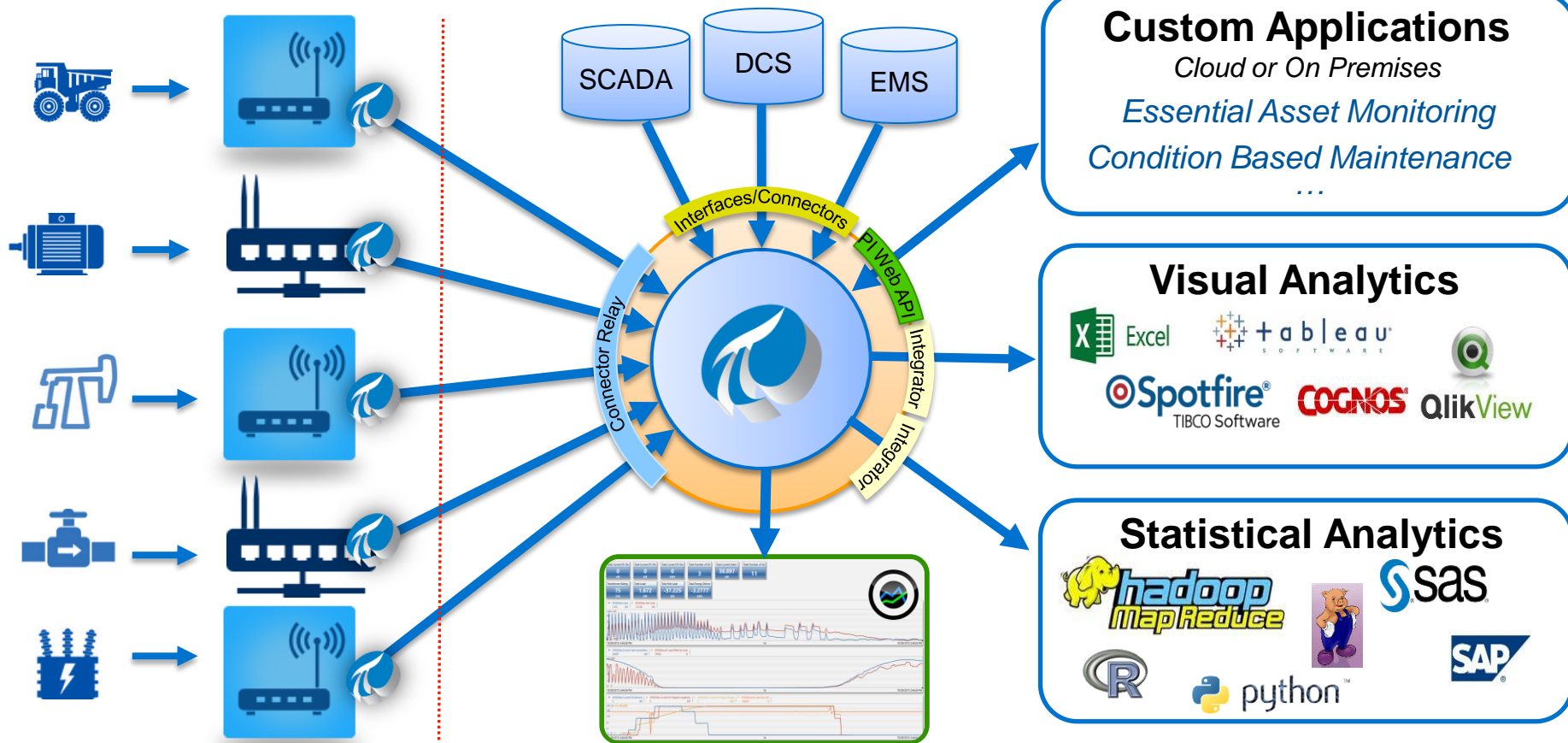


IIoT Architecture

OSIsoft Typical Architecture

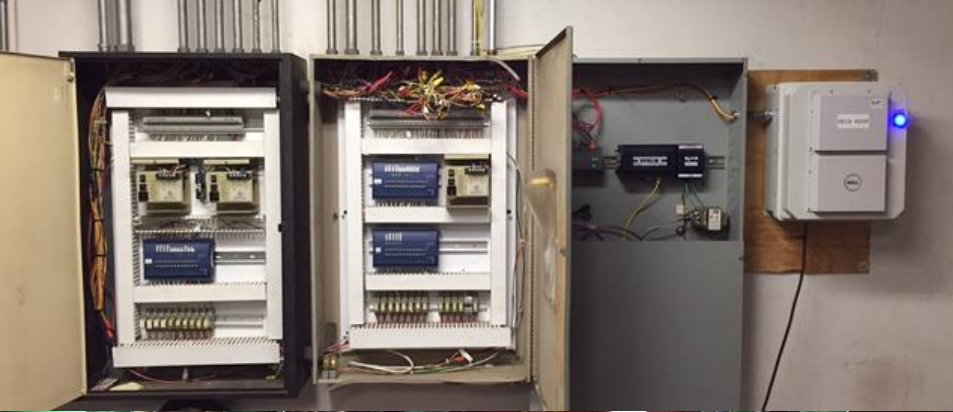


OSIsoft IIoT Architecture

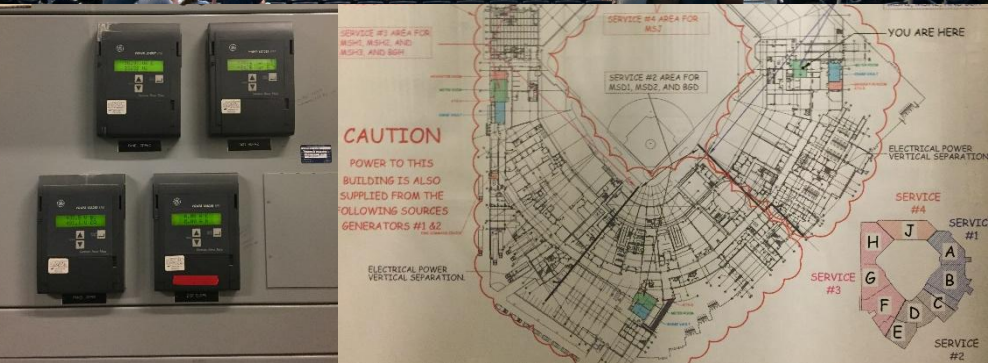
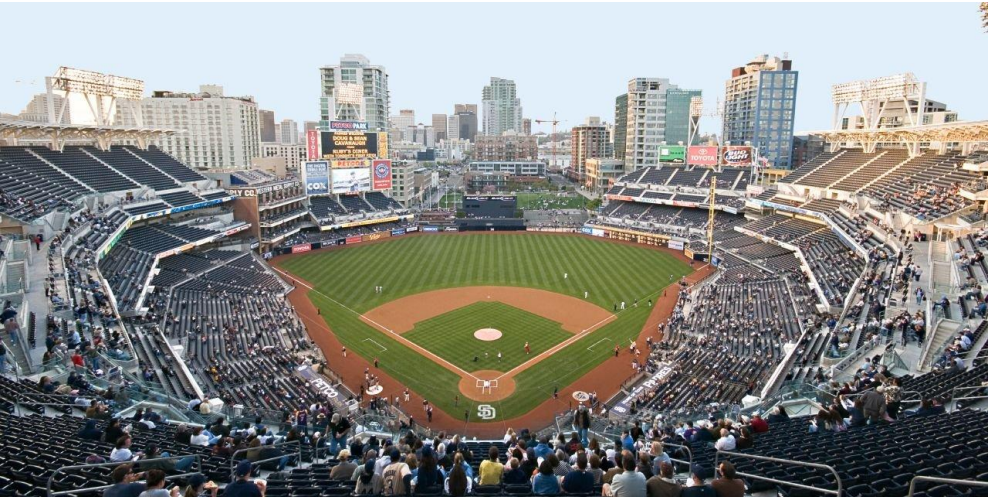


IIoT Deployment Examples

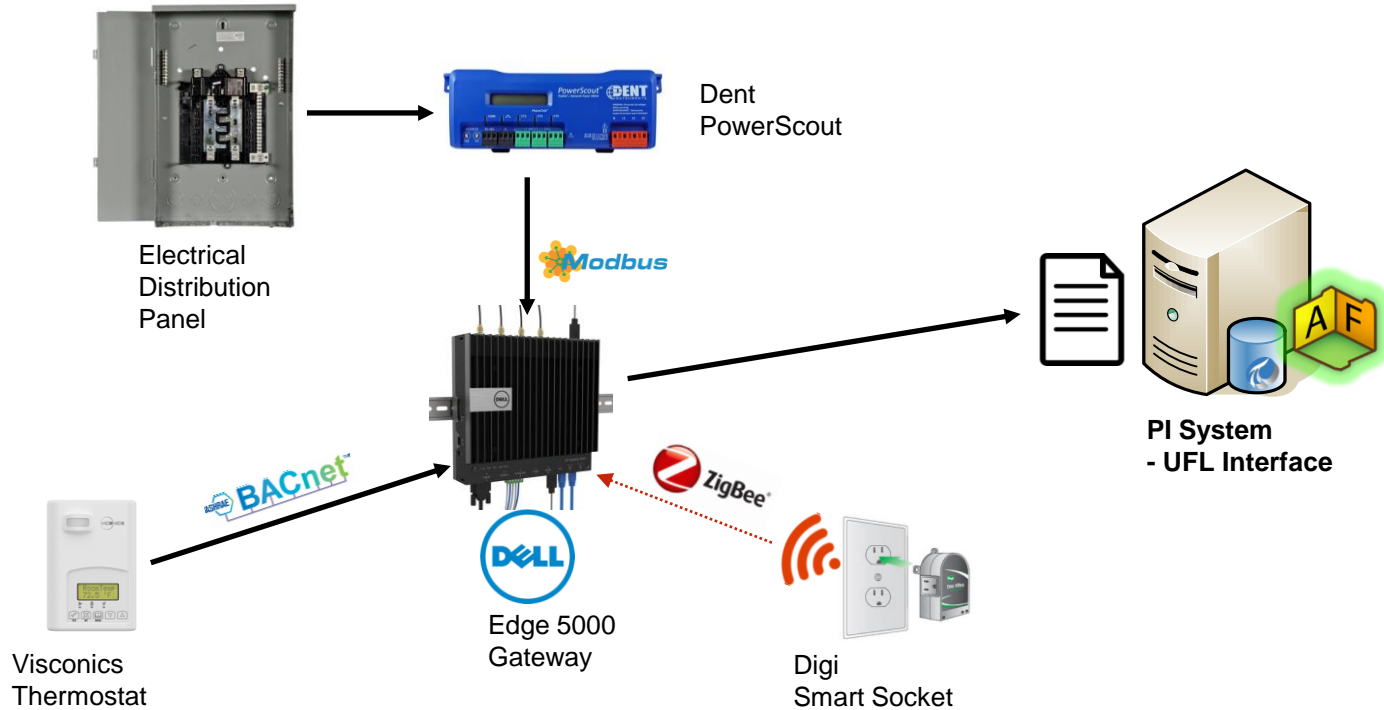
Large City Port Infrastructure



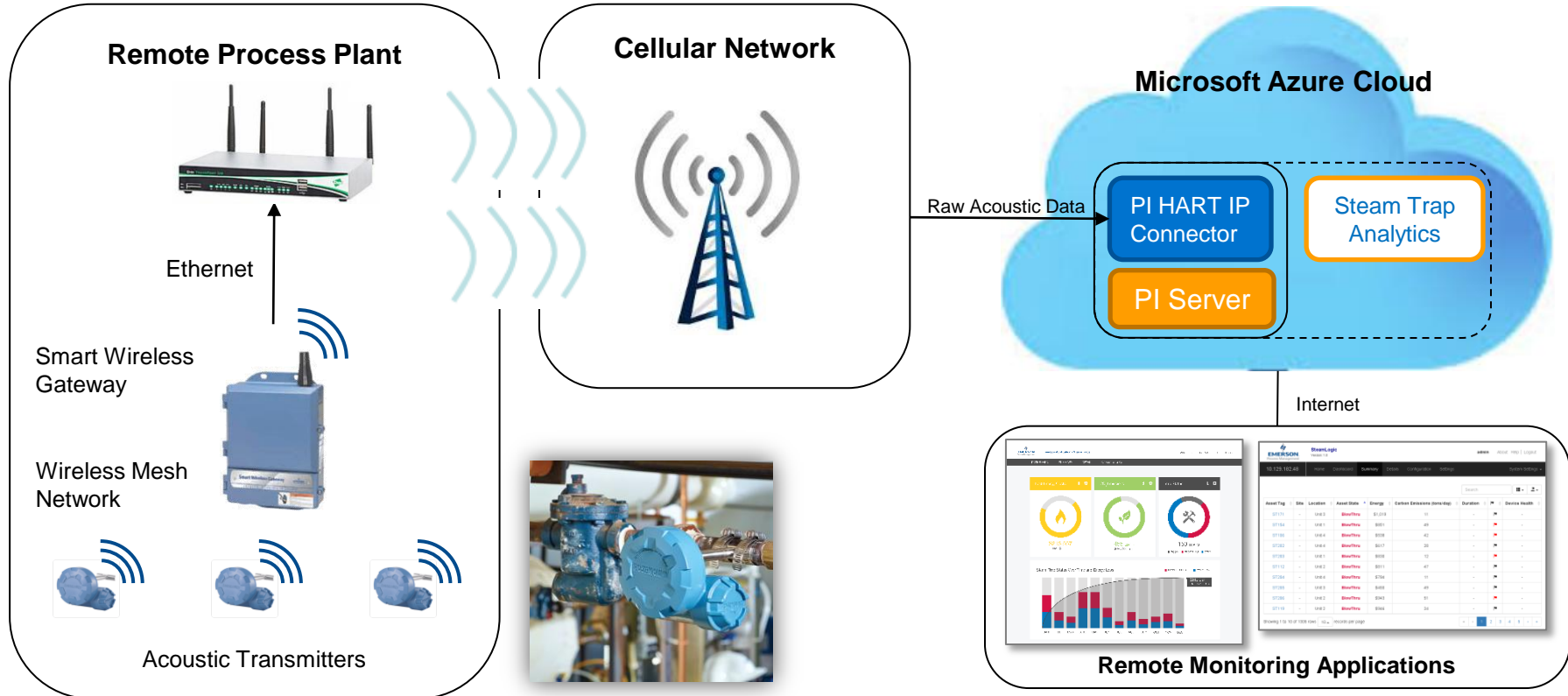
Major League Baseball Stadium



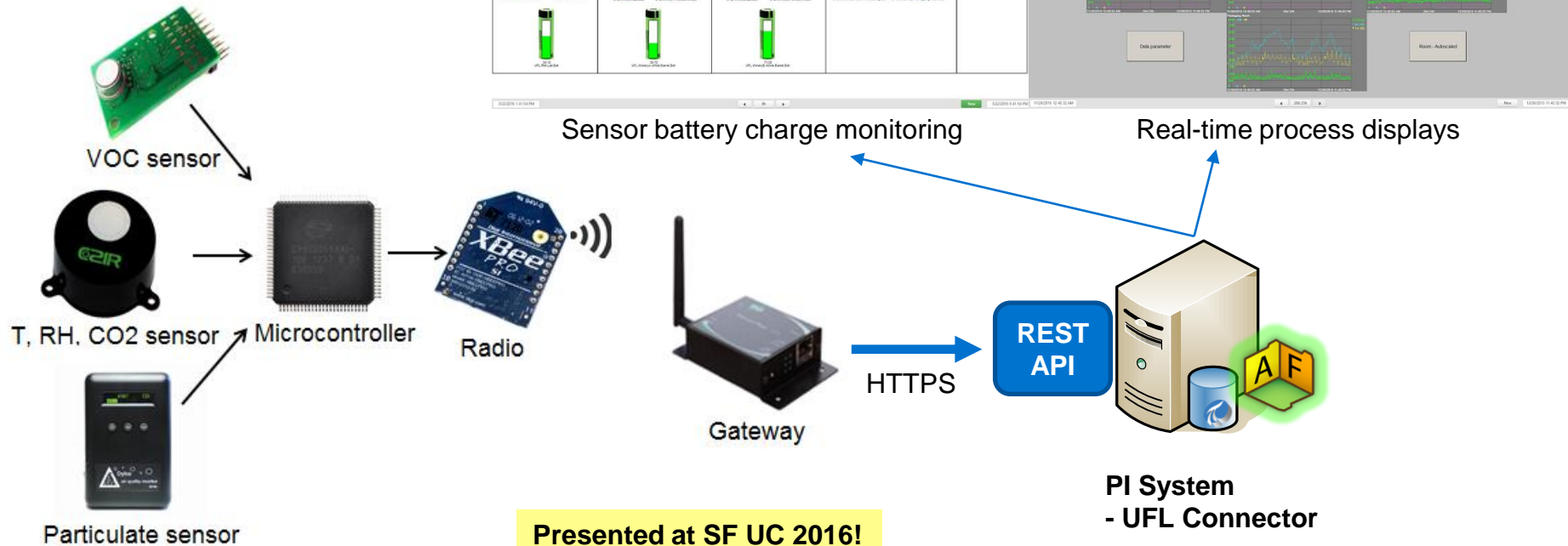
Facility Power Distribution Monitoring



Steam Trap Monitoring



Indoor Air Quality Monitoring



Presented at SF UC 2016!

Transmission Line Monitoring



HTTPS

REST
API



PI System
- PI Web API



IIoT Gateway Examples



Monico



Dell



HPE



Cisco



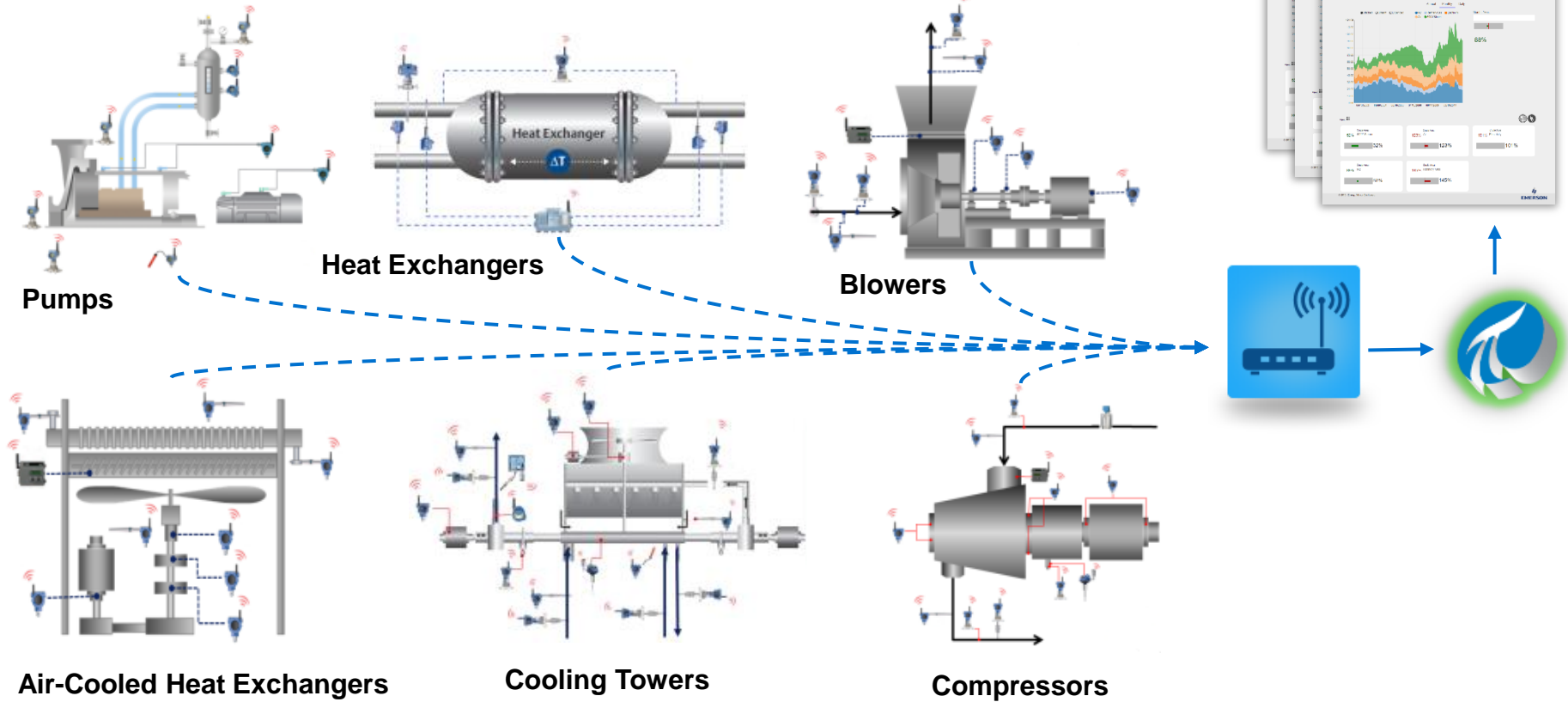
Intel / ODM

Getting Started

Typical IIoT Data Patterns

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IIoT Opportunities



For More Information

- OSIssoft IIoT [microsite](#)
- Videos featuring IIoT scenarios:
 - Distributed Energy Resources ([DER](#))
 - [San Diego Airport](#)
 - [UC San Diego](#)
 - [Smart Cities: Smart Buildings](#)

Contact Information

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OSIssoft



Questions

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

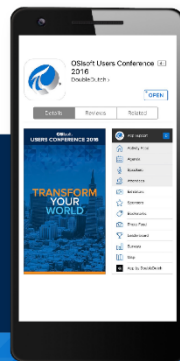


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감사합니다

谢谢

Danke

Merci

Gracias

Thank You

ありがとう

Спасибо

Obrigado

The background of the image is a dark blue gradient with a faint, stylized cityscape of San Francisco, including the Golden Gate Bridge and the Transamerica Pyramid. The OSIsoft logo is positioned at the top center.

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