OSIsoft®

USERS CONFERENCE 2016

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TRANSFORM YOUR WORLD

Getting Started with IIoT and the PI System

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

Agenda

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

IIoT Overview

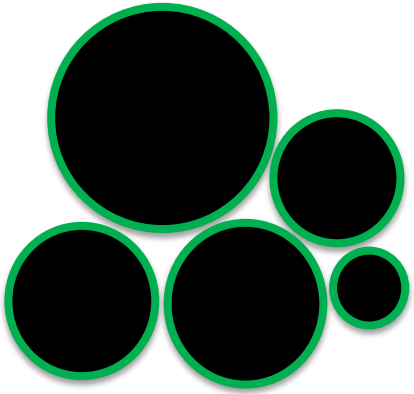
OSIsoft and IIoT

- 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?

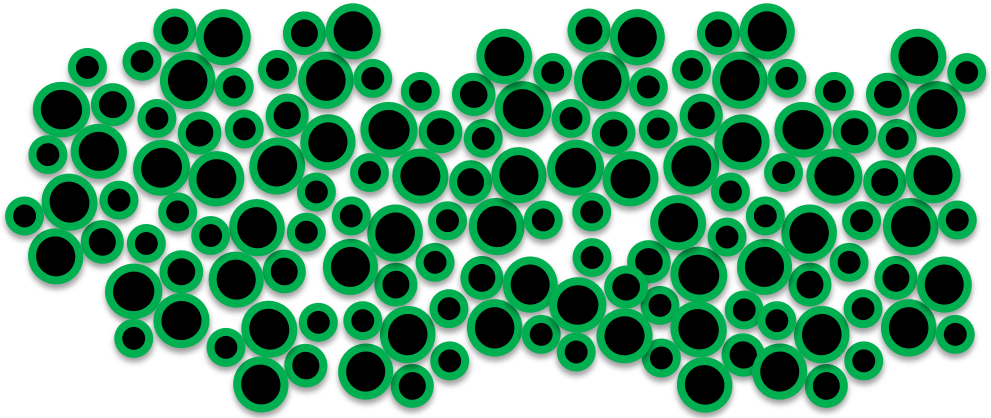
Traditional data pattern

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**

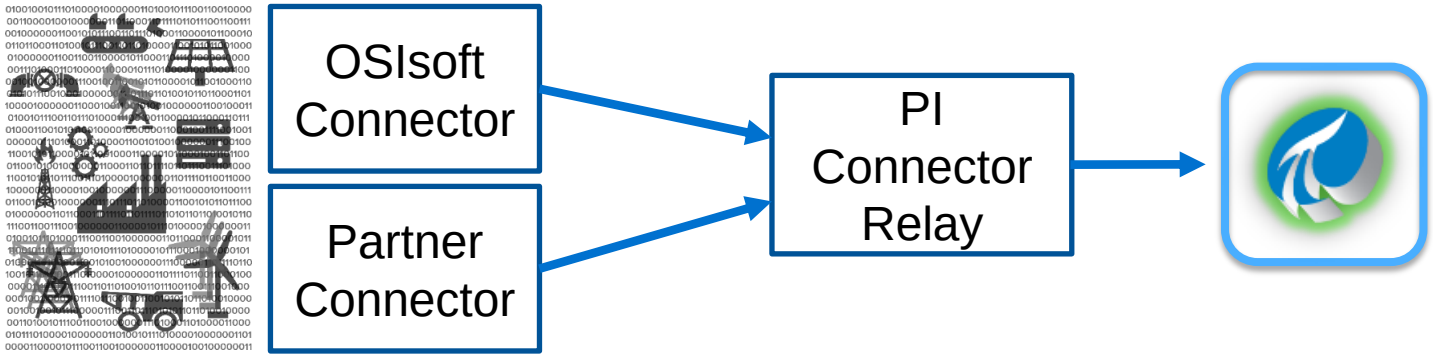
How to Address the IIoT Industry Challenges

- 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


```
TraceStream :: OnNext
Timestamp = 9/17/2015 12:46:43 PM
Value = 198
Online = 1
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
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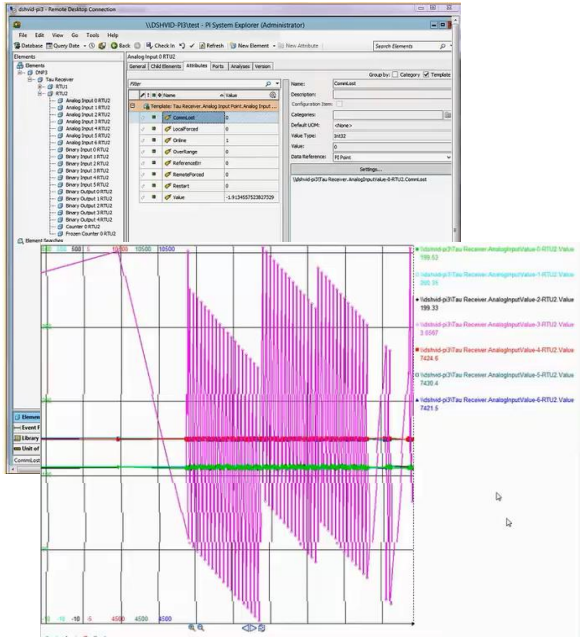
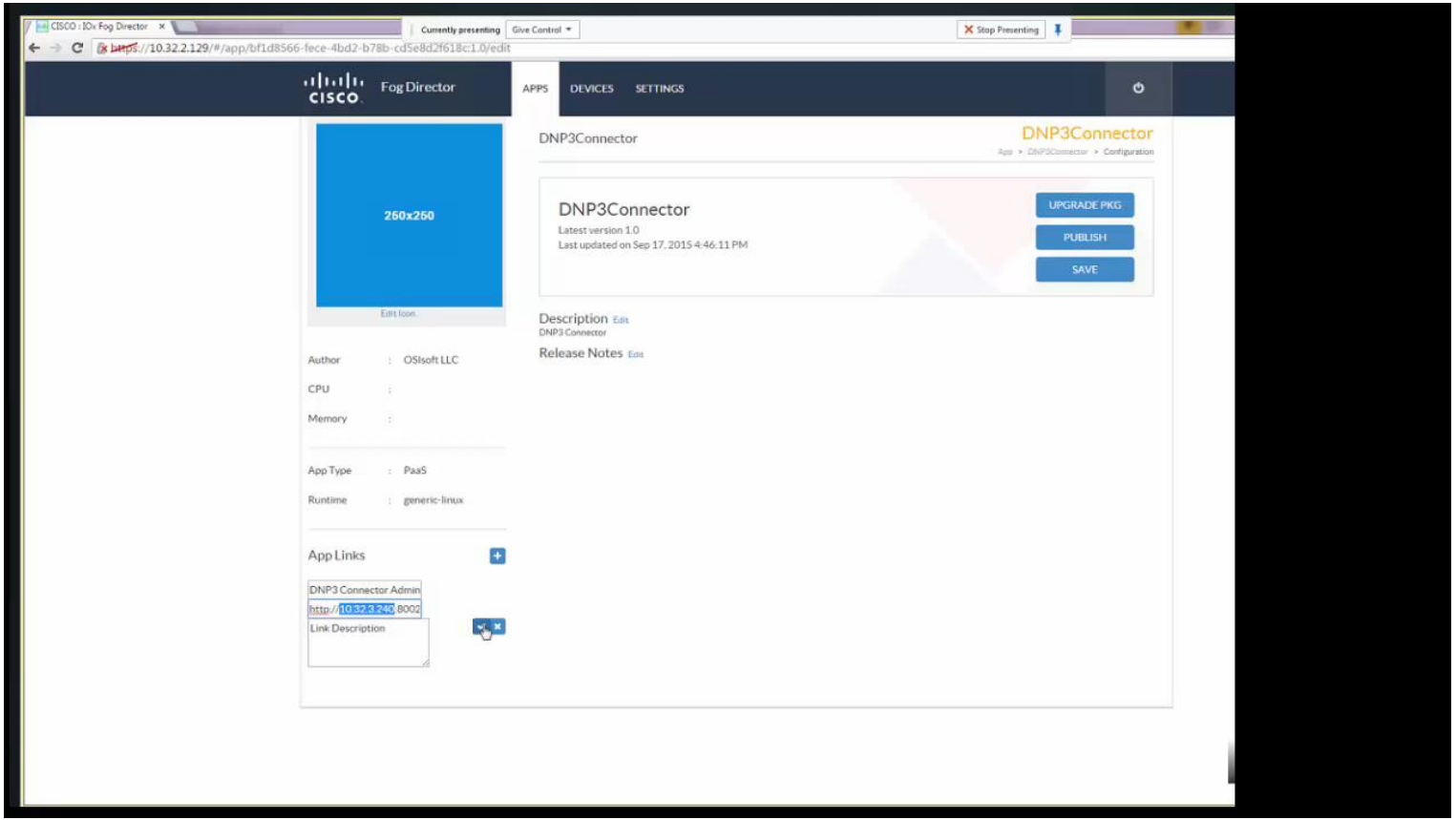


Deploy & Upgrading a PI Connector on Cisco IOx



Administer the PI Connector on Cisco Device

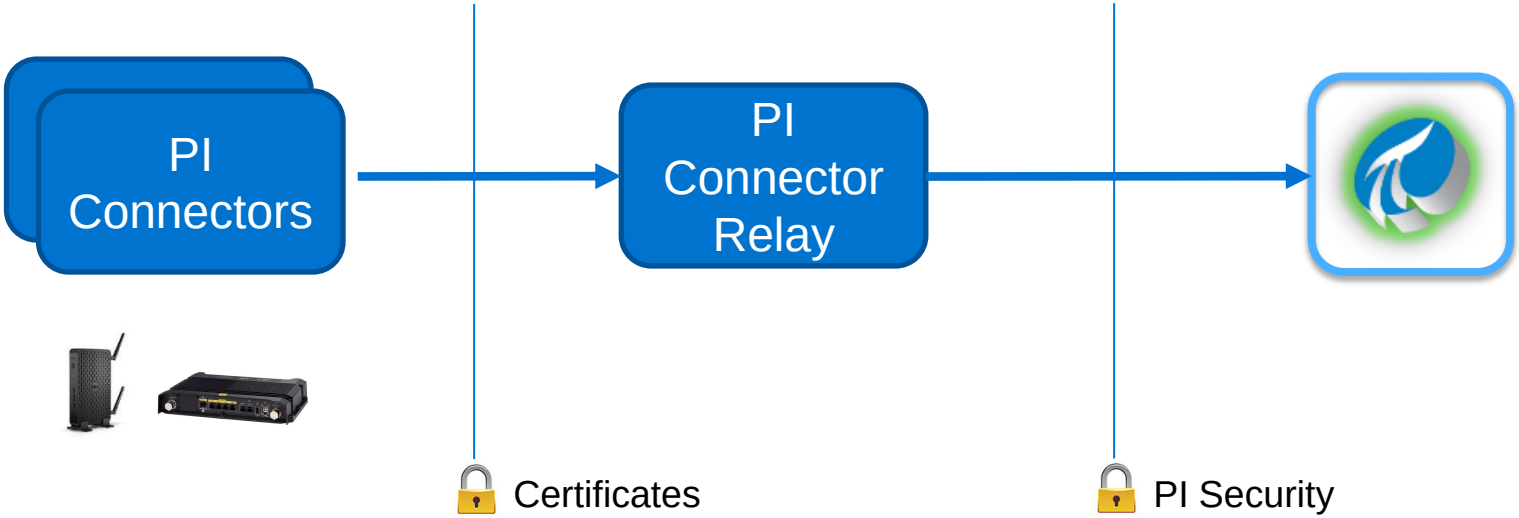
DNP3 Connector Administration User Interface

DNP3 Connector Running on Cisco's ISR 829 Device

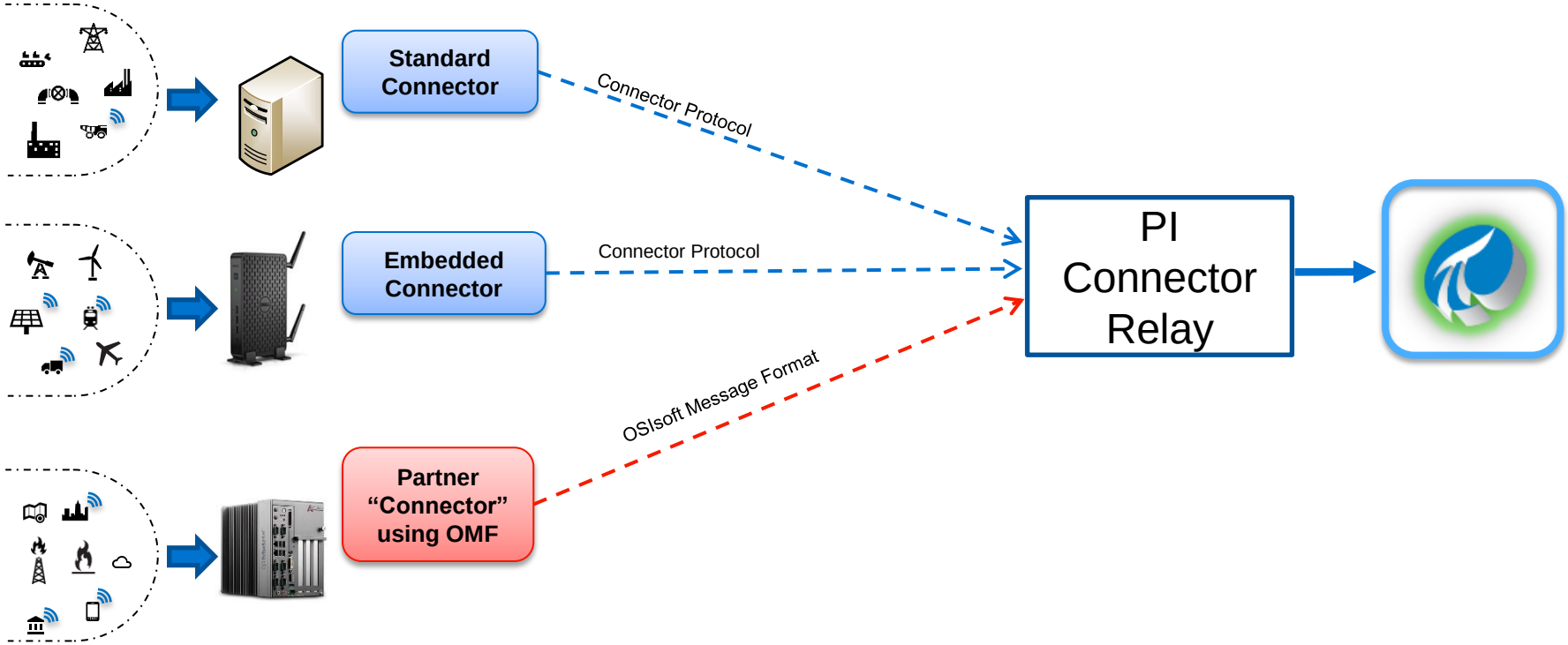
OSIsoft.

Security

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

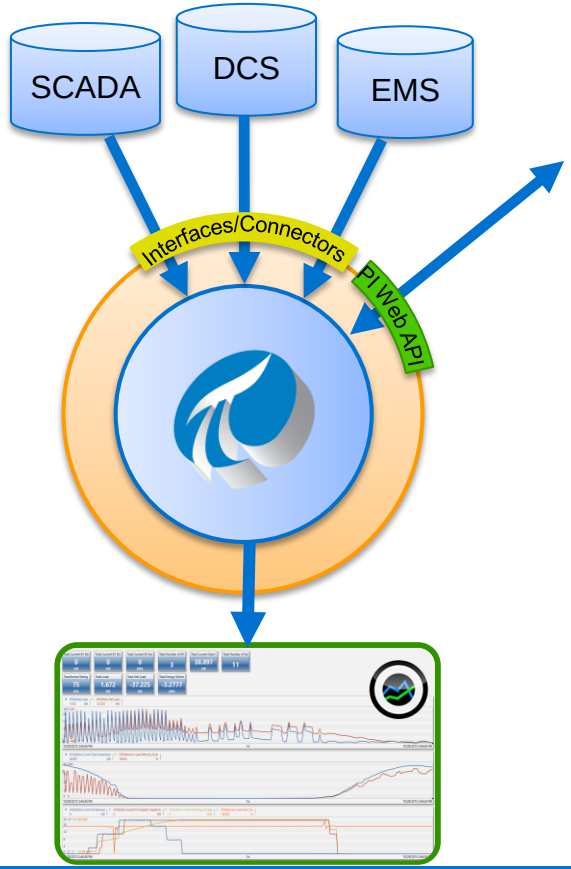


Enabling Partner Developed Connectors



IIoT Architecture

OSIsoft Typical Architecture



Custom Applications

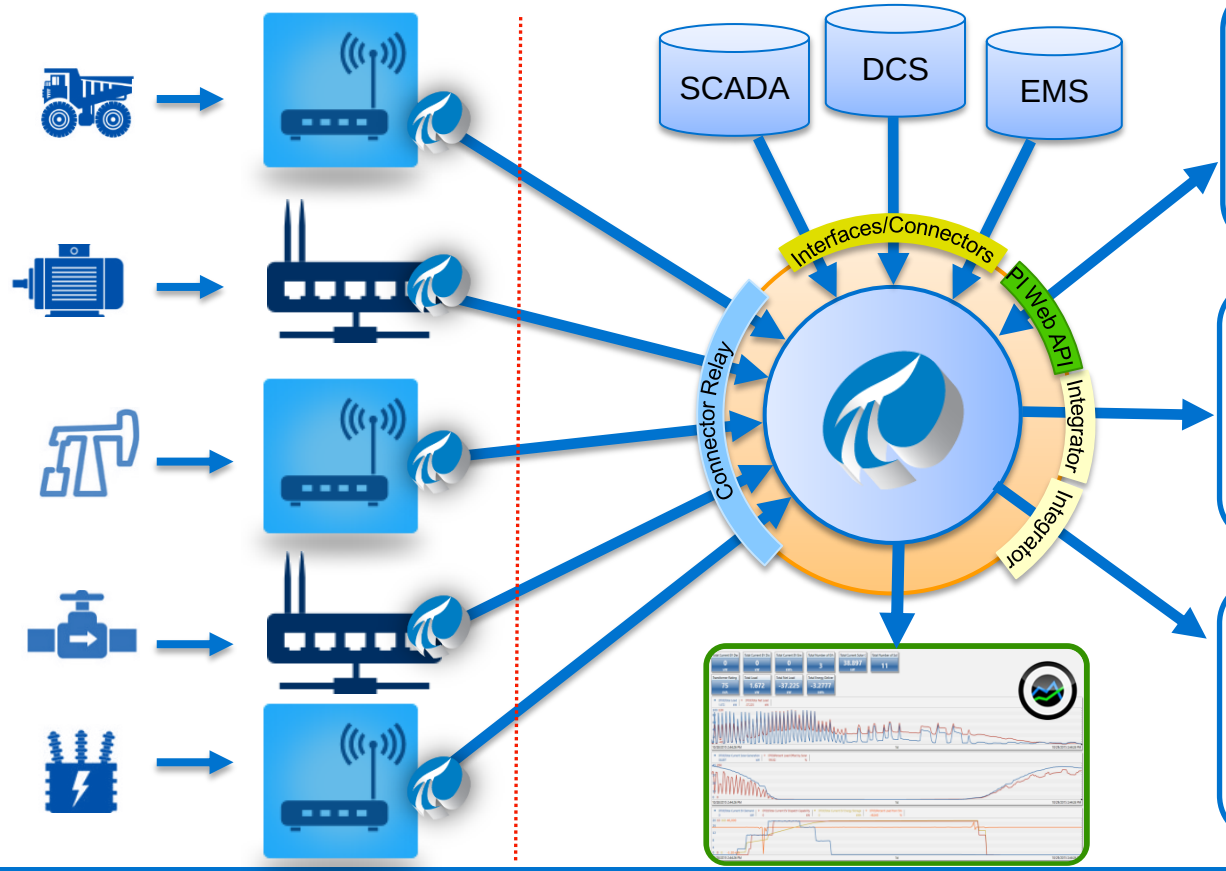
Cloud or On Premises

Essential Asset Monitoring

Condition Based Maintenance

…

OSIsoft IIoT Architecture



Custom Applications

Cloud or On Premises

Essential Asset Monitoring

Condition Based Maintenance

…

Visual Analytics

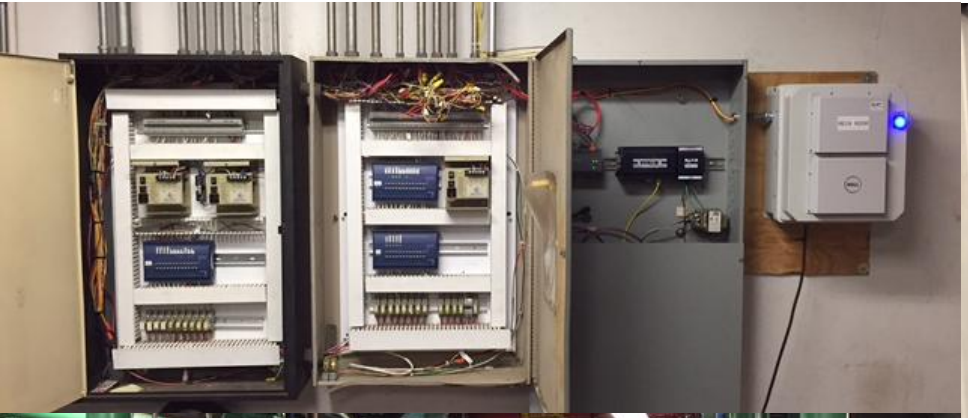
Excel, tableau, Spotfire TIBCO Software, COGNOS, QlikView

Statistical Analytics

hadoop MapReduce, SAS, R, python, SAP

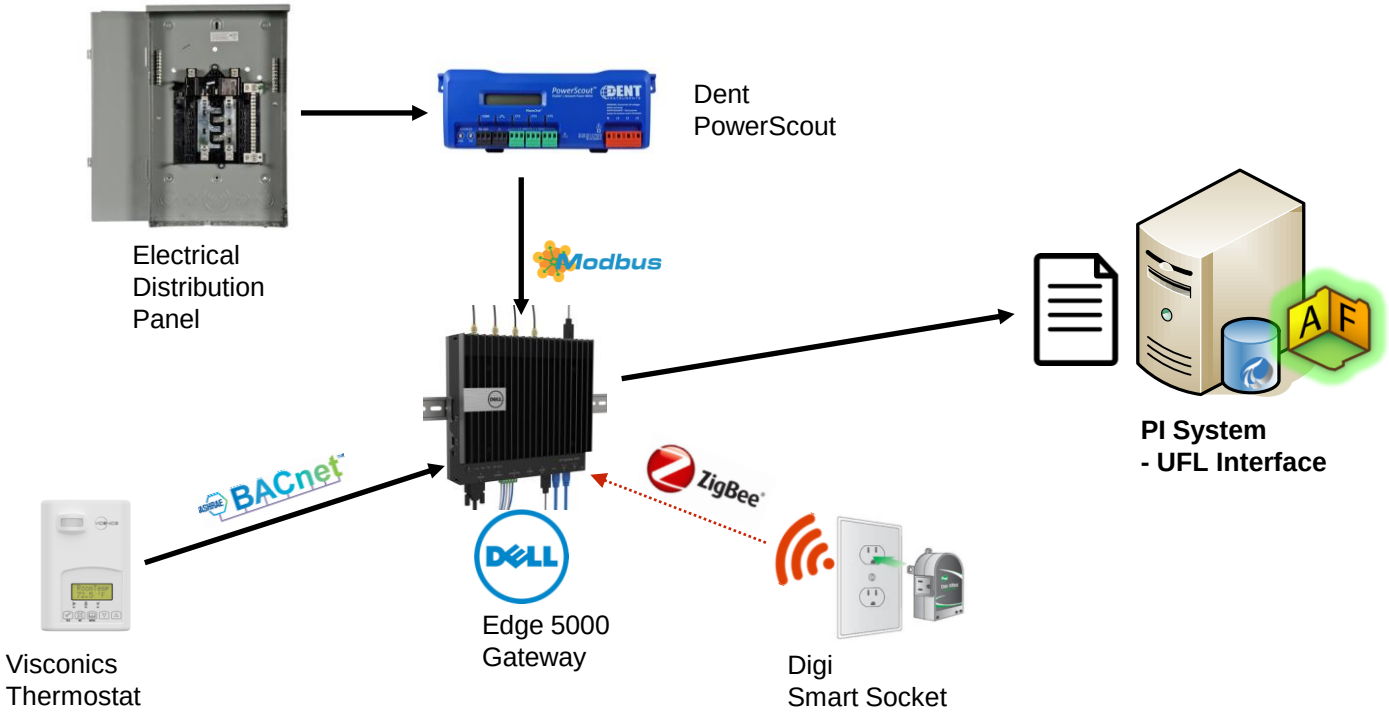
IIoT Deployment Examples

Large City Port Infrastructure

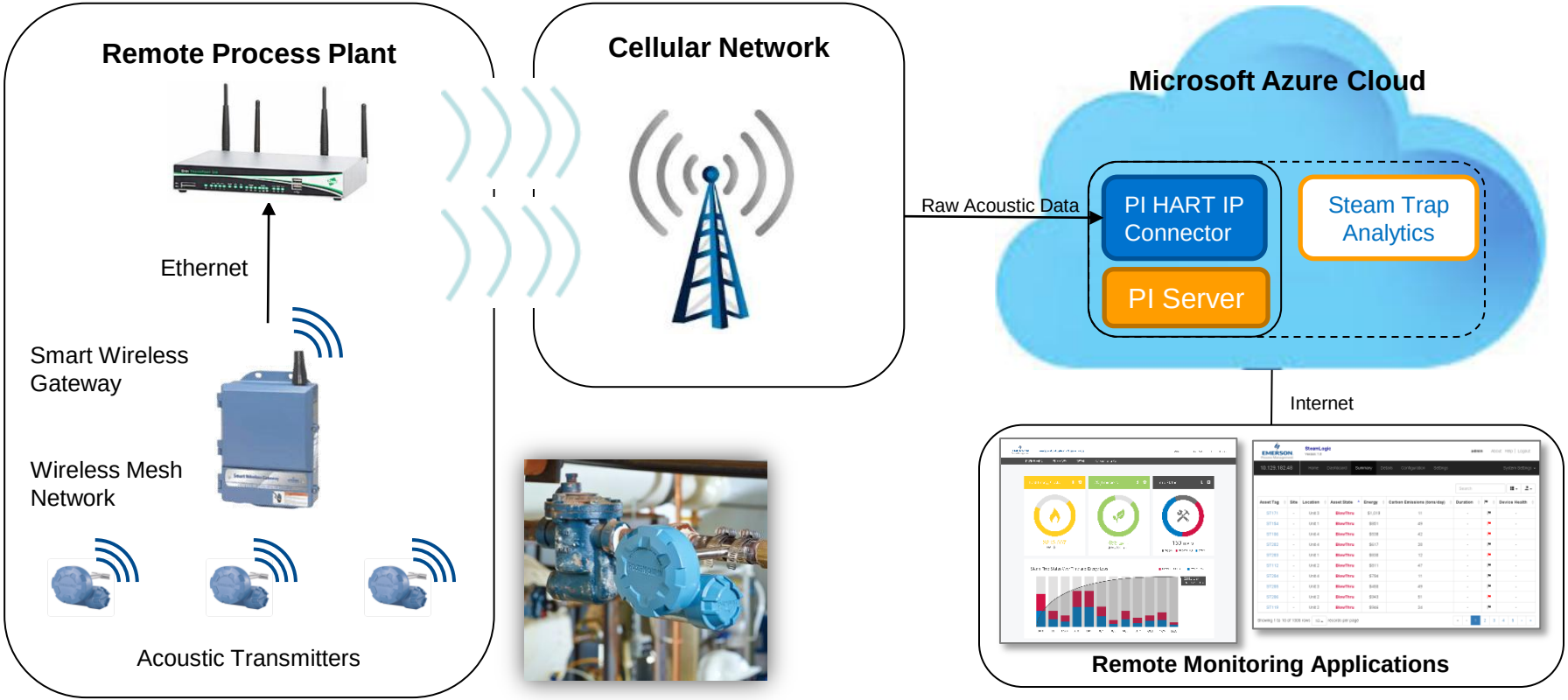


Major League Baseball Stadium

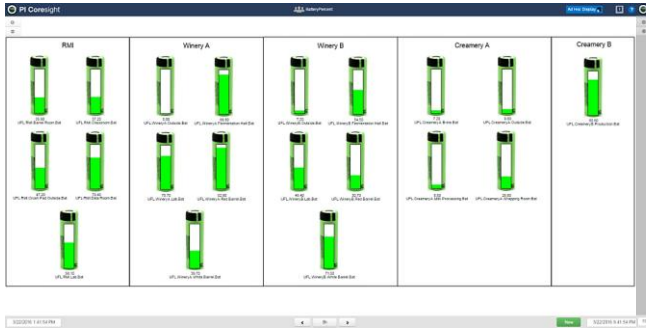
Facility Power Distribution Monitoring



Steam Trap Monitoring



Indoor Air Quality Monitoring



Sensor battery charge monitoring

Real-time process displays

VOC sensor

T, RH, CO2 sensor

Microcontroller

Radio

Gateway

HTTPS

REST API

PI System
- UFL Connector

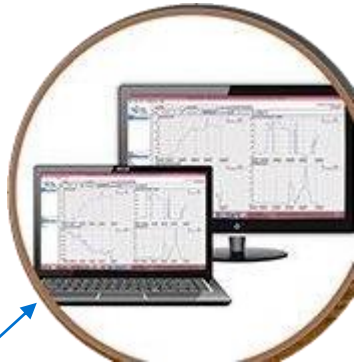
Particulate sensor

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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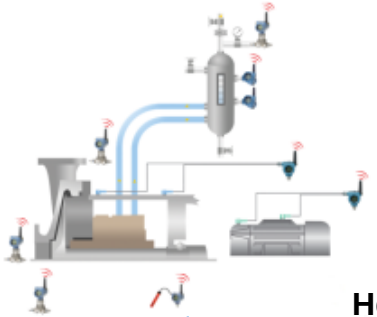
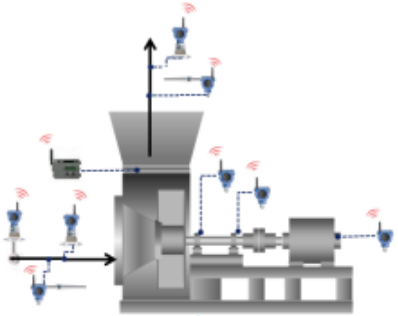
IIoT Opportunities

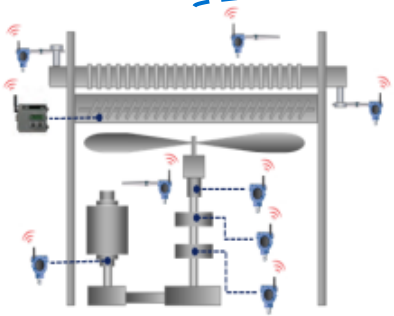


Pumps

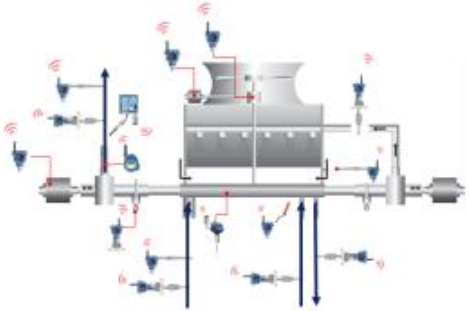
Heat Exchangers



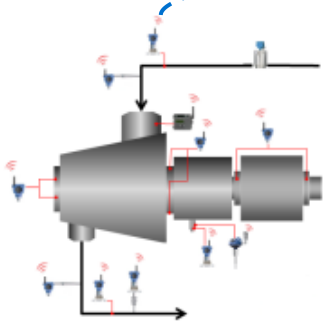
Blowers



Air-Cooled Heat Exchangers



Cooling Towers



Compressors

For More Information

- OSIsoft 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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Questions

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

State your **name & company**

Please remember to…

Complete the Online Survey for this session

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감사합니다

谢谢

Danke

Merci

Gracias

Thank You

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Спасибо

Obrigado

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