# Firsthand experience of OSIsoft Product Roadmap

From the OSIsoft Team

Chris Nelson, VP Software Development

# What to expect for Day 3

| Hilton | Hilton | Hilton | Parc 55 | Parc 55 | Parc 55 | Parc 55 | Parc 55 | Parc 55 |
|---|---|---|---|---|---|---|---|---|
| Product Track | Analytics Track | Marketplace Showcase | Developer Track 1 | Developer Track 2 | Developer Track 3 | Developer Track 4 | Developer Track 5 | Developer Track 6 |
| **PI System 2018 & OSIsoft Cloud Services** | **Introduction to Time-Series Analysis with PI System and R** | Advanced Analytics with Seeq | What's New & Upcoming in Developer Technologies | Introduction to FogLAMP | LiveCoding: Coding for OCS | HOWTO: Extreme PI System Hardening | HOWTO: How to Put Your AF Server into a Container | Writing Highly Performant PI Web API Applications |
| **Pervasive Data Collection - All the Ways to Collect Your Data** | **Advances in PI System Streaming Analytics with MATLAB** | Accelerating Innovation in the Industrial Internet of Things | Build PI Applications Faster with PI Web API Client Libraries | Advanced Analytics for PI Data for Data Scientists | | | | |
| PI Vision: Enabling Real-Time Monitoring and Analysis for the Enterprise | PI System Analytics, Fit for Purpose | CI2BI - Chemicals Injection Real Time Data to Business Intelligence | Fog Computing on the Plant Floor | Introduction to Data Science for PI Data for PI Professionals | LiveCoding: Exploring Blockchain Applications with OSIsoft Research | HOWTO: Data Collection at the Edge | LiveCoding: Getting the Most Out of the New AF Search | Streaming calculation with the PI System and MATLAB |
| Actionable Insights with PI Integrators | Using OSIsoft Cloud Service to Fuel Cognitive Computing & Machine Learning | Enabling External Access to Historian Data without Compromising OT Security | Next Generation PI SQL | Why a Data Lake Alone Can't Replace Your PI System | | | | |

# OSIsoft Headquarters

- Leverage PI System to support the facility
- Collect data from Building Management System (BMS)
- Operational excellence
- Single pane of glass
- Energy management
- Optimize energy usage
  - HVAC performance
- Anomaly detection

# OSIsoft's new Headquarters, the SLTC story

Gregg Le Blanc – VP Product

# Agenda for the next 82 minutes

- SLTC Business Challenges and Product Roadmap
- Pervasive Data Collection
- Data Storage and Management
- Analytics
- Visualization
- OSIsoft Cloud Services
- Dev Con Kickoff
- Summary

Future will extend in all directions

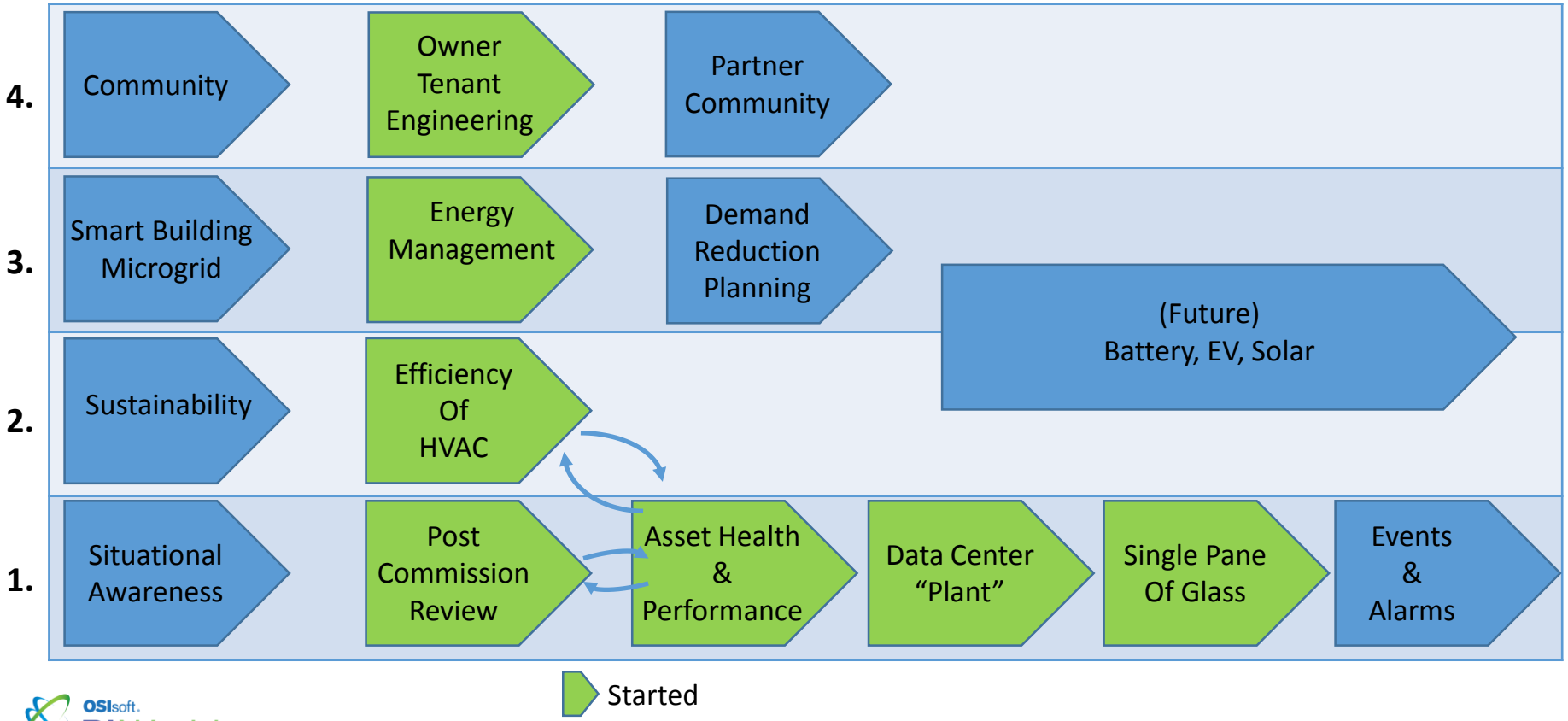
PDC/Edge

PI System

OSIsoft
Cloud Services

| Sensors | Assets | Plant | Enterprise | Community |
| --- | --- | --- | --- | --- |
| Millions of **Smart Devices** | Multiple **Sensors** | Multiple **Assets** | Multiple **Plants** | Multiple **Enterprises** |

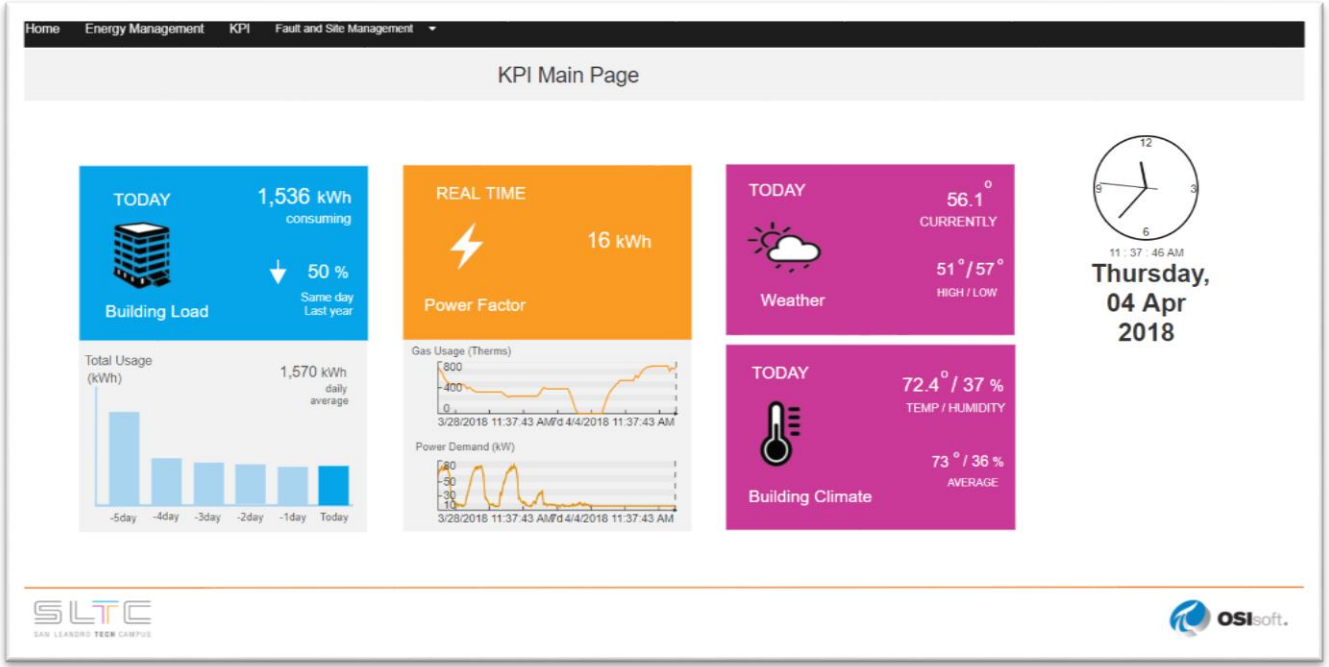
# OSIsoft – as a Customer



# Rollout and Development Themes

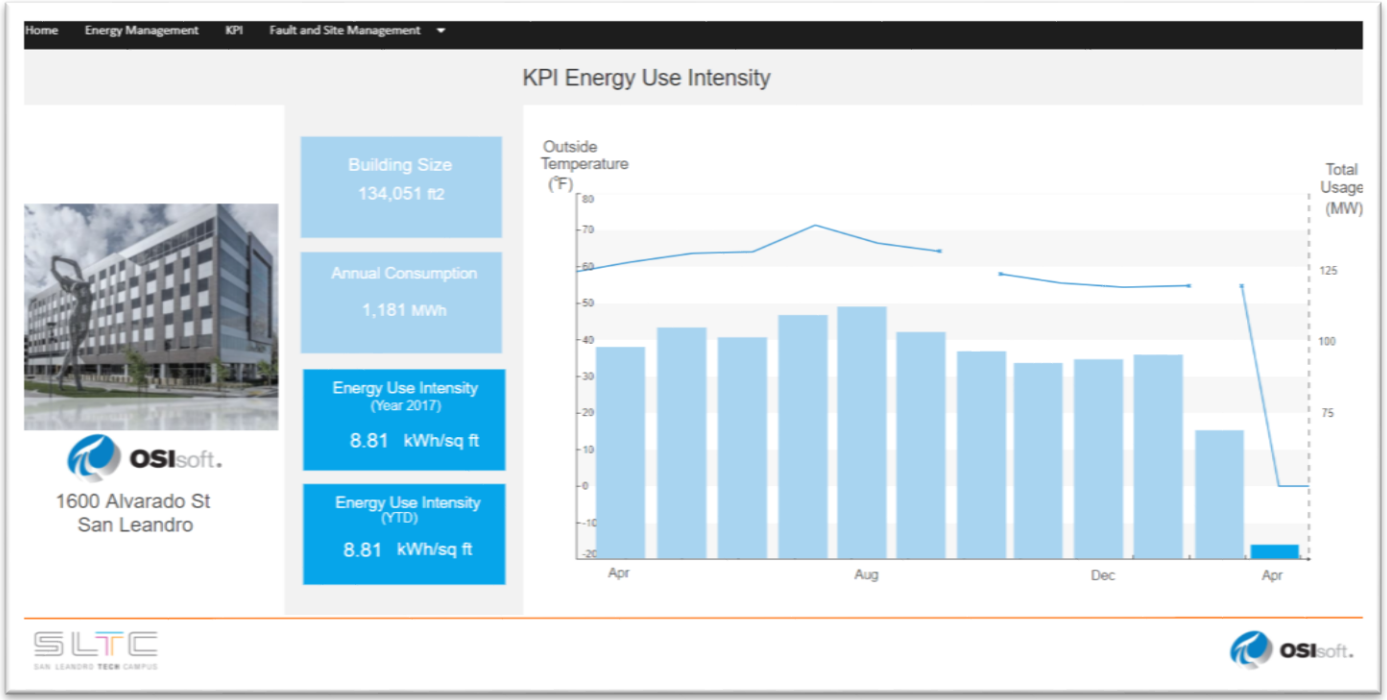
- Manageability
  - Installing PI System Health
  - Using OSIsoft Cloud Services to aggregate data
  - Using PI Vision to centralize UI work
- Seamless infrastructure
  - Using Connectors to collect our data
  - Deploying IoT and Edge devices
  - Using new analytics features of PI System 2018
  - Connecting PI System to OSIsoft Cloud Services

# Management KPI - Energy Dashboard




Quick comparison against prior year

# Management KPI – Building Benchmark



# Baseline vs. Targets

The target for the building was an improvement from **26 kWh/sf** (old building) to **8.5 kWh/sf** (new building) how to be validate design and evaluate the commission process for errors.

## CHALLENGE

The commission process is only as good as the design specifications

- Design vs. actual performance
- Failed equipment
- Inadequate or missing specifications

## SOLUTION

Implement PI for benchmarking the HVAC, hot water and window tinting system.

- BACnet Connector
- PI Vision
- PI Interface for UFL
  - for Energy Data

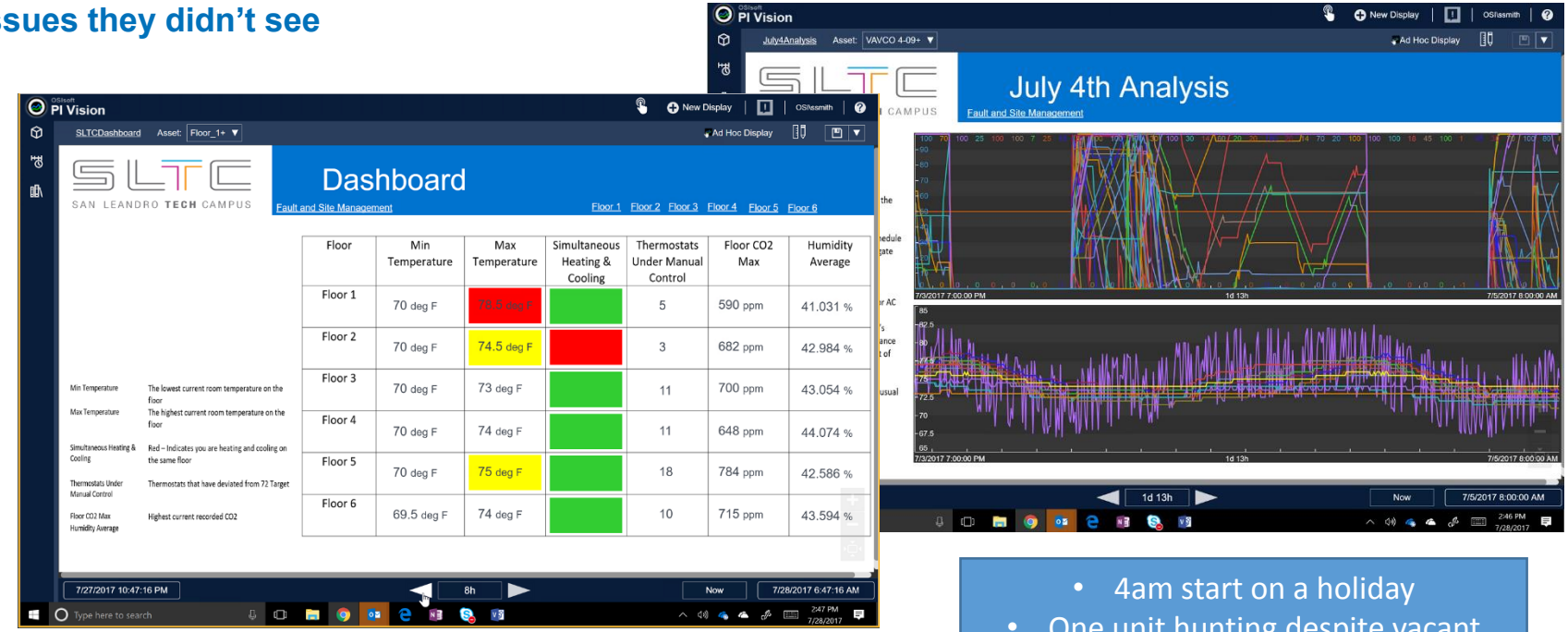
## RESULTS

Found numerous gaps between the design specification and the actual system requirements.

- Failed or poorly installed equipment
- Lack of BMS required features
- Programming errors
- Building design issues

# Problems with the real world

## Issues they didn't see



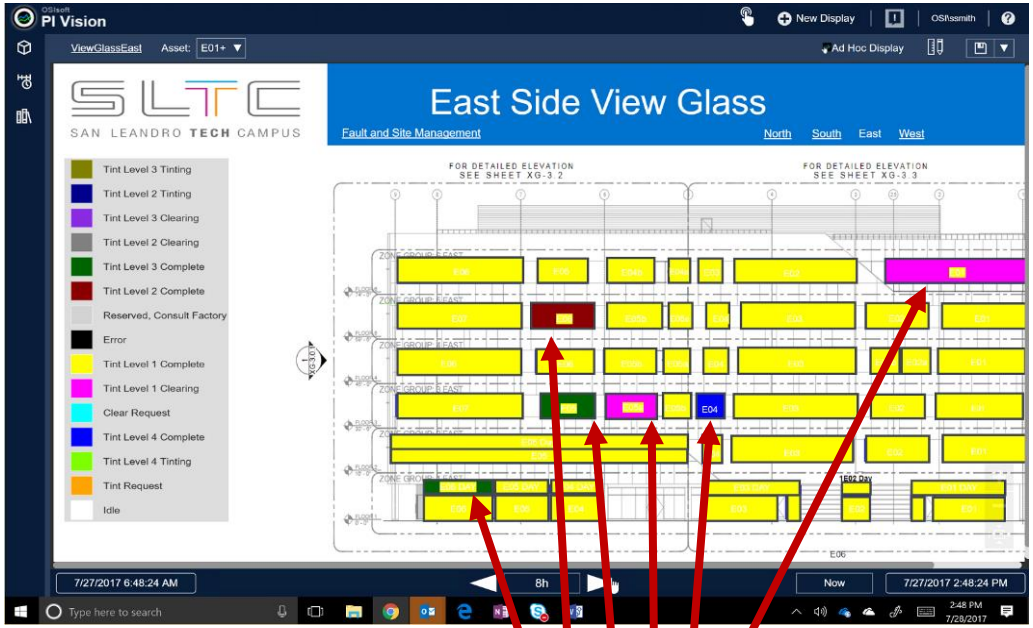

- Cooling faults
- No reset on manual override

- 4am start on a holiday
- One unit hunting despite vacant

# Problems with the real world

## Commissioning of specialized systems

How it should work




Reality = hidden faults

# Single Pane of Glass

We installed new technologies that provided no management console and additional building systems were not connected to Building Management System.

## CHALLENGE

We lacked completed system visibility

- ViewGlass window tinting system had no HMI.
- Lighting & ViewGlass not in BMS
- BMS lacked ability to share data with multiple participants

## SOLUTION

Leverage PI Vision for dashboards, troubleshooting and root cause analysis

- Dashboards for the current status of the system
- Integrate trending
- Troubleshooting Analytics

## RESULTS

Real Time Reporting for multiple stakeholders and missing HMI system

- ViewGlass Displays (Vendor Now Interested in using PI)
- 3 Stakeholders Access – engineering, landlord, tenant
- Internal Customer Screens

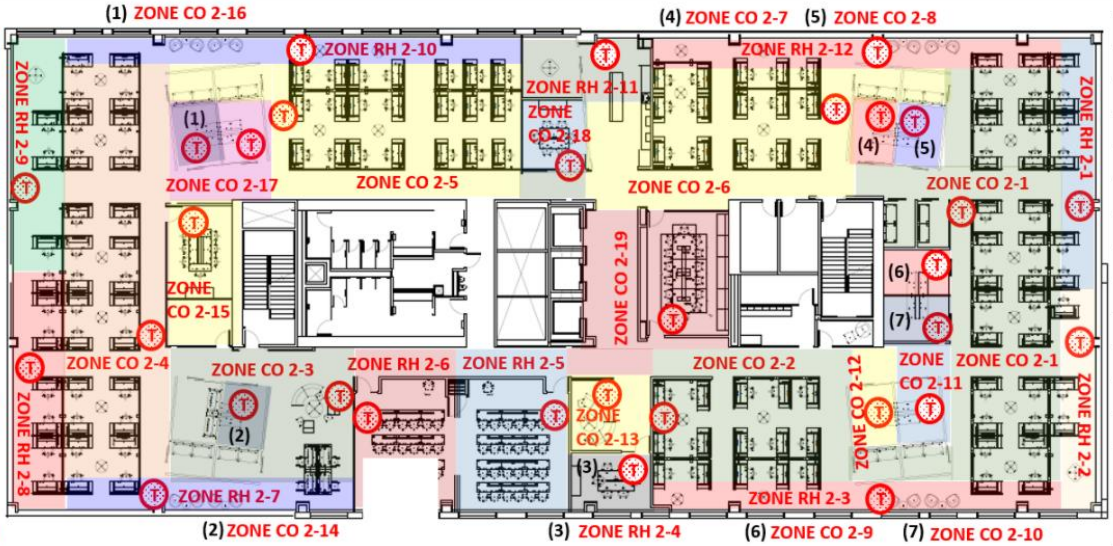
# Single Pane of Glass

SLTC
SAN LEANDRO TECH CAMPUS

Energy Management | Fault and Site Management | KPI

Floor 2

| Zone | SP | Temp |
|---|---|---|
| RH 2-5 | 73 deg F | 72 deg F |
| RH2-6 | 70 deg F | 70.5 deg F |
| RH 2-7 | 72 deg F | 71.5 deg F |
| RH 2-8 | 72 deg F | 71 deg F |
| RH 2-9 | 72 deg F | 70.5 deg F |
| RH 2-10 | 72 deg F | 71 deg F |
| RH 2-11 | 72 deg F | 71.5 deg F |
| CO 2-3 | 72 deg F | 71.5 deg F |
| CO 2-4 | 72 deg F | 72 deg F |
| CO 2-5 | 72 deg F | 71.5 deg F |
| CO 2-14 | 72 deg F | 72 deg F |
| CO 2-15 | 72 deg F | 71.5 deg F |
| CO 2-16 | 72 deg F | 70.5 deg F |
| CO 2-17 | 72 deg F | 71.5 deg F |
| CO 2-18 | 73 deg F | 72.5 deg F |
| CO 2-19 | 71 deg F | 71.5 deg F |




| Zone | SP | Temp |
|---|---|---|
| RH 2-1 | 72 deg F | 71.5 deg F |
| RH 2-2 | 72 deg F | 71 deg F |
| RH 2-3 | 72 deg F | 71.5 deg F |
| RH 2-4 | 68 deg F | 73 deg F |
| RH 2-12 | 72 deg F | 70 deg F |
| CO 2-1 | 72 deg F | 72 deg F |
| CO 2-2 | 72 deg F | 72.5 deg F |
| CO 2-6 | 72 deg F | 71.5 deg F |
| CO 2-7 | 73 deg F | 71.5 deg F |
| CO 2-8 | 72 deg F | 71.5 deg F |
| CO 2-9 | 72 deg F | 71.5 deg F |
| CO 2-10 | 72 deg F | 71.5 deg F |
| CO 2-11 | 72 deg F | 71.5 deg F |
| CO 2-12 | 72 deg F | 71.5 deg F |
| CO 2-13 | 72 deg F | 72 deg F |

# HVAC Performance

The BMS system included it's own algorithm on the optimization of the start-up process. Plus the amount of manual temperature overrides we needed to understand system performance tied to comfort for employees.

## CHALLENGE

We monitored inefficient use of the HVAC system and need to understand performance.

- Start-up 4 hour duration but units achieving set point temperature in as little as 30 minutes
- Significant manual overrides causing simultaneous heating and cooling in contiguous zones

## SOLUTION

Analyze system performance with Machine Learning and analyze trends of manual overrides

- Integrator for Business Intelligence
- Power BI, R, Orange
- PI Vision Adhoc Trending
- PI Vision Dashboards

## RESULTS

Identified multiple contributing issues contributing to a minimum of 5% energy consumption

- BMS Software Bugs
- BMS Configuration Issues
- HVAC Design Issue
- BMS optimization algorithm not optimized for energy conservation

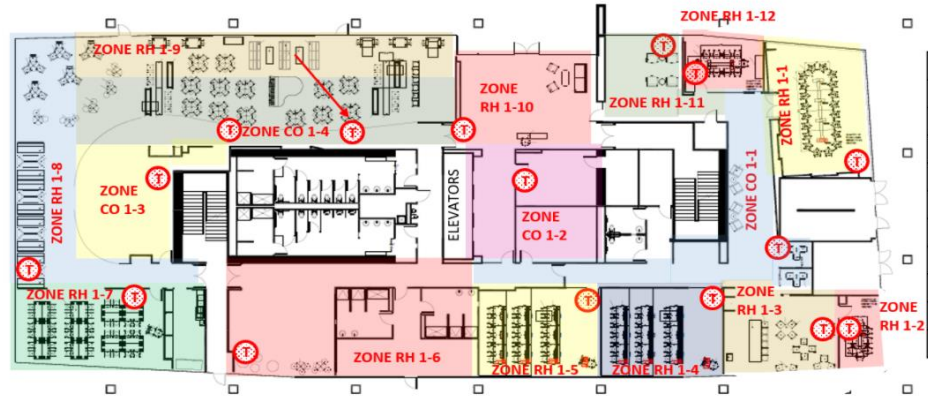
# Problems with the real world

First Floor Failed Pre-Conditioning Prior to Occupancy

SAN LEANDRO TECH CAMPUS

Energy Management | Fault and Site Management | KPI

Floor 1




| Zone | SP | Temp |
|---|---|---|
| RH 1-6 | 72 deg F | 70.5 deg F |
| RH 1-7 | 71 deg F | 68.5 deg F |
| RH 1-8 | 72 deg F | 70.5 deg F |
| RH 1-9 | 72 deg F | 69.5 deg F |
| CO 1-3 | 68 deg F | 70.5 deg F |
| CO 1-4 | 72 deg F | 69.5 deg F |

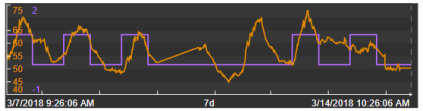
| Zone | SP | Temp |
|---|---|---|
| RH 1-10 | 72 deg F | 69.5 deg F |
| RH 1-11 | 72 deg F | 69.5 deg F |
| RH 1-12 | 72 deg F | 70 deg F |
| RH 1-1 | 71 deg F | 70 deg F |
| RH 1-2 | 72 deg F | 68.5 deg F |
| RH 1-3 | 72 deg F | 69.5 deg F |
| RH 1-4 | 72 deg F | 69 deg F |
| RH 1-5 | 72 deg F | 70 deg F |
| CO 1-2 | 72 deg F | 71.5 deg F |
| CO 1-1 | 72 deg F | 70.5 deg F |

SAN LEANDRO TECH CAMPUS

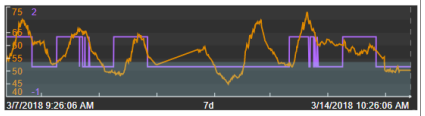
## Simultaneous Heating and Cooling

Fault and Site Management

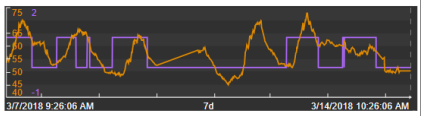
Floor 1



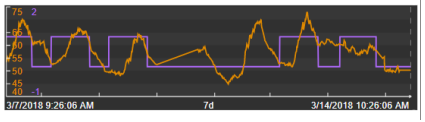

Floor 4




Floor 5




Floor 6




Manual Overrides created extensive heating and cooling issues

# Machine Learning Insights

## How long is startup taking?

1.84

Average of Duration (hour)

0.97

Average Duration (setpoint reached)


## Are the VAV Units reaching setpoint? At what time?

72%

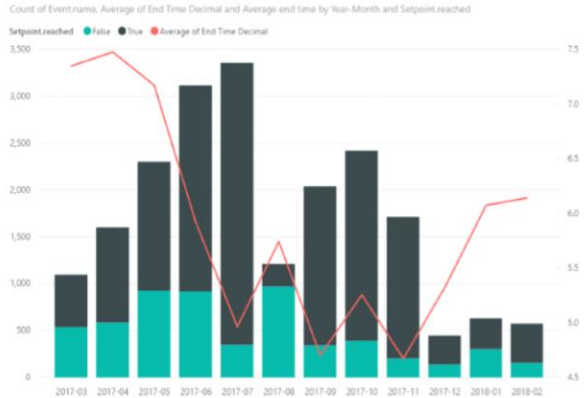
% Setpoint reached

5:38:08

Average end time

| Side | Number of Events | % Setpoint reached | Average end time |
|---|---|---|---|
| East | 7623 | 68% | 5:48:06 |
| NA | 2056 | 53% | 6:45:09 |
| West | 10809 | 78% | 5:23:26 |
| **Total** | **20488** | **72%** | **5:38:08** |

| Floor | Number of Events | % Setpoint reached | Average end time |
|---|---|---|---|
| 1 | 2056 | 53% | 6:45:09 |
| 2 | 3064 | 74% | 5:13:56 |
| 3 | 3825 | 71% | 5:20:35 |
| 4 | 3720 | 77% | 5:43:27 |
| 5 | 2963 | 74% | 5:44:50 |
| 6 | 4860 | 73% | 5:38:09 |
| **Total** | **20488** | **72%** | **5:38:08** |



# Energy Management

While the building is energy efficient we lacked visibility of energy consumption by system and for building two the need for multi-tenant billing support. Plus we want to plan for a 25% reduction in demand charges.

## CHALLENGE

We had no real time view of energy data.

- 48 Hour delayed utility data
- Building only

## SOLUTION

PXiSE solution for 10 hertz data for real time and high frequency data to determine system demand.

- PXiSE Microgrid Controller with embedded PI
- PI Connector for UFL
- PI Vision & AF Analytics
- Future – Sub Metering

## RESULTS

Identified building base load, 25% potential demand reduction, individual systems impact on energy.

- Full PG&E Bill Audit Analytics
- Battery Sizing Calculated
- Energy Impact of Window Tinting (Future)
- Energy Impact of Demand Reduction Lighting System (Future)

# Community

We are part of an ecosystem as a customer and as a manufacturer of the solution. We need to share our data with the landlord, building engineering, Microgrid provider, independent software vendors, system integrators and building technology vendors.

## CHALLENGE

A disparate group of community members with different requirements.

- Building engineering wanted real time access
- ISV and SI wanted streaming data to build market solutions
- Technology providers was point in time snapshots

## SOLUTION

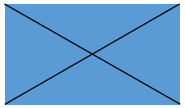
Leverage the toolkit for an appropriate solution for each customer with no additional overhead.

- PI Cloud Connect
- PI System Connector
- PI Datalink
- PI Vision Dashboards
- PI System Integrator

## RESULTS

A subscriber menu based on requirements we can provide quick and easy access with history.

- 3rd party companies with PI who want streaming data took PI Cloud Connect
- Internal we used all of the options based on use cases (ML, Training, Demo)
- Building engineering just want pre-built displays



## CHALLENGE

## SOLUTION

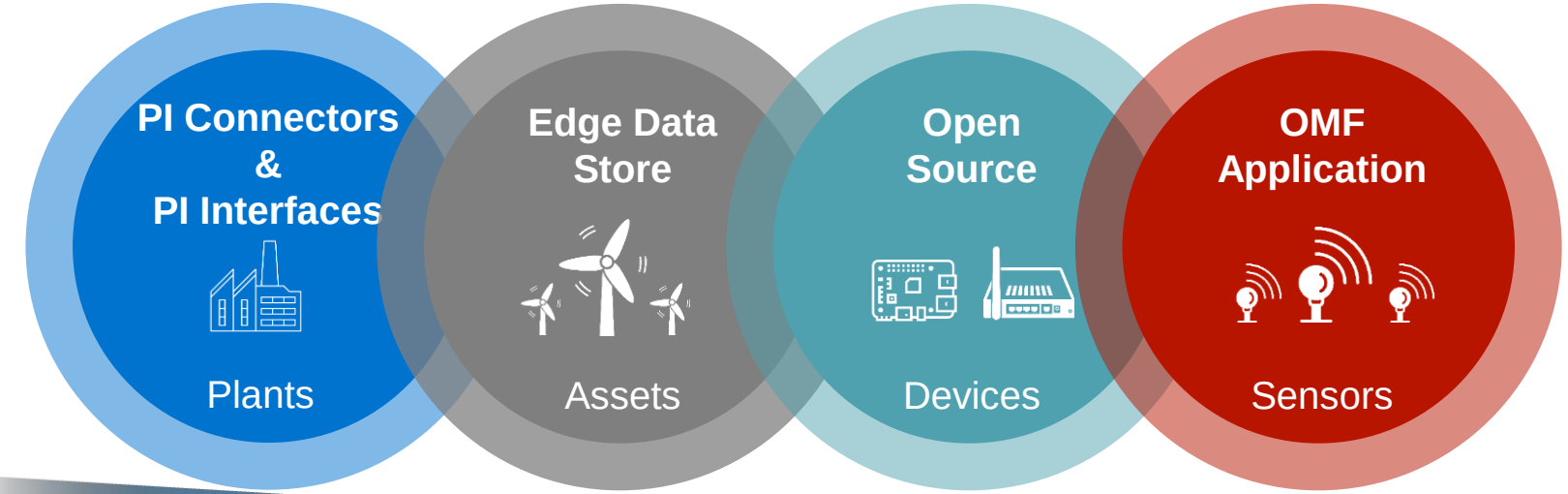
## RESULTS

# Pervasive Data Collection

Abbas Saboowala – Product Manager
Chris Felts – Product Manager

# Pervasive Data Collection



# BOB AND NOT SOB

# PI Connectors help you to be strategic


## Streamlined Configuration

Auto create PI Points and AF reference model with rules-based data selection.

## Auto discover data, now and later

PI Connectors monitor the source so you don't have to.

## Unified Admin Experience

A one-stop shop to manage data collection across your sources.

## Secure & Flexible Architectures

Send data securely across diverse networks to multiple destinations.

# What do we collect


**BACnet**

**UFL**

**Redfish**

Collect Building Management Data

Parse Energy Data

Server monitoring for IT Operations

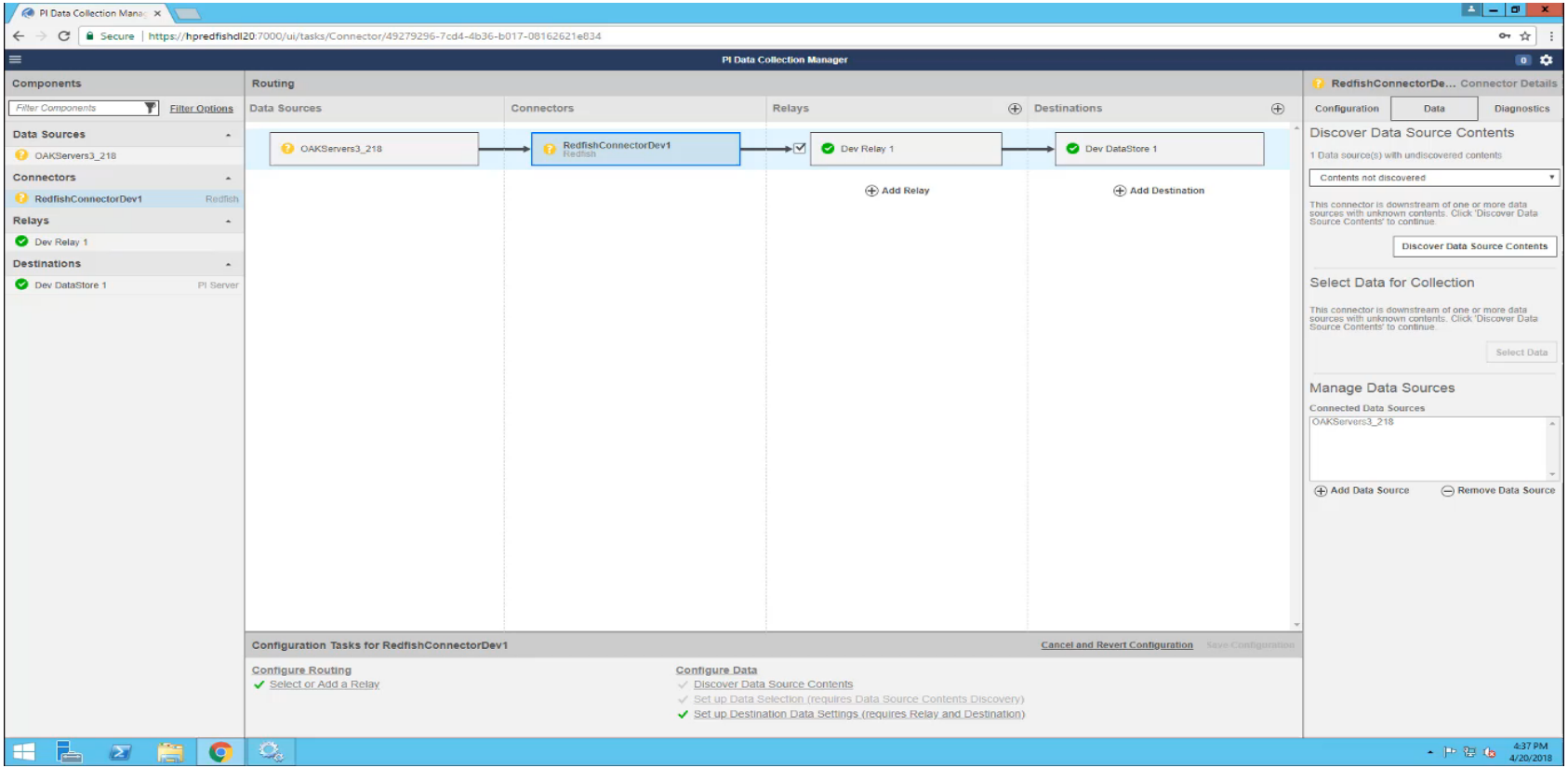
OSIsoft Cloud Services

**PI Server**

Edge Data Store

# DEMO

# Data Discovery and Data Selection



# Edge Data Store Built for Purpose


## Persistent Data Storage

Collect and store thousands of data streams easily and securely.

## Self-Healing

Designed from the ground up for unmanned, remote operation.

## Upload to PI and OCS

Automatic data transfer for advanced viewing, analytics, data sharing and long term storage.

## Application & Analytics Ready

Modern, RESTful APIs for local and remote data access for application and analytics integration.

# OMF Expands Data Connectivity


## Maximum Flexibility

Application developer is only required to adhere to the specification, otherwise is free to develop any required features and functions.

## Lightweight Footprint

Targeting the smallest device and sensor data sources.

## Any Environment

Any hardware, any operating system, any development tools.

## Partner Enablement

Message structure abstracts the backend OSIsoft storage technology, easing the application development effort.

# Rooftop Solar – Parking Garage

# Learn more…

## Product Booth

**Data Ingress**
**OEM Enablement**

Live demos
Ask questions
Speak with Developers

Hilton Union Square

## Other Talks Today

Pervasive Data Collection – All the Ways to Collect Your Data
(Product Track)
Hilton Imperial Ballroom A
11:30am

Fog Computing on the Plant Floor
(Developer Track)
Parc 55, Cyril Magnin II, Level 4
2:30 pm

Data Collection at the Edge
(Developer Track)
Parc 55, Powell, Level 3
2:30 pm

# Data Storage and Management

From the OSIsoft Team (Janelle Minich and Stephen Kwan)

## AF

- Attribute Display Digits
- Improved searches
- Bi-linear interpolation of AF tables

## Asset Analytics

- **MATLAB Integration**
- Arrays in analyses
- Functions supporting arrays
- Dynamic output timestamps
- Support for Excluded attributes

## Notifications

- Notify on EF close only
- Support for Excluded attributes

**New Capabilities and Improved Usability**

## Data Archive Management

- PI Collective balanced connections and failback
- **Scheduled archive shifts**
- Single integrated setup kit

## AF Management

- Preserve IDs on import
- Connection history
- Audit trail enhancements
- **Single integrated setup kit**

## PI System Health

- Health traits
- Health score
- PI System Directory
- PI System Health

**System Manageability**

# Learn more…

## Product Booth

**Data Management Area**
**Data Processing Area**

Live demos
Ask questions
Hang out with Developers and Product Manager

Hilton Union Square

## Other Talks Today

PI System 2018 and Beyond
Hilton Imperial Ballroom A
10:30am

Advances in PI System Streaming Analytics
Hilton Imperial Ballroom B
11:30 am

Streaming Calculation with the PI System and MATLAB
PARC 55 Mason Level 3
2:30 pm

## PI System Roadmap

6 months release schedule

https://techsupport.osisoft.com/Products/Roadmaps/PI-System

New feature requests

https://feedback.osisoft.com

What are customers telling us?

# Managing your PI System should be easy

Enterprise view of PI System Health

Guidance for troubleshooting, best practices

Subscribe to Notifications of health incidents

Monitor the health of your data flow

PI System Health

Automatically detect your PI System inventory

PI System Directory

Simplifies upgrade planning across your enterprise

Easily organize your computers and components

Informs PI System Health what is available to monitor

PI System Health

Janelle

Secure | https://piworldmon.osisoft.int/piwebapi/pisystemhealth/health/systemOverview

**PI System Health** OSIJanelle

Dashboards Incidents

System Components

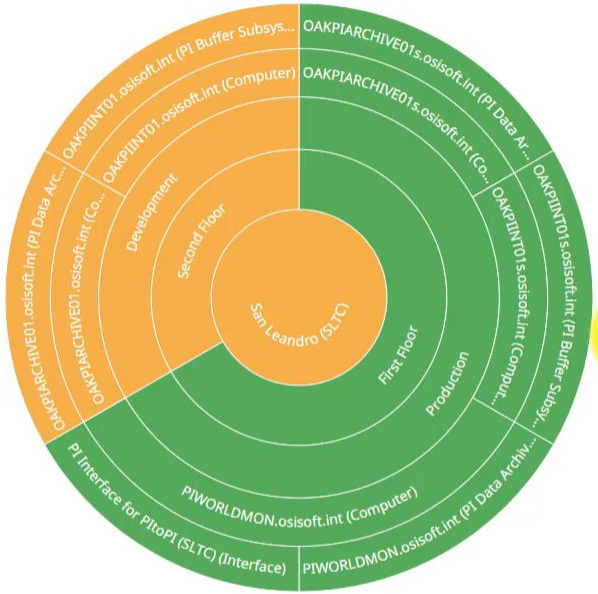
Collapse All -

System Overview

- San Leandro (SLTC)
  - First Floor
    - Development
    - Production
      - OAKPIARCHIVE01s.osisoft.int (Computer)
      - OAKPICORESIGHT.osisoft.int (Computer)
      - OAKPIINT01s.osisoft.int (Computer)
      - PIWORLDMON.osisoft.int (Computer)
  - Second Floor

System

San Leandro (SLTC)




| Healthy | Error |
|---|---|
| 10 | 0 |

| Warning | Maintenance |
|---|---|
| 4 | 0 |

System Details (Under Construction)

## Recent Incidents

| Severity | Name | Component Name | Item | Computer | Start | Duration | Acknowledged |
|---|---|---|---|---|---|---|---|
| ⚠ | PI Data Archive Backup Incident | OAKPIARCHIVE01.osisoft.int | PIDataArchive | OAKPIARCHIVE01.osisoft.int | 2018-04-17 10:43:28 AM | 9 hours | No |
| ⚠ | Stale Value Incident | OAKPIINT01.osisoft.int | PIBufferSubsystem | OAKPIINT01.osisoft.int | 2018-04-17 10:43:28 AM | 9 hours | No |

# Learn more…

## PI System 2018 and Beyond

**TODAY**

**10:30-11:15am**

Hilton
Union Square

## Product Booth

See live demo of software

Ask questions

Hilton Union Square

## Sign up for Beta

Visit the Manageability Booth

Or

Send email request to janelle@osisoft.com

# Analytics

Stephen Kwan and Joy Wang

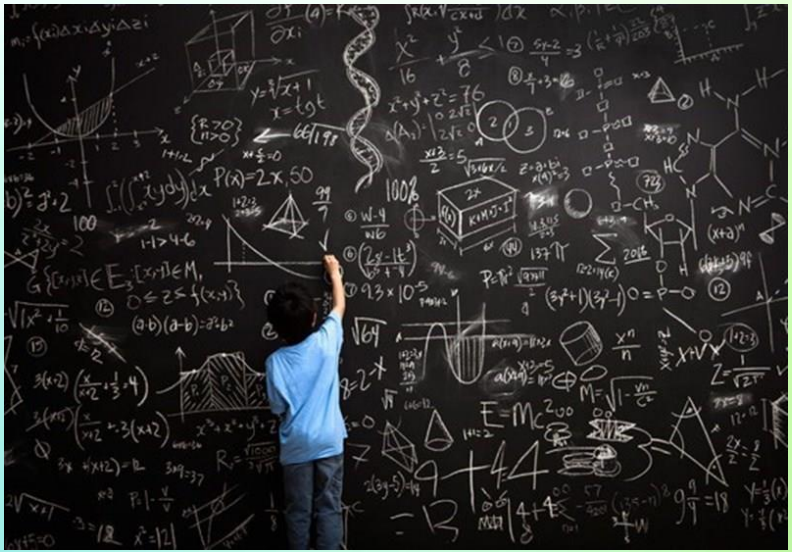
# OSIsoft Headquarters

- Leverage PI System to support the facility
- Collect data from Building Management System (BMS)
- Operational excellence
- Single pane of glass
- Energy management
- Optimize energy usage
  - HVAC performance
- Anomaly detection

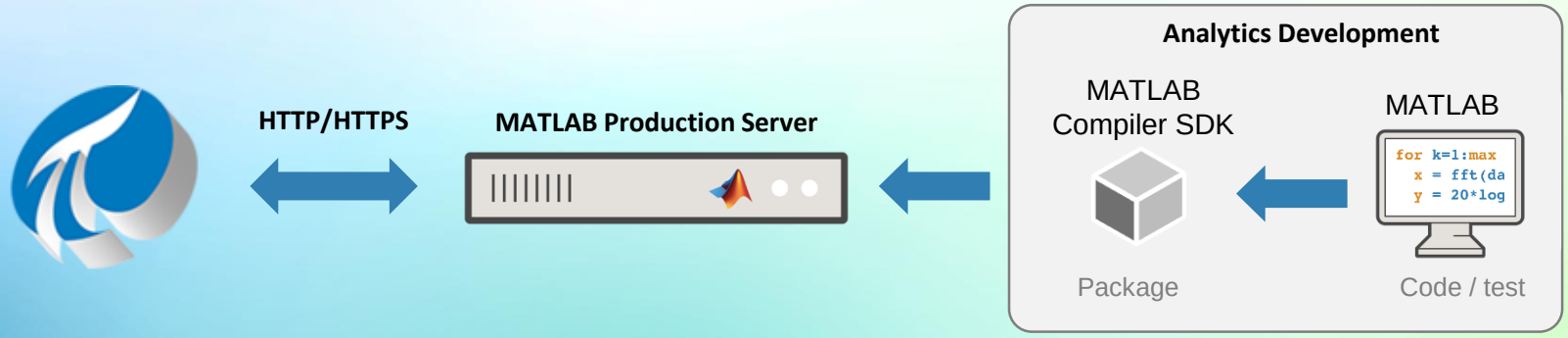
**How can we predict Energy Usage?**

# Advanced Streaming Calculations

- Asset Analytics released in 2014
- PE replacement
- Leverages AF and PI System
- Configuration experience
- Robust engine with scheduler
- Widely used, but users want more
  - Advanced calculations
  - More flexibility
  - Retain “ease of use”

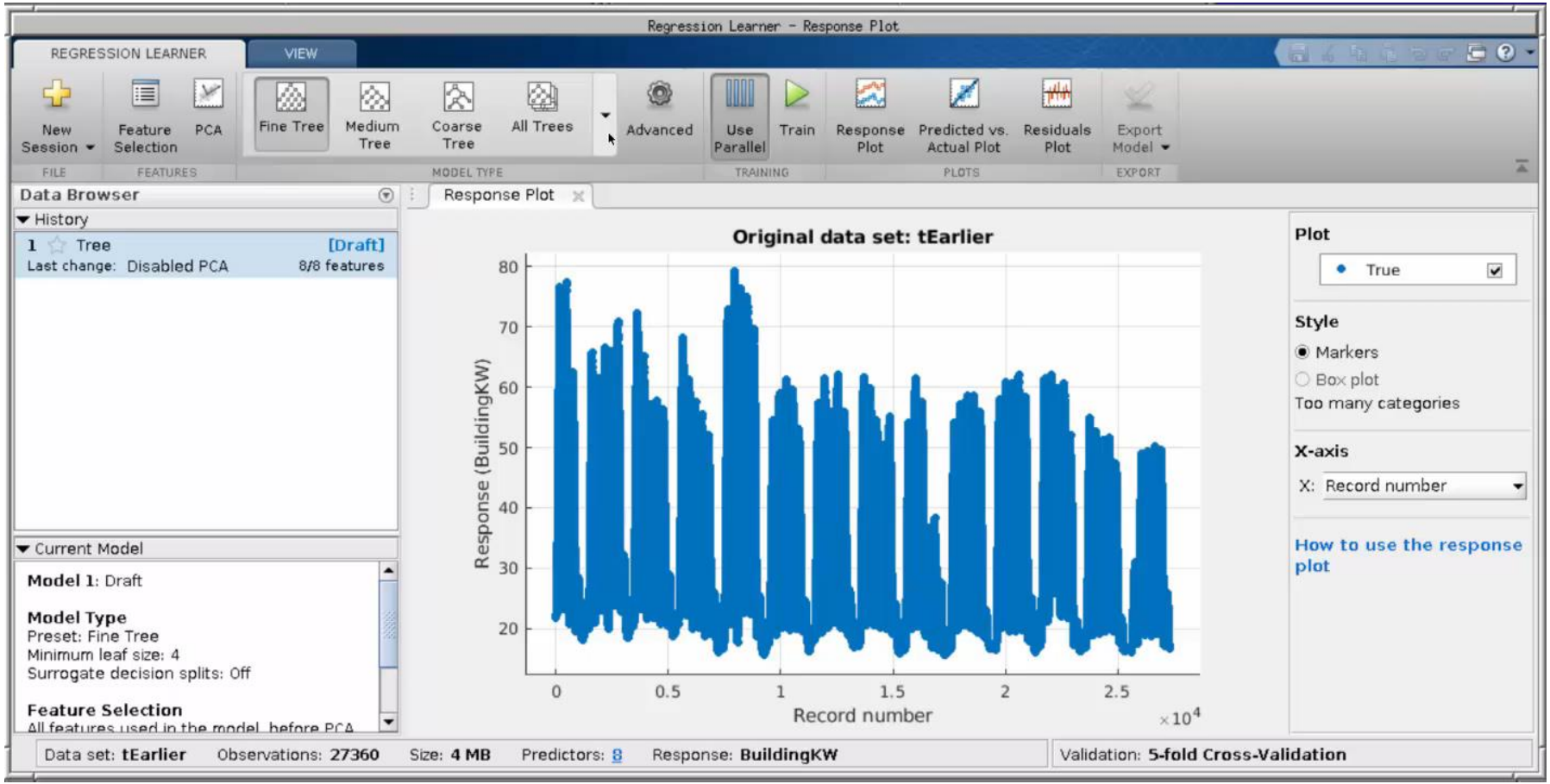


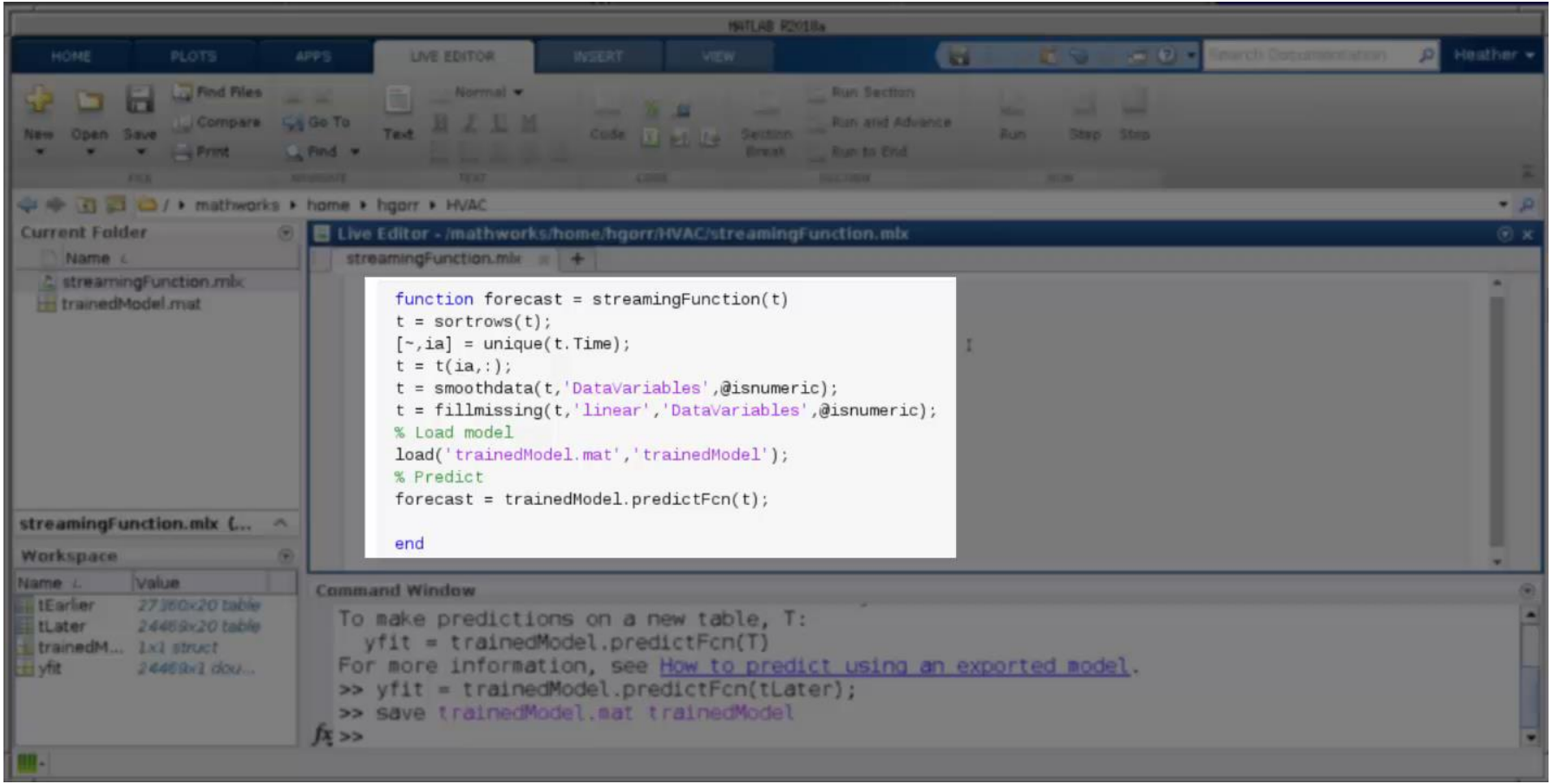
# Integration with MATLAB Production Server

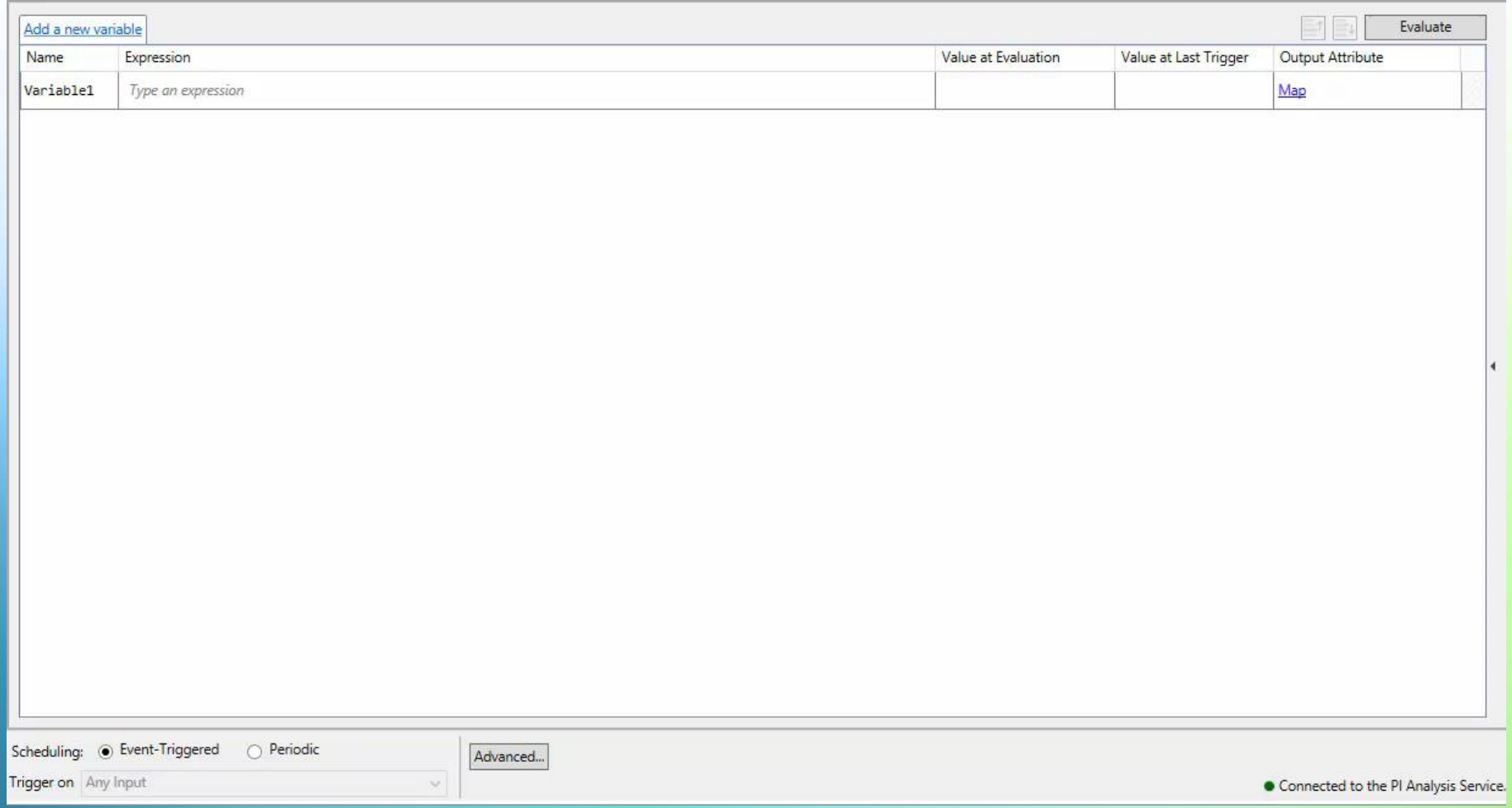



- Requirements
  - PI Asset Framework 2018
  - MATLAB Production Server 2018a
  - MATLAB, MATLAB Compiler and MATLAB Compiler SDK

# DEMO







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PARC 55 Mason Level 3
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***PI Integrators speed the process** that **brings trustworthy data** to many unique analytical tools*

# PI Integrators 2018

**Refined user experience** for effortless data preparation

**Distributed processing** to parallelize jobs in queue

**Live streaming updates** for evergreen algorithms

# Recall…

## Are the VAV Units reaching setpoint? At what time?

72%

% Setpoint reached

5:38:08

Average end time

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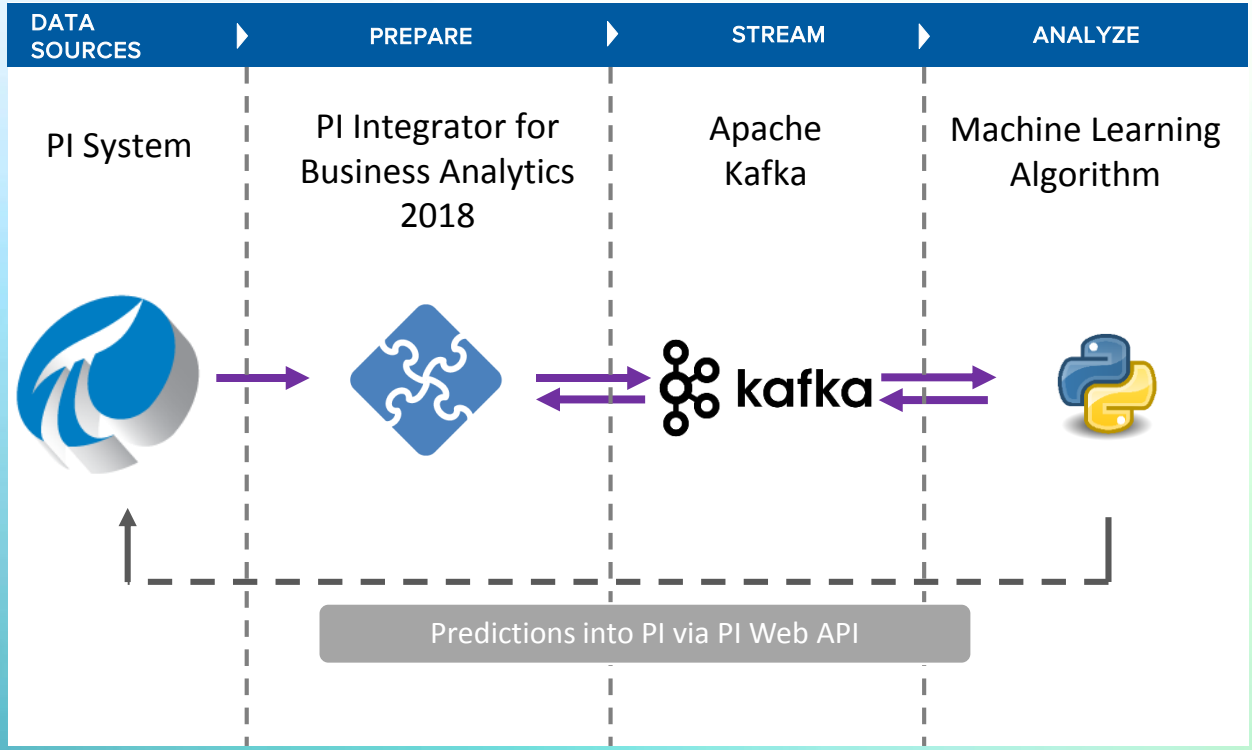
| West | 10809 | 78% | 5:23:26 |
| **Total** | **20488** | **72%** | **5:38:0** |

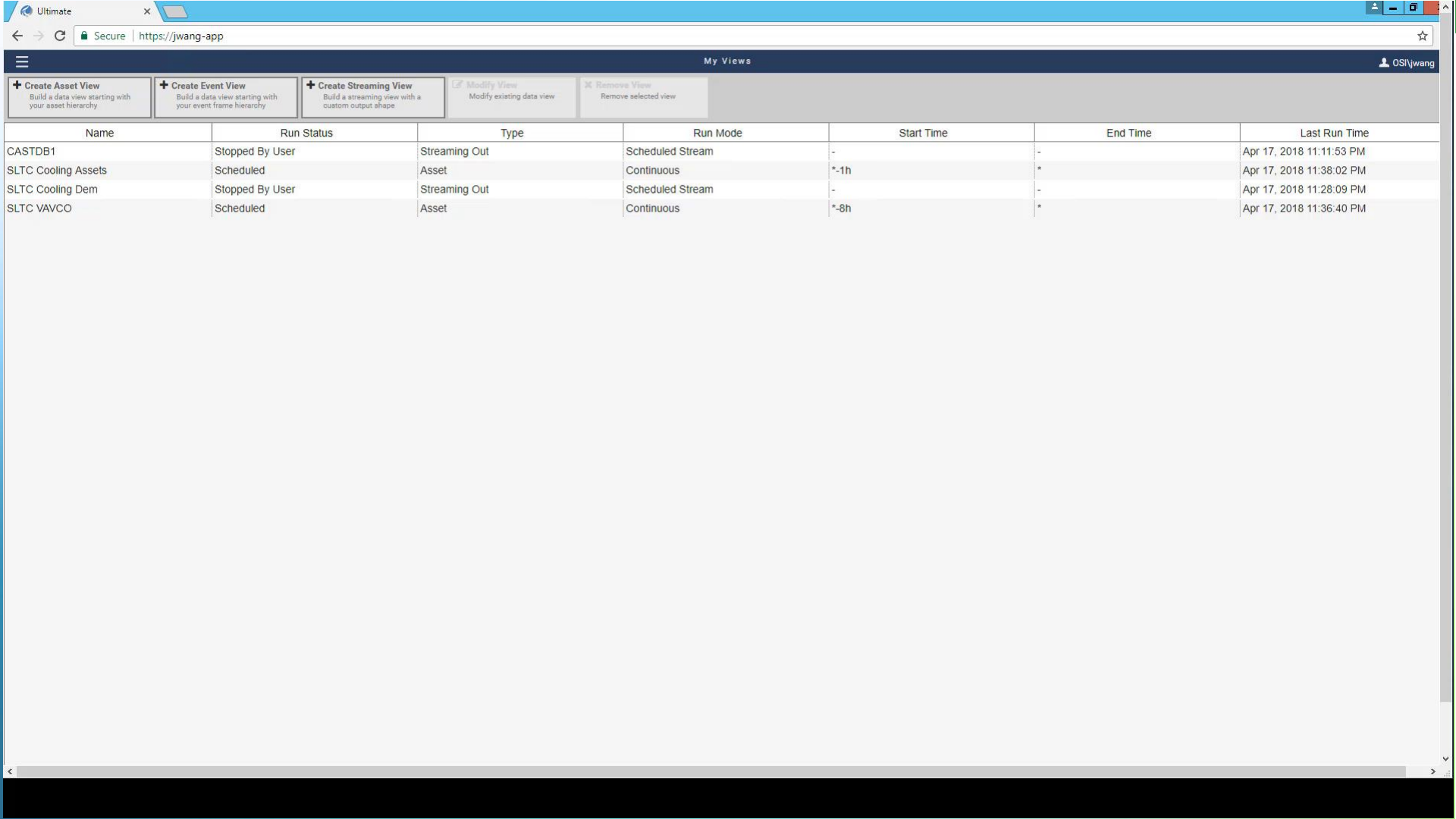
| Floor | Number of Events | % Setpoint reached | Average end time |
|---|---|---|---|
| 1 | 2056 | 53% | 6:45:09 |
| 2 | 3064 | 74% | 5:13:56 |
| 3 | 3625 | 71% | 5:20:35 |
| 4 | 3720 | 77% | 5:43:27 |
| 5 | 2963 | 74% | 5:44:50 |
| 6 | 4860 | 73% | 5:38:09 |
| **Total** | **20488** | **72%** | **5:38:08** |


Can we optimize our current energy usage?

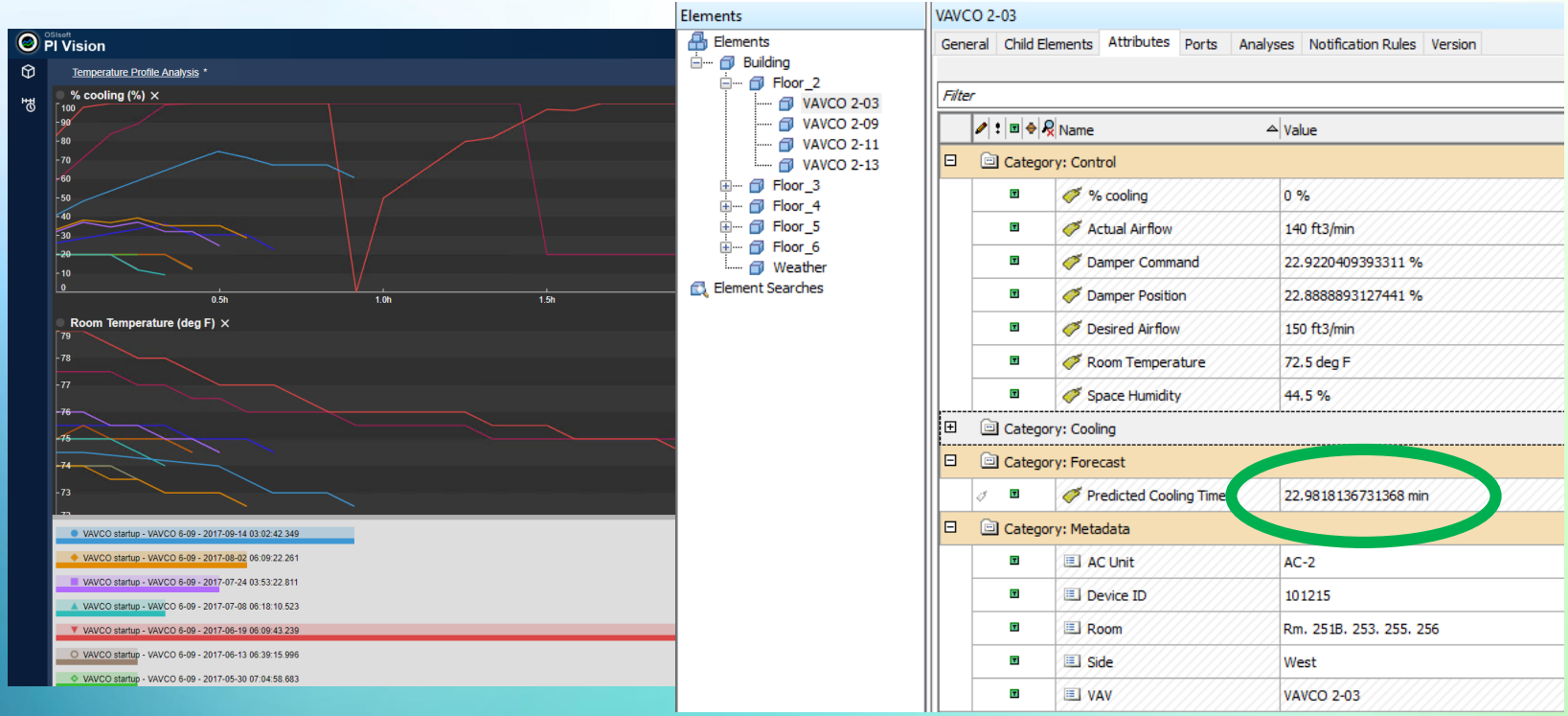
# Data Science Enablement with PI Integrators



# DEMO


Ultimate
Secure | https://jwang-app
My Views
OSI\jwang
Create Asset View
Build a data view starting with your asset hierarchy
Create Event View
Build a data view starting with your event frame hierarchy
Create Streaming View
Build a streaming view with a custom output shape
Modify View
Modify existing data view
Remove View
Remove selected view
Name | Run Status | Type | Run Mode | Start Time | End Time | Last Run Time
CASTDB1 | Stopped By User | Streaming Out | Scheduled Stream | - | - | Apr 17, 2018 11:11:53 PM
SLTC Cooling Assets | Scheduled | Asset | Continuous | *-1h | * | Apr 17, 2018 11:38:02 PM
SLTC Cooling Dem | Stopped By User | Streaming Out | Scheduled Stream | - | - | Apr 17, 2018 11:28:09 PM
SLTC VAVCO | Scheduled | Asset | Continuous | *-8h | * | Apr 17, 2018 11:36:40 PM

# Next Steps for Building Management



# Learn more…

## Talks

Advanced Analytics for PI Data for Data Scientists
**11:30-12:15pm**

Actionable Insights with PI Integrators
**3:30-4:15pm**

Hilton Union Square

## Product Booth

Visit the Egress Booth

Talk to developers and product specialists

Hilton Union Square

## Hands-On Lab

Apply Predictive Machine Learning Models to Operations

**1:30-4:30pm**

Hilton Union Square

# Visualization

Alicia Coppock, Product Manager

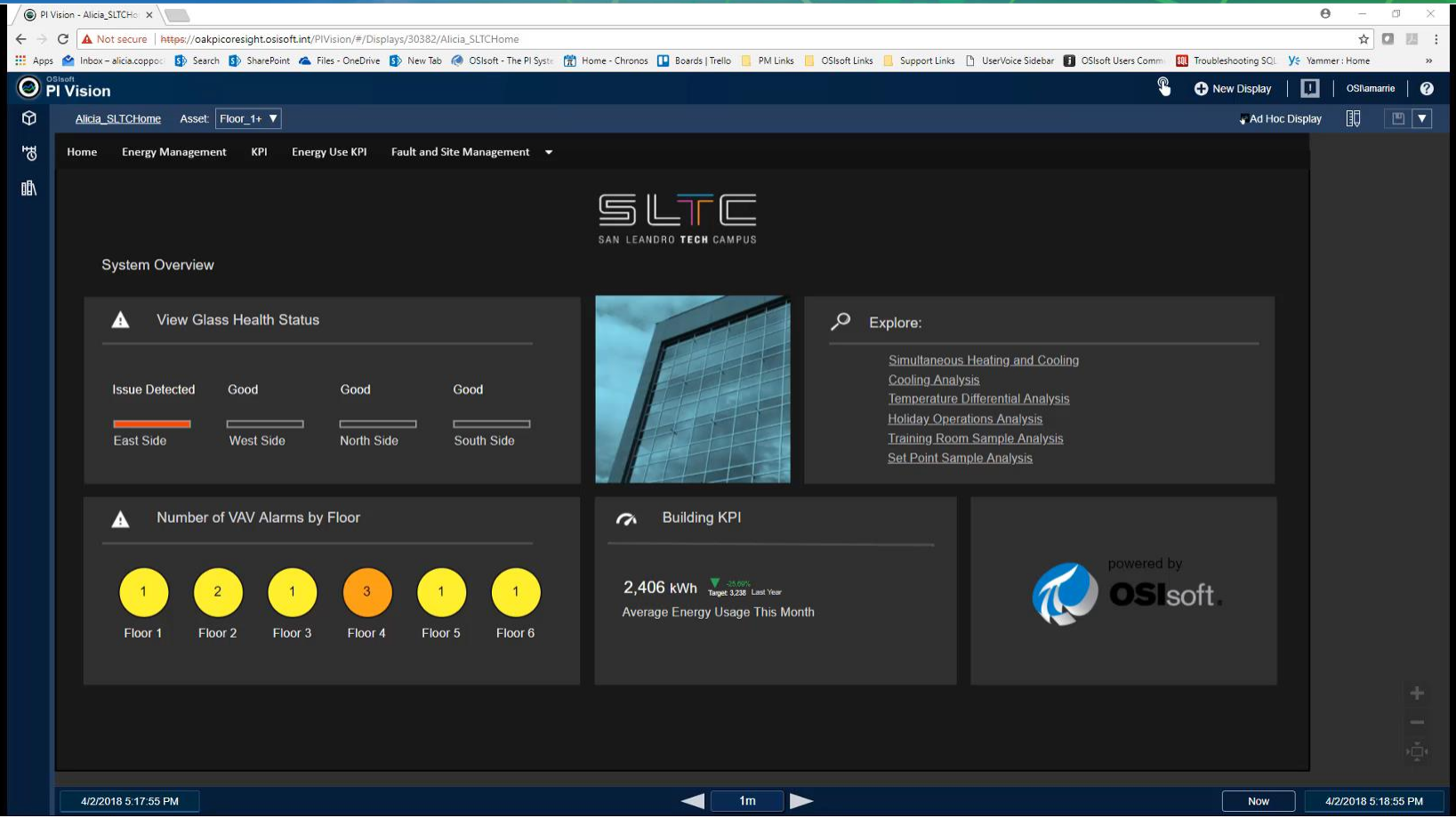
# What is PI Vision?

## The fastest, easiest way to visualize PI System data

- Access data from any web browser, including mobile device browsers
- Collaborate and share comments across the company
- Deploy and roll-out rapidly

# PI Vision

We are embarking on a **unified visualization infrastructure** to deliver a seamless, powerful, extensible experience.



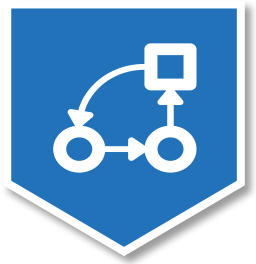
# What's next?

Meet PI Vision 4.x.

# PI Vision 4.x

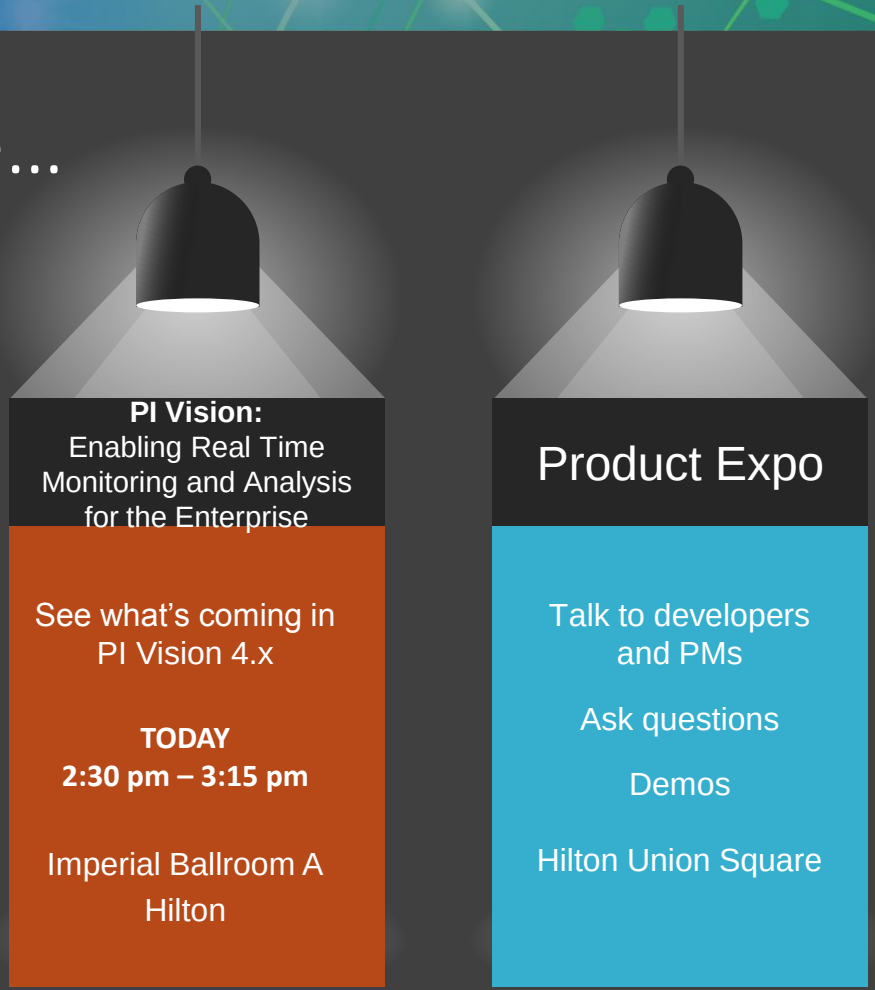
Speed and performance

Faster deployment of new features



Runs beautifully on any device

# Learn more…



**PI Vision:**
Enabling Real Time Monitoring and Analysis for the Enterprise

See what's coming in PI Vision 4.x

**TODAY**
**2:30 pm – 3:15 pm**

Imperial Ballroom A
Hilton

## Product Expo

Talk to developers and PMs

Ask questions

Demos

Hilton Union Square

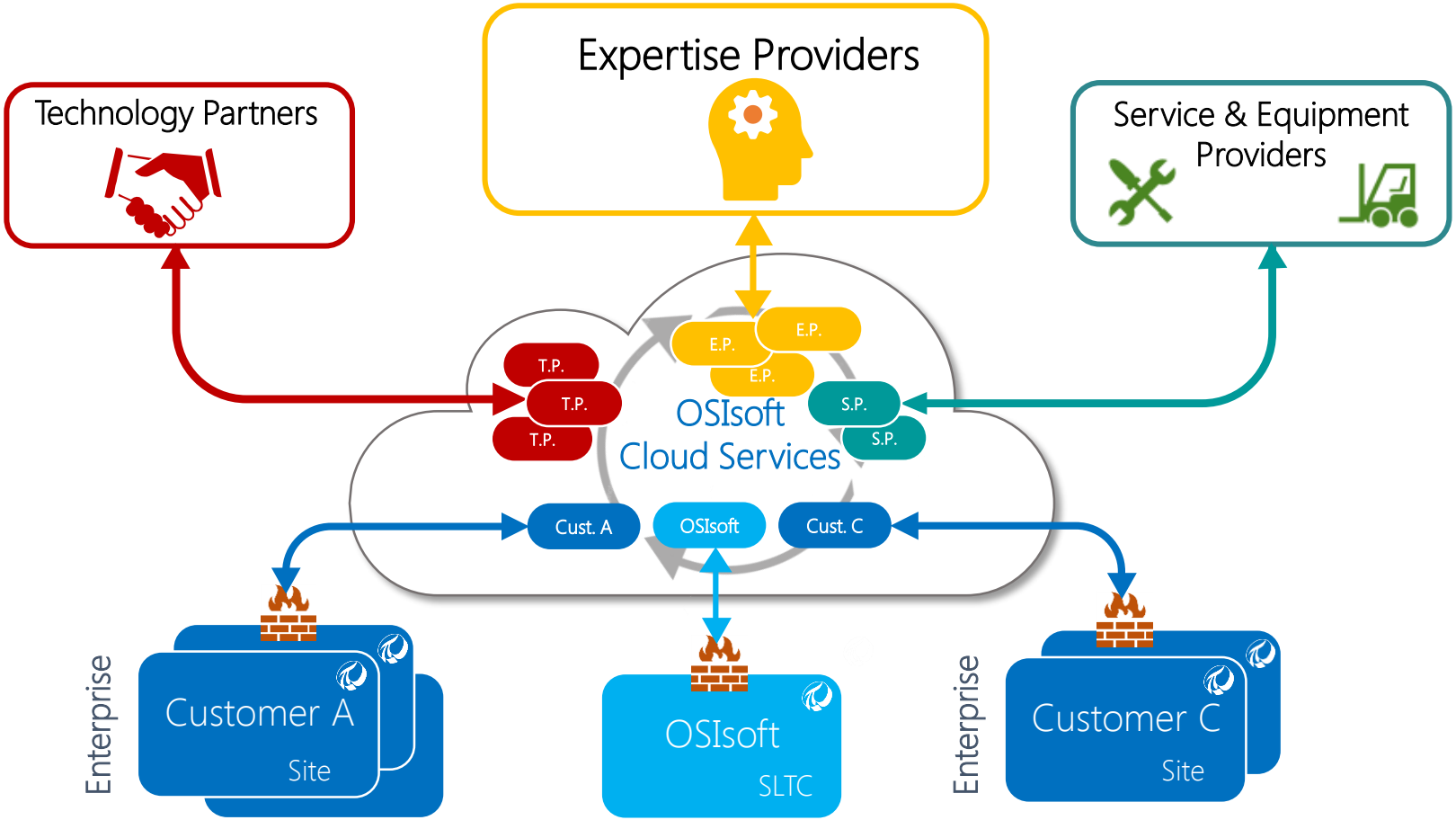
# OSIsoft Cloud Services (OCS)

From the OSIsoft Team – Laurent Garrigues, Product Manager
Hans De Leenheer, Director Technology Alliances @ Trendminer

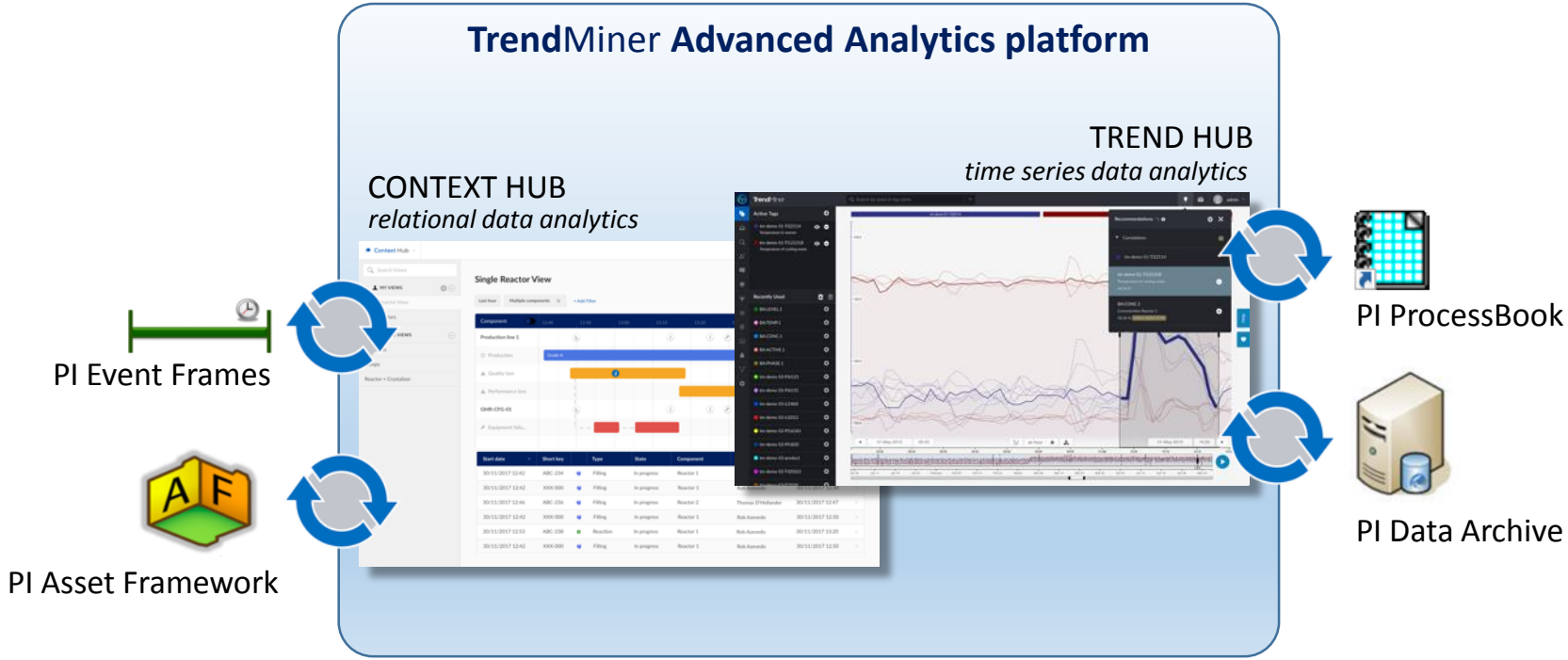
# OSIsoft Cloud Services Vision

Develop & maintain an
operational data ecosystem
that connects **you** (the customer)
with best-in-class Analytics and
your community of vendors & partners.



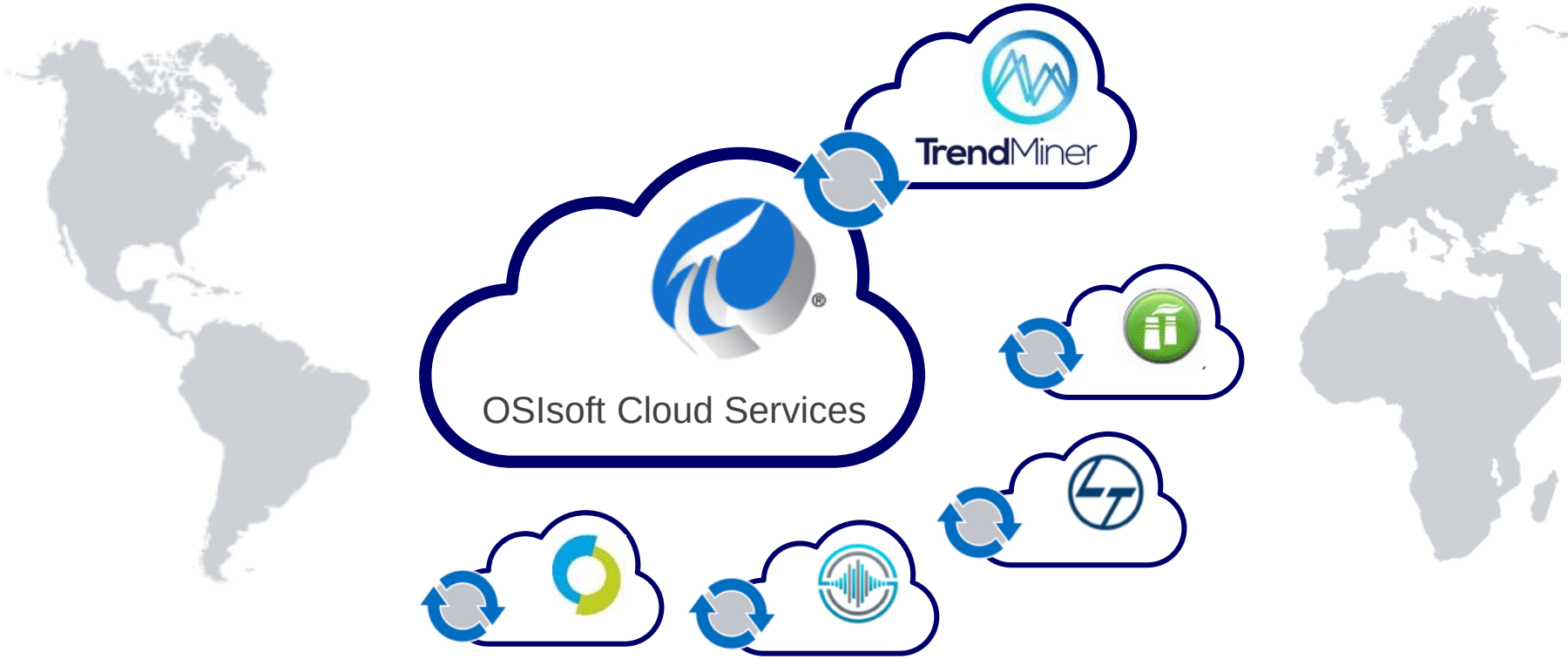
# OCS Partner Preview

# unlocking OSIsoft Data Infrastructure potential with TrendMiner self-service analytics



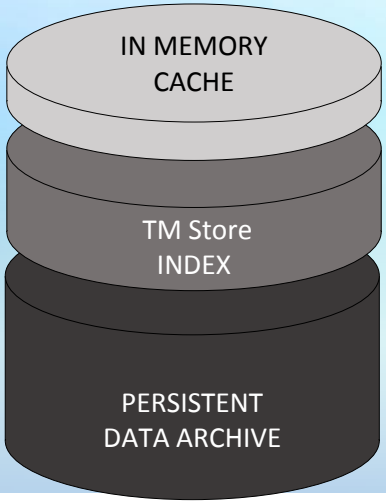
# unlimited connectivity with the flip of a switch!

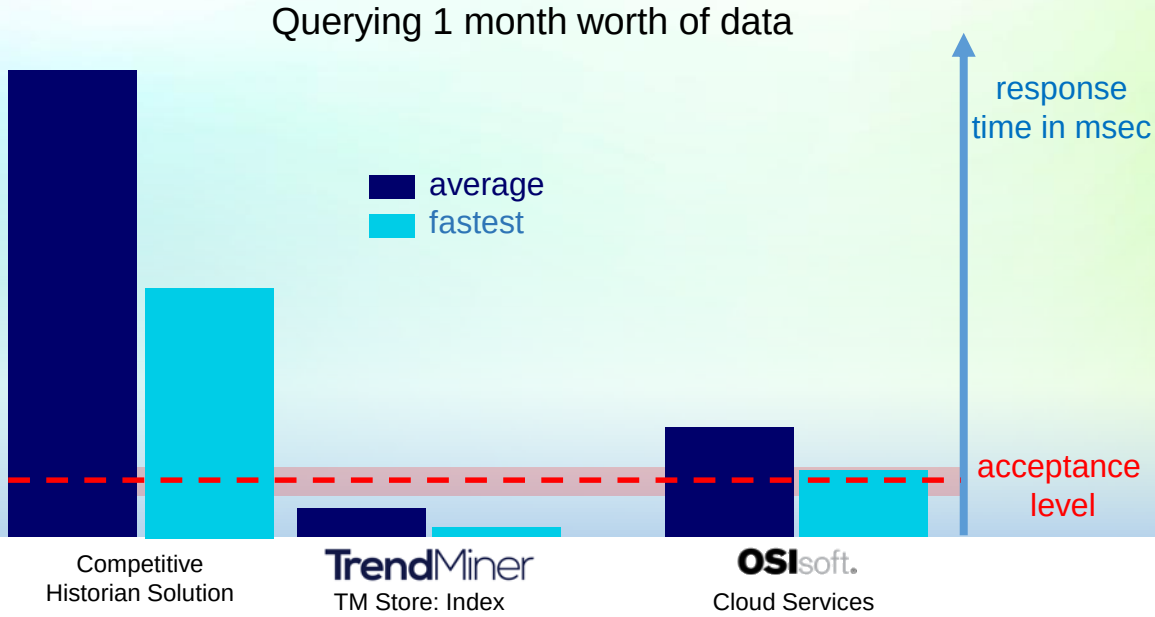
# every application, everywhere, for everyone!



# OSIsoft Cloud Services – NextGen IIoT platform!

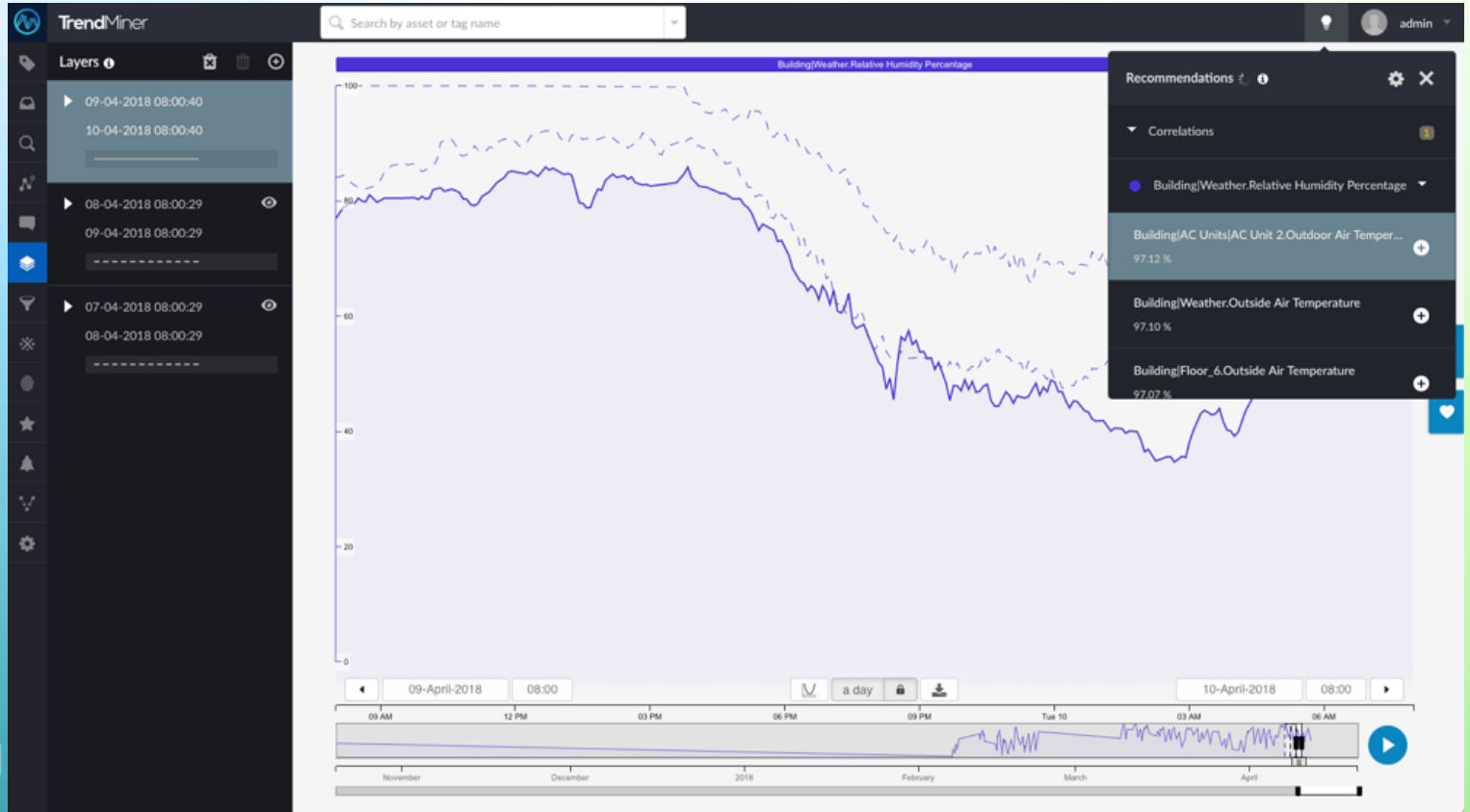
## the biggest challenge for a self-service platform is user experience



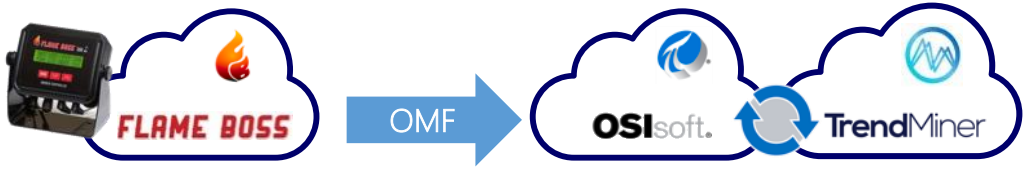



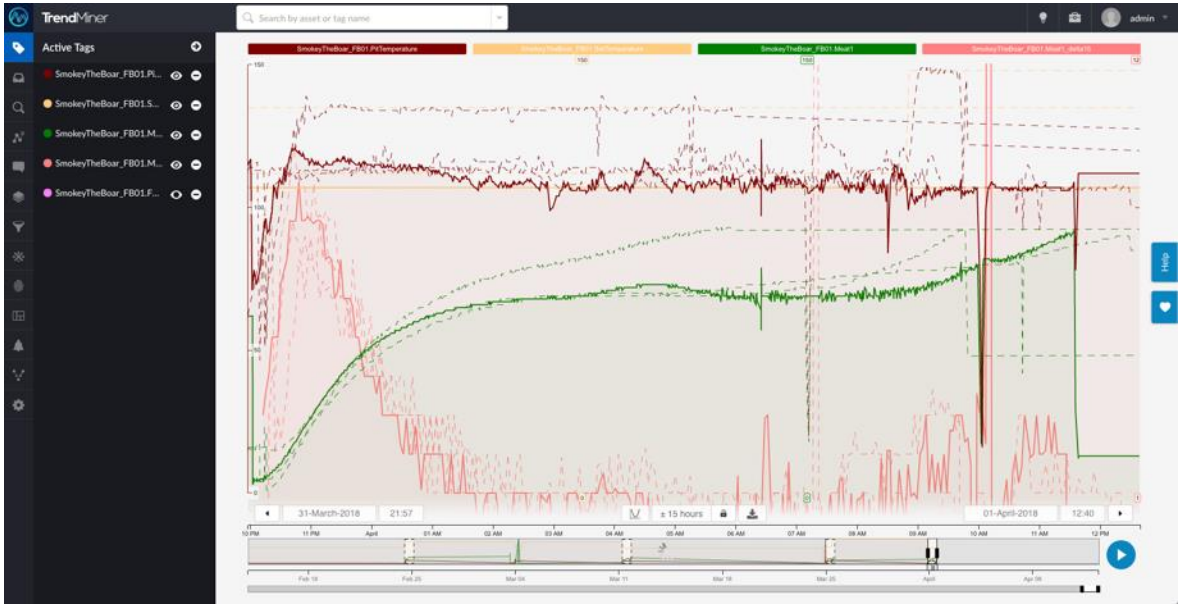
# **Trend**Miner Cloud Services – NextGen Analytics

the biggest challenge for analytics is scalable performance



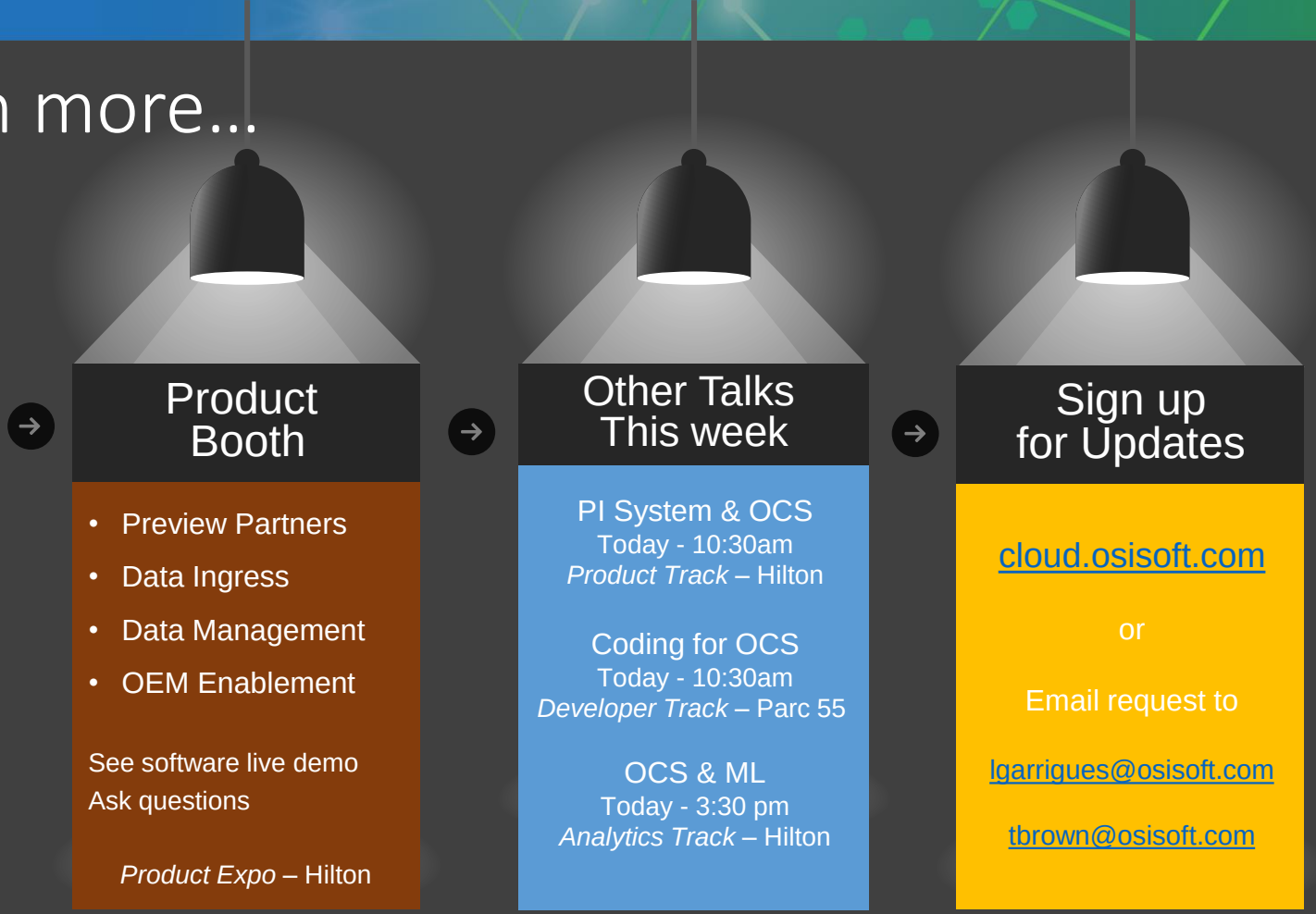
# Smoke your own …




BOOTH #52

# Learn more…



## Product Booth

- Preview Partners
- Data Ingress
- Data Management
- OEM Enablement

See software live demo
Ask questions

*Product Expo* – Hilton

## Other Talks This week

PI System & OCS
Today - 10:30am
*Product Track* – Hilton

Coding for OCS
Today - 10:30am
*Developer Track* – Parc 55

OCS & ML
Today - 3:30 pm
*Analytics Track* – Hilton

## Sign up for Updates

cloud.osisoft.com

or

Email request to

lgarrigues@osisoft.com

tbrown@osisoft.com

# Welcome to PI World 2018 Dev Con

Mike Sloves, OSIsoft, Director Technology Enablement

# A Dedicated PI Geek Space

- Parc 55 – An entire hotel just for us!
- Talks
- Hands-On Labs
- Exciting new changes
- Developer Reception at 5:00 tonight!
- We actually started *yesterday*

# Who should walk across the street?

- If you are…
  - A Developer
  - A Data Scientist
  - A Business Analyst
  - A Security Professional
  - A PI System Administrator
  - Someone that LOVES being a GEEK!

# What’s going on at Dev Con

- Talks and a Roadmap Discussion
  - Customer or Partner interested in upcoming features
  - "Coding for OCS"
  - "Extreme PI System Hardening"
  - "Advanced Analytics for PI System data for Data Scientists"
  - "Fog Computing"
  - "Writing Highly Performant Web API Code"
- Hands-On Labs
  - "Building Symbols in PI Vision 2018 Extensibility"
  - "Advanced Analytics for PI Data for Data Scientists"
  - "Introduction to PI Developer Technologies"

# What's Changed This Year

- Live-Coding
- How-To's

# Hackathon Changes

- Programming Hackathon is now the *Innovation Hackathon!*
  - Solution to Challenges are more Data Science than Programming
  - All skillsets are welcome to participate
  - Bring your own tools or use ours
- Special Thanks to DCP Midstream for being Data Sponsor
- Pitch Panel
- 71+ Participants

# Awards

- At the Developer Reception this evening at the Parc @ 5:00
- Hackathon Winners
  - 1st Place – Sonos Player:5 and Amazon Echo Dot, Free Registration
  - 2nd Place – Bose Quiet Comfort Series III, 50% Registration
  - 3rd Place – Raspberry PI Retro Gaming Kit
- PI Developers Club All-Stars
  - Individuals that contribute to the betterment of the community
  - Trophies and $400(US) Amazon Gift Cards
- Visualization Virtual Hackathon

# Don’t Forget

- Developer Reception at the Parc 55 @ 4:30
  - Awards Ceremony at 5:00
- GEEK NIGHT!

# Final Words of Wisdom

```
#wife {
   right: 100%;
   margin: 0;
}
```

# PI World Day 3 Summary

Chris Nelson, OSIsoft, VP Engineering
Gregg Le Blanc, OSIsoft, VP Product

# Day 3 Highlights

## Product Track

- PI System 2018 & OSIsoft Cloud Services
- Pervasive Data Collection
- Visualization
- Integrators and Integration

| Hilton | Hilton | Hilton | Parc 55 | Parc 55 | Parc 55 | Parc 55 | Parc 55 | Parc 55 |
|---|---|---|---|---|---|---|---|---|
| Product Track | Analytics Track | Marketplace Showcase | Developer Track 1 | Developer Track 2 | Developer Track 3 | Developer Track 4 | Developer Track 5 | Developer Track 6 |
| **PI System 2018 & OSIsoft Cloud Services** | **Introduction to Time-Series Analysis with PI System and R** | Advanced Analytics with Seeq | What's New & Upcoming in Developer Technologies | Introduction to FogLAMP | LiveCoding: Coding for OCS | HOWTO: Extreme PI System Hardening | HOWTO: How to Put Your AF Server into a Container | Writing Highly Performant PI Web API Applications |
| **Pervasive Data Collection - All the Ways to Collect Your Data** | **Advances in PI System Streaming Analytics with MATLAB** | Accelerating Innovation in the Industrial Internet of Things | Build PI Applications Faster with PI Web API Client Libraries | Advanced Analytics for PI Data for Data Scientists | | | | |
| PI Vision: Enabling Real-Time Monitoring and Analysis for the Enterprise | PI System Analytics, Fit for Purpose | CI2BI - Chemicals Injection Real Time Data to Business Intelligence | Fog Computing on the Plant Floor | Introduction to Data Science for PI Data for PI Professionals | LiveCoding: Exploring Blockchain Applications with OSIsoft Research | HOWTO: Data Collection at the Edge | LiveCoding: Getting the Most Out of the New AF Search | Streaming calculation with the PI System and MATLAB |
| Actionable Insights with PI Integrators | Using OSIsoft Cloud Service to Fuel Cognitive Computing & Machine Learning | Enabling External Access to Historian Data without Compromising OT Security | Next Generation PI SQL | Why a Data Lake Alone Can't Replace Your PI System | | | | |

# Questions

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

State your **name & company**

# Please remember to…

Complete the Online Survey for this session

# Thank you!

**Chris Nelson**
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OSIsoft, LLC

**Gregg Le Blanc**
gleblanc@OSIsoft.com
VP, Product
OSIsoft, LLC