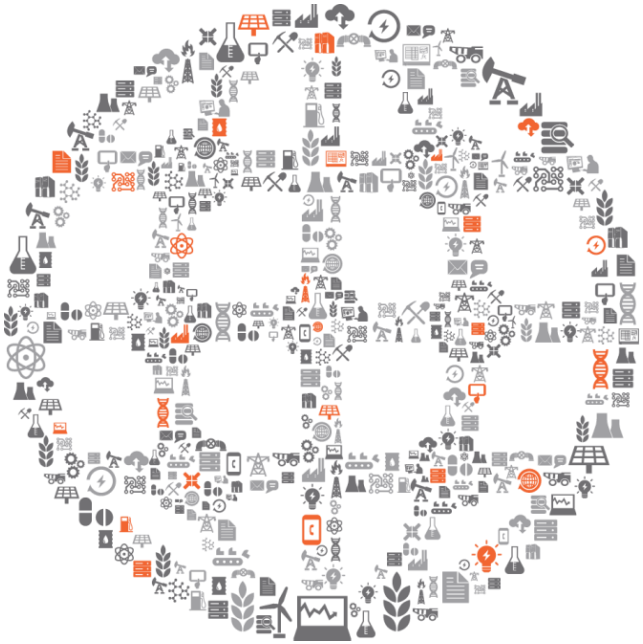

OSIsoft.

REGIONAL SEMINAR

The Power of Data

THRIVING IN A WORLD OF CHANGE

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The Power of a Data Infrastructure: The PI System® Explained

Presented by **Mariana Sandin, Systems Engineer**

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Why a Data Infrastructure

Electrical Power	Water Systems	Transportation	Communication	Data
Sustainable	Reliable	Accessible	Enabling	Organized

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Context

*"I am the **energy efficiency expert**. I need to **analyze** and **compare** truck **performance** for **different mining sites** located hundreds of miles from my office."*

"An incident happened last night."

"I need data to assess the situation but it is not readily available."

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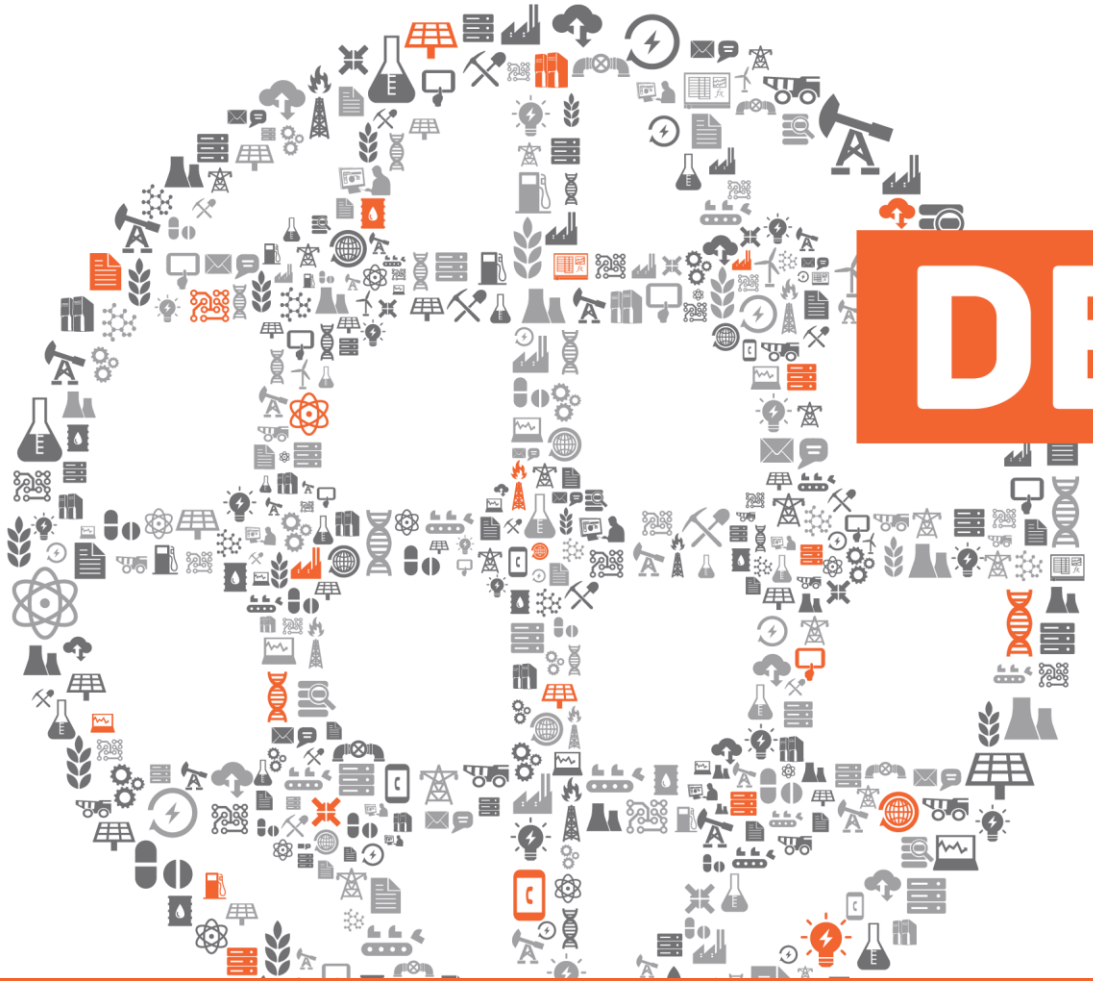

DEMO

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PI ProcessBook - [Mining Truck Status*]

File Edit View Insert Tools Draw Arrange Window Help

9/16/2013 9/18/2013

C:\Users\mmckay\Desktop\Mining Truck Status.pdi

Element Relative Display

Search

wt-*

Elements of Interest

Group by: Template

Filter

Name	Description	Elec
Mine Truck 1		Mining
Mine Truck 2		Mining
Mine Truck 3		Mining
Mine Truck 4		Mining
Mine Truck 5		Mining

OSIsoft

Mine Truck

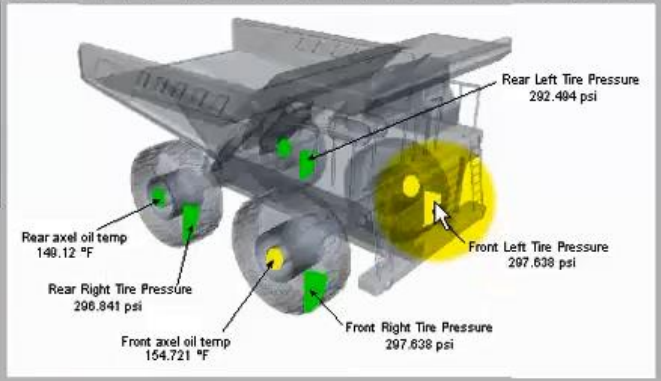
Komatsu Mine Truck 3

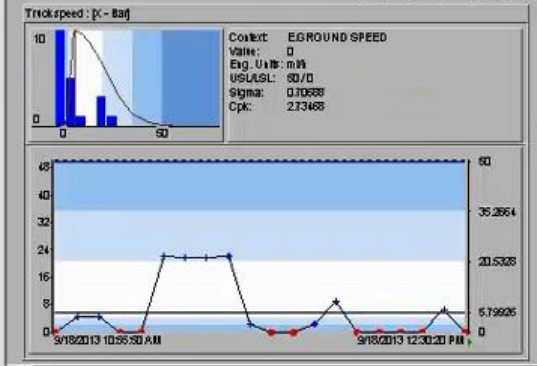
Tilt dump amps

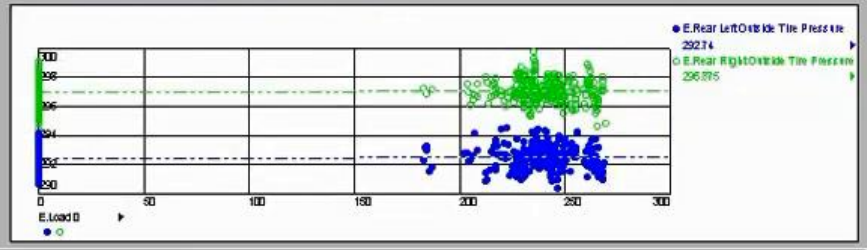
Driver	Neil Macer
Route	Route A
Speed	0.00 km/h
Engine RPM	0.00 rpm
Cooling Temp.	358.11 deg C
Load	0.00 t

0 2 4 6 8 10 12 14 16 20

Status







Ready

Server Time

FR 12:36 PM 9/18/2013

PI System Infrastructure

I need to be notified when this kind of events happen.

I need the big picture of my wind turbines to understand what is going on.

The pump is not working. What's the problem?

I need to analyze and compare turbines performance.

Information must be shared across the enterprise through different business systems.

We all want to know how the plant is performing in real-time.

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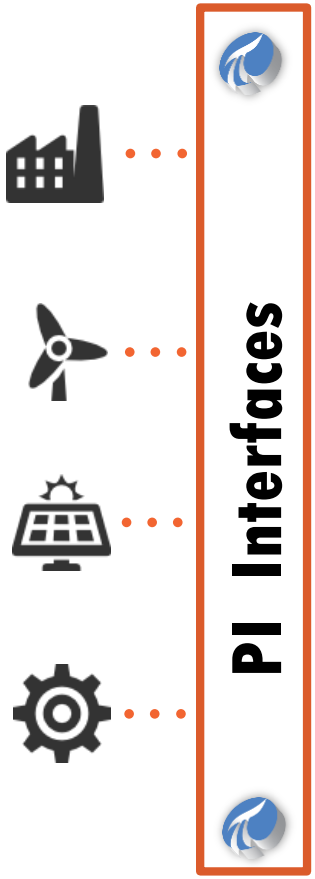
PI System Infrastructure



The pump is not working. What's the problem?

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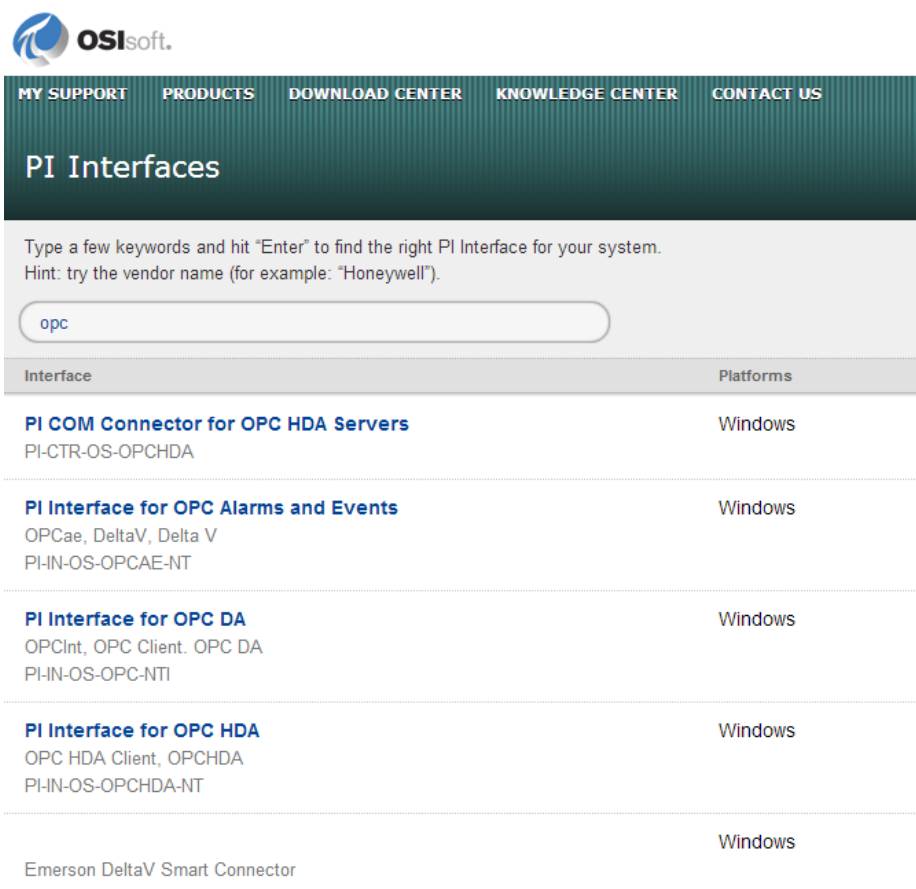
PI Interfaces

- More than **450** interfaces
- Support multiple **protocols** and **data sources**
  - OPC, Modbus, SNMP, Text File, ODBC
- Robust and reliable



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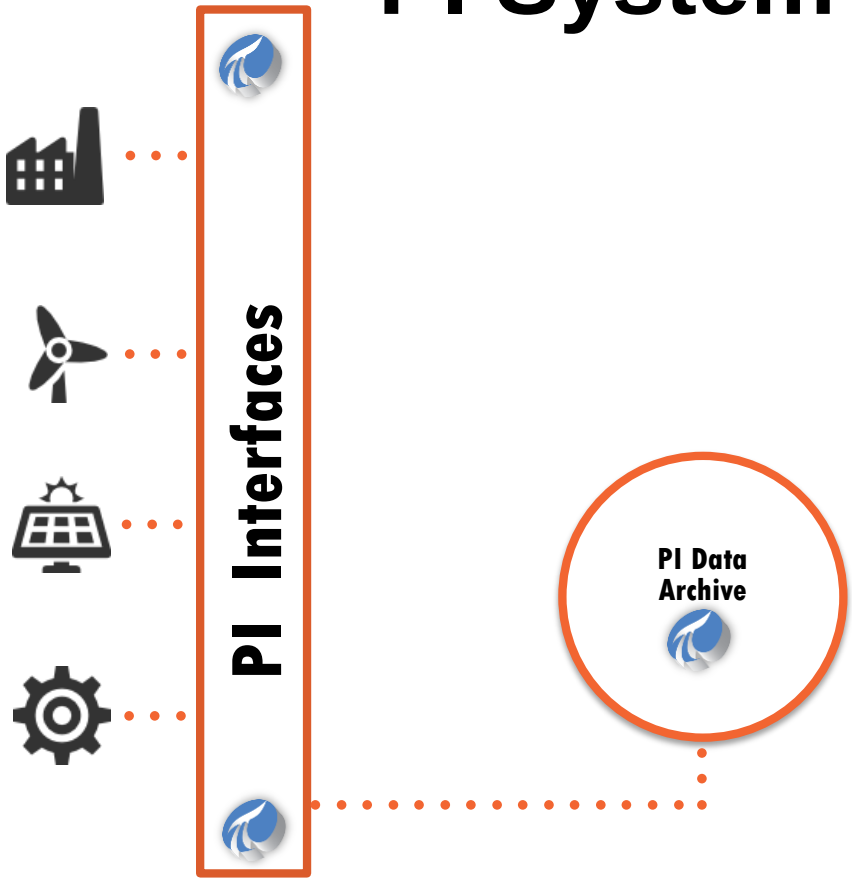
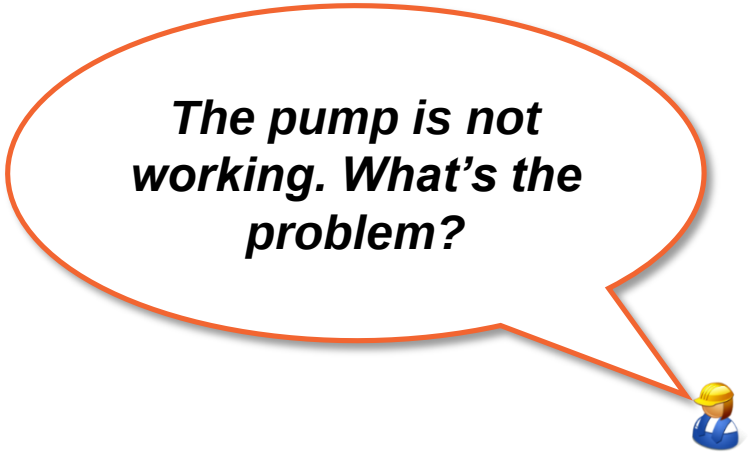
PI System Infrastructure





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PI Data Archive

- Optimized for **real time** data **streams** - TAGS

TAG	TIME	VALUE	STATUS
TIC1001.PV	23-MAY-08 11:01:02	12.3	GOOD
LIC30211.PV	23-MAY-08 11:01:03	198.4	GOOD
...	...	...	...

- Designed to archive data for **millions** of tags and **tens** of years

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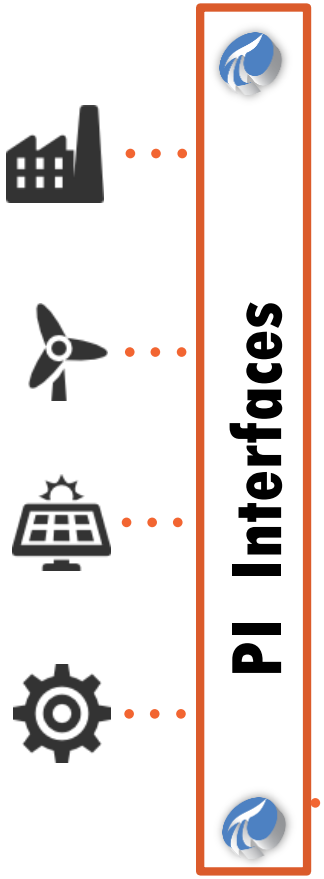
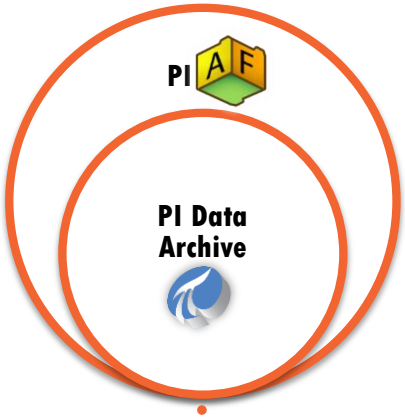
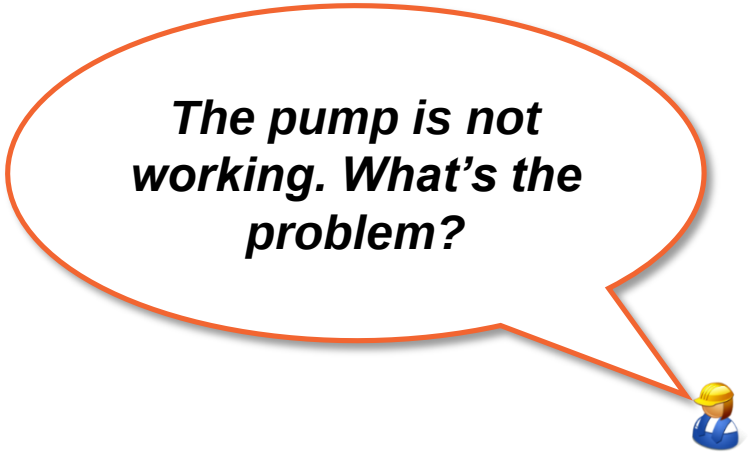
PI System Infrastructure







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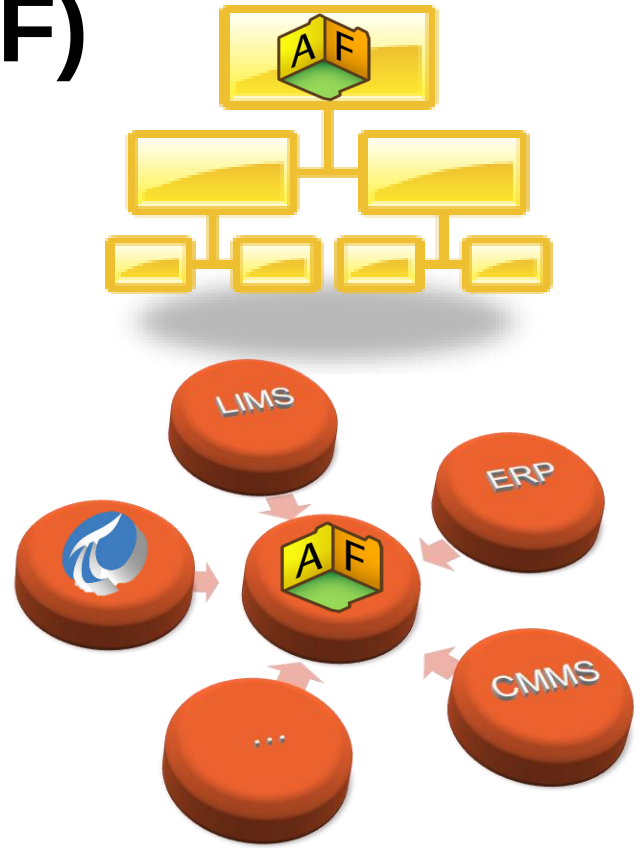
PI Asset Framework (PI AF)

- Organize your assets data in a **hierarchical**, **scalable**, **secure**, and **extensible** database
- Model data from **different PI Servers**
- Relate **non time-series** data sources
- Integrate with **analyses** and **notifications** tools



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The Big Picture

- Elements
  - Boilers
  - Equipment
  - NuGreen
    - Houston
      - Cracking Process
        - Equipment
          - B-210
          - B-235
          - F-321
          - F-409
          - H-2043
          - H-230
          - K-304
          - K-556
          - P-214
          - P-456
          - P-560
      - Extruding Process
      - Milling Process
    - Little Rock
    - Tucson
    - Wichita
  - Pumps
    - P-007
    - P-009
    - P-020
    - P-099
    - P-101

Analyses
- Efficiency analysis
- Key Performance Indicators (KPI)

Time-series
- In-Flow
- Pressure
- Vibration data

Events
- Downtime
- Startup
- Failure

Asset details
- Name
- Model
- Manufacturer

Notifications
- High speed
- Rotor failure
- Low pressure

External data
- Performance curves
- Last maintenance date
- Design documents
- Best operating procedures

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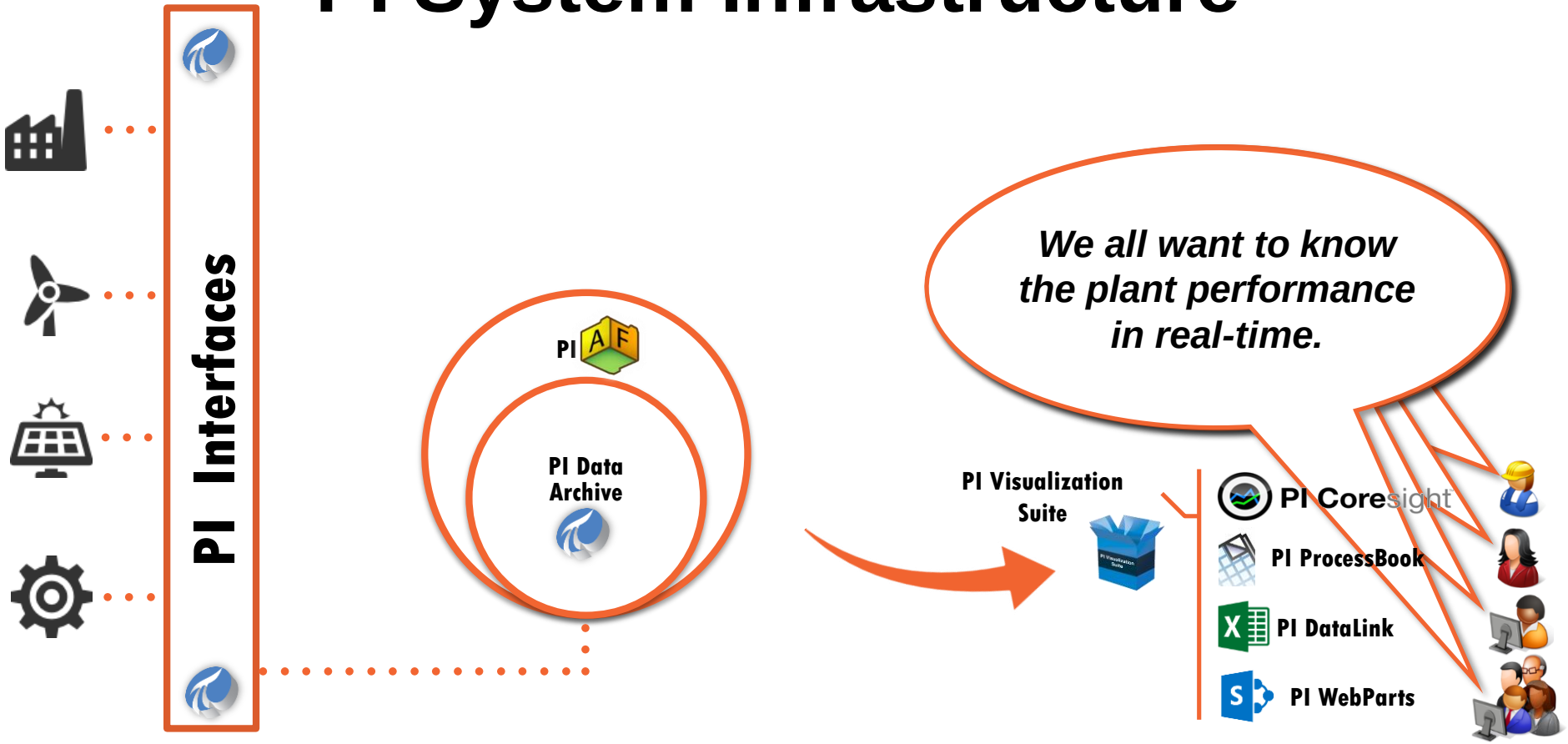
PI System Infrastructure



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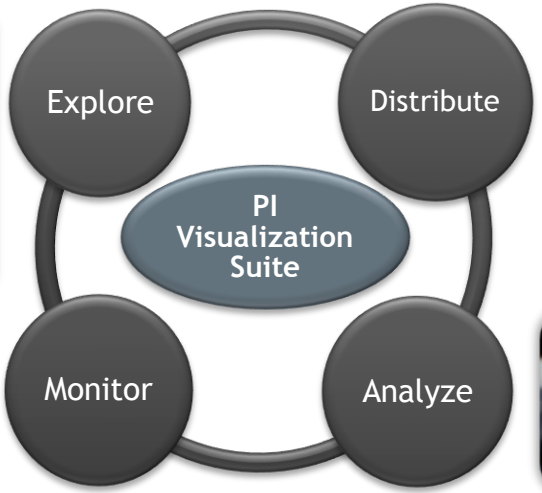
Visualization Landscape

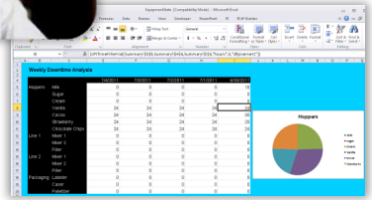
PI Coresight
Collaboration and ad hoc analysis



PI WebParts
Composite web applications

PI ProcessBook
Authoring tool for process displays and trends

PI DataLink
Reports and data analysis



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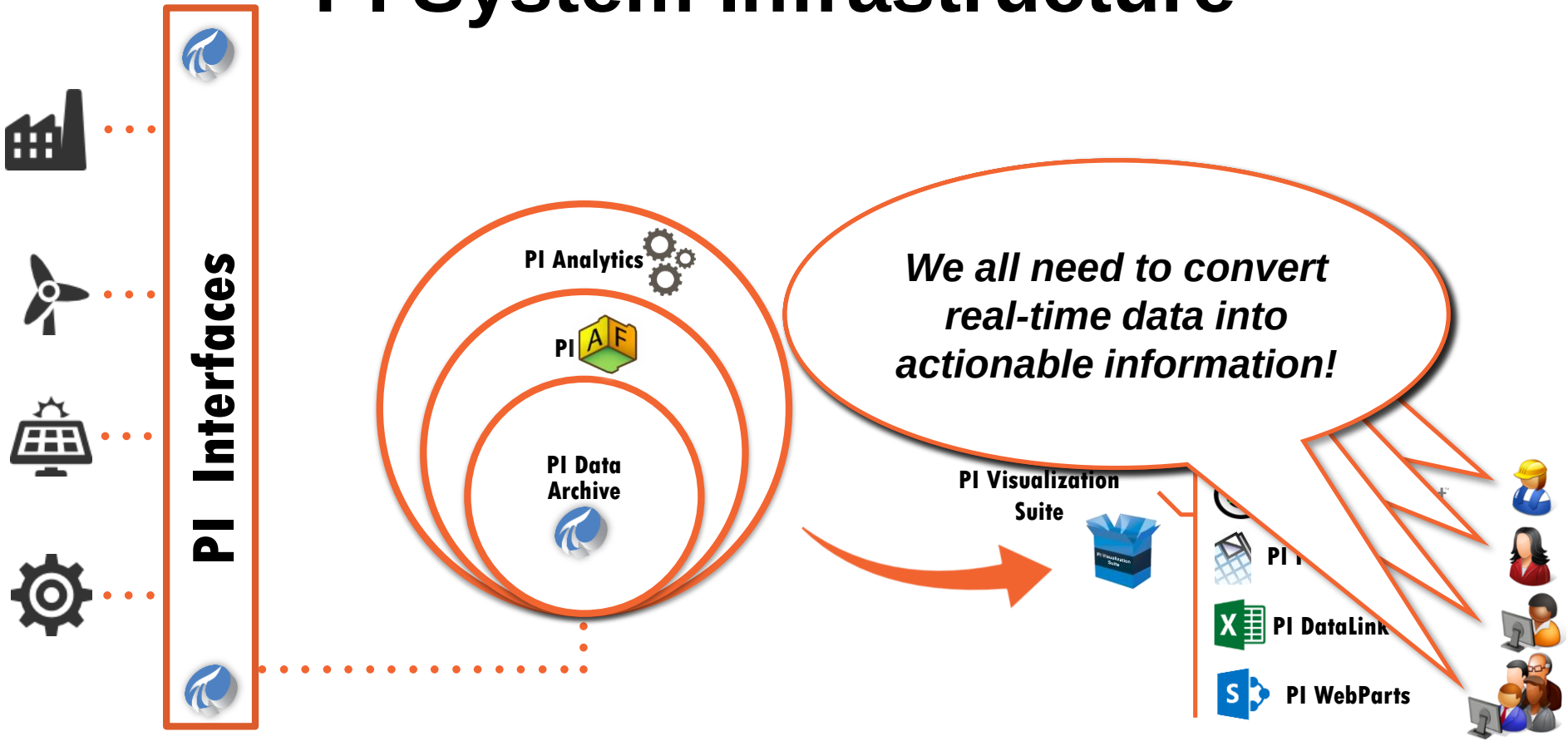
PI System Infrastructure



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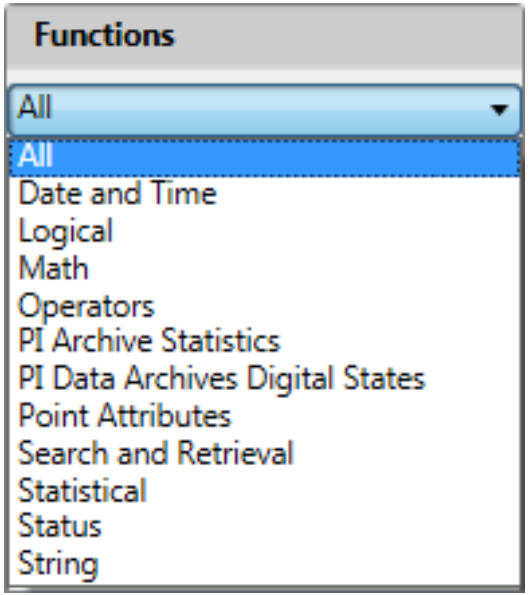
PI Analytics

- Transforms operational data into **actionable information**
- The analyses are:
  - Created by configuration or programming
  - Triggered periodically or on events
  - Consulted on-demand or historized



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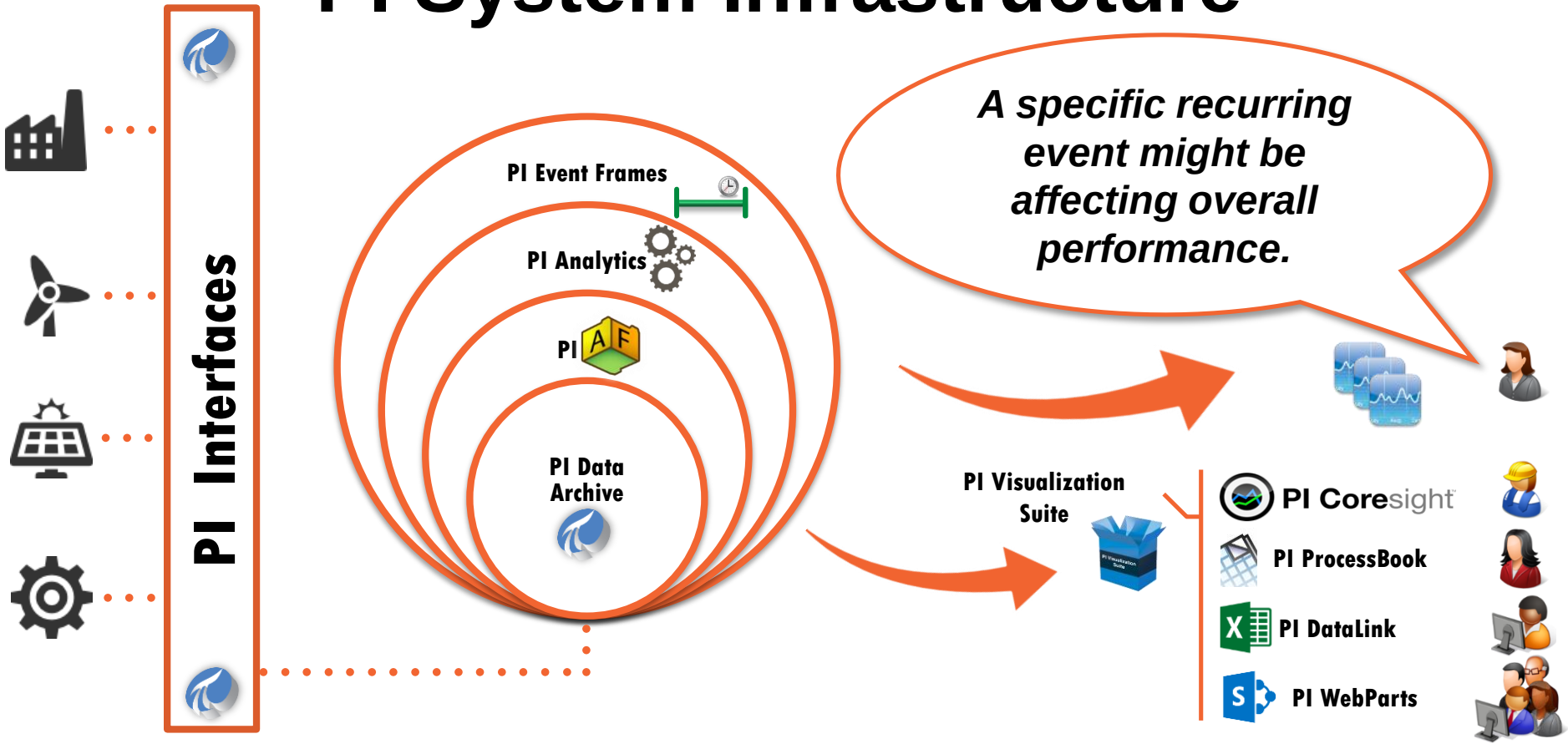
PI System Infrastructure



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Bookmarks for your Real-Time Data

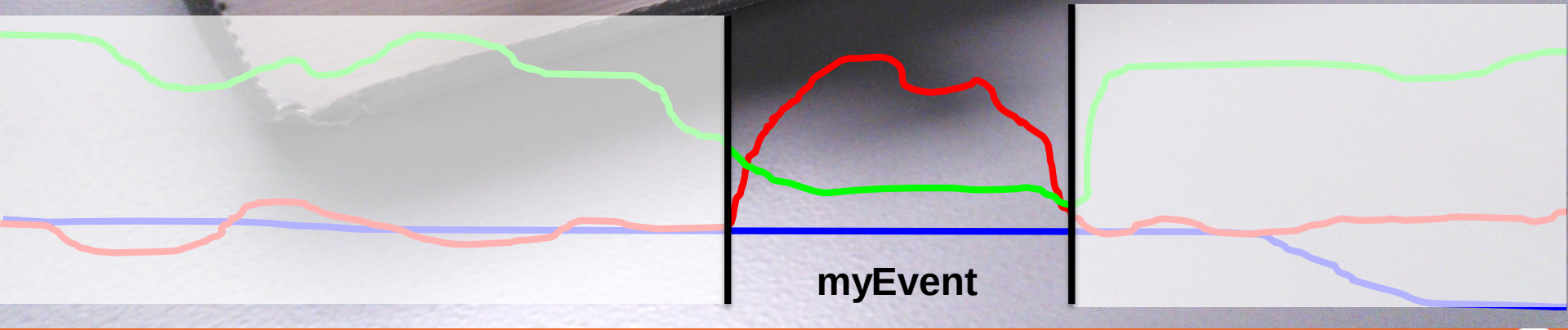
PI Event Frames

Info

Start

End

Your Data



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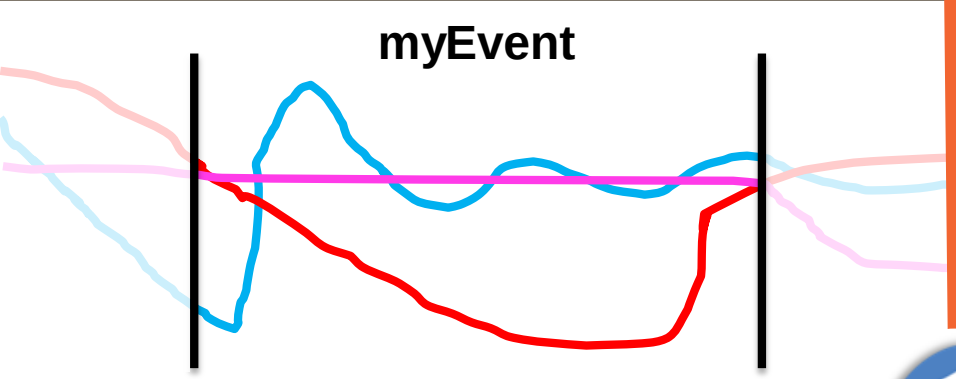
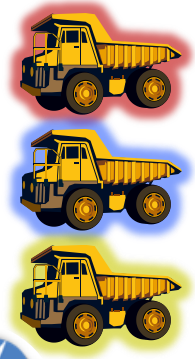
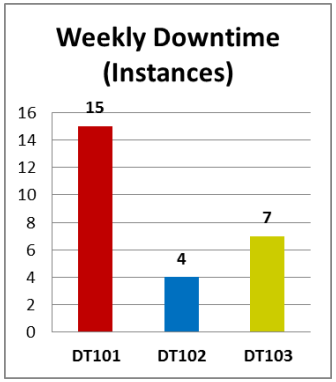
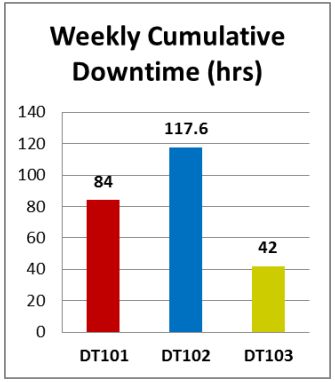
Simplify Data Analysis

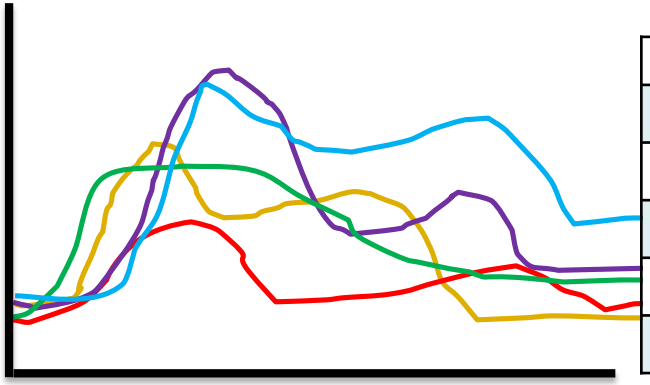


Perform Asset Comparisons







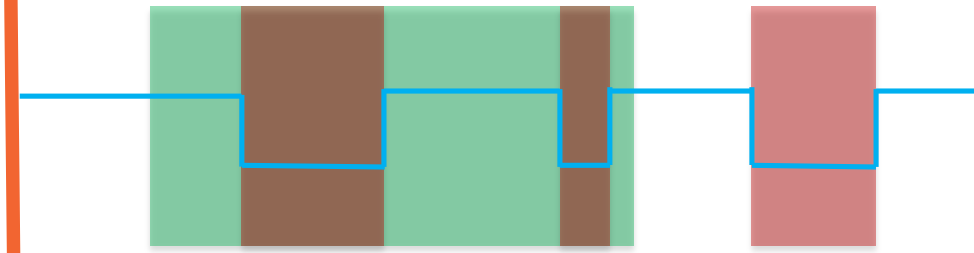


Name	Temp.Max
EF1	122.47
EF2	109.34
EF3	112.73
EF4	98.61
EF5	125.24

Downtime Events for Product XYZ

Product XYZ (1)

Downtime (2)



Perform Event Comparisons

Discover Event Interrelationships

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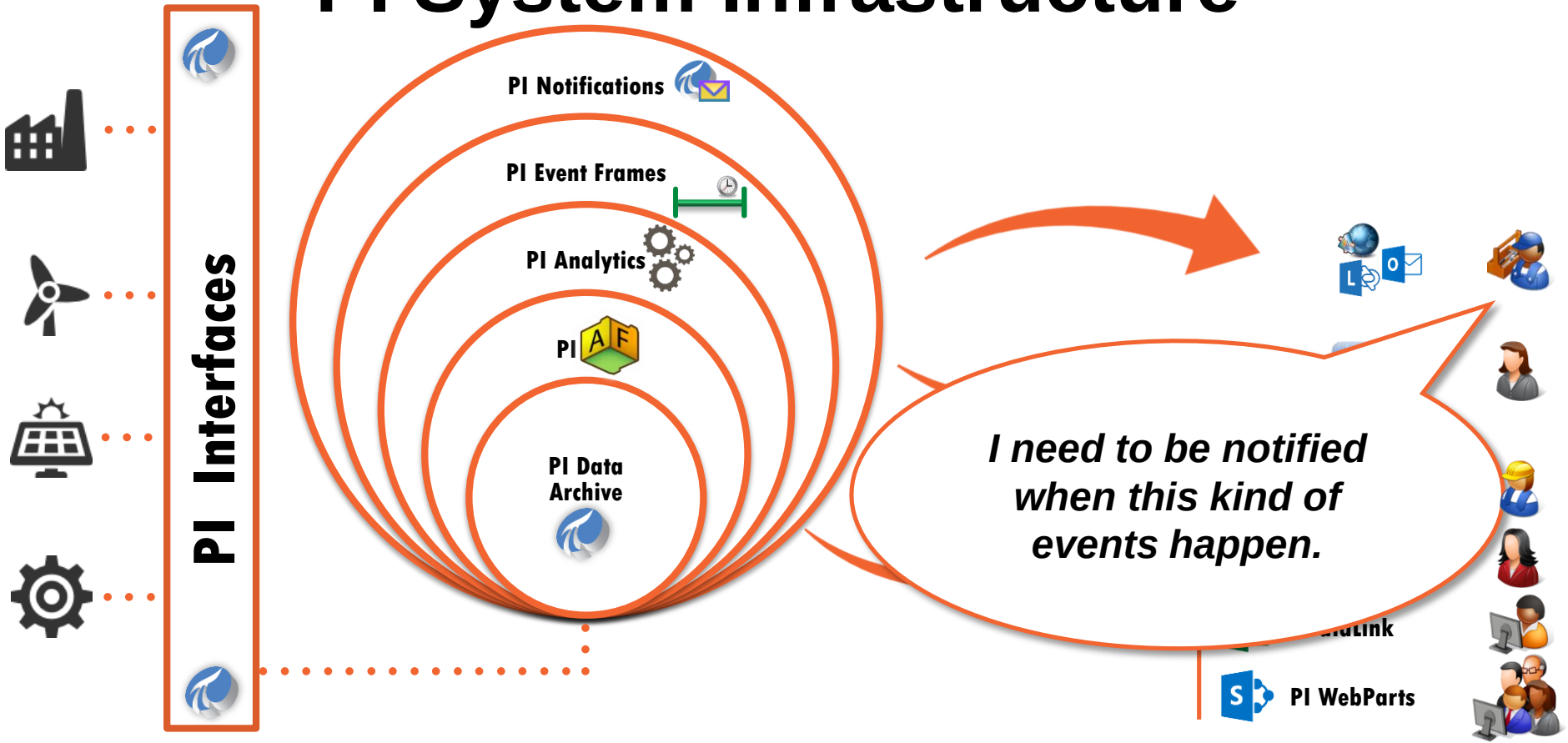
PI System Infrastructure



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PI Notifications

DELIVER

From: PINotAdmin
To: Mariana Sandin
Cc:
Subject: Transformer TR0842 Load is in hi

Instant PI WebParts Trend
Acknowledge With Comment
Acknowledge

Name:	Transformer Load - H
State:	High
Trigger Time:	7/29/2012 9:07:01 A
Start Time:	7/29/2012 9:07:01 A
End Time:	1/1/1970 12:00:00 AM
Triggering Condition:	Load > 22
Target:	TR0842

Wind Farm availability is under 70%
DF PI Notifications - Offline
IM Call Video Share
pinotifications@osidf.test.int 2:45 PM
Wind Farm availability is under 70%
Name: Wild River Wind Farm
Server: DFPIAF
Database: Windtopia
Start Time: 8/1/2012 2:30:00 PM Pacific Daylight Time (GMT-07:00:00)
Trigger Time: 8/1/2012 2:45:00 PM Pacific Daylight Time (GMT-07:00:00)
Target: Wind Power Generation Fleet\Wild River Wind Farm
State: OutsideControl
Priority: Normal
Link:
Wind Farm Overview
Actions:
Acknowledge
DF PI Notifications
Wind Farm availability is under 70%
Redirect Ignore

Web Service

SAP

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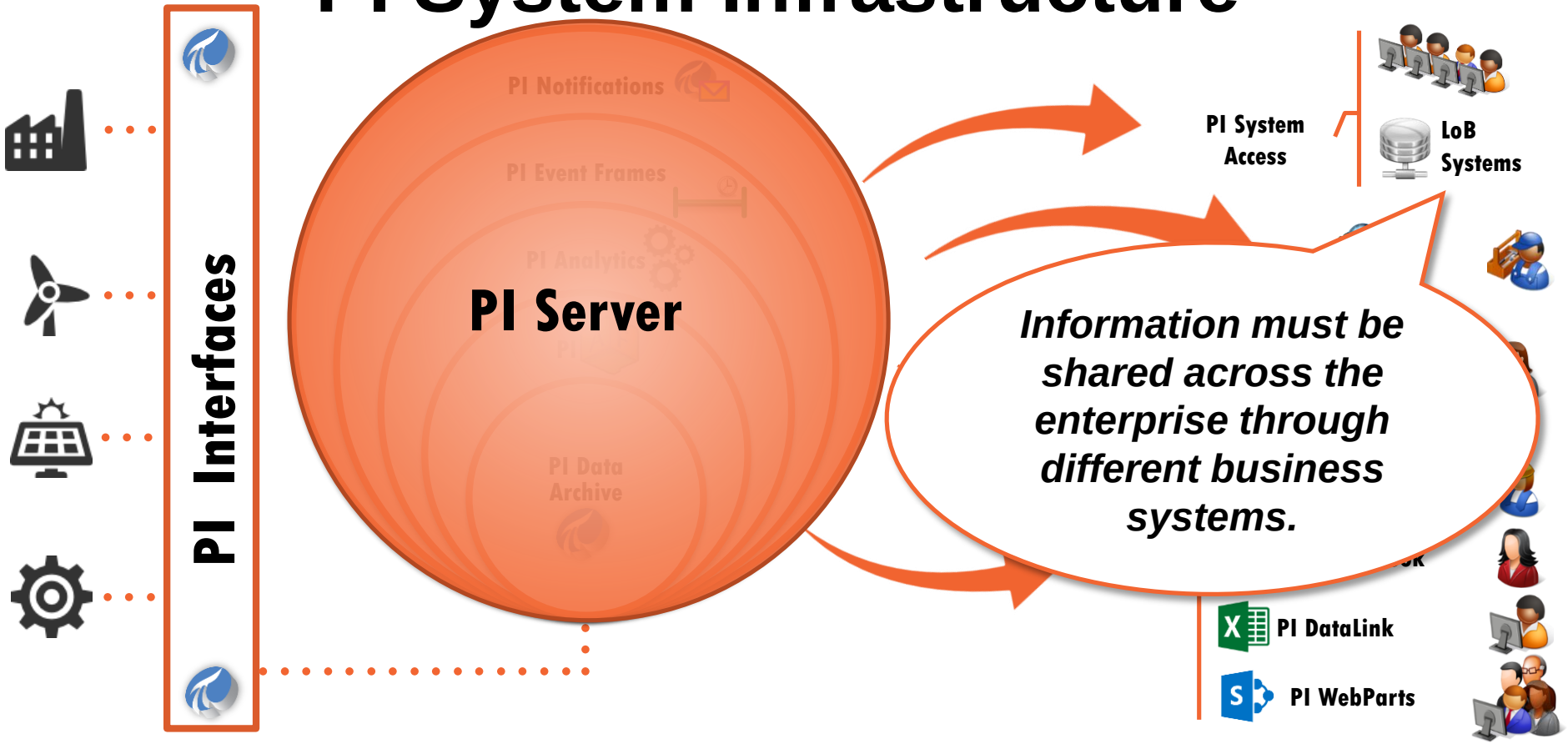
PI System Infrastructure



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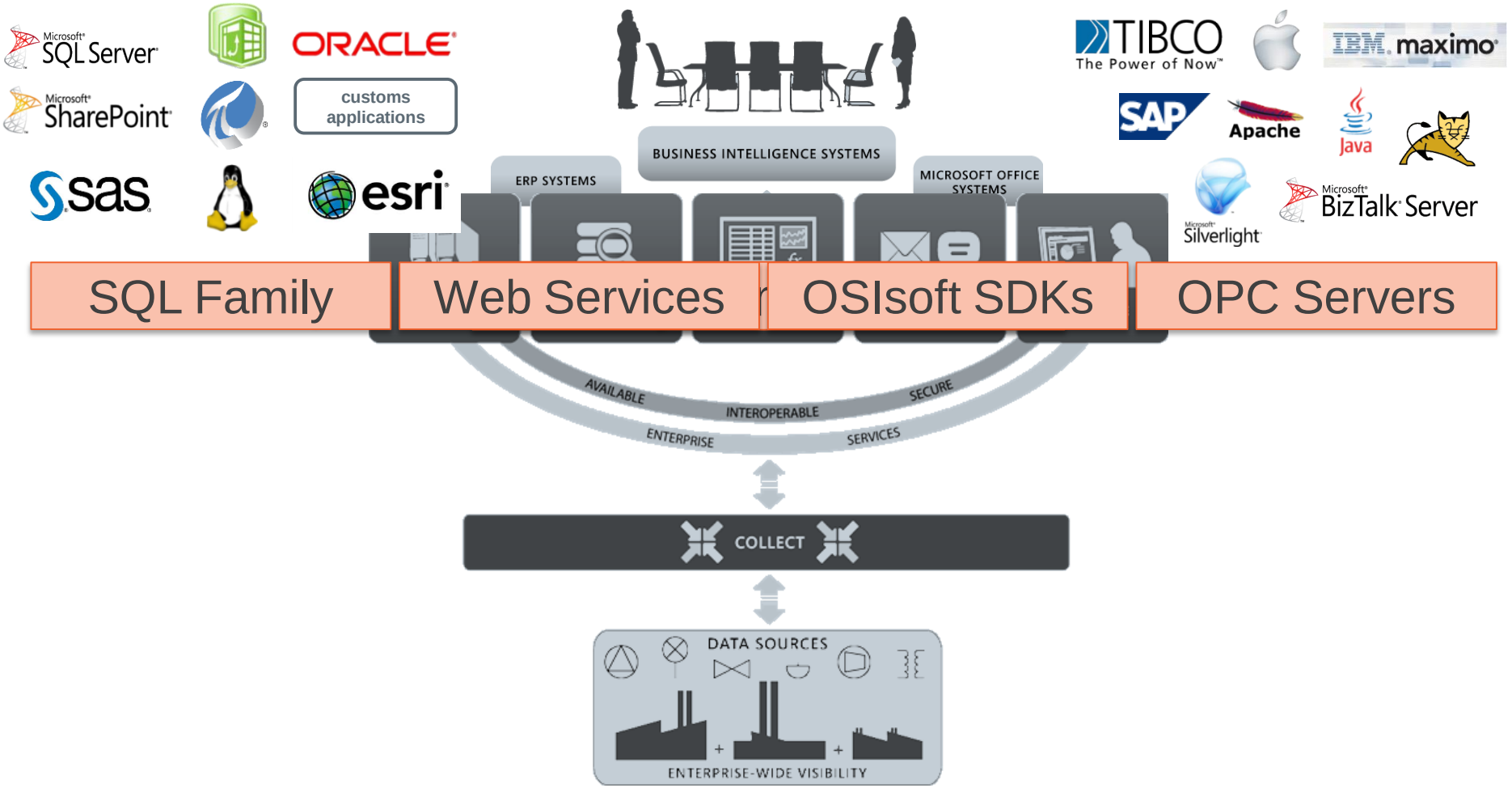

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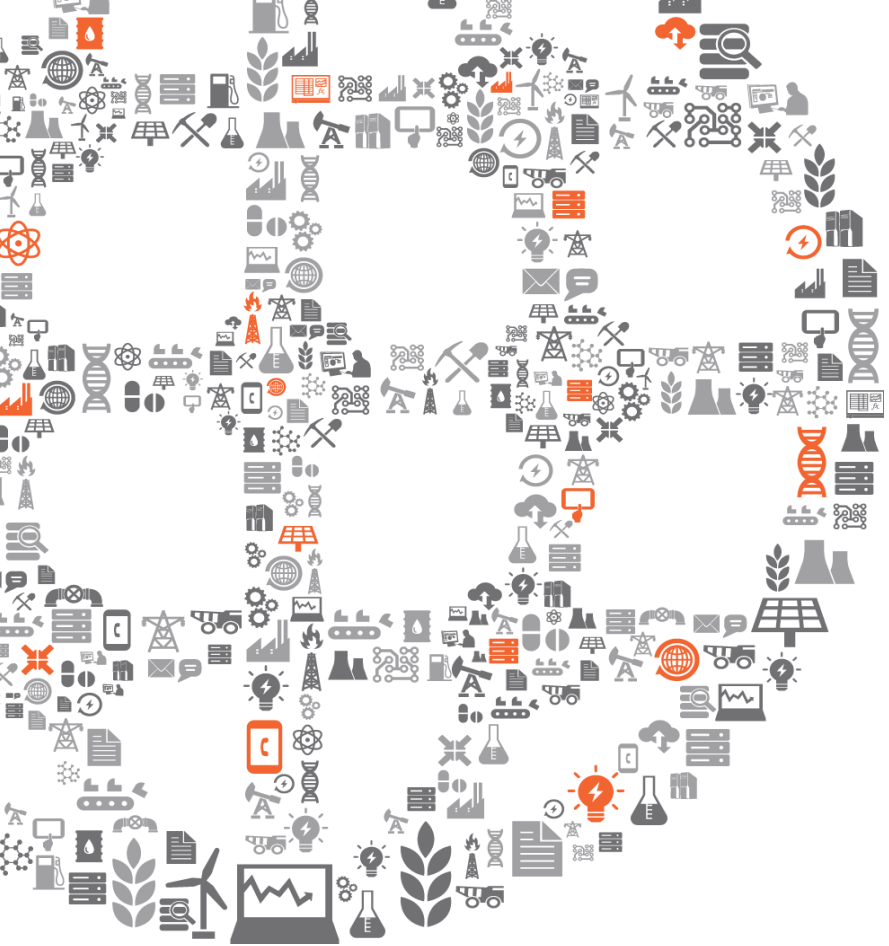

Partners

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- ESRI is the maker of **ArcGIS**, the leading product of Geographical Information Systems **(GIS).**

- Rely on the PI System infrastructure to **combine GIS** data with **real-time** information

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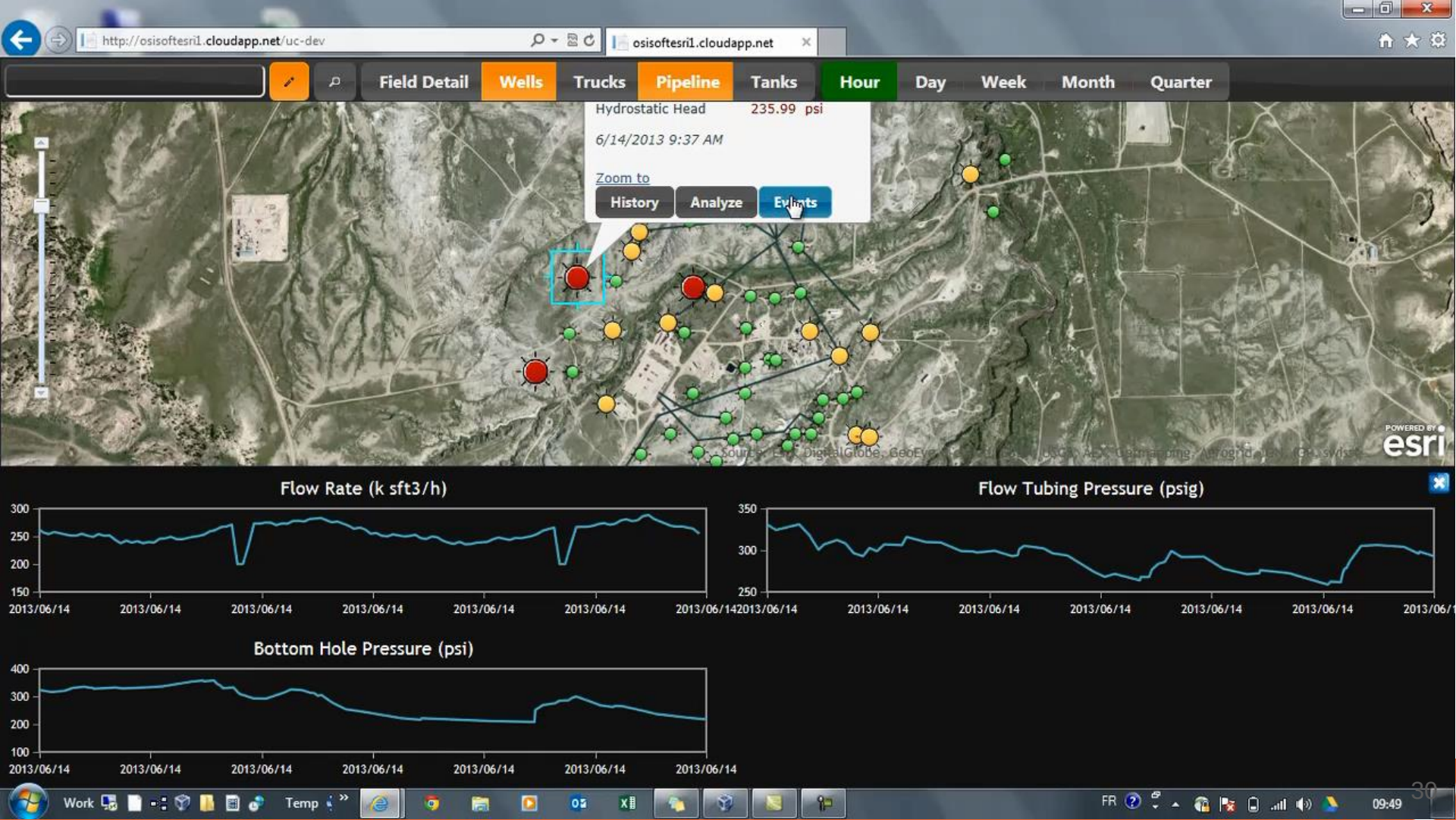
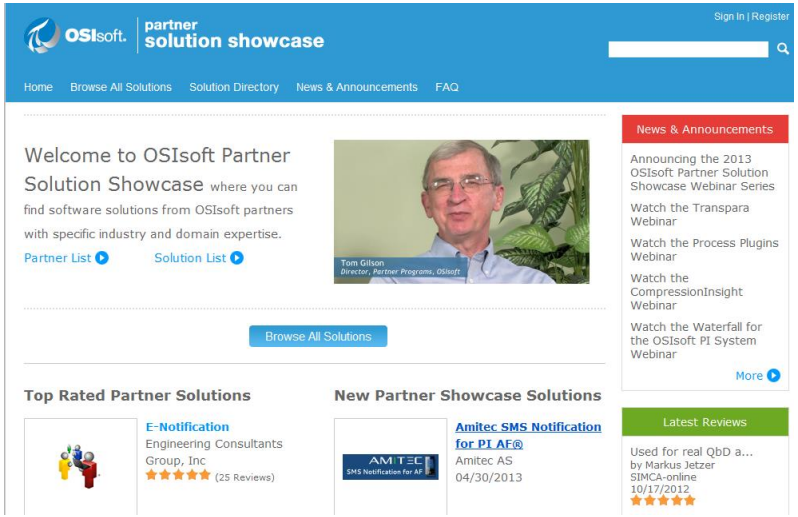
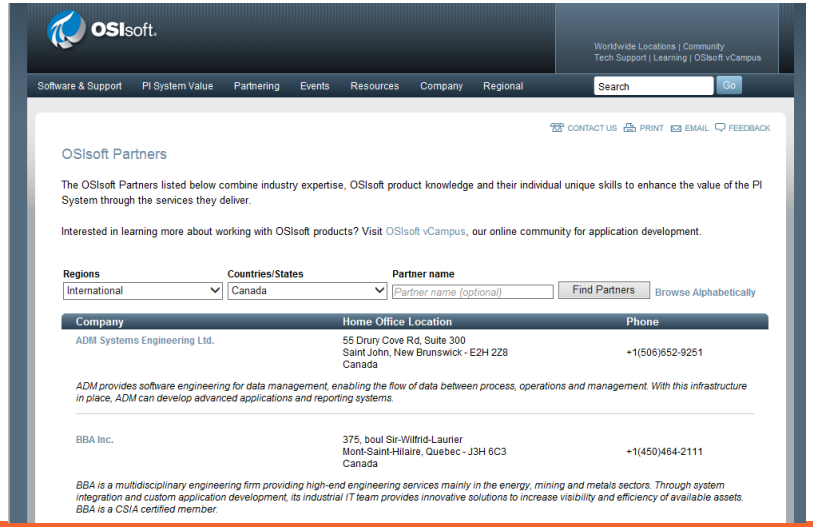

http://osisoftesri1.cloudapp.net/uc-dev
osisoftesri1.cloudapp.net
Field Detail
Wells
Trucks
Pipeline
Tanks
Hour
Day
Week
Month
Quarter
Hydrostatic Head 235.99 psi
6/14/2013 9:37 AM
Zoom to
History
Analyze
Events
Flow Rate (k sft3/h)
300
250
200
150
2013/06/14
Flow Tubing Pressure (psig)
350
300
250
Bottom Hole Pressure (psi)
400
300
200
100
esri
Work
Temp
FR
09:49

Find Out More About Our Partners

- Partner Solution Showcase
- Partner List





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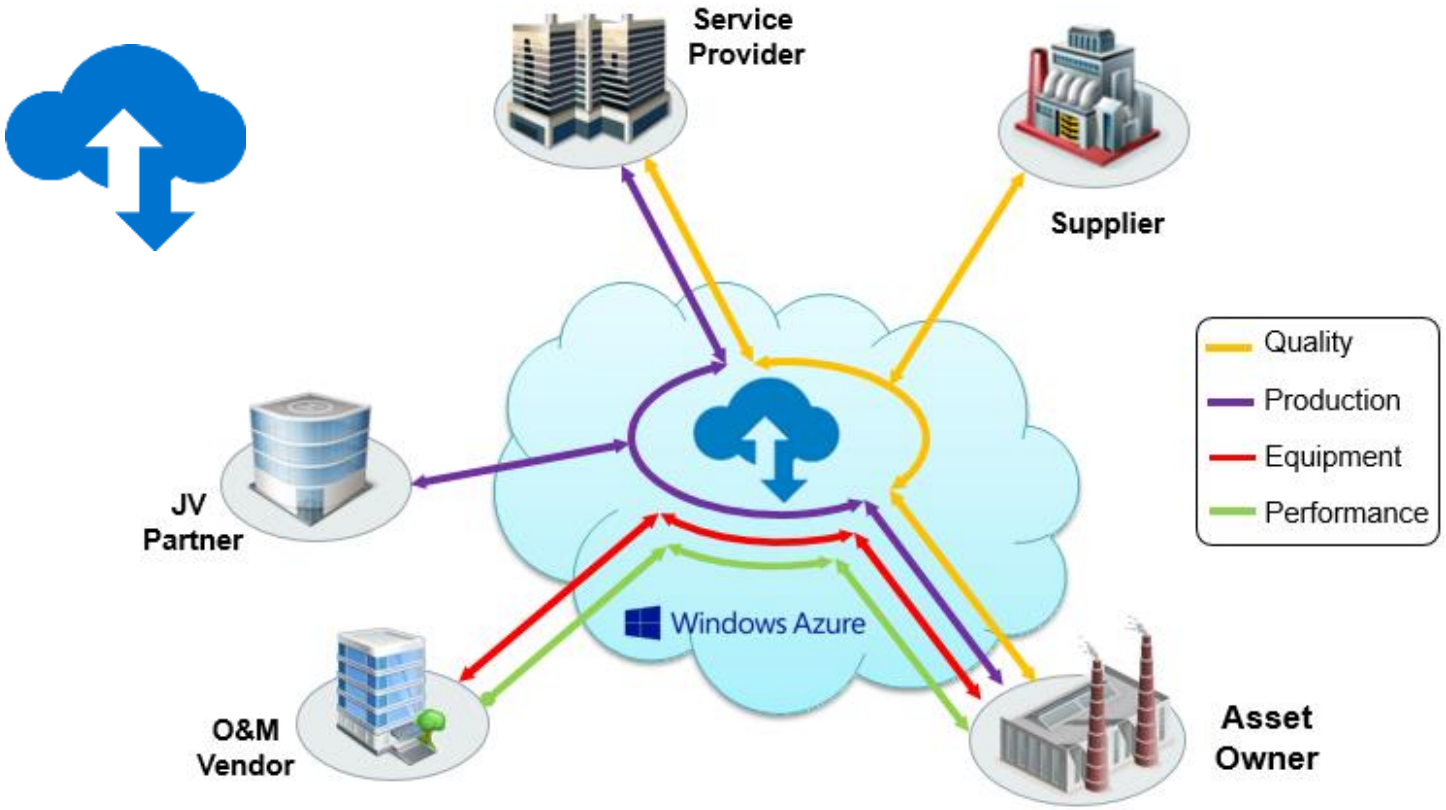
PI System Data Sharing



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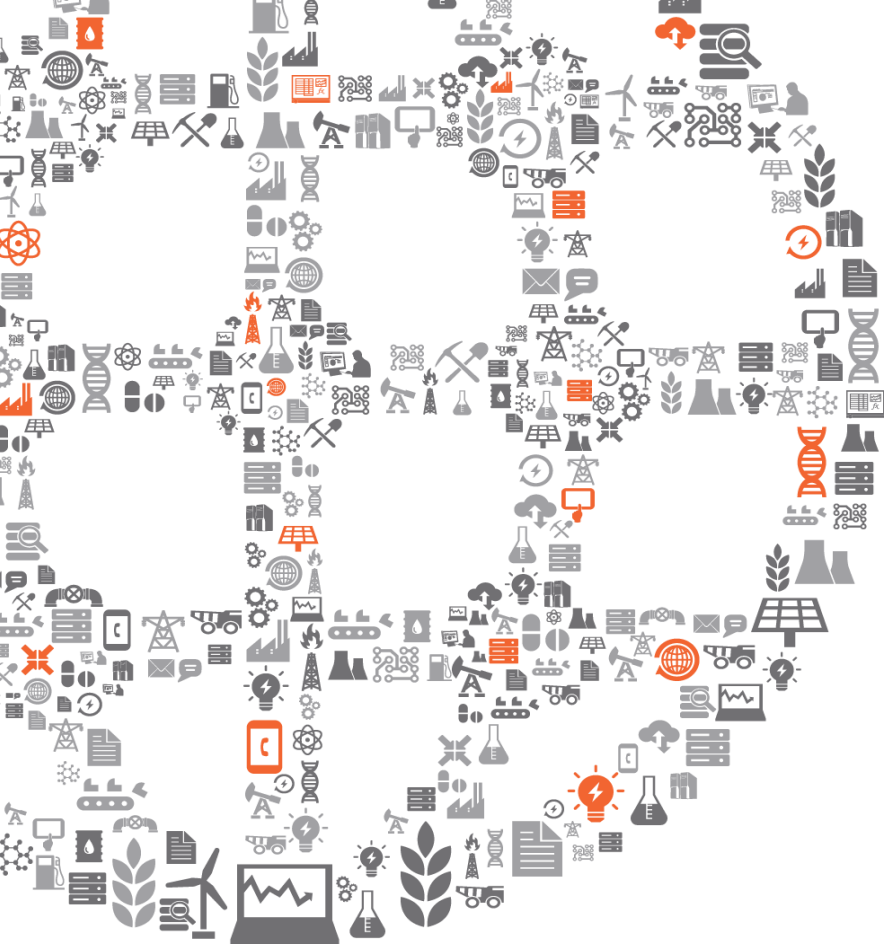

Recap

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PI System Infrastructure

PI Visualization Suite / PI System Access

PI Event Frames

PI Interfaces for Health Monitoring

PI Asset Framework

PI Notifications

PI Data Archive

PI Analytics

PI Interfaces

Cloud Computing

Windows Integrated Security

High Availability (HA)

64-bit Architecture

Virtualisation

Microsoft® Hyper-V™

CITRIX® vmware®

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Key Points to Take Home

The PI System infrastructure…

… manages and stores **time-series**, **assets**, and **events** information regardless of the data sources.

… is **interoperable**, **extensible**, and **secure.**

… continues to **evolve** so you can unleash the Power of your Data!

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Questions

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

State your **name & company**

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Mariana Sandin

msandin@osisoft.com

Systems Engineer

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