



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

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Why a Data Infrastructure

Electrical Power



Water Systems



Transportation



Communication



Data



Our Customer's Challenge:



Engineer

What is the forecast
of productivity?



COO



The pump is not
working – what's the
problem?

I need to combine
data from 3 sources



Plant
Manager

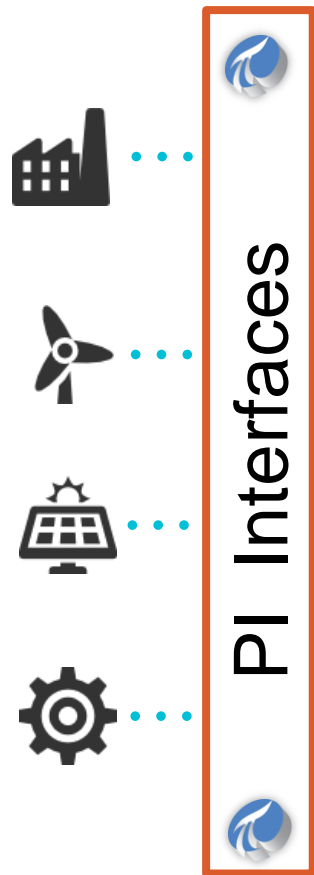


Maintenance
Technician



I need to know the
moment it goes out of
tune

PI System Infrastructure

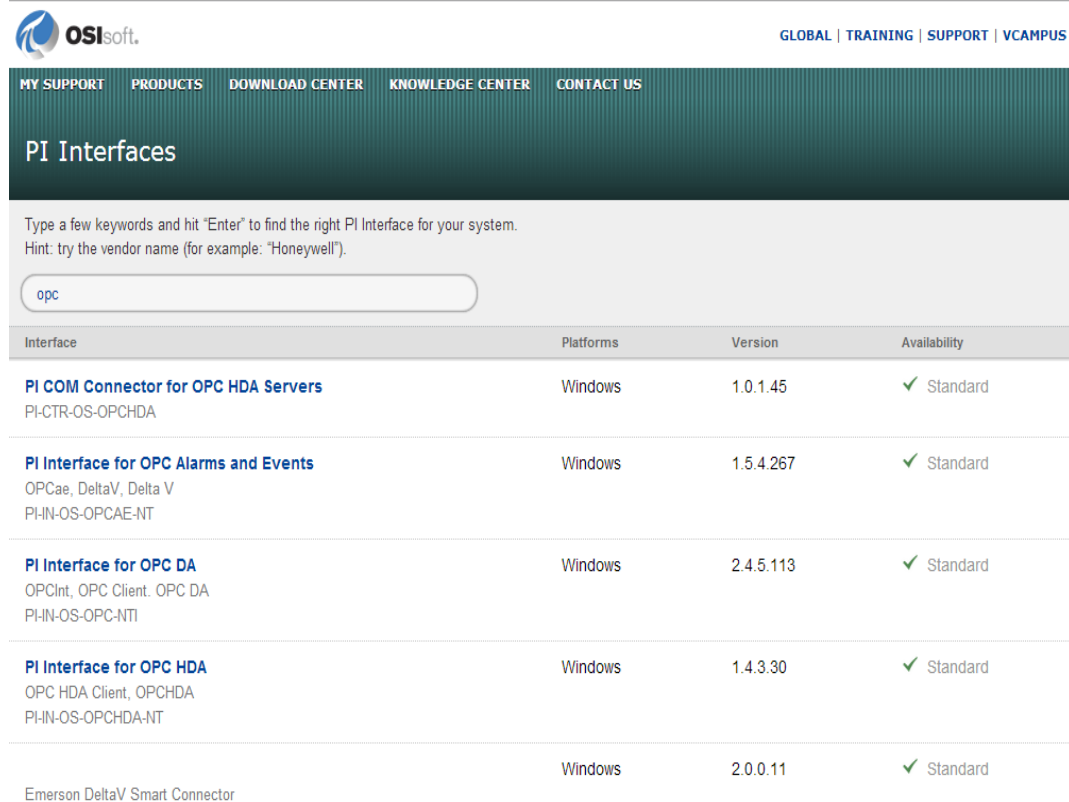


The pump is not working. What's the problem?



PI Interfaces

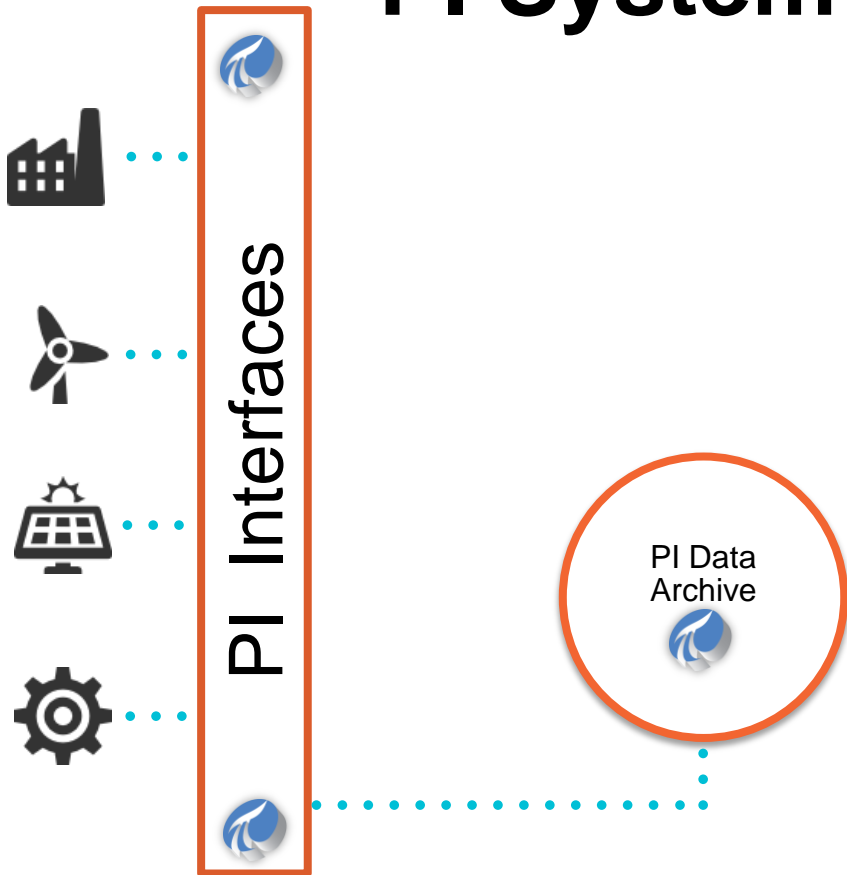
- More than **450** interfaces
- Support multiple **protocols** and **data sources**
 - OPC, Modbus, SNMP, Text File, ODBC
- Robust and reliable



The screenshot shows the OSIsoft website's 'PI Interfaces' section. At the top, there's a navigation bar with links: MY SUPPORT, PRODUCTS, DOWNLOAD CENTER, KNOWLEDGE CENTER, and CONTACT US. Below this is a search bar with the text 'Type a few keywords and hit "Enter" to find the right PI Interface for your system. Hint: try the vendor name (for example: "Honeywell").' The search bar contains the text 'opc'. Below the search bar is a table listing various PI interfaces.

Interface	Platforms	Version	Availability
PI COM Connector for OPC HDA Servers PI-CTR-OS-OPCHDA	Windows	1.0.1.45	✓ Standard
PI Interface for OPC Alarms and Events OPCae, DeltaV, Delta V PHIN-OS-OPCAE-NT	Windows	1.5.4.267	✓ Standard
PI Interface for OPC DA OPCInt, OPC Client, OPC DA PHIN-OS-OPC-NTI	Windows	2.4.5.113	✓ Standard
PI Interface for OPC HDA OPC HDA Client, OPCHDA PHIN-OS-OPCHDA-NT	Windows	1.4.3.30	✓ Standard
Emerson DeltaV Smart Connector	Windows	2.0.0.11	✓ Standard

PI System Infrastructure



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



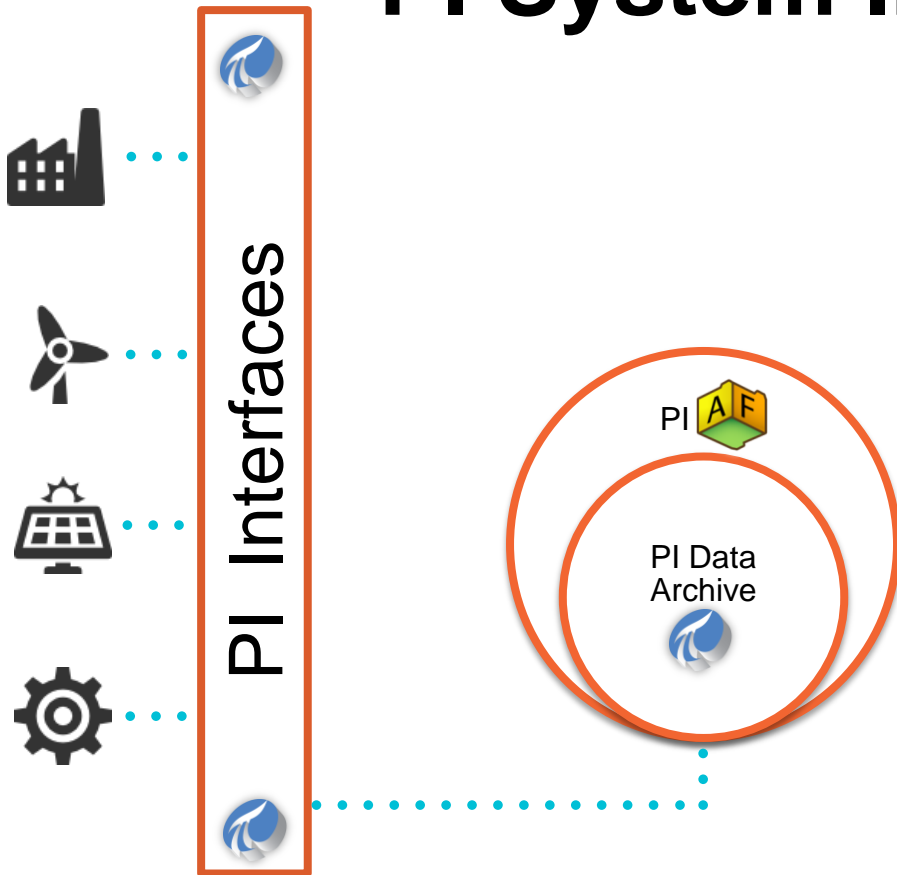
PI Data Archive

- 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

PI System Infrastructure

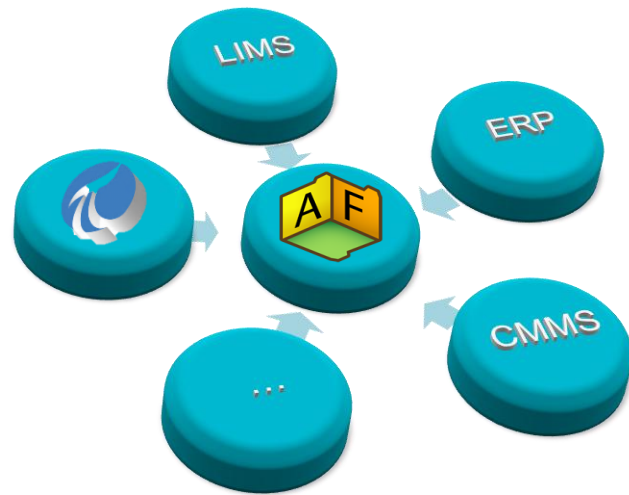
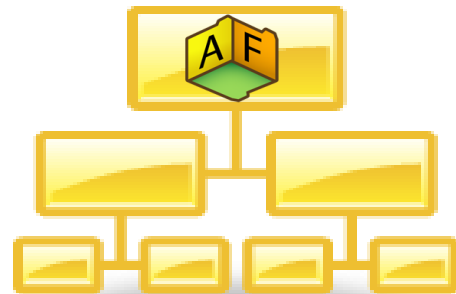


The pump is not working. What's the problem?

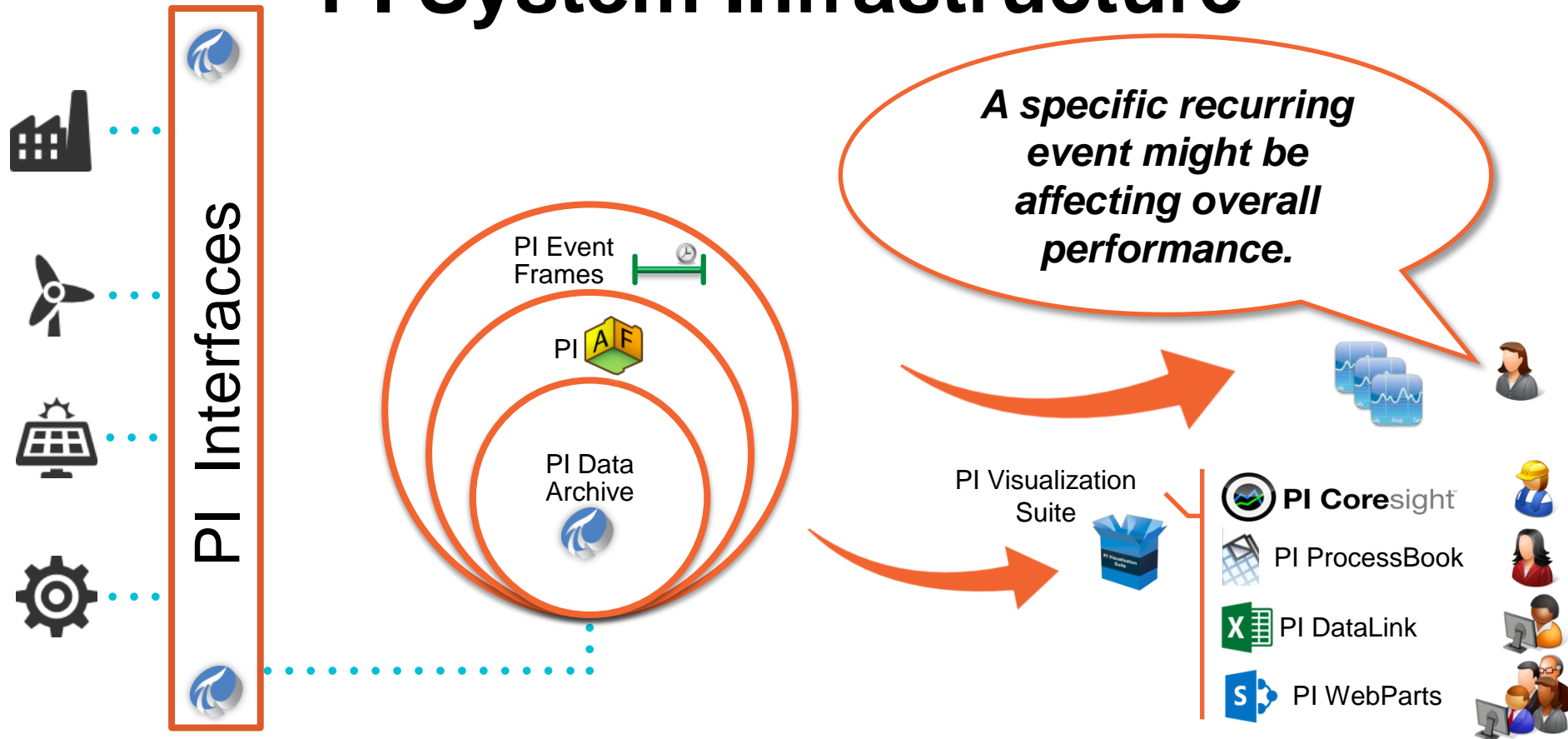


PI Asset Framework (PI AF)

- 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 tools **analyses** and **notifications** tools



PI System Infrastructure



Bookmarks for your Real-Time Data

PI Event Frames

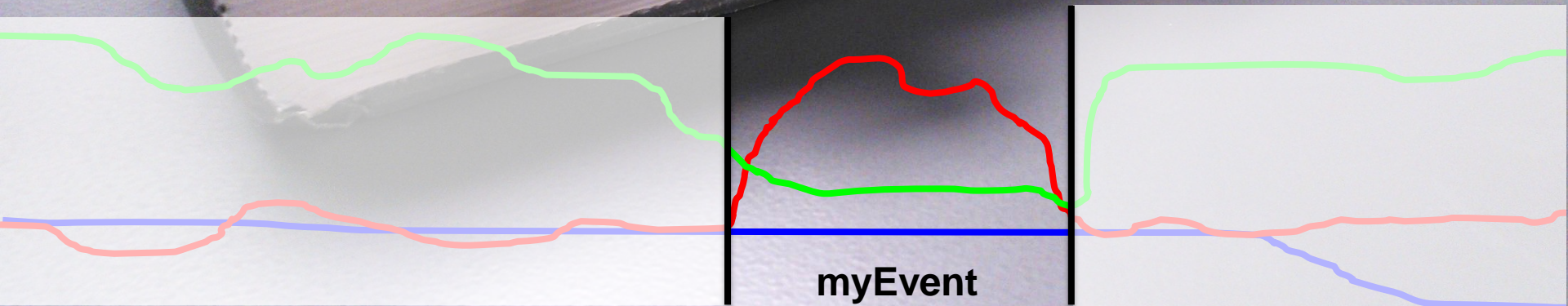


Start

Info

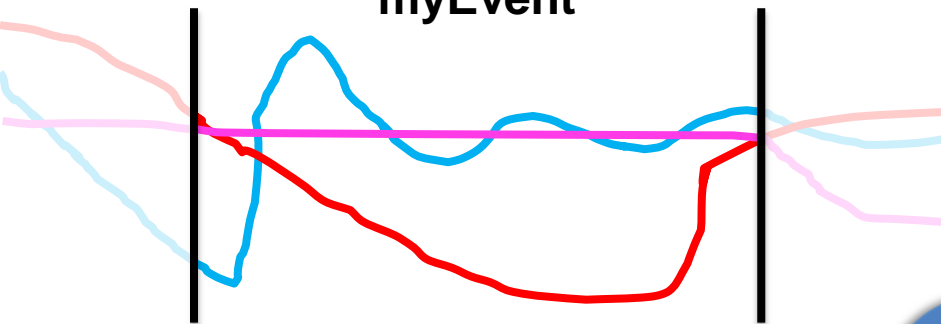
End

Your
Data



Simplify Data Analysis

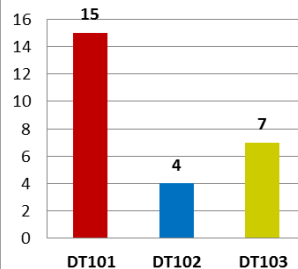
myEvent



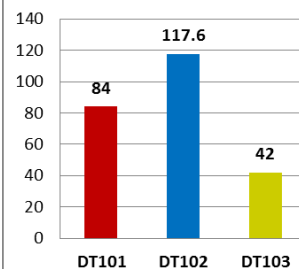
Perform Asset Comparisons



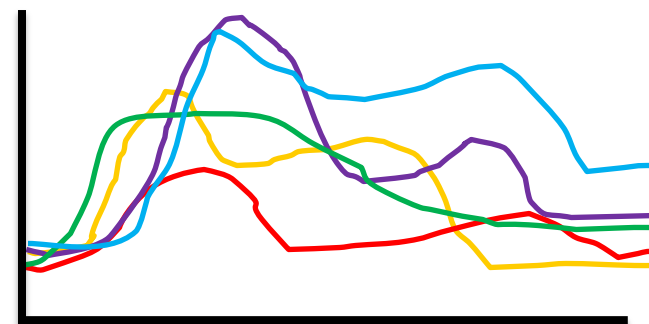
Weekly Downtime
(Instances)



Weekly Cumulative
Downtime (hrs)



Event Overlay Trend (Temp.)

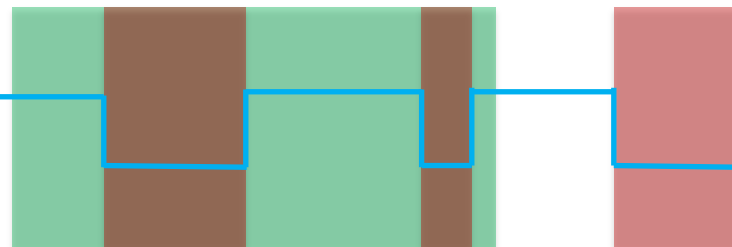


Name	Temp.Max
EF1	122.47
EF2	109.34
EF3	112.73
EF4	98.61
EF5	125.24

Downtime Events for Product XYZ

Product XYZ (1)

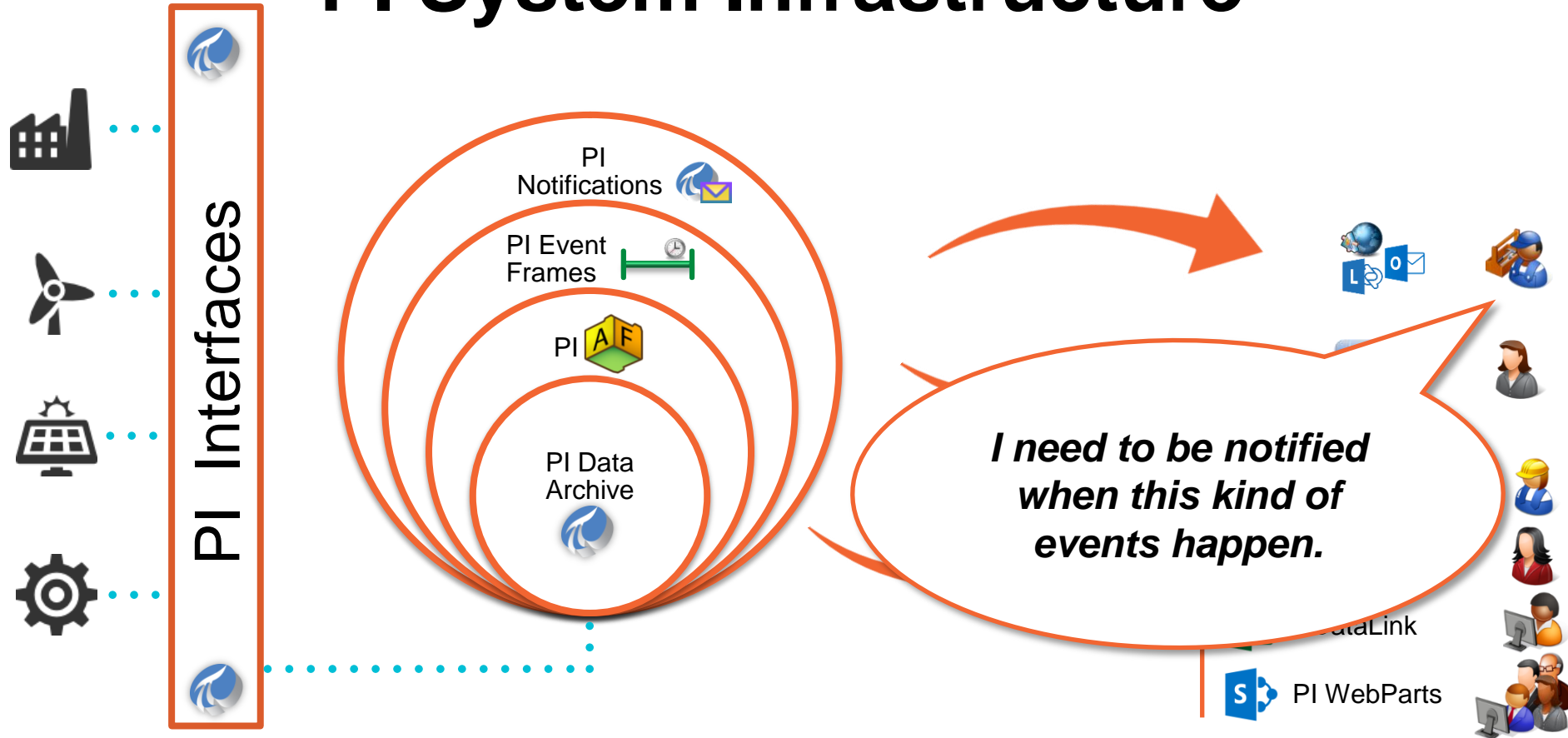
Downtime (2)



Perform Event Comparisons

Discover Event Interrelationships

PI System Infrastructure



PI Notifications Keeps You Informed



DELIVER

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

[Instant PI WebParts Trend](#)
[Acknowledge With Comment](#)
[Acknowledge](#)

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

Wind Farm availability is under 70%

DF PI Notifications - Offline

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:

DF PI Notifications

Wind Farm availability is under 70%

[Acknowledge](#)

Last message received

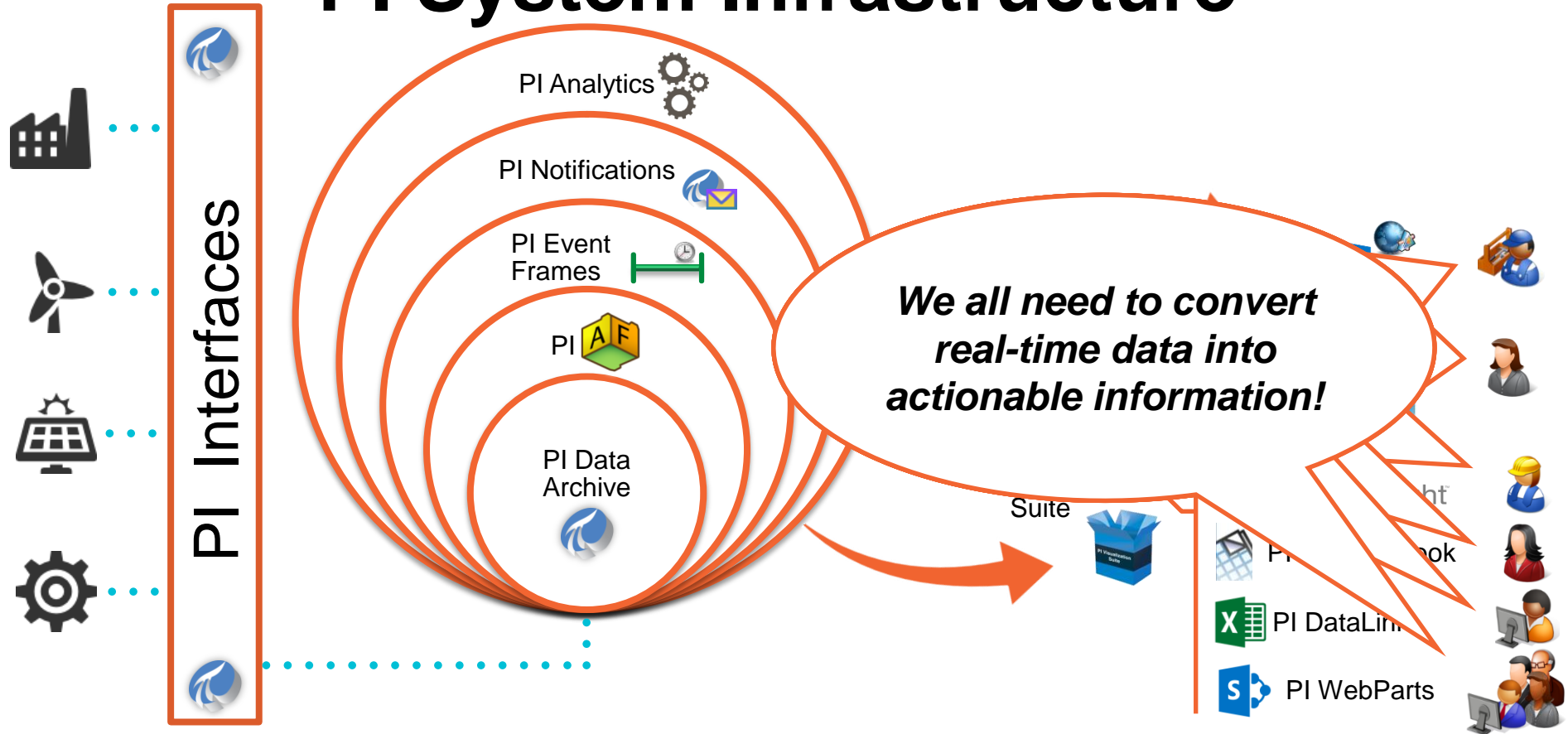
Redirect Ignore



Web Service

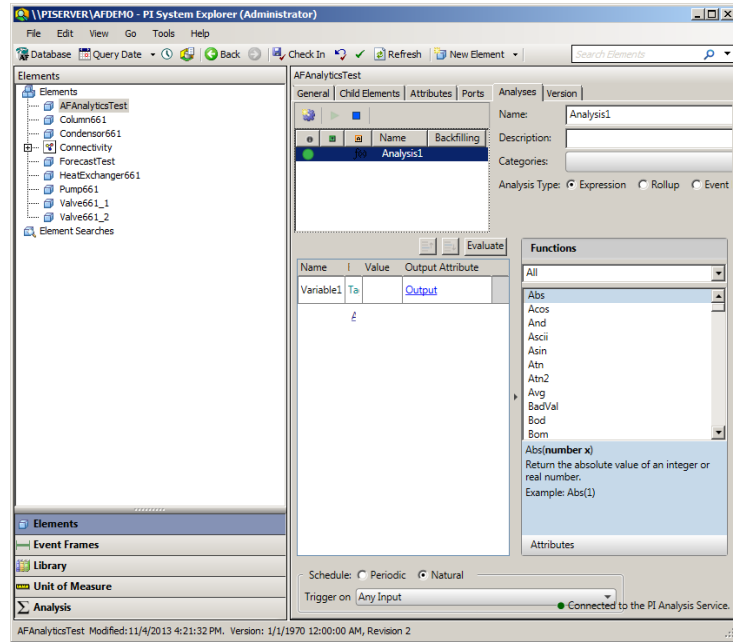


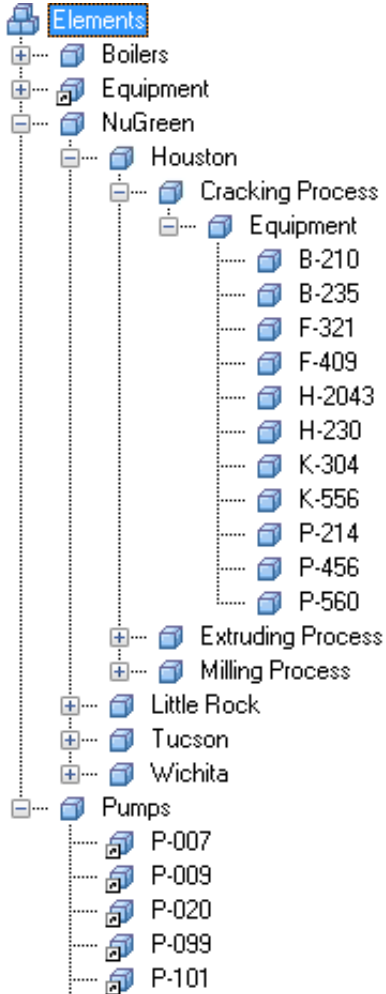
PI System Infrastructure



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





The Big Picture

Analyses

- Efficiency analysis
- Key Performance Indicators (KPI)

Time-series

- In-Flow
- Pressure
- Vibration data

Events

- Downtime
- Startup
- Failure

Asset details

- Name
- Model
- Manufacturer

Notifications

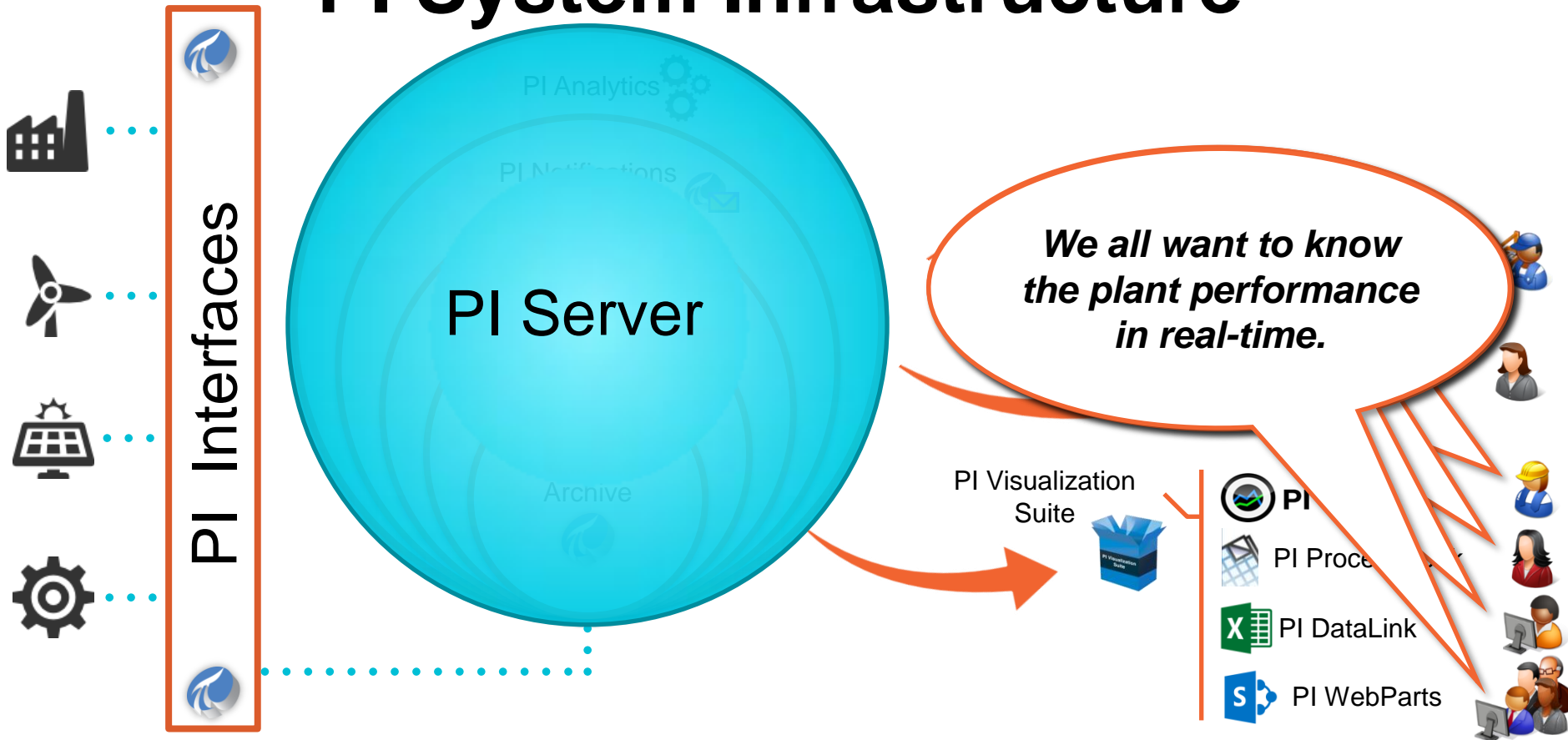
- High speed
- Rotor failure
- Low pressure

External data

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



PI System Infrastructure



Visualization Landscape

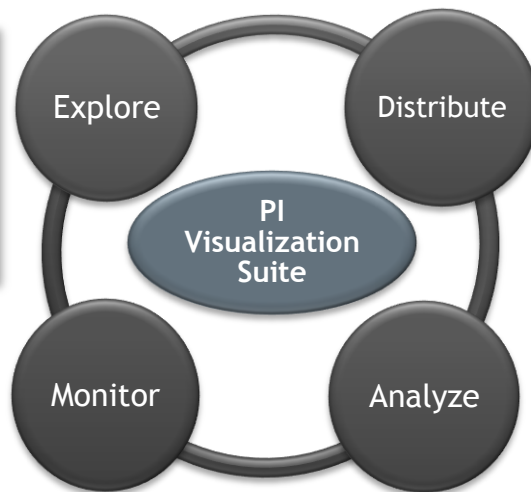
PI Coresight

Collaboration and ad hoc analysis



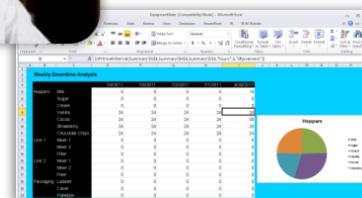
PI WebParts

Composite web applications



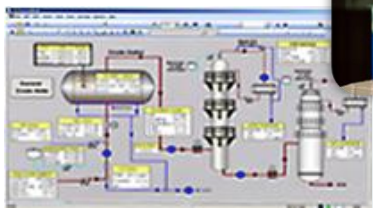
PI DataLink

Reports and data analysis

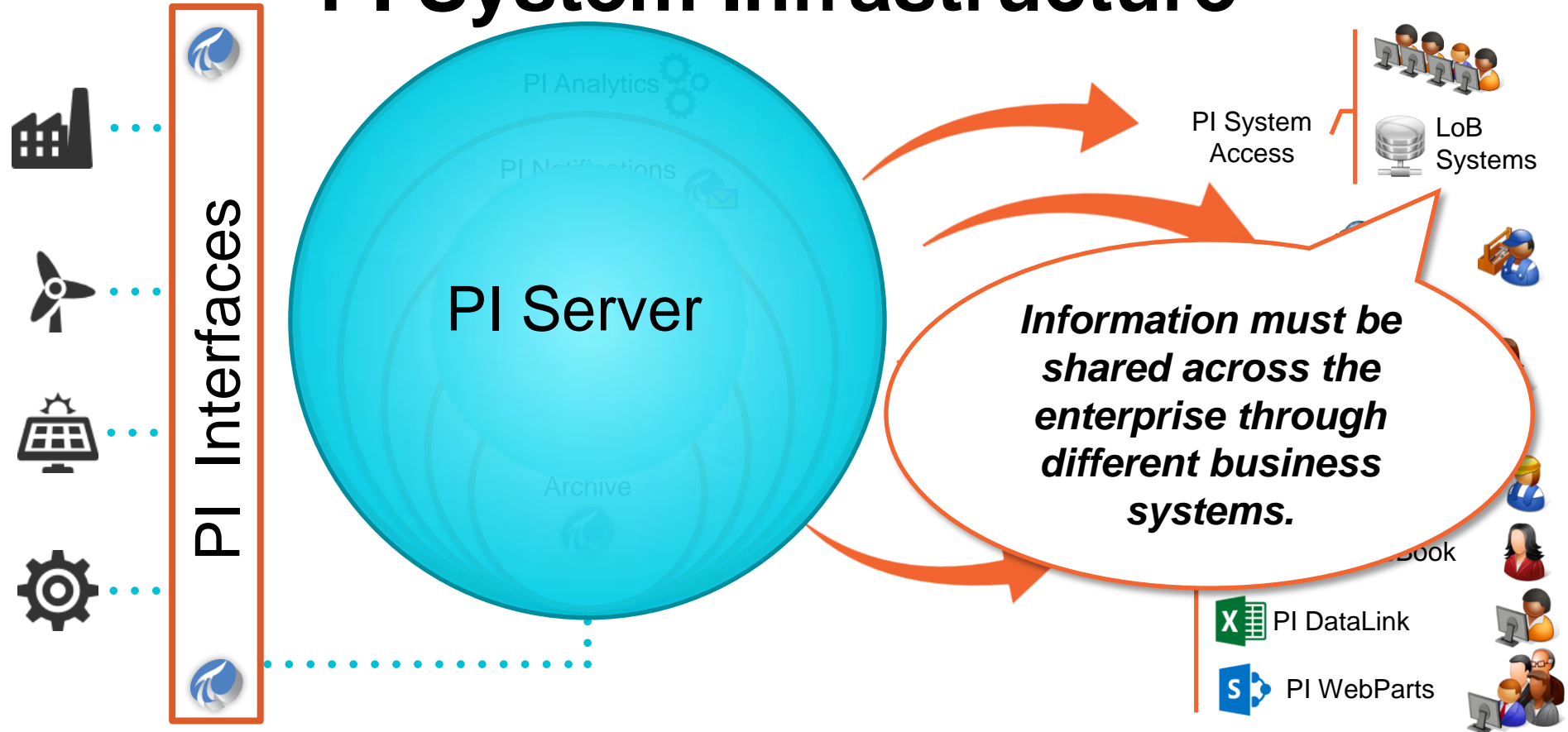


PI ProcessBook

Authoring tool for process displays and trends



PI System Infrastructure



PI System Access



PI JDBC

PI Web
Services
(SOAP)

PI WebAPI
With OData
(REST)

PI ODBC

PI OLEDB
Enterprise

PI OPC DA/HDA
Server

OSisoft SDKs



Asset Information /
Metadata

Notifications

Analytics

Relational / Non Time Series
Data



PI Data Archive



PI Data Archive
Collective

Time Series Data

From Raw Data to Decision Ready Data



System of Record

- Guaranteed Delivery & Storage
- Full Fidelity of Sensor
- Optimized for Real-Time
- Backup/Restore
- HA
- Security

Needs:

Cleanse

Augment

Shape

Transmit



Statistical Analytics



Analytics Packages

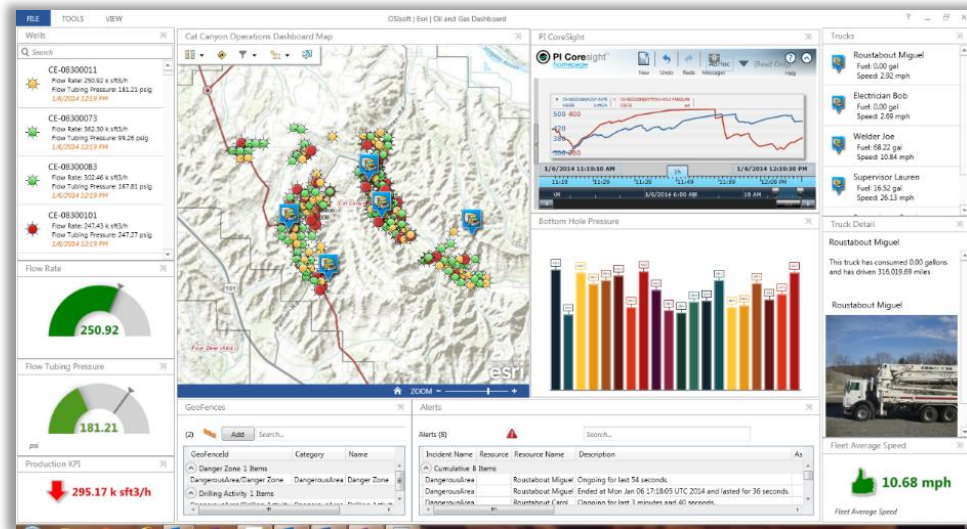
- Designed to Analyze Large Sets
- Expects that the Data Exists
- Problem Defines Data Shape
- Typically Evenly Spaced in Time



- 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

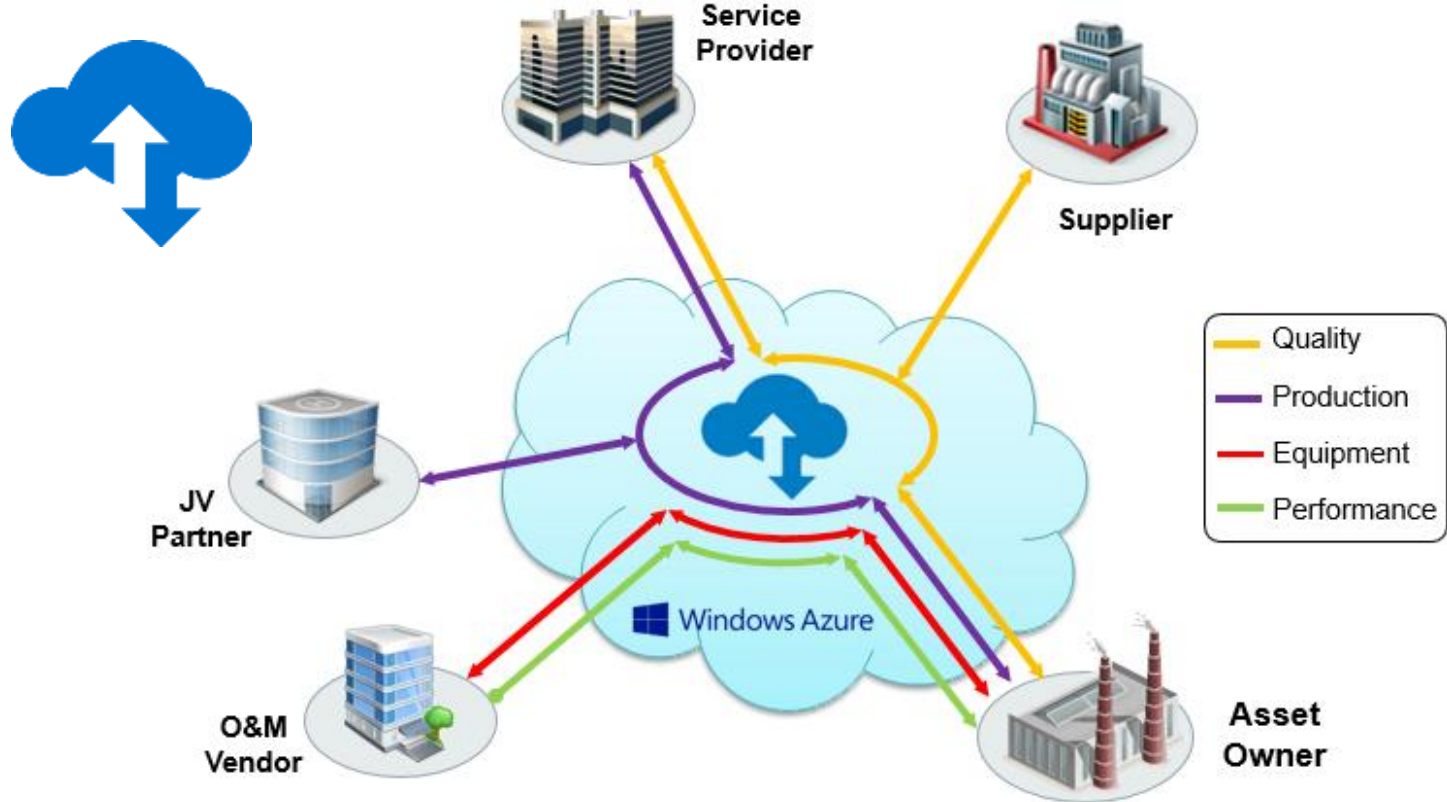
PI Integrator for Esri ArcGIS

Overlay Assets and Real-time Information onto Esri Maps



- Overview of your PI System assets using Esri maps
- Esri maps become live with PI System data
- Drill into asset data using PI Coresight
- Import Esri ArcGIS assets into PI AF

PI System Data Sharing – PI Cloud Connect



Contact Information

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