

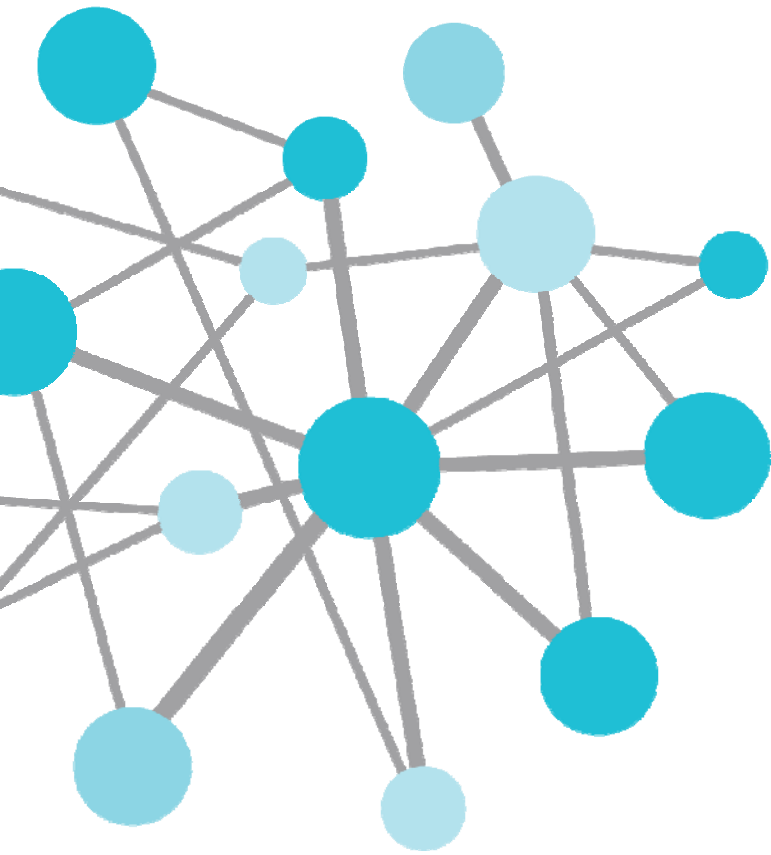
OSIsoft.

PI SYSTEM ²⁰¹⁴ ROADSHOW

The **Power** of **Data**

DECISION READY IN REAL-TIME

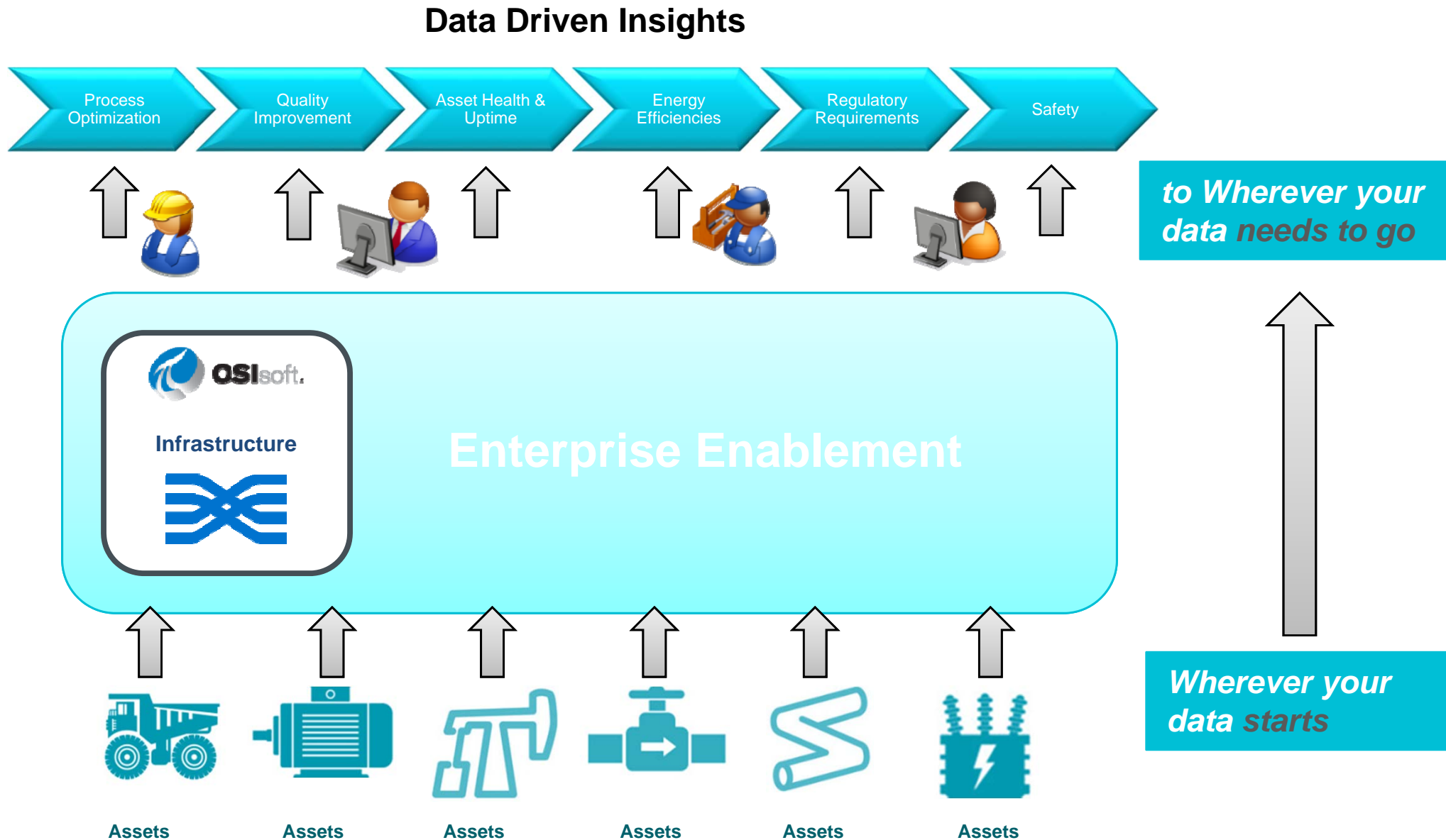
O C E A N I A



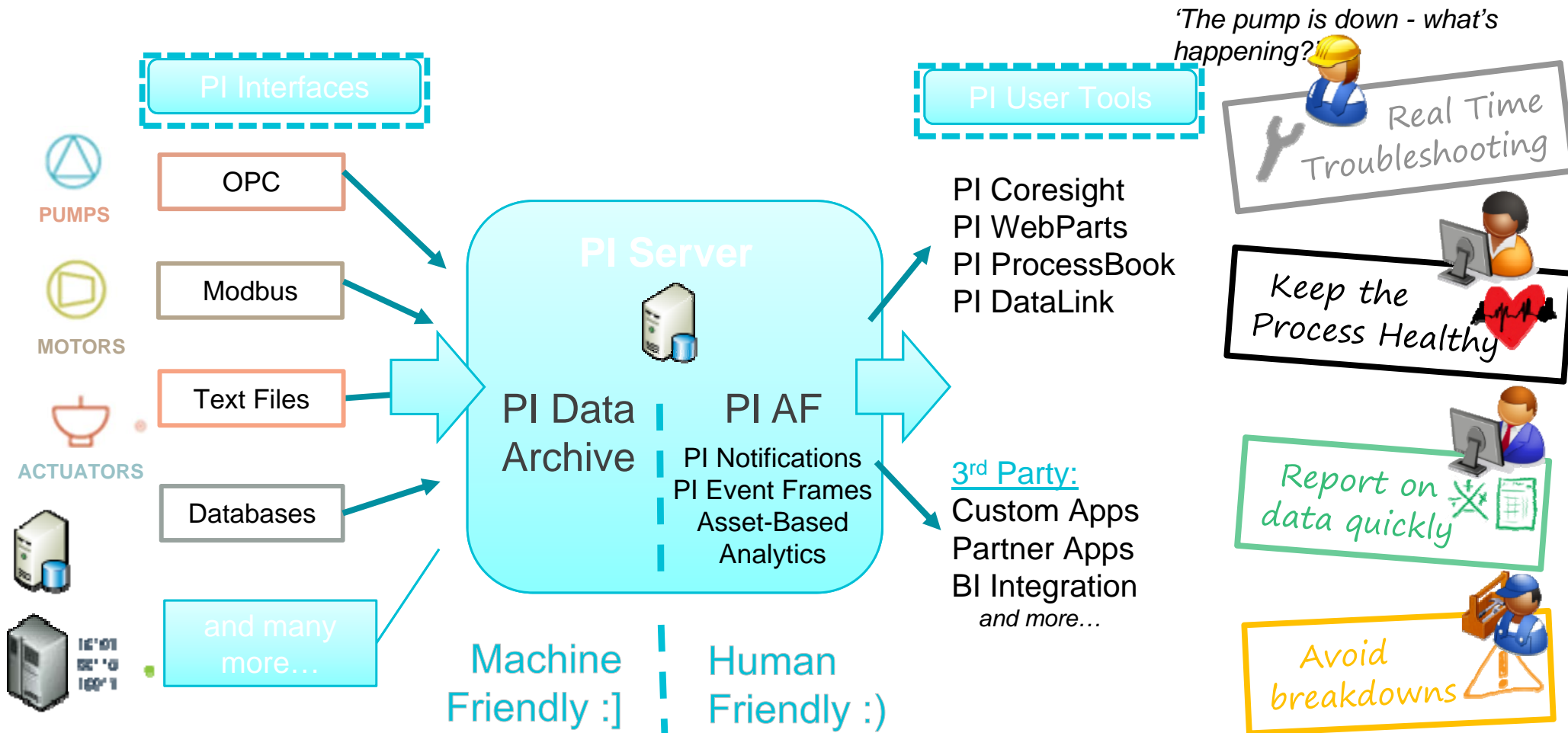
What is new with the PI System?

Presented by **Michael Luo**, Technical Consultant, OSIsoft

An Enterprise Infrastructure



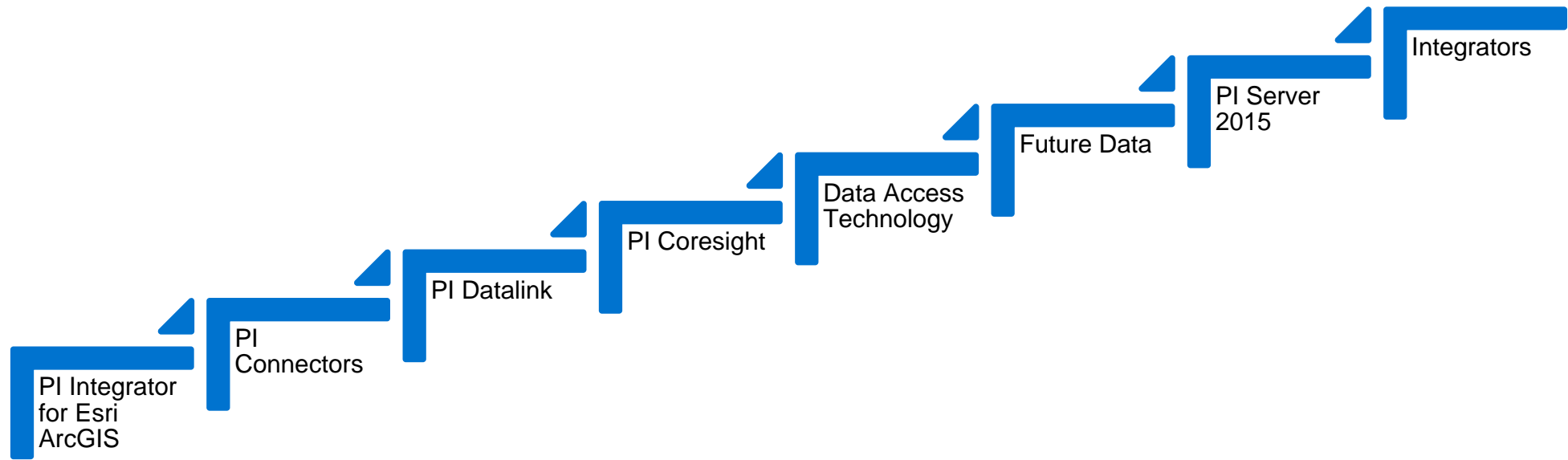
What is part of our Infrastructure...



What is included in PI Server 2014

- **Time Series Data Storage**
 - PI Data Archive
- **Contextual, Organize and Find**
 - PI Asset Framework (PI AF)
- **Mark Important Events**
 - PI Event Frames
- **Notify Based on Conditions**
 - PI Notifications
- **Analytics and Event Generation**
 - Asset-Based Analytics
 - PI ACE (Advanced Computing Engine)
 - PI Performance Equations
 - PI Totalizers
- **System Management**
 - PI System Management Tool
 - PI Interfaces for System Management

Future OSIsoft technologies are based on assets



PI System Roadmap

<https://techsupport.osisoft.com/Products/Product-Roadmap>

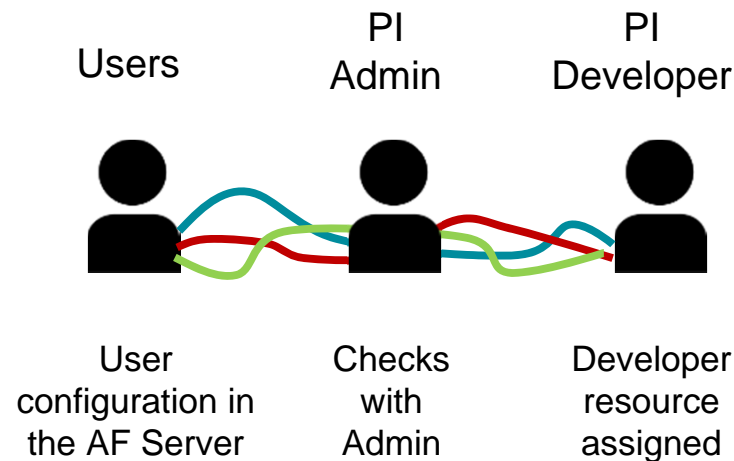
Asset-Based Analytics

- Easy – empower users to build their own calculations
- Reuse and standardize
 - Clarity and correctness
- KPIs and Rollups
- Automatic Event marking
- And of course, *Performance and scalability*



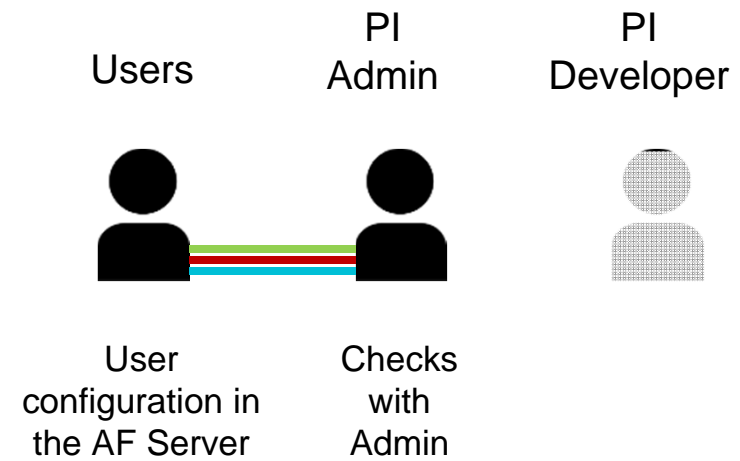
Asset-Based Analytics: Self-Service Analytics

Before



- Slows down time to value
- Creates complexities (interactions are numerous)

After



- Immediate feedback, validate what your looking for
- Build new elements from templates, added analysis inherited by derived elements

\\Kaboom\NuGreen - PI System Explorer (Administrator)

File View Go Tools Help

Database Query Date Back Check In Refresh New Template Search Element Templates

Library

- NuGreen
 - Categories
 - Analysis Categories
 - Attribute Categories
 - Element Categories
 - Reference Type Categories
 - Table Categories
 - Templates
 - Element Templates
 - Boiler
 - Combined Cycle Power Plan
 - Compressor
 - Condenser
 - Cooling Fan
 - Enterprise
 - Gas Turbine
 - Heater
 - HRSG
 - Monitored Site
 - Plant
 - Process
 - Pump
 - Steam Turbine
 - Unit
 - Event Frame Templates
 - Model Templates
 - Transfer Templates

Gas Turbine

General Attribute Templates Ports Analysis Templates

Name
G

Name:

Description:

Categories:

Analysis Type: ☒ Expression ☐ Rollup ☐ Event Frame Generation

Example Element: [NuGreen\Houston\Power and Steam Generation\Gas Turbine 1](#)

Name	Expression	Value	Output Attribute
Variable1	Type an expression		Click to map
Add a new expression			

Evaluate

Functions

Insert functions into the expression

All

- Abs
- Acoss
- And
- Ascii
- Asin
- Atn

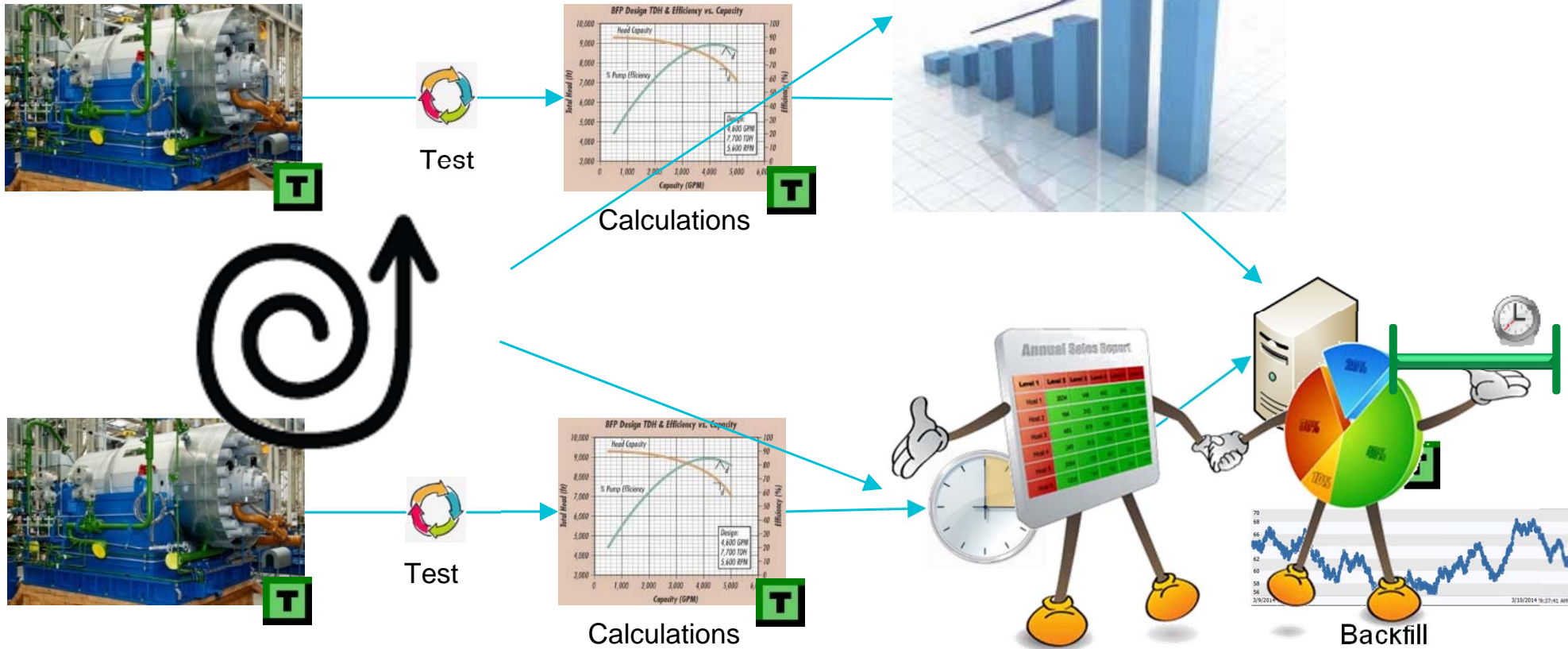
Abs(number x)
Return the absolute value of an integer or real number.
Example: Abs(1)

Attributes

Scheduling: ☐ Event-Triggered ☒ Periodic
Period: 00h 05m 00s [Configure](#)

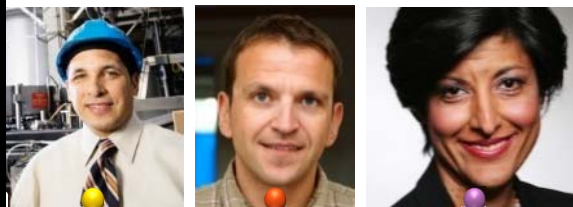
Gas Turbine Modified: 3/13/2014 12:52:45 PM.

Usage Scenarios





Information Challenges



PI Event Frames

Events Shorten the Time to Insight

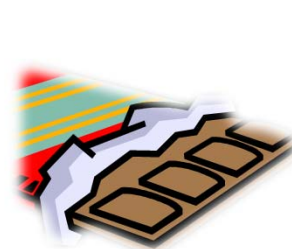
Too High!



Downtime

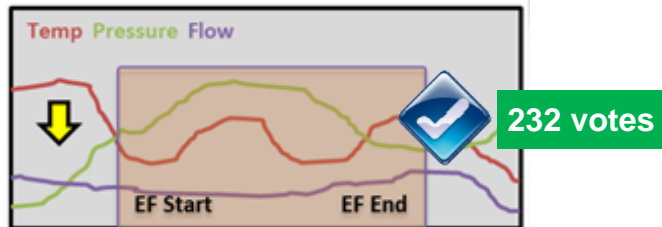


Batches



EF Customer Survey: Most Important EF Visualization

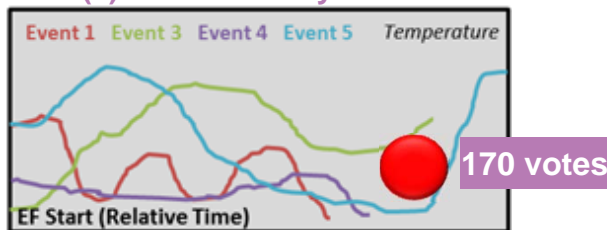
(1) Trend: Time Leading up to EF Start



(2) Trend: EF Start to EF End



(3) Event Overlay Trend

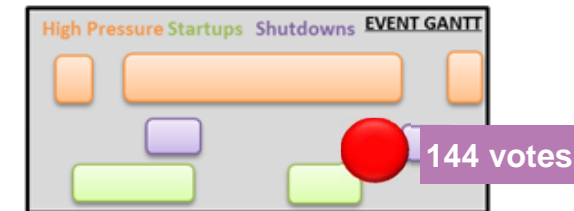


(4) View Event Attributes in Table

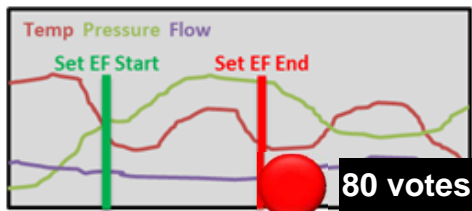
Event Name	Duration	Start Time	End Time	Template
EF Demo Event Process	1	2013		
5/6/2013 07:20:13:00:00 13:00	00:04:00	5/6/2013 3:00:00 PM	5/6/2013 4:00:00 PM	Down time
5/6/2013 07:20:13:00:00 13:06	00:04:00	5/6/2013 3:06:00 PM	5/6/2013 4:00:00 PM	Down time
5/6/2013 07:20:13:00:00 13:14	00:04:00	5/6/2013 3:14:00 PM	5/6/2013 4:00:00 PM	
5/6/2013 07:20:13:00:00 13:26	00:04:00	5/6/2013 3:26:00 PM	5/6/2013 4:00:00 PM	
5/6/2013 07:20:13:00:00 13:36	00:04:00	5/6/2013 3:36:00 PM	5/6/2013 4:00:00 PM	
5/6/2013 07:20:13:00:00 13:44	00:04:00	5/6/2013 3:44:00 PM	5/6/2013 4:00:00 PM	Down time

154 votes

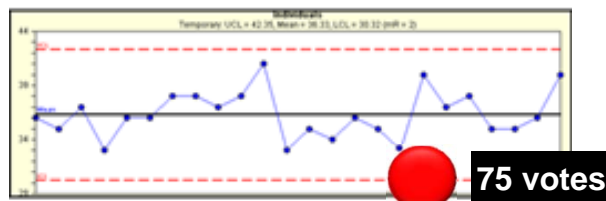
(5) Gantt Chart (aligned w/trend)



(6) Manual Creation of Events



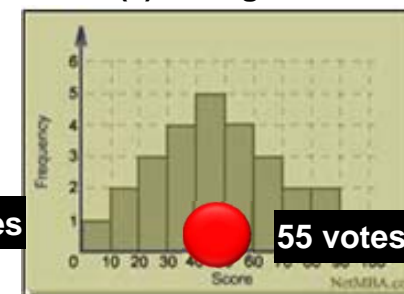
(7) SQC Chart



(8) Line / Column Chart (Event x-axis)



(9) Histogram



PI AF Asset Based Analytics – Event Detection

The screenshot displays the PI System Explorer application window. The left pane shows a hierarchical tree of assets and templates. The main pane shows the configuration for the 'Boiler Feed Pump Vibration Anomaly' event frame template. The 'General' tab is active, showing the template's name, description, and categories. The 'Analysis Type' is set to 'Event Frame Generation'. The 'Event Frame Template' is also set to 'Boiler Feed Pump Vibration Anomaly'. The 'StartTrigger' is configured with a complex logical expression. The 'EndTrigger' is set to 'Type an expression (optional)'. The 'Duration' is set to 1 day. The 'Scheduling' is set to 'Event-Triggered'. The 'Trigger on' is set to 'Any Input'. The 'Functions' pane on the right lists various mathematical and logical functions available for use in the expressions.

Element Template

EF Start Trigger

Time True

Root Cause Child Events

Type = EF Generation

PE Functions

PI AF Asset Based Analytics – Event Preview

The screenshot displays the PI AF Asset Based Analytics software interface. The main window is titled "\\UCAFSVR\Power Generation - PI System Explorer". The left pane shows a hierarchical tree of elements, including Generation, OSISoft Power, and various power plants. The right pane shows the configuration for a specific element, "Boiler Feed Pump #1". A pop-up window titled "Preview results for Boiler Feed Pump Vibration Anomaly" is open, displaying a table of event data. A callout bubble points to the table with the text "Results Preview".

Event Preview Window Data:

Name	Duration	Start time	End time
- Boiler Feed Pump Vibration Anomaly - 2014.03.28.15	01:57:30	3/28/2014 3:57:11 PM	3/28/2014 5:54:41 PM
- Boiler Feed Pump Vibration Anomaly - 2014.03.29.15	01:57:30	3/29/2014 3:57:11 PM	3/29/2014 5:54:41 PM
- Boiler Feed Pump Vibration Anomaly - 2014.04.01.00	06:58:18.0144869	4/1/2014 12:43:11 AM	

Software Interface Details:

- Menu Bar:** File, Edit, View, Go, Tools, Help
- Database:** Query Date, Back, Check In, Refresh, New Element
- Search Elements:** Search Elements
- Elements Pane:**
 - Generation
 - OSISoft Power
 - Big Creek Power Plant
 - Cleveland Power Plant
 - Houston Power Plant
 - Philadelphia Power Plant
 - San Leandro Power Plant
 - Unit 1
 - Air Heater
 - Balance of Plant
 - Feedwater System
 - Boiler Feed Pump #1
 - Boiler Feed Pump #2
 - Generator
 - Mills
 - Turbine
 - Wind Power Generation Fleet
 - Transmission and Distribution

- Event Frames Pane:**
- Event Frames
- Library
- Unit of Measure
- Analyses
- Configuration:**
- Name: Boiler Feed Pump Vibration Anomaly
- Description:
- Categories:
- Analysis Type: ☐ Expression ☐ Rollup ☒ Event Frame Generation
- Start Time: *-1w
- End Time: *
- Generate Results
- Close
- StartTrigger true for: 30 Seconds
- Generate child root cause event frame before parent event frame starts
- Duration: 1 Days
- Name: Root Cause
- Category:
- Scheduling: ☒ Event-Triggered ☐ Periodic
- Trigger on: Any Input
- Footer:**
- Boiler Feed Pump #1 Modified: 3/27/2014 12:29:21 AM. Version: 1/1/1970 12:00:00 AM, Revision 13
- Connected to the PI Analysis Service.
- 7:42 AM 4/1/2014

Results Preview

PI AF Asset Based Analytics – Backfilling Events

The screenshot displays the PI System Explorer application window. The title bar reads "\\UCAFSVR\Power Generation - PI System Explorer". The interface includes a menu bar (File, View, Go, Tools, Help), a toolbar with icons for Database, Query Date, Back, Check In, and Refresh, and a left-hand pane with a tree view of analyses.

The main pane shows a table of 8 checked analyses. A callout bubble points to the 'Backfilling' column, stating "Backfill Events into History".

Status	Element	Name	Template	Backfilling
✓	Generation\OSISoft Power\Cleveland Power Plant\Unit 1\Balance of Plant\Feedwater System\Boiler Feed Pump #1	Boiler Feed Pur	Boiler Feed Pump Vibration	✓
✓	Generation\OSISoft Power\Cleveland Power Plant\Unit 1\Balance of Plant\Feedwater System\Boiler Feed Pump #2	Boiler Feed Pur	Boiler Feed Pump Vibration	✓
✓	Generation\OSISoft Power\Philadelphia Power Plant\Unit 1\Balance of Plant\Feedwater System\Boiler Feed Pump #1	Boiler Feed Pur	Boiler Feed Pump Vibration	✓
✓	Generation\OSISoft Power\Philadelphia Power Plant\Unit 1\Balance of Plant\Feedwater System\Boiler Feed Pump #2	Boiler Feed Pur	Boiler Feed Pump Vibration	✓
✓	Generation\OSISoft Power\San Leandro Power Plant\Unit 1\Balance of Plant\Feedwater System\Boiler Feed Pump #1	Boiler Feed Pur	Boiler Feed Pump Vibration	✓
✓	Generation\OSISoft Power\San Leandro Power Plant\Unit 1\Balance of Plant\Feedwater System\Boiler Feed Pump #2	Boiler Feed Pur	Boiler Feed Pump Vibration	✓
✓	Generation\OSISoft Power\Houston Power Plant\Unit 1\Balance of Plant\Feedwater System\Boiler Feed Pump #2	Boiler Feed Pur	Boiler Feed Pump Vibration	✓
✓	Generation\OSISoft Power\Houston Power Plant\Unit 1\Balance of Plant\Feedwater System\Boiler Feed Pump #1	Boiler Feed Pur	Boiler Feed Pump Vibration	✓

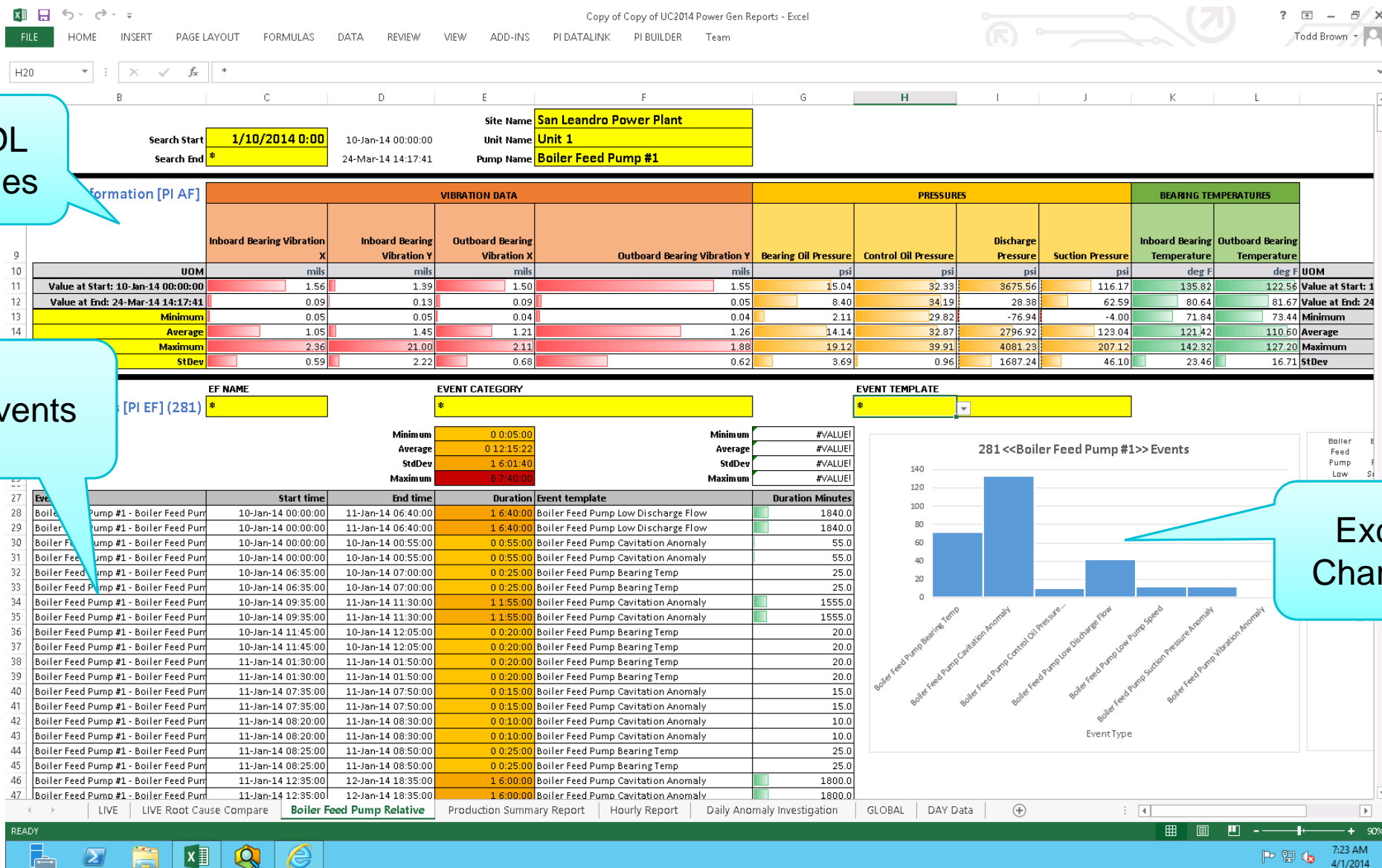
The bottom pane shows the 'Analysis details' for the selected analysis, 'Boiler Feed Pump Vibration Anomaly configuration'. It includes fields for Analysis type, Description, Element path, Template, and Schedule. The 'Status' section indicates the analysis is 'Enabled' and 'Running'.

PI DataLink 2014 – Pump Relative Report

AF DL
Queries

Events

Excel
Charting



PI DataLink 2014 – Daily Events Production Report

Copy of Copy of UC2014 Power Gen Reports - Excel

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW ADD-INS PI DATALINK PI BUILDER Team

B21: (=PIEFDat(GLOBAL!\$B\$2,'Production Summary Report'!\$C\$3,'Production Summary Report'!\$C\$4,'Production Summary Report'!\$F\$4,'Unit TIME.Day','Production Summary Report'!\$F\$3,"**","**","**","active in range","start time

EF Template Unit Time.Day
 Search Start 1/10/2014 0:00
 Search End *

Site Name San Leandro Power Plant
 Unit Name Unit 1
 EF Name *

Day of Week *

Top 10% Bottom 10%

Start time	End time	Duration	Site Name	Primary element	Day of Week	Day Type	AMBIENT TEMPERATURE			GROSS MW				
							Ambient Temperature.Min	Ambient Temperature.Avg	Ambient Temperature.Max	Gross MW.Start	Gross MW.End	Gross MW.Min	Gross MW.Avg	Gross MW.Max
10-Jan-14 00:00:00	11-Jan-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	FRIDAY	WEEKDAY	39.38	53.15	62.12	389.42	383.05	371.63	382.90	405.87
11-Jan-14 00:00:00	12-Jan-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	SATURDAY	WEEKEND	42.95	51.00	58.65	383.05	548.17	377.83	513.15	587.87
12-Jan-14 00:00:00	13-Jan-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	SUNDAY	WEEKEND	36.49	39.77	42.97	548.17	557.14	532.21		
13-Jan-14 00:00:00	14-Jan-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	MONDAY	WEEKDAY	31.43	34.38	37.44	557.14	557.33	445.87		
14-Jan-14 00:00:00	15-Jan-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	TUESDAY	WEEKDAY	29.40	36.46	44.59	557.33	561.43	513.01		
15-Jan-14 00:00:00	16-Jan-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	WEDNESDAY	WEEKDAY	36.39	39.39	45.72	561.43	483.70	443.01		
16-Jan-14 00:00:00	17-Jan-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	THURSDAY	WEEKDAY	31.79	33.96	38.39	483.70	559.58	472.09		
17-Jan-14 00:00:00	18-Jan-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	FRIDAY	WEEKDAY	27.75	31.90	36.31	559.58	584.55	556.32		
18-Jan-14 00:00:00	19-Jan-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	SATURDAY	WEEKEND	32.18	36.37	41.00	584.55	580.75	556.34		
19-Jan-14 00:00:00	20-Jan-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	SUNDAY	WEEKEND	28.63	33.16	40.24	580.75	581.87	574.66		
20-Jan-14 00:00:00	21-Jan-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	MONDAY	WEEKDAY	25.36	30.89	33.64	581.87	585.70	517.12		
21-Jan-14 00:00:00	22-Jan-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	TUESDAY	WEEKDAY	21.31	29.28	36.49	585.70	586.95	578.56		
22-Jan-14 00:00:00	23-Jan-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	WEDNESDAY	WEEKDAY	31.02	36.55	43.74	586.95	582.22	543.00		
23-Jan-14 00:00:00	24-Jan-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	THURSDAY	WEEKDAY	30.67	35.83	39.71	582.22	584.35	550.69		
24-Jan-14 00:00:00	25-Jan-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	FRIDAY	WEEKDAY	34.48	36.28	38.73	584.35	1.57	1.57	497.81	631.87
25-Jan-14 00:00:00	26-Jan-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	SATURDAY	WEEKEND	33.30	36.73	40.87	1.57	1.41	1.35	1.52	1.52
26-Jan-14 00:00:00	27-Jan-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	SUNDAY	WEEKEND	37.34	41.12	46.49	1.41	1.57	1.35	1.48	1.52
27-Jan-14 00:00:00	28-Jan-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	MONDAY	WEEKDAY	35.64	42.73	50.00	1.57	1.51	1.51	1.57	1.57
28-Jan-14 00:00:00	29-Jan-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	TUESDAY	WEEKDAY	35.96	42.99	50.79	1.51	1.51	1.35	1.50	1.50
29-Jan-14 00:00:00	30-Jan-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	WEDNESDAY	WEEKDAY	37.32	45.35	51.52	1.51	1.57	1.35	1.43	1.50
30-Jan-14 00:00:00	31-Jan-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	THURSDAY	WEEKDAY	38.37	45.66	53.09	1.57	1.57	1.35	1.50	1.50
31-Jan-14 00:00:00	01-Feb-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	FRIDAY	WEEKDAY	45.71	52.39	61.25	1.57	564.46	1.57	329.83	587.87
01-Feb-14 00:00:00	02-Feb-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	SATURDAY	WEEKEND	34.55	41.15	52.62	564.46	584.37	499.94	575.82	591.87
02-Feb-14 00:00:00	03-Feb-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	SUNDAY	WEEKEND	29.58	37.42	45.33	584.37	502.19	502.19	581.74	587.87
03-Feb-14 00:00:00	04-Feb-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	MONDAY	WEEKDAY	31.52	38.18	47.16	502.19	581.26	502.19	580.03	587.87
04-Feb-14 00:00:00	05-Feb-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	TUESDAY	WEEKDAY	41.13	41.29	41.45	581.26	582.85	581.26	582.05	587.87
05-Feb-14 00:00:00	06-Feb-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	WEDNESDAY	WEEKDAY	40.82	40.97	41.13	582.85	584.43	582.85	583.64	587.87
06-Feb-14 00:00:00	07-Feb-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	THURSDAY	WEEKDAY	40.68	43.56	53.49	584.43	584.13	496.15	575.45	591.87
07-Feb-14 00:00:00	08-Feb-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	FRIDAY	WEEKDAY	48.62	57.47	60.77	584.13	585.30	405.41	473.67	587.87
08-Feb-14 00:00:00	09-Feb-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	SATURDAY	WEEKEND	43.24	51.08	67.00	585.30	581.77	557.08	583.15	591.87
09-Feb-14 00:00:00	10-Feb-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	SUNDAY	WEEKEND	43.60	47.53	54.25	581.77	581.77	572.93	583.79	587.87
10-Feb-14 00:00:00	11-Feb-14 00:00:00	1 0:00:00	San Leandro Power Plant	Unit 1	MONDAY	WEEKDAY	42.88	46.16	50.80	581.77	583.44	472.99	578.89	587.87

READY LIVE LIVE Root Cause Compare Boiler Feed Pump Relative Production Summary Report Hourly Report Daily Anomaly Investigation GLOBAL DAY Data

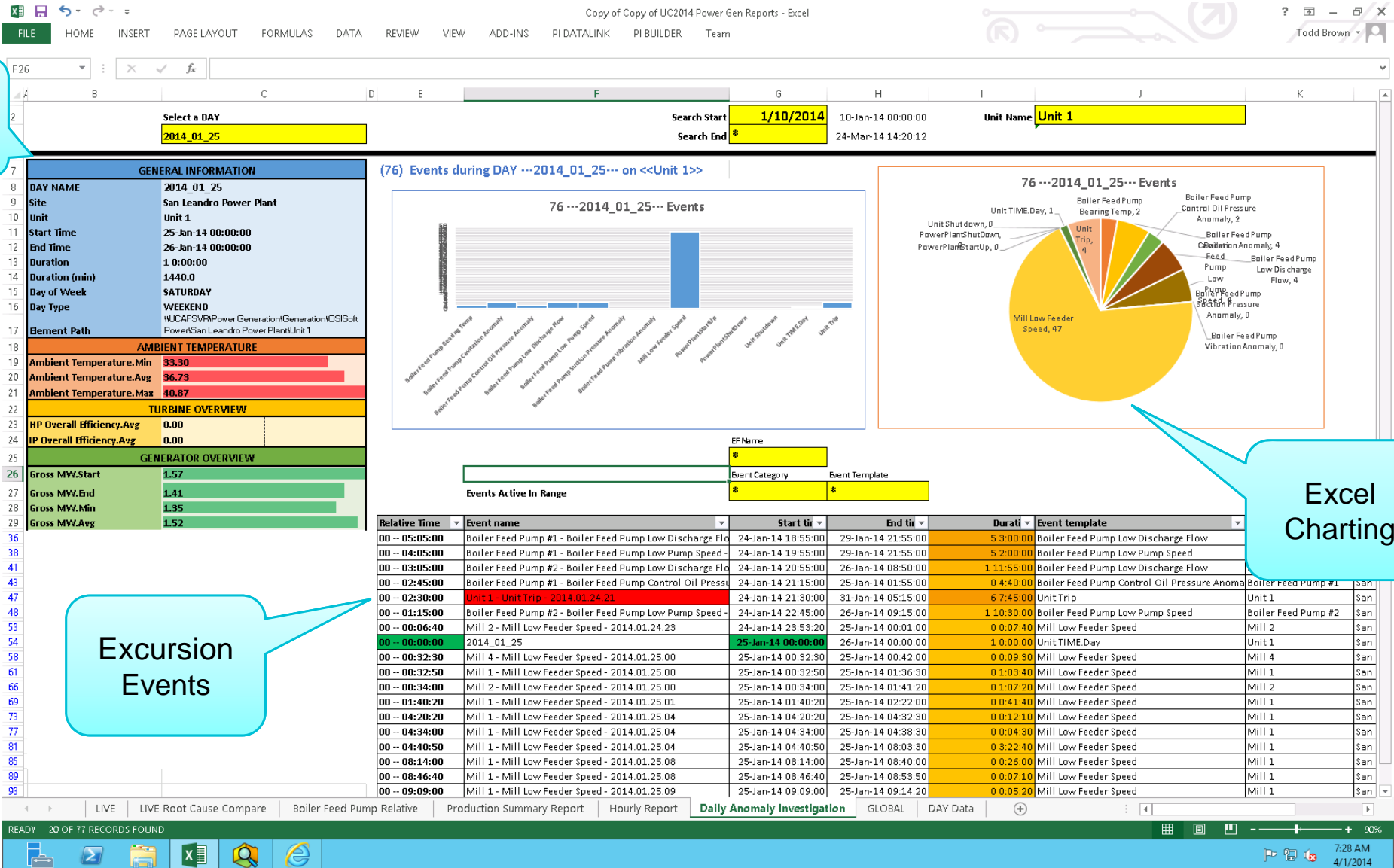
7:25 AM 4/1/2014

Daily Events

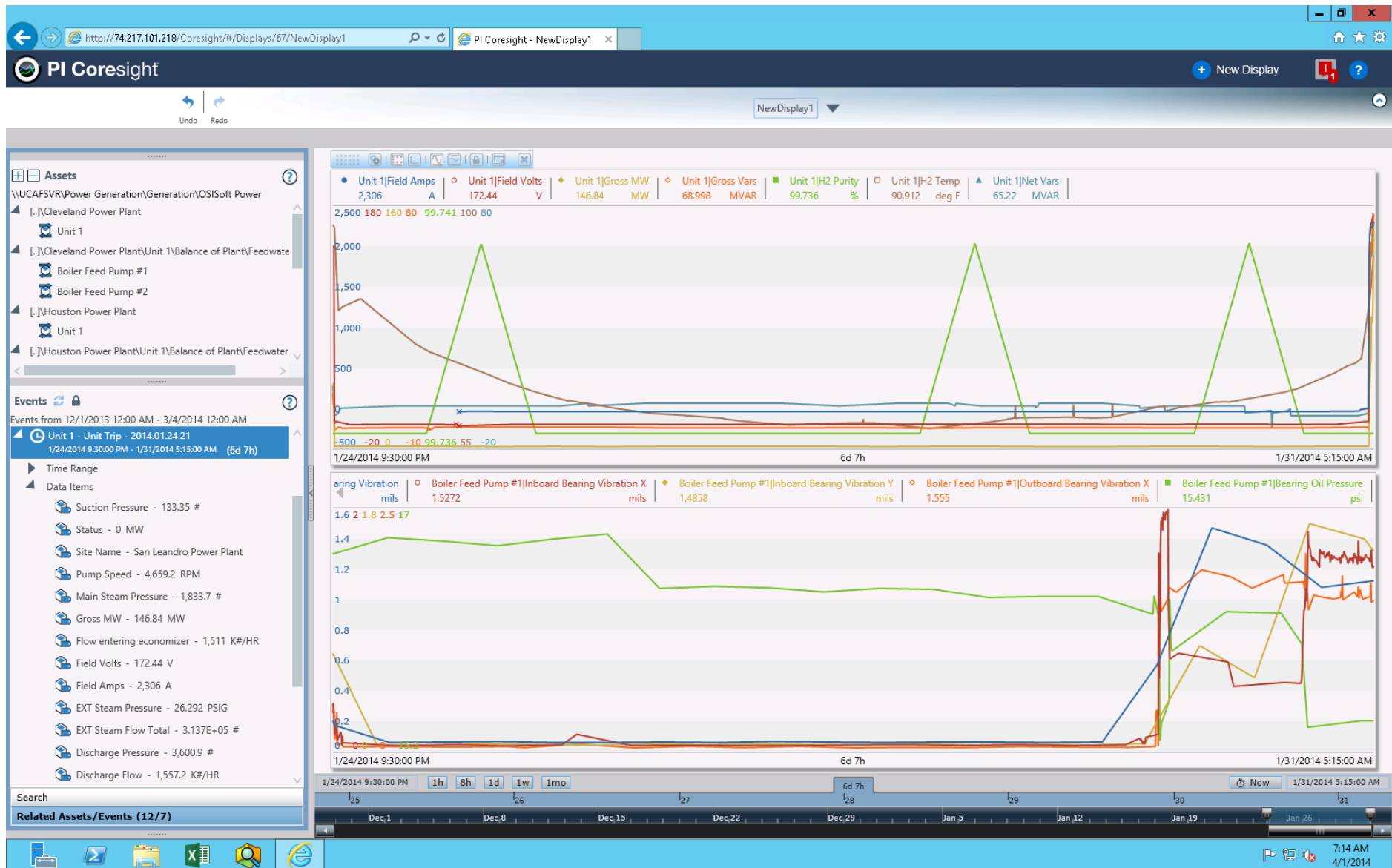
Unit Trip!

PI DataLink 2014 – Daily Anomaly Report

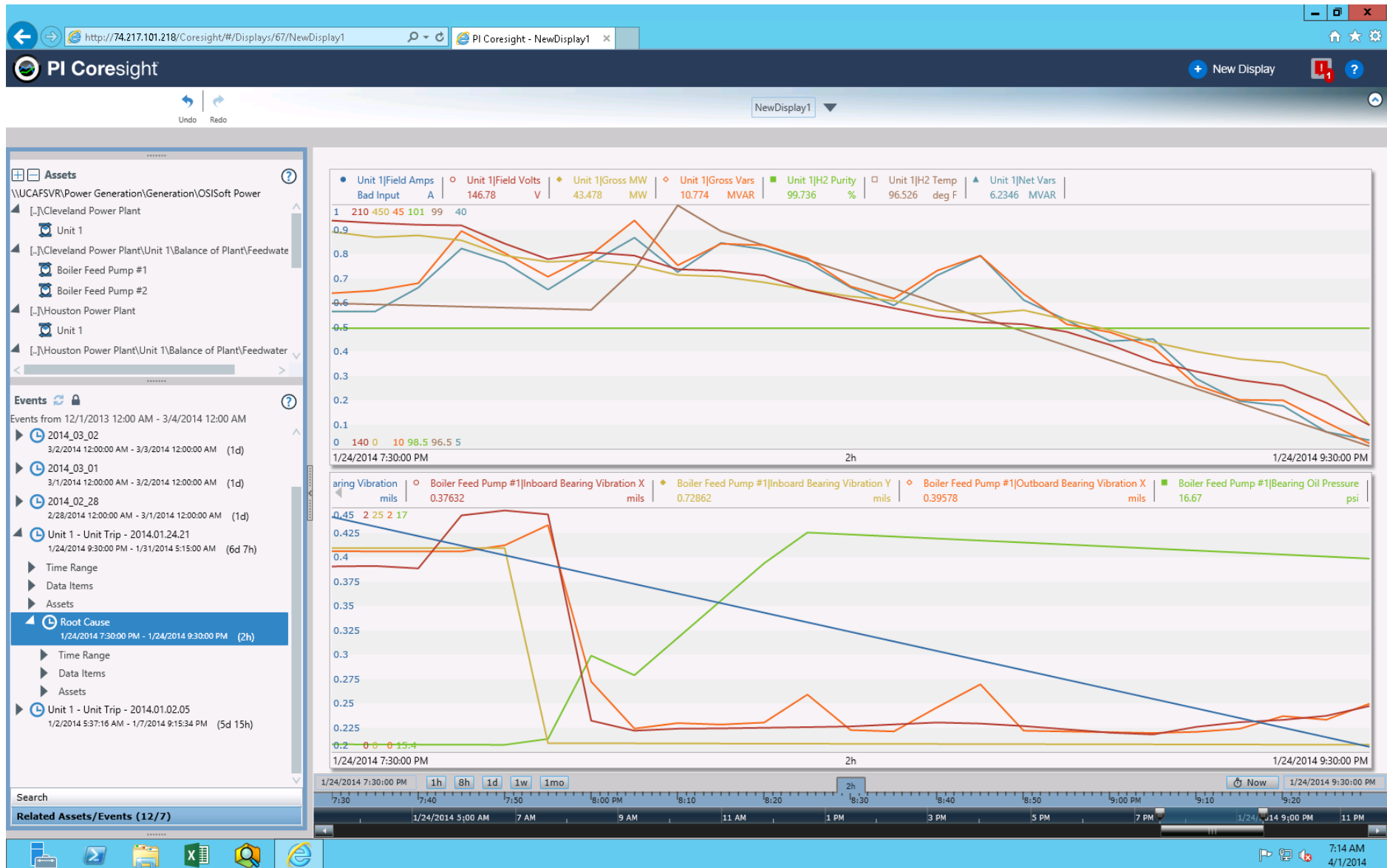
Daily Data



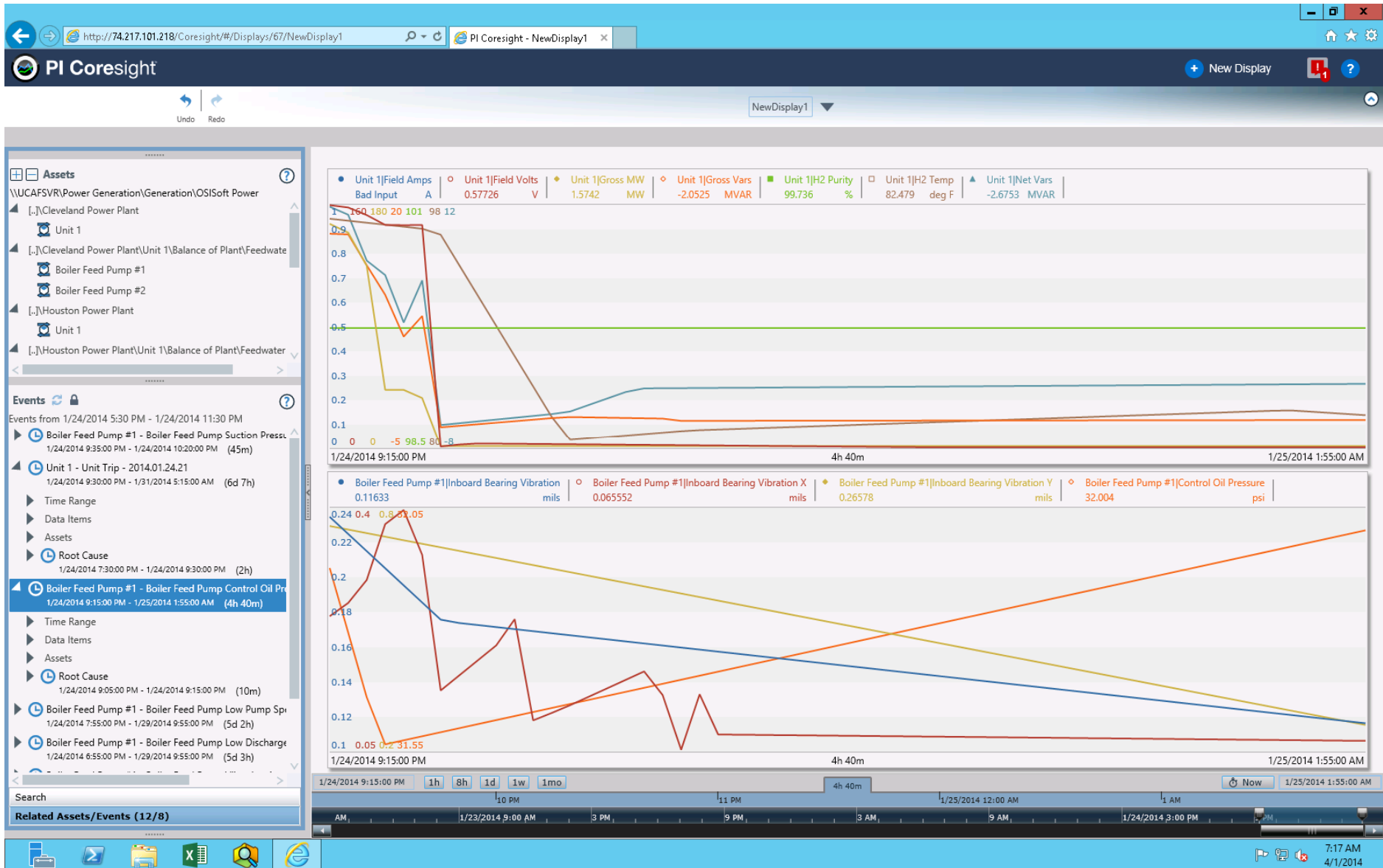
PI Coresight – Event Trending & Related Data



PI Coresight – Root Cause Event Trending



PI Coresight – Anomaly Events



PI Event Frames



2014



PI Web API – Initial EF Support



PI AF Asset Based Analytics – Event Detection



PI DataLink 2014 – Events in Excel



PI AF 2014 – EF Value Capture, Locked EFs



PI AF 2014 – Audit Trail Viewer



PI Coresight – Hierarchical Events



PI Coresight – Related Events



PI System Access – PI OLEDB
Enterprise, PI Web Services, PI JDBC



PI Event Frames Generator



PI AF SDK – Programmatic Access

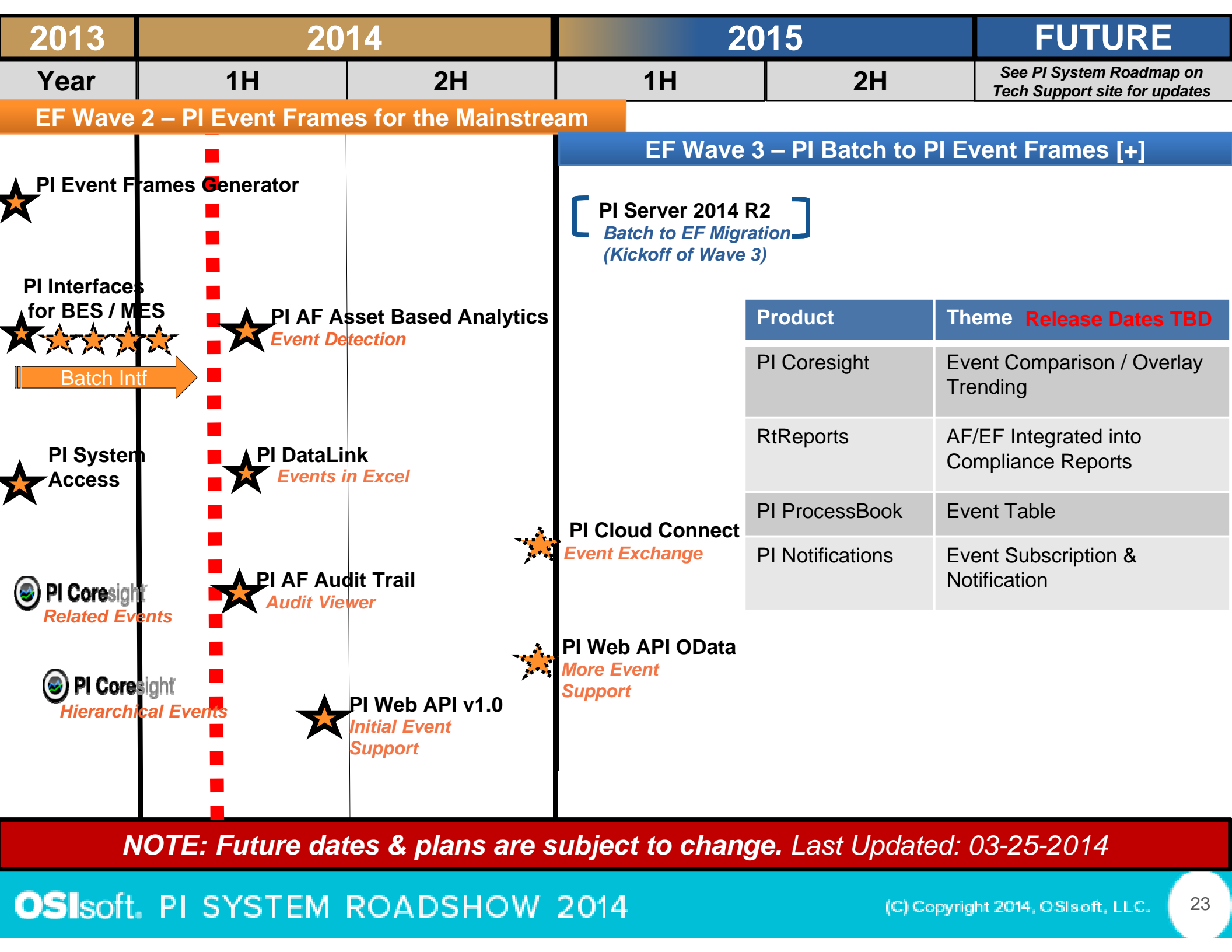


PI AF – PI Event Frames Database



2012

2013



PI Coresight 2014

Transitional release with Big New Features

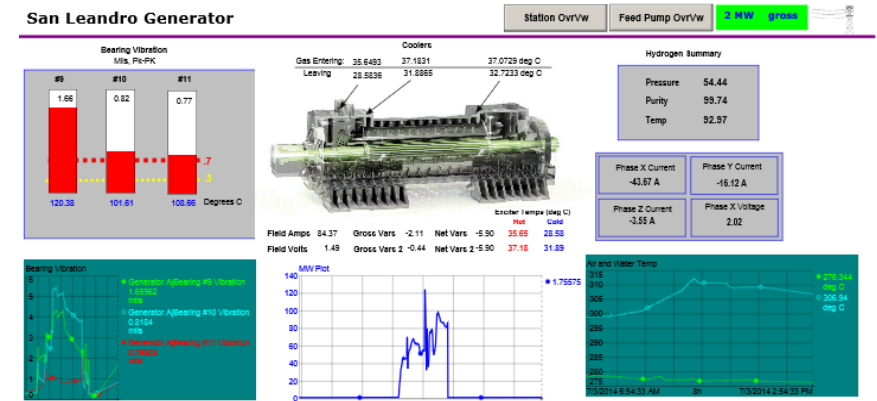
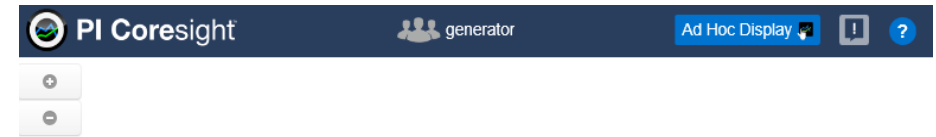
- Moving from desktop browser only to phone, tablet, and desktop
- Making PB displays available on new devices and combine them with new visualization tools
- Improving performance and scalability
- On the path to fully integrated visualization toolset
 - High fidelity display editor
 - Ad-hoc investigation
 - Analytics and Notifications
 - Any device anywhere

PI Coresight 2014

I need to access my graphic displays and real-time data using any modern browser so that I can trouble shoot problems without special software installed.

PI ProcessBook Display Viewing

- Viewable on any modern browser
- Displays organized by import folder
- No special software needed on the client machine

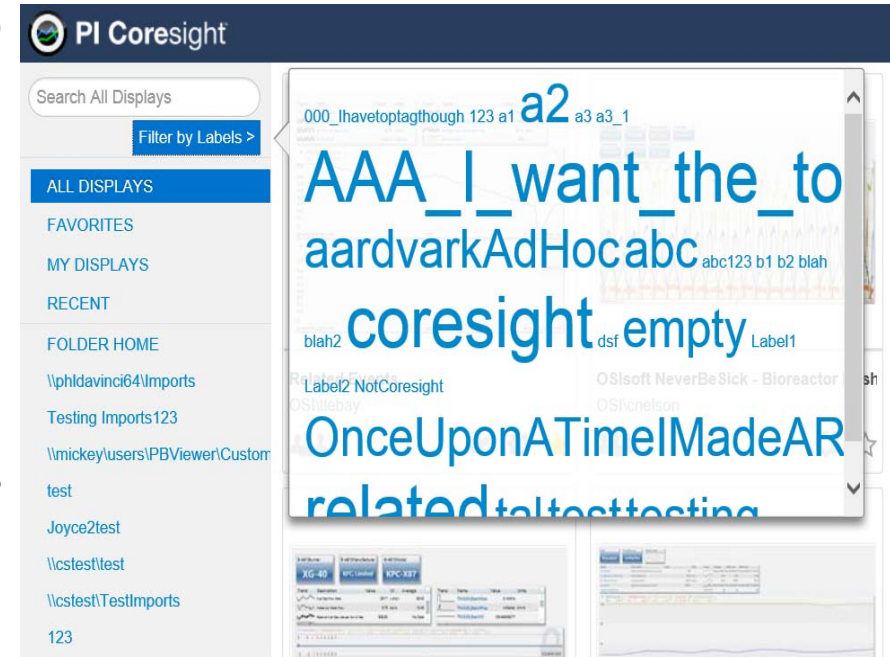


PI Coresight 2014

I need to quickly filter the list of displays to see only the ones I am interested in so I don't waste time hunting for what I want.

New Home Page

- Available using any modern browser
- Find and open native Coresight or PB displays
- Organize displays with folders or labels
- Administrator can manage any display



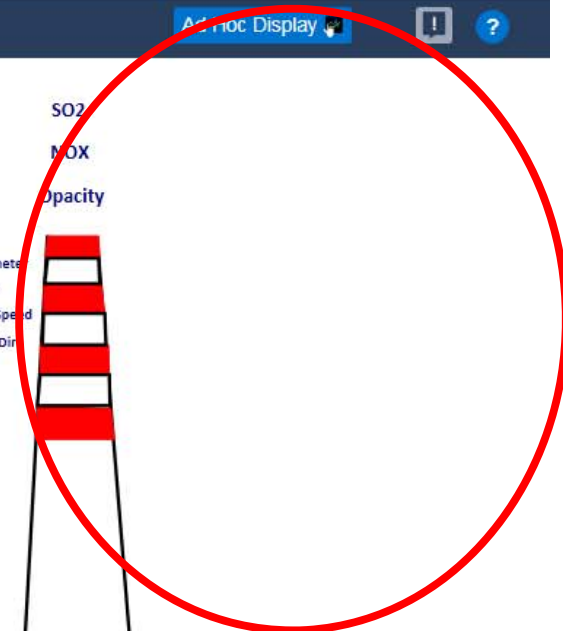
PI Coresight 2014

I need access to my data and displays from anywhere and with any device, so I can solve problems even before I get there.

Mobile site

- Automatically displayed on small screen devices
- Find and display native Coresight and PB displays
- Full display, data item, and asset search





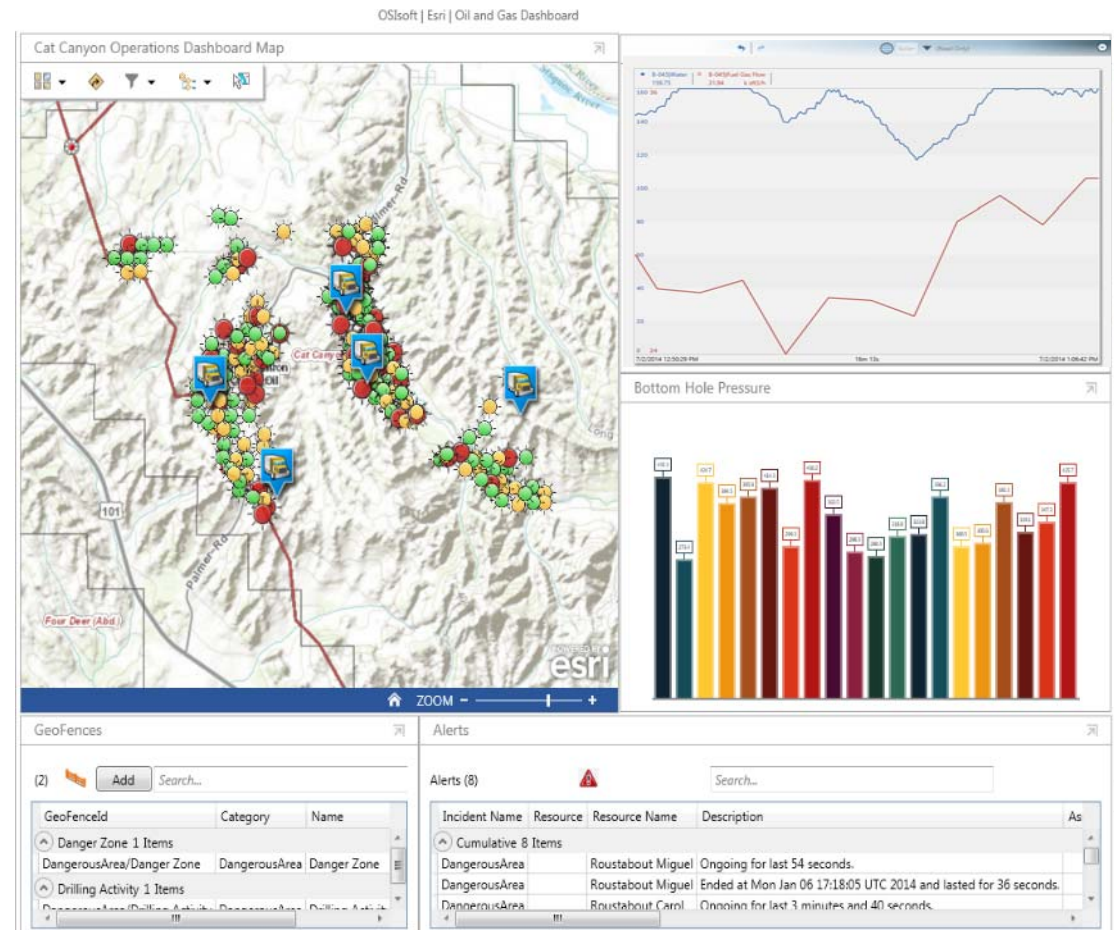
25/08/2014 12:34:27 PM

PI Coresight 2014

I need to integrating PI Coresight with business applications and portal sites to get a complete view of operations.

New URI parameters

- Hide Toolbar, Timebar
- Set element of interest for PB displays
- Set time zone for the current display



What works where?

Desktop
browser only



Displays built
in PI
Coresight

Any modern browser



Homepage



Mobile site



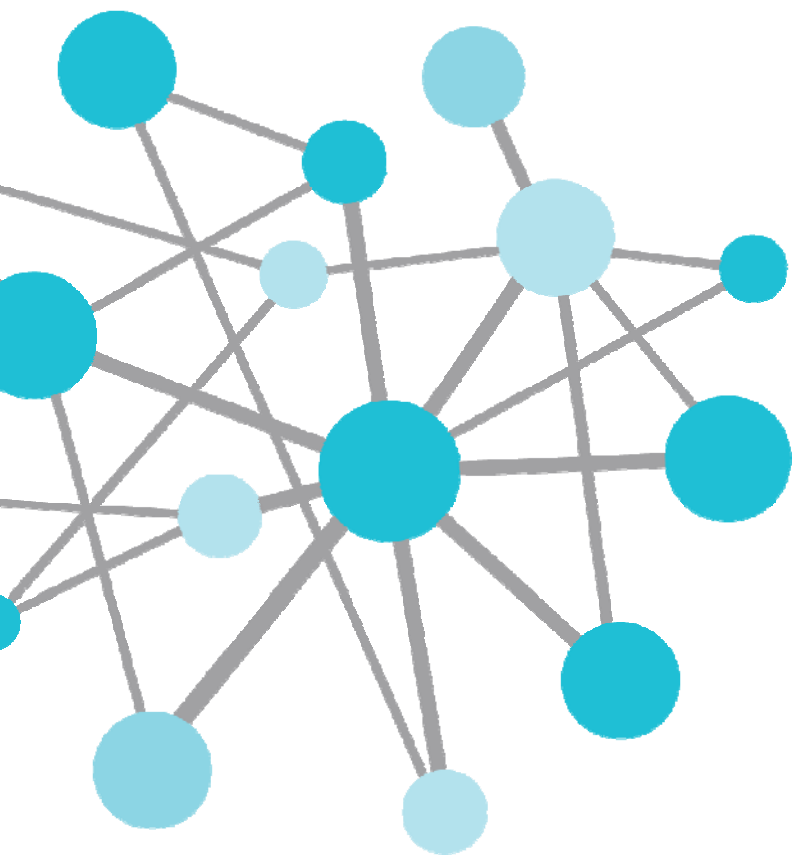
PB Displays



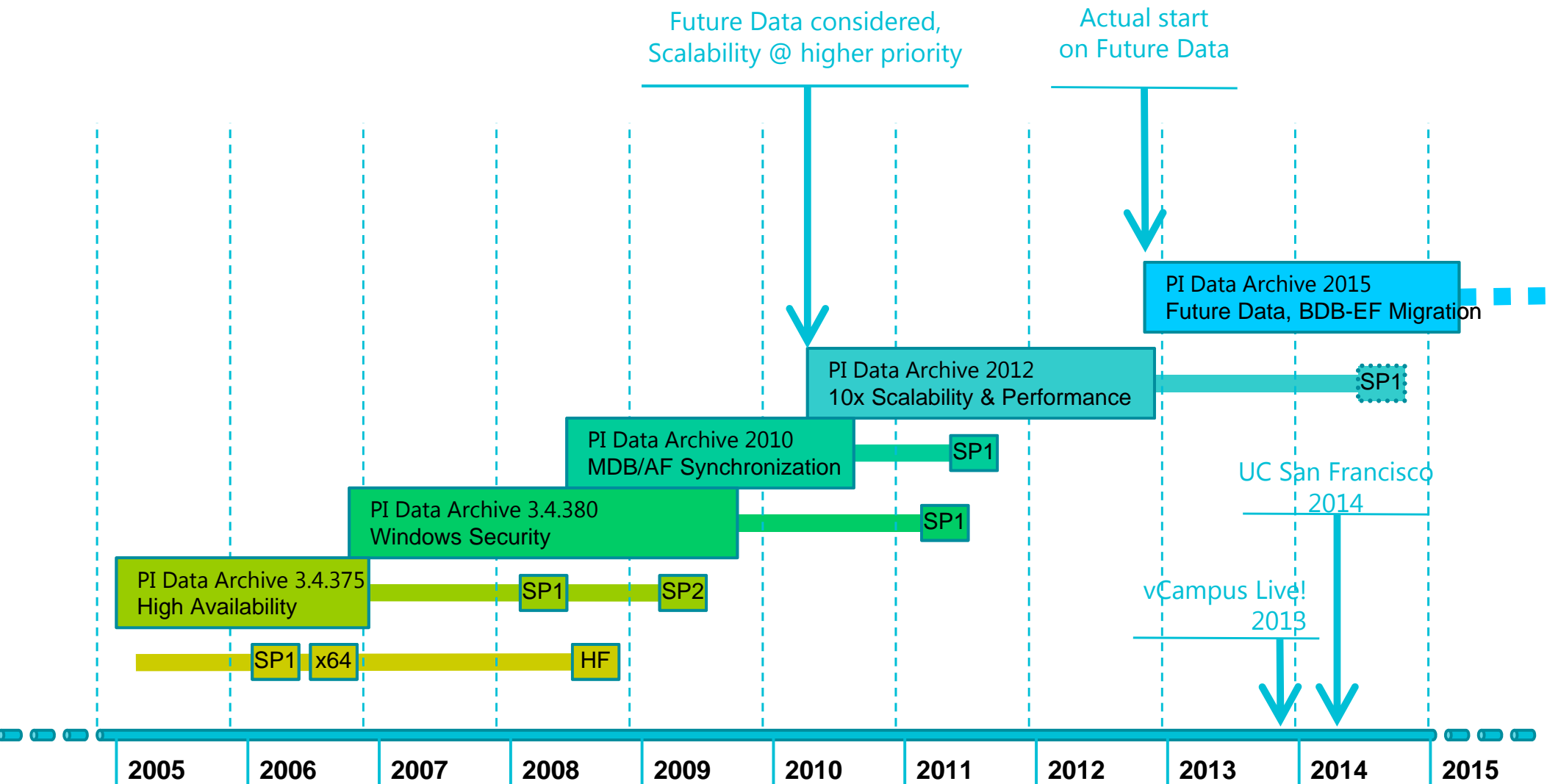
Native Apps



iPad
iPhone

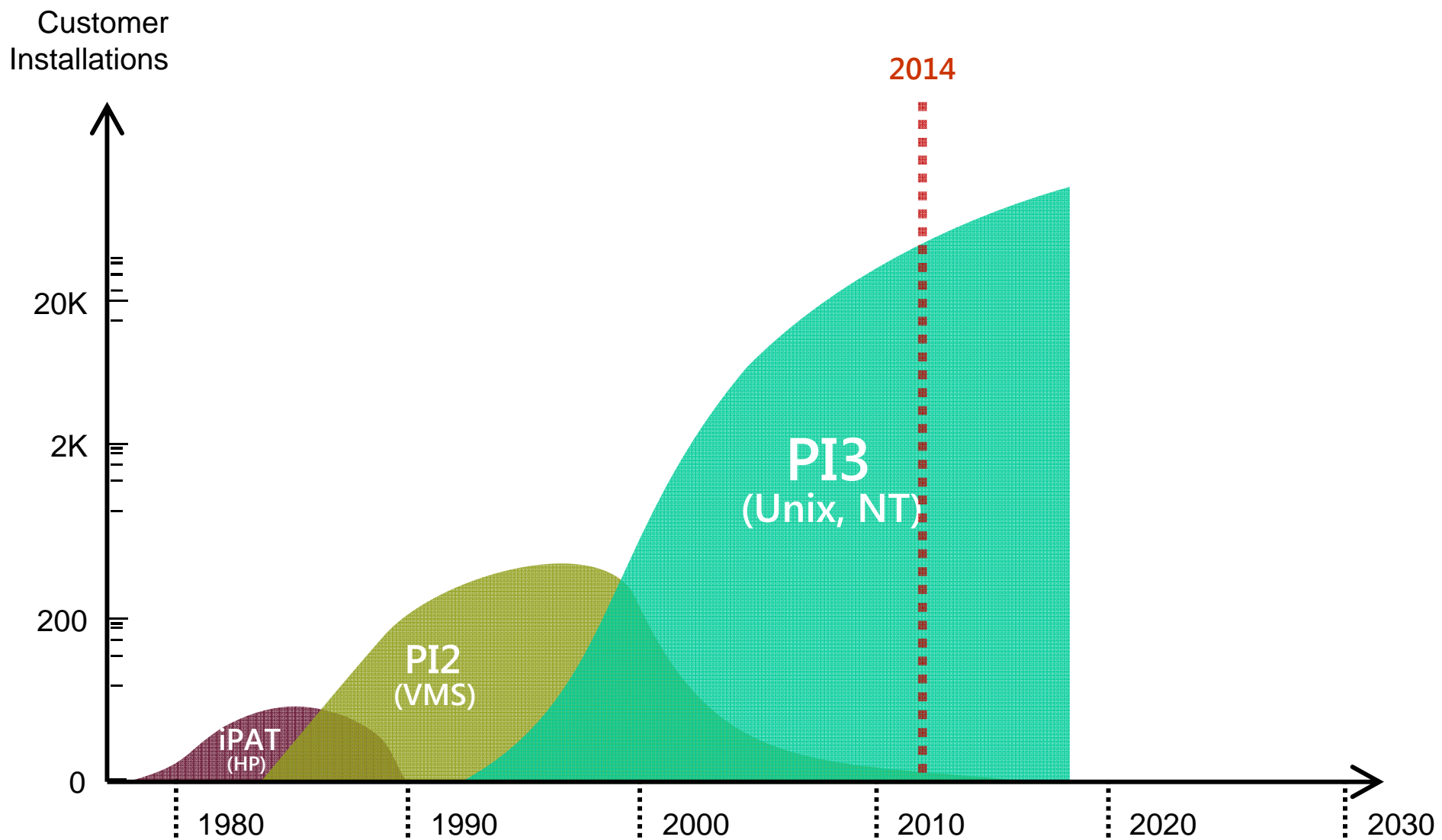


Future Data





Does it still matter?

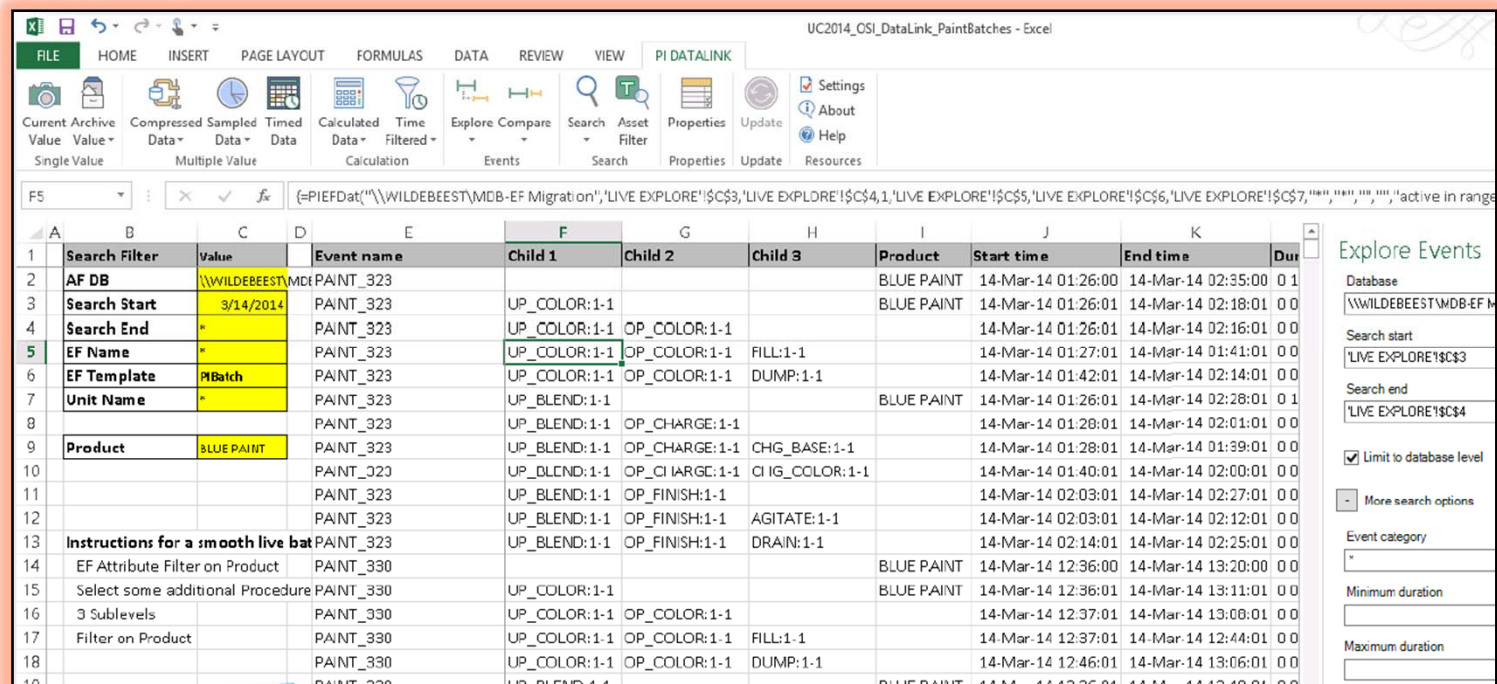


FUTURE DATA “PERFECT STORMS”

PI Event Frames

Analysis, Reporting, Visualization

Use Case: capture and search forecast metadata



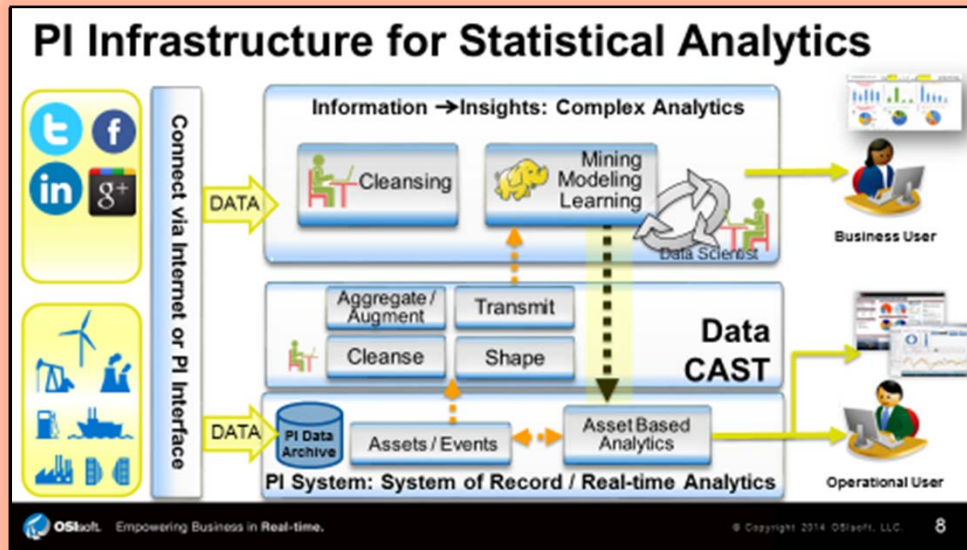
The screenshot shows the OSIsoft PI Datalink Excel interface. The main window displays a table with columns for Search Filter, Value, Event name, Child 1, Child 2, Child 3, Product, Start time, End time, and Duration. The table contains data for various paint batches, including 'AF DB', 'Search Start', 'Search End', 'EF Name', 'EF Template', 'Unit Name', 'Product', and 'Instructions for a smooth live batch'. The 'Explore Events' sidebar on the right provides search options, including Database, Search start, Search end, Limit to database level, More search options, Event category, Minimum duration, and Maximum duration.

	A	B	C	D	E	F	G	H	I	J	K	L
	Search Filter	Value		Event name	Child 1	Child 2	Child 3	Product	Start time	End time	Dur	
1	AF DB	\\WILDEBEEST\MDB-PAINT_323		PAINT_323	UP_COLOR: 1-1			BLUE PAINT	14-Mar-14 01:26:00	14-Mar-14 02:35:00	0 1	
2	Search Start	3/14/2014		PAINT_323	UP_COLOR: 1-1	OP_COLOR: 1-1		BLUE PAINT	14-Mar-14 01:26:01	14-Mar-14 02:18:01	0 0	
3	Search End	*		PAINT_323	UP_COLOR: 1-1	OP_COLOR: 1-1			14-Mar-14 01:26:01	14-Mar-14 02:16:01	0 0	
4	EF Name	*		PAINT_323	UP_COLOR: 1-1	OP_COLOR: 1-1	FILL: 1-1		14-Mar-14 01:27:01	14-Mar-14 01:41:01	0 0	
5	EF Template	PIBatch		PAINT_323	UP_COLOR: 1-1	OP_COLOR: 1-1	DUMP: 1-1		14-Mar-14 01:42:01	14-Mar-14 02:14:01	0 0	
6	Unit Name	*		PAINT_323	UP_BLEND: 1-1			BLUE PAINT	14-Mar-14 01:26:01	14-Mar-14 02:28:01	0 1	
7				PAINT_323	UP_BLEND: 1-1	OP_CHARGE: 1-1			14-Mar-14 01:28:01	14-Mar-14 02:01:01	0 0	
8	Product	BLUE PAINT		PAINT_323	UP_BLEND: 1-1	OP_CHARGE: 1-1	CHG_BASE: 1-1		14-Mar-14 01:28:01	14-Mar-14 01:39:01	0 0	
9				PAINT_323	UP_BLEND: 1-1	OP_CHARGE: 1-1	CI IG_COLOR: 1-1		14-Mar-14 01:40:01	14-Mar-14 02:00:01	0 0	
10				PAINT_323	UP_BLEND: 1-1	OP_FINISH: 1-1			14-Mar-14 02:03:01	14-Mar-14 02:27:01	0 0	
11				PAINT_323	UP_BLEND: 1-1	OP_FINISH: 1-1	AGITATE: 1-1		14-Mar-14 02:03:01	14-Mar-14 02:12:01	0 0	
12	Instructions for a smooth live batch			PAINT_323	UP_BLEND: 1-1	OP_FINISH: 1-1	DRAIN: 1-1		14-Mar-14 02:14:01	14-Mar-14 02:25:01	0 0	
13	EF Attribute Filter on Product			PAINT_330	UP_COLOR: 1-1			BLUE PAINT	14-Mar-14 12:36:00	14-Mar-14 13:20:00	0 0	
14	Select some additional Procedure			PAINT_330	UP_COLOR: 1-1	OP_COLOR: 1-1		BLUE PAINT	14-Mar-14 12:36:01	14-Mar-14 13:11:01	0 0	
15	3 Sublevels			PAINT_330	UP_COLOR: 1-1	OP_COLOR: 1-1			14-Mar-14 12:37:01	14-Mar-14 13:08:01	0 0	
16	Filter on Product			PAINT_330	UP_COLOR: 1-1	OP_COLOR: 1-1	FILL: 1-1		14-Mar-14 12:37:01	14-Mar-14 12:44:01	0 0	
17				PAINT_330	UP_COLOR: 1-1	OP_COLOR: 1-1	DUMP: 1-1		14-Mar-14 12:46:01	14-Mar-14 13:06:01	0 0	
18				PAINT_330	UP_BLEND: 1-1			BLUE PAINT	14-Mar-14 12:36:01	14-Mar-14 13:11:01	0 0	

FUTURE DATA “PERFECT STORMS”

PI Integrator “CAST” for Hadoop *Big Data Analytics*

Use Case: feed predictive data back to the PI Server



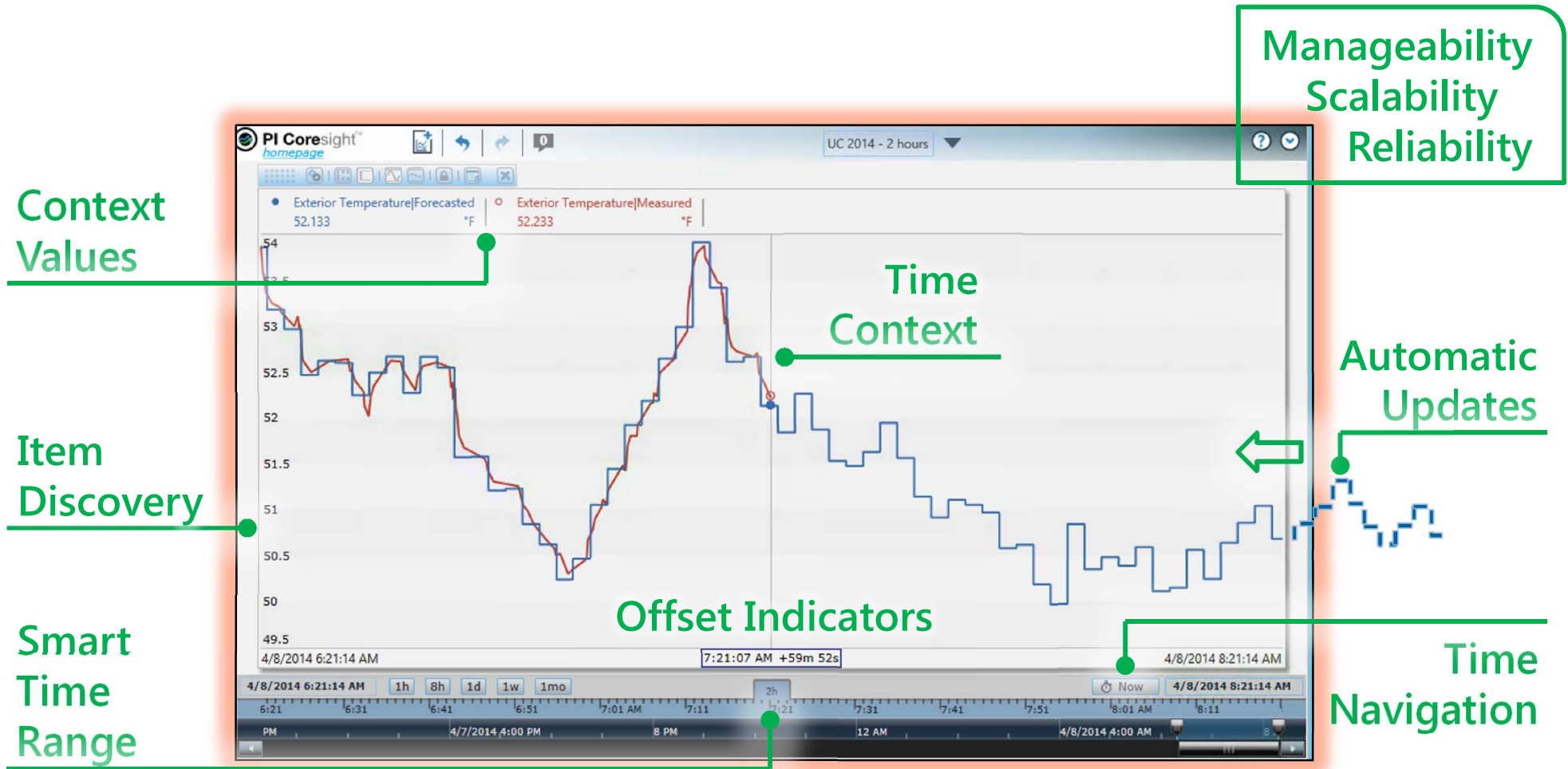
PI Integrator for Esri ArcGIS

Geospatial Forecasts (e.g., Weather)

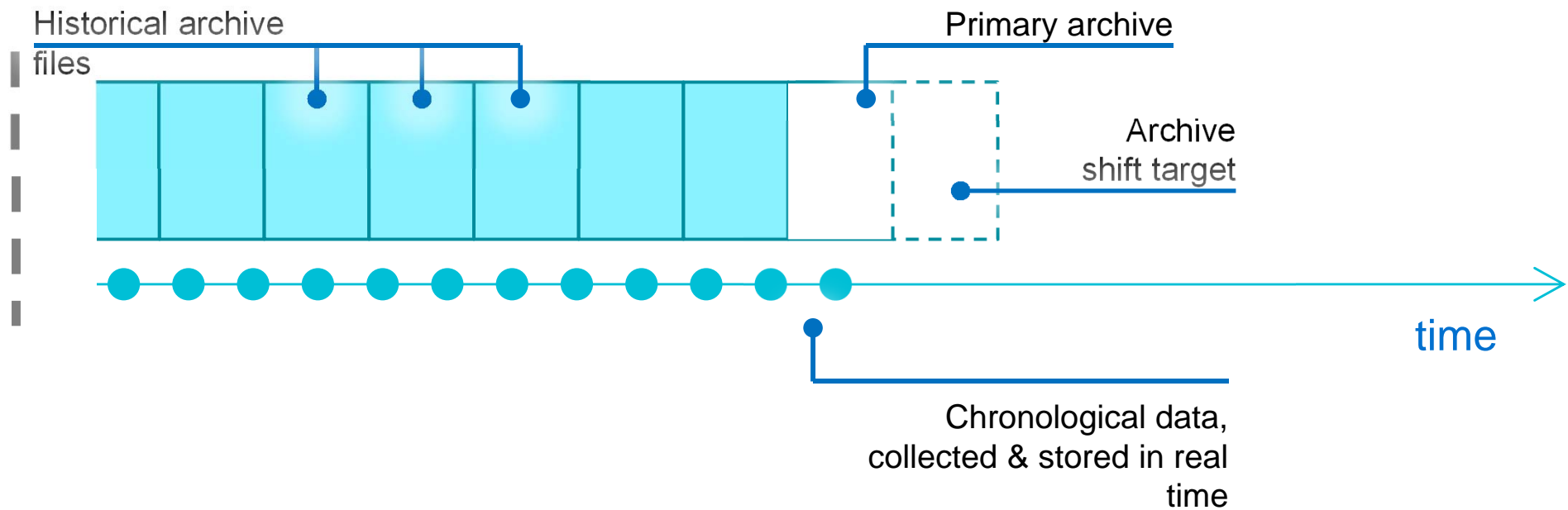
Use Case: overlay future data on live maps



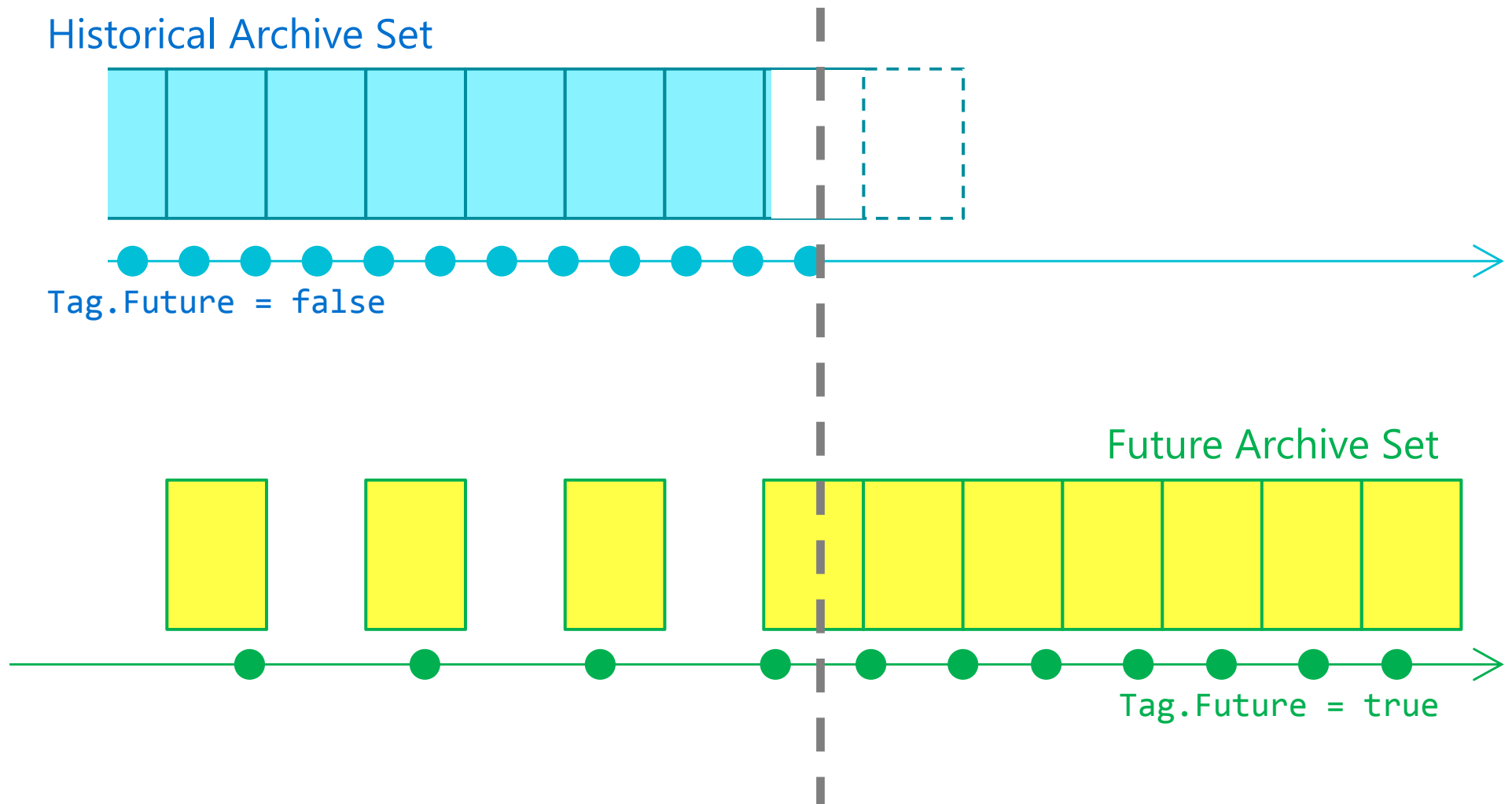
More Than Meets the Eye



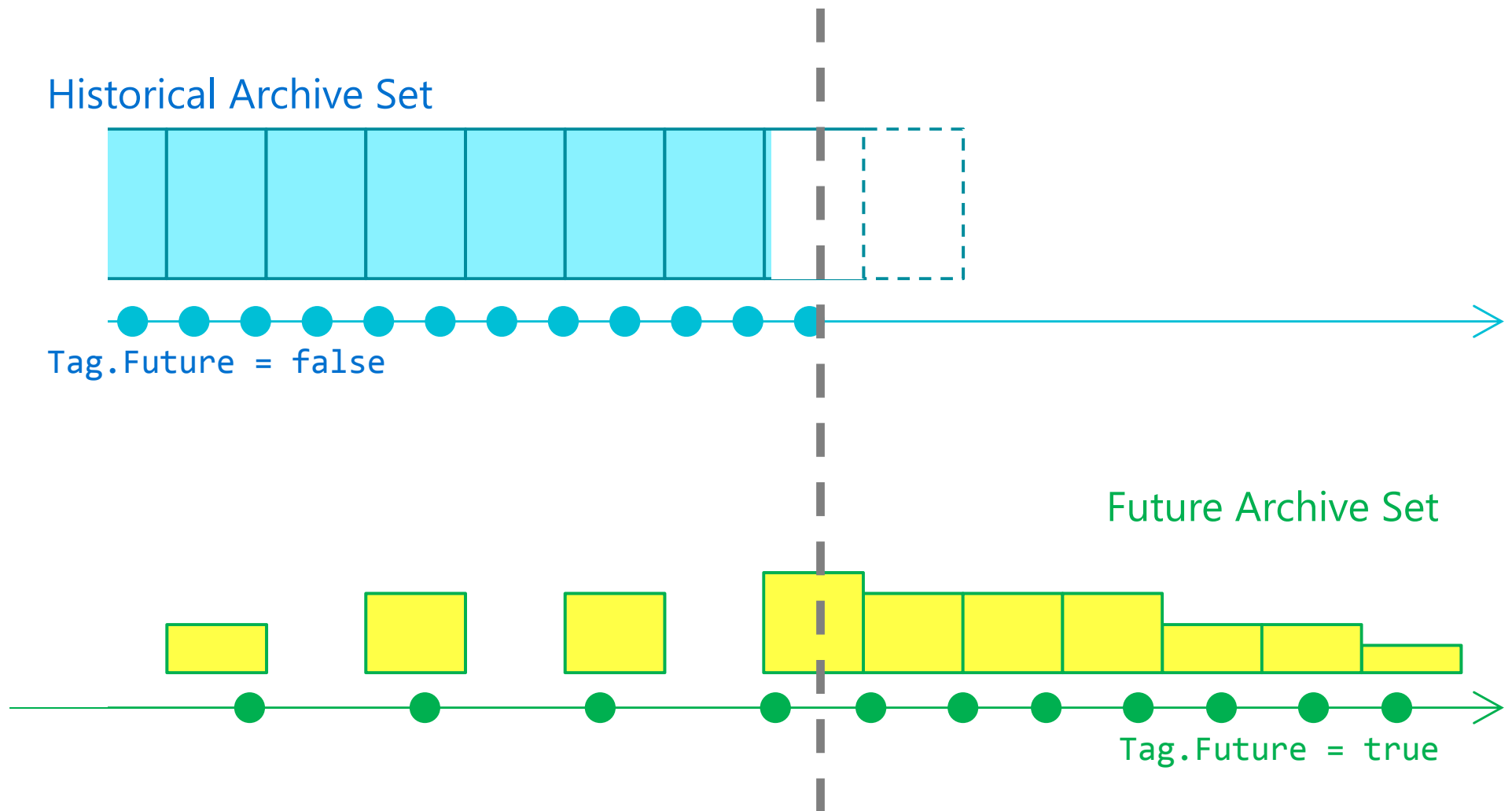
Storing “Historical” Data...



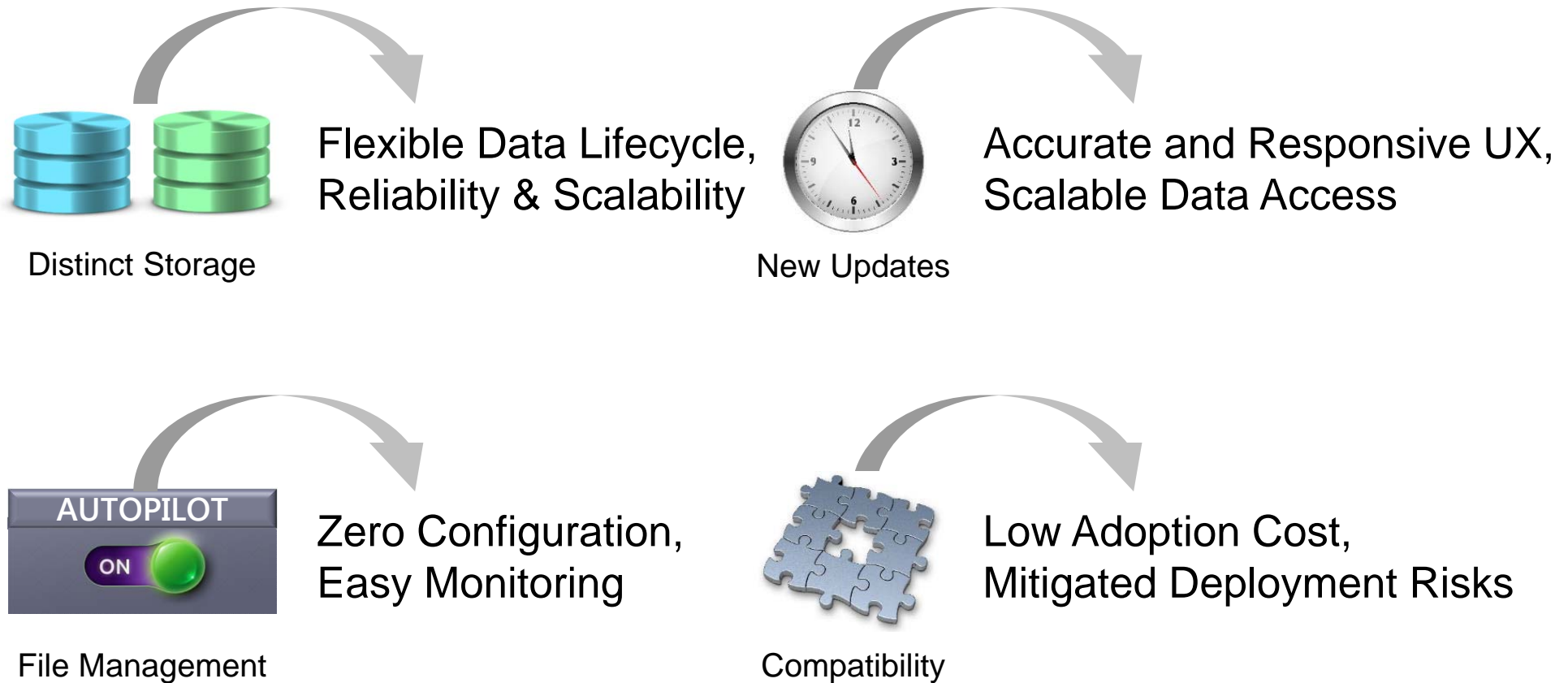
...And Storing “Future” Data

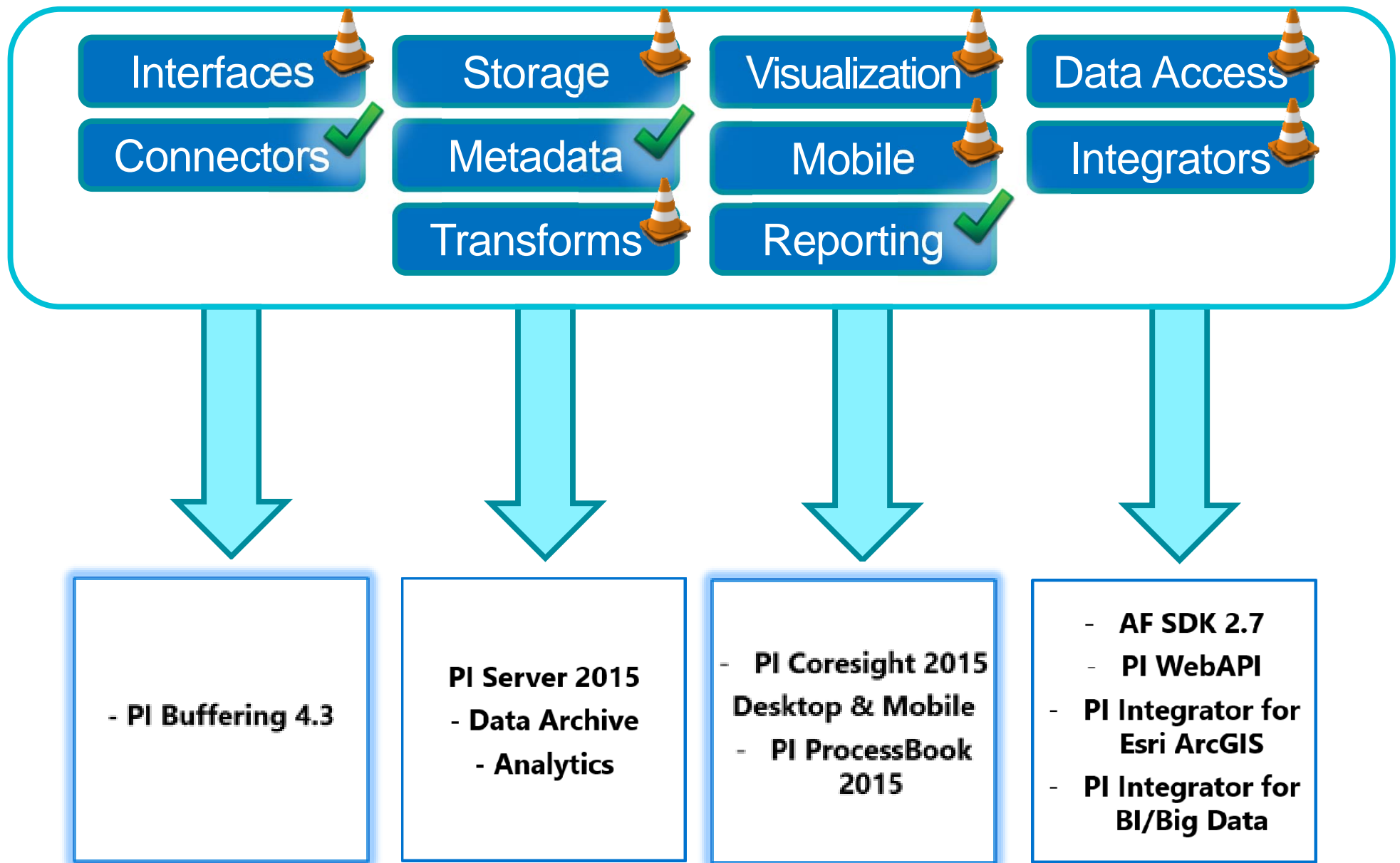


...And Storing “Future” Data



TURNING CHALLENGES INTO DIFFERENTIATORS





Michael Luo

mluo@osisoft.com

Technical Consultant

OSIsoft Australia Pty Ltd

PI System Roadmap

<https://techsupport.osisoft.com/Products/Product-Roadmap>



THANK YOU

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