OSIsoft PI System Product Update & Roadmap

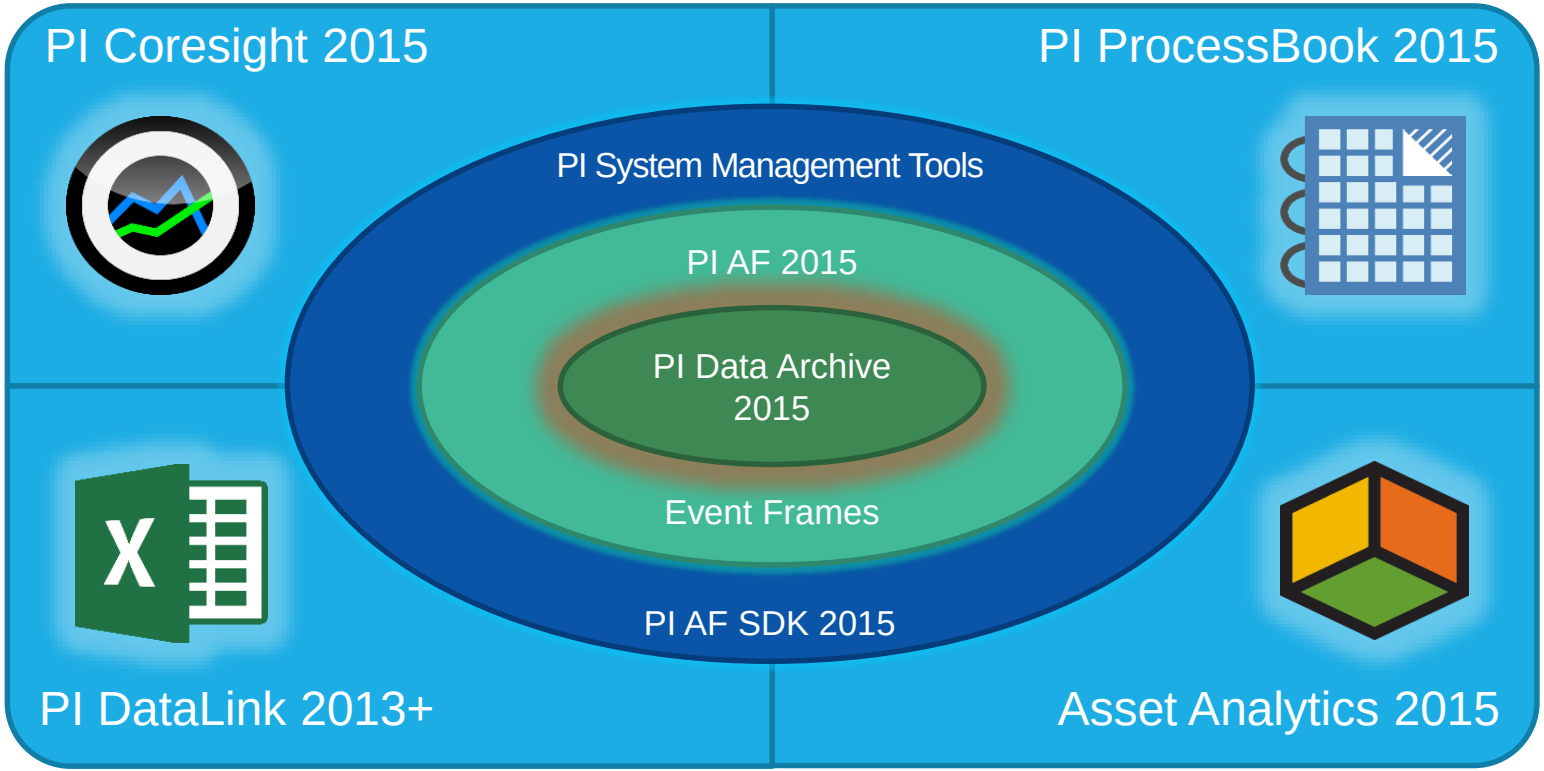
Presented by **Sam Pride**

Today's Agenda

- **Recent Releases and What's to come:**
  - PI Server 2015
  - PI Visualisation
  - PI Interfaces & Connectors
  - PI Integrators
  - PI Batch & Event Frames
  - PI Developer Technologies

PI Server 2015

PI Server 2015 – Focus on Future Data



PI Server 2015 and 2015 R2

Data Archive

- Native future data support
- Transport security
- Batch to Event Frames migration
- PI Data Archive 2012 SP1
- Improve testing, maintainability and reliability (R2)
- Begin manageability initiative (R2)
- Infrastructure support for downstream clients (R2)

Asset Framework

- Native future data support
- Unified PI Security model
- Excluded and hidden attributes
- AF SaaS (parallel effort with on-prem)
- Begin merging on-prem with SaaS (R2)
- Attribute enhancements (R2)
- Infrastructure support for downstream clients (R2)
    - CAST, Notifications, Coresight, etc.

Analytics

- Future data in calculations
- Override output time stamp
- On-demand calculations
- New PE functions
- Improve maintainability and reliability (R2)
- Improve analysis management (R2)
- Improve backfilling (R2)

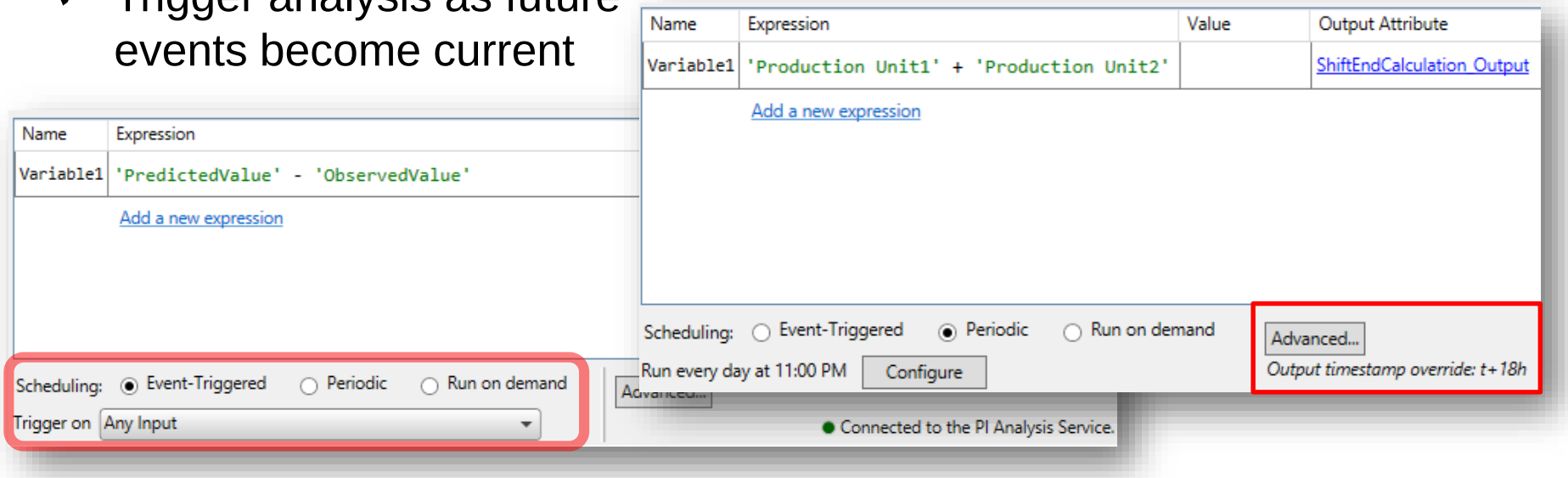
Notifications

- Complete rewrite of Notifications (2016 release)

Asset Analytics 2015

- ✓ Use future data as analysis input
- ✓ Trigger analysis as future events become current

- ✓ Output time context
  - – Relative to trigger (e.g. '*+1h')
  - – Absolute time

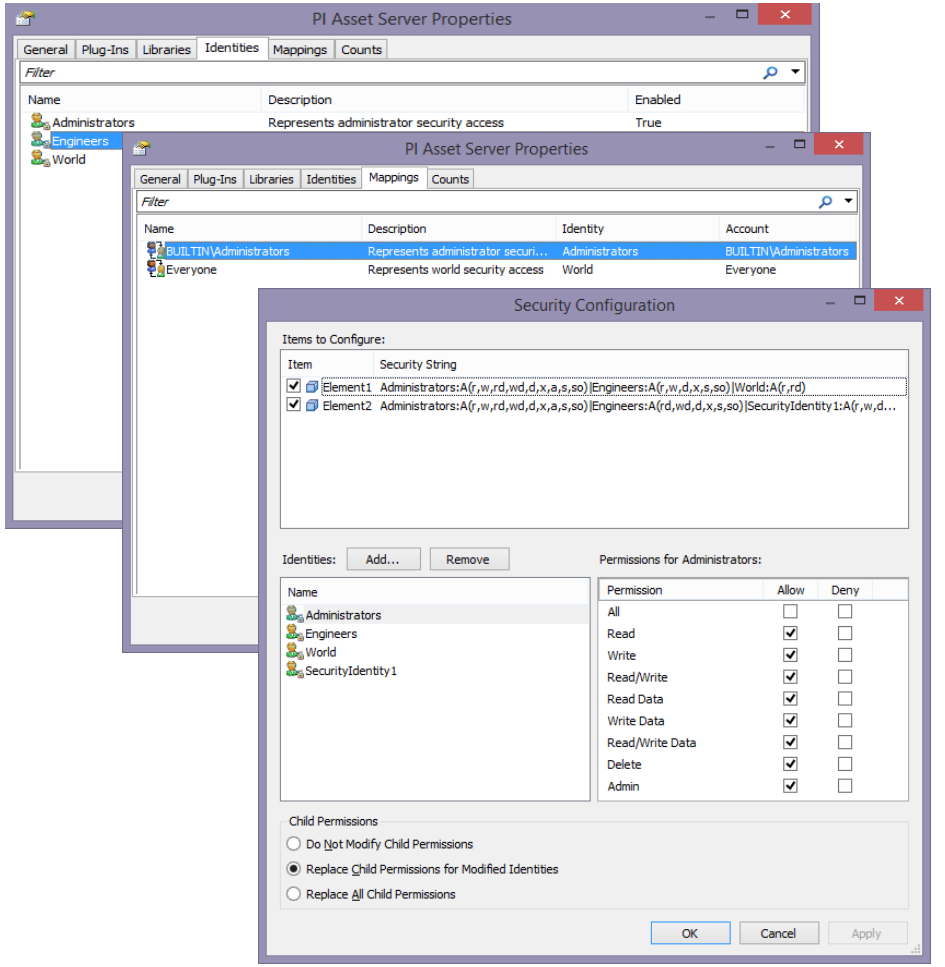


Transport Security with PI Server 2015

From \ Connection	PI Trust	NTLM RC4/MD5	Active Directory (Kerberos) AES256/SHA1*
PI Buffer Subsystem	✗	✓	✓
PI Connectors	✗	✓	✓
PI DataLink	✗	✓	✓
PI ProcessBook	✗	Future	Future

PI AF Security Model Changes

- Same model as PI Data Archive
- Make security easier to manage and configure
- No direct Windows ACLs on AF Objects
- Improved out-of-the-box experience
- Backward compatibility



PI Event Frames Roadmap

2012

- **PI AF: PI Event Frames Database**
- PI AF SDK: Programmatic Access

2013

- **PI Coresight: Related Events**
- **PI Coresight: Hierarchical Events**
- PI Event Frames Generator
- PI System Access: PI OLEDB Enterprise, PI Web Services, PI JDBC

2014

- **PI AF Analytics: Event Detection**
- **PI DataLink 2014: Events in Excel**
- PI AF 2015: EF Value Capture, Locked EFs
- PI AF 2014: Audit Trail Viewer
- PI Web API: Initial EF Support

2015

- **PI Server 2015: Batch to EF Migration**
- [TBD]
  - PI Coresight: Event Comparison

2016

- [TBD]
  - PI Coresight: Batch Event Comparison
  - PI Coresight: Process Monitoring
  - PI Notifications
  - RtReports

In Development (not released)

What should I do if today if I Use Batch?

Event Frames – Wave 3

Requirements →	(A) Basic Batch Trending + Excel Reporting + Data Access	(B) Batch Overlay Trending		(C) RtReports Compliance Reporting	(D) Custom Apps, 3rd Party Integration, Significant Batch Usage	(E) Non Batch Process Monitoring Use Case (Downtime, Excursions, etc.)
Existing Batch Site →	**READY!** ★ **Event Frames + PI Server 2015 (Migration)**	**READY!** ★ **Event Frames + Partner** (Mirabo LivePoint) **+ PI Server 2015 (Migration)**	**Batch**	**Batch**	**Batch** **Custom Batch applications will not work against Event Frames following migration.**	**READY!** ★ **Event Frames**

Batch or Even Frames for a NEW PI System?

Event Frames – Wave 3

	(A) Basic Batch Trending + Excel Reporting + Data Access	(B) Batch Overlay Trending		(C) RtReports Compliance Reporting	(D) Custom Apps, 3rd Party Integration, Significant Batch Usage	(E) Non Batch Process Monitoring Use Case (Downtime, Excursions, etc.)
Requirements →						
New PI System site →	**READY!** ★ Event Frames	**READY!** ★ Event Frames + Partner (Mirabo LivePoint)	Batch	Batch	**READY!** ★ Event Frames	**READY!** ★ Event Frames

PI Server – 2016 and beyond

Data Archive

- Focus on manageability
- Infrastructure support for downstream clients
  - New RPCs
  - Improve Update Manager
- Performance improvement as needed

Asset Framework

- Infrastructure support and enhancements for downstream clients
- Specialized Attributes – Limits, Prediction, Location
- In-Process Buffering
- Event Frame Annotations, Reason Codes
- UOM Grouping (Metric vs US)
- Asset Mapping
- Performance and scalability

Analytics

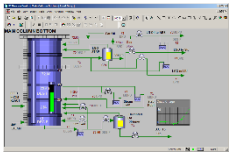
- Support new Notifications
- Failover and High Availability
- Recalculation
- PE enhancements
- Research running 3rd party and custom analytics

Notifications

- Trigger Notification Rules based on event frames
- Use event frames instead of PI Points to store history
- New configuration UI
- Support monitoring of 1MM Notifications
- Improve Web Service Delivery Channel
- Migrate existing users

Visualisation

TODAY (2015)

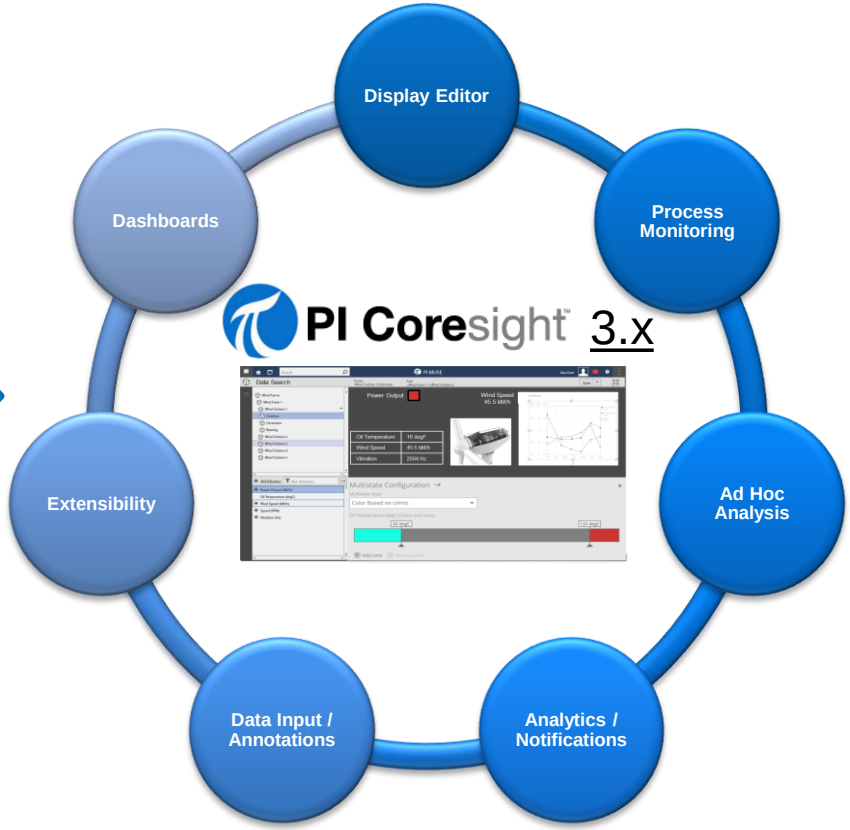


PI ProcessBook
Display Editor
Process Monitoring

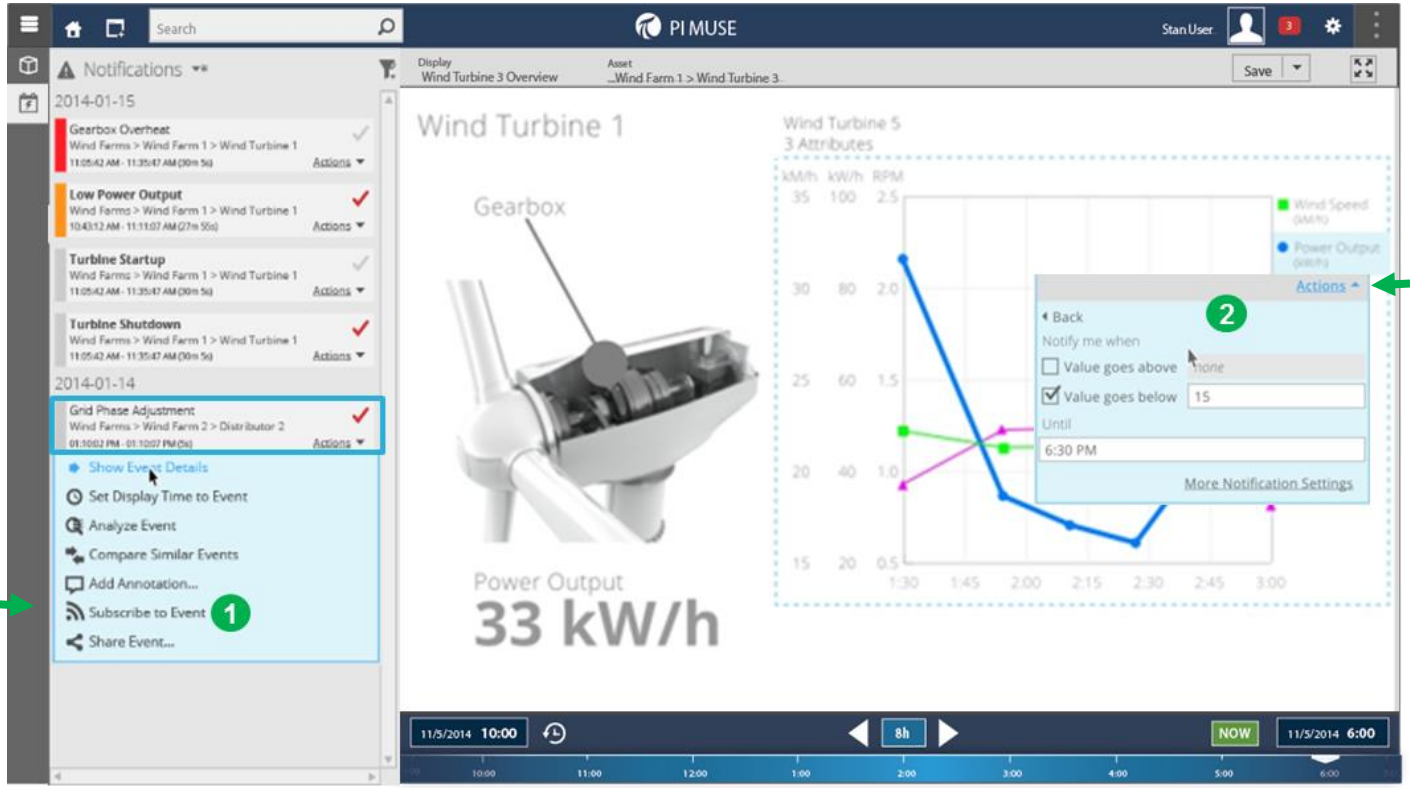
PI Coresight 2.x
Ad Hoc Analysis
PB Display Viewer

PI WebParts
Dashboards

FUTURE (2016+)



PI Coresight 3.1 - Self Service

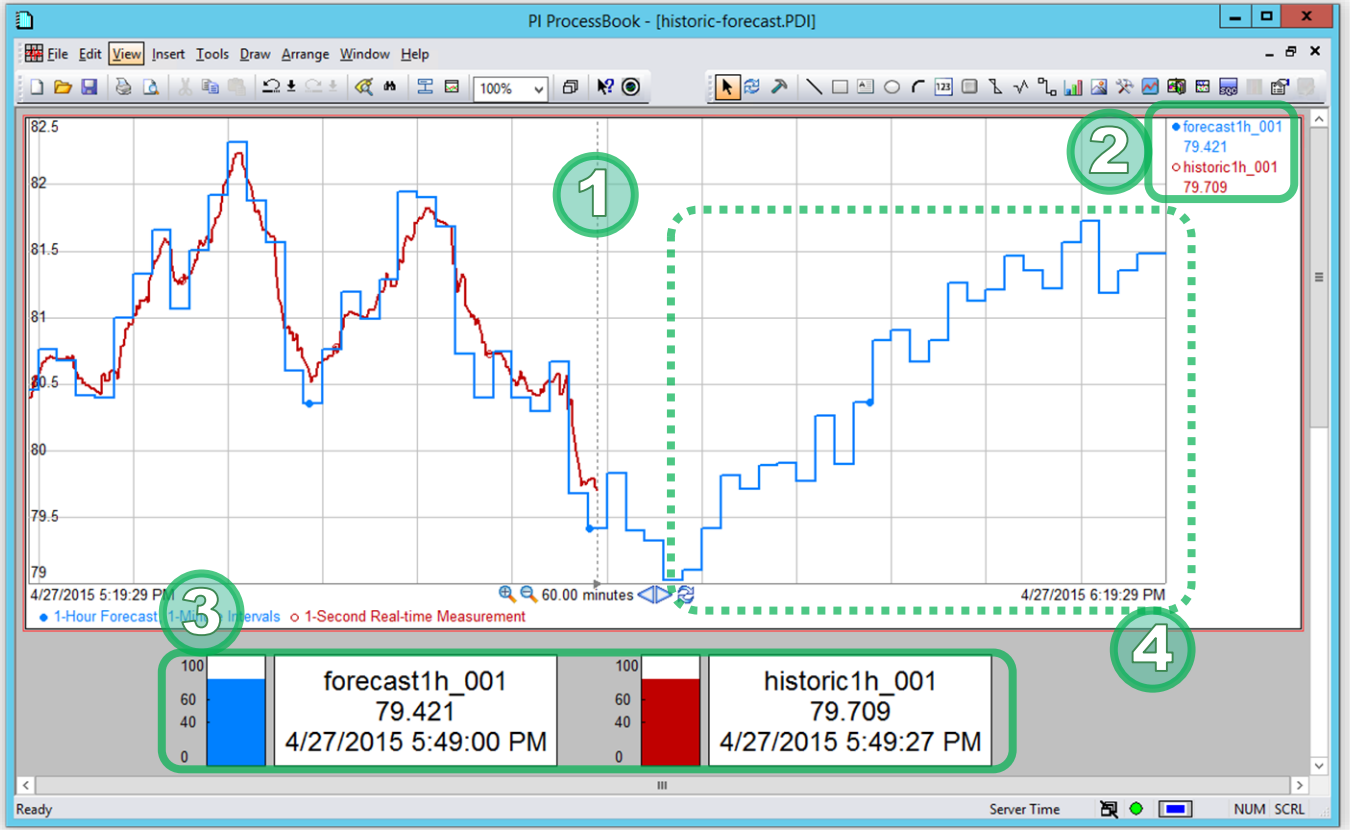


Subscribe to events

Simple self service notifications

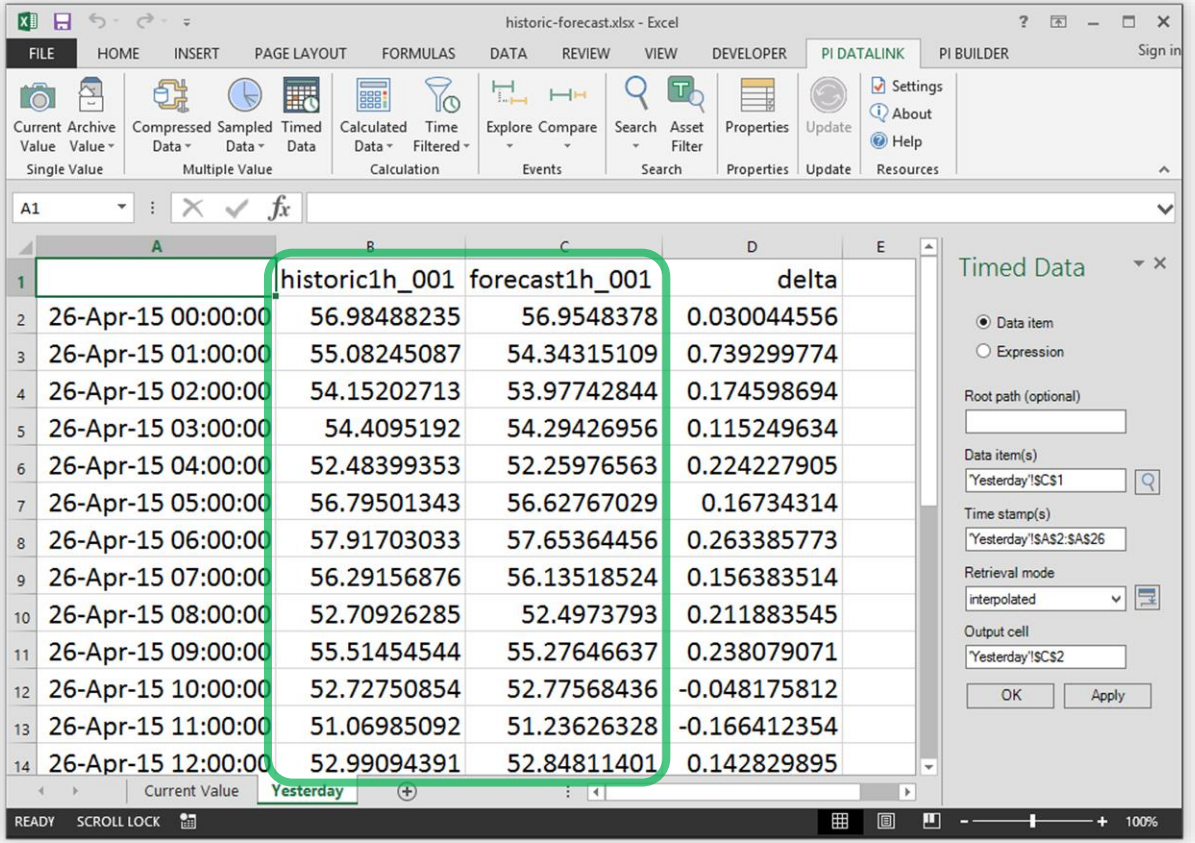
PI ProcessBook 2015 – Display Future Data!

1. Now Line
2. Legend Values
3. Symbol Values
4. Live Forecast Updates

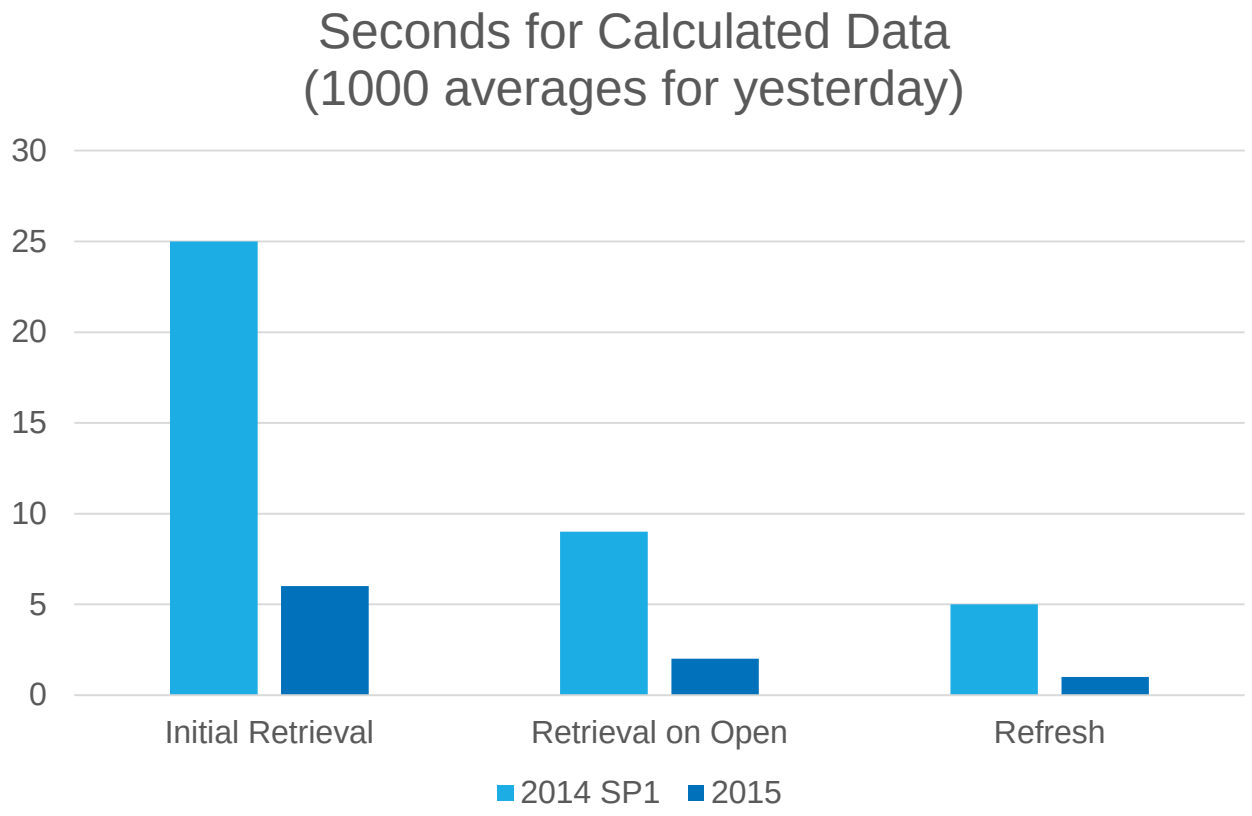


PI DataLink 2013+ - Retrieve Future Data!

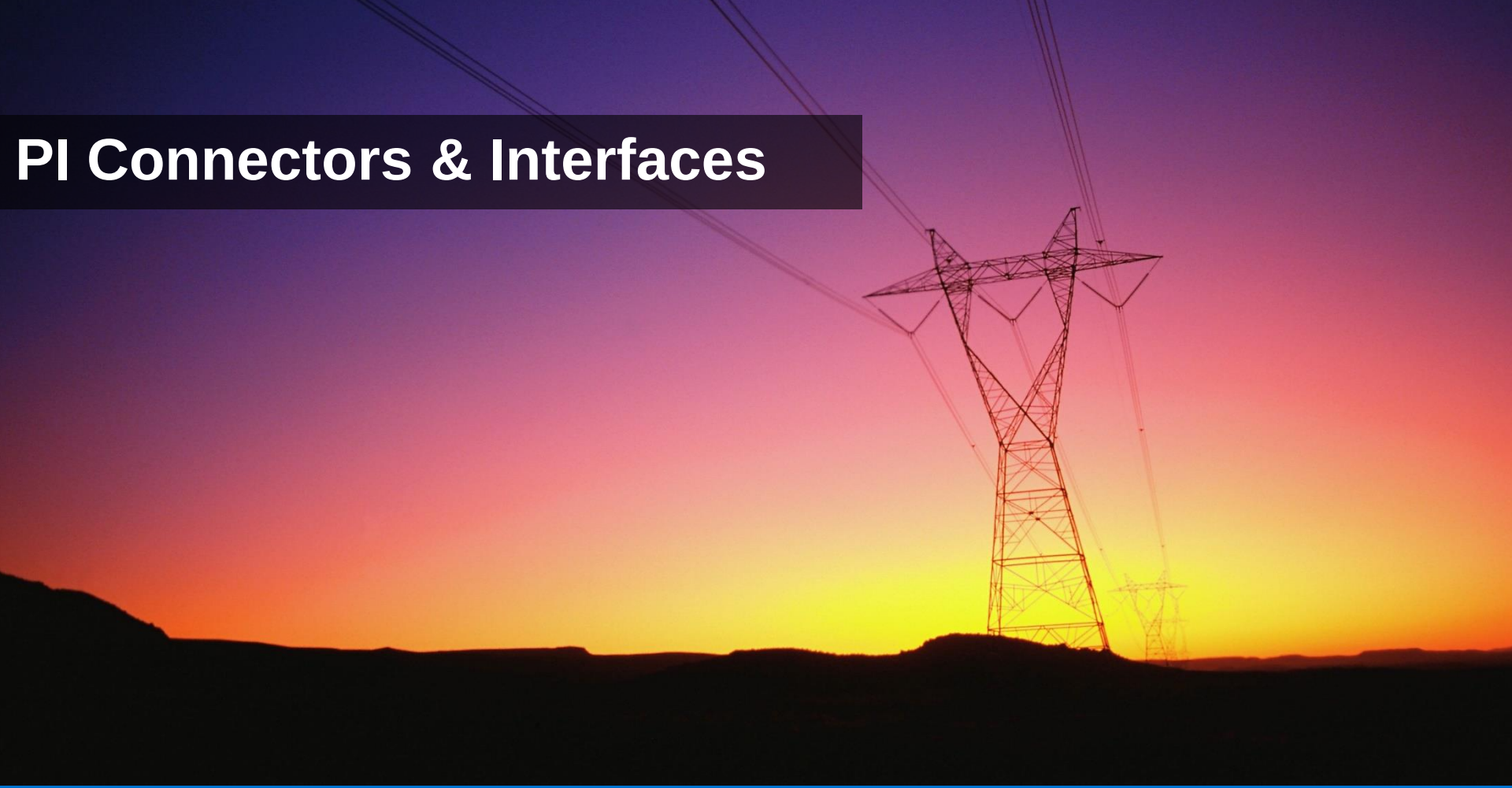
(with AF Client 2015)



PI DataLink 2015 – Performance++



PI Connectors & Interfaces



PI Connectors – Customer Challenges

Time

Spend a lot of time configuring tags

Configuration

Challenging to configure interface

Build

Time consuming to build an asset model

Speed

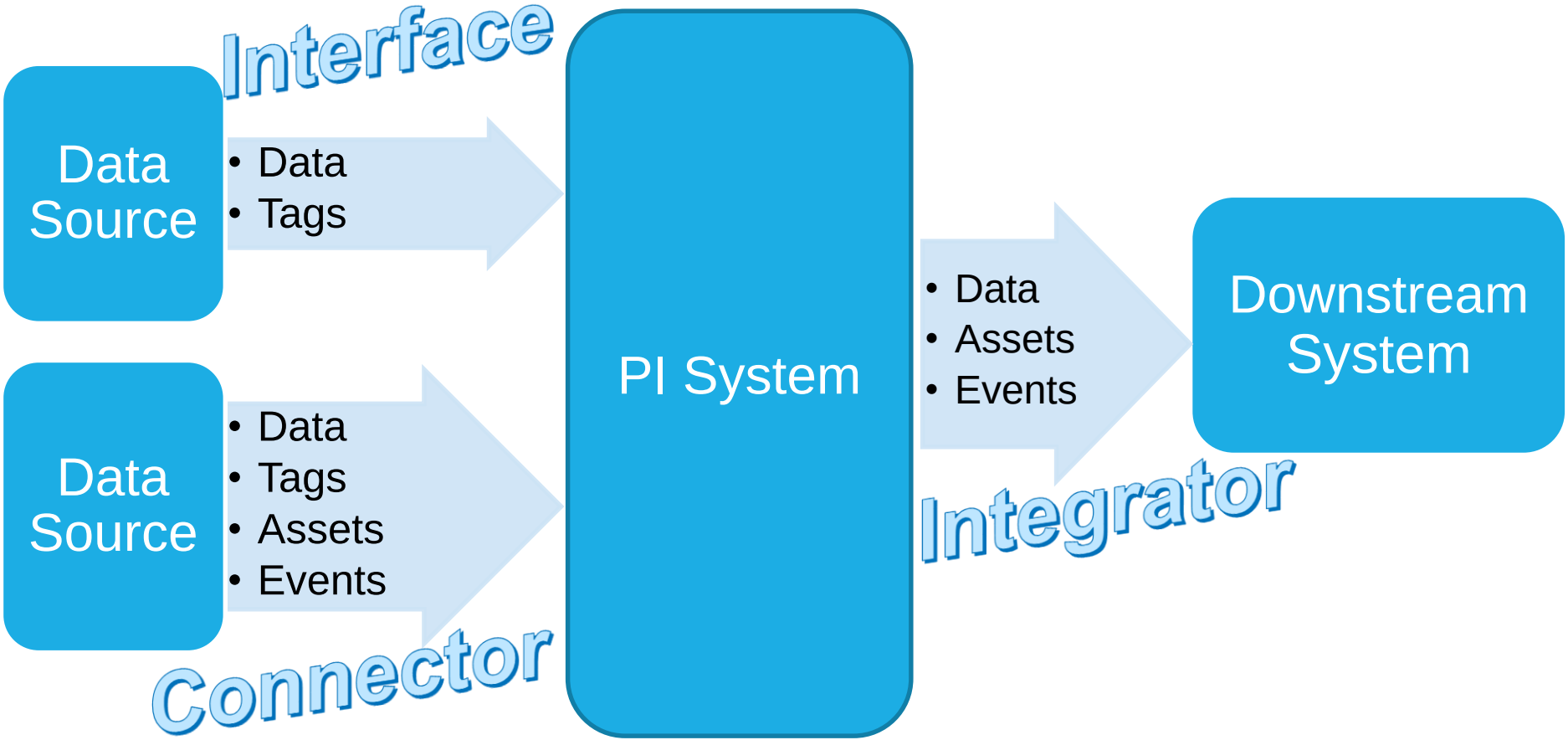
Collect high speed data

Embedded

Run on embedded devices / Linux

Secure

Security



Released PI Connectors

PI Connector	Market	Status
IPMI	Data centers	
CygNet	Upstream Oil and Gas	
EtherNet/IP	High-speed discrete mfg	
IEC 608070-5-104	T&D, substations	
HART-IP	Wired and wireless sensors	
Wonderware Historian	Many industries	

PI Connector	Market	Notes	Status
HART-IP	Many. Wired and wireless sensors	v 1.1	RC
Wonderware Historian	Many	v 1.0.1	RC
DC Systems RTscada	T&D, others		RC
CygNet	Oil and gas, upstream	v 1.1	RC
IPMI	Data centers	v 1.1	RC
BACnet	Facilities (across industry)		Beta
Siemens Simatic PCS 7	Many	Based on OPC UA	Beta
WITSML	Oil and gas, upstream , drilling		Alpha
DNP3 (Cisco devices)	T&D	Linux, small footprint	Alpha
UFL compatible conn.	All	REST endpoint to pass data to	Dev
“PI System” Connector	Aggregate PI Servers (AF, tags, data)	Working product name	Research
IEC 60870-5-104	T&D Substations	v 1.1	Planned
IEC 61850	T&D Substations and others		Planned
EtherNet/IP	High-speed discrete mfg	v 1.0.1	Planned
Redfish	Data centers		Planned

PI Connectors – what's next?

- **Units of Measure** support
- **Improved data quality** – system digital states in addition to questionable bit)
- **Support for embedded Linux** potentially for many connectors (DNP3 on Cisco already shown)
- **Asset mapping** research to map data source AF model that connector creates to process or business model

PI Interfaces – what's next?

- New Uniint v4.6 with enhanced security:
  - Least privileges – service runs under
  - Whitelist for output points
  - Read-only versions of PI Interfaces
- Roll-out Uniint-based PI Interfaces
  - PI Interface for IEEE C37.118
  - PI Interface for ESCA HABConnect
  - PI to PI (security update + future data support)
  - As needed with planned updates and patches
  - Big 5 (OPC DA, PI to PI, Modbus, RDBMS, not UFL b/c non-uniint)

PI Integrators

Problem Complexity Drives the Need for Integrators

Disparate assets or interacting one-by-one

Interacting with common assets as a fleet

Complexity

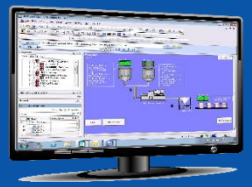
Monitoring

Real-time visibility

- HMI

Process Optimization

Real-time & historical view across any plant asset



- PI ProcessBook
- PI Coresight
- PI Datalink

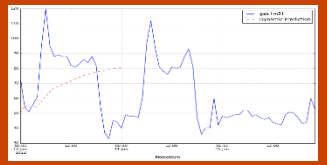
Benchmarking

Fleet-wide performance comparison

- BI App (ie Spotfire)
- PI Integrator for BI

System Optimization

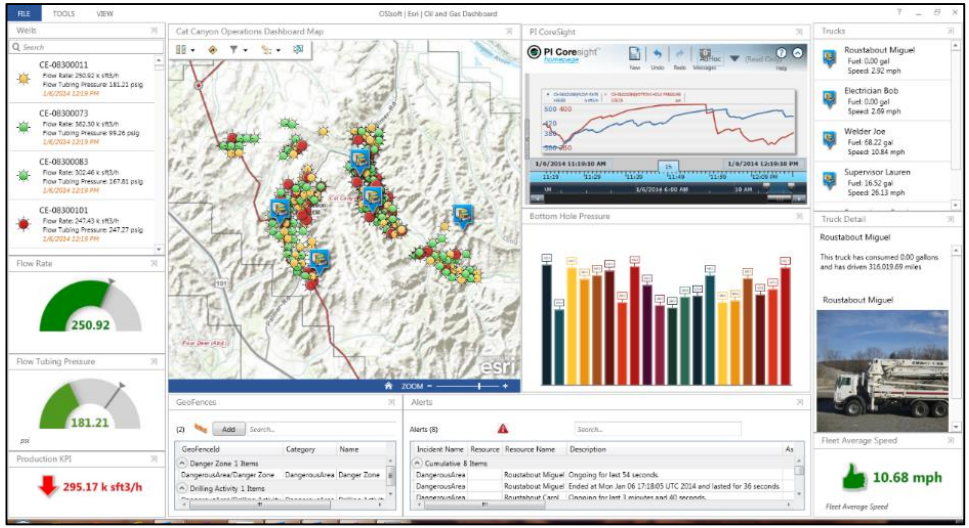
Fleet-wide prediction and prevention



- Machine Learning
- PI Integrator for ML

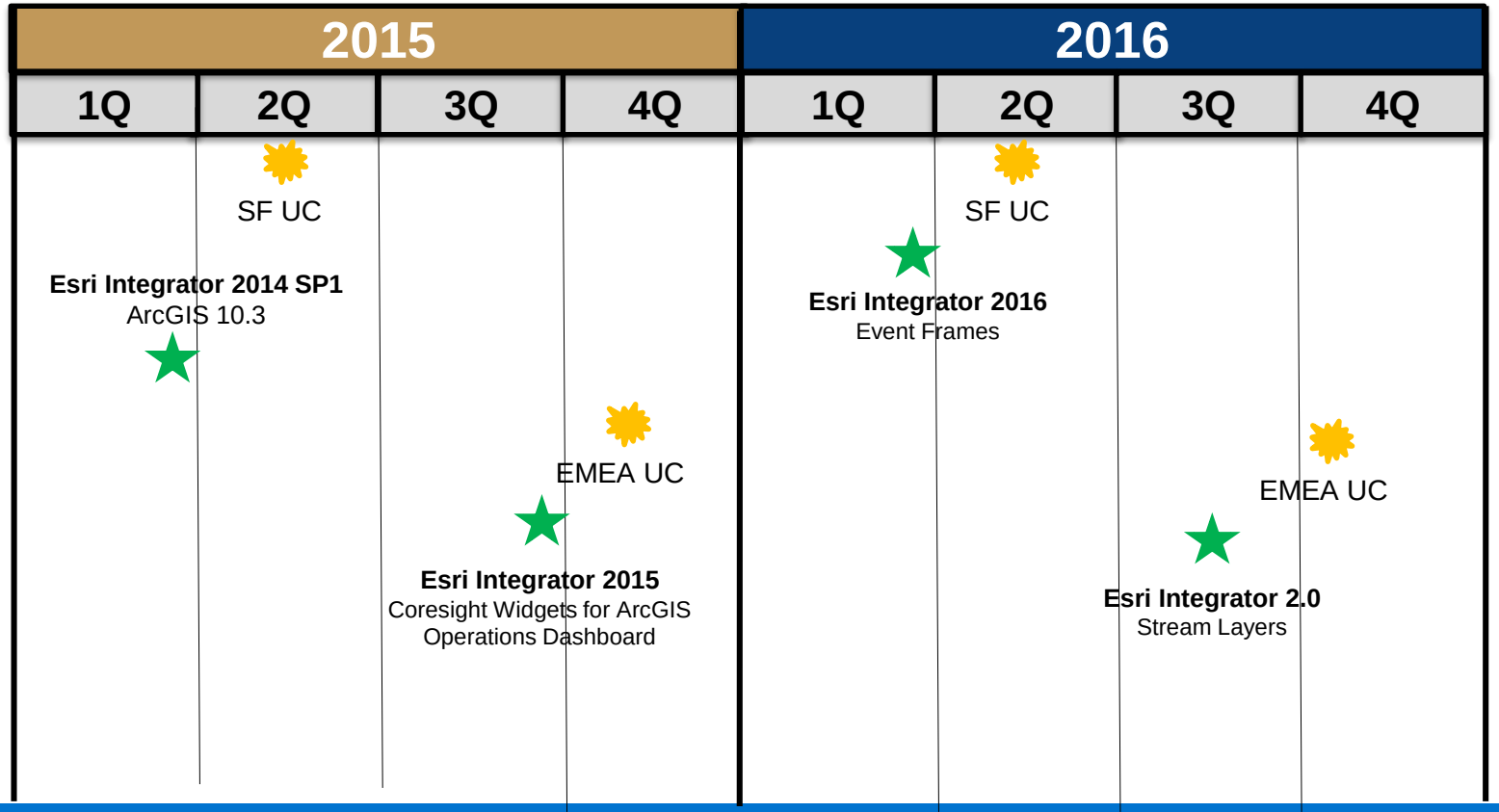
PI Integrator for Esri ArcGIS

Overlay assets and real-time information onto Esri maps



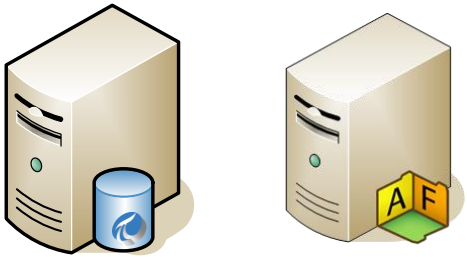
- Overview of your PI System assets using Esri maps
- Esri maps become live with PI System data
- Drill into asset data using PI Coresight
- Import Esri ArcGIS assets into PI AF

PI Integrator for Esri ArcGIS



PI Integrator for Business Analytics

System of Record



OSIsoft.

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

Needs

- Cleanse
- Aggregate
- Shape
- Transmit

Analytics Packages

Visual Analytics

Excel, tableau, QlikView, DATAWATCH, TIBCO Spotfire, COGNOS

Statistical Analytics

R, SAS, python, SAP

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

PI Integrators

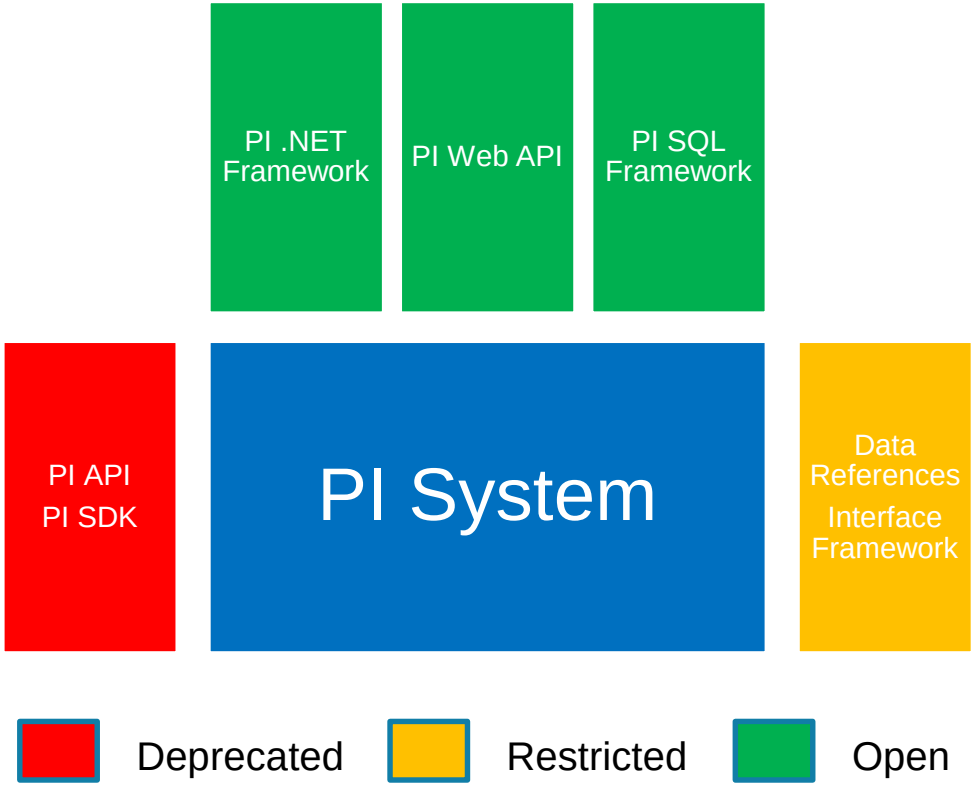
- PI Integrator for ESRI ArcGIS
- PI Integrator for Business Intelligence (3Q2015)
  - Data Designer UI
  - Data Extraction, Shaping, Cleansing
  - MS SQL Server - Intermediate Store
  - Pull Data from PI using ODBC
- PI Integrator for SAP HANA (3Q2015)
  - Uses Same above, but adds into HANA Smart Data Access (SDA)
  - Create virtual tables corresponding to Views in PI

PI Developer's Technology

Launching Open Licensing Rights

Developer Technology	
.NET Framework	AF SDK
PI Web API	Core Services OData (CTP) Indexed Search
PI SQL Framework	PI OLEDB Enterprise PI OLEDB Classic PI ODBC PI JDBC

PI Developer Platform



Modern Development

Expanded Developer Ecosystem

Hybrid PI System

2015

AFSDK 2015, 2015 R2

PI Web API 2015, R2, R3

PI Web API 2015 R2

Focus: PI Server 2015 Support

- Tested with and supports Data Archive/AF Server 2015
- Improved installation and configuration experience

Schedule

- Released with PI Server 2015 release

PI Web API 2015 R3

Focus: Performance, PI SaaS Support

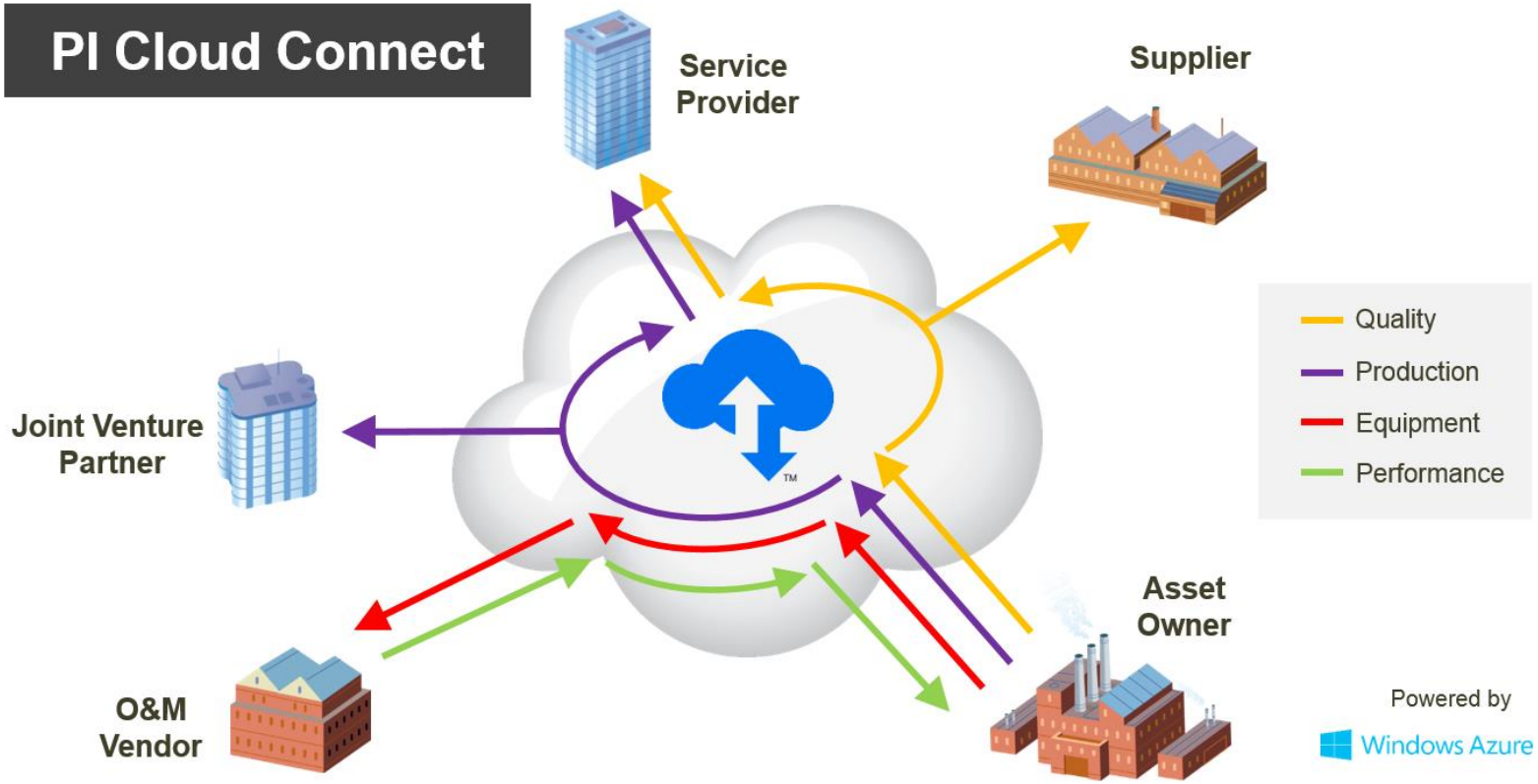
- Configuration utility
- Improved JSON serialization
  - This is currently the biggest performance bottleneck
  - We are replacing Microsoft's libraries with our own
- Multiple PI Web API requests in bulk
- PI SaaS Issues
  - URL length limitations in Microsoft Azure
  - Performance testing and profiling
  - WAAD Integration

Schedule

- 4th Quarter, 2015 release

PI Cloud Services

PI Cloud Connect



Development: PI Cloud Connect

- 100 Happy Customers
- Future Data
- Custom Tag Prefix
- Internal Tables
- More than 30 days of history

Research: PI SaaS

Customer Value

Immediate

- Lower support cost
- Administration free
- Rapid commissioning
- Scalable & elastic
- Highly available & redundant

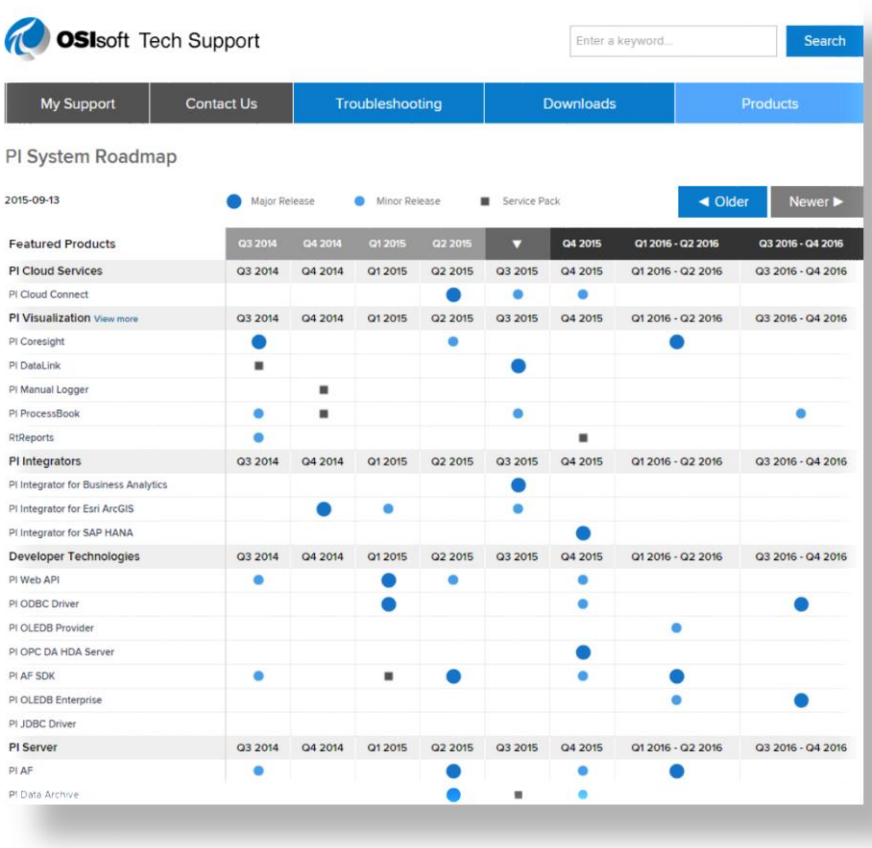
Long Term

- Provide a path for the future
  - Evolve to a hybrid offering
- Begin next generation
  - Services and servers

PI System Roadmap

Most up to date info on releases:

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



Contact Information

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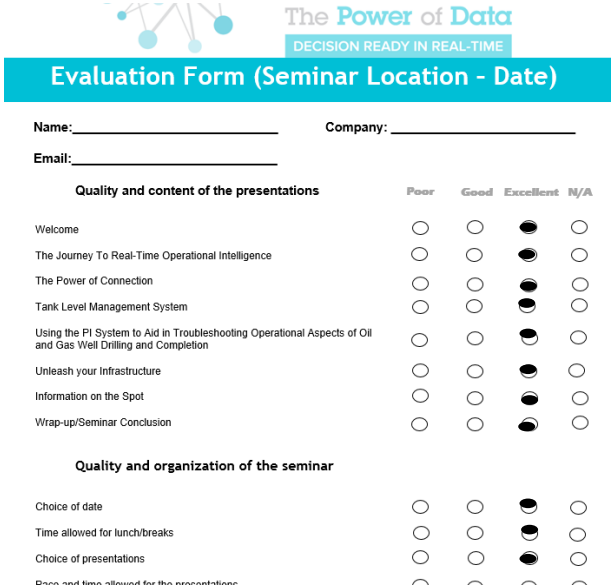
Questions

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

State your **name & company**

Please don't forget to…

Complete the Survey for this session



The Power of Data

DECISION READY IN REAL-TIME

Evaluation Form (Seminar Location - Date)

Name:_____ Company: _____

Email:_____

Quality and content of the presentations	Poor	Good	Excellent	N/A
Welcome	○	○	●	○
The Journey To Real-Time Operational Intelligence	○	○	●	○
The Power of Connection	○	○	●	○
Tank Level Management System	○	○	●	○
Using the PI System to Aid in Troubleshooting Operational Aspects of Oil and Gas Well Drilling and Completion	○	○	●	○
Unleash your Infrastructure	○	○	●	○
Information on the Spot	○	○	●	○
Wrap-up/Seminar Conclusion	○	○	●	○

Quality and organization of the seminar				
Choice of date	○	○	●	○
Time allowed for lunch/breaks	○	○	●	○
Choice of presentations	○	○	●	○
Pace and time allowed for the presentations	○	○	●	○

감사합니다

谢谢

Danke

Gracias

Merci

Thank You

ありがとう

Спасибо

Obrigado