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USERS CONFERENCE 2015

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PI System Roadmap for the Enterprise Data Infrastructure

Presented by Mark Hughes

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Managing Complexity

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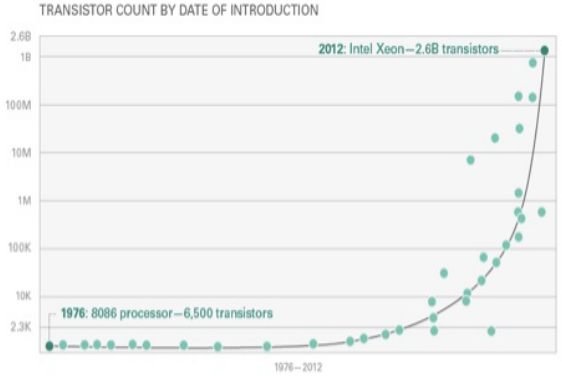
Why are systems getting more complicated?



Moore's Law

HART at the Speed of Ethernet

Distributed Network Protocol

WITSML™

ASHRAE BACnet™

More data transport protocols

Security requirements

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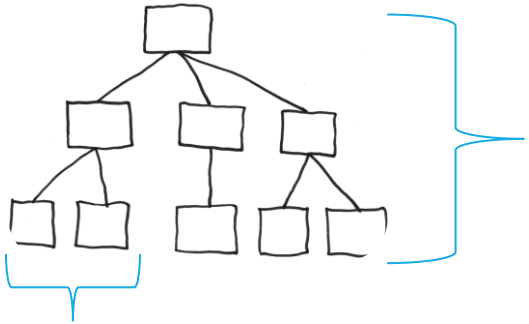
How to handle more of everything: Asset Framework & Event Frames

Context



Hierarchy

Grouping

Common Names
Units of Measure
Hidden and Excluded Attributes New

Consistency

Reuse

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New features

- PI Server 2015
  - Batch Database migration to Event Frames
  - Hidden and Excluded attributes
- PI Web API 2015 – edit Asset Framework and Event Frame databases

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Next year

- PI Notifications
- Asset Analytics enhancements
- System management improvements in the PI Data Archive

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Data Protocols

BACnet

DNP3

EtherNet/IP

HART-IP

IEC 60870-5-104

IPMI

OPC Unified Architecture

WITSML

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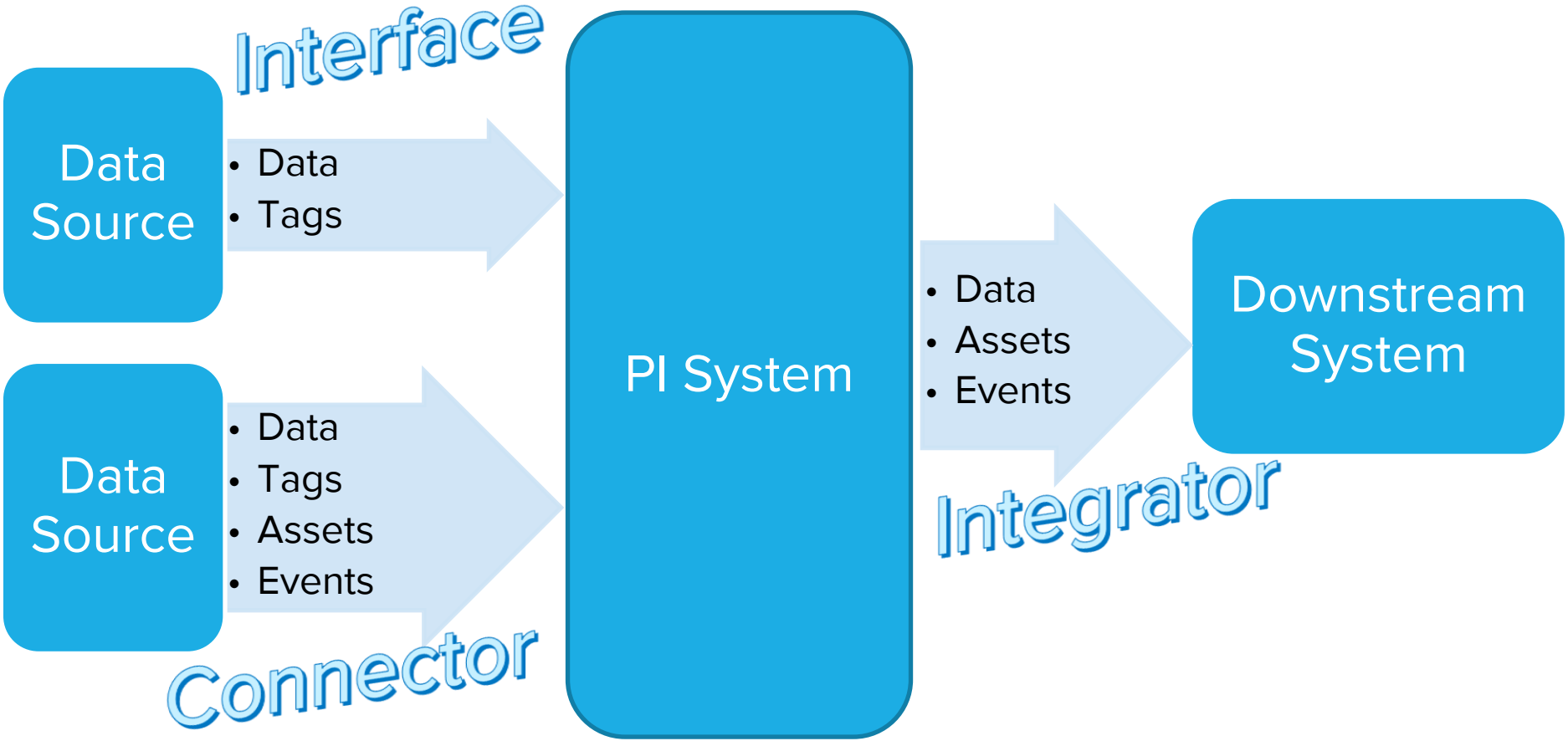

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Advantages of PI Connectors

- Auto-discover & auto-create assets and tags
- Collect event data type (Event Frames)
- Simple configuration
- Higher speed
- Ability to run on Linux
- Security

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New PI Connectors

BACnet (beta)

DNP3 (in development)

EtherNet/IP (released)

HART-IP (beta)

IEC 60870-5-104 (beta)

IPMI (released)

OPC UA (in development for Siemens SIMATIC PCS 7)

WITSML (in development)

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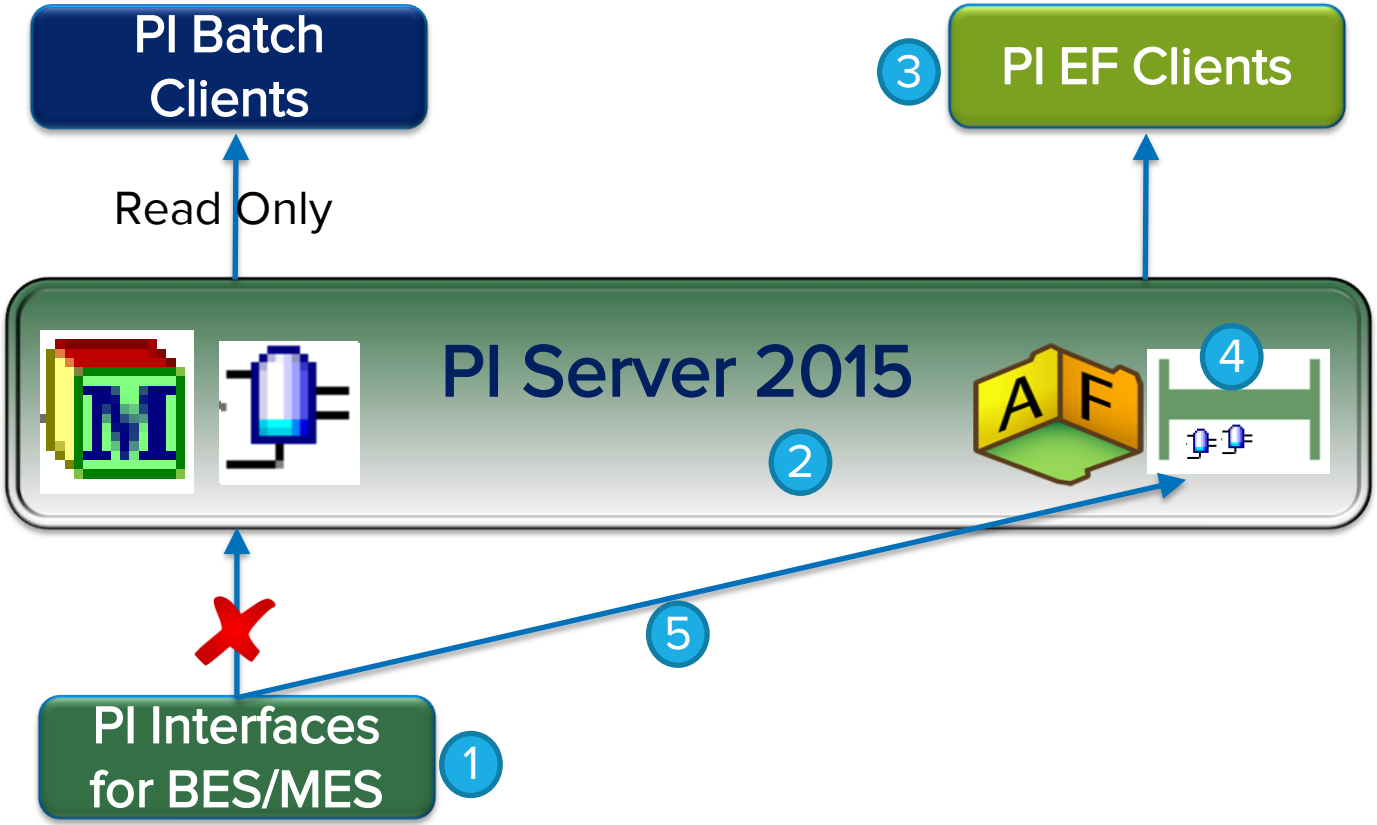
Batch to PI Event Frames Migration Process



1. Upgrade Interfaces
2. Upgrade Server
3. Install EF Clients
4. Migrate Batch Data
5. Switch Interfaces

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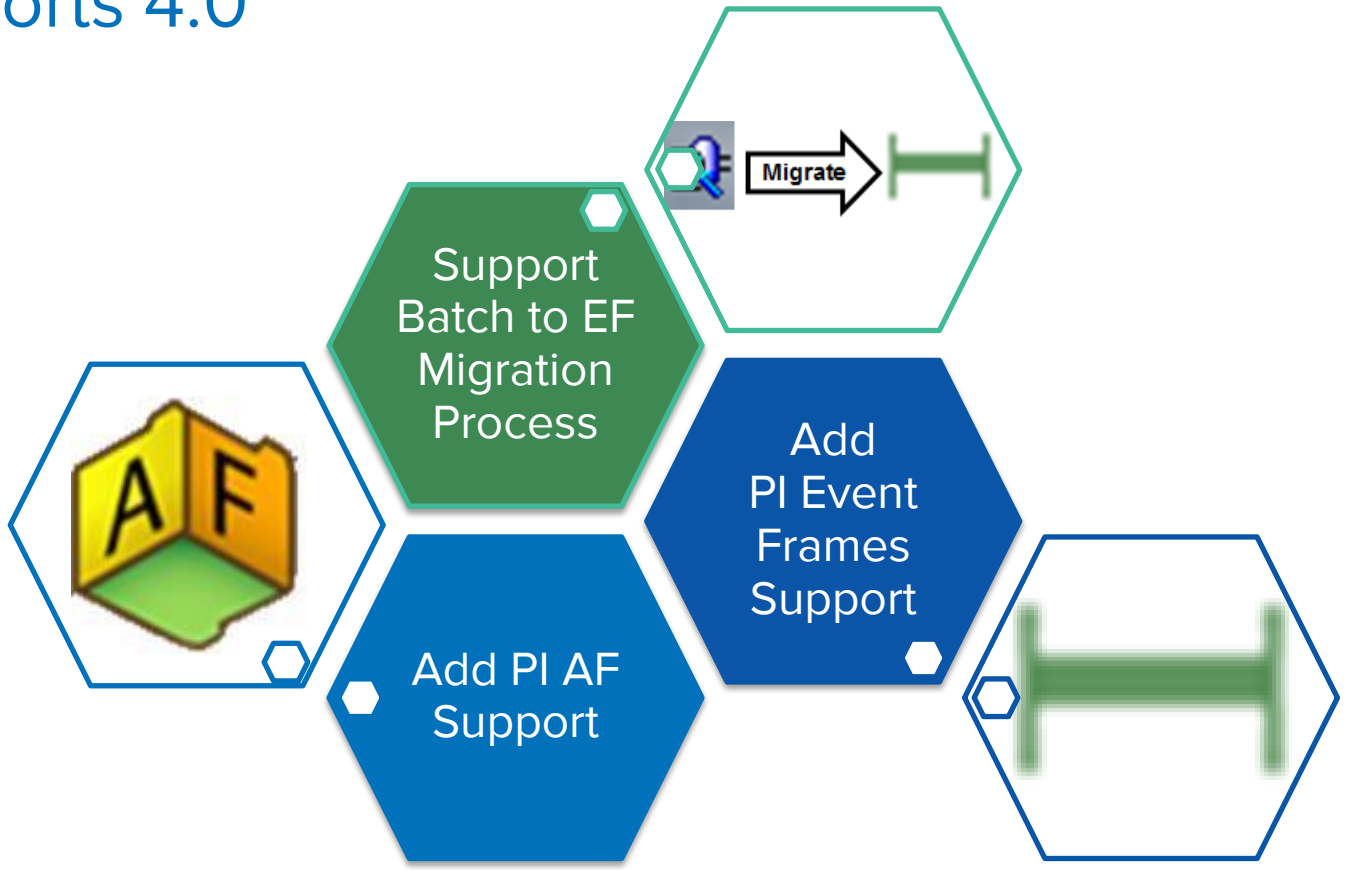
RtReports 4.0



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Security

- Identity
- Transport security

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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

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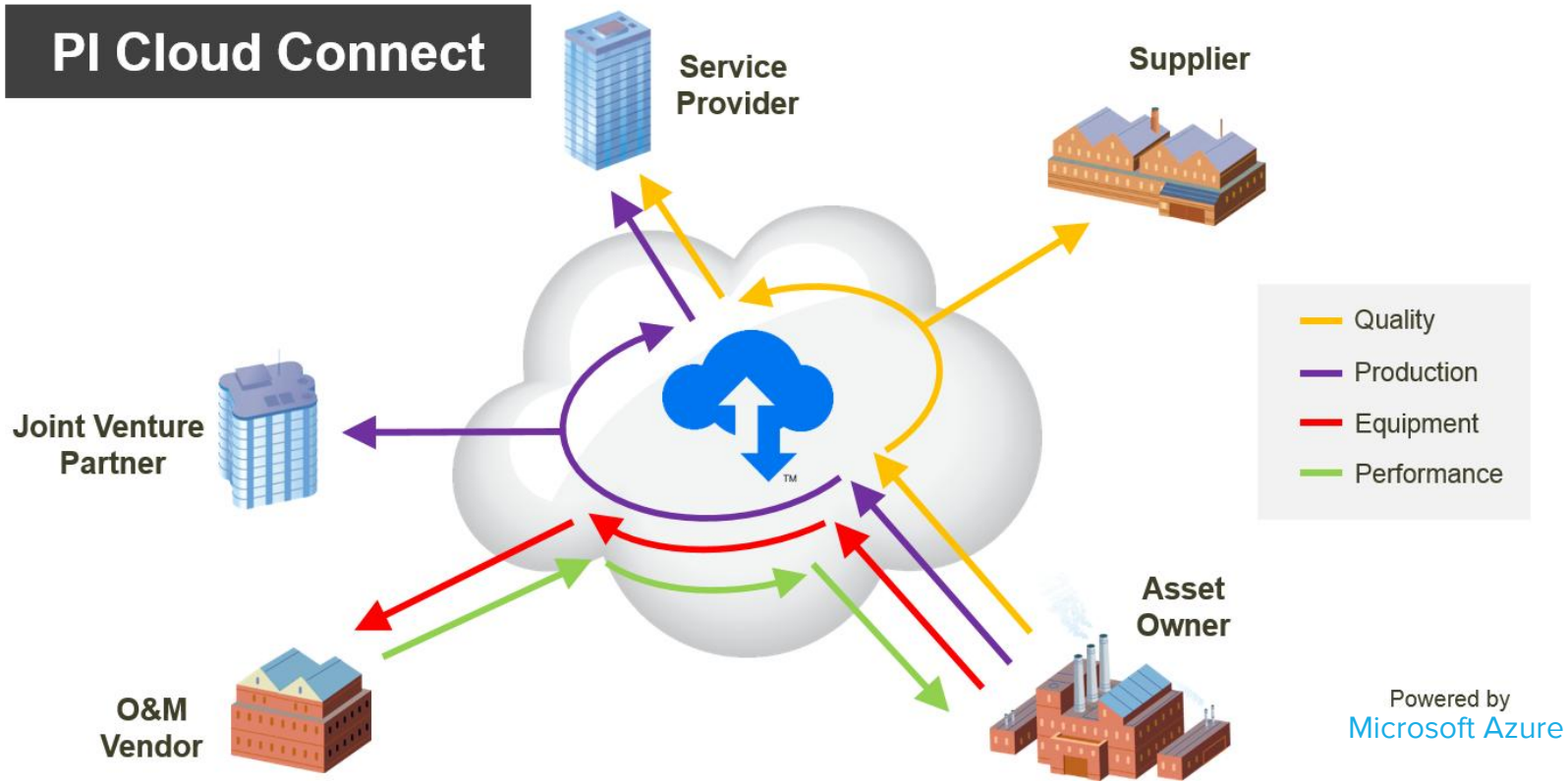
Software as a Service



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Managing Complexity

- PI Asset Framework & PI Event Frames
- PI Connectors
- Batch Migration
- Security (transport security, claims-based identity)
- PI Cloud Connect

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Data

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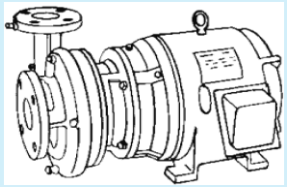
Asset Analytics

Element Template



Analysis Template

- Schedule or Attribute triggers
- Expressions or rollups or event frame generation

Element

Analysis

- Applied to specific attributes
- Automatically follows changes to template

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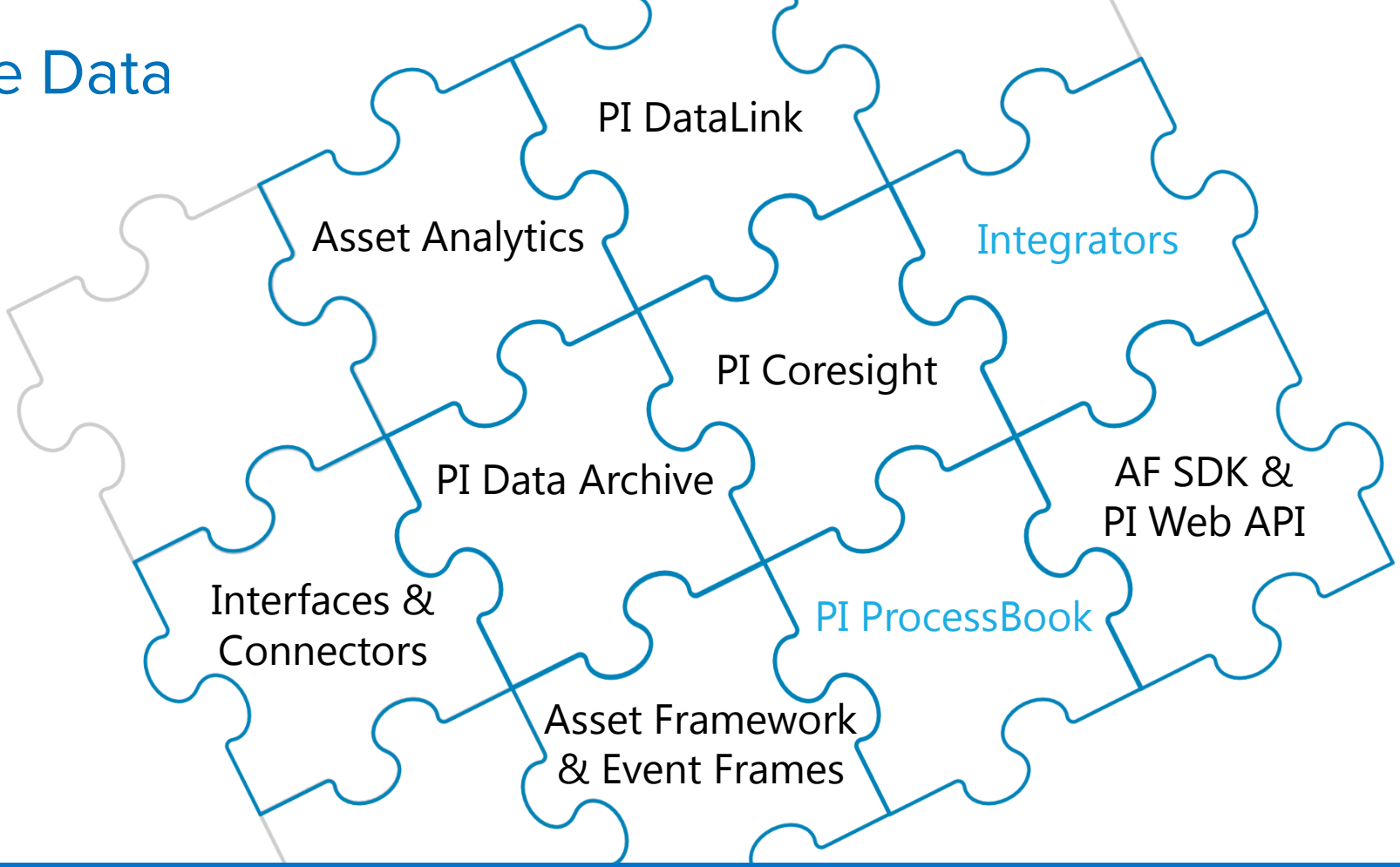
Future Data



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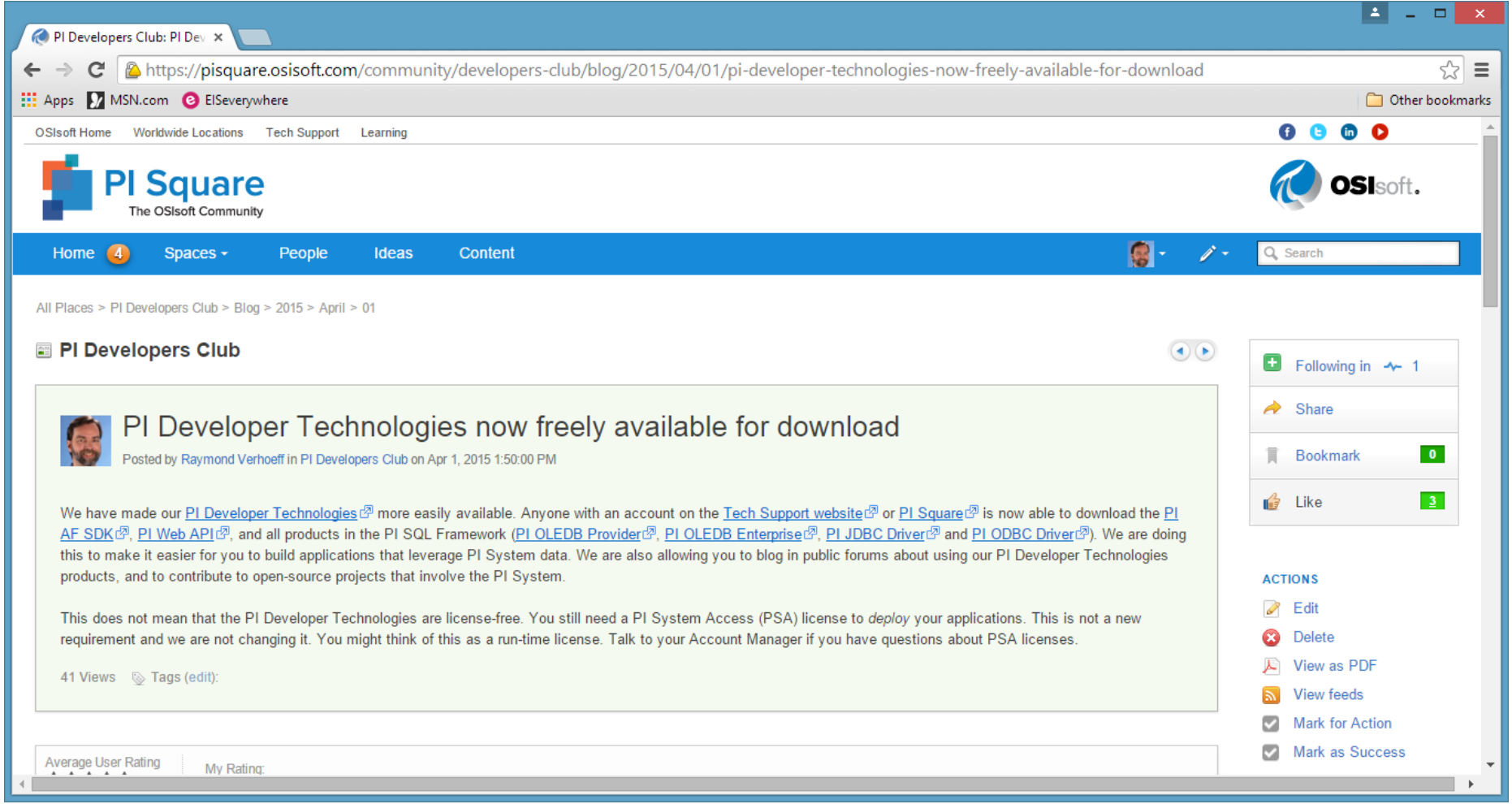

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Launching Open Licensing Rights

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

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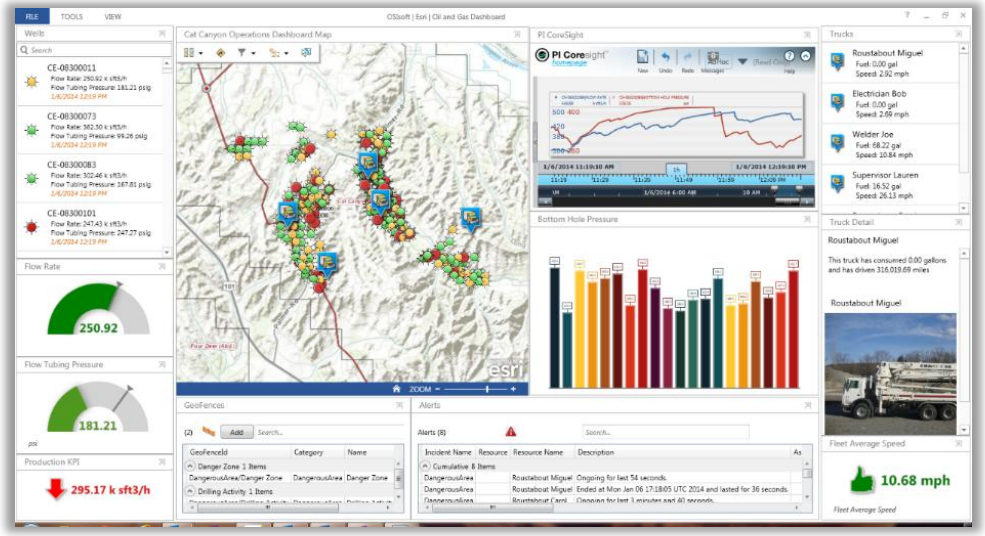
PI Integrator for Esri ArcGIS

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

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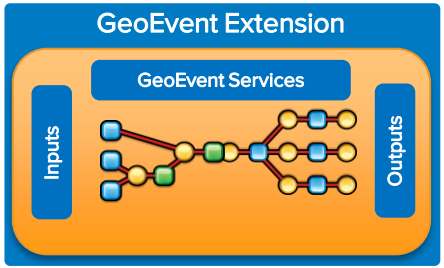
New Features in PI Integrator for Esri ArcGIS

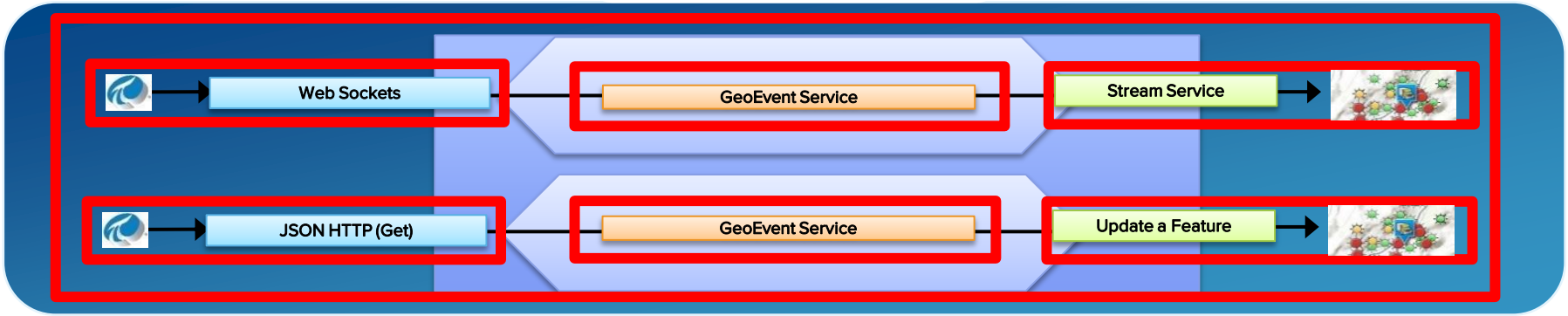
Version 2014 SP1 (March 2015)

- ArcGIS v 10.3.0 support
- Oracle support



Version 2015 (Oct. 2015)

- Publish PI Event Frames to ArcGIS
- More Operations Dashboard widgets
- Add Stream Service support through web



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Business Intelligence, MapReduce, Machine Learning

Fleet Assets and Different Brands

Optimization

Startups and Plant turn-arounds

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Why do you need a PI Integrator?

Real-time Data isn't perfect

- Naturally incomplete (delays, shutdowns)
- Not evenly spaced
- Doesn't look and behave like SQL (RDBMS)
- Subject to errors in measurement
- Varies in fidelity
- Needs context (Assets, Events)
- Hard to collect effectively

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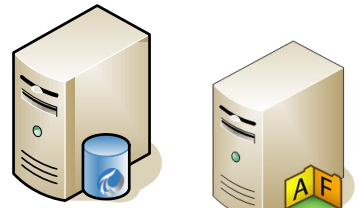
From Raw Data to Decision Ready Data



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System of Record

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

Needs:

- Cleanse
- Augment
- Shape
- Transmit

Visual Analytics

Excel, tableau, Spotfire TIBCO Software, COGNOS, QlikView

Statistical Analytics

hadoop MapReduce, sas, SAP

Analytics Packages

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

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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

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Data

- Asset Analytics
- Future data
- Open SDKs
- Integrators
  - PI Integrator for Esri ArcGIS
  - PI Integrator for Business Intelligence
  - PI Integrator for SAP HANA

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Viewing data

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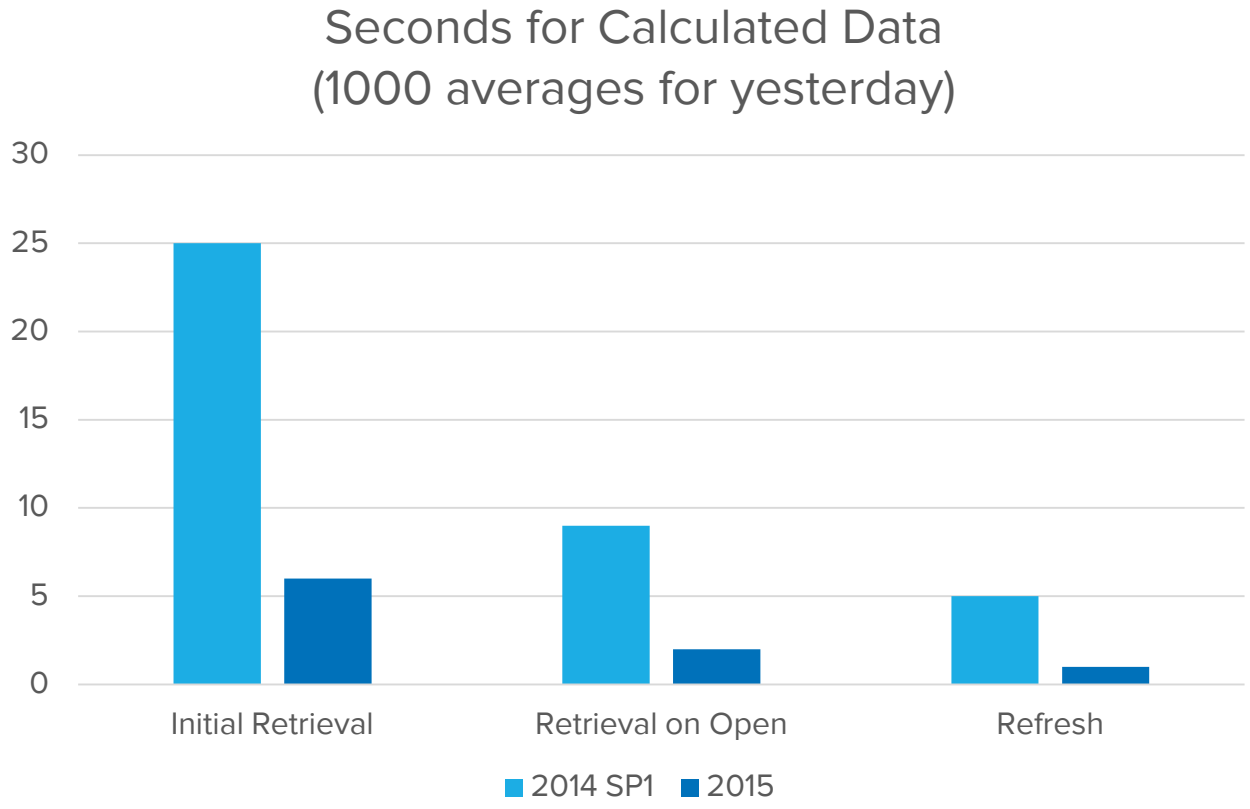
PI DataLink 2015



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PI Coresight 2014

- Fast and easy access to PI System data
- PI ProcessBook display viewing in any browser
- New mobile web site designed for small screens and accessible on any device

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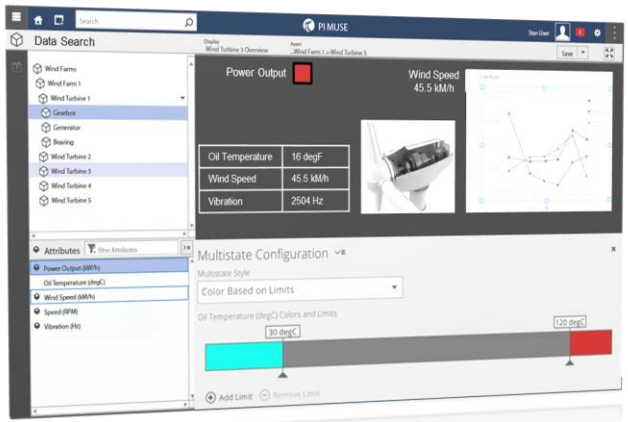
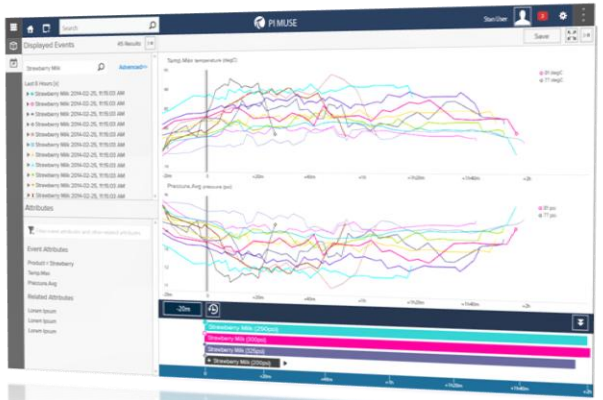
Visualization for today's PI System

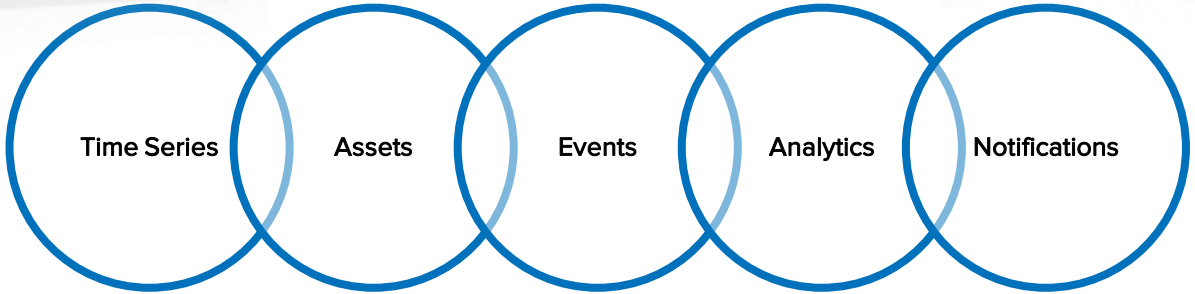


Authoring

Monitoring



Ad Hoc Analysis



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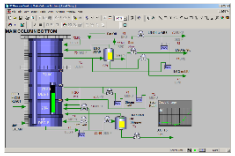


PI ProcessBook

Display Editor
Process Monitoring

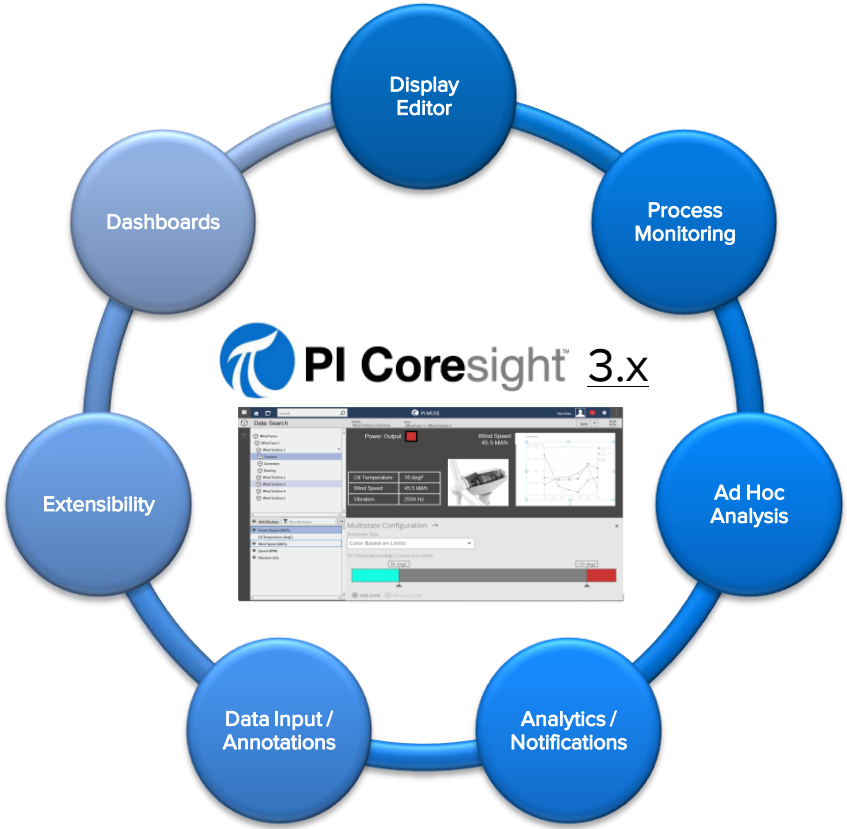
PI Coresight 2.x

Ad Hoc Analysis
PB Display Viewer

PI WebParts

Dashboards

TODAY (2015)



FUTURE (2016+)

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Viewing data

- PI DataLink
- PI Coresight
  - ProcessBook Viewer
  - Mobile experience
  - Event comparison
  - Notifications
  - Extensibility

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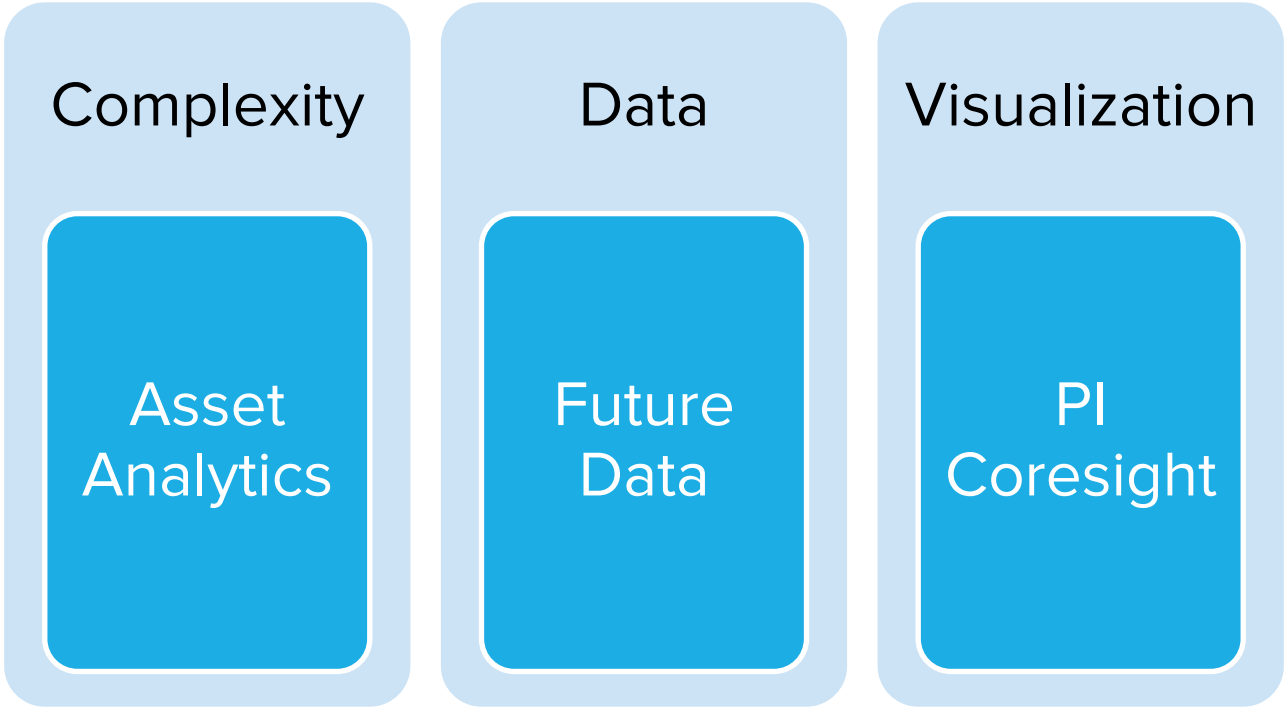
What should you do next?



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