PI System Product Roadmap

Presented by

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VP Marketing, OSIsoft LLC

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PI System Overview

The OSIsoft PI System is the highly scalable and secure real-time and event infrastructure that connects people and systems with the right operational information at the right time in order to *analyze, collaborate,* and *make smart decisions*

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PI System Themes

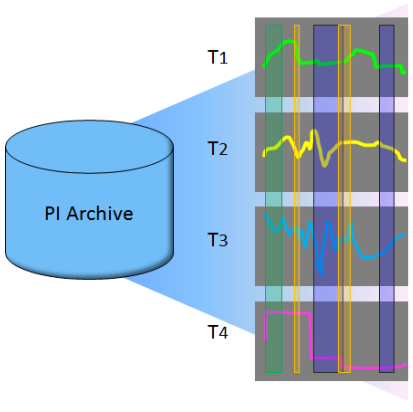
What are we working on?

Scaling

More data
More updates
More robust

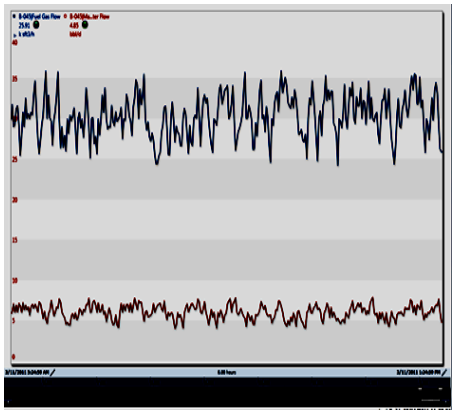
Analytics

Manage large numbers of calculations



Event Frames

Identify and user important events in your data



Visualization

The fastest, easiest way to visualize PI System data

Also, significant work in: Asset PI System, Security, Interfaces, Data Access

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Collect

- Interface Themes
  - High Speed
  - Meta Data, Auto Configuration
  - High Availability
  - Buffering
  - Proactively built—let us know if you have a data source in need.

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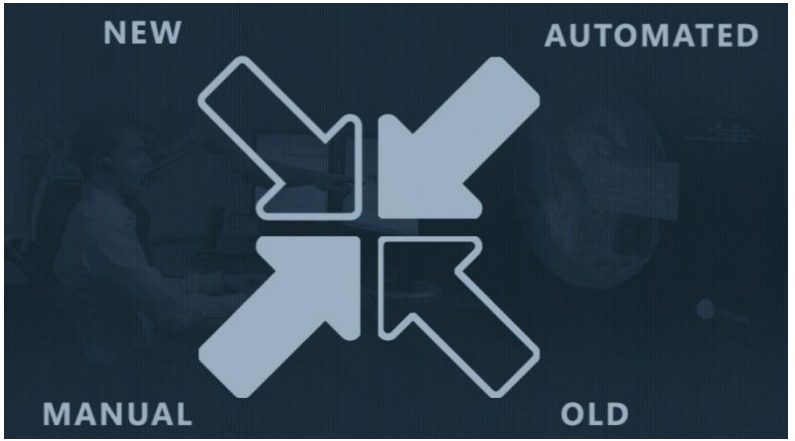
Collect

- Over 400 PI Interfaces getting data from:
  - Devices
  - Systems
  - Standards
  - Manually entered data
  - IT assets
  - Manufacturing assets
  - Databases
  - Internet



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Historize

- Store large volumes of data for a long period of time with the least amount of disk space possible.
- Allows retrieval of any data, no matter how old, in seconds.
- Securely Scale Up and Scale Out to support growing business needs

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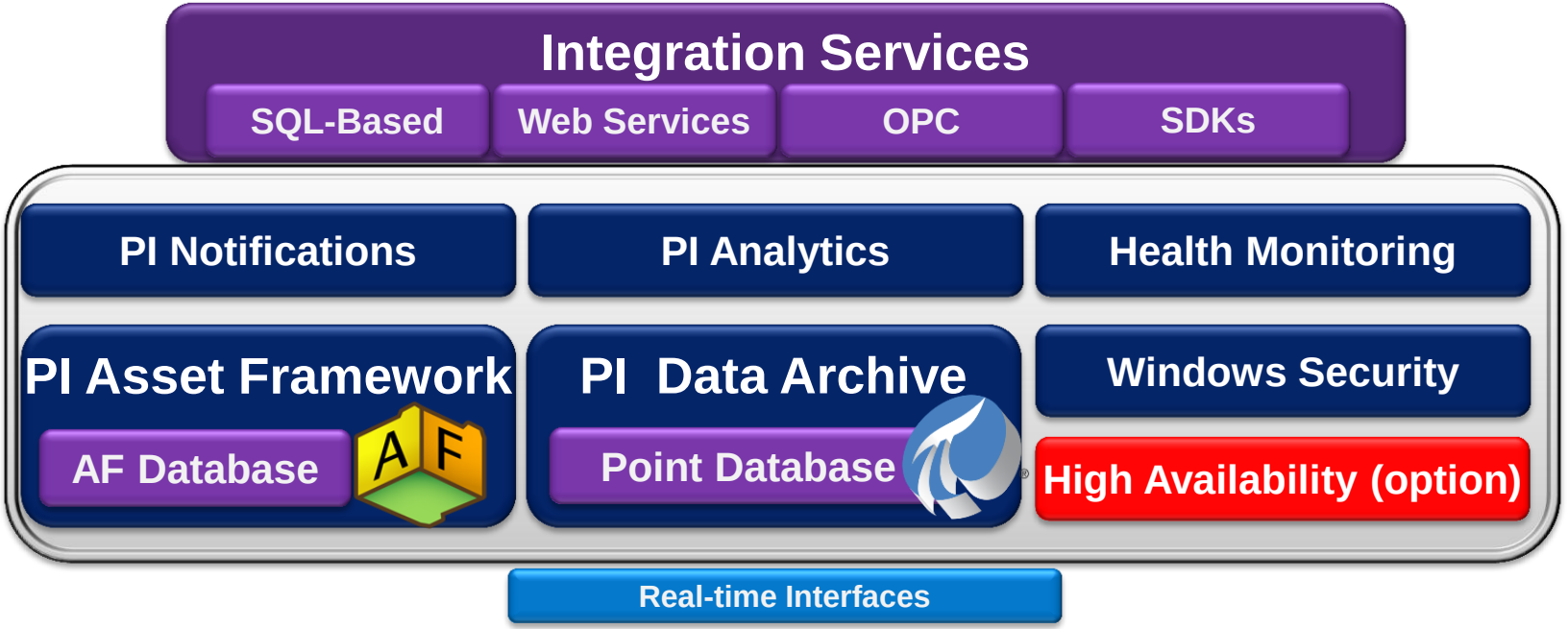
PI Server 2010



Real-Time Data
DCS / PLC / SCADA / OPC
HISTORIANS /
INTERFACES

Custom Data
APIs / SDKs

IT Data
IT MONITOR

Relational Data
OLEDB / ODBC
SQL SERVER /
ORACLE

Web Services
SOA / EXTERNAL DATA
LEGACY APPS

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Security

- Windows Integrated Security
  - True single sign-on (SSO)
  - Easier to manage
    - User account in Windows AD Only
    - Leverage AD tools and Policies
  - Upgrade experience
    - Backward compatible
    - PI SDK upgrade delivers to all clients
- Development efforts
  - External testing, Idaho National Labs
  - Programming standards and policies

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PI Server Future Direction: PI Server 2012

- More Scaling Goals:
  - 20 million data streams in a Single PI Server
  - 1 million events per second
  - Data In / Data Out – order of magnitude improvement
  - Significantly Faster Startup and Shutdown Time

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Find

- Find all data by name, relationship, or usage
- Find important configurations such as analytics and displays
- Easily find work that you or colleagues have already completed
- Organize and Categorize data so it’s easier to find next time
- Leverage your teams work

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PI Asset Framework (PI AF)

“An information model to organize and structure all your data with context”

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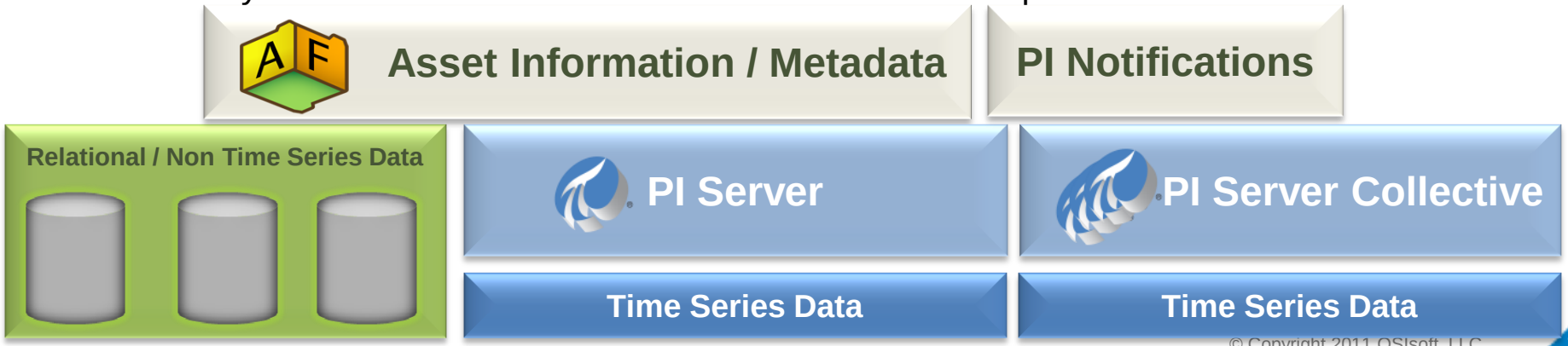
PI AF

- Asset centric view of your plant via elements and attributes – templates for standardization and reuse
- Build hierarchy, categories and connectivity models
- Data references to time series (PI Points) and other data
- Search across multiple PI Servers to find information
- Leverage PI Notifications
- Rich set of AF SDK functions to customize your applications
- Access your data via PI Web Services and PI OLEDB Enterprise



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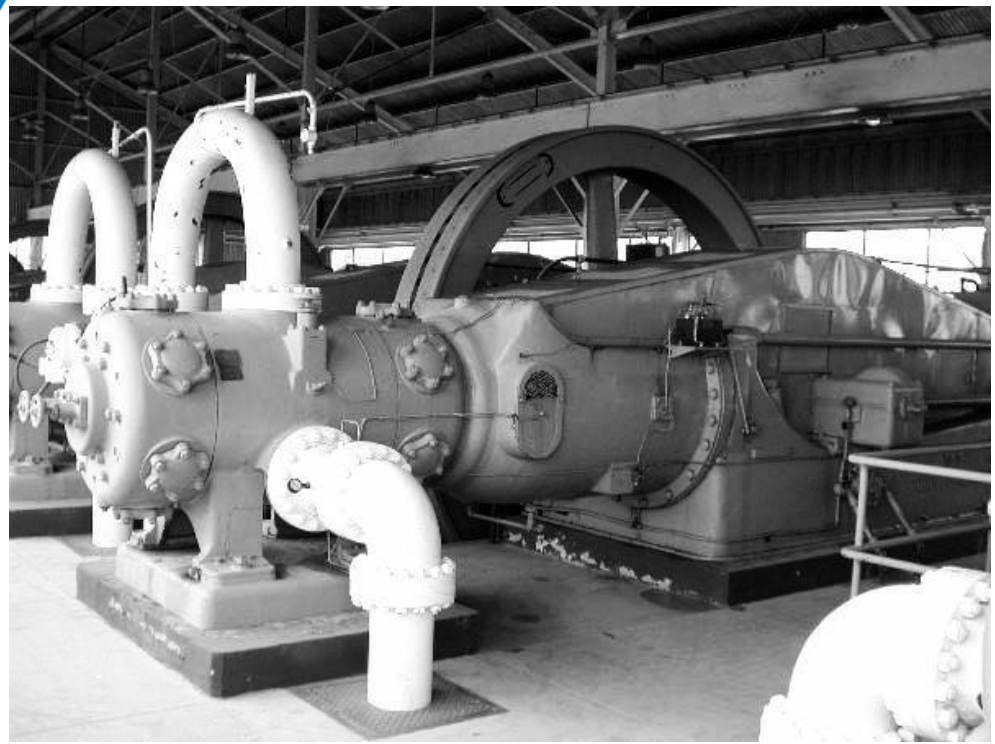
PI AF Assent Centric PI Example



Natural Gas Compressor

- RPM
- Fuel consumption rate
- Exhaust temperature
- Oxygen sensor

PI Tags

- Flow in
- Flow out
- Pressure differential

Calculations

- Last service date
- Service type
- Mfr documentation

External Database

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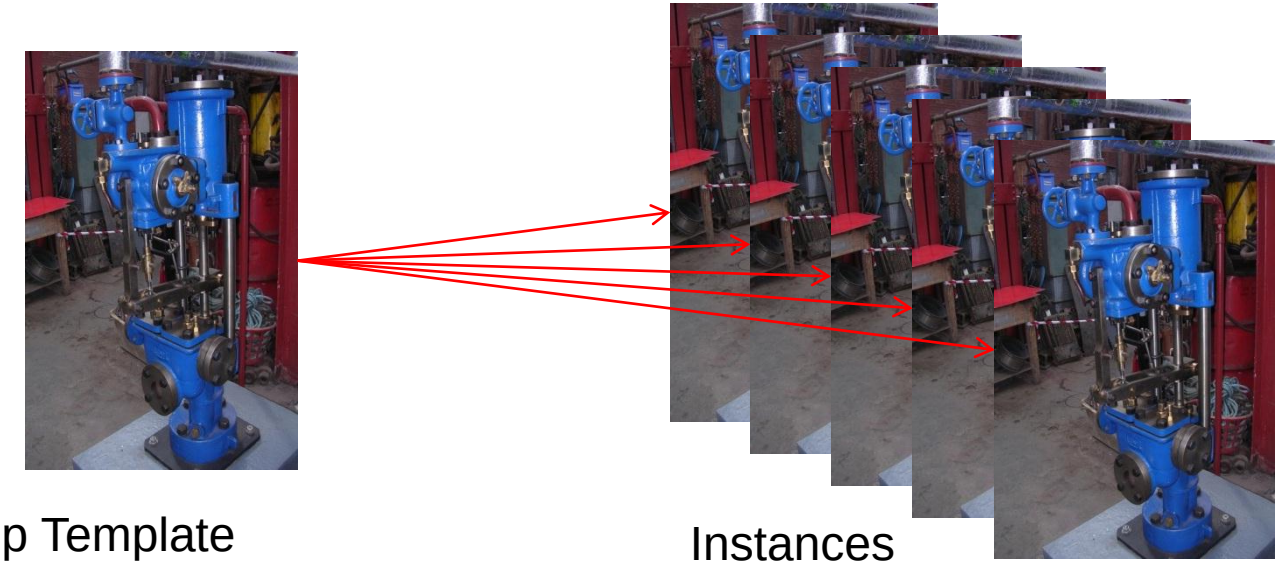
PI AF Elements and Attributes

- Element Templates can be created and reused for consistency – changes are propagated to each instance
- Elements can also be created without an Element Template for flexibility



Pump Template

Instances

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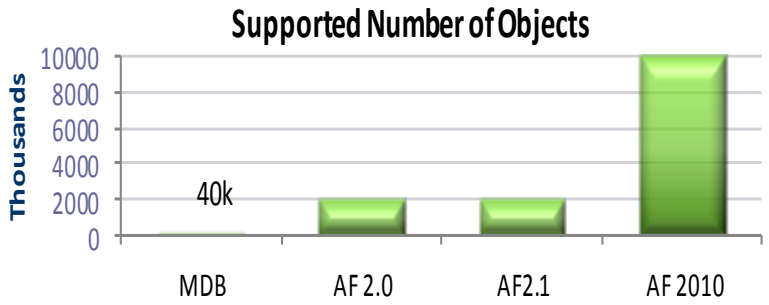
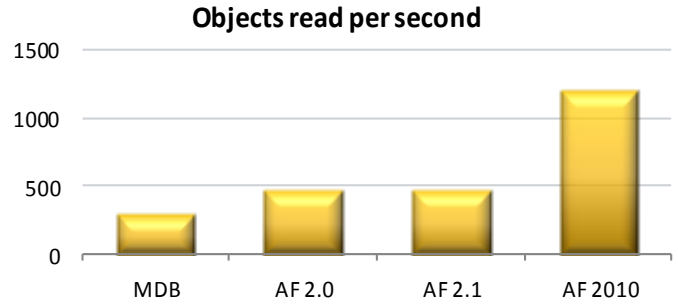
Trends of PI AF Server Performance

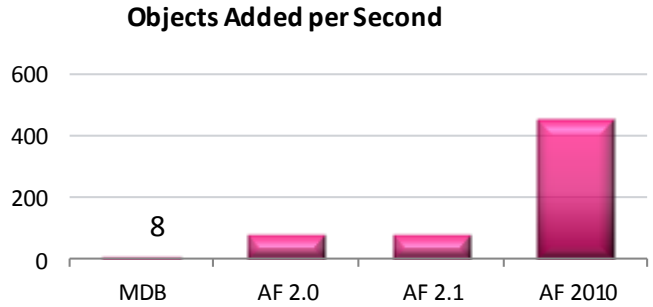
Total Objects



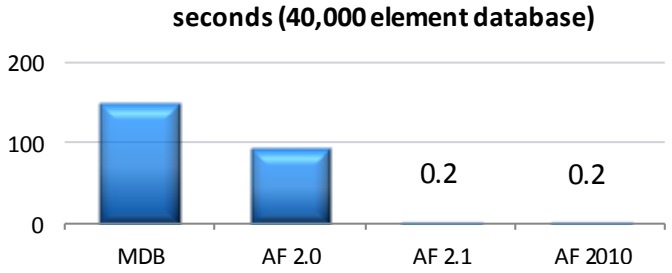
Read Performance



Insert Rate



Search Time



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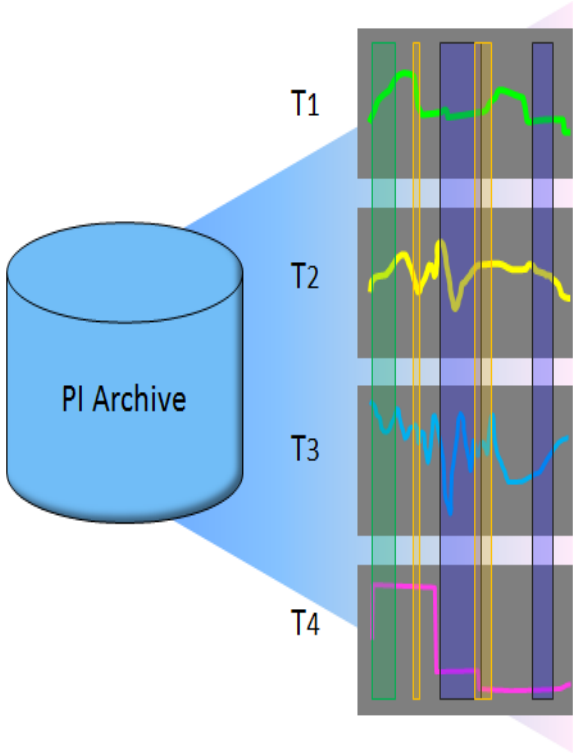
PI Event Frames

- Identify and name interesting time slices



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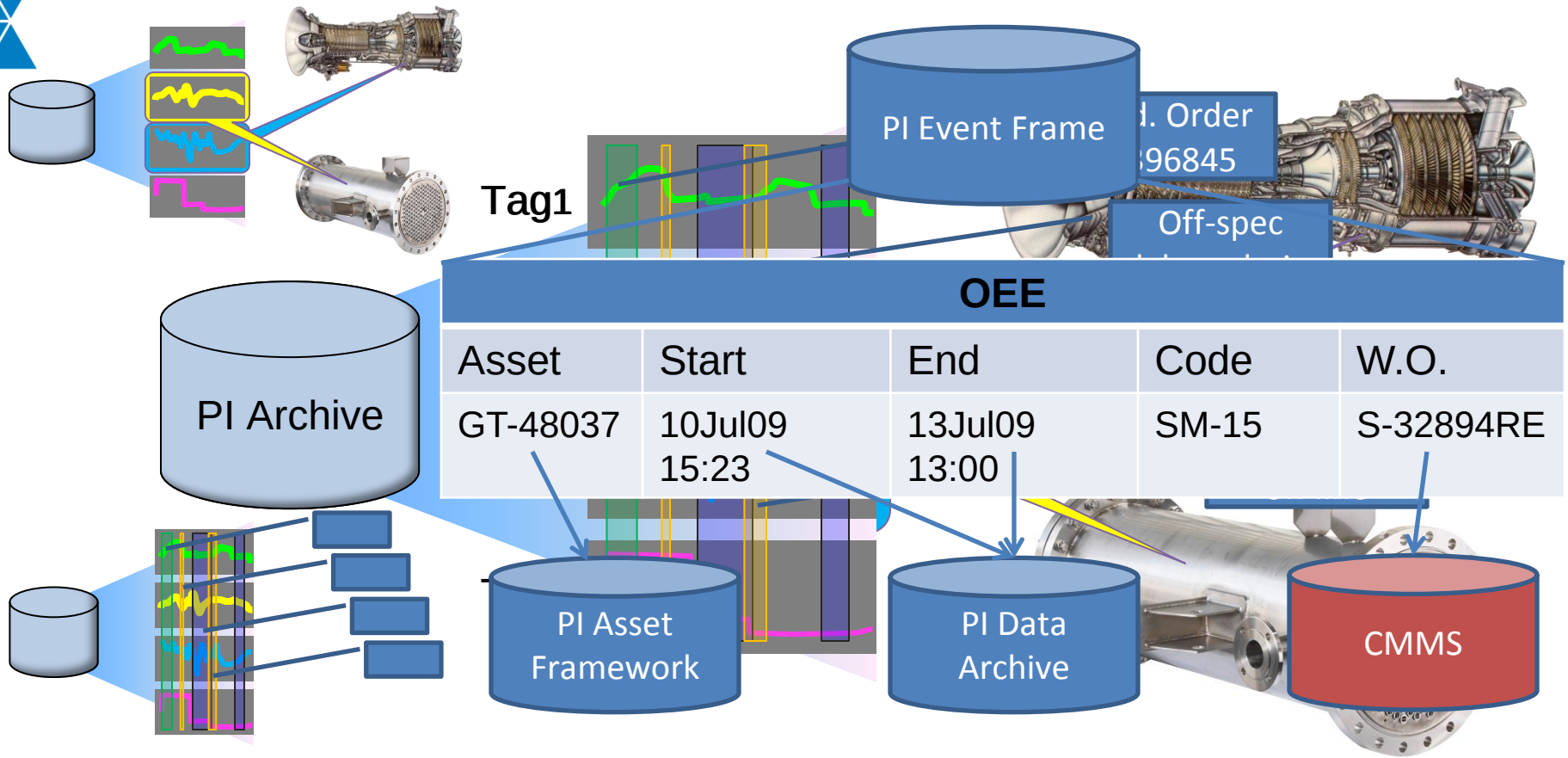

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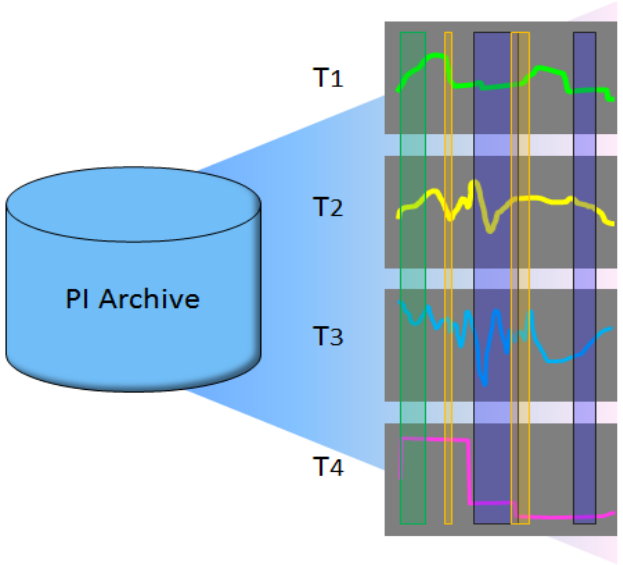
Event Frame Use Cases

- Any event in your process
  - Such as a downtime or incident
- Automatically identify important events
  - Based upon patterns in your PI data
- Search these events
- Visualize and analyze them
  - To improve your process

- *Imagine:*
  - A simple downtime tracking tool
  - Configuration, no programming



2011 Users Conference: PI Event Frames - Find Your Data by Events

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Event Frames – Infrastructure Changes

- Interfaces
  - Batch Interfaces
- Servers
  - Events Frames stored in AF Server
  - Batch to EF transition
- Analytics
  - Generating Event Frame on patterns
- Data Access
  - AF SDK
  - PI Web Services
  - PI OLEDB Enterprise & PI JDBC
- Clients
  - PI DataLink
  - PI WebParts
  - PI ProcessBook
  - PI Coresight

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Analyze

- Derive information from data
  - Combine data elements together
  - Aggregate totals and averages
  - Filter out irrelevant data.
  - Includes both configured and programmed analytics
  - Enables organizations to continually improve by analyzing data and obtaining insight into their operations.

BATCH ID	PI MIN	PI AVG	PI MAX	PI RANGE	PI STDEV
MP_20090911_115632	147.1	172.6	205.6	58.5	13.6
MP_20090910_204531	266.7	316.9	366.9	100.2	26.5
MP_20090910_170536	32.8	102.5	230.0	197.2	36.4
MP_20090910_160842	141.8	188.3	220.1	78.4	21.6
MP_20090909_220449	230.0	328.4	426.3	196.3	56.2
MP_20090909_153813	201.5	256.4	289.0	87.5	18.2
MP_20090909_142545	264.1	291.1	327.9	63.8	14.7
MP_20090909_132727	295.4	338.1	377.1	81.7	25.4
MP_20090902_171845	32.3	129.7	292.8	260.5	88.1
MP_20090902_153523	108.6	184.5	251.6	143.0	35.2
MP_20090901_204325	311.9	363.5	409.4	97.4	23.4
MP_20090831_194329	340.6	361.8	396.0	55.4	13.2

MIN	AVG	MAX	MAX	MAX
32.3	252.8	426.3	260.5	88.1

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PI Analytics Landscape

Configuration	Programming
PI Performance Equations	PI ACE
PI Totalizer	Microsoft StreamInsight & PI for StreamInsight
PI Real-time SQC	PI AF Custom Data Reference
PI AF Formula Data Reference	

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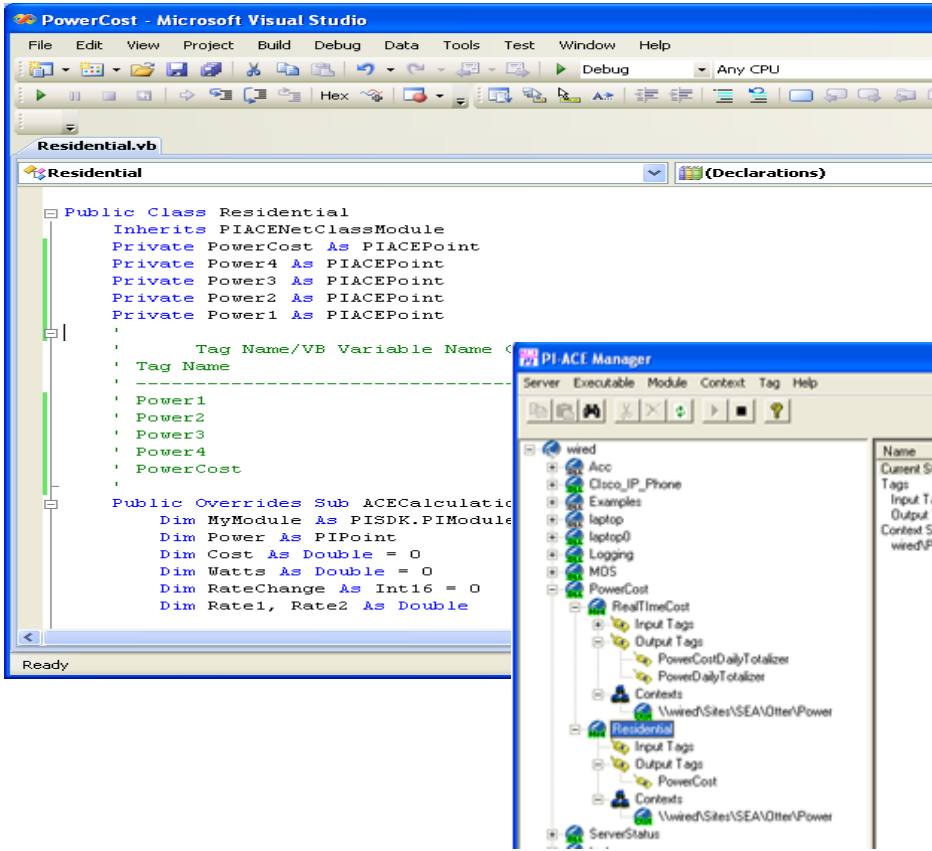
PI ACE 2010 R2

- Develop with Visual Studio
  - Wizard to simplify implementation
  - Flexibility of a programming environment
- Manage with configuration
  - Apply calculations to multiple assets
- Schedule
  - Scalability with multiple schedulers
- Examples
  - Condition based maintenance, KPI and roll-ups



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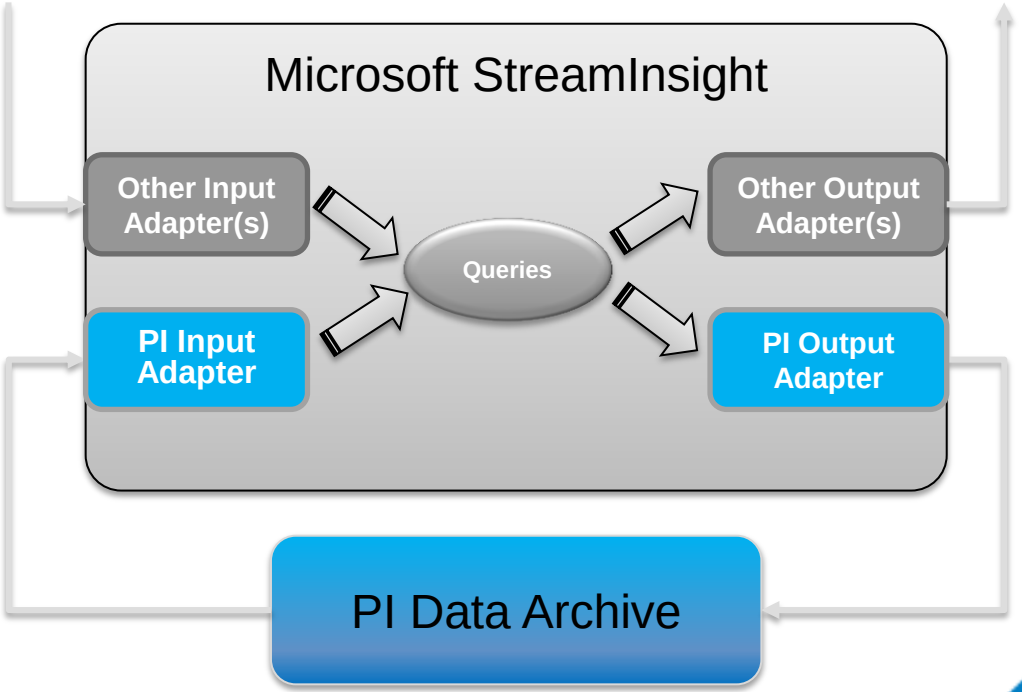
PI for StreamInsight

- Complex Event Processing for the PI System
- Leverages Microsoft's CEP Engine
  - StreamInsight
- "Standing" queries in LINQ
- High perform—all in-memory



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PI AF Configured Analytics - Goals

- Majority of your analytics through configuration
- Rich Configuration in PI AF
  - Merge of PE and Formula DR syntax
  - Configuring rollup calculations
- OSIsoft takes care of
  - Scheduling
  - Dependencies
  - Writing results to the PI System
- Very Large Scale
  - Improvements in data access
  - OSIsoft managed scale-out

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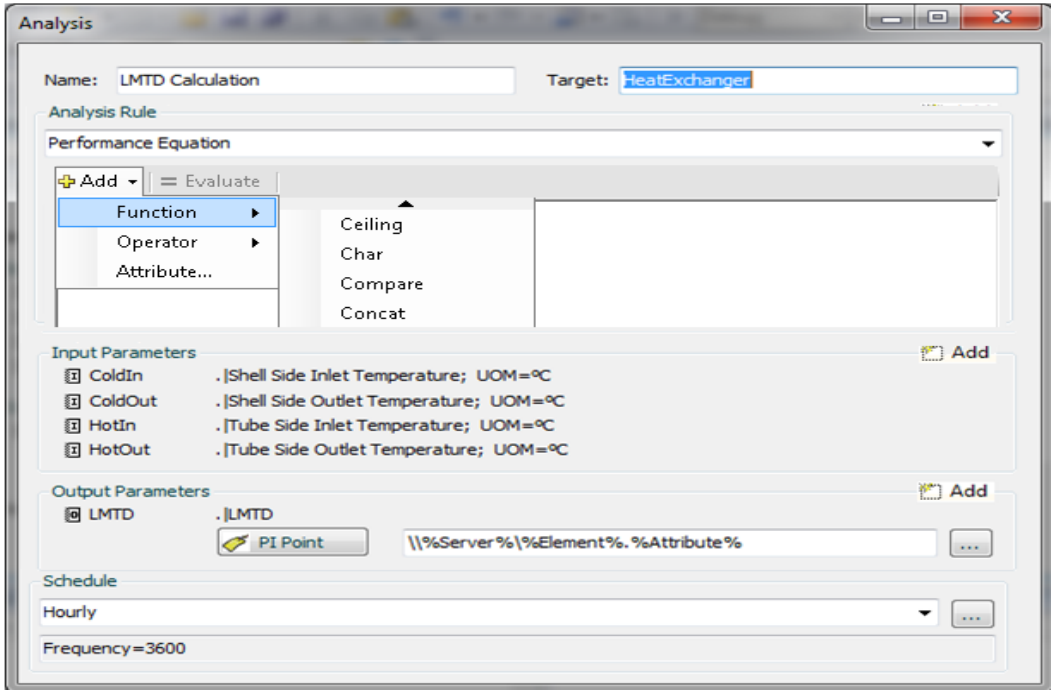
Analytics – Simple Configuration

- Equation defined on an attribute or a template



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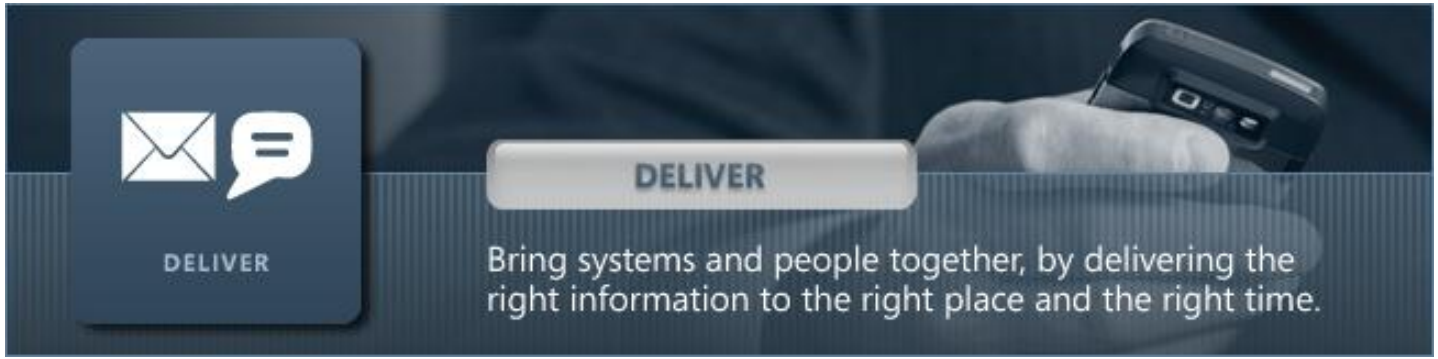
Deliver



- PI Notifications – deliver exceptions to humans or push to other systems
- ~~PI Data Access~~ PI Integration Services – enables development of custom PI System applications, as well as integration with business systems
  - SQL Data Access
  - Web Services
  - OPC Servers
  - Software Development Kits (SDKs)

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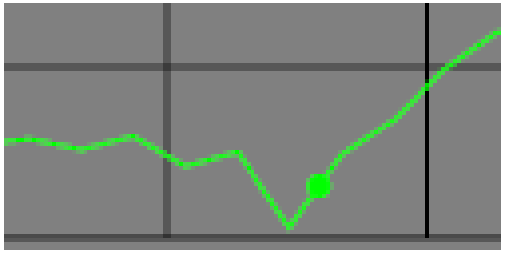
PI Notifications 2010 R2

- Define rules to identify key events
  - Comparison, PE, SQC, PI ACE, sensor value
- Customize information to send
  - Values, trigger condition, links
  - Recipients from Active Directory
- Deliver the notification
  - Email, Instant Message, or Web Service - Extensible
- Make sure someone acts
  - Acknowledgement and escalation
- Simplify deployment with templates



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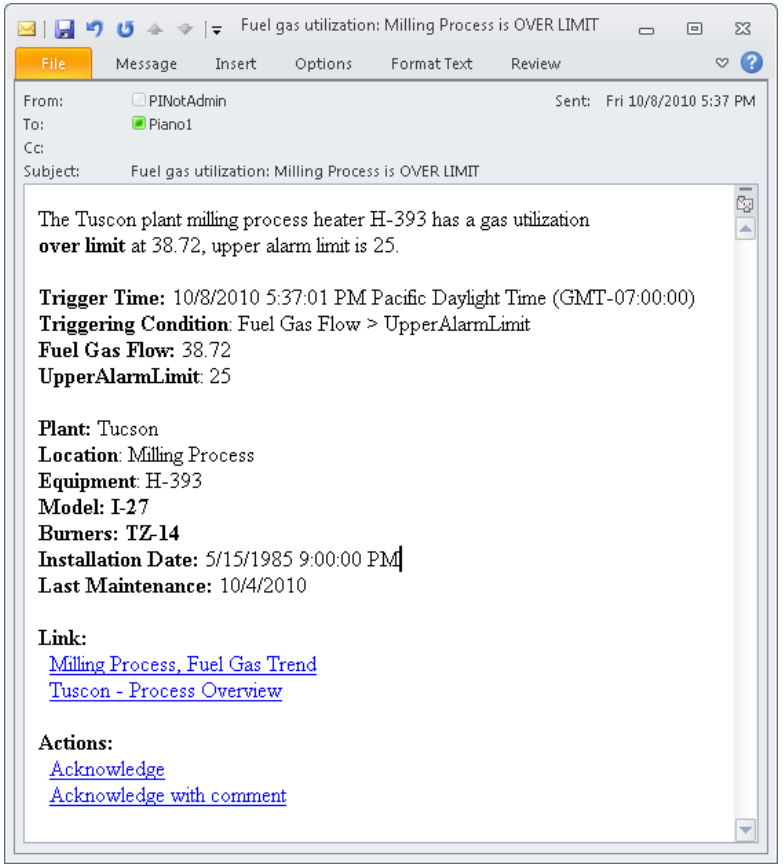
Delivery Channels

- How a message is delivered
- Supported Delivery Channels:
  - Email
  - Web Service
  - Microsoft Office Communicator / Lync
- Extensible – write your own!
  - Helper classes available
- OSIsoft vCampus example
  - XML delivery channel



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PI Integration Services: The 2010 Wave

SAP NetWeaver
SAP MII
IBM maximo
ORACLE
Microsoft BizTalk Server
Microsoft SQL Server
Analysis/Reporting Services
CERTIFIED FOR COMPLIANCE OPC FOUNDATION
Microsoft Visual Studio
Java
TIBCO The Power of Now™
Microsoft Silverlight
Microsoft SharePoint

PI JDBC | PI Web Services 2010 | PI OLEDB Enterprise 2010 | PI OPC DA/HDA Server 2010 | OSIsoft SDKs

Asset Information / Metadata

Notifications

Analytics

Relational / Non Time Series Data

PI Server

PI Server Collective

Time Series Data

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PI Integration Services Futures

- More focus on *integration*
  - ERP
  - BI
  - CMMS
- Bulk Queries – ability to query many data streams (millions) for values in a particular timeframe
- Higher Speed for all access methods
- Event Frame support to PI OLEDB Enterprise, PI JDBC, and PI Web Services

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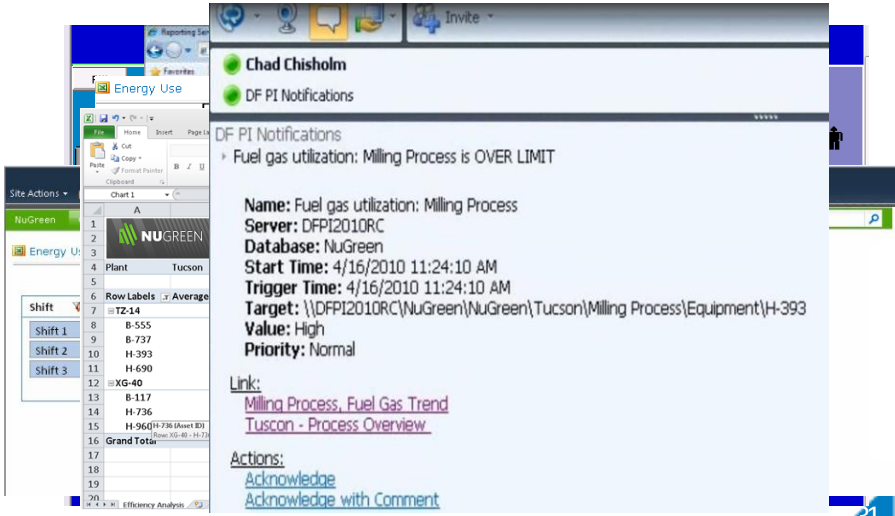
Visualize

- PI ProcessBook
  - Easy to build process graphics and data analysis displays
- PI WebParts, PI DataLink
  - Collaborate, Share Information, KPIs
  - Build and Publish Drill Down Reports
  - Integrate with standard off the shelf tools
- PI Notifications
  - Deliver the visual



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PI for Office 2010

- Productivity through familiar and intuitive tools
- End users to create their own BI solutions
- Improve sharing and discovery of insights

- Organizational productivity through dashboards
- Visibility into key team and organizational metrics
- Business user efficiency and collaboration

- Cut costs by leveraging existing IT investments
- Scale-out to support BI for all users
- Familiar and intuitive management tools

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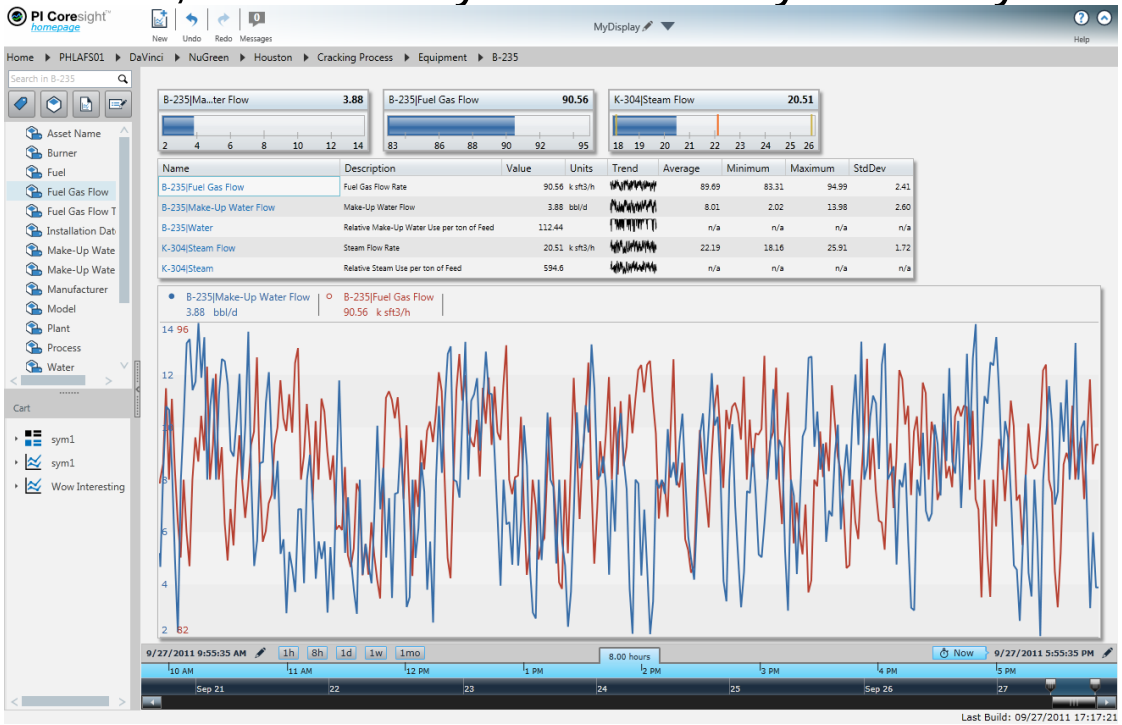
PI Coresight

- The fastest, easiest way to visualize your PI System data



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User Interaction – Future Directions

- PI Coresight
  - Improved PI AF Integration – asset relative displays
  - Event Frame integration in search, timebar
  - More Built-In Trending Analytics
  - More graphics – XY Plot
- Continue to leverage Microsoft Office and SharePoint
- Mobility
  - Notifications
  - Trend Visualization
  - Health Monitoring / Diagnostics

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Evolution of Operating Systems

hp UX

Sun microsystems

solaris

Tru64™ UNIX®

IBM AIX

Windows Server 2008 R2 Enterprise

Windows Azure™

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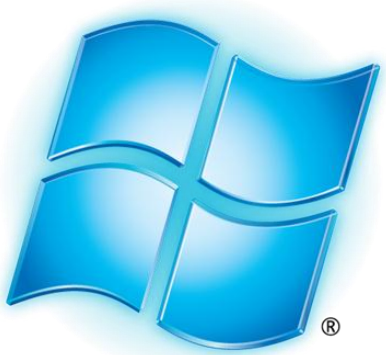
Windows Azure based PI System

- Research stage
- Report expected August 2011
- Approach will include multiple steps



Windows Azure™

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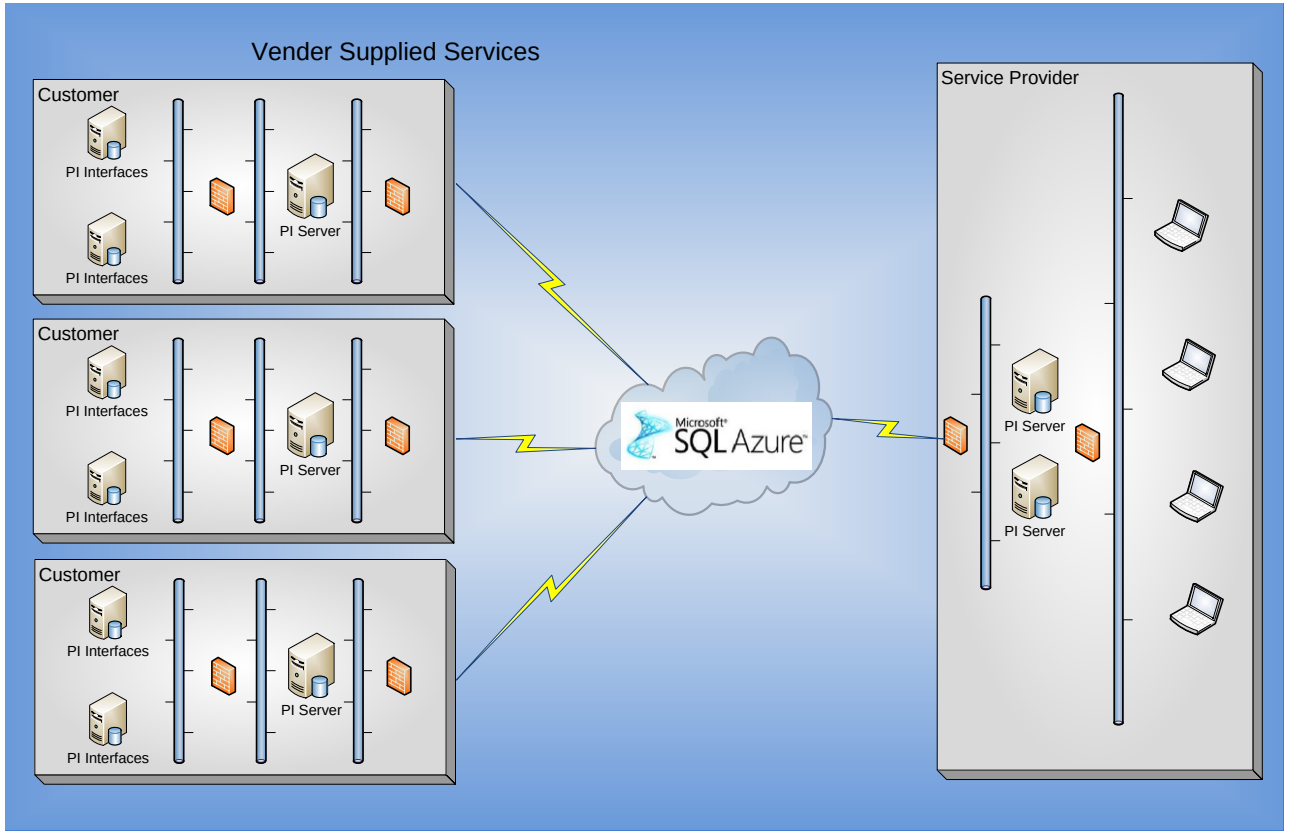
Scenario: Vendor Services

- Data Driven Services
- Secure data transfer
  - Privacy



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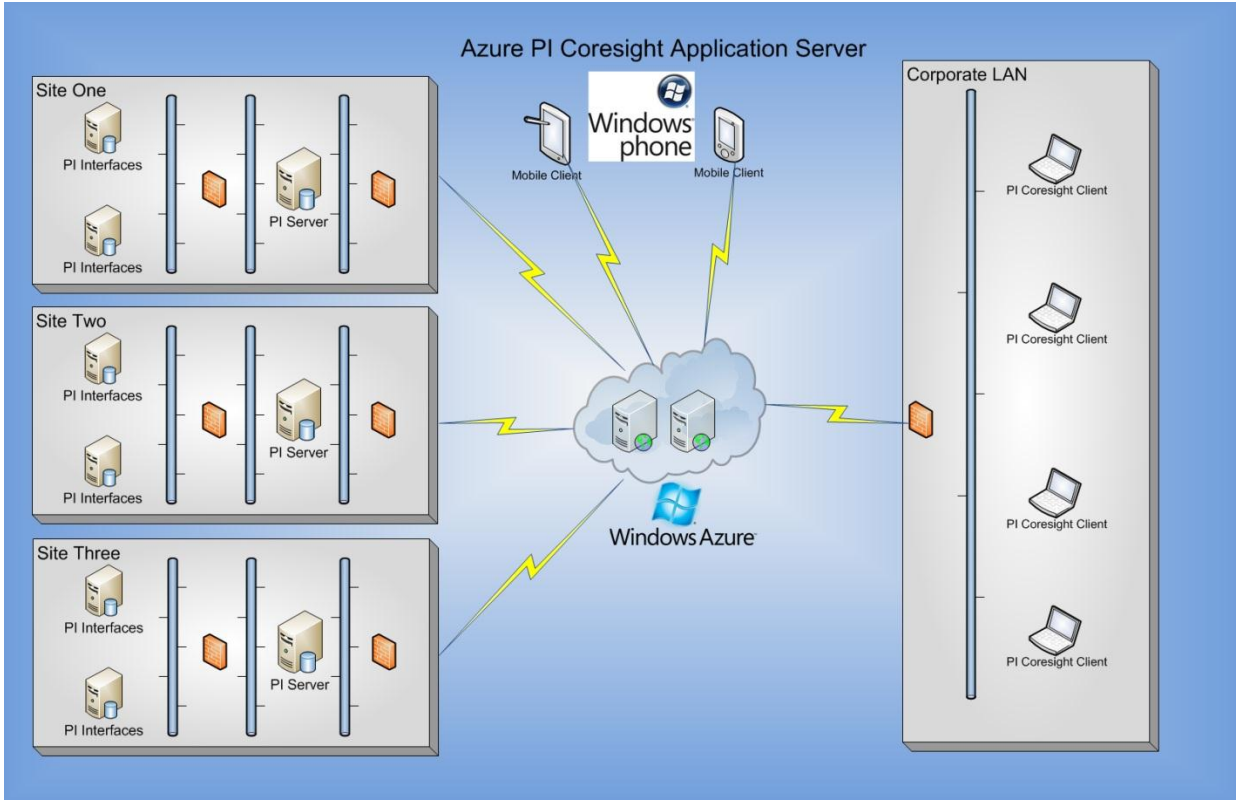
Scenario: Azure PI Coresight App Server

- Quick deployment
- Secure public internet access
- Mobility access via telco wireless network



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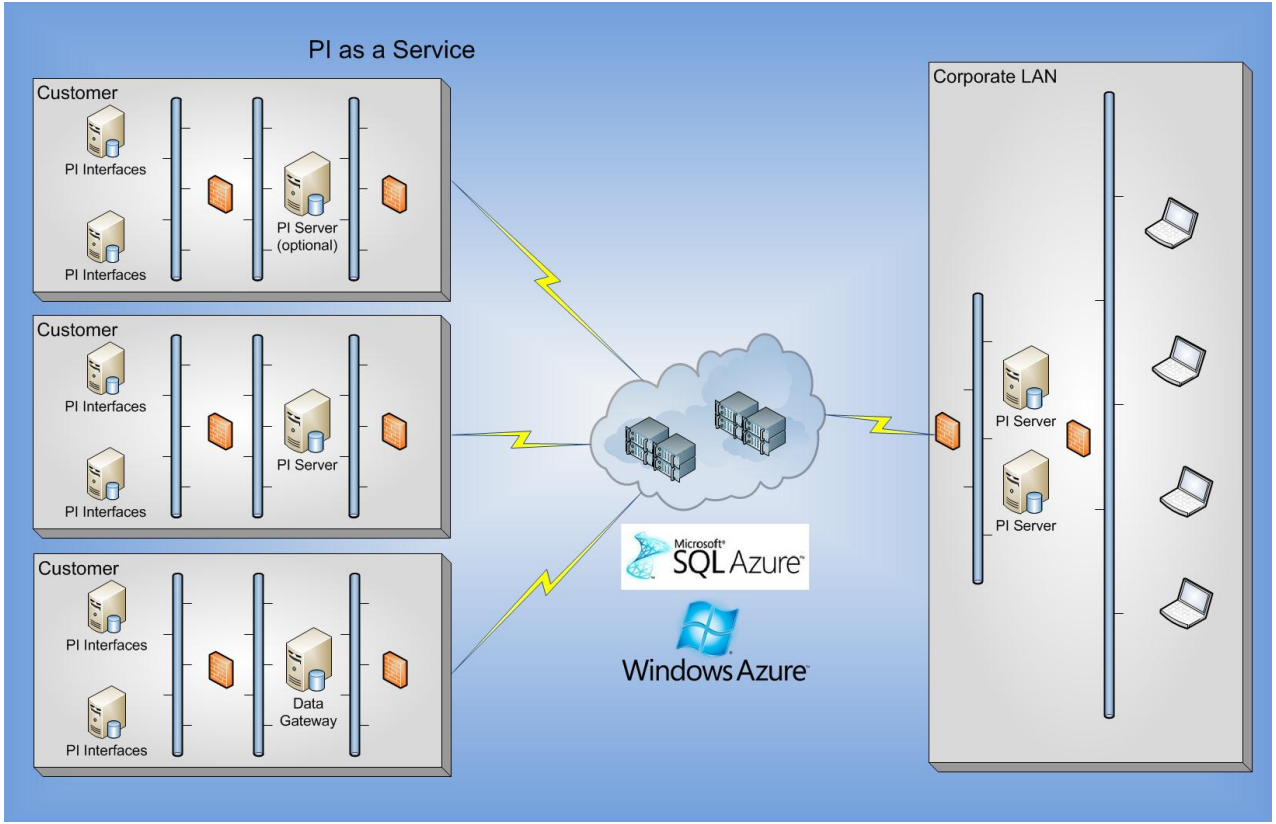
Scenario: PI System as a Service

- Optional local PI Servers
- Secure data gateway
- Federated security



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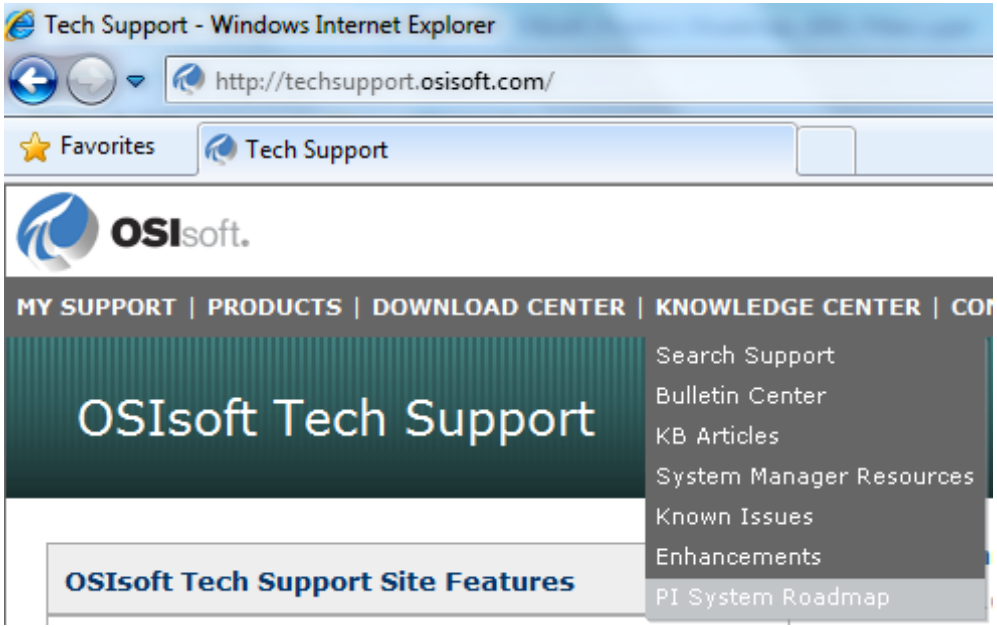
Stay Up-To-Date on the Web

- PI System Roadmap on OSIsoft Technical Support Site

http://techsupport.osisoft.com/techsupport/NonTemplates/roadmap.aspx



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