



**OSIsoft®** VALUE NOW, VALUE OVER TIME



# OSIsoft Product Roadmap

## *The Server*

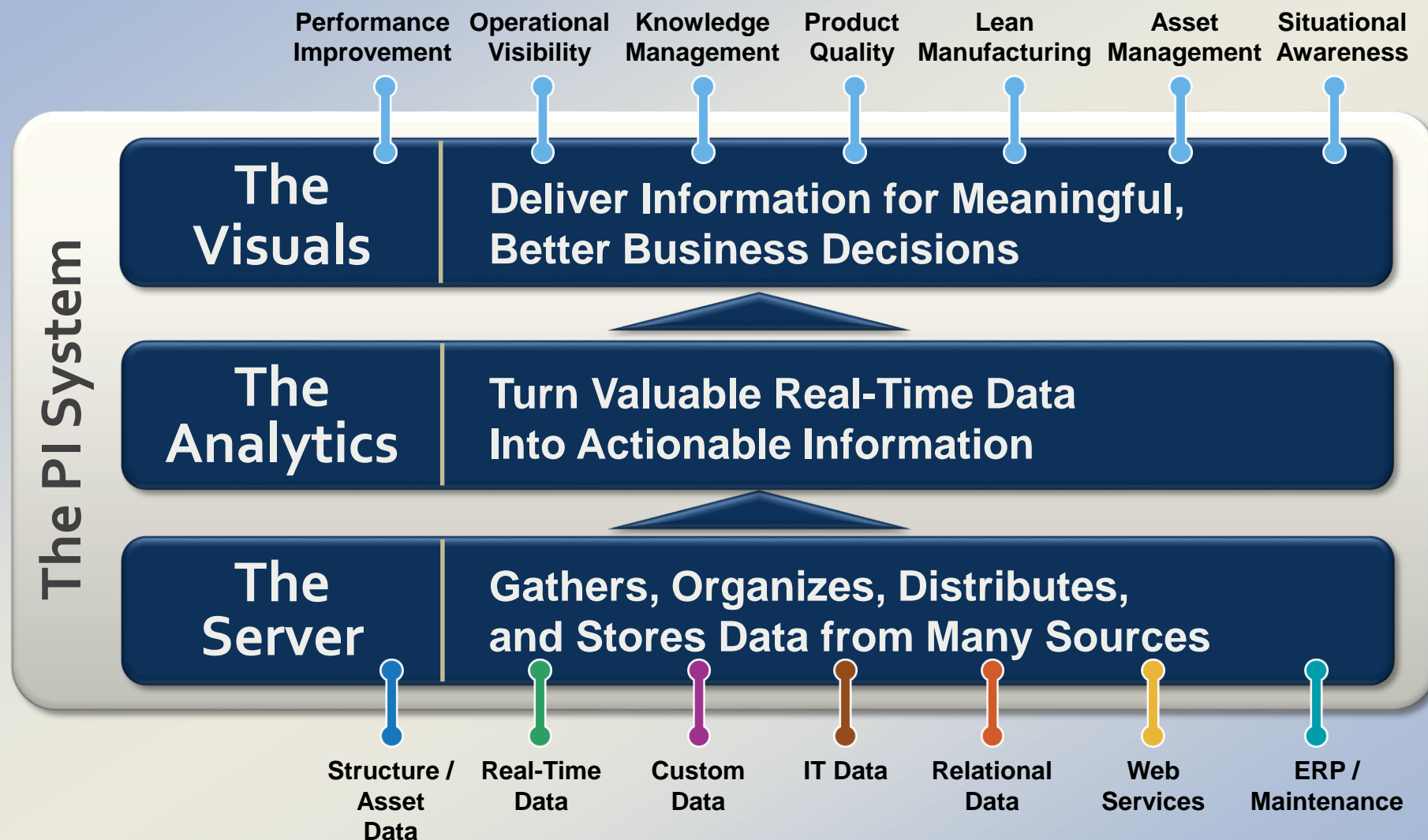
Tom Hosea

*Director of Product Marketing*

# Intrinsic Values of the PI System

- Scalable (asset, site and enterprise)
- Available (independent of system faults)
- Reliable (believable, auditable)
- Extensible (open feature set)
- Secure (multiple security models)
- Interoperable (open to multiple systems)

# Functional Groups of The PI System



# Aspects of The PI System

## Cross Functional Aspects of the PI System

Scalable

Available

Reliable

Extensible

Secure

Interoperable

**The  
Visuals**

**Deliver Information for Meaningful,  
Better Business Decisions**

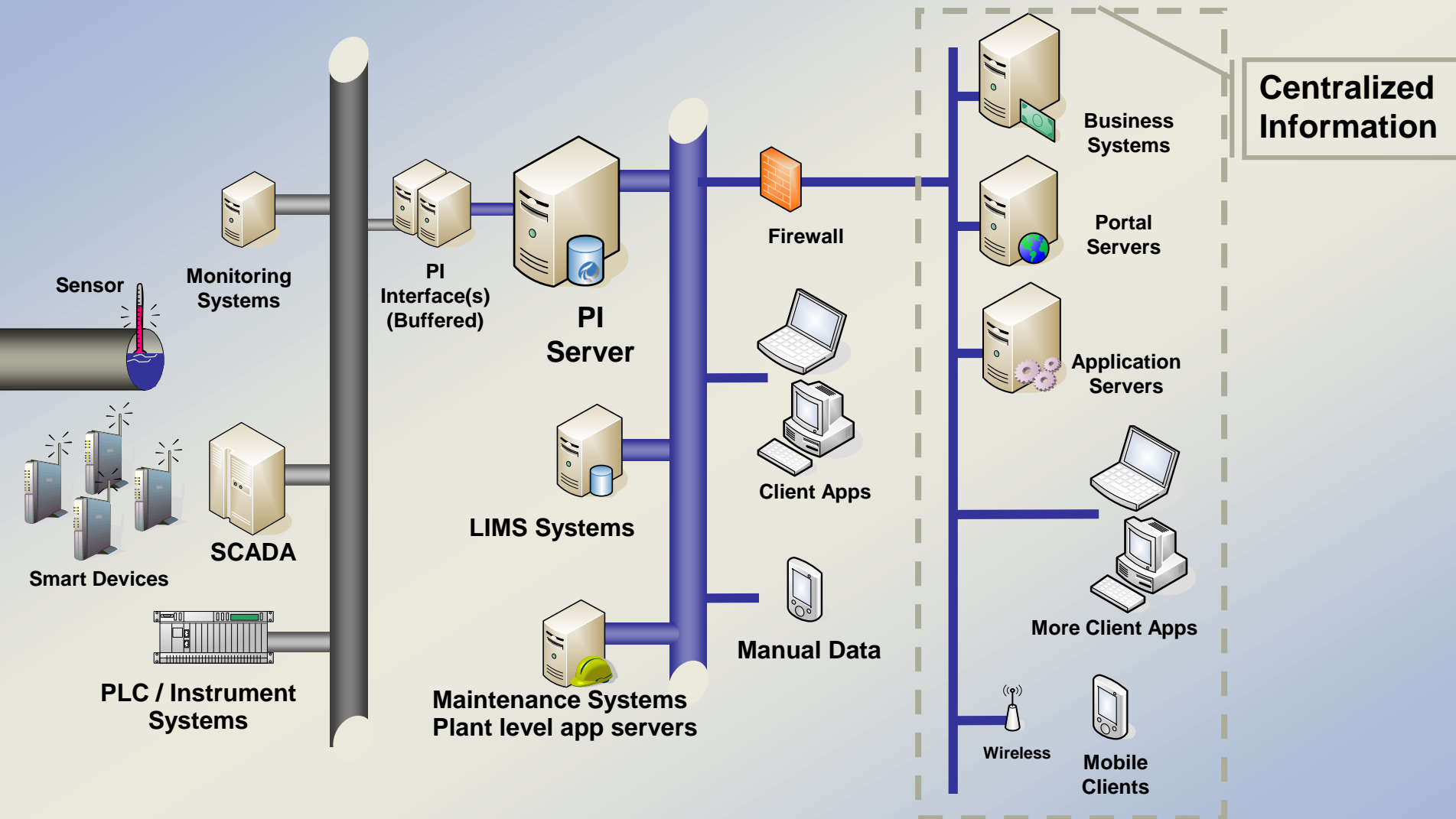
**The  
Analytics**

**Turn Valuable Real-Time Data  
Into Actionable Information**

**The  
Server**

**Gathers, Organizes, Distributes,  
and Stores Data from Many Sources**

# System Architecture



# The PI System

## The Server

PI Archive

PI AF

Real-Time Interfaces

Data Access

MCN Health Monitor

## The Analytics

## The Visuals

# The PI System

## The Server

PI Archive

PI AF

Real-Time Interfaces

Data Access

MCN Health Monitor

## The Analytics

ACE

PI Analytics

RtReports

PI Notifications

Sigmafine

## The Visuals

# The PI System

## The Server

PI Archive

PI AF

Real-Time Interfaces

Data Access

MCN Health Monitor

## The Analytics

ACE

PI Analytics

RtReports

PI Notifications

Sigmafine

## The Visuals

### Smart Clients

PI ProcessBook

PI DataLink

PI Activeview

PI BatchView

### Thin Clients

RtWebParts

RtPortal iViews

RtReports Clients



# The PI System

## The Server

PI Archive

PI AF

Real-Time Interfaces

Data Access

MCN Health Monitor

## The Analytics

ACE

PI Analytics

RtReports

PI Notifications

Sigmafine

## The Visuals

### Smart Clients

PI ProcessBook

PI DataLink

PI Activeview

PI BatchView

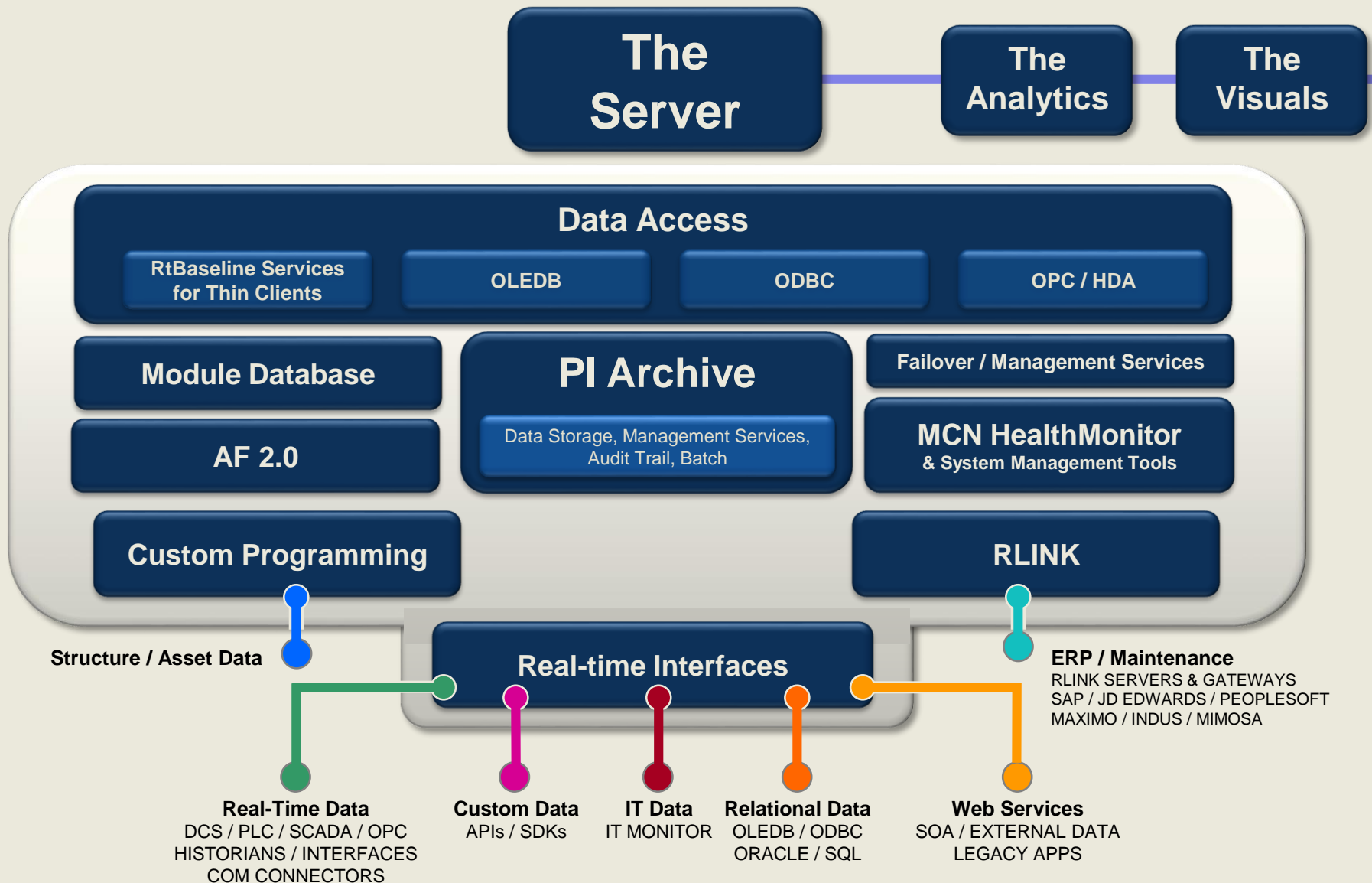
### Thin Clients

RtWebParts

RtPortal iViews

RtReports Clients

# The PI Server Today



# The Analytics within the PI System Today

The  
Server

The  
Analytics

The  
Visuals

Advanced Computing Engine (ACE)

PI Notifications

RtReports  
Compliance & Standard

Enterprise Services

PI Analytics  
(Performance Equations, Totalizers, Alarm, RTSQC)

**The  
Server**

**The  
Analytics**

**The  
Visuals**

## Smart Clients

BatchView  
SQC Client  
AF Modeler Add-in

**ProcessBook**

MS Excel Add-ins:  
BatchView  
AF

**DataLink**

**ActiveView**

## Thin Clients

**RtWebParts**

RtActiveView  
RtGauge  
RtGraphic  
RtTable  
RtTagSearch  
RtTreeView  
RtTrend  
RtTable  
RtXYPlot

**iViews**

RtActiveView  
RtGauge  
RtGraphic  
RtTable  
RtTagSearch  
RtTreeView  
RtTrend  
RtTable  
RtXYPlot  
RLINK iViews

**Other Thin  
Clients**

DataLink for Excel Services  
RtReports Generator  
RtReports Editor

Performance  
Improvement

Operational  
Visibility

Knowledge  
Management

Product  
Quality

Lean  
Manufacturing

Asset  
Management

Situational  
Awareness

The  
Server

The  
Analytics

The  
Visuals

## Smart Clients

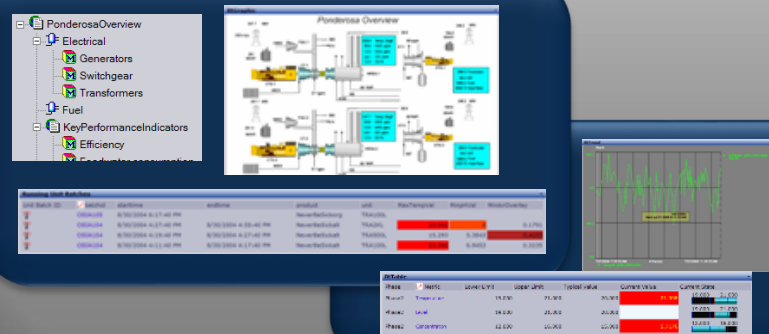
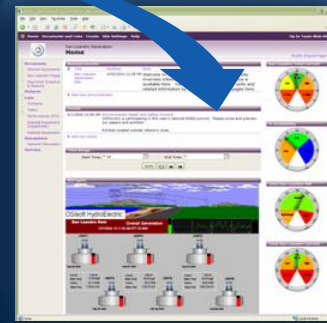
Visualization  
Root Cause Analysis  
Planning  
Content Authoring

Seamless  
Interaction  
Between Smart  
Clients & Portal  
Environment



## Thin Clients

Structured Portal  
Environment Allows  
Users to Build Displays  
Without IT Training



Performance  
Improvement

Operational  
Visibility

Knowledge  
Management

Product  
Quality

Lean  
Manufacturing

Asset  
Management

Situational  
Awareness

# Point Count

~~PRR231(335)5x644~~

21,000,000

# In Other Words...

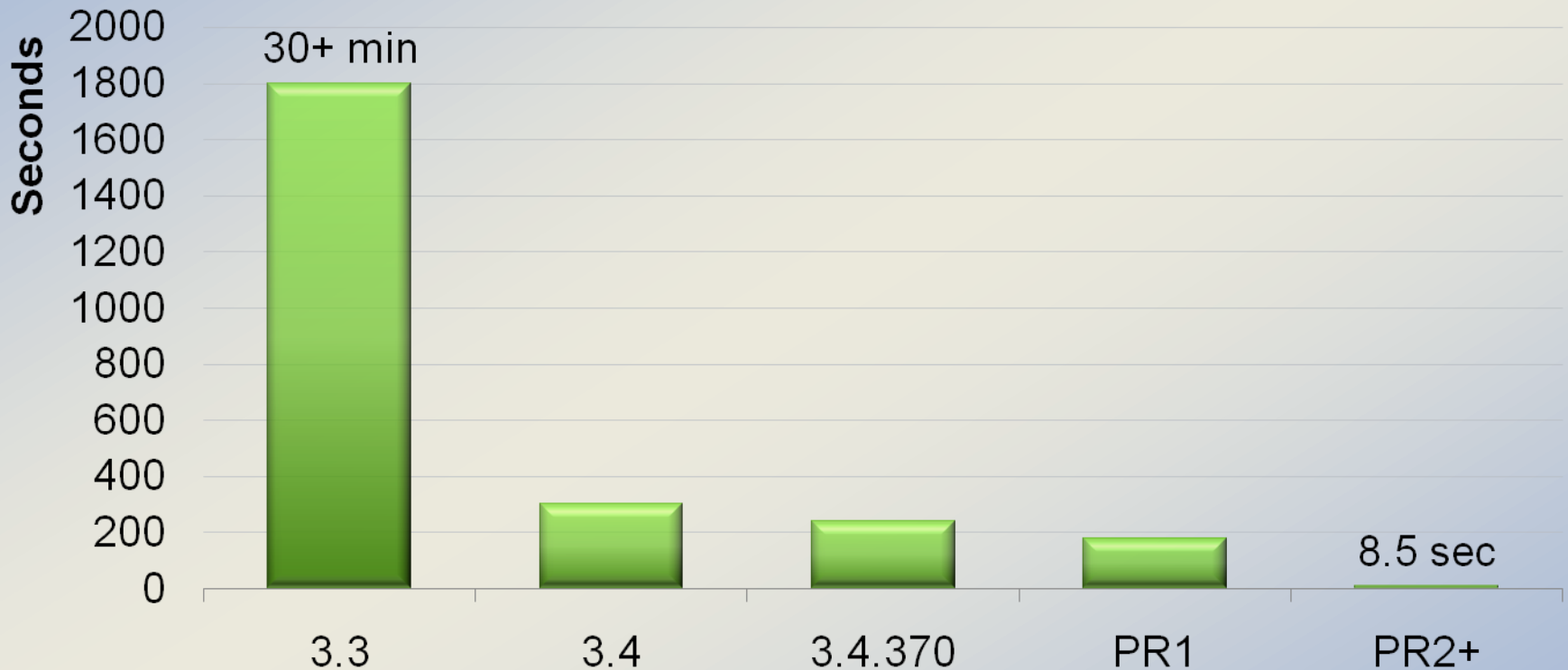
PI 3.3 ➡ 3.4 ➡ 3.5

> 100X



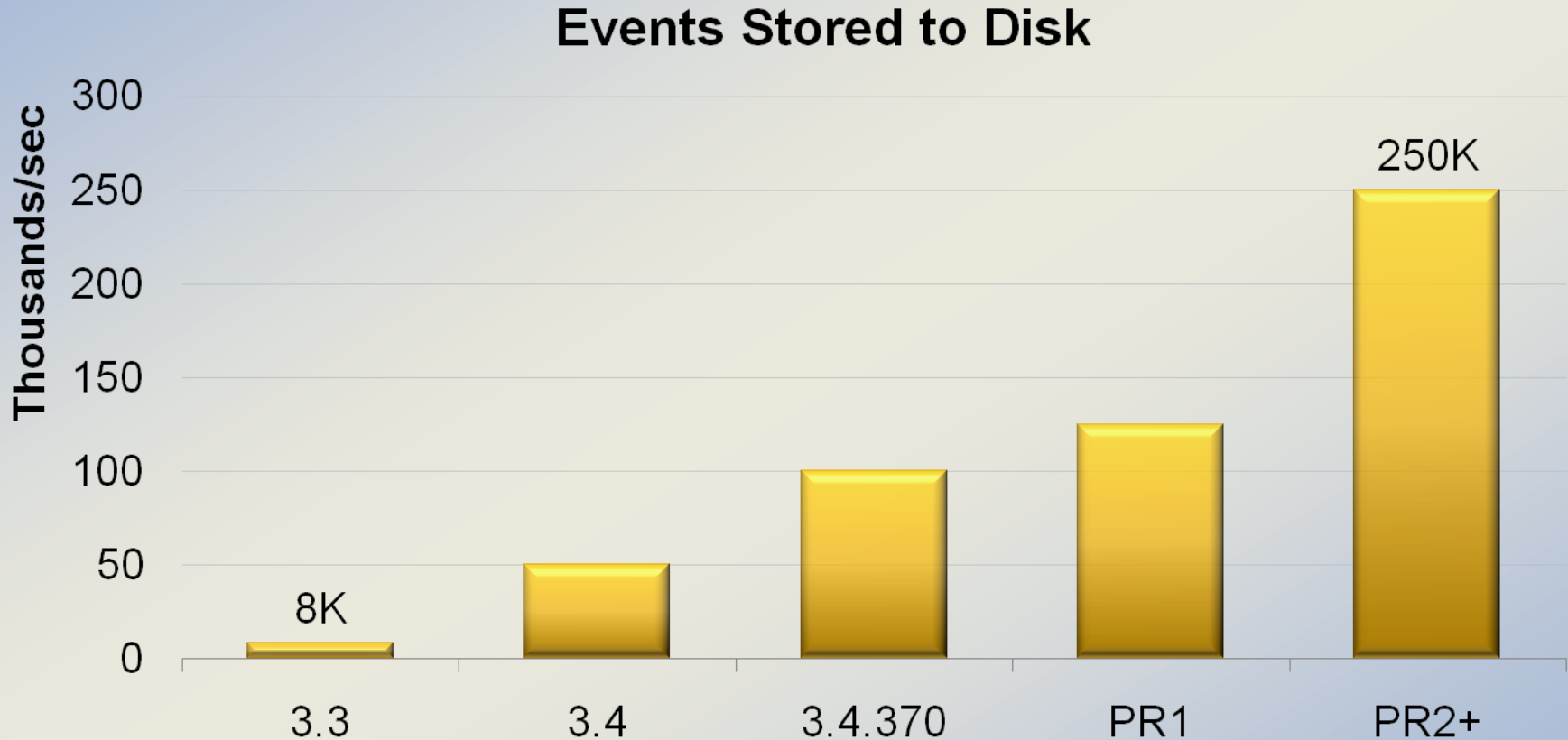
# Startup Time

Initialization Time per Million of Points



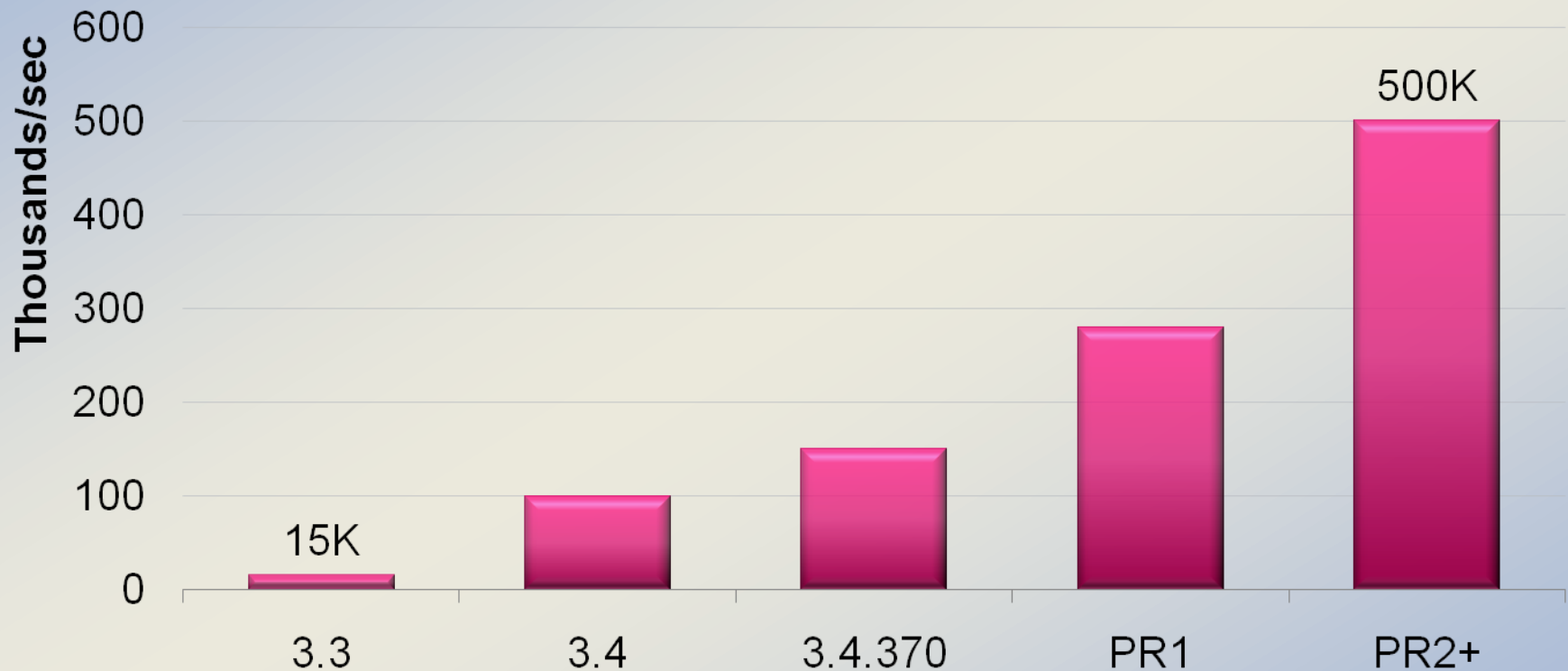


# Archiving Rate

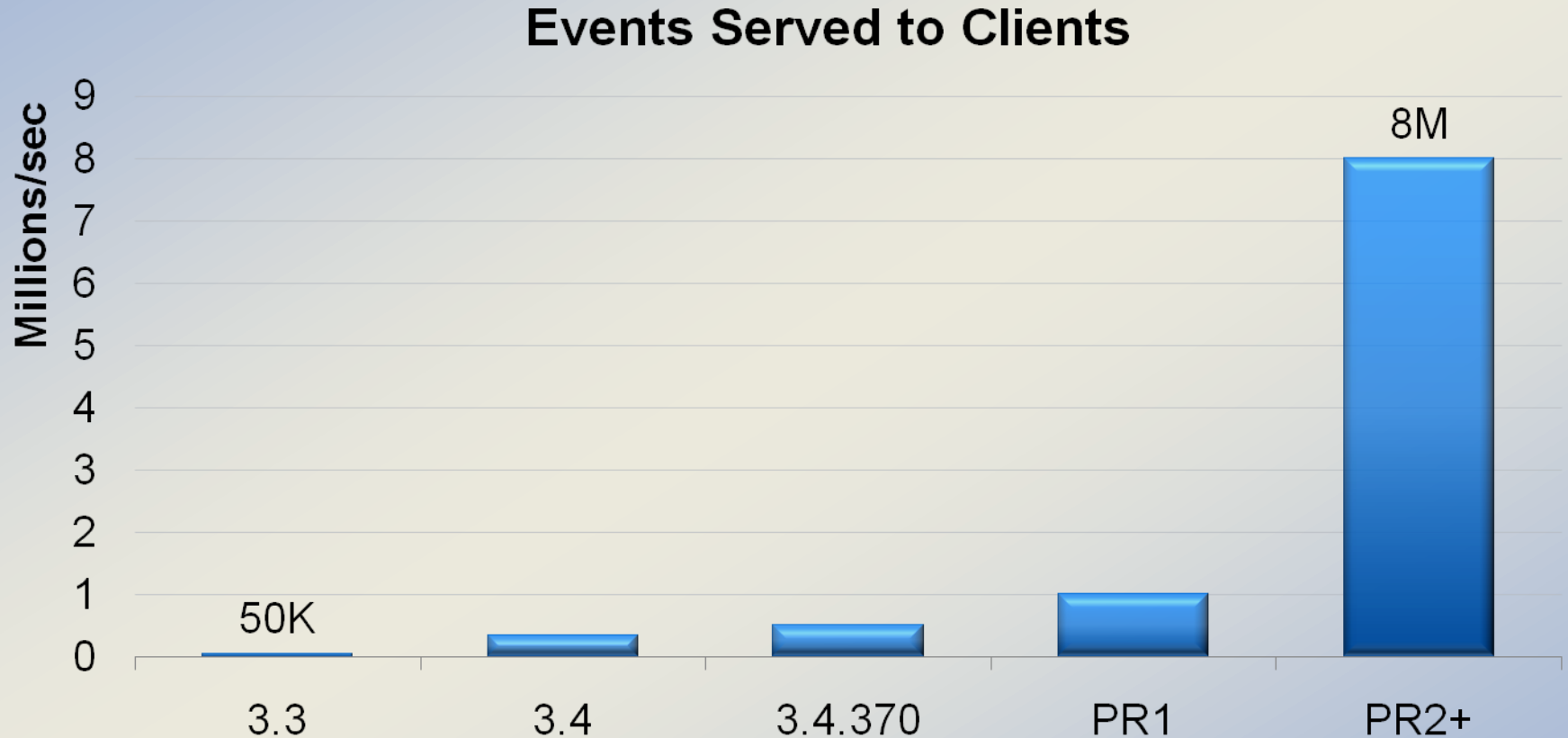


# Snapshot Rate

Events Processed in Memory



# Archive Query Rate





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# PI High Availability

# Motivations: Why High Availability?

- Network Failure
- Administrative/User Failure
- Upgrades and Migrations
  - Hardware
  - Operating System Software (Patches)
  - Applications Software

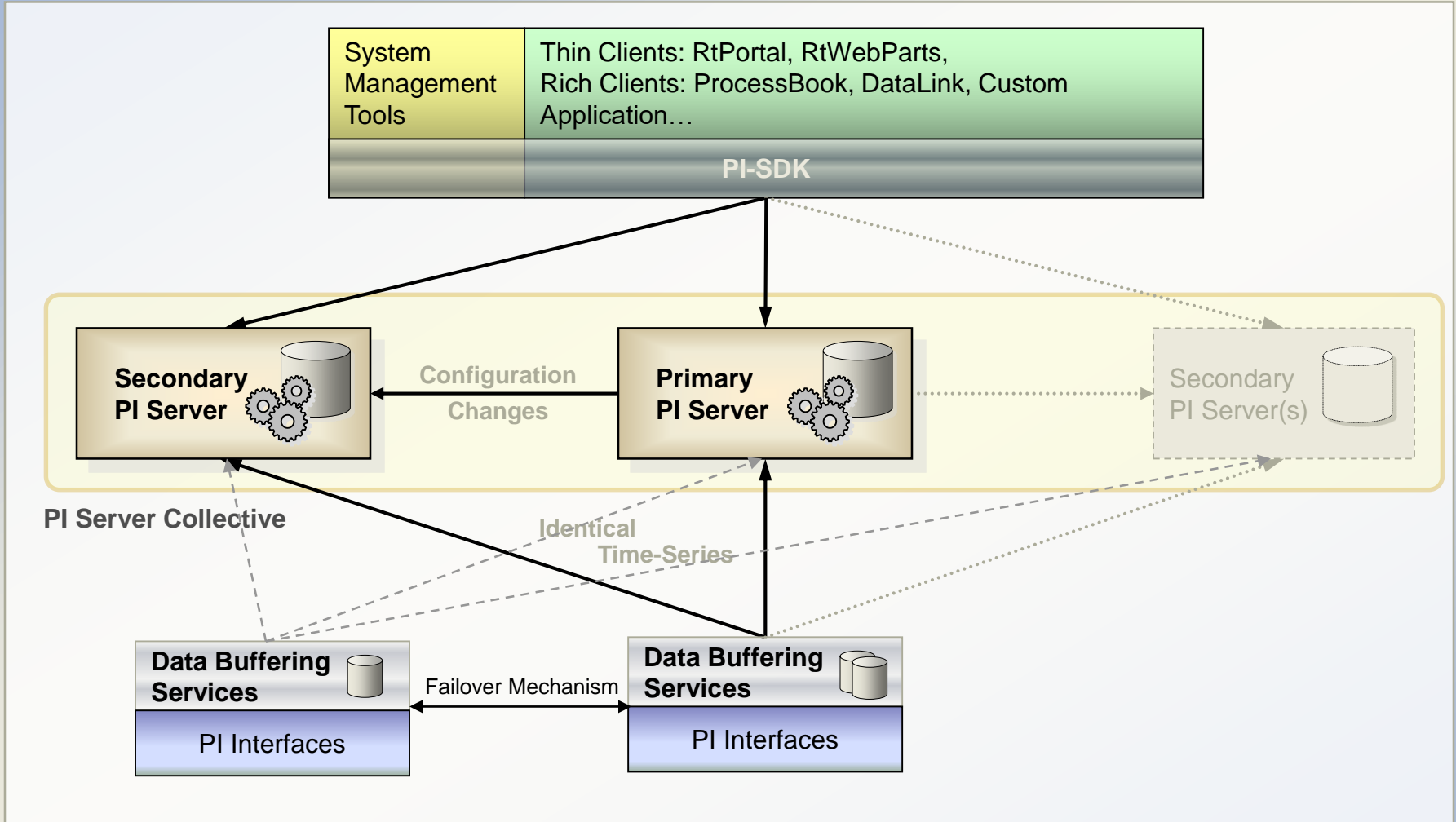
# The Business Case for HA

- How much downtime can you afford?
  - $365 \text{ Days} \times 24 \text{ Hours} = 8760 \text{ Hours/year}$
  - 99.7% uptime = 26.3 hours of downtime/year
  - 99.9% uptime = 8.7 hours of downtime/year

# The Value of High Availability today

- More uptime during server outages
  - Planned
  - Unplanned
- Automatic failover for data consumers
- Automatically publish changes from a primary to secondary servers
  - Multiple configurations possible

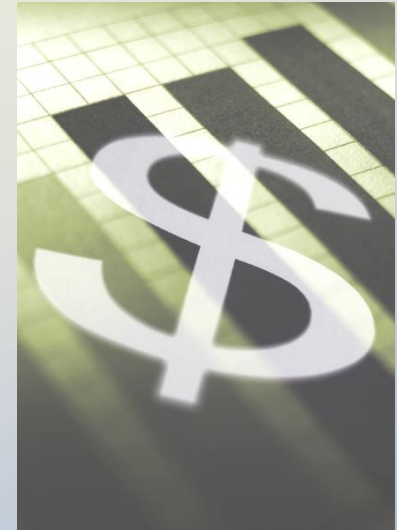
# PI Replication Architecture



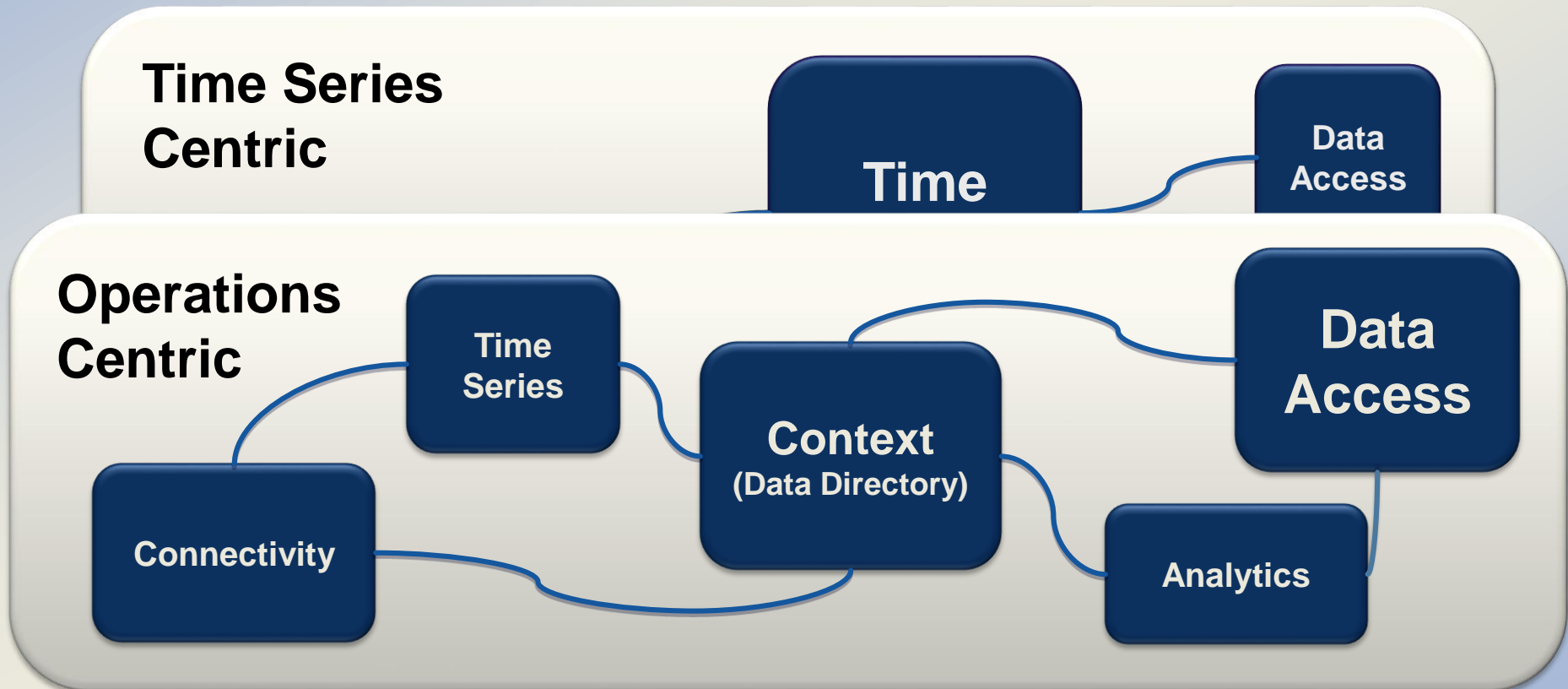


# PI Replication Summary

- Features
  - Synchronization of PI Server configuration
  - Transparent client failover, simple load balancing
  - Fanning of real-time data to multiple servers
- Value
  - High Availability to your PI System
  - Peace of mind for Administrators
  - Direct support for existing PI Clients
  - Simple, scalable and flexible architecture



# Shifting Platform Usage



# Shifting Platform Usage

**Operations  
Centric**



# Migration from PI MDB

- PI AF 2.0 succeeds PI Module Database
- OSIsoft is committed to moving customers and partners forward to AF 2.0...
- ...While preserving value of existing applications

# What is PI AF 2.0?

## PI AF 2.0 Is ...

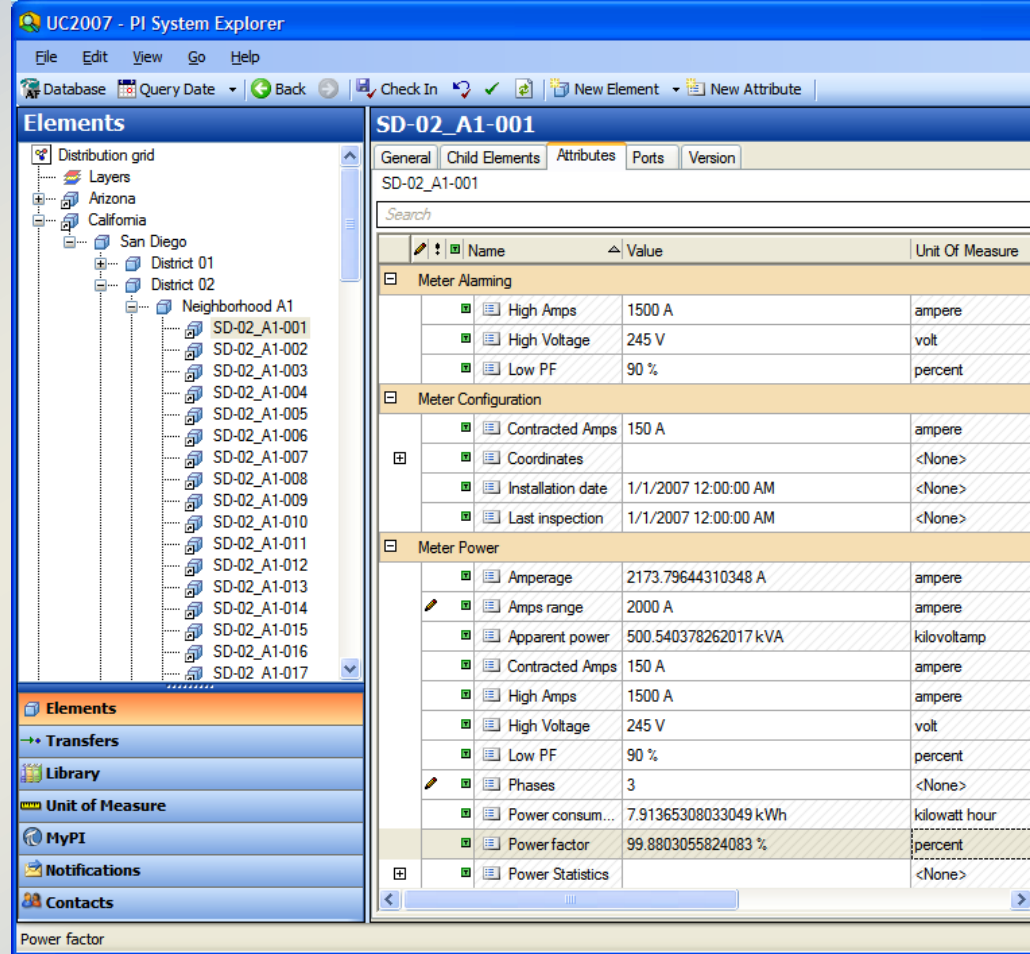
A set of tools for organizing data around your processes, operations, facilities and organization.

## Helping You To ...

structure your data in a meaningful way to search and view it in the right context so problems can be solved faster.

# AF 2.0 Assists Users

- Search your data more intuitively
- Access more than PI data
- Define generic calculations
- Create display and report Templates
- Scale to the Enterprise



# AF Features

- Attributes can be:
  - From Relational Databases
  - Calculated
  - Inherited from a Template
- Assets can be:
  - Classified
  - Connected
  - Versioned
  - Hierarchical and Linked
  - From an existing Asset Model – “Smart Connectors”
- XML Compatible (import and export)

# PI AF 2.0 Benefits

- Visibility
  - Information about data, assets and models is available to visualization suite of tools
- Single Version of the Truth
  - Creates unified assets and relationships
  - Assets and models become basis for consistent visualization and analyses
- Communication & Collaboration
  - People use the same asset and model reference for their visualization and analyses



# PI AF 2.0 Benefits

- Search and Find information
  - Expose a more intuitive, equipment centric view of our data so everybody in the corporation can quickly access the data relevant to their jobs
- Knowledge Management
  - Synchronize and eliminate disparate assets, models and analysis to improve traceability and accountability

# PI AF 2.0 – New Features

- AF 2.0 provides a great deal of performance and scalability
  - Millions of assets mapping multi-millions of PI points
- Provides a world class application layer
- Fully functional SDK
- Multiple PI Server Support
- Improved Element Hierarchy

# PI AF 2.0 – New Features

- Object History (versioning)
  - Keeps track of configuration changes over time
- Hierarchical Attributes and Categories
- Advanced Attributes Types
  - Files, Arrays, Tables
- Enumeration Sets
- Object Level Security
  - Windows Integrated Security

# PI AF 2.0 in the PI System

- Data structured and organized by asset
- Spans multiple PI Systems
- Incorporates non time series data

PI AF 2.0

Asset-Equipment Centric access to the Data



## Non Time Series Data Sources



SCM

RDBMS

MES

## PI Server 2

### Vendor Specific Interfaces

Honeywell Interface ABB Interface Delta-V Interface Rockwell Interface

### Generic Interfaces

OPC Interface XML Interface Modbus Interface SNMP Interface

### Time Series Data Sources



Honeywell

ABB

Delta-V

Rockwell

Other

## PI Server 1

### Vendor Specific Interfaces

Honeywell Interface ABB Interface Delta-V Interface Rockwell Interface

### Generic Interfaces

OPC Interface XML Interface Modbus Interface SNMP Interface

### Time Series Data Sources



Honeywell

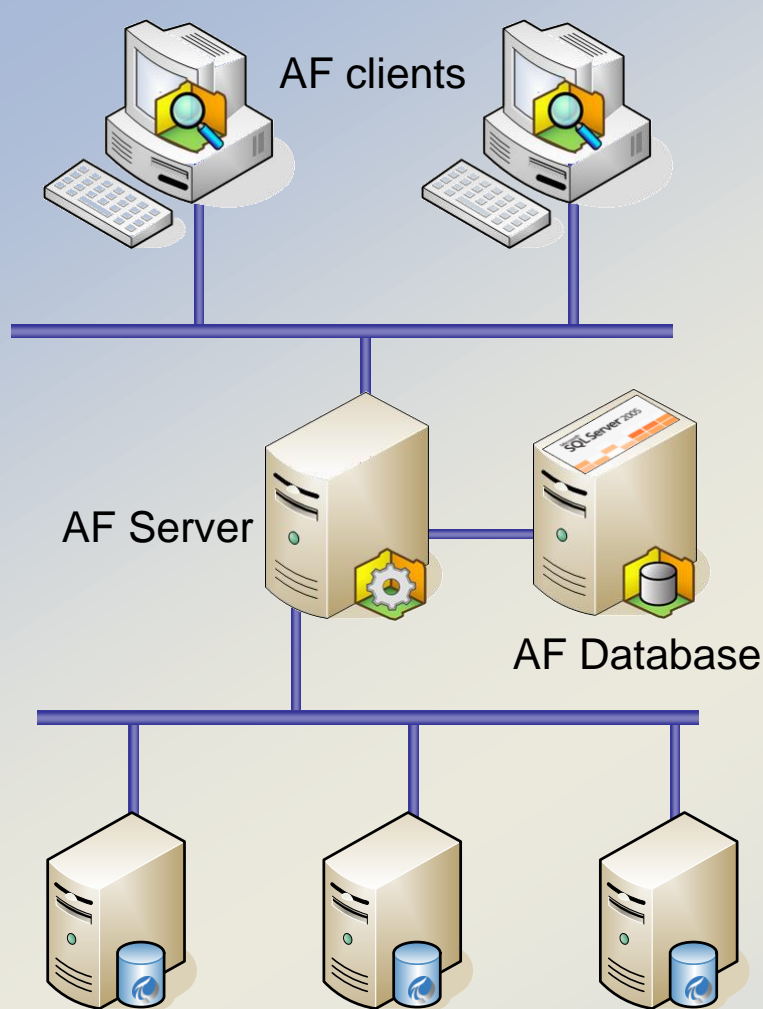
ABB

Delta-V

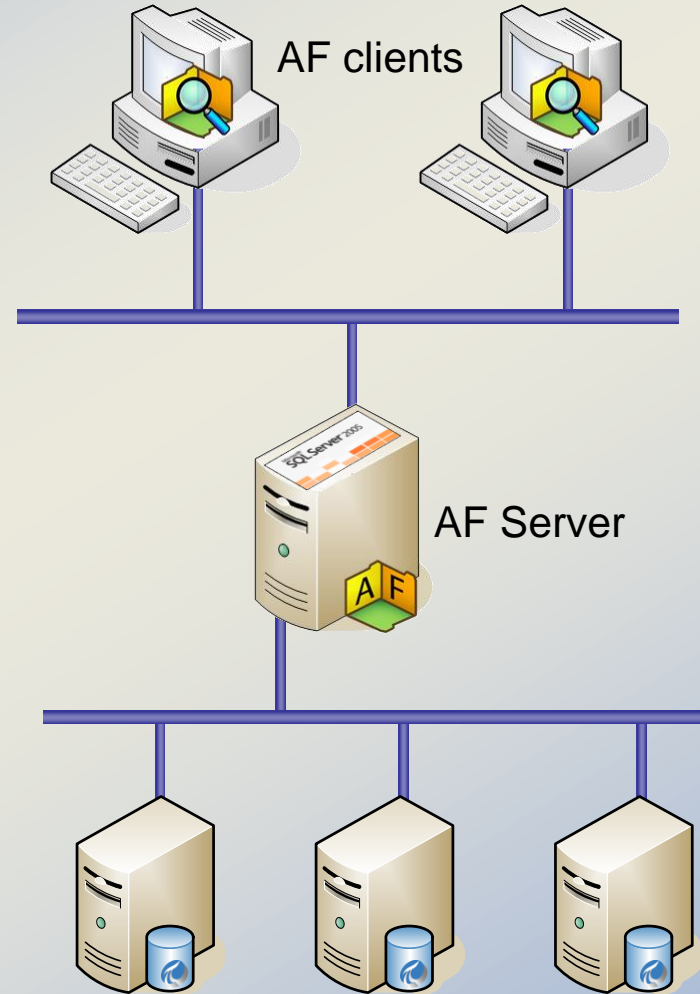
Rockwell

Other

# PI AF 2.0 Architecture



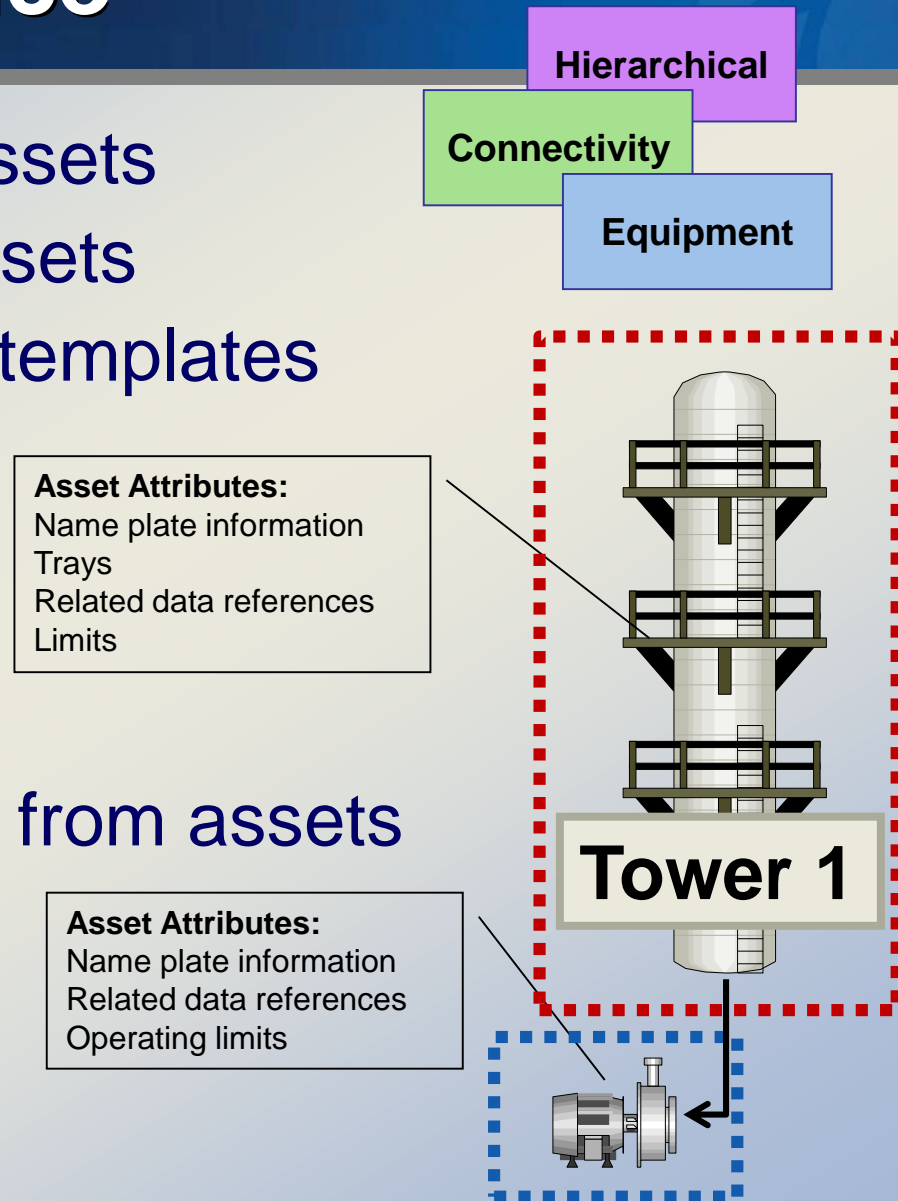
Scenario 1



Scenario 2

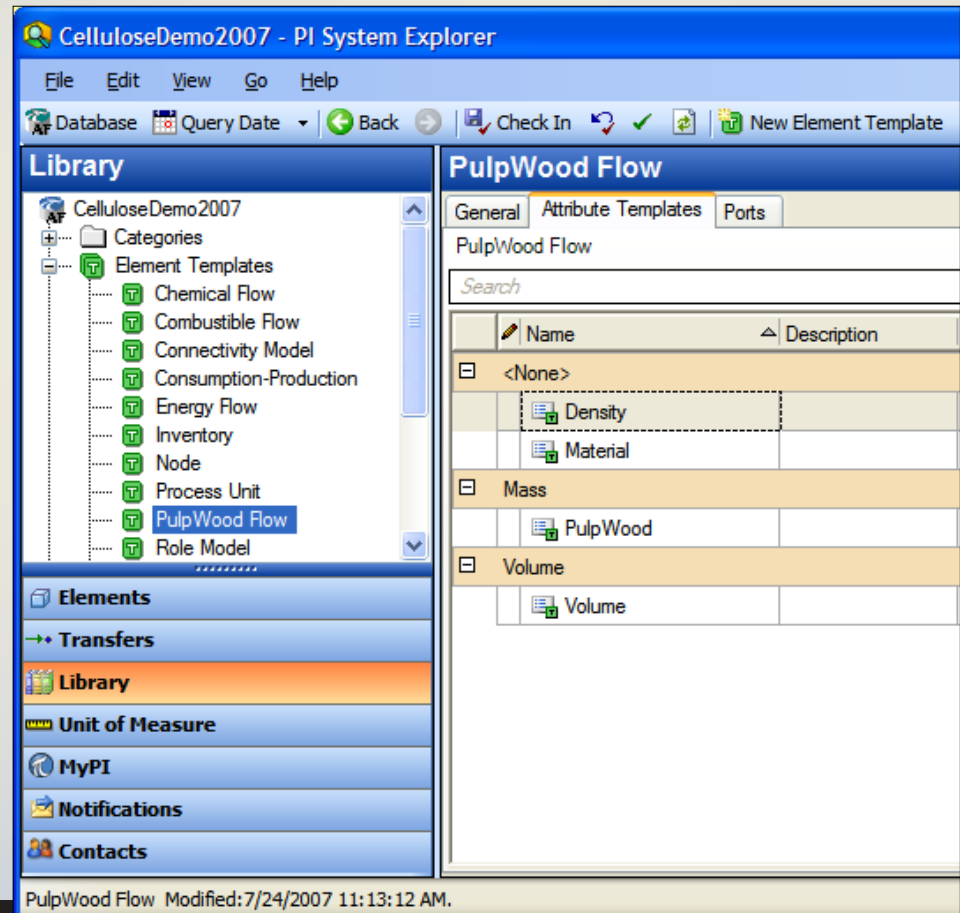
# Putting AF into practice

- Start with a collection of assets
- Associate data with the assets
- New assets are based on templates
- Assets can be connected
- Assets can be grouped
  - By function
  - By location
- Relationships are sourced from assets
- Apply and run analyses
- Visualize results



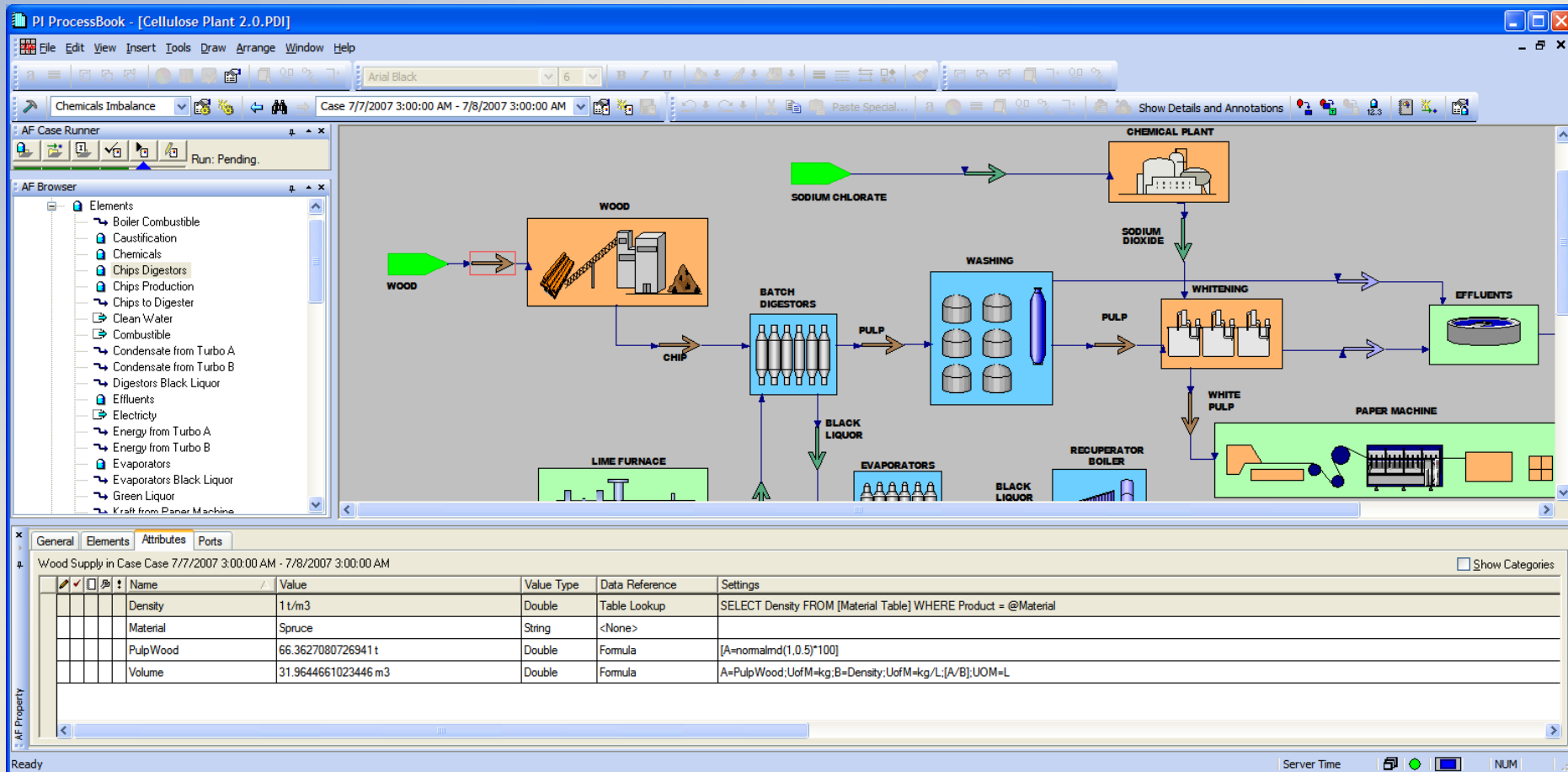
# Features: PI System Explorer

- View the structure of the database
  - Templates, Elements, Relationships, Tables, Notifications
- Create new content
  - All AF objects
- Configure items
  - assign data references
- Create structures
  - Hierarchies, models



# Features: ProcessBook Modeler

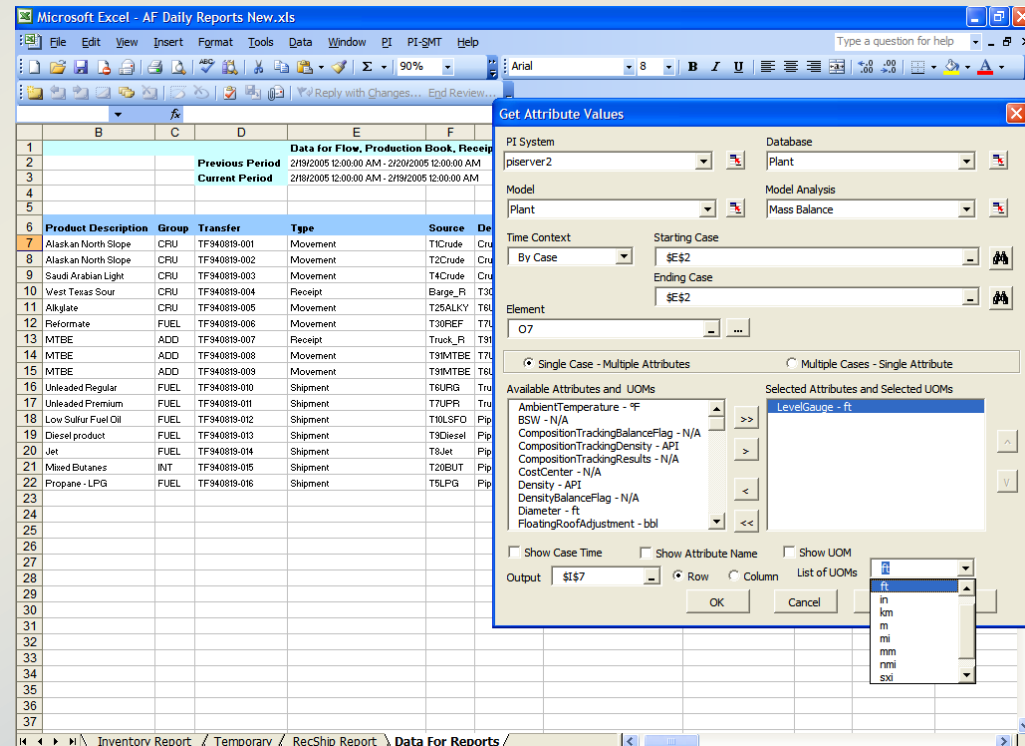
- Provides a visual representation of AF





# Features: Excel Add-in

- Manage configuration
  - Specify data references for attributes that will override the template definition
- Report information
  - Create report templates similar to using DataLink
  - Retrieve information regarding model connectivity and context



# Features: AF SDK

- Comprehensive Managed Code Class Library
  - .Net based
  - Access to AF Database
- Common UI Components
  - Rich library of controls
- Extensive User Guide and Programmer Reference
  - Tutorial Guiding Developer Through AF Programming Experience

# PI AF 2.0 Advantages

- Allows organization of all of your data -millions of points - in a meaningful way
  - According to an equipment model
  - According to the way you would use it in calculations
- Create relationships between collections or organizations (e.g., assets)
- Allows you to bring in relational and complex data into the same context as your real-time data

# PI AF 2.0 Advantages

- Custom domain knowledge can be re-used in new analyses because it's in one central place (not in an Excel spreadsheet)
- Replaces programming with configuration
- Protects your investments in your displays, reports, and business logic

# Summary

- AF is
  - A framework that organizes data around assets and their relationships
  - A set of tools for modeling your process
  - A framework for analysis, visualization and reporting
- AF
  - Allows you to bring in relational and complex data into the same context as your real-time data
  - Replace programming with configuration
  - Protect your investments in your displays, reports, and business logic
- AF is extensible with the AF SDK as a programmatic interface to the PI System
- AF is shipping today



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# Break

# PI Notifications (Bridge) & PI Analytics (PR 3)

- RtAlerts -> PI Notifications
- ACE, Analysis Rules -> Best practices for PI Analytics
  - Single metadata and structure basis
  - Uses any data referenced in The PI System
- Smart Connectors
- DataLink for Excel Services
- PI Security
- PI Batch
- PI Reporting

# What is PI Notifications?

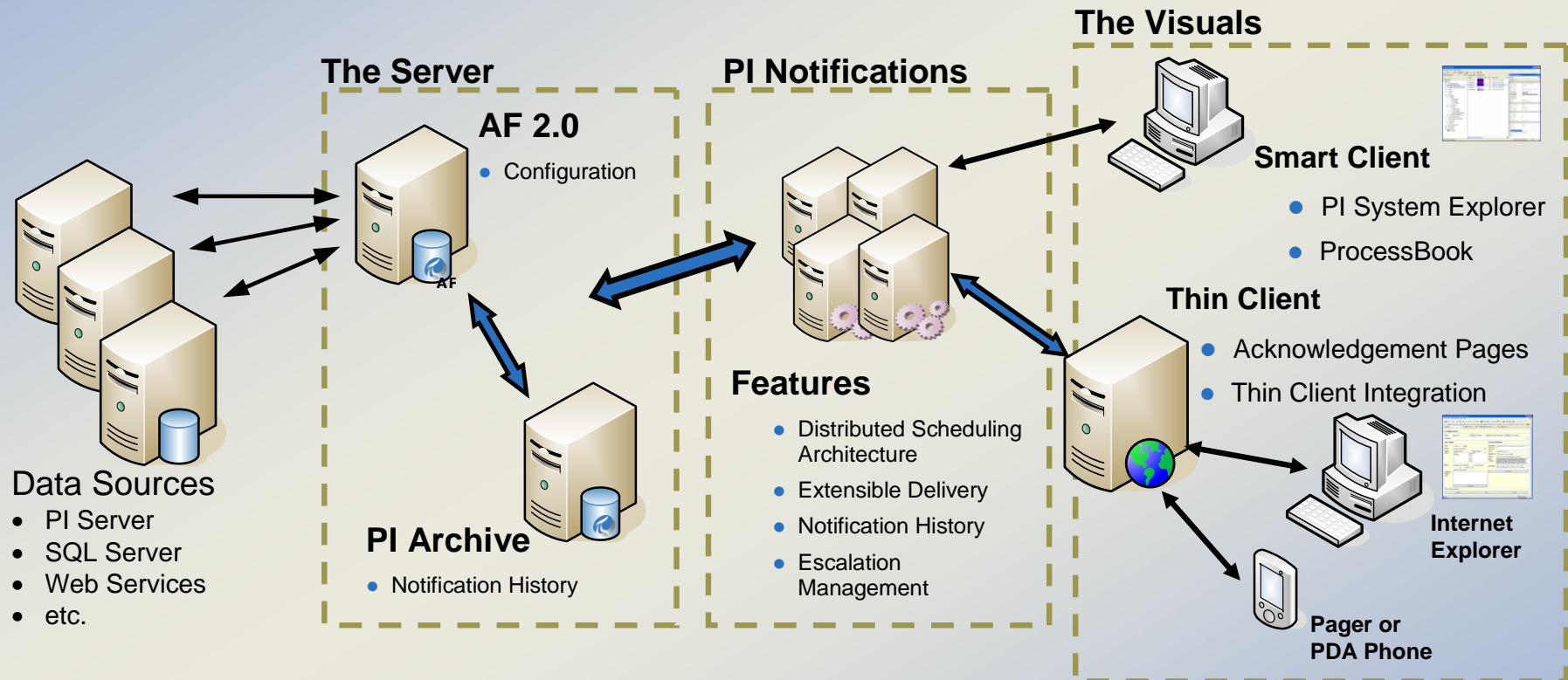
- A scalable, highly available, notification and alarming infrastructure
- Why infrastructure?
  - Extensible
    - Users can customize notification rules and scheduling
  - Integral part of the PI System
    - Real-time event delivery
    - PI System Client integration
  - Consistent with Enterprise Message of PI



# PI Notifications: The Value

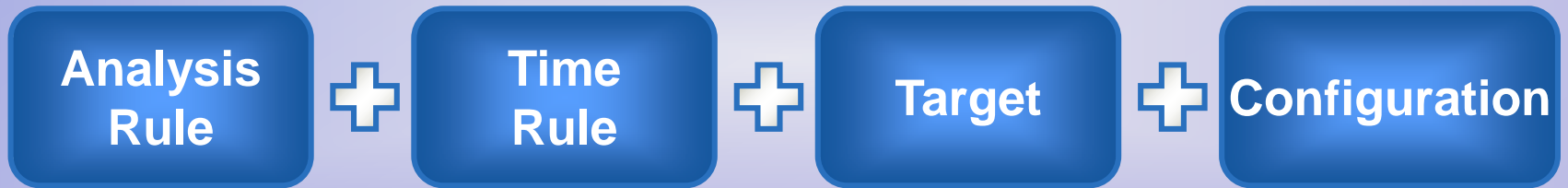
- Alerting “out of band” – anywhere, anytime
- Escalation
- Notification history (including acknowledgements and other actions) maintained forever
- No programming required
- Extensible delivery channels that can integrate with 3<sup>rd</sup> party systems and applications

# PI Notifications Topology

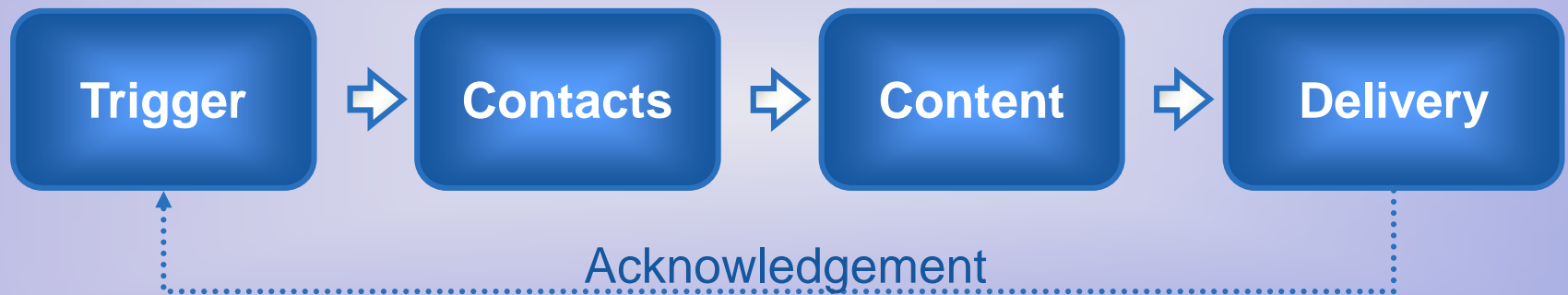


# PI Notifications

## Business Logic



## Notification Emission



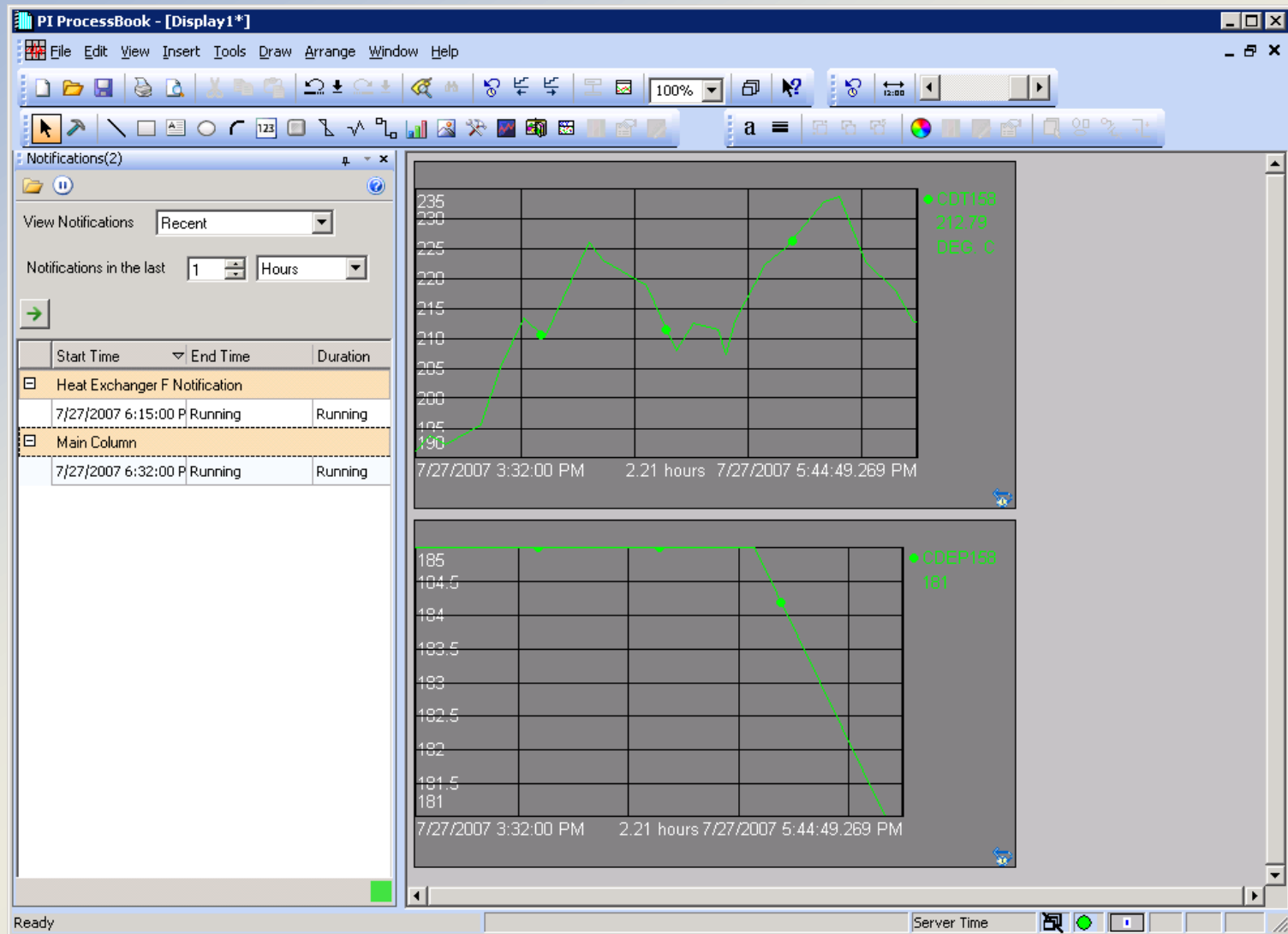
# The PI Notification Process

1. PI Notification Service collects inputs and evaluates the Trigger condition(s).
2. Subscriptions are evaluated for the correct Contact(s).
3. Content is added to the Notification.
4. Subscriptions are filled via delivery channels.
5. Subscribers can acknowledge the Notification.

# Notifications

- Once a Trigger condition is satisfied, a historical record is created for that condition.
- Only the Trigger is required to create a PI Notification - Content and Subscriptions are optional.

# PI ProcessBook Integration



# PI DataLink Integration

Book1 - Microsoft Excel

Home Insert Page Layout Formulas Data Review View Add-Ins PI

Current Value Single Value Functions Archive Value Tag Attributes Compressed Data (Start Time/Number) Multiple Value Functions Compressed Data (Start Time/End Time) Sampled Data Timed Data Calculated Data Calculation Functions Advanced Calculated Data Filtered Time Utility Functions Point ID to Tag Attribute Mask to Tag Alias Property Tag Search Module Database

A1 {=PINotificationSearch(0, "LITWAREDEMO", "\*", "t", "DU,SA,PR,AK,AC,CN,CM,AE", 23)}

	A	B	C	D	E	F	G	H	I	J
1	Notification Count:	4								
2	Duration	State	Priority	Acknowledged	Action	Contact	Contact Method	Acknowledge		
3	00:00:05	OutsideControl	Normal	No						
4					Sent	Administrator_Email1	Email			
5					Sent	Jay Lakumb	Email	<a href="#">Acknowledge</a>		
6	00:02:30	OutsideControl	Normal	No						
7					Sent	Administrator_Email1	Email			
8					Sent	Jay Lakumb	Email			
9	00:02:42	OutsideControl								
10										
11										
12	162:01:25	OutsideControl								
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										

Notification Search

Search Settings

PI System: LITWAREDEMO Connect

View Notifications: Timerange Start Time: End Time:

Output Cell: Sheet1!\$A\$1

	Start Time	End Time	Duration	State	Priority	Acknowledged	Action
7/31/2007 6:40	Active	Active	OutsideControl	Normal	No		
7/31/2007 6:40							Sent
7/31/2007 6:40	7/31/2007 6:41	00:01:20	OutsideControl	Low	No		
7/31/2007 6:40							Sent
7/31/2007 6:40							Sent
7/31/2007 6:17	7/31/2007 6:20	00:02:30	OutsideControl	Normal	No		
7/31/2007 6:17							Sent
7/31/2007 6:17							Sent
7/31/2007 6:06	7/31/2007 6:09	00:02:42	OutsideControl	Normal	No		

Sheet1 Sheet2 Sheet3

Ready

# PI System Explorer Integration

**Webinar Database - PI System Explorer**

File Tools View Go Help

Database Query Date Back Check In Apply Template

**Notifications**

- New
- Israel Notification
- Israel Webinar Notification
- New Notification12

**Israel Notification**

Overview Trigger Content Subscriptions History

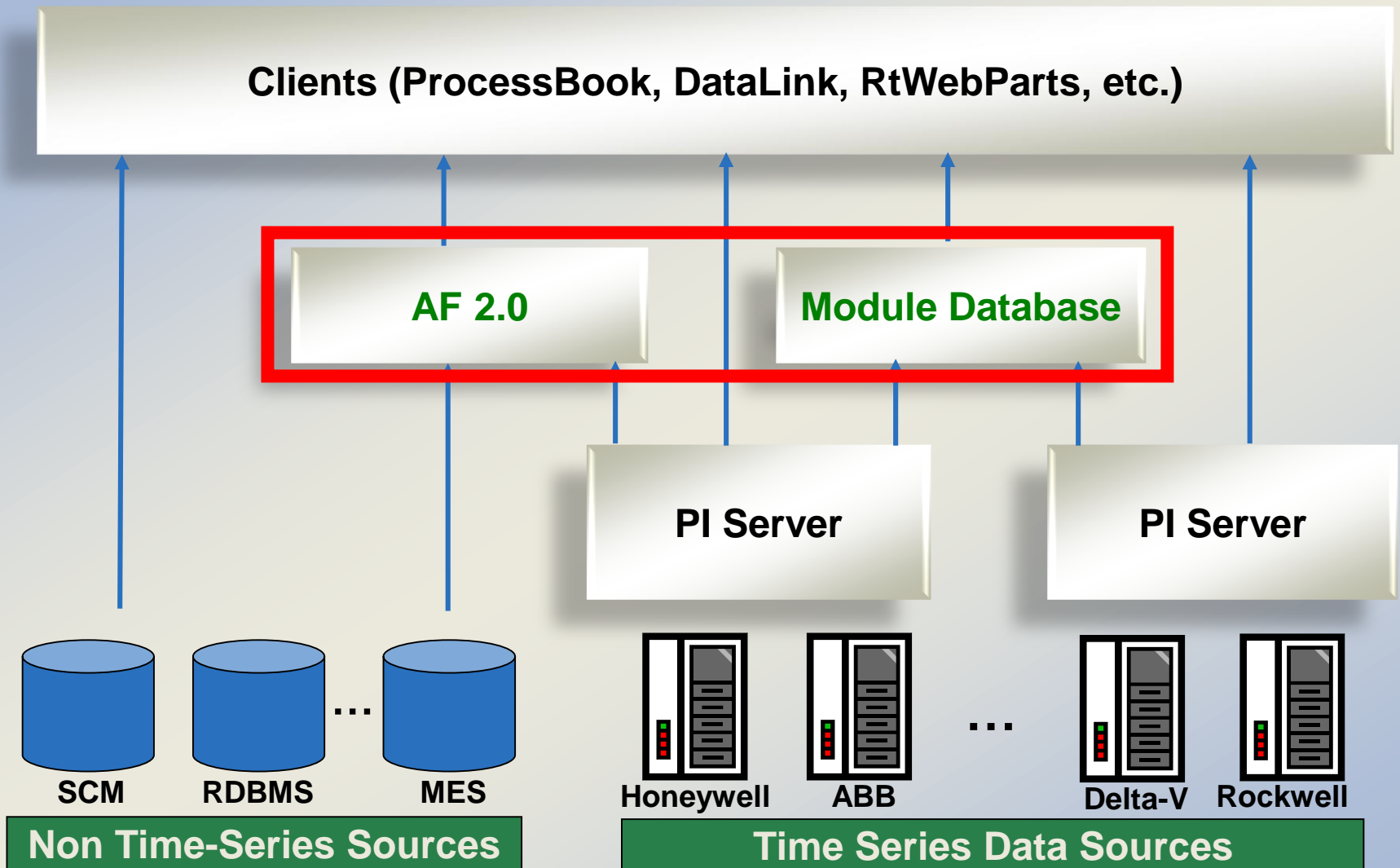
- Subscriptions (1 Required acknowledgments)
  - Don Baron - Email
  - PR Escalation (Escalation period: 00:00:05)
    - Don Baron - Email
    - Tom Tunnell - Email
    - Email via Webservice

**Contacts**

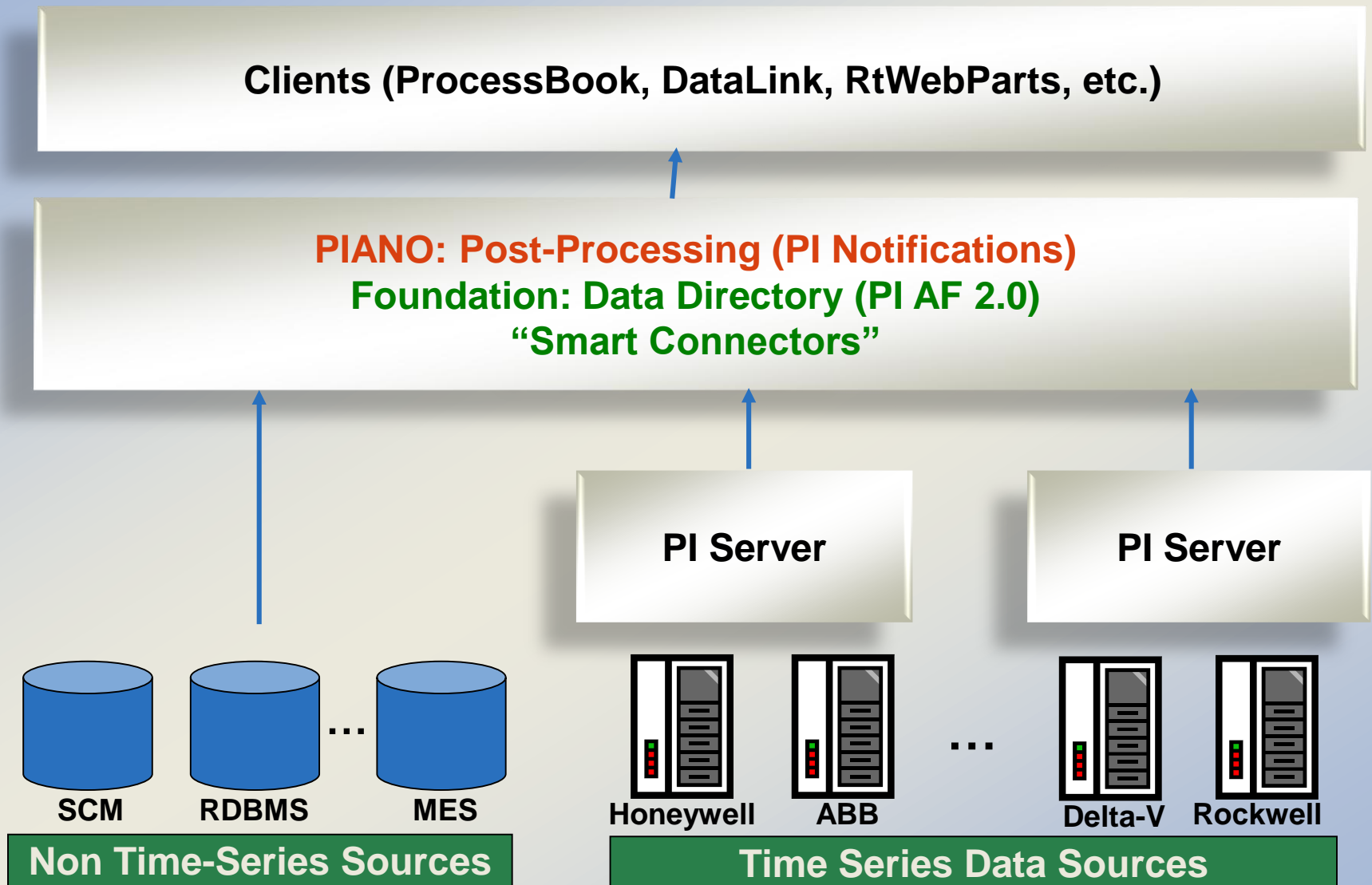
- Contacts
  - Escalation Teams
    - New Escalation
    - Escalation
    - Don then Alton
    - The Dons
    - GreggAndDon
    - PR Escalation
    - New Escalation
  - Groups
    - Delivery Endpoints
      - DB Email
      - Email via Webs
      - Delivery endpoi
      - Delivery endpoi
      - BugTest
      - email persist tes
      - webserv test
      - test123456
      - OutsideEmail A
      - Maintenance R
      - WSTESTTEST
      - TestWebServic
      - GopalWeb
      - Richard Test
      - testfinal?



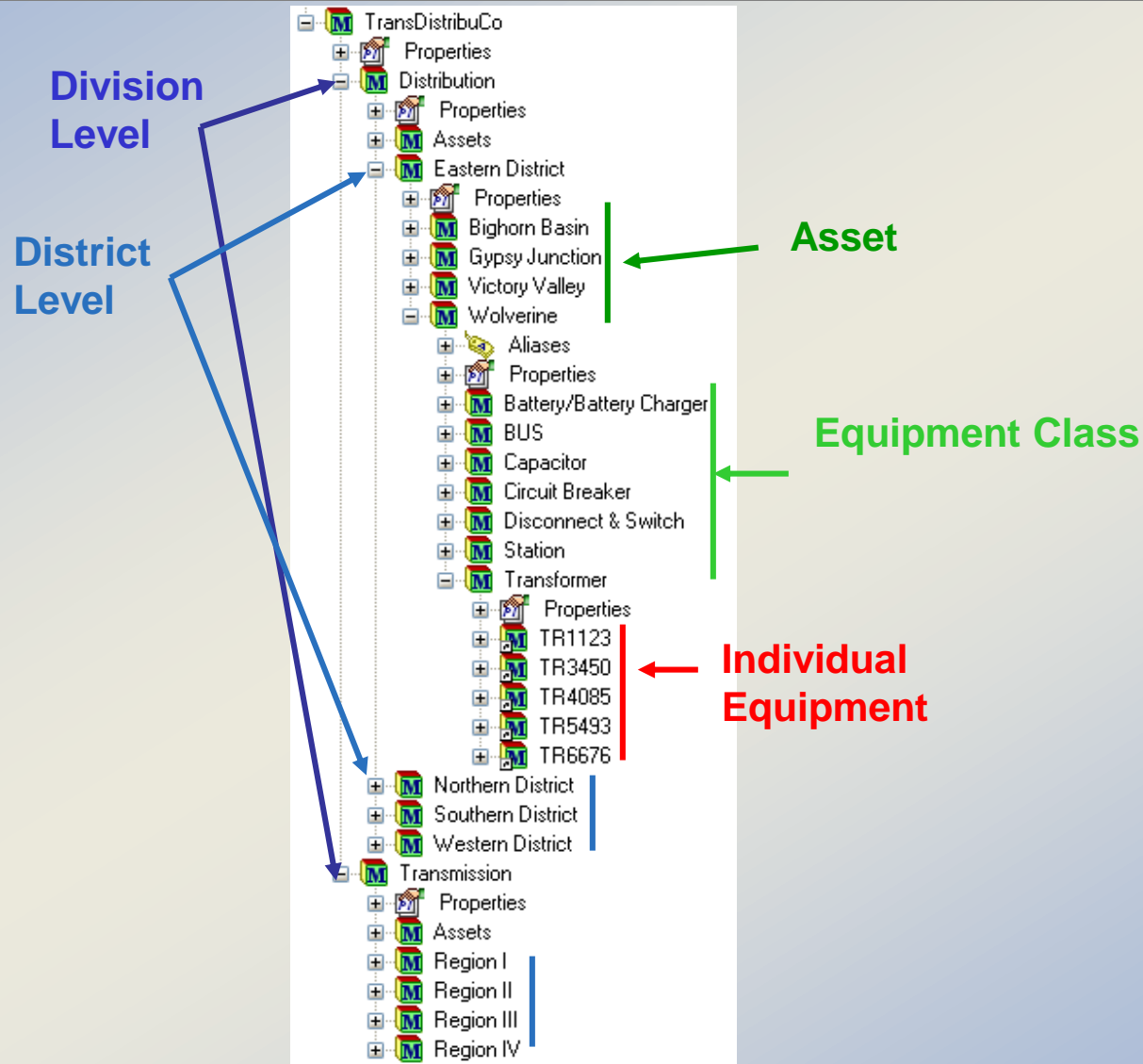
# PI Analytics – Today



# The Analytics – Bridge Release



# PI Module Database – Asset Hierarchy

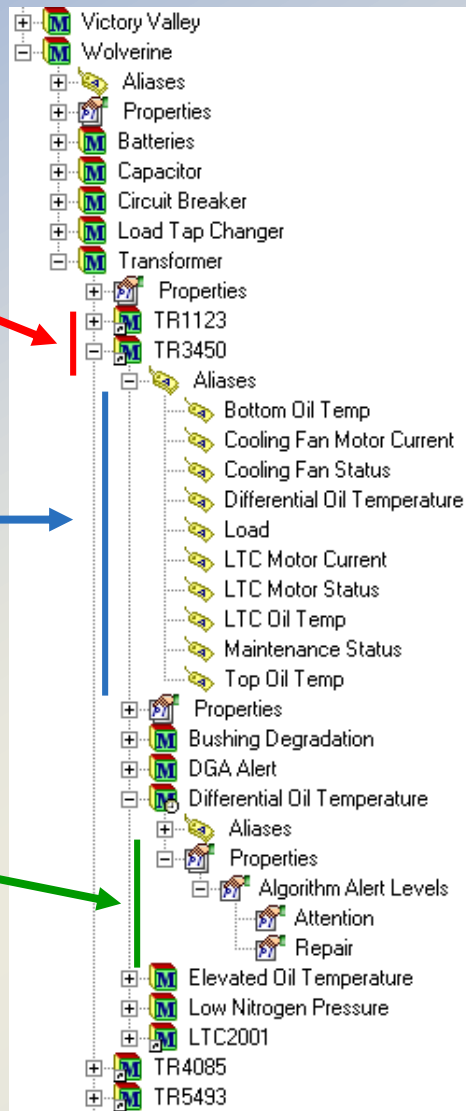


# PI Module Database – Attributes

Individual Equipment

Aliases

Properties



Alias Configuration

Alias Name: Bottom Oil Temp

PI Server: Finn

Tag Name: TR3450\_TI7859

OK Cancel

Property Configuration

Property Name: Coefficient

Data Type: Double

Property Value: 75.66

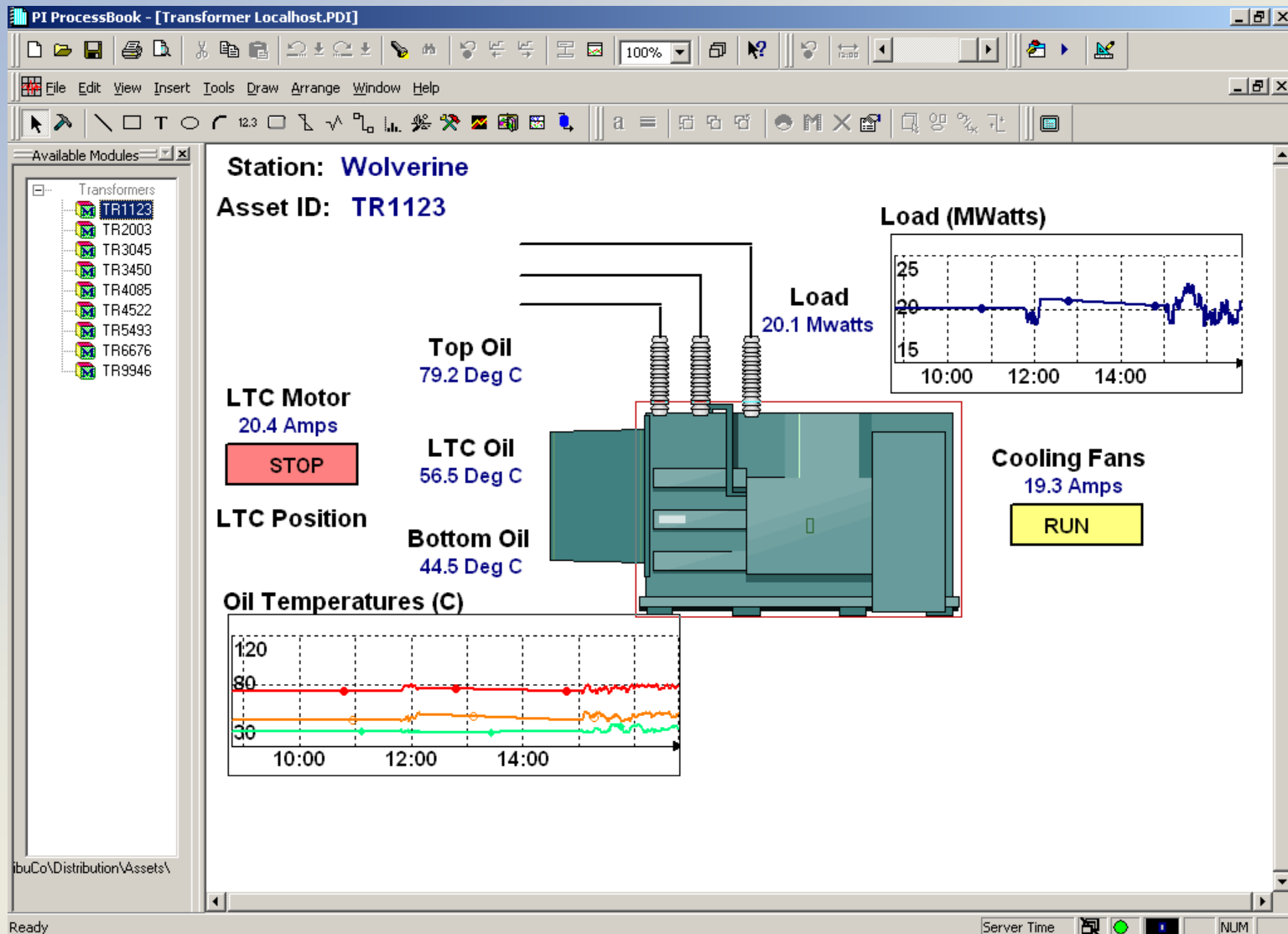
LBound: 0

Elems: 0

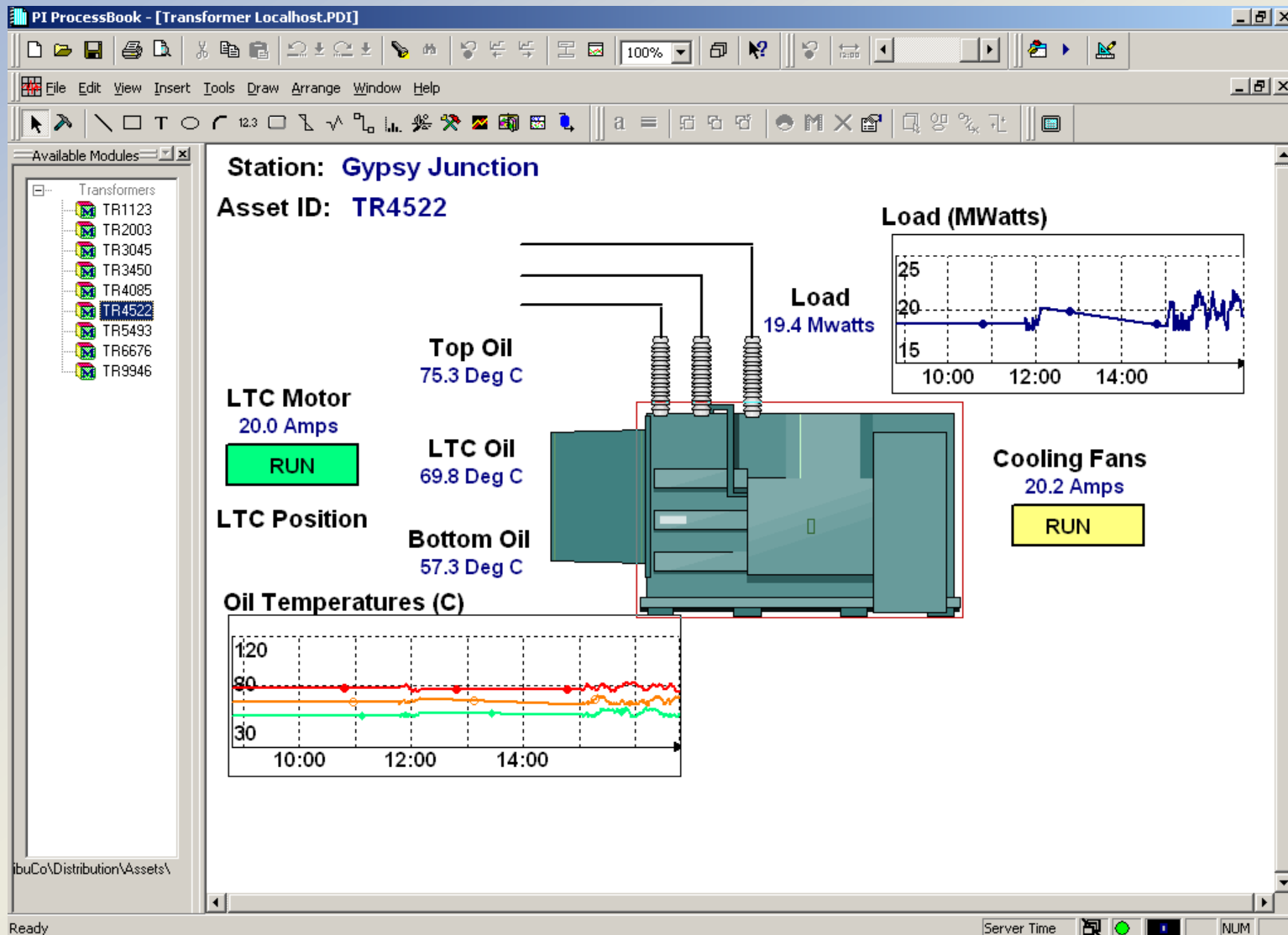
Resize Array

Add Delete Update OK Cancel

# PI Module Database – Asset Relative Displays



# PI Module Database – Asset Relative Displays



# PI DataLink – Asset Relative Reports

A	B	C	D	E	F	G	H	I
1			Great River					
2								
3	Reporting Period							
4		Start Time	*-24h					
5		End Time	*					
6								
7	Supplier	KV			Load			
8	Great River							
10		Current Value	77.55			94.97		
12		Maximum	4/8/07 15:29	80.41		4/8/07 11:46	96.31	
13		Minimum	4/8/07 12:07	73.14		4/8/07 15:25	93.06	
14		Average		76.15			95.98	
15								
16								
17		MVA			MW			
18								
19		Current Value	224.24			1405.29		
21		Maximum	4/7/07 16:24	230.74		4/8/07 15:19	1406.35	
22		Minimum	4/8/07 11:46	223.78		4/8/07 12:01	1398.10	
23		Average		227.14			1399.89	
24								
25								
26								
27								
28								

Sheet1 / Sheet2 / Sheet3

# PI DataLink – Asset Relative Reports

A	B	C	D	E	F	G	H	I
1			Louisville Gas and Electric					
2								
3	Reporting Period							
4		Start Time	*-24h					
5		End Time	*					
6								
7		Supplier	KV			Load		
8		Louisville Gas and Electric						
10		Ameren IP	Current Value		45.91		99.02	
11		Consumers						
12		Great River	Maximum	4/8/07 15:23	49.68	4/8/07 15:29	100.71	
13		Hoosier Energy	Minimum	4/8/07 11:46	33.22	4/8/07 15:28	97.00	
14		Louisville Gas and Electric	Average		37.63		98.83	
15								
16								
17			MVA			MW		
18								
19			Current Value		53.69		2209.30	
20								
21			Maximum	4/7/07 16:27	63.48	4/8/07 15:02	2399.82	
22			Minimum	4/8/07 15:23	47.09	4/8/07 11:46	1616.81	
23			Average		54.92		1831.48	
24								
25								
26								
27								
28								

Sheet1 Sheet2 Sheet3



# PI ACE – Consistent Performance Metrics

- Scalable application development environment
- One, consistent calculation can be used for all similar processes or equipment
- Integrates access to data and functionality from other systems

The screenshot displays the PI-ACE Manager application window. The main tree view on the left shows a hierarchy starting with 'piserver2', which contains 'Exchangers', 'Heat\_Duty', 'Input Tags', 'Output Tags', 'Contexts', 'Pumps', and 'Controllers'. The 'Contexts' folder is expanded, showing two sub-contexts: '\\piserver2\\All Exchangers\\E100' and '\\piserver2\\All Exchangers\\E239'. Both are highlighted with red boxes. To the right, a 'Current Status' table is visible, showing various system components and their status (On/Off).

Below the main tree, two detailed views for specific equipment are shown, each with a 'Folder Items' pane and a 'PI Alias' table.

**E100 View:**

- Folder Items:** My Module Databases, localhost, PI BatchDB, PI ModuleDB, %OSI, DevNet, Equipment Library.
- PI Alias Table:**

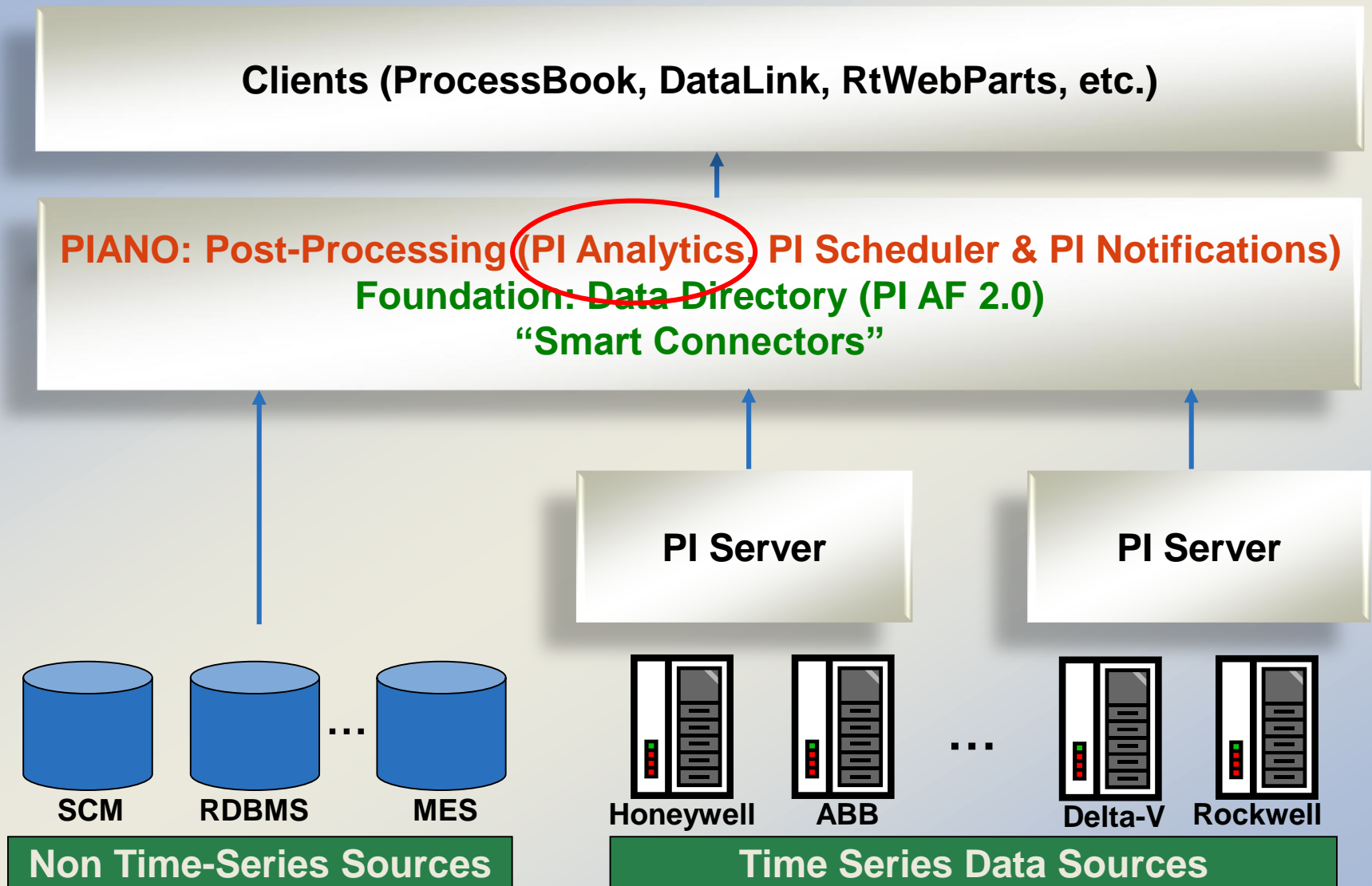
PI Alias Name	Tag Name
Cold Side Inlet Temp	TI-101
Cold Side Outlet Temp	TI-102
Hot Side Inlet Temp	TI-105
Hot Side Outlet Temp	TI-107
Heat Duty	Q100

**E239 View:**

- Folder Items:** My Module Databases, localhost, PI BatchDB, PI ModuleDB, %OSI, DevNet, Equipment Library, Controllers, Exchangers, E100, E239.
- PI Alias Table:**

PI Alias Name	Tag Name
Cold Side Inlet Temp	TI-
Cold Side Outlet Temp	TI-
Hot Side Inlet Temp	TI-
Hot Side Outlet Temp	TI-
Heat Duty	Q2

# PI Analytics - Future



# Highlights of Smart Connectors

- Family of Products
  - Interfaces (today and beyond)
  - Asset Connectors (Bridge Release and beyond)
  - Business Gateways (~PR 3)
- Asset Connectors
  - Use Windows Communication Foundation
  - Re-use lessons from 25+ years of interface dev.

# Smart Connectors

- Establish and maintain relationship between PI System and Foreign System
  - Configuration
  - Sensor
  - Meta-data
- Goal of Smart Connectors:
  - “Zero” management
  - “Near-Zero” installation & configuration

# PI and the Smart Grid

- Press Release May 5, 2008

*“OSIsoft ... announces the addition of two products for their Advanced Metering Infrastructure (AMI) and Smart Grid initiatives: **“PI Smart Connectors”** and **“PI Business Gateways”**.”*

*OSIsoft has developed “Smart Connectors” that will interface metering systems (AMI) to the PI System in order to **unify, validate, rationalize, store and synchronize** the metering data at the speeds necessary to support next generation grid management applications.”*

# Benefits of the PI Infrastructure

- PI High Availability (HA)
  - Fault tolerant Mission Critical environment
  - Split architecture security
  - Interface failover, buffering, data replication and a service interface
- PI AF – a template framework that supports
  - Simultaneous models
    - network connectivity,
    - correlative, or
    - process (CBM)
  - Meta-data store

# Benefits of the PI Infrastructure

- Infrastructure stays in place while the systems it collects data from, or the systems it presents data to, evolve
  - Secure, Robust, Information rich
- Industry standard web and desktop environments
  - Analytics
  - Notifications
  - Alarms

# Benefits for The Smart Grid

- Integration of meter information
  - End-to-end view of a utility
  - Generation to the meter
  - Event-oriented environment
- Easy integration
  - Geographic Information Systems,
  - Power Modeling Applications and
  - Outage Management Systems.

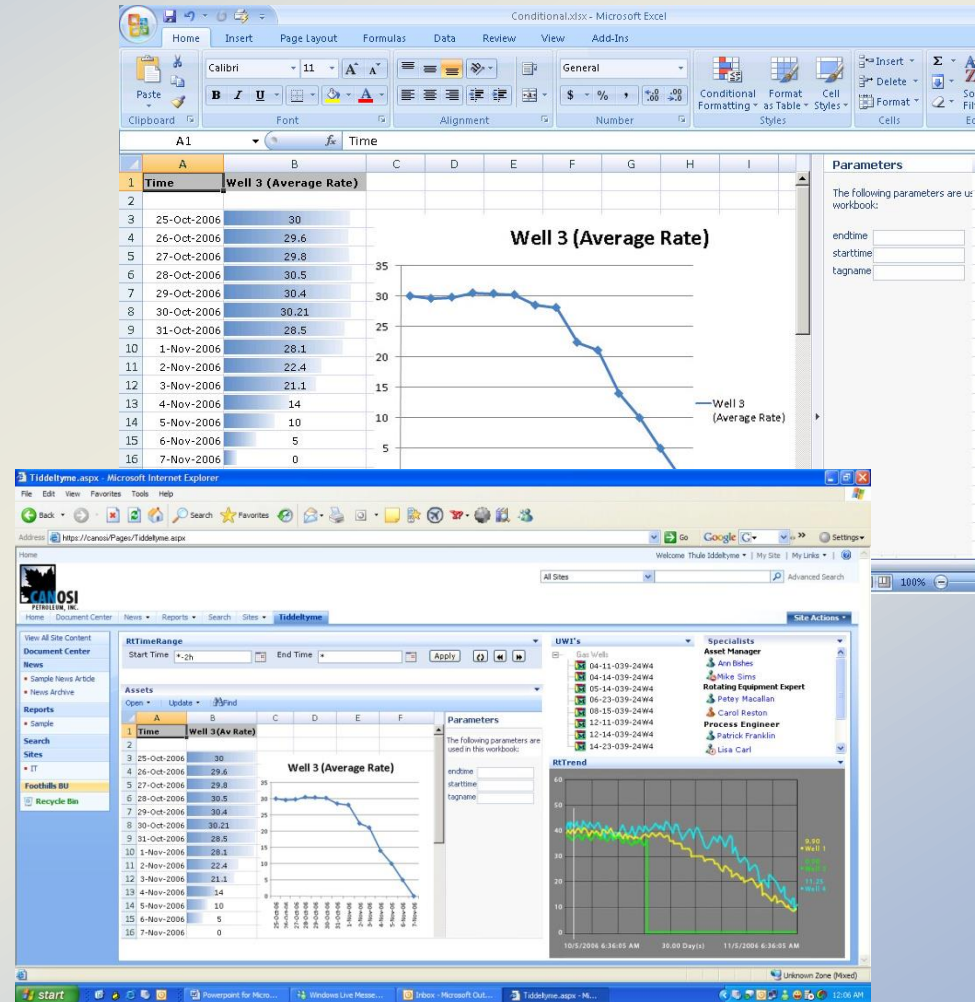


# Benefits for The Smart Grid

- Standard capabilities allow users to
  - Determine circuit profiles and feeder efficiencies
  - Optimize load
  - Evaluate grid and asset health
  - Within an actionable environment
- Positioning for more advanced integration involving the interplay of
  - Market dynamics
  - Distributed energy resources
  - Smart homes

# DataLink for Excel Services (DLES)

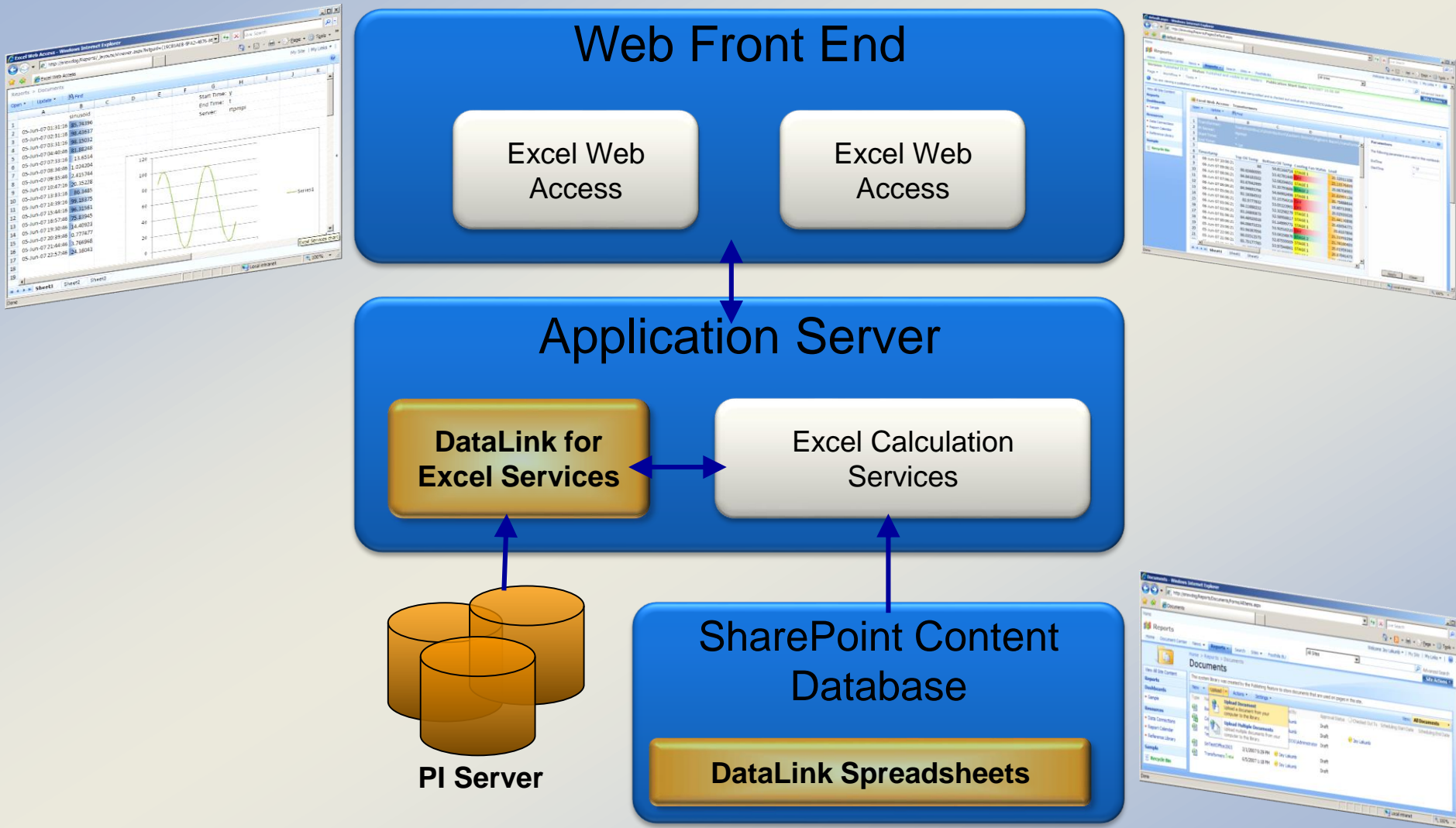
- **PI DataLink on the Web**
- Only requirement is a Web Browser
  - No DataLink or Excel installation on client
- Move existing spreadsheets to the SharePoint portal
- Deploy DataLink functions at the Enterprise level:
  - Install SharePoint 2007 on the server machine
  - Install DataLink functions on the server machine



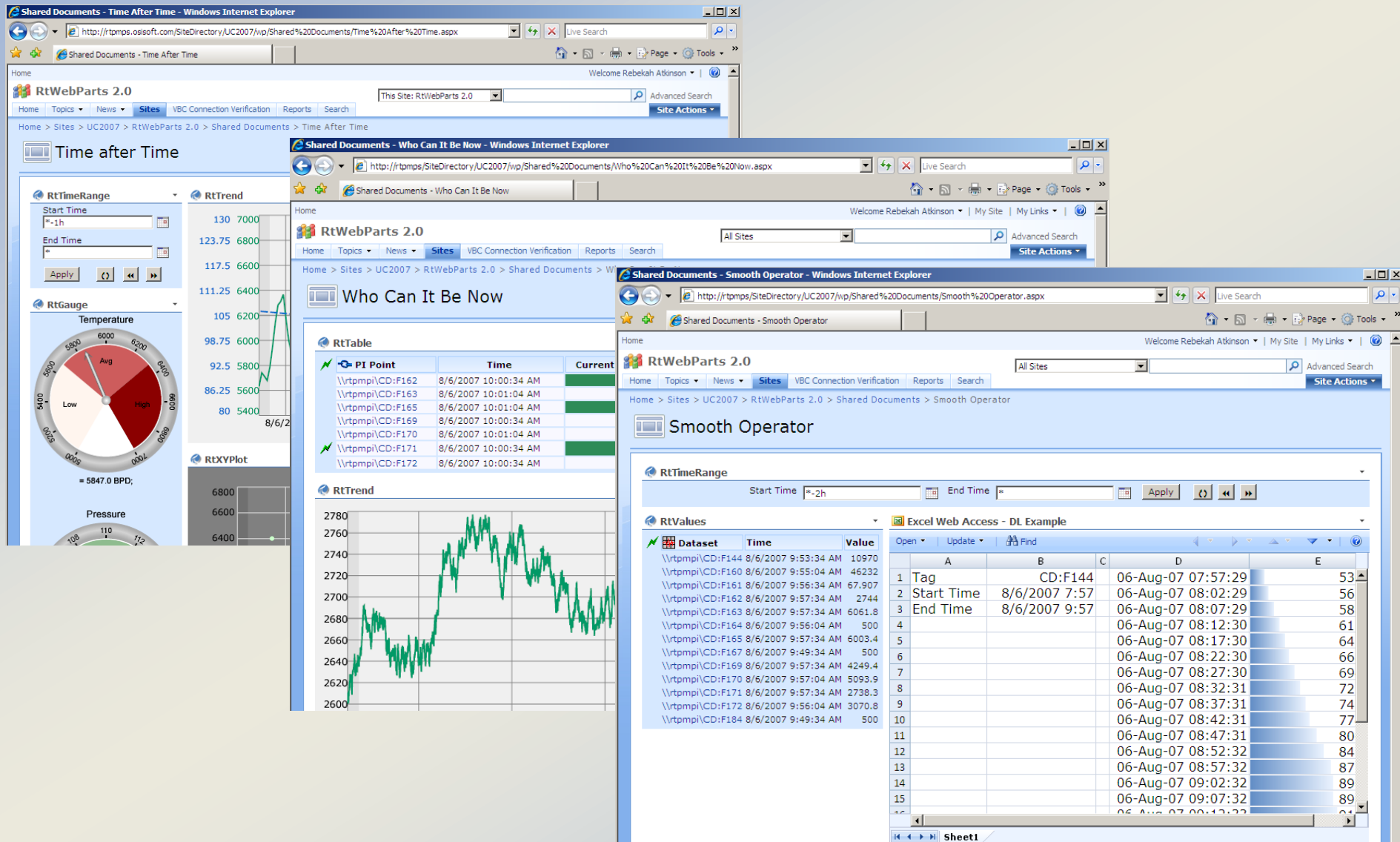
# DLES – The Value

- Shows “one version of the truth”
  - Simplify collaboration around spreadsheets
- Provides enterprise content management
  - Make spreadsheets accessible and manageable
  - Allow dynamic spreadsheets, but keep them secure
  - Not able to directly edit cells on spreadsheet
- Enables business intelligence in real-time
  - Improve business insight into PI data on demand
  - Display graphical, interactive pages using context

# DLES – Architecture



# DLES – Examples

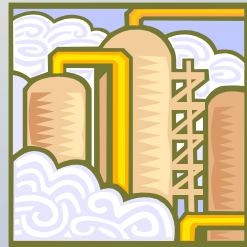




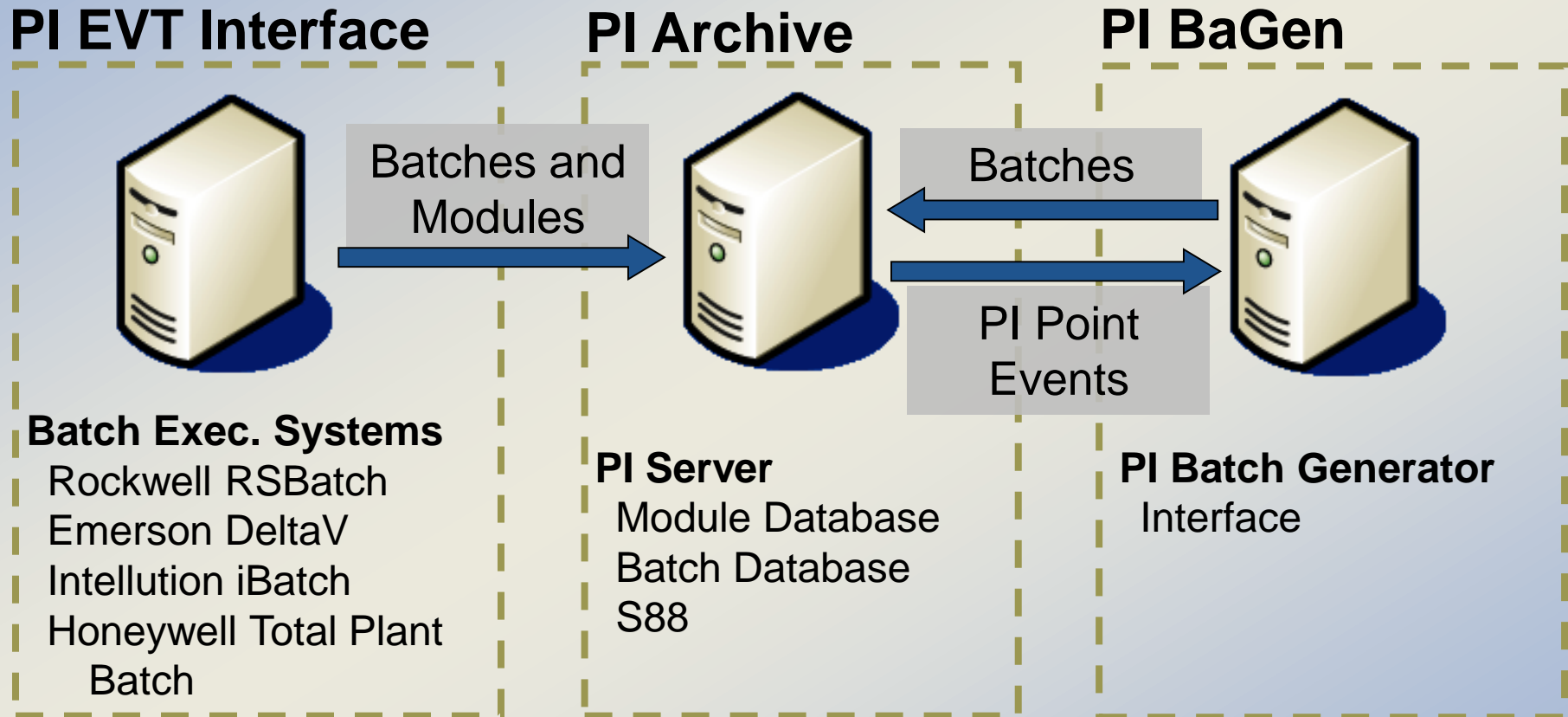
# Batch and Event Analysis

Every process has some kind of repeatable event

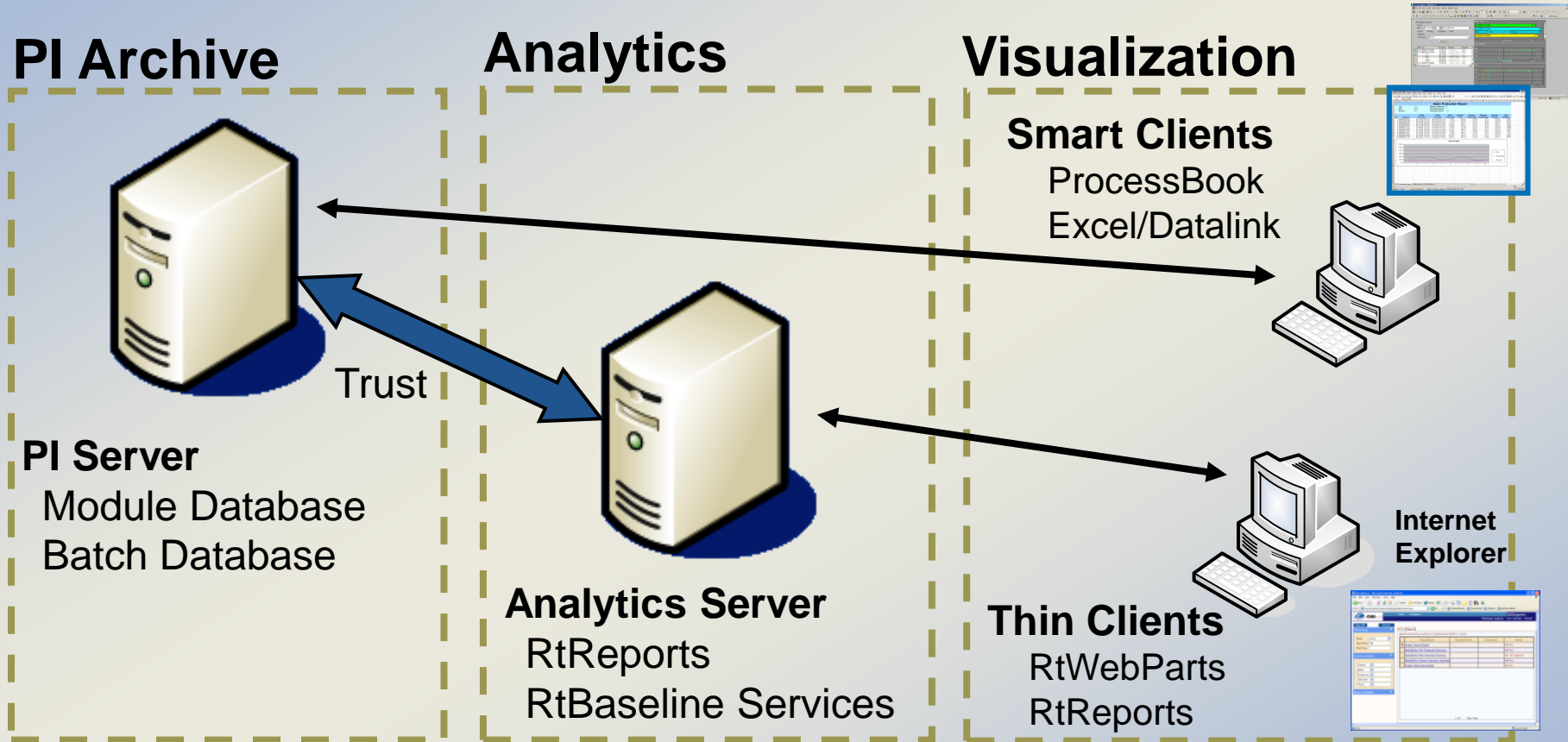
- Batch process
  - Am I making it the same way as yesterday?
  - How do I make the best product?
  - How can I reduce cycle times?
- Continuous process
  - What causes downtime?
  - Can I improve my startup or grade change times?
  - How can I track and study environmental excursions?
- Discrete process
  - What is my Overall Equipment Effectiveness?
  - What are my top 10 causes of downtime?



# PI Batch Architecture



# PI Batch Architecture





# RtReports Editions

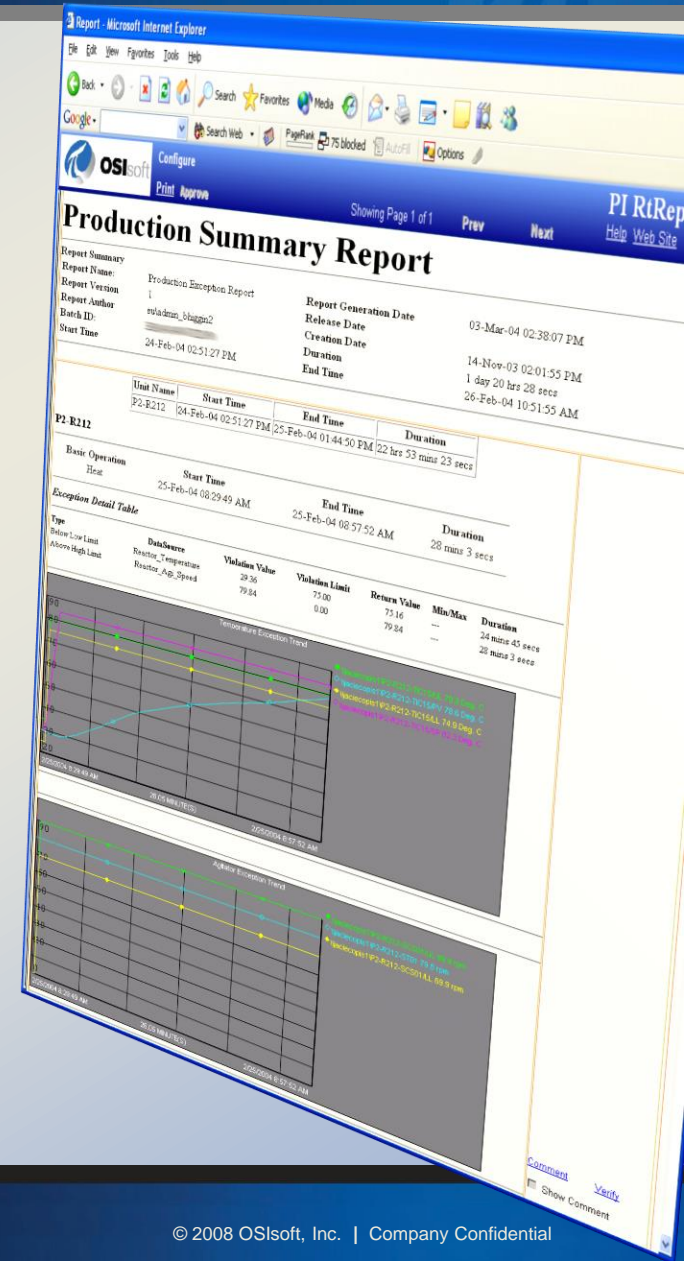
- *Standard Edition*
  - Intended for customers that need web-based, real-time reporting who are not constrained by regulatory requirements
- *Compliance Edition*
  - Complies with government regulations to meet electronic signatures
  - Suitable for customers constrained by FDA or EPA

# RtReports Benefits

- Improve employee efficiency
  - Reports built and regenerated without programming
  - Library of processing rules and formatting rules allow for rapid report generation
- Enhance knowledge management and collaboration
  - Reports available on-demand, via the Web
- Reduce variability in reporting
  - Information workers retrieve information from the same source
  - Generate tamper-proof reports
- Improve manufacturing agility
  - Accelerate product release
  - Automate environmental reports

# RtReports

- Standardized enterprise reporting
  - Templates for repeatable reports and data retrieval
  - Import/Export utilities for moving report templates between locations
  - Configuration – no programming
- Manage change through versioning
  - Versioned Report templates
  - Review and Release workflow for report templates
    - Comment print, verify report sections, and approve final report
- Tracks report output
  - No need to store output
    - Regenerated on demand
    - Print to paper, PDF, SharePoint DL
  - Who printed, how many, when last printed?



# RtReports Differentiators

- Comprehensive reporting tool
  - Specify the format, content and management of reports
- Integrates internal and external data sources
  - Relational and web services data
- Report Template Versioning
- Flexible context meta-data
- Compliance Edition Workflow

# RtReports Capabilities

- Batch Based
- Time Based
- AF Case Based

**Nisqually Creamery Batch Production Report**

Batch ID: 100000000000000666  
Product: Five Gallon  
Recipe: Chocolate Chocolate Chip  
Start Time:  
End Time:  
Duration:

Batch Summary

Total Cartons  
Average Production  
Mixer 1 Total D  
Mixer 2 Total D

Unit Name  
Mixer 1:1  
Parameters  
Line 1  
Mixer 2  
Flow

Report Name:  
Report Version:  
Report Author:

Weekly

Sunday  
Monday  
Tuesday  
Wednesday  
Thursday

Done

Start

**Weekly Report for Sunday, July 10, 2005**

Report Start Time 10-July-2005 12:00:00 AM Report End Time 17-July-2005 12:00:00 AM Completed ---

**RtReports Report Viewer - Microsoft Internet Explorer**

Element Name	Element Description	Element Type
SF_MilkTank1	Milk Tank 1	Node
Attribute Name	Attribute Value	Attribute UOM
AmbientTemperature	0.0000	°C
BSW	0.0000	No UOM Returned
CorrectedVolumeTolerance	0.0000	L
CorrectedWeight	0.0000	kg
CostCenter	No Data Returned	No UOM Returned
Density	1.0000	SG
DensityBalanceFlag		No UOM Returned
Diameter	0.0000	m
EnergyBalanceFlag		No UOM Returned
FloatingRoofAdjustment	0.0000	L
GrossVolume	1247.7434	L
Height	300.0000	m
ComponentBalanceFlag		No UOM Returned
HighAlarm	0.0000	m
InequalityBalanceFlag		No UOM Returned
InferredStatus	No Data Returned	No UOM Returned
LevelGauge	5.1472	m
LiquidVaporSpace	0.0000	L
LiquidVaporSpace	0.0000	L
LowAlarm	0.0000	m
ManualAdjustmentFlag		No UOM Returned
MassTolerance	0.4336	kg
MassVaporSpace	0.0000	kg
CompositionTrackingBalanceFlag		No UOM Returned
Material	MilkA	No UOM Returned



**OSIsoft®**

VALUE NOW, VALUE OVER TIME

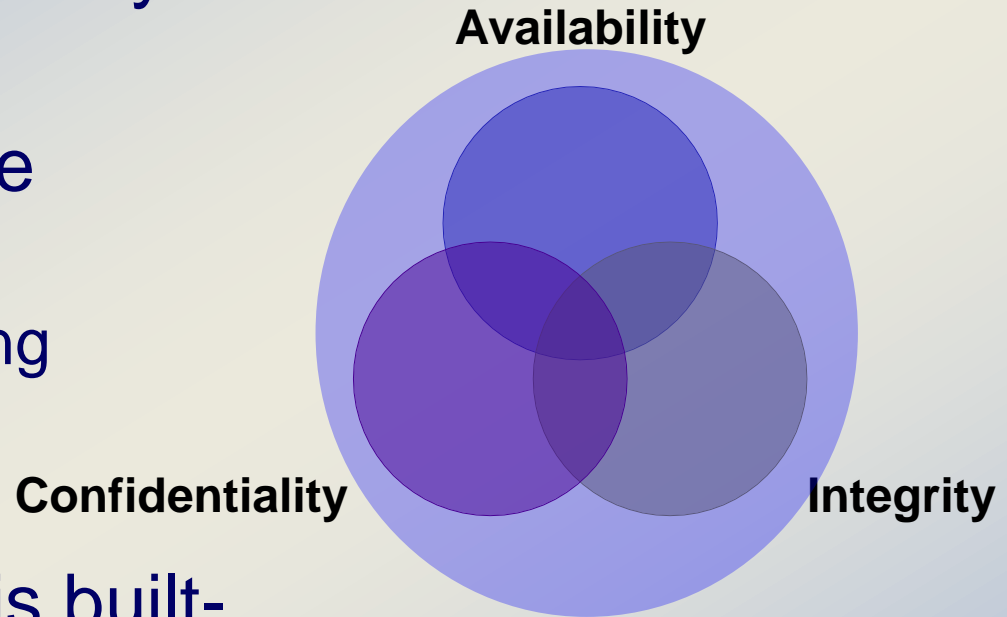


# PI Security



# The C.I.A. Security Model for PI

- It's really about Quality!
- Core Infrastructure
  - High Availability
  - Integrity Monitoring
  - Modern Platform
- Security lifecycle is built-in and serviceable.



# PI Feature Map for C.I.A.

- High Availability
  - PR1 Collectives and Interface Failover (HA)
  - mPI Software Update Service
- Integrity
  - Audit Trail and Logging
  - Quality of Service Monitoring (ITM & NOC)
- Confidentiality
  - Integrated Authentication and Authorization
  - Object Oriented Security Policy
  - Best Practices (CoE)

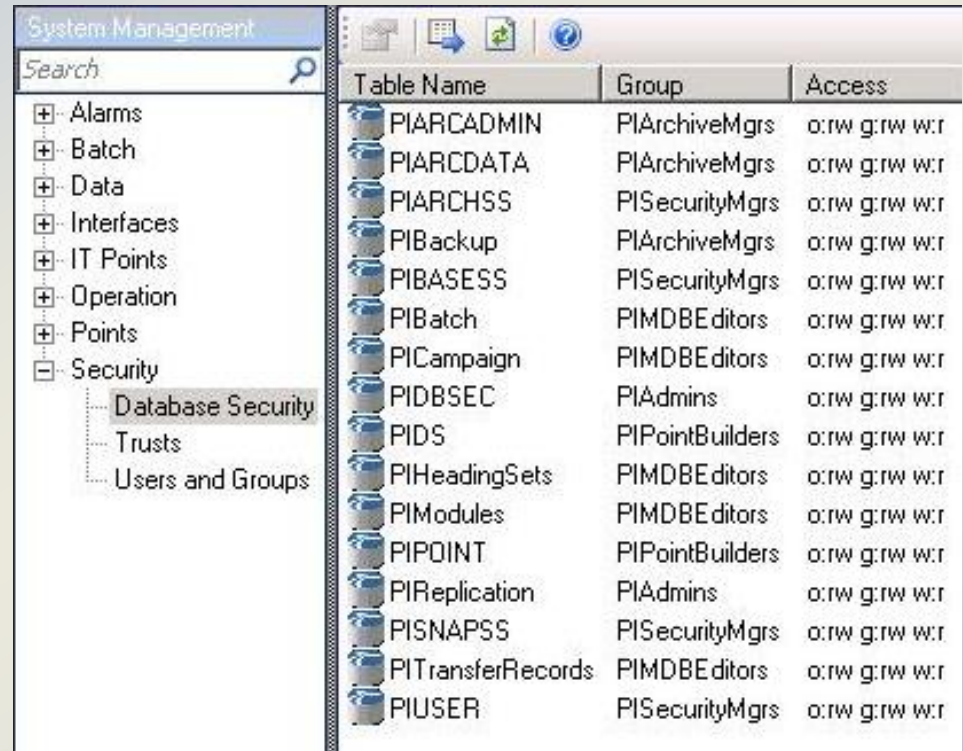


# Is the PI System Data Encrypted?

- PI data is transmitted in the clear with binary encoding for performance
  - Secondary characteristic is “security by obscurity”
  - Transmits on exception, not deterministic polling [eg. Modbus]
  - Normally acceptable for data privacy inside a trust boundary
- PI is compatible with encryption policy deployment
  - RtWebParts\RtReports\DLES (via MS Sharepoint) [TLS/SSL]
  - Thick Clients (via Terminal Services) [RSA/RC4]
  - Any PINET TCP/IP connection [VPN/IPSEC]
- PI is not usually the driver for encryption policy
  - Align with privacy for MS Office user files
  - Often required across public infrastructure and wireless media
  - Performance is an issue in legacy environments

# Recent Security Changes in PI

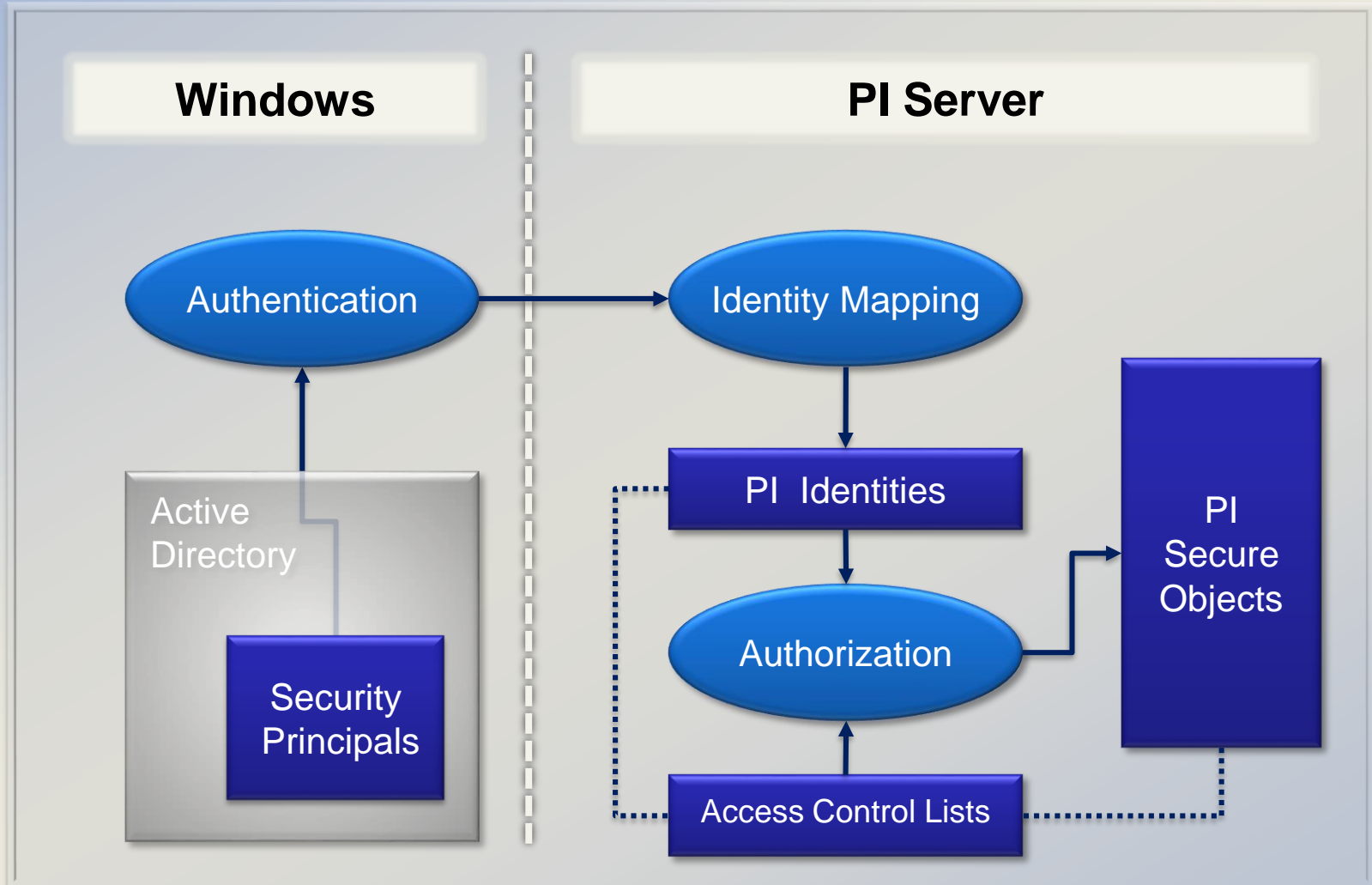
- DBSecurity Roles
- PI Trust Attributes
  - Host name
  - Application name
- PI Module
  - Permission Inheritance
- Interfaces
  - New Buffer Subsystem
  - Disconnected Startup



The screenshot shows the 'System Management' console. The left pane has a tree view with 'Security' expanded, showing 'Database Security', 'Trusts', and 'Users and Groups'. The right pane displays a table with the following data:

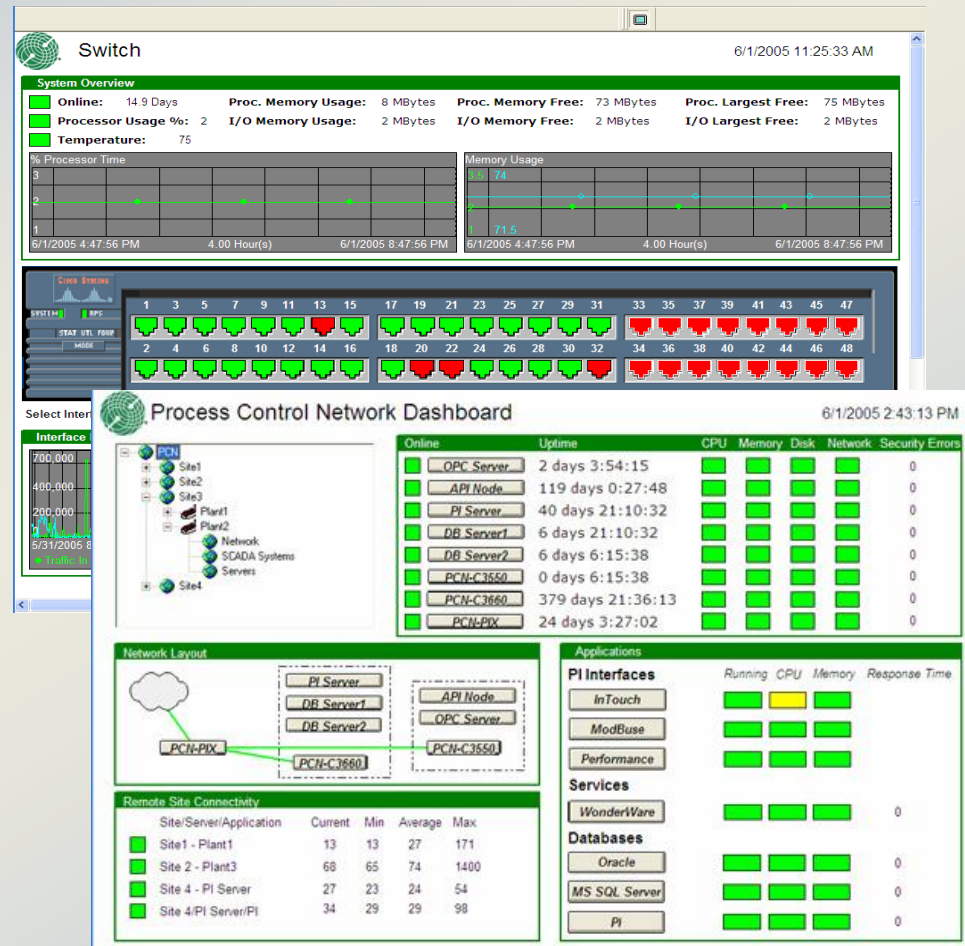
Table Name	Group	Access
PIARCAADMIN	PIArchiveMgrs	o:rw g:rw w:r
PIARCDATA	PIArchiveMgrs	o:rw g:rw w:r
PIARCHSS	PISecurityMgrs	o:rw g:rw w:r
PIBackup	PIArchiveMgrs	o:rw g:rw w:r
PIBASESS	PISecurityMgrs	o:rw g:rw w:r
PIBatch	PIMDBEditors	o:rw g:rw w:r
PICampaign	PIMDBEditors	o:rw g:rw w:r
PIDBSEC	PIAdmins	o:rw g:rw w:r
PIDS	PIPointBuilders	o:rw g:rw w:r
PIHeadingSets	PIMDBEditors	o:rw g:rw w:r
PIModules	PIMDBEditors	o:rw g:rw w:r
PIPOINT	PIPointBuilders	o:rw g:rw w:r
PIReplication	PIAdmins	o:rw g:rw w:r
PISNAPSS	PISecurityMgrs	o:rw g:rw w:r
PITransferRecords	PIMDBEditors	o:rw g:rw w:r
PIUSER	PISecurityMgrs	o:rw g:rw w:r

# WIS: Simplified Diagram



# MCN Health Monitor

- Management Console enables proactive network monitoring and informed decision-making
  - Capacity Planning
  - Critical Application Performance Monitoring
  - Root Cause Analysis
    - Applications
    - Hardware
    - Devices
- Immediate and tangible benefits
  - Increases profitability
    - Identifies manufacturing system operational bottlenecks
    - Reduces system downtime and maintenance costs
  - Improves IT system management
  - Leverages the PI System core technology and maximizes system ROI



# Thank You

## Questions?