Engineering Review

Richard Beeson
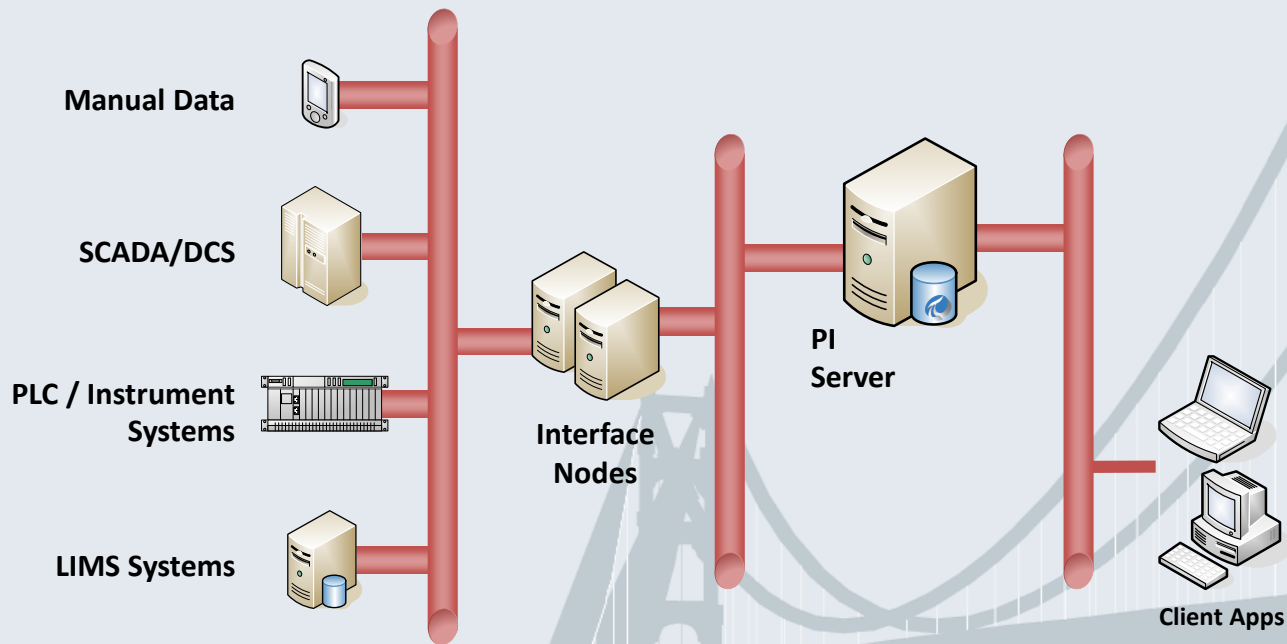
Ray Hall

Brian Bostwick

Ray Verhoeff

OSIsoft®
USERS CONFERENCE
2009
SAN FRANCISCO

Empowering Business in **Real Time**
PI Infrastructure for the Enterprise

Traditional PI Deployment

Manual Data

SCADA/DCS

PLC / Instrument Systems

LIMS Systems

Interface Nodes

PI Server

Client Apps

Interconnected Sites

Site 1 — PI Server — Firewall — Client Apps

Site 2 — PI Server — Firewall — Client Apps

Site 3 — PI Server — Firewall — Client Apps

Site N — PI Server — Firewall — Client Apps

Business Systems
Portal Servers
Application Servers
More Client Apps
Wireless
Mobile Clients

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Enterprise Deployment

Joint Ventures
Employees
Regulatory Agencies

Application Servers

Portal Servers

Business Systems

Enterprise

Data Access

PI Analytics

Interfaces

Enterprise PI System

Division HQ's

PI Analytics

Interfaces

Division Level PI System

Unstaffed Asset
(100's of sites)

Interfaces

AF

Staffed Asset
(10's of sites)

Interfaces

OSIsoft®

2009 USERS CONFERENCE
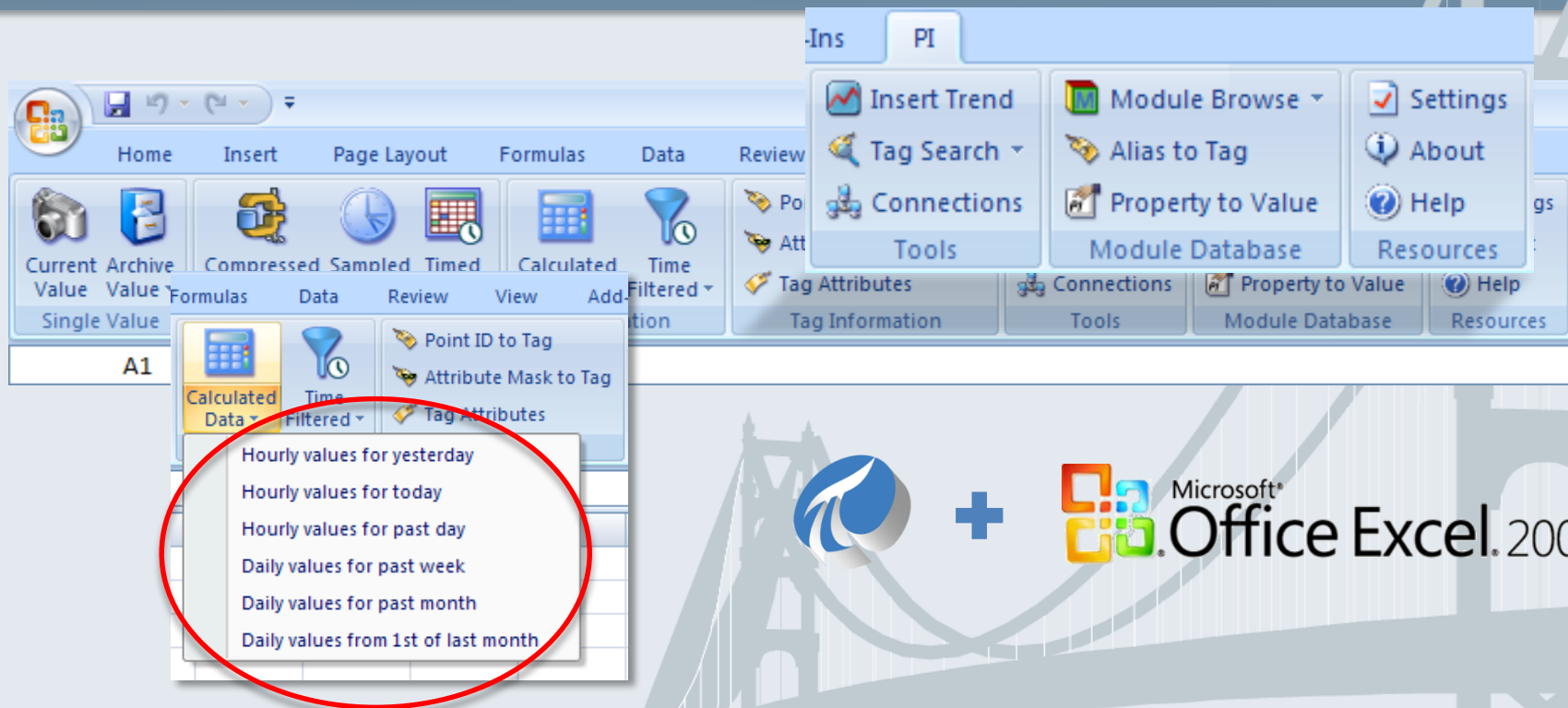SAN FRANCISCO

2009 Value Themes

- Security

- 64-bit servers

- Asset Centric PI
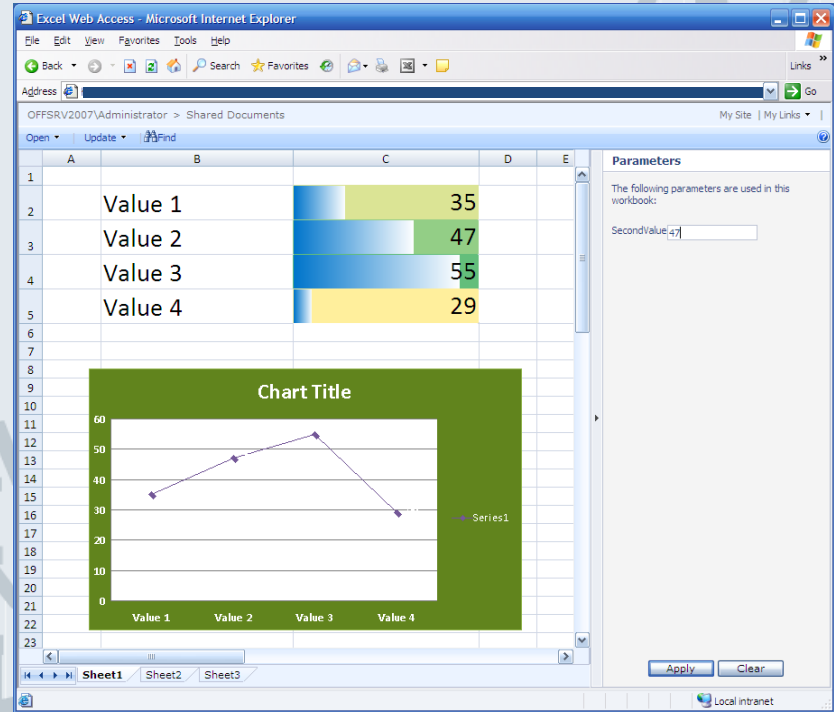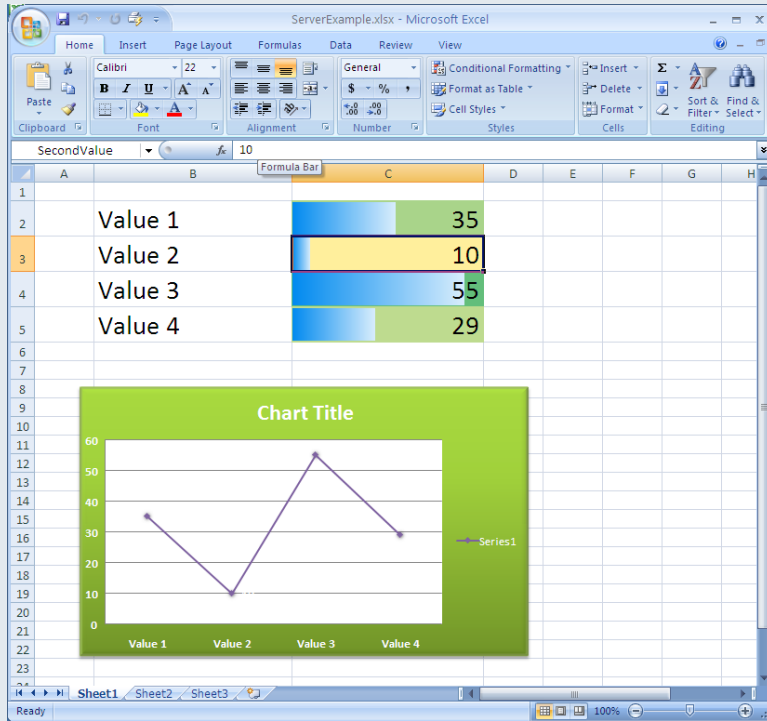
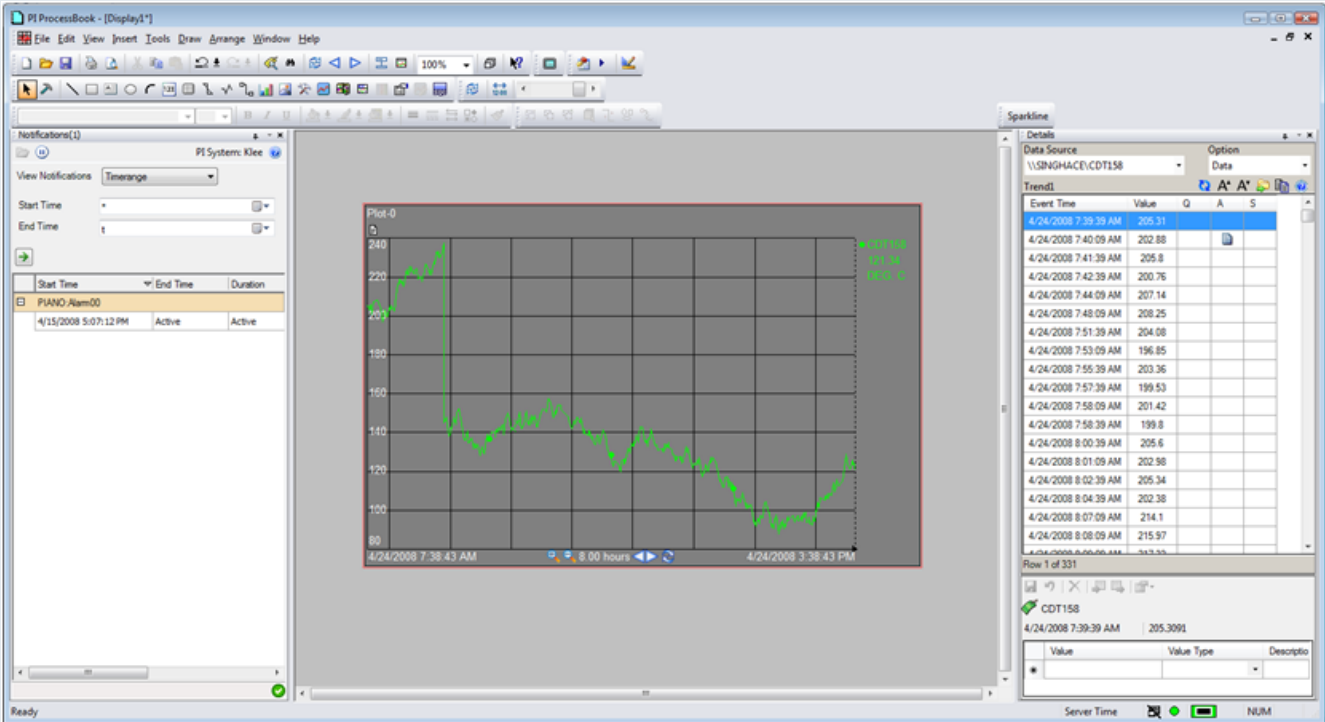- Internationalization

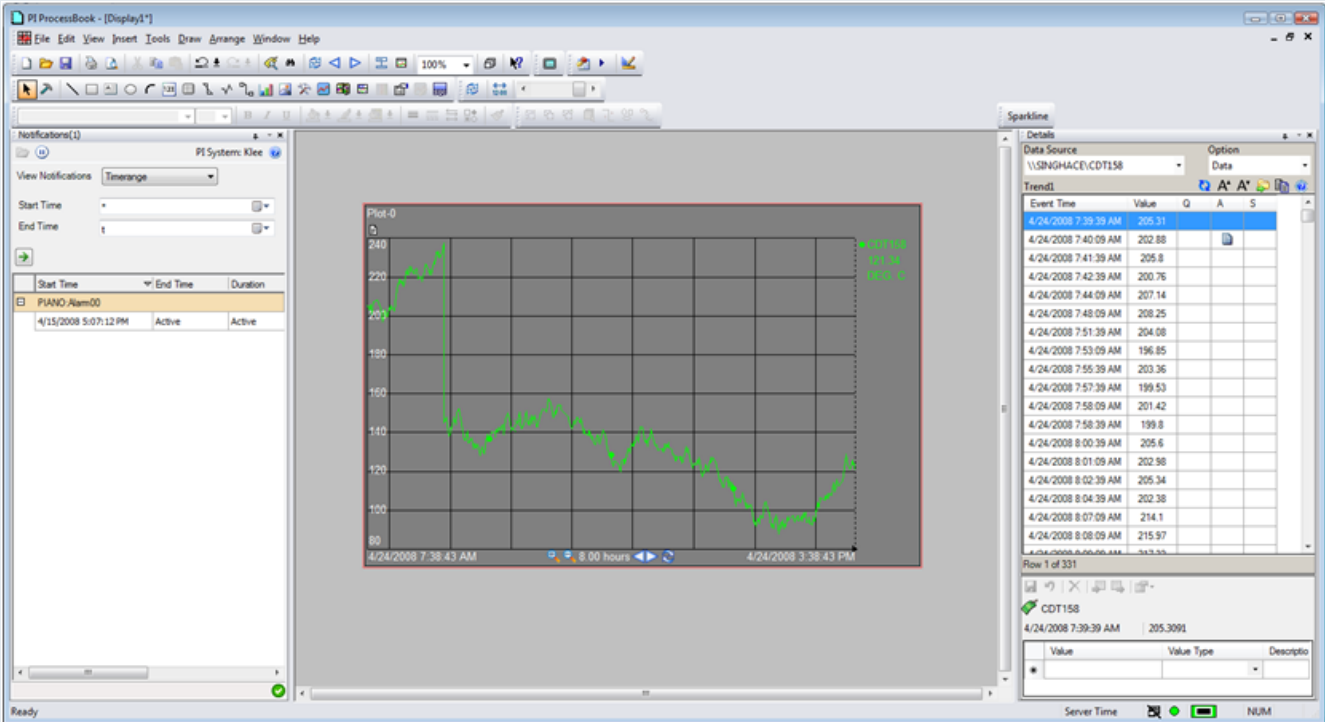- System scaling

Client: Accomplishments
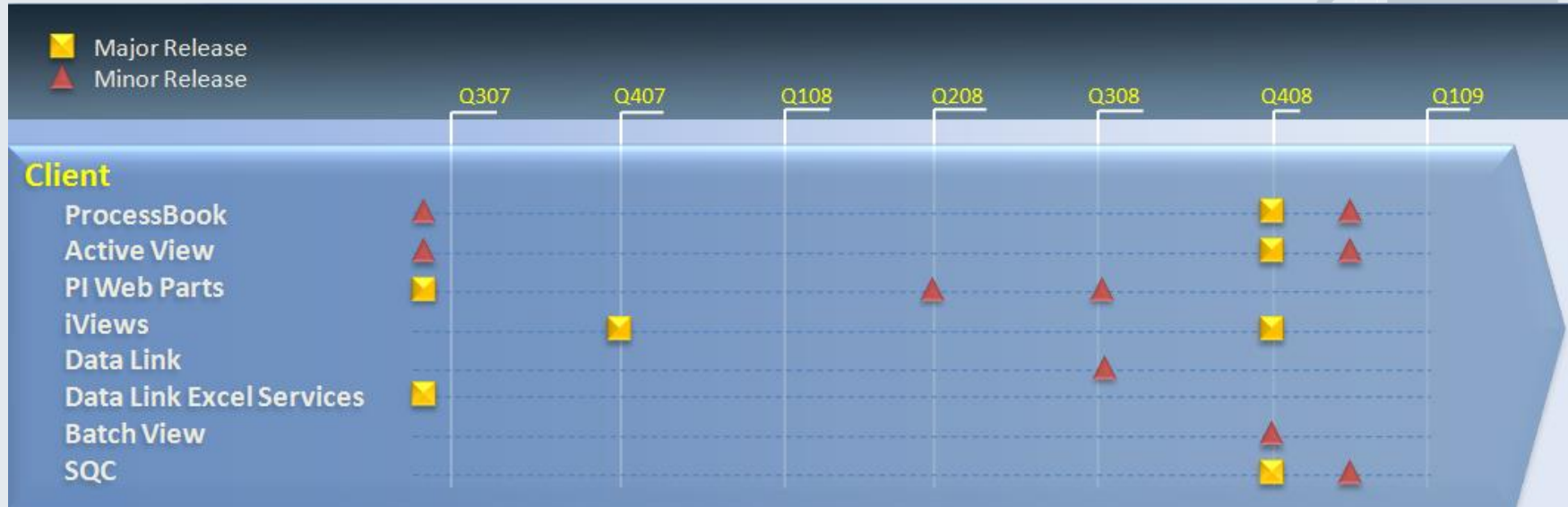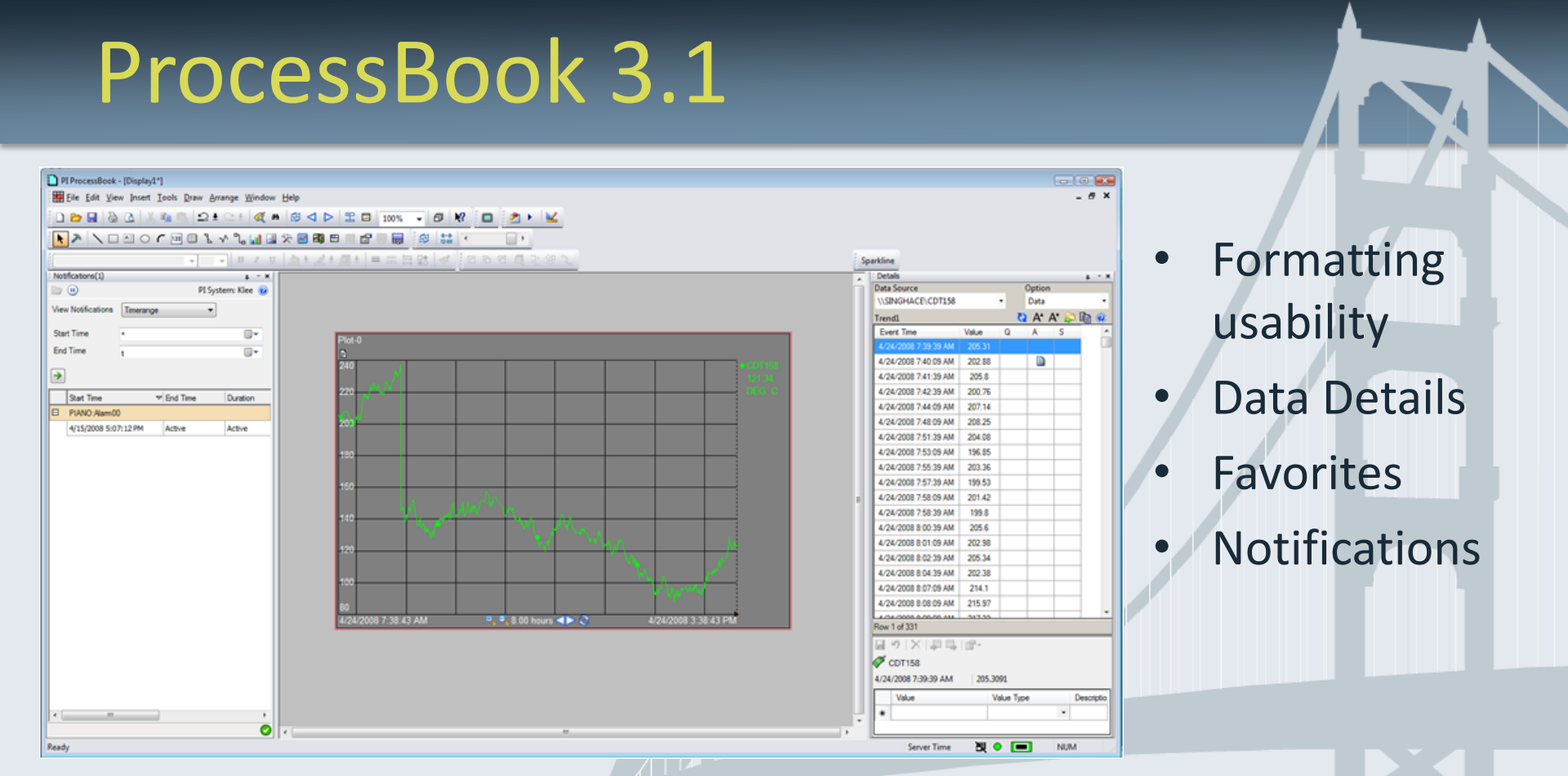
DataLink 4.0

DataLink 4.0 for Excel Services

ProcessBook 3.1

- Formatting usability
- Data Details
- Favorites
- Notifications

RtWebParts 2.x

- RtBatchTable
- Printing enhancements
- PI Notifications Integration
- Usability improvements
- Multiple condition column formats for tables
- Localization Support
- Forms based authentication
- Support for reverse proxy servers, ISA server.
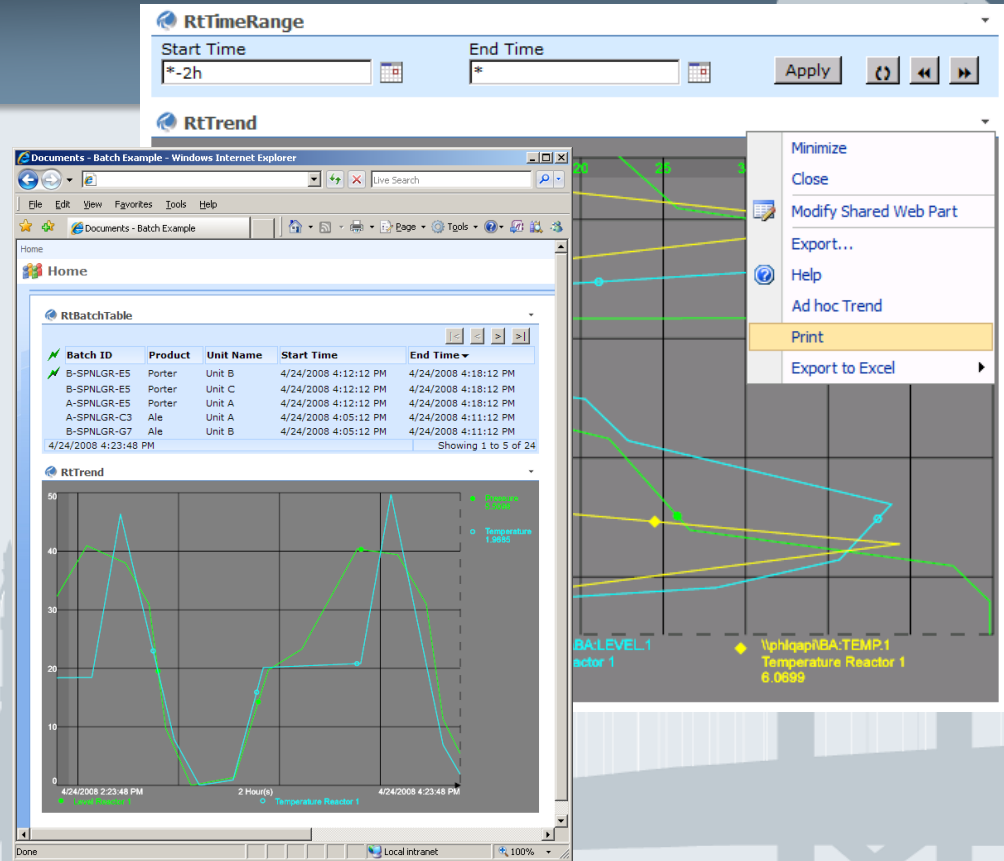
Data Access: Accomplishments

- **PI SDK**
  - Windows Authentication
  - Performance, scaling improvements

- **OPC COM Server**
  - Certified by OPC Foundation
  - Nominated as OPC reference standard

- **PI OLE DB**
  - Performance, scaling improvements
  - Enhanced for BizTalk, BDC

Virtual Campus

- OSIsoft Developer Community
- New Software+Services (S+S) offering from OSIsoft
- One- or multi-year subscription
- Community-oriented and resource-rich website and services
- Provide everything necessary to build applications on top of PI, with focus on 'doing it right' (guidance, learning, etc.)
  - PI software for development (PI Application Toolkit)
  - Architectural guidance
  - Support/Collaboration in various ways

Servers: Accomplishments

- **PI Server**
  - 3 Patch Releases
  - Security Threat Patch
- **ACE**
  - Visual Studio 2008

- **PI Notifications**
  - Major Release 1.0
- **PI SMT**
  - 2 Major Releases

- **AF**
  - Major Release 2.0

Interfaces: Accomplishments

- Phase II failover being widely implemented
  - OPC DA, PIToPI, RDBMS, OPC HDA, OPC A&E
- New Batch Framework
  - Emerson DeltaV Batch, Rockwell FactoryTalk Batch, Emerson DeltaV Compliance Suite (Syncade)
- New Product development
  - BACnet Interface , DSS Plant Monitoring System Interface, DeltaV Smart Connector, GE XA/21 APS Connector
- Version 3.8.1.0 PIToPI released
- PI SDK 1.3.6.364 (disconnected startup fix plus other issues which affected interfaces)
- 119 Separate Interface Releases since Monterey Users Conference

Interfaces

OSIsoft Product Roadmap

🟨 Major Release
🔺 Sevice Release

	Jan	Feb	Mar	Apr	May	Jun	Q3 '09	Q4 '09	H1 '10	H2 '10
General Interfaces										
PI to PI			🔺							
AutoPointSync					🔺					
PI UFL			🔺							
RDBMS							🔺			
WITSML		🟨								
IT Monitor			🔺							
Power Meter						🟨				
OPC Interfaces										
PI OPC UA Interface							🟨			
PI OPC Interface					🔺					
PI OPC Alarms & Events					🔺					
Batch Interfaces										
ABB 800xA		🟨								
Emerson CompSuite		🟨								
Siemens Simatic PCS7						🔺				

OSIsoft Product Roadmap

🟨 Major Release
🔺 Sevice Release

	Jan	Feb	Mar	Apr	May	Jun	Q3 '09	Q4 '09	H1 '10	H2 '10
Vendor Specific Interfaces										
ABB Bailey SemAPI										
ABB Ulma 2000 NT										
Areva (ESCA) HabConnect			🔺							
C37.118					🔺					
Cal ISO Dispatch			🔺							
Cyberctec			🔺							
DNP3			🔺							
DS&S SAIC PMS/Win			🟨							
GE Cimplicity										
GSE TrendR			🔺							
Hartman & Braun ConlinkX					🔺					
Honeywell PHD					🔺					
Intellution iFIX						🔺				
IPMI					🟨					
L&W Autoline 300										
Modbus					🔺					
Siemens Power TG			🟨							
Yokogawa FAST/Tools			🔺							

- 425+ interfaces
- 14 developers
- 3 QA engineers

- 6 Locations
- 150 man-years of OSIsoft experience

Interfaces: Ongoing

- Interfaces on Windows Vista and Windows 2008 Server
- Release of 64 bit MCN Health Monitor Interfaces
- Uniint failover supporting a direct socket connection
- First LINUX based interface – Siemens Power TG Interface
- OPC DA
  - Three new plug-ins
  - Vista and 2008 Server support
  - Performance improvements
- N-way buffering of batch data
- GUI for UFL Interface
- Server level failover for RDBMS Interface

Interfaces: Ongoing

- Development of next generation interface framework
    - More scalable
    - Easier management
    - Supports point and structure creation
- Interfaces for Power Meters
    - Silver Springs
    - GridNet
    - Itron
    - Elster

Security

- PI System data may being useful to secure across traditional organizational boundaries of your company

- Companies have invested heavily in Active Directory implementations and configuration and want to leverage that with mission critical applications

- Allows PI to securely scale across the complete network infrastructure of a company to all their employees

Security

- Windows Authentication
- Supports Active Directory as well as Local Groups and Users
  - Windows Principals
  - Groups
  - Flexible ACLS
- Single Sign-On Eliminates need for PI Server Log On
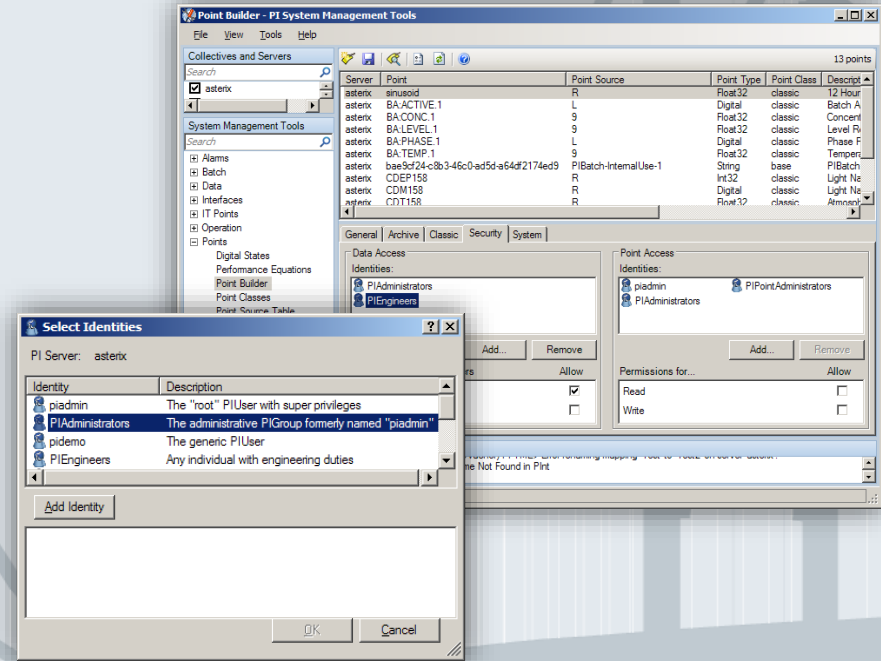
Security Configuration

PI Identity Management
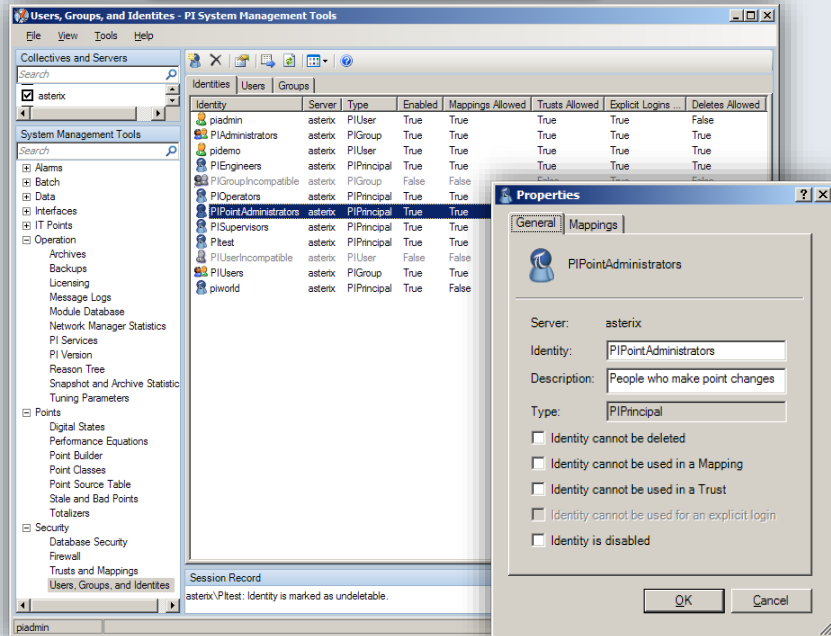
Windows/AD Mappings
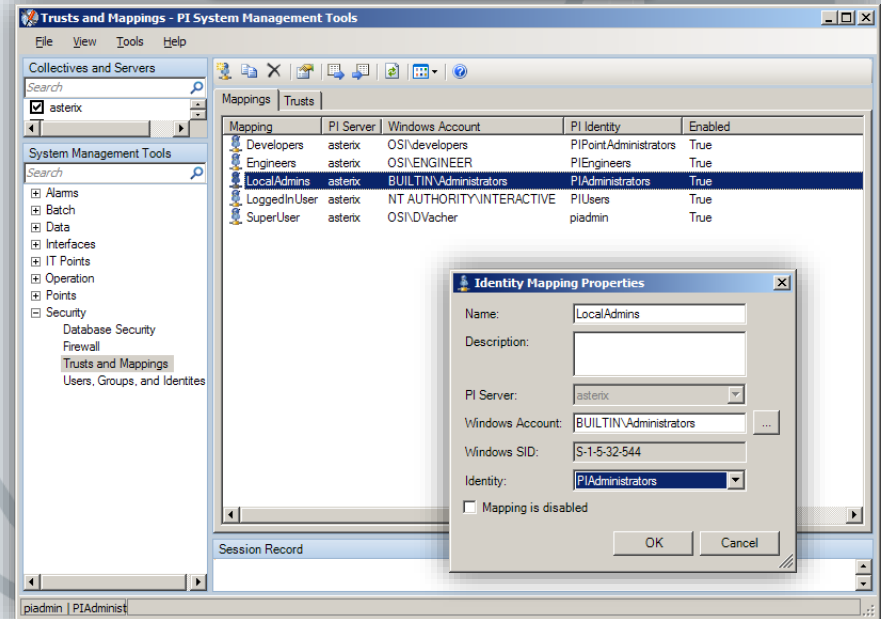
Security – Platform Solution

- System Wide Testing of PI Server 380
    - Coordinated, comprehensive platform test effort
    - Interfaces
    - Client Applications
    - Various domain and workgroup configurations
    - Testing at customer sites
    - Regression tests
- Security Threats
    - Committed to professional, collaborative approach in cyber security response
    - Dedicated Cyber Security Manager
    - Q42008 Patch Releases
        - Issue found by independent testing
        - Issue was coordinated through government CERT organizations
        - Effective response from the PI3 team

Go See: Security Theatre Talk

64 bit Support

- Most server hardware today is 64 bits
- Allows full utilization of hardware
- Scaling is mostly an issue on OSIsoft servers and customer applications
- Our servers and our programmatic interfaces require 64 bit
  - Programmatic interfaces are used by servers
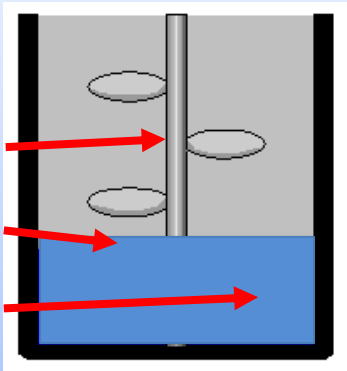- Some interfaces will support 64 bits

64 bit Support

Plan for 64 bit Support
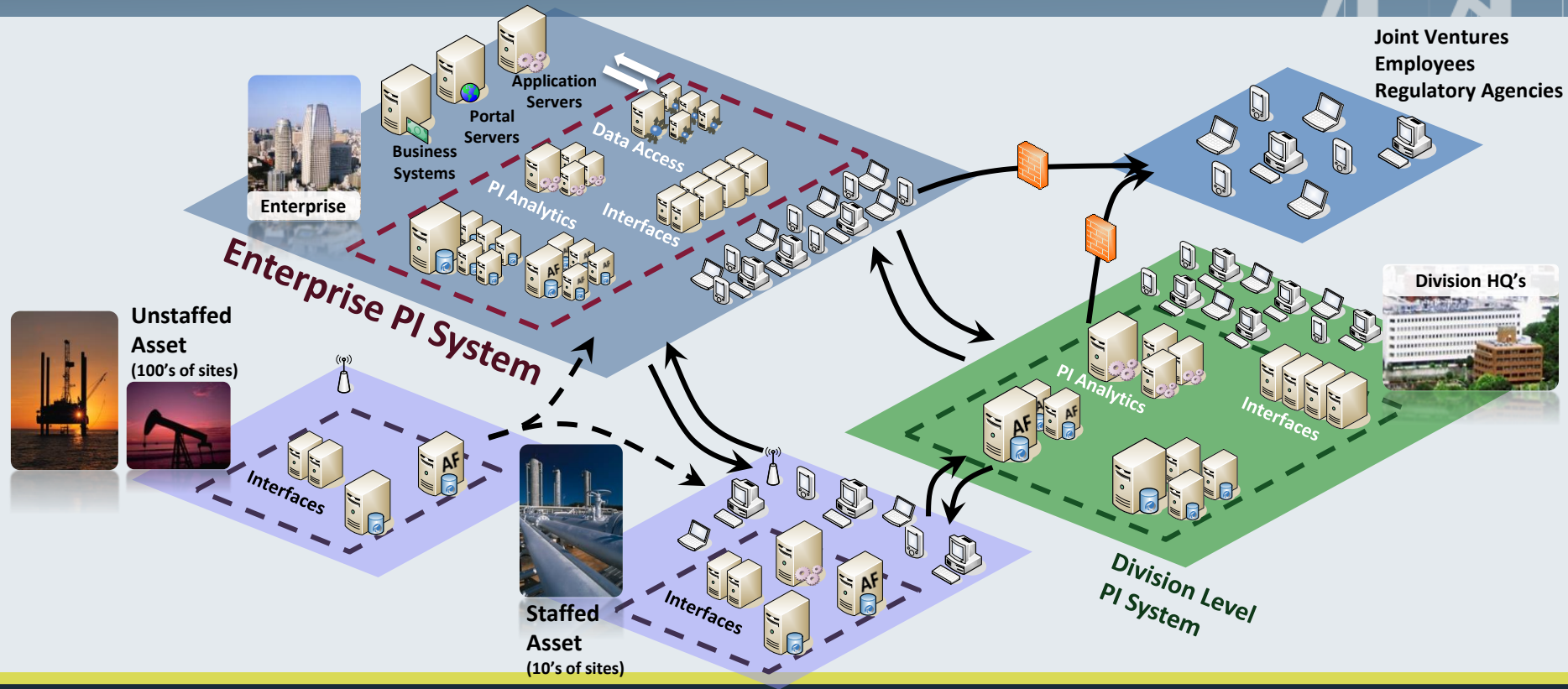
Asset Centric PI

Units and PI Tags

U34:Temp.1

U34:Level.1

U34:Conc.1

U35:Temp.1

U35:Level.1

U35:Conc.1
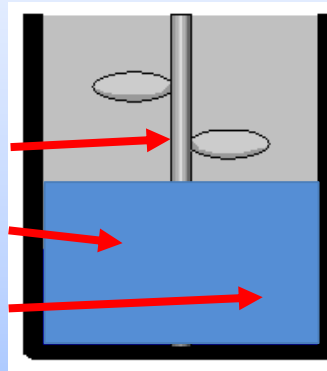
U36:Temp.1

U36:Level.1

U36:Conc.1

. . . .

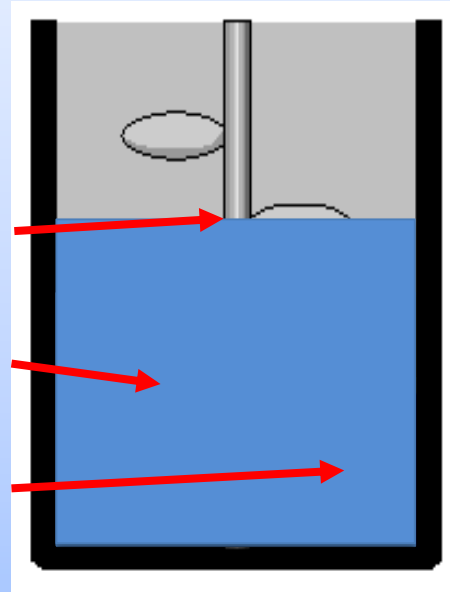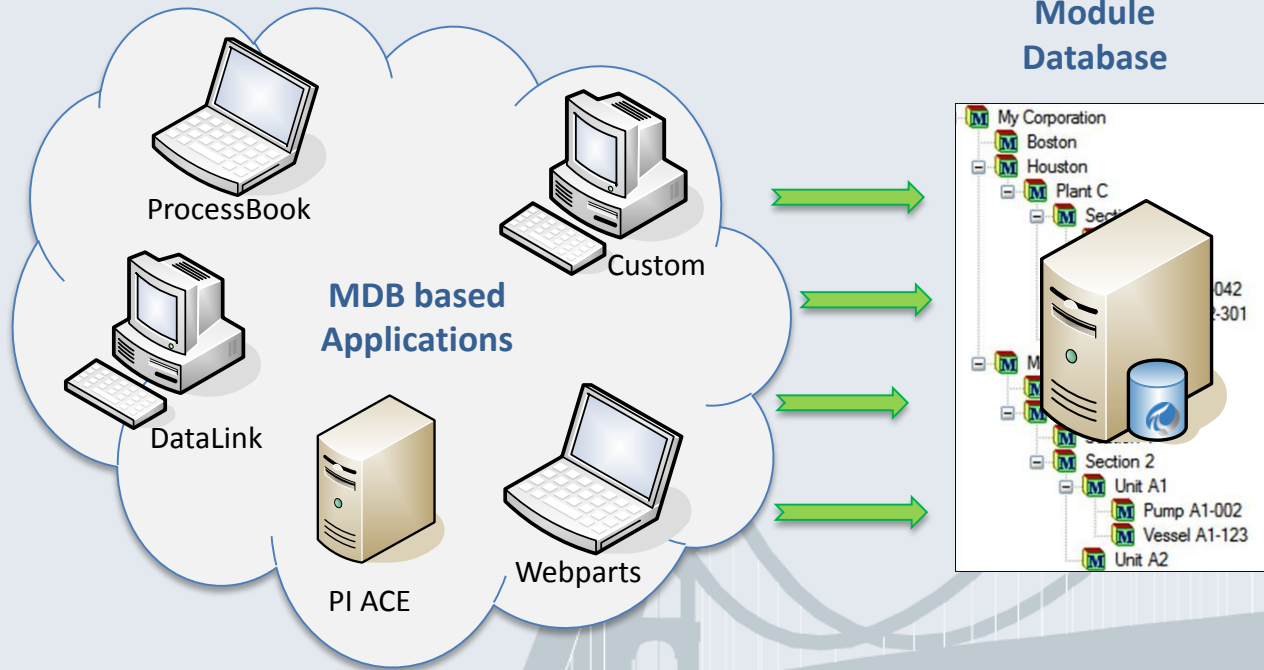# Units Abstracted

Unit 34

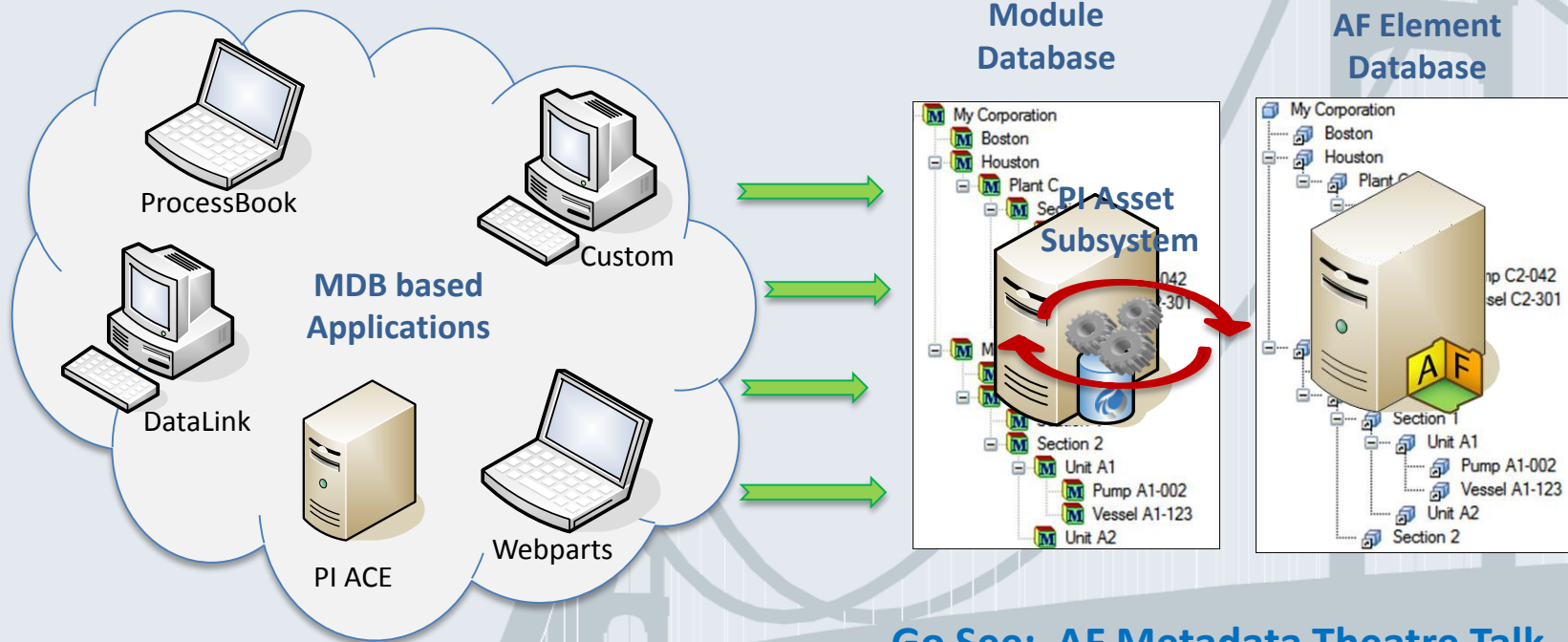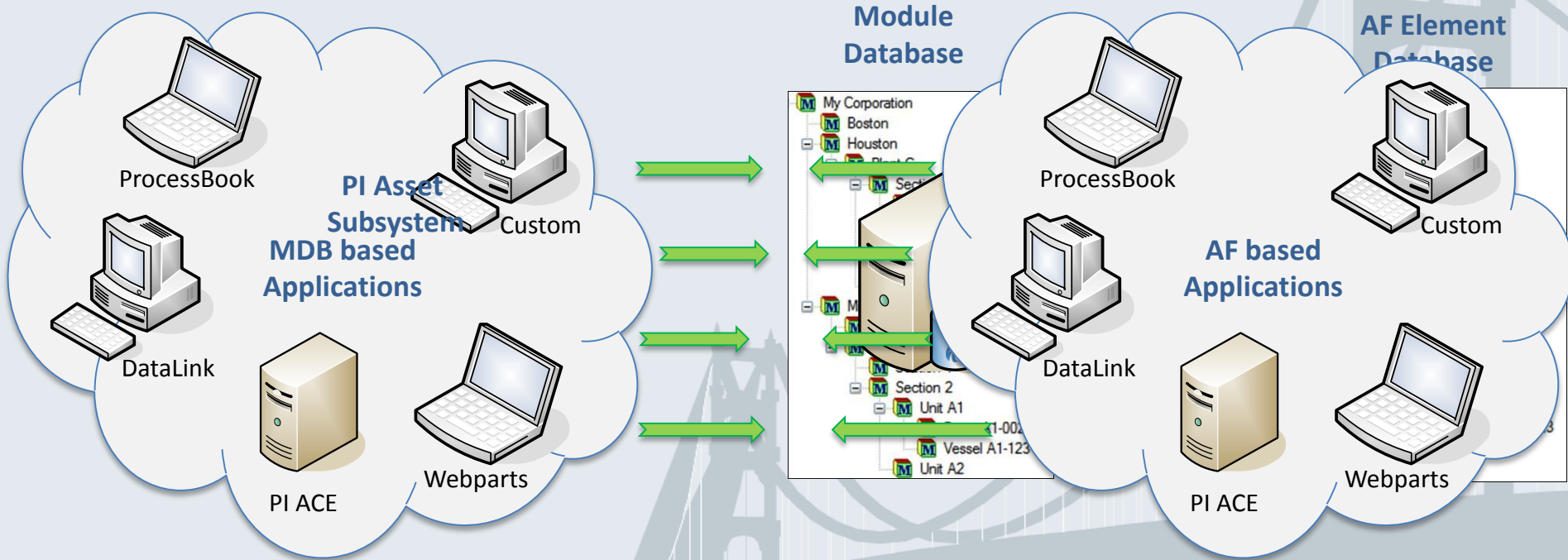Unit 35

Unit 36

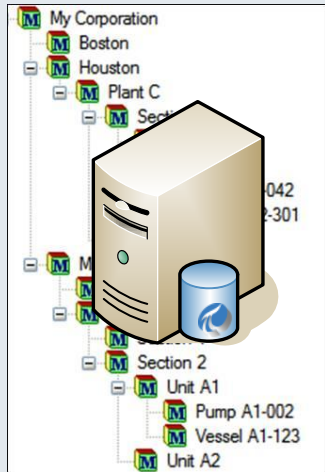....

Temp

Level

Conc

Asset Centric PI: Module DB

Module Database

MDB based Applications

ProcessBook
Custom
DataLink
PI ACE
Webparts

My Corporation
Boston
Houston
Plant C
Sect...
...042
...-301
...
Section 2
Unit A1
Pump A1-002
Vessel A1-123
Unit A2

Migration

ProcessBook

Custom

DataLink

MDB based Applications

PI ACE

Webparts

Module Database

AF Element Database

PI Asset Subsystem

Go See: AF Metadata Theatre Talk

New Releases are AF Based

ProcessBook

PI Asset Subsystem

MDB based Applications

Custom

DataLink

PI ACE

Webparts

Module Database

AF Element Database

ProcessBook

AF based Applications

Custom

DataLink

PI ACE

Webparts

Asset Centric PI: AF Element DB

Module Database

AF Element Database

PI Asset Subsystem

AF based Applications

ProcessBook

Custom

DataLink

PI ACE

Webparts
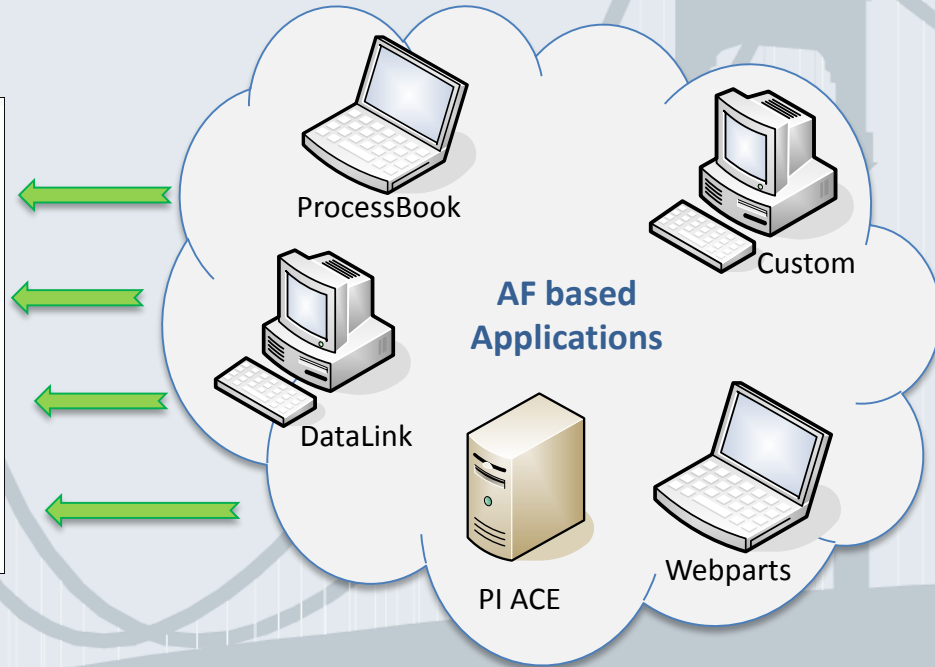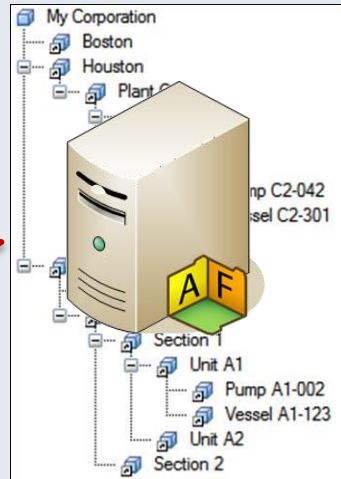
ProcessBook 3.2: Element Relative
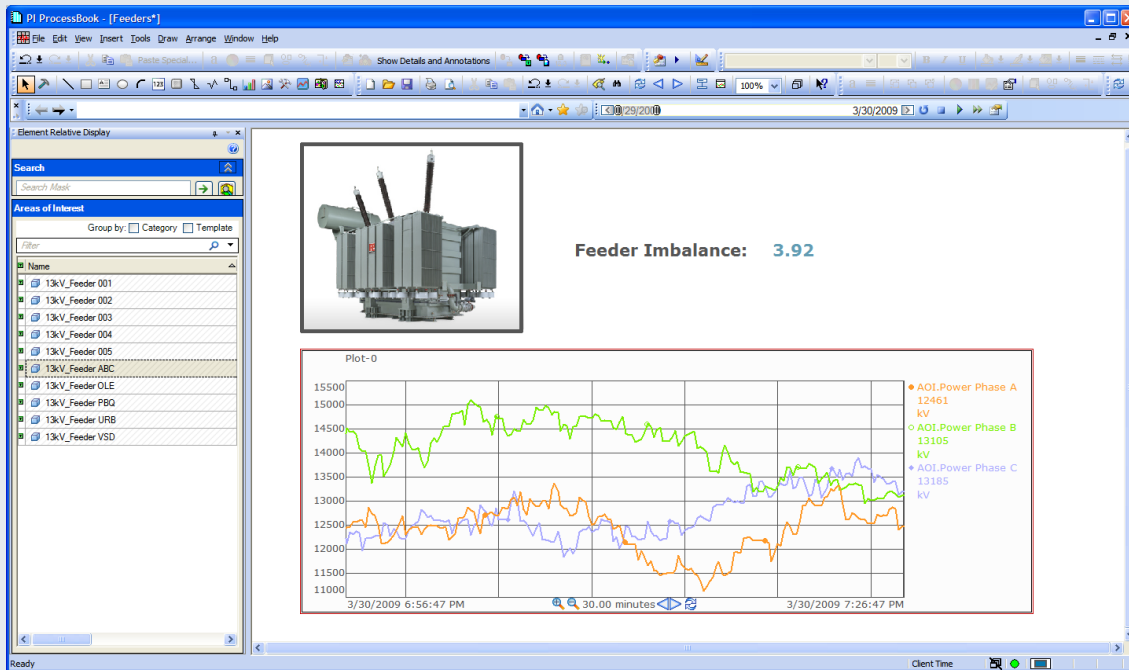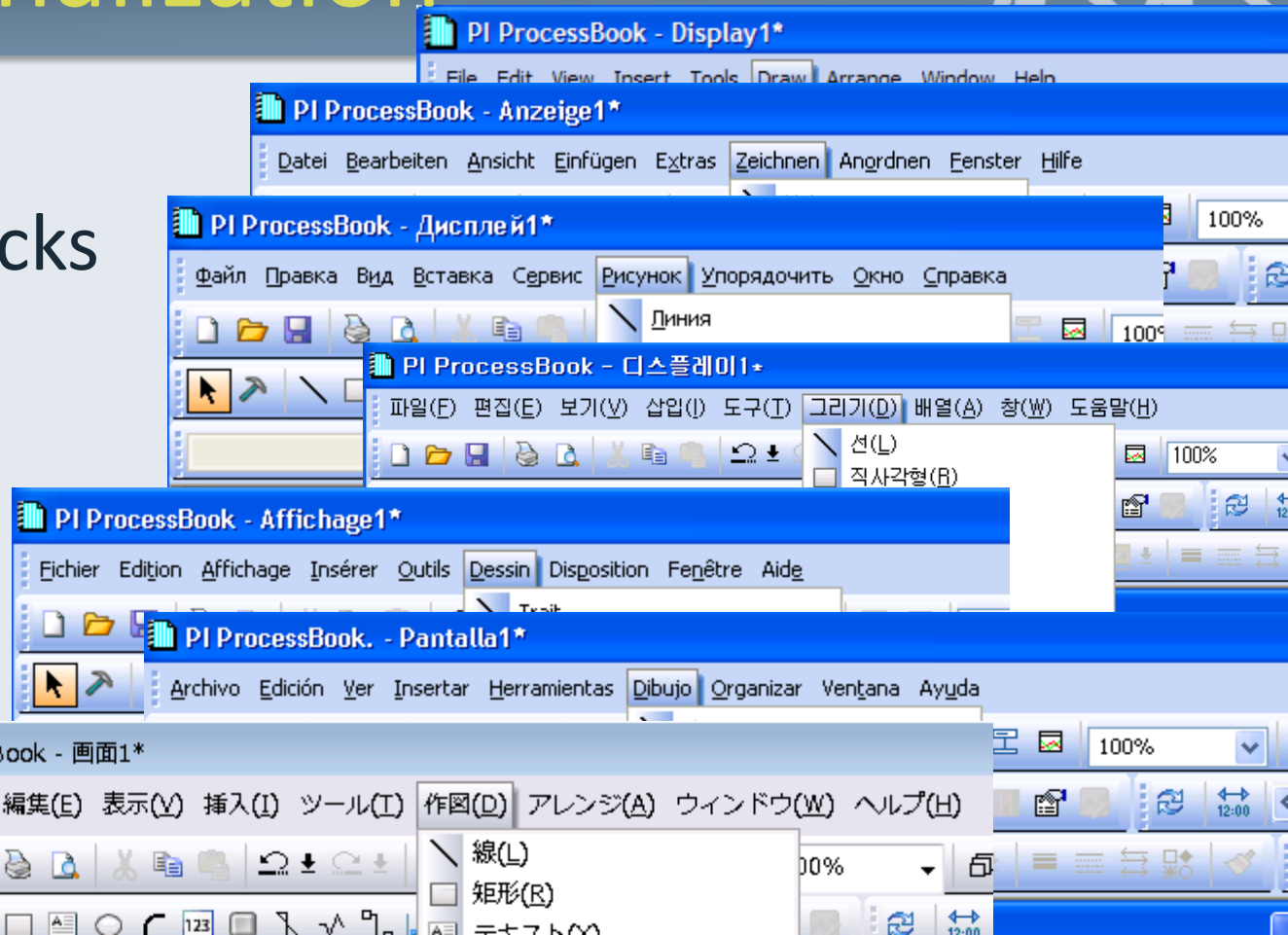
Go See: ProcessBook Theatre Talk

Asset Centric PI

Plan for Asset Centric PI
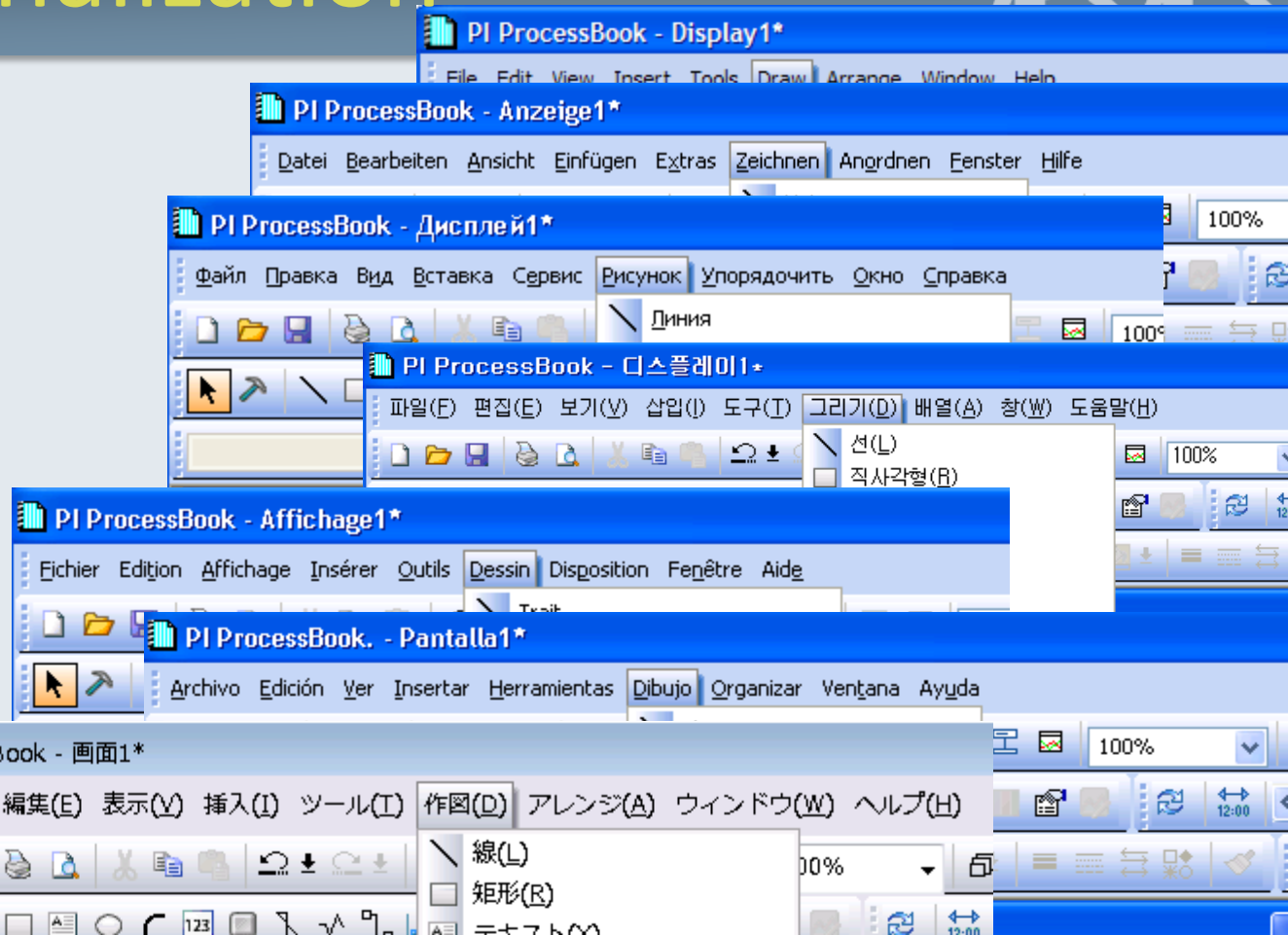
Internationalization

- Application Language packs
- 8 Languages
- Language Selection

Internationalization

- Brazilian Portuguese
- Simplified Chinese
- Russian
- German
- French
- Spanish
- Korean
- Japanese

**Go See:
Internationalization
POD**

Value Theme: System Scaling

- Making PI work well on a large scale
- System Scaling requires that…
  - All products (analysis components, PI-to-PI interfaces, etc.) must support large point counts and data rates
  - Installation and maintenance of large numbers of distributed nodes are manageable
  - Users can find any data
  - Complexities (caching, aggregation, security, redundancy) are hidden from users and system managers

System Scaling

- AF
  - High Availability
  - PI System Search
  - Performance Improvements
- PI Notifications
  - Performance and scalability

- OPC UA Server

- PI OLE DB

- PI System OLE DB

- PI Data Services

- AMI

PI Notifications

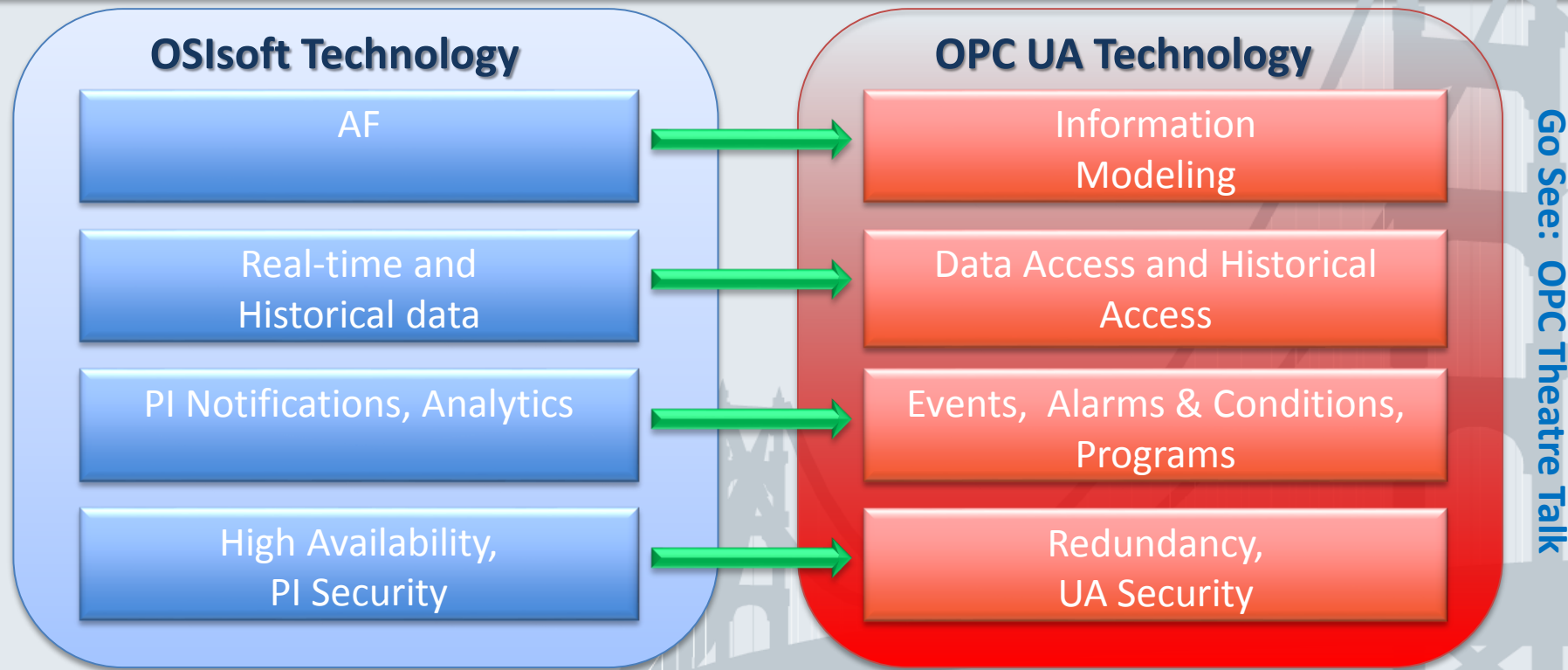**v1.1: Scalability
Q2 2009**

- Performance

  Improvements in **startup time** and **throughput**

- Configuration

  Templates enable **rapid** creation of **maintainable** notifications

Go See: PI Notifications Theatre Talk

Mapping the PI System to OPC UA

PI System Data Access through SQL

- PI OLEDB provider allows applications (OLE DB consumers) working with PI Server data through SQL queries:
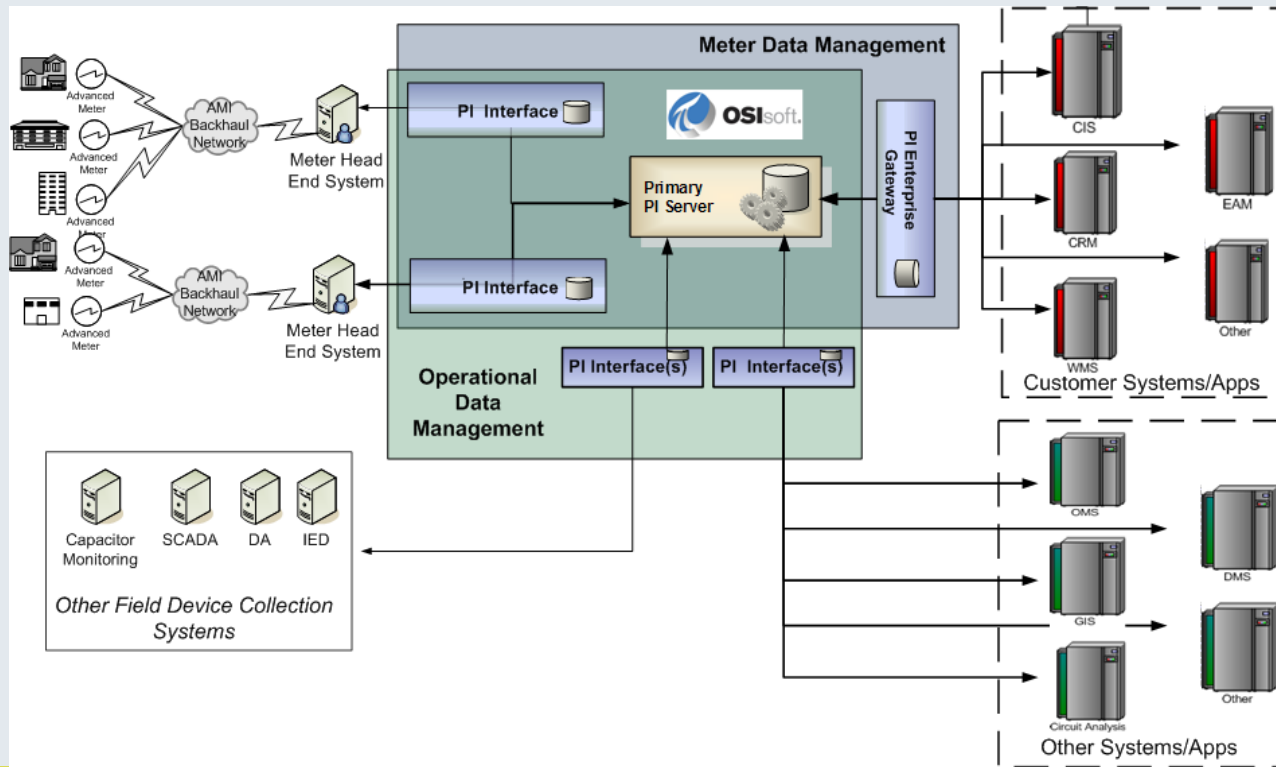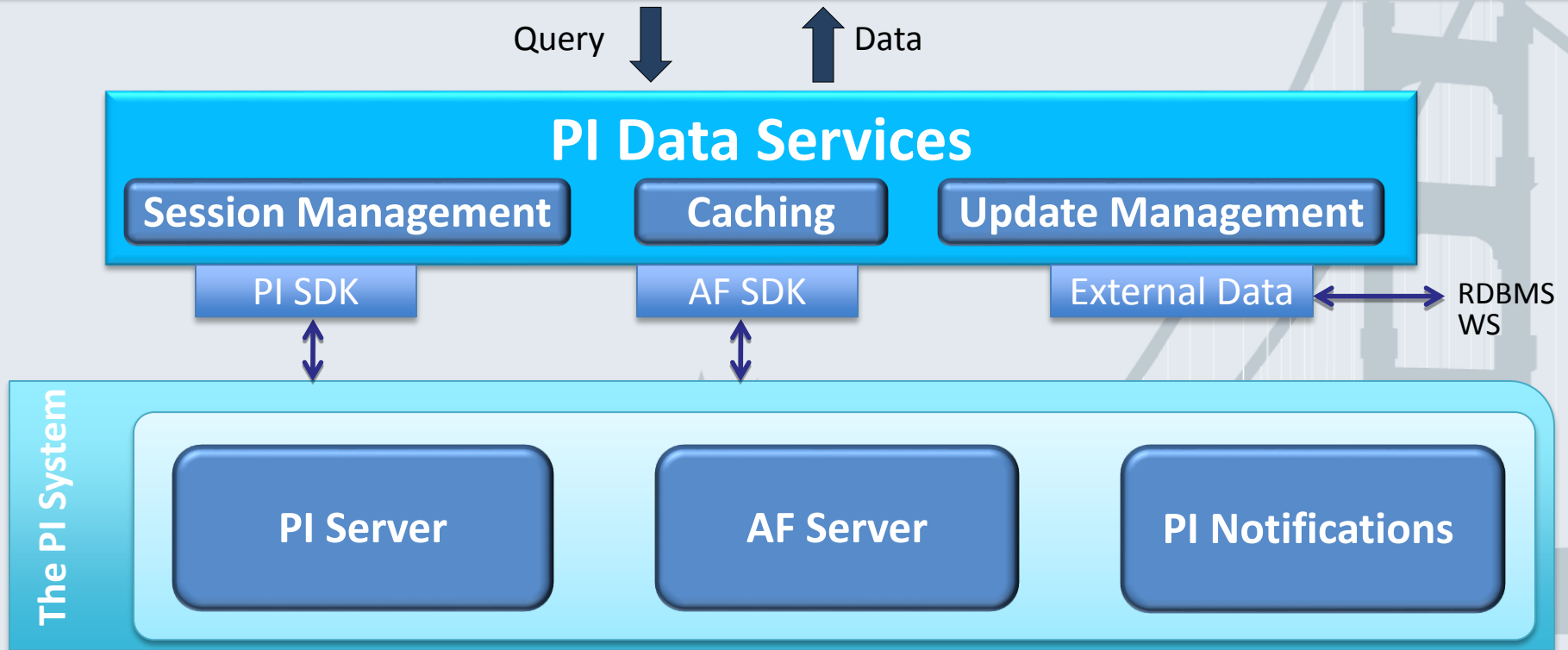
PI Server

Client Application

SQL Engine

OLE DB/ COM

OLE DB Consumer

PI OLEDB Provider

SQL Queries

Go See: OLE DB Theatre Talk

Coming soon:

- Introduce PI JDBC

- Support asset centric PI through "PI System OLE DB Provider"

- Improve architecture in order to scale

AMI: Built upon the Infrastructure

Go See these Theatre Talks:

- AMI
- Enterprise Gateway

Data Services

- Expose what we already do using new technology

- Reference data using:
  - PI tags
  - AF Element Attributes

- Easy to consume
  - Including code-free environments like:
    - Microsoft InfoPath
    - Microsoft BizTalk

Go See: Web Services Theatre Talk

Data Access

Conclusions

- Shift in the use of the traditional PI System
  - We are seeing more of an Enterprise approach
  - OSIsoft product development strategy is to support this
- Major Value Themes
  - System Scaling
  - Security
  - Internationalization
  - 64-bit support
  - Asset Centric PI
- Be sure to go to product talks
- More details in the product expo