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3. Fore*%^(%) (point in server.PIPoints)?!!??  
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5. if (time_to_market > expected)  
{  
    solution = vCampus;}  
6. if (time_to_market > expected)  
{  
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}
```

"where PI geeks meet"

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2009

LIVE!

Palace Hotel, San Francisco, CA ▪ Dec. 1-2, 2009

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OSIsoft Extensibility Overview, PI Data Access, and the new PI Access License

John Baier – OSIsoft

Ray Verhoeff – OSIsoft

Jay Lakumb - OSIsoft

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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

**Gather, Organize, Distribute,
and Store Data from Many Sources**

The Visuals within the PI System

The
Server

The
Analytics

The
Visuals



Local Computer



Mobile Device or Browser

Graphic Authoring

Analysis

Reporting

Manual Entry

PI ProcessBook



PI DataLink



PI WebParts /
iViews for SAP



PI DataLink for
Excel Services



PI ActiveView



PI Manual Logger



ProcessBook Add-Ins

The screenshot displays the PI ProcessBook software interface. The main window is titled "PI ProcessBook - [ERD Display.PDI]". The menu bar includes File, Edit, View, Insert, Tools, Draw, Arrange, Window, and Help. The toolbar contains various icons for file operations, navigation, and drawing. The status bar at the bottom shows the time as 1:38 PM and the date as 11/29/2009 2:00:53 PM.

On the left side, there is an "Organizer" pane with "Bookmarks" and "History" tabs. The "Bookmarks" tab is active, showing a tree view of the project structure. The "ERD Display.PDI" folder is selected. Below the Organizer, there is an "Element Relative Display" pane with a "Search" field containing "TestElem*" and a list of "Elements of Interest".

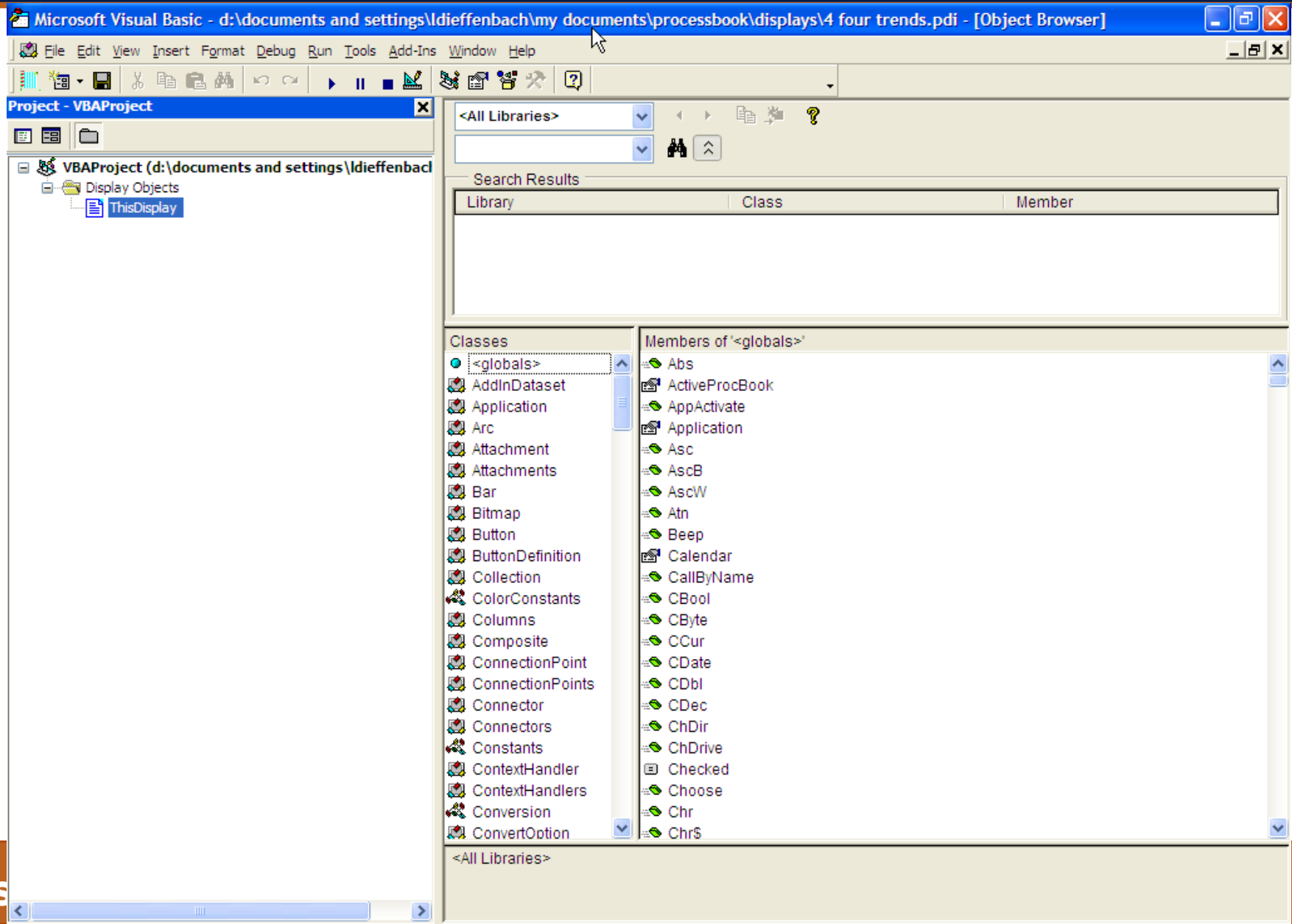
The main display area shows a graph titled "Reactor Data". The graph has a y-axis ranging from 0 to 100 and an x-axis showing time. A green curve is plotted, and a blue bar chart is visible at the bottom. The label "TestElem5" is positioned below the graph.

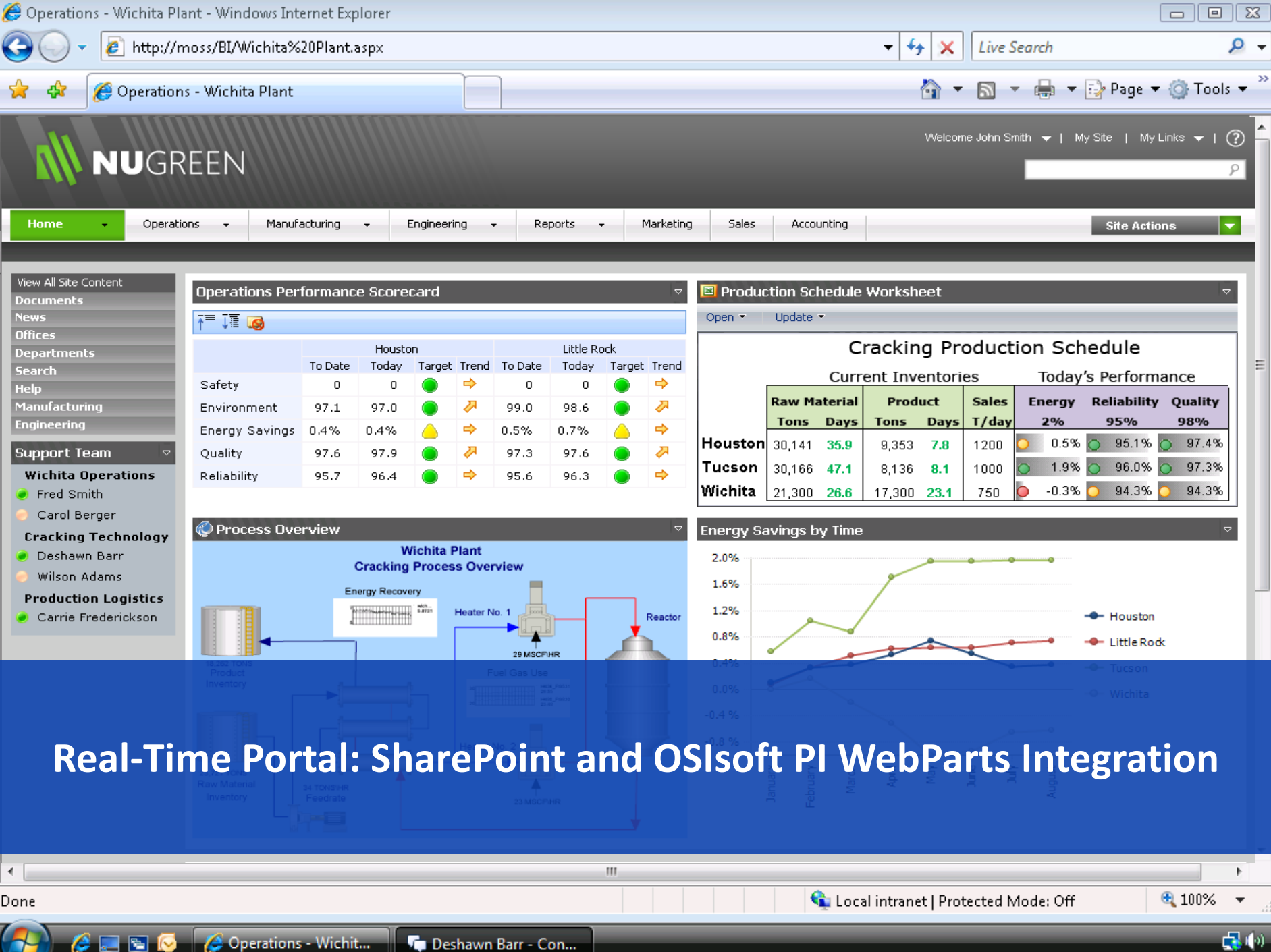
An "Add-In Manager" dialog box is open in the foreground. It has a title bar with a close button. The dialog contains a table of available add-ins and their load behaviors. The "AF 2.x Data Set" add-in is selected. The "Description" field shows "AF 2.x Data Set Add-In to ProcessBook". The "Load Behavior" section has checkboxes for "Loaded/Unloaded" (checked), "Load on Startup" (checked), and "Command Line" (unchecked).

Available Add-Ins	Load Behavior
AF 2.x Data Set	Startup / Loaded
Data Favorites	Startup / Loaded
Details	Startup / Loaded
Element Relative Displays	Startup / Loaded
Extended Toolbar Manager add-in	Startup / Loaded
IT Overview	Startup / Loaded
Module Context	Startup / Loaded
PI Notifications Viewer	Startup / Loaded
ProcessBook SVG FileConverter	Startup / Loaded
ToolTipStatistics	Startup / Loaded

Buttons: OK, Cancel, Help

VBA in ProcessBook, Excel/DataLink





The Analytics within the PI System

The
Server

The
Analytics

The
Visuals

PI Notifications

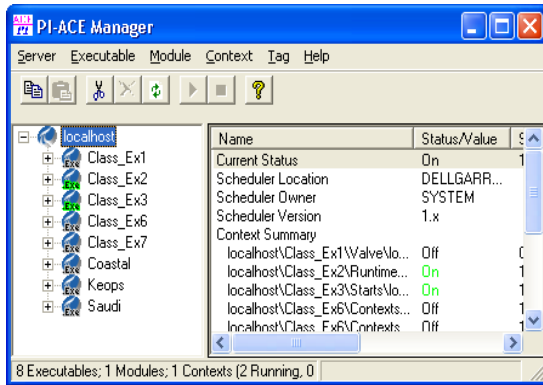
Advanced
Computing Engine
(ACE)

Microsoft
StreamInsight
(future)

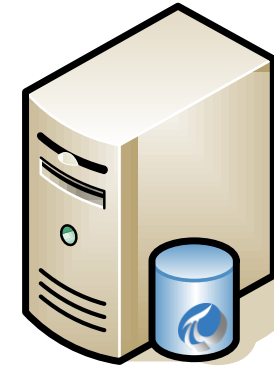
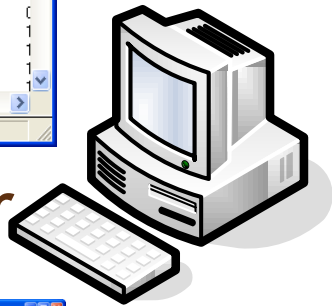
PI Configured Analytics
(PI Performance Equations, PI Totalizers, PI Alarms, PI RTSQC)

Analytic Services
(scheduling, event mgmt)

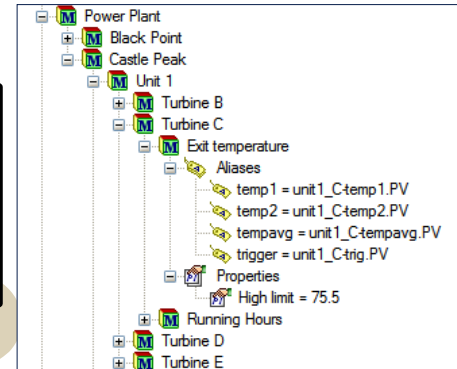
PI Advanced Computing Engine



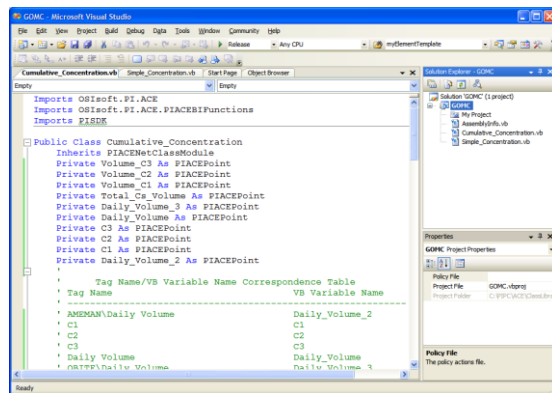
PI ACE Manager



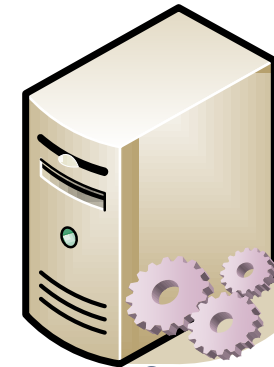
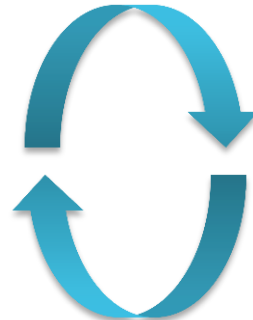
PI Server



PI MDB Structure



PI ACE Wizard



Scheduler

PI ACE Server



VB6 EXE
.Net DLL

PI Notifications Architecture

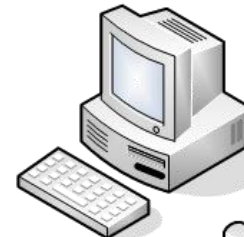
Others data sources



PI NOTIFICATIONS



PI Server



PI ProcessBook

PI DataLink

PI DLES

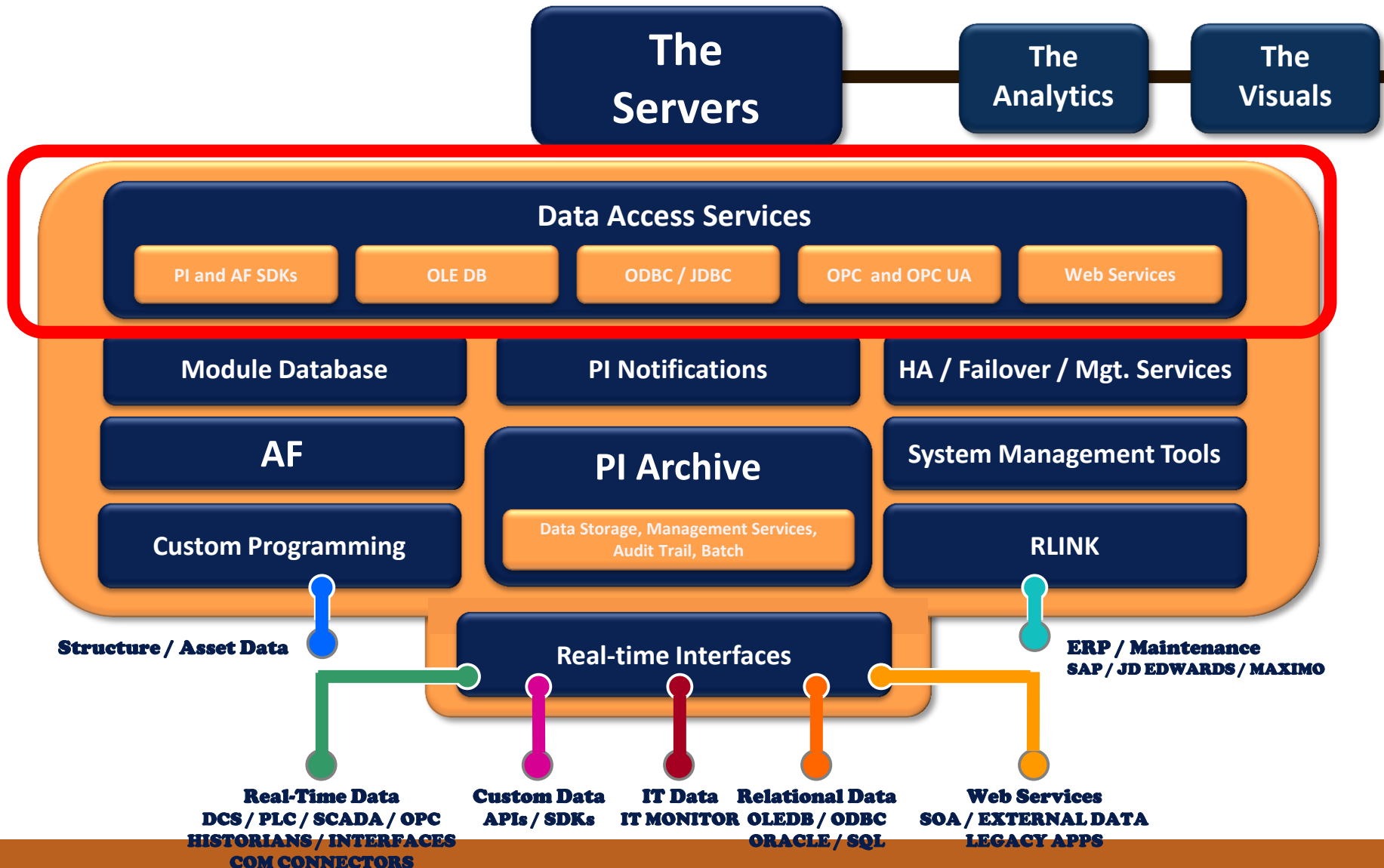
SharePoint

Desktop Alert

Delivery channels:

- Email Delivery
- Web services
- OCS
- Custom Developed

The PI Servers



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PI Data Access Overview

Ray Verhoeff

Director, Development – Data Access

OSIsoft

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```

PI System “Surface Area”

- Collection of all products that offer programmatic access to all or part of the PI System
 - PI SDK
 - AF SDK
 - Including AN SDK
 - OPC
 - SQL-based access
 - OLE DB
 - ODBC
 - JDBC
 - PI Web Services *

OSIsoft-specific

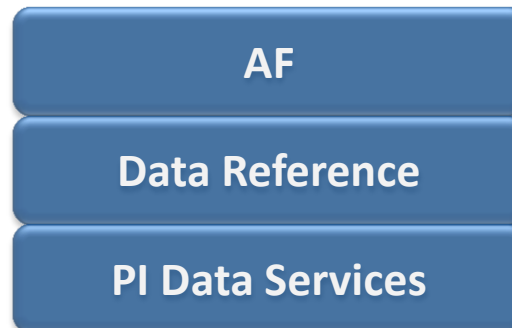
Standards-based

Two Styles of Data Access

- Object model
 - Navigate object relationships to locate data
 - E.g. PI SDK, AF SDK and OPC UA
 - AF SDK access to PI data uses the PI SDK
- “Declarative” model
 - Specify what you want, not how to get it
 - Basic pattern:
 - In: query (tag, Element.Attribute or SQL)
 - Out: data (timeseries or other)
 - E.g. SQL family and PI Web Services

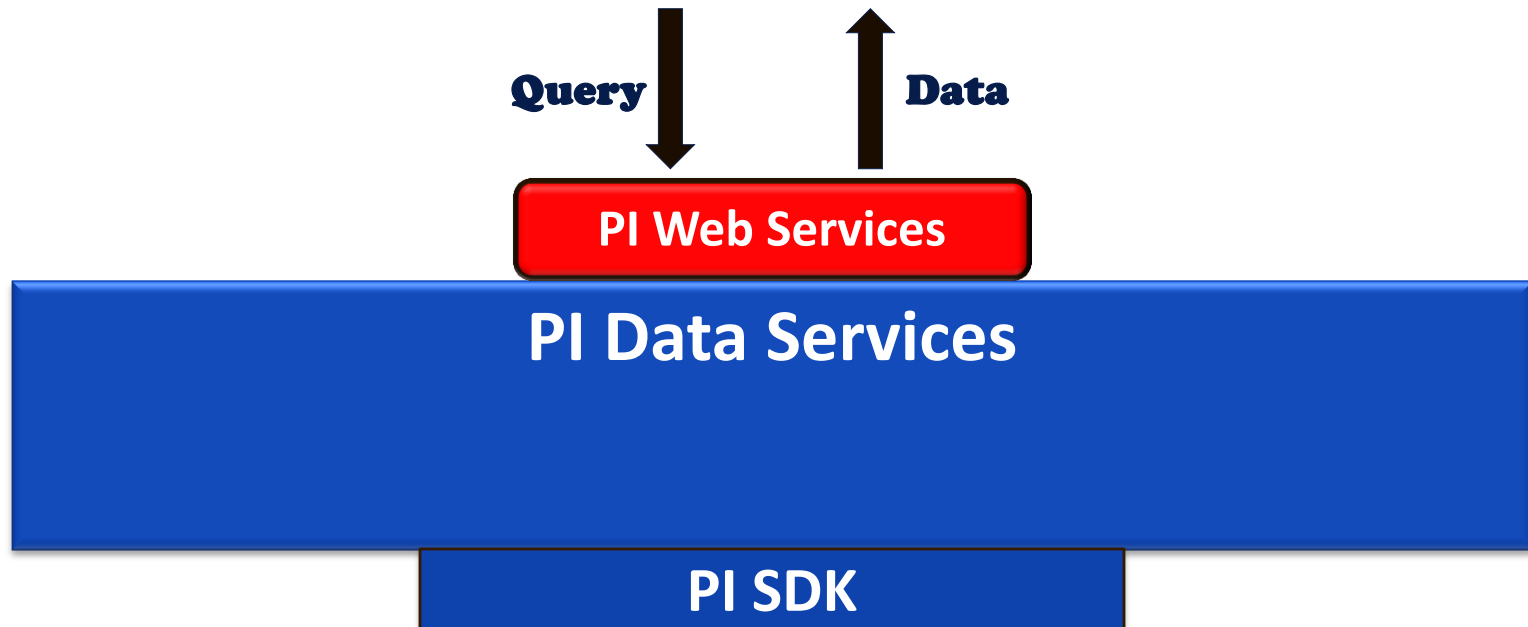
Data Access with PI Data Services

- PI Data Services (formerly RtBaseline) provides:
 - Access to many data sources
 - Connection pooling
 - User session management
 - Data caching
- Used now for PI Web Parts
- Some AF Data References will use PI Data Services



PI Web Services

**Web methods implemented using
PI Data Services .NET assemblies**



This will take time

- AF GetValue(s) methods need to expose the full features of the PI Server
 - For now: **GetRawPIPoint**
- Add data by exception to AF
- Consolidate access to foreign data:
 - Examples:
 - AF and PI Data Services can both access relational databases
 - Only PI Data Services can access foreign web services

PI SDK

- High-fidelity access to the PI Server
 - Includes making HA available to clients
- Implements Windows Security against PI 3.4.380
- 64-bit
- Localized

Go See: What's New with the OSIsoft SDKs

Data Access through SQL

- PI OLE DB Provider allows applications (OLE DB Consumers) to work with PI data through SQL queries:



Our Direction:

- New PI JDBC Driver
- Access to AF Elements and Attributes in PI OLE DB 4.0
- Goal is to support "The PI System"

**Go See: Programming
through JDBC
and OLE DB Data Access**

PI Web Services

- Expose what we already do using new technology
- Reference data using:
 - PI tags
 - AF Element Attributes
- Easy to consume
 - Major development platforms like:
 - Microsoft Visual Studio
 - Eclipse
 - Including code-free environments like:
 - Microsoft InfoPath
 - Microsoft BizTalk

PI Web Services

- These are actually Windows Communication (WCF) Services
 - Other Bindings are possible:
 - SOAP
 - NetTCP
 - NetNamedPipe
- Demos!
 - .NET and Java Developer tools
 - Silverlight
 - Microsoft BizTalk

Go See:
1001 Uses for
PI Web Services

OSIsoft and OPC

- OPC COM-based standard
 - DA and HDA Interfaces
 - Collect other people's data
 - DA and HDA Servers
 - Exposes PI data
- What is the OPC Foundation doing next?
 - OPC Unified Architecture (UA)!
 - OSIsoft is an active member of the UA workgroup

OPC UA Server

- OSIssoft will not release an OPC UA Server product *at this time*
- Market research has shown relatively small numbers of OPC UA Clients that need PI data
- OPC UA Server remains available as Community Technology Preview (CTP) on vCampus website
 - We can make the bits available for testing if you need them
 - We will continue to enhance our Server as the OPC UA specification evolves

OPC UA “Client”

- OPC UA Interface plans are unchanged
- OPC UA Servers expose Nodes and Attributes
 - Exactly like AF Elements and Attributes
 - This means an interface must be able to replicate UA Server Nodes to AF Elements
- Timeseries data remains the staple of OPC UA

**Attend the Technology Roundtable:
OPC Standards and more**

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PI Access License

Jay Lakumb - Product Manager, OSIsoft

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What is the current PI DA license?

- Based on size of PI Server



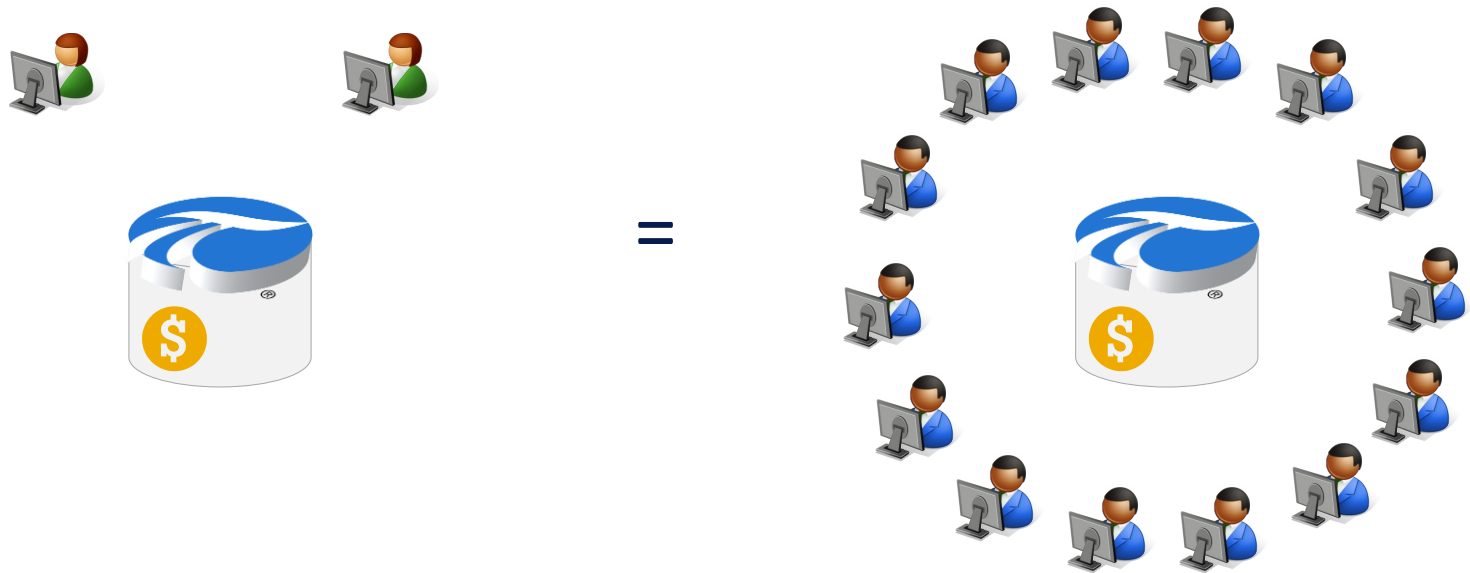
- Separate license for each PI Server



- PI DA includes PI OLEDB, ODBC, and OPC

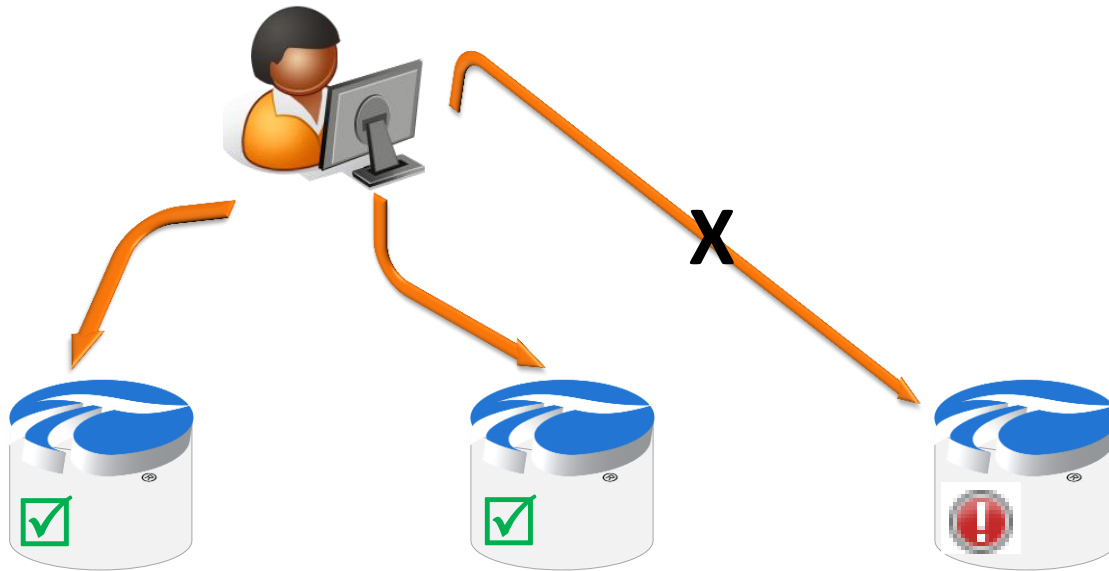
What are the issues with PI DA?

- Issue 1: Value depends on number of users



What are the issues with PI DA?

- Issue 2: Can only access licensed PI Servers



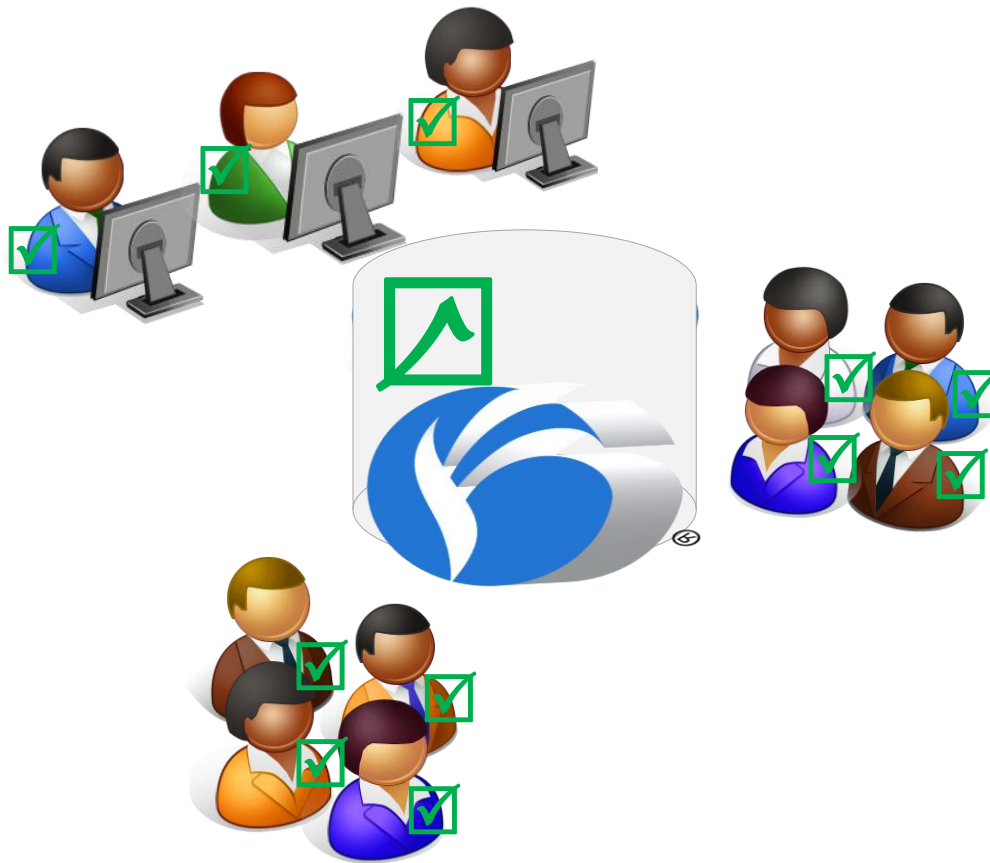
What is the solution?



What is the solution?



Introducing the new PI Access License



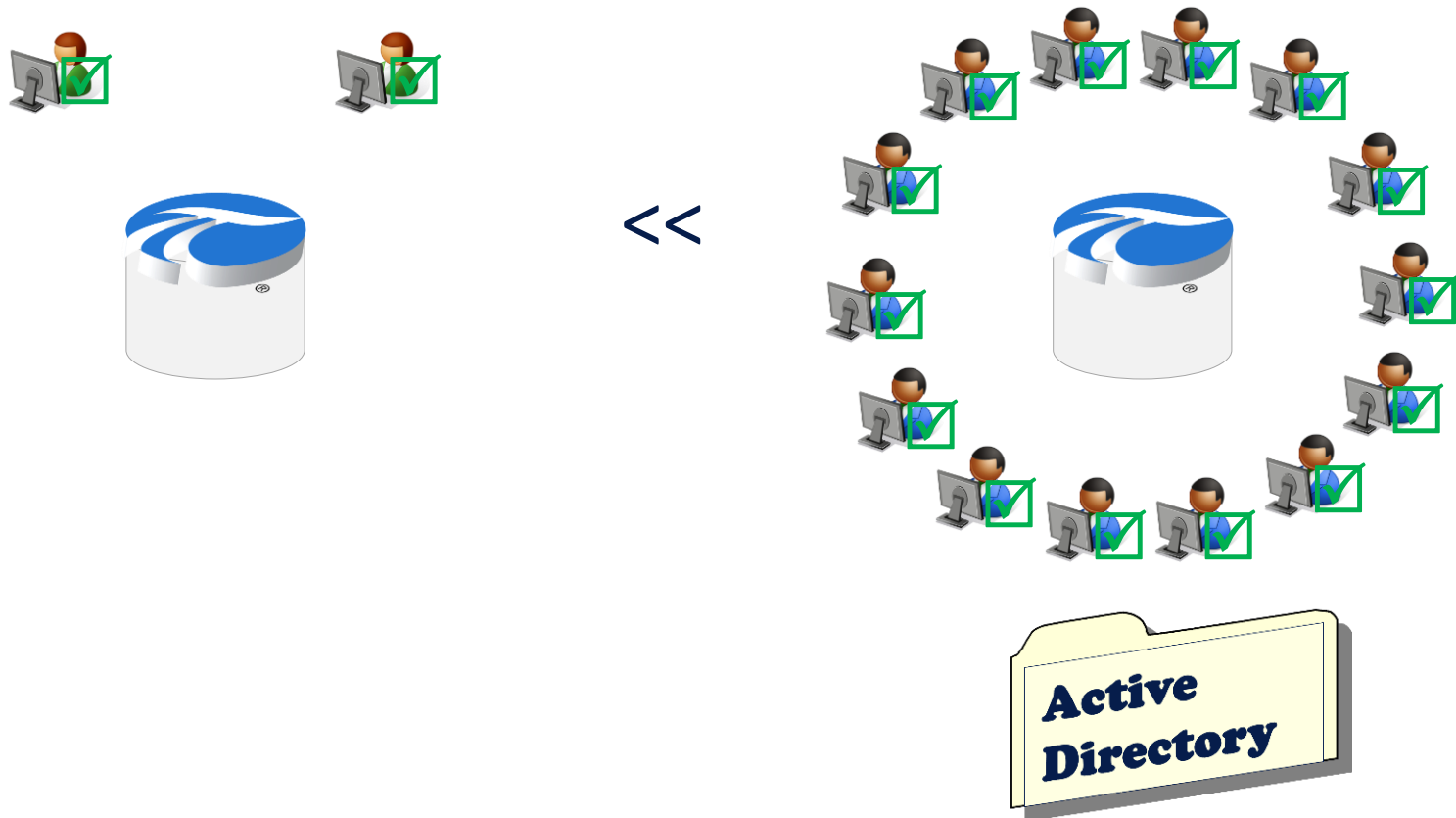
PAL makes it easier to get value from PI

- PAL is fair because you only buy what you need



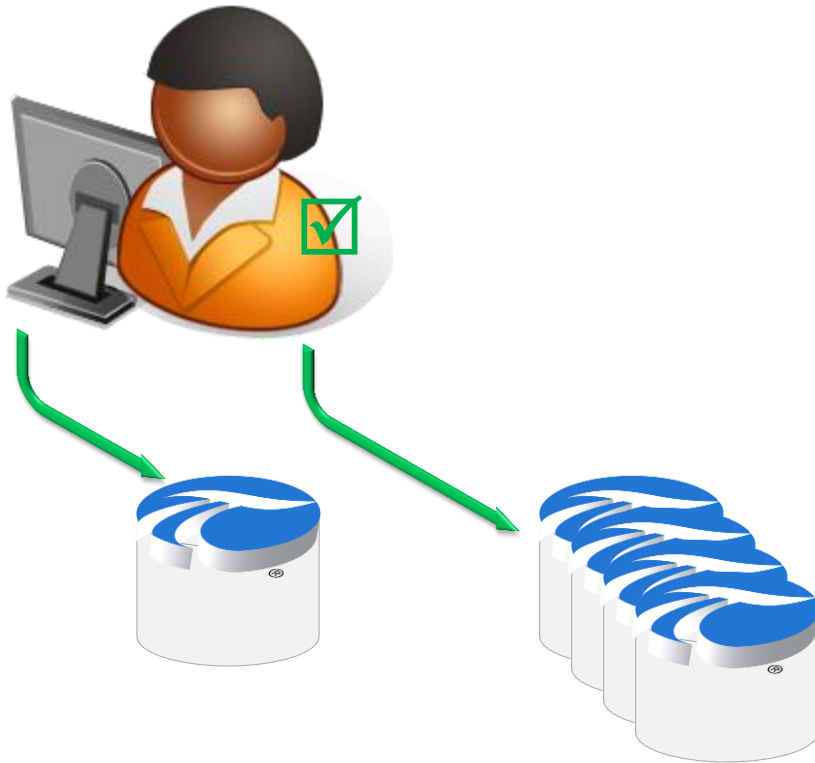
PAL makes it easier to get value from PI

- PAL usage grows as your need to access PI grows



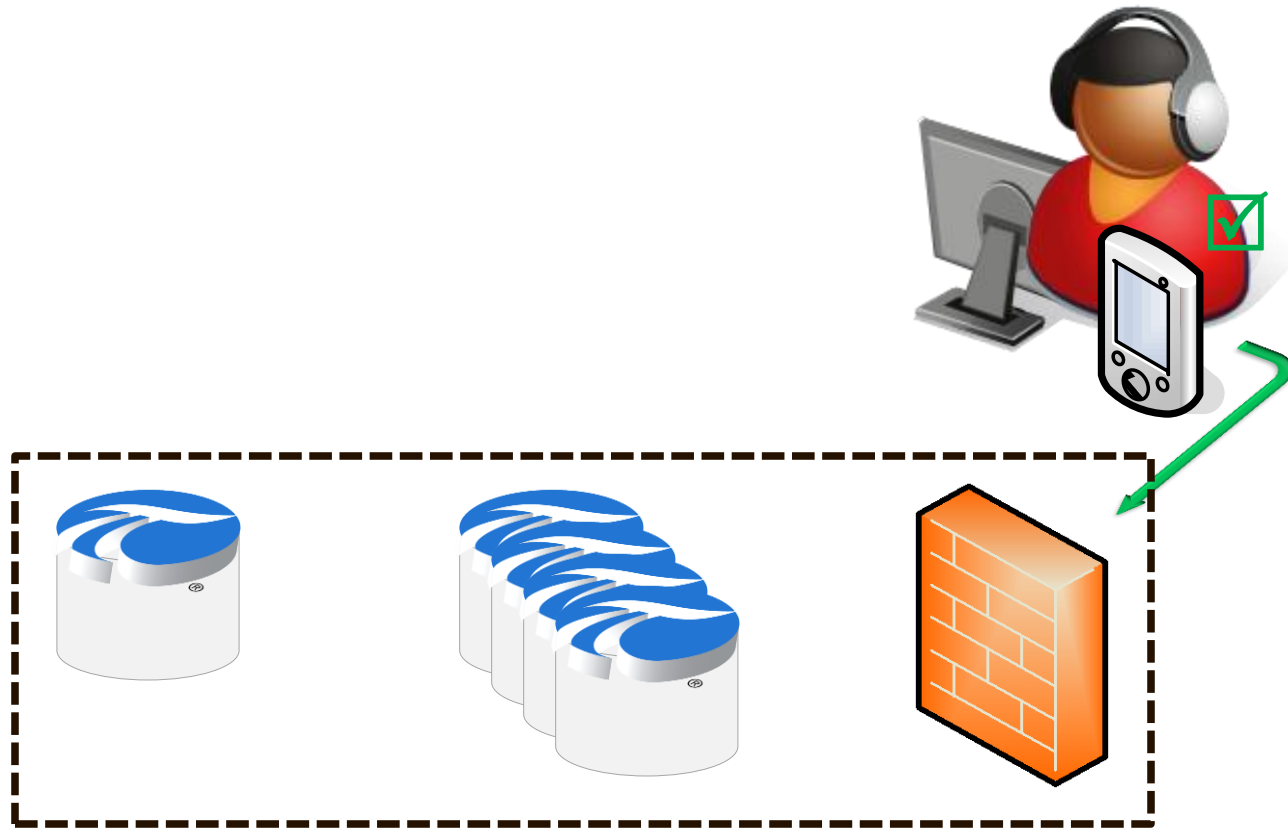
PAL provides the right to access PI data

- Access any number of PI Servers per user



PAL provides the right to access PI data

- ...across the organization, from anywhere



PAL is the single runtime license for PI Data Access

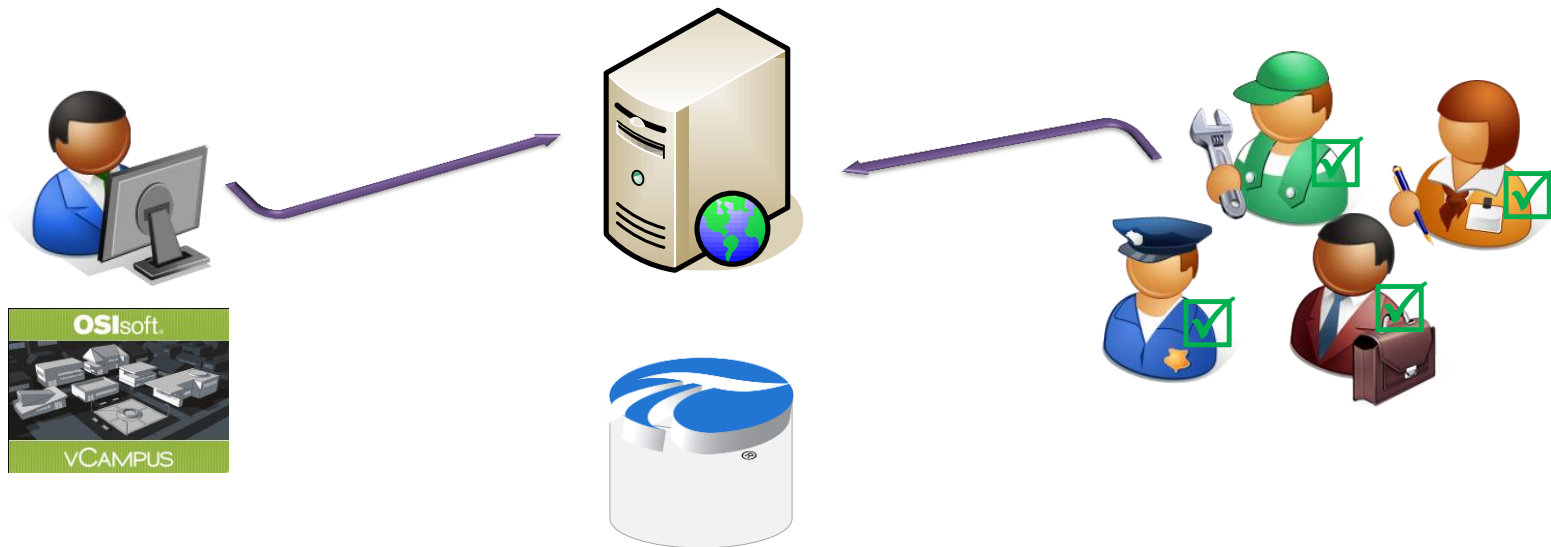
- **AF SDK (includes AN/EF SDK)**
- **PI API***
- **PI JDBC Driver**
- **PI ODBC Client**
- **PI OLEDB Provider**
- **PI OPC DA/HDA Server**
- **PI SDK**
- **PI Web Services****

* For runtime licensing of existing applications only

** Not yet released, but planned for PAL

How is PAL related to vCampus?

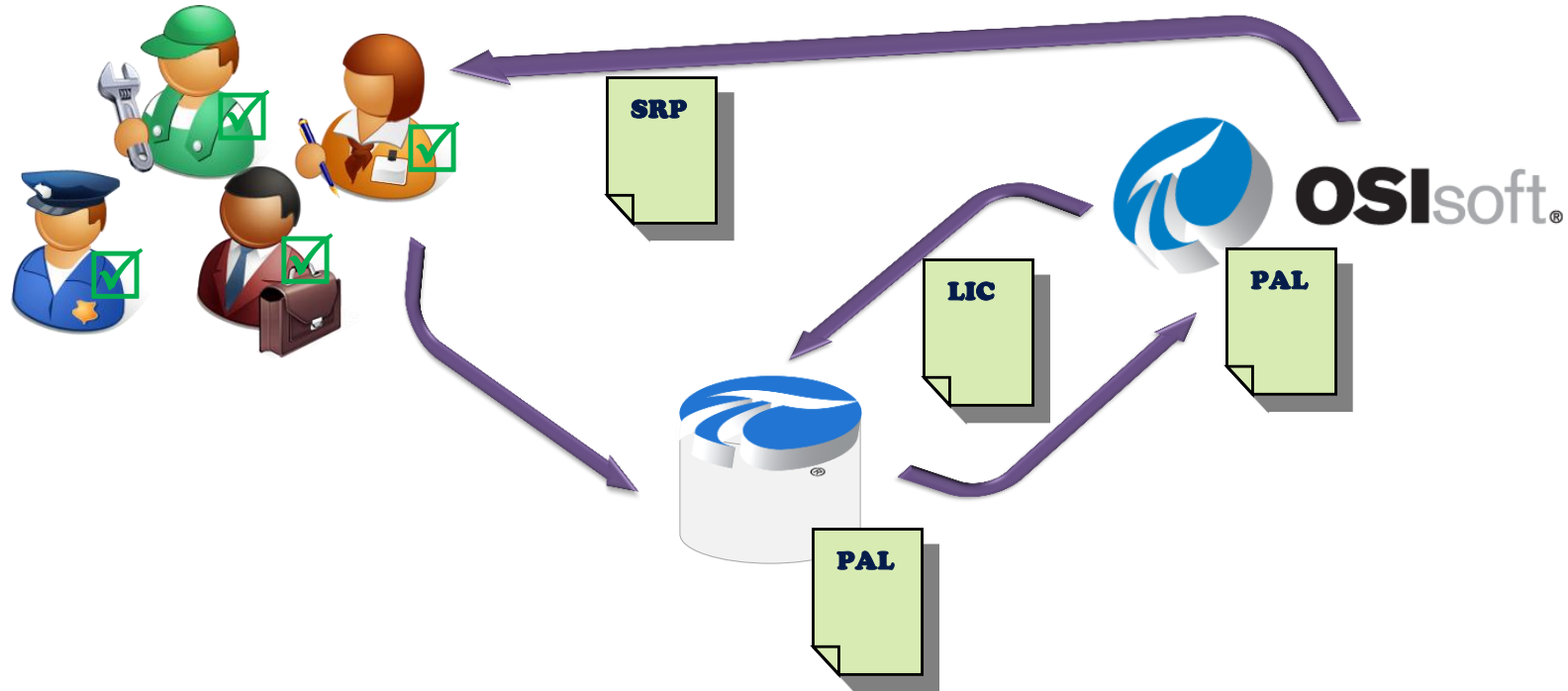
- vCampus provides the Development license and PAL provides the Runtime license per user



What is the migration path for PALs?

- Scenario 1 – Customer has a current PI DA/DAP license and wants to use a tool that only requires DA/DAP.
 - No change. Customer continues using existing DA/DAP license.
- Scenario 2 – Customer has no PI DA/DAP license and wants to use a tool that requires new PAL (e.g. AF SDK, PI JDBC, PI Web Services).
 - Customer purchases PALs for each user.
- Scenario 3 – Customer has a current PI DA/DAP license and wants to use a tool that requires new PAL.
 - Option A: Customer purchases new PALs. Leave existing DA/DAP license.
 - Option B: Customer may trade-in existing DA/DAP license for PALs.

How are PALs monitored and enforced?



When will PALs be available?

- PALs announced at vCampus Live! on 12/1/09
- PALs available in early 2010

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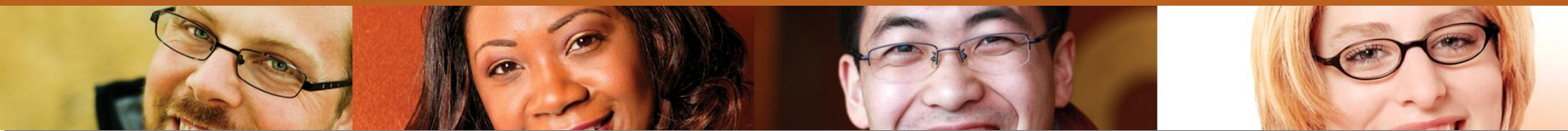
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THANK YOU.



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