

New to PI SDK and AF SDK 2010

Presented By:

Jay Lakumb and Charlie Henze,
OSIsoft



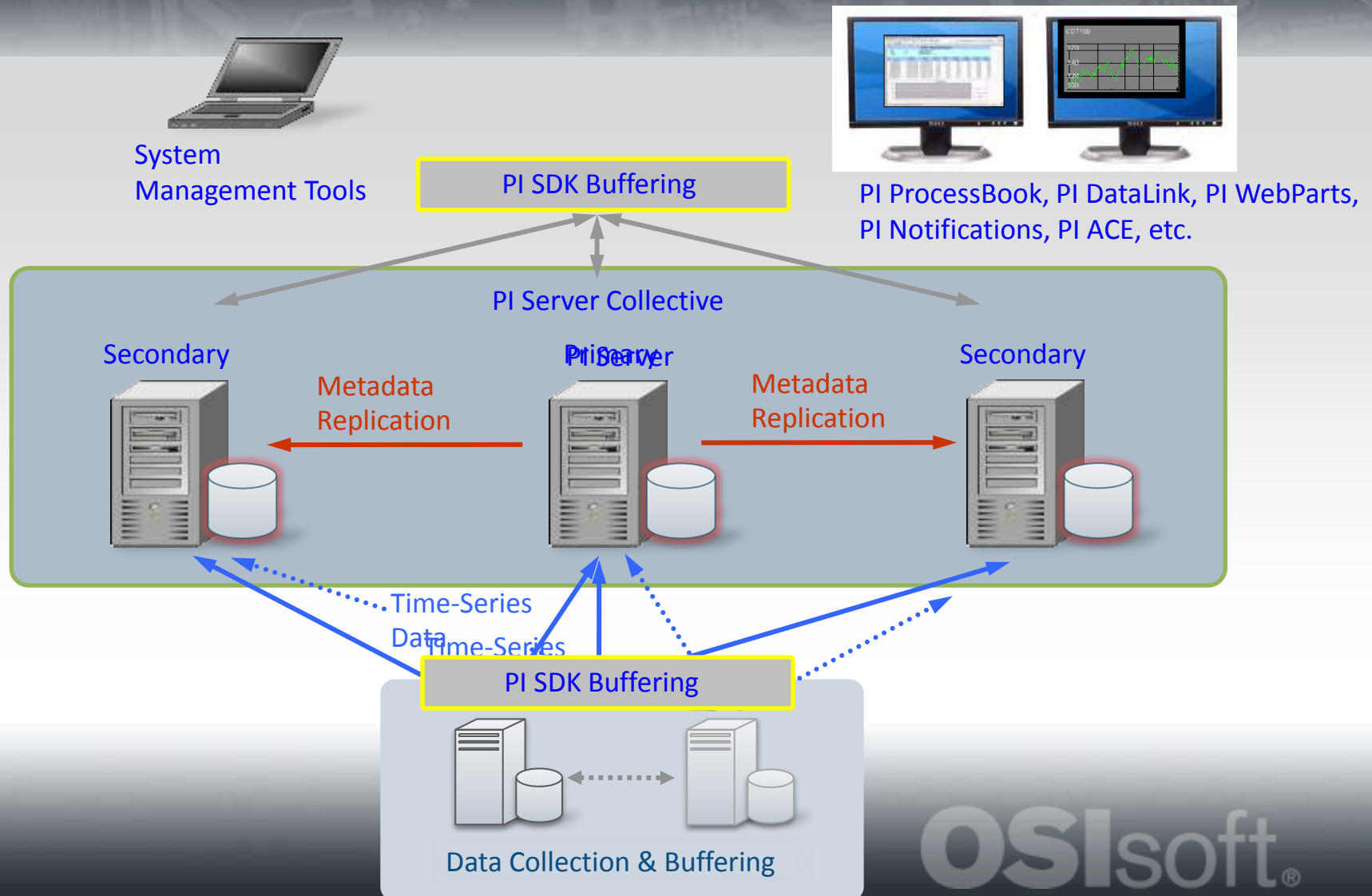
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PI SDK Buffering

- Use Cases
- Functionality
- Demo
- New PI SDK Utility
- Next Steps



High Availability



Use Cases

- Writing to HA PI Collective (fanning)
- Disconnected writes (buffering)
- Support PI Interfaces, Clients, Analytics, and Data Access
- Support Custom SDK applications



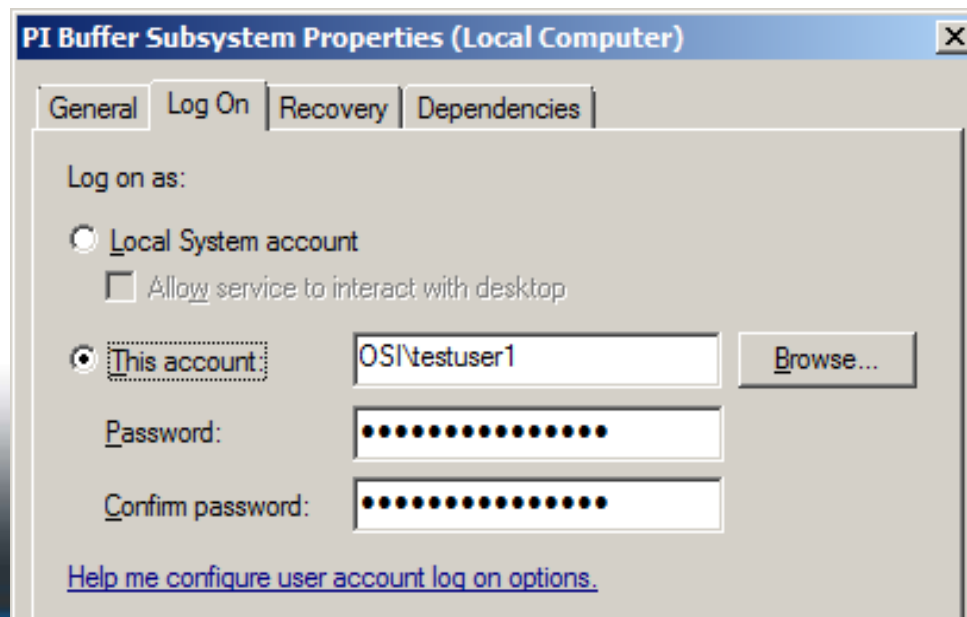
Buffering Behavior

- PI SDK 1.4 installs PI Buffering Subsystem
- Opt-in to enable SDK Buffering at install
- Fanning to all PI Collective members
- Buffering both PI SDK and PI API
- Supports Windows XP and above



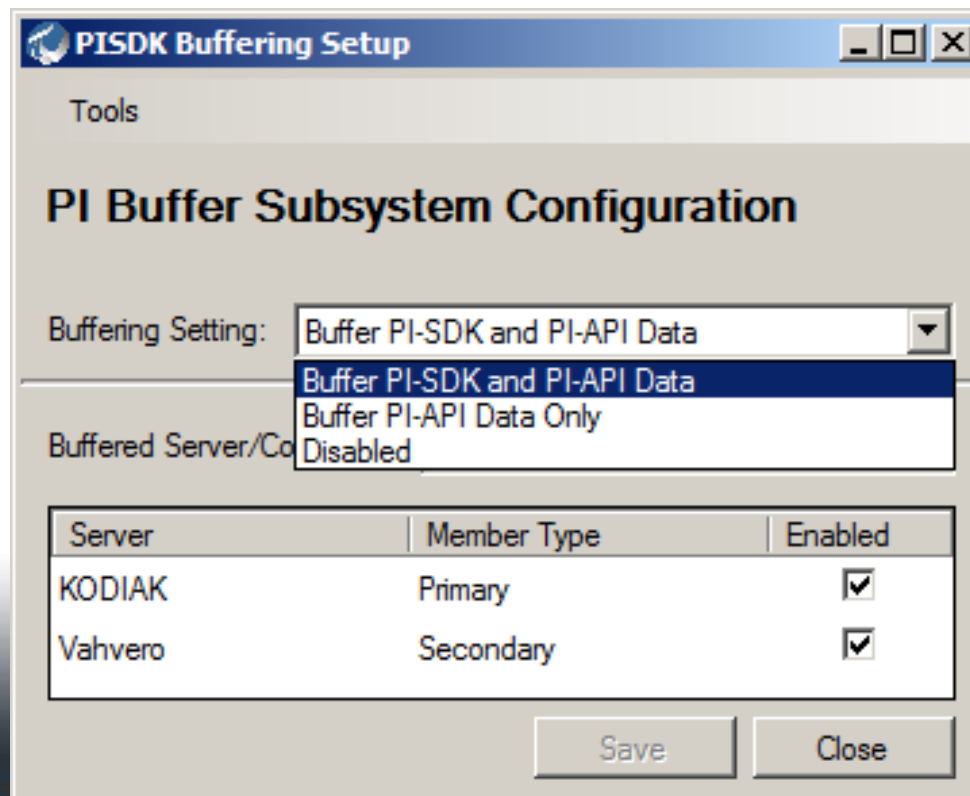
PIbufss Service Configuration

- PIbufss authenticates as PIIdentity or PITrust
- Local System (default) requires machine mapping
- Recommend domain user and automatic startup
- PI Server 2010 requires timeout parameter



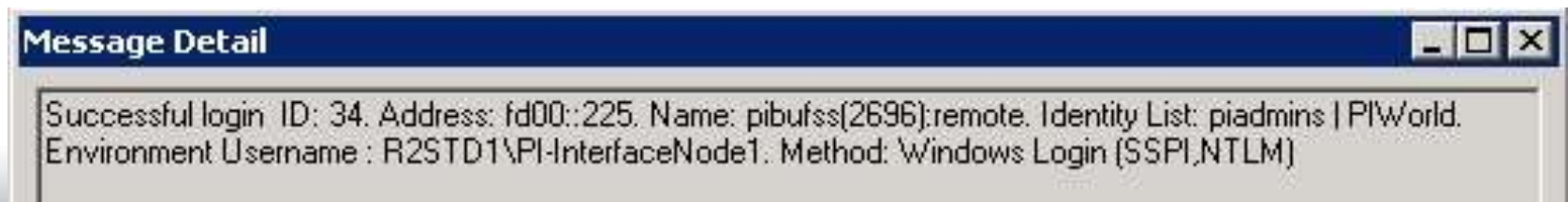
PIbufss Configuration Utility

- Choose buffering of PI SDK and/or API
- Choose one PI Server or PI Collective



Developing Buffered SDK Apps

- PIData.UpdateValue and UpdateValues
 - Insert, Reject duplicates modes only
 - Asynchronous mode is supported
 - MemberOpen behavior
 - New error for writing to collective if data is not buffered (edit, delete calls)



Buffering Demo

- PI SDK Buffering configuration
- Manual input, Interface stream
- Fanning data to a PI collective
- Buffering data while disconnected





Recycle Bin



PI Proc...

PI Proc...

polar.o...

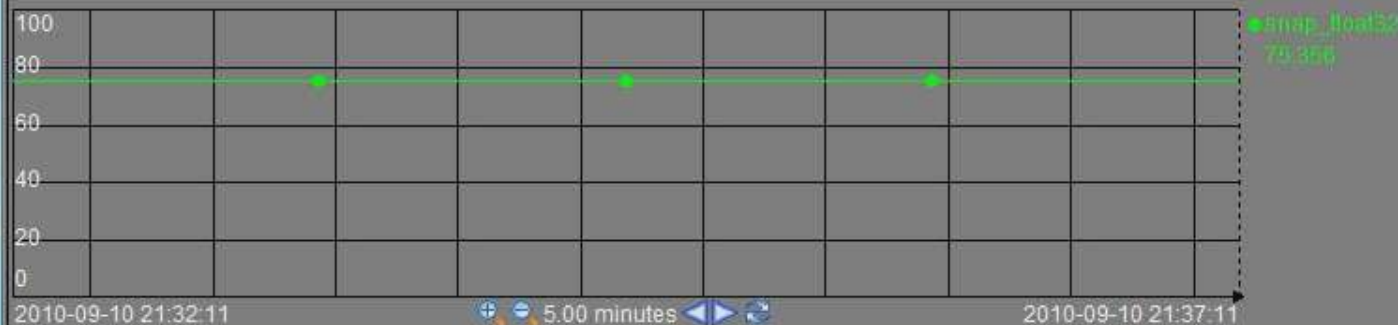
kodiak ...

PI ProcessBook - [PISDKdemo1.PDI]

File Edit View Insert Tools Draw Arrange Window Help



Plot-0



Today is Beautiful
2010-09-10 20:20:17



Server Time



Buffering Limitations

- One PI Collective or PI Server 3.4.375+
- No support for edits of existing data
 - ReplaceValue, RemoveValues, RemoveSpecifiedValues
- No adding annotations to existing data
- No PI Point, Batch, MDB configuration
- No support for client impersonation
 - Uses Pibufss process identity (not client user account), similar to API BufServ
- Pibufss and BufServ cannot run side-by-side



New PI SDK Utility

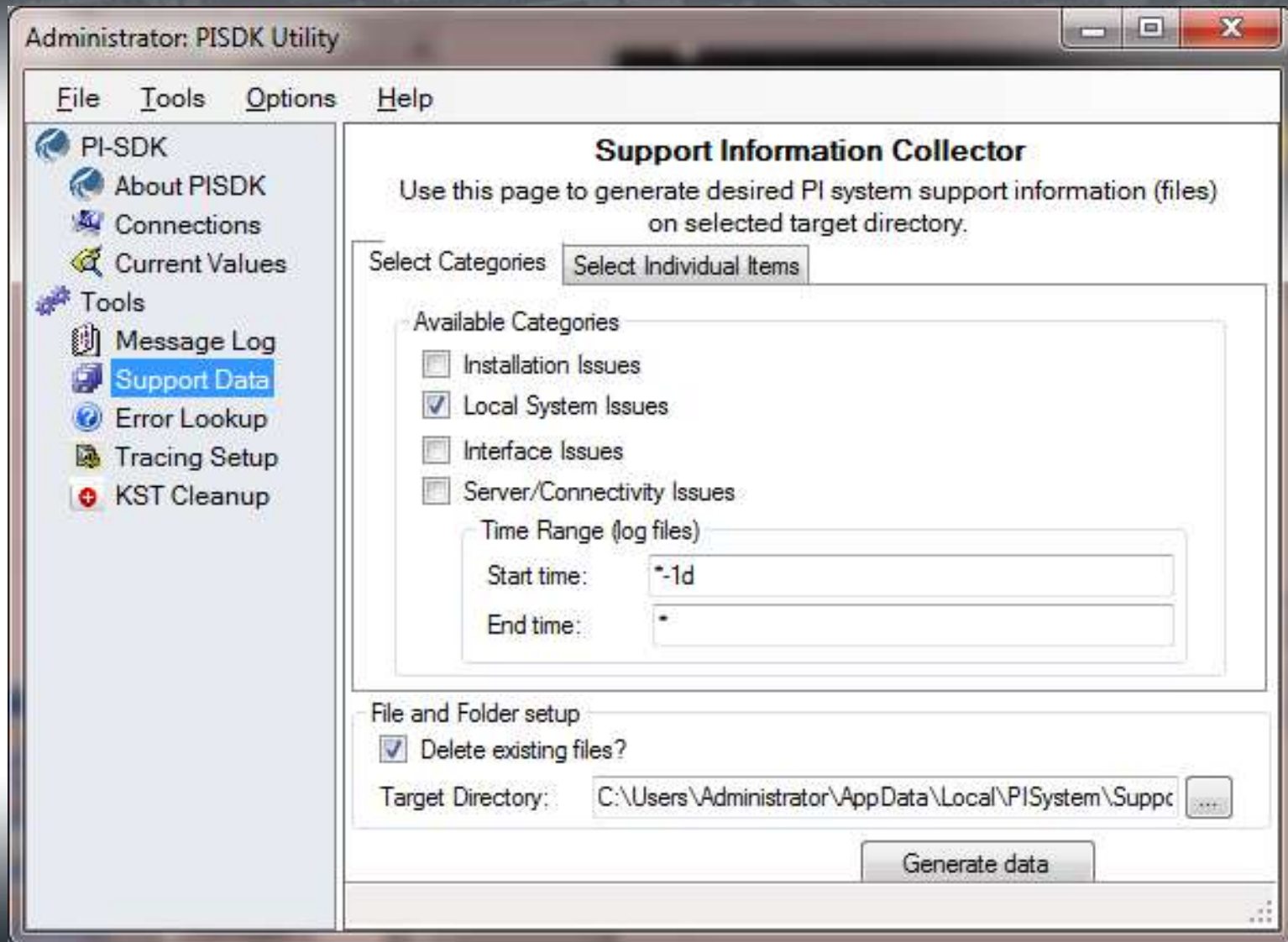
- Health and Support utilities
- Configuration and Maintenance
- Replacement for About PI SDK
- Both 32 and 64-bit installations



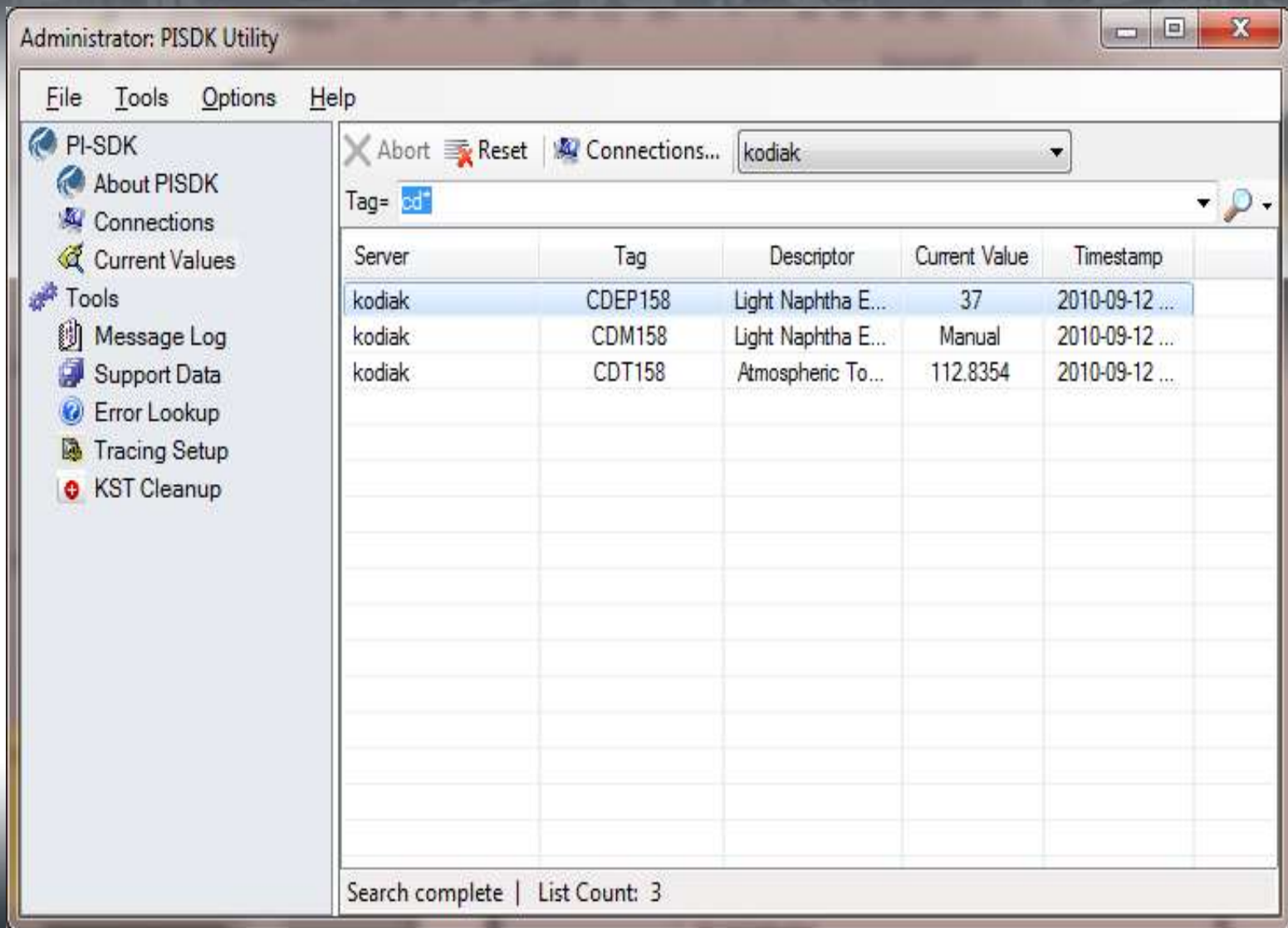
PI SDK Utility Status



PI SDK Node Information



PI SDK Current Values



Next Steps

- SDK Buffering datasheet at Product Expo
- PI SDK 1.4.0 CTP will be available on vCampus later this month
- Check your SDK code to determine if any changes are required
- Test with PI Client/Data Access products and your Custom applications
- Send feedback to pisdkbeta@osisoft.com



What's New in AF SDK 2010 (AF 2.2)

Presented By:

Chris Manhard

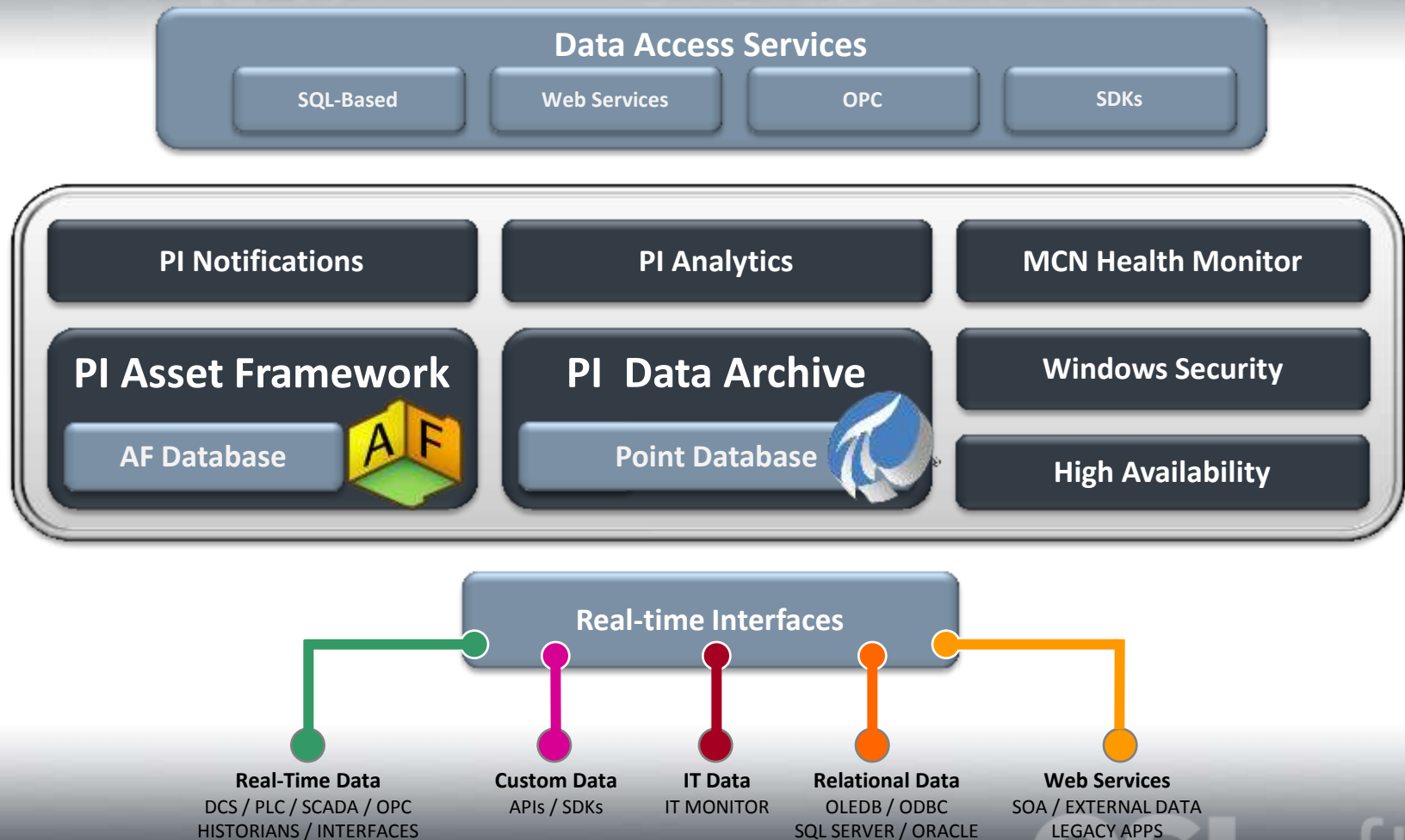


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Agenda

- PI Server 2010 – MDB and AF Link
- PI AF Performance and Scalability Enhancements
- PI OLEDB Enterprise / PI Web Services
- Roadmap

PI Server 2010

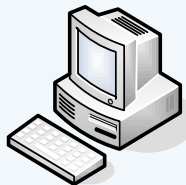


Migrating from MDB to AF

MDB-based Products



RtWebParts
ProcessBook
DataLink
BatchView
RtReports

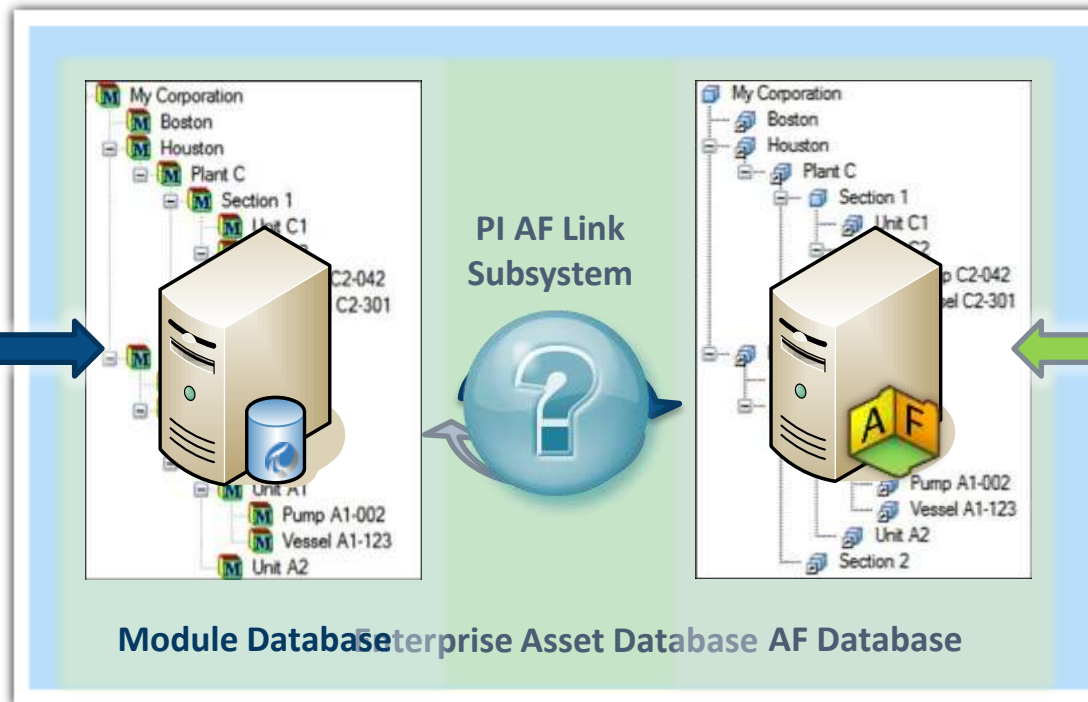


PI OLEDB
PI JDBC
PI OPC Server
PI SDK



PI ACE

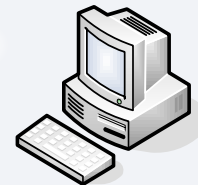
Continue using your existing MDB-based products



AF-based Products



PI WebParts
ProcessBook
DataLink (future)



OLEDB Enterprise
PI JDBC (future)
PI Web Services
AF SDK



PI Notifications

Upgrade to AF-based products when you are ready

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PI AF and MDB

- PI AF is now the system-of-record for MDB
- PI AF 2010 Enhanced to support demands of two-way multi-threaded synchronization with MDB
- You should develop new asset-based applications using PI AF (AF SDK, PI OLEDB Enterprise, PI Web Services)
- OSIsoft will maintain support for MDB applications
 - PI ACE
 - PI Batch
 - Your Applications

Translate MDB paths to PI AF

- Use **OSIsoft.PB.MDB2AFPath** Assembly
Installed into the GAC with PI ProcessBook 3.2 and PI WebParts 2010.

```
public static bool Translate(string mdbFullPath,  
                             out string afFullPath,  
                             out string error)
```

MDB Path Format:

\\piserver\module
\\piserver\module|alias
\\piserver\module||property



AF Path Format:

\\afserver\database\element
\\afserver\database\element|attribute

Uses AF Element established by the PI 2010 AF Link sub-system

See “Migrating your application from MDB to AF” at
<http://vcampus.osisoft.com/Library/library.aspx>

Add PI AF capabilities to your Applications

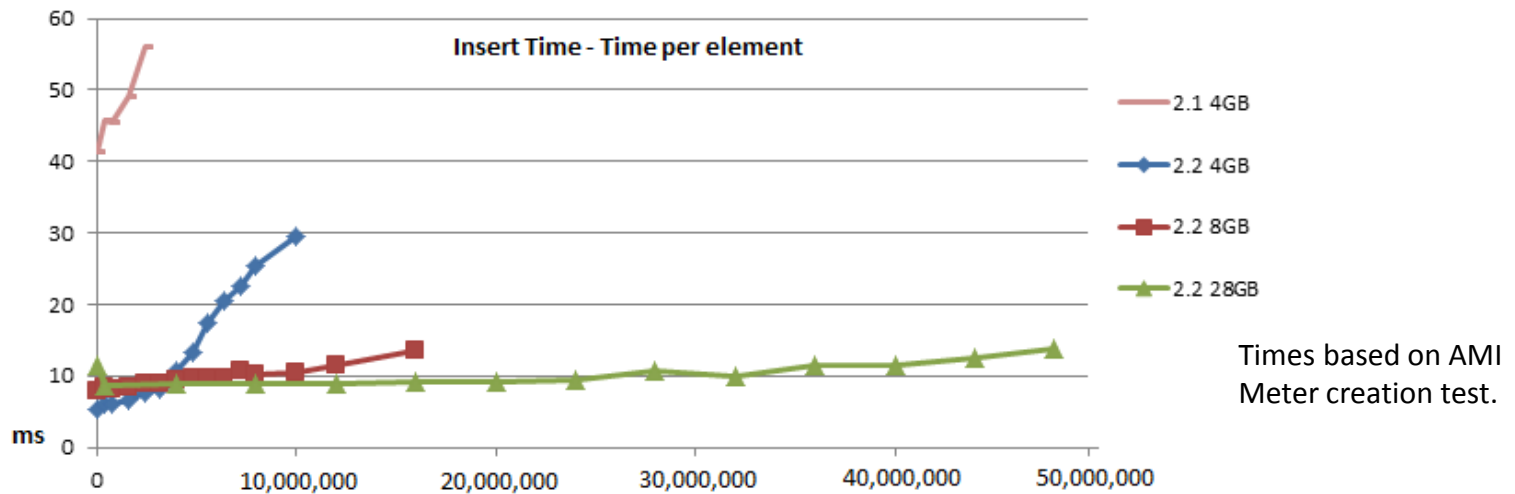
- **Find / Search**
- **Bulk Operations**
- Notifications
- Templates
- Relational Data
- Custom data sources
- Units of Measure
- GUI Components
- Relationships and Modeling
- Import / Export

See the Builders' Café Webinar: "Transitioning from ModuleDB to AF".

PI AF Performance & Scalability

- Element Creation

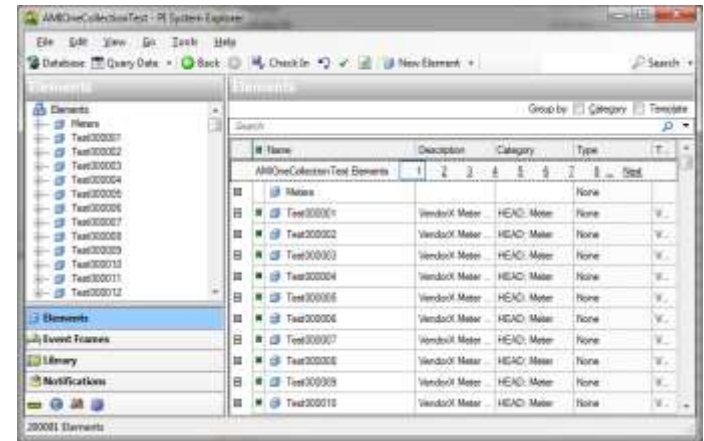
- 10x increase in element creation performance
- 10x improvement in element scalability



- Support for roughly 10 million* templated elements
(* can vary significantly based on element structure and use)

Large Collections

- Paging of Collections
 - Support for large element collections



- Improved behavior for applications in which multiple processes/threads add to the same element collection.

Paging in the PI AF SDK

- All Element Find methods accept parameters for paging.
- PI AF SDK will automatically page when iterating through large collections.

C#

```
public static AFNamedCollectionList<AFElement> FindElements(  
    AFDatabase database,  
    AFElement searchRoot,  
    string query,  
    AFSearchField field,  
    bool searchFullHierarchy,  
    AFSortField sortField,  
    AFSortOrder sortOrder,  
    int startIndex,  
    int pageSize,  
    out int totalCount  
)
```

```
foreach (AFElement e in AFDB.Elements)  
{  
    ProcessElement(e);  
}  
  
AFDB.Elements.KeepInMemory = true;  
while (true)  
{  
    foreach (AFElement e in AFDB.Elements)  
    {  
        ProcessElement(e);  
    }  
}
```

PI AF Search Performance

- Search Performance
 - Significant improvements in hierarchy searches.

```
C#  
  
public static AFNamedCollectionList<AFElement> FindElements(  
    AFDatabase database,  
    AFElement searchRoot,  
    string nameFilter,  
    AFCategory elemCategory,  
    AFElementTemplate elemTemplate,  
    AFElementType elemType,  
    bool searchFullHierarchy,  
    AFSortField sortField,  
    AFSortOrder sortOrder,  
    int maxCount  
)
```



- However, it is still significantly faster to search the entire database when possible.

More Performance Enhancements

- Faster trending of Formula and other “Calculation Data References”
- Attribute.SetValue
- Updating objects
- Deleting Elements
- Finding Parents
- Loading Elements in Bulk
- Multi-threaded operations

Paged Collection Demonstration



Meters														
General Child Elements Attributes Ports Version														
Search														
Name														
Meters Elements 1 2 3 4 5 6 7 8 9 10 11 12 13 14														
+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Test000000														
Test000001														
Test000002														
Test000003														
Test000004														

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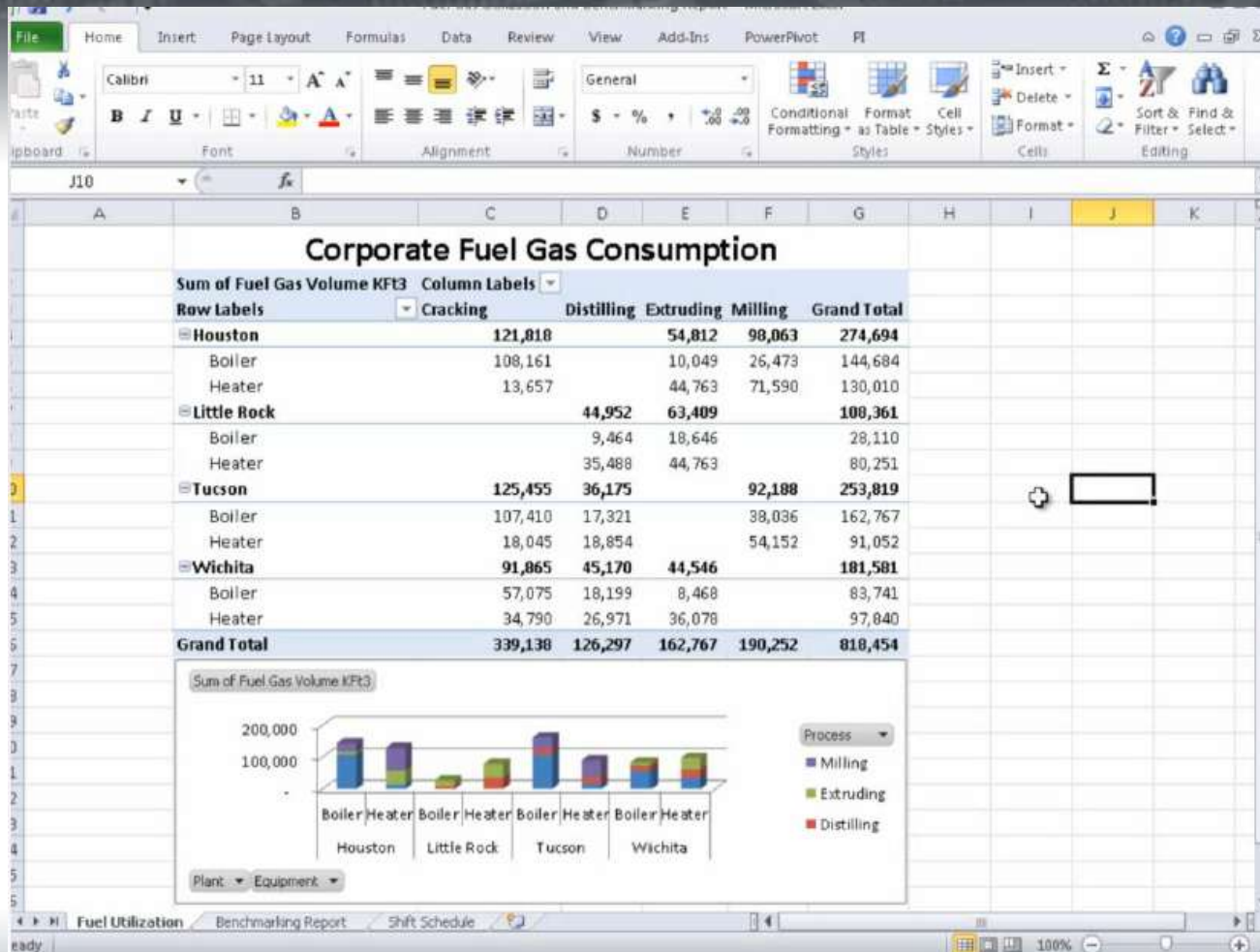
Recycle Bin



Adobe Reader
9

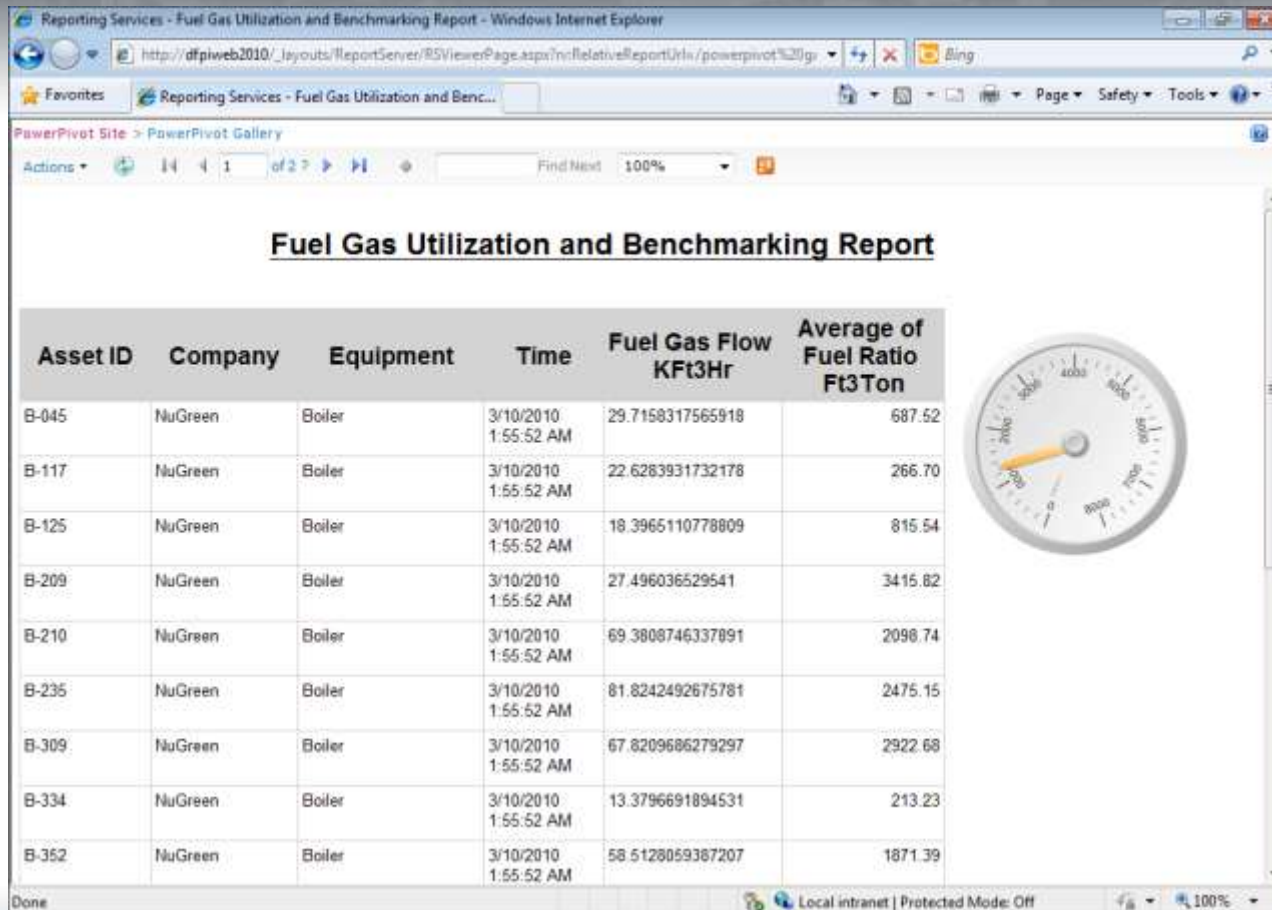


PI OLEDB Enterprise in PowerPivot



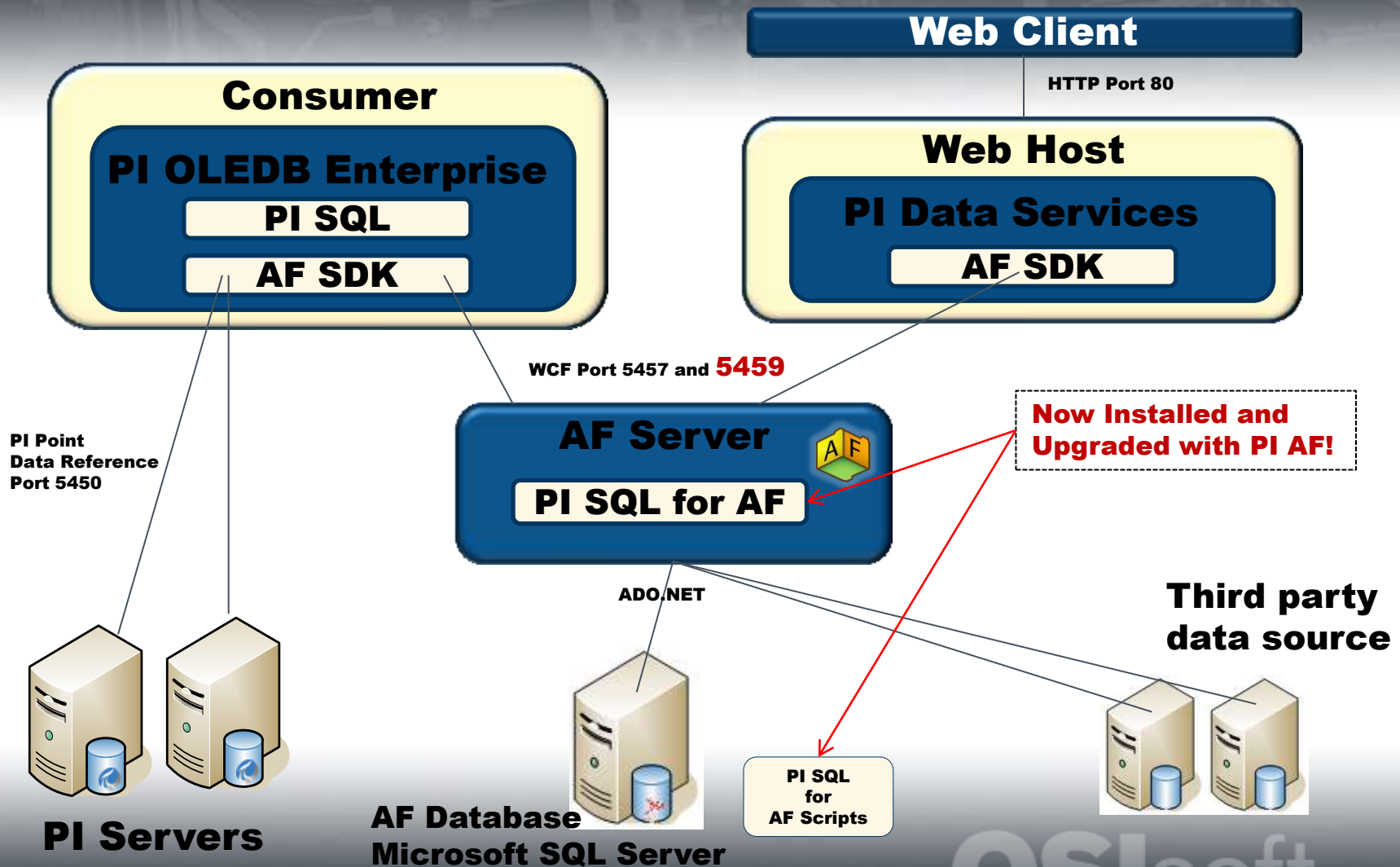
See the Builders' Café Webinar: "Personal BI with PI DataLink and Office 2010".

PI OLEDB Enterprise in SQL Server Reporting Services



See the Builders' Café Webinar: "PI OLEDB Enterprise 2010".

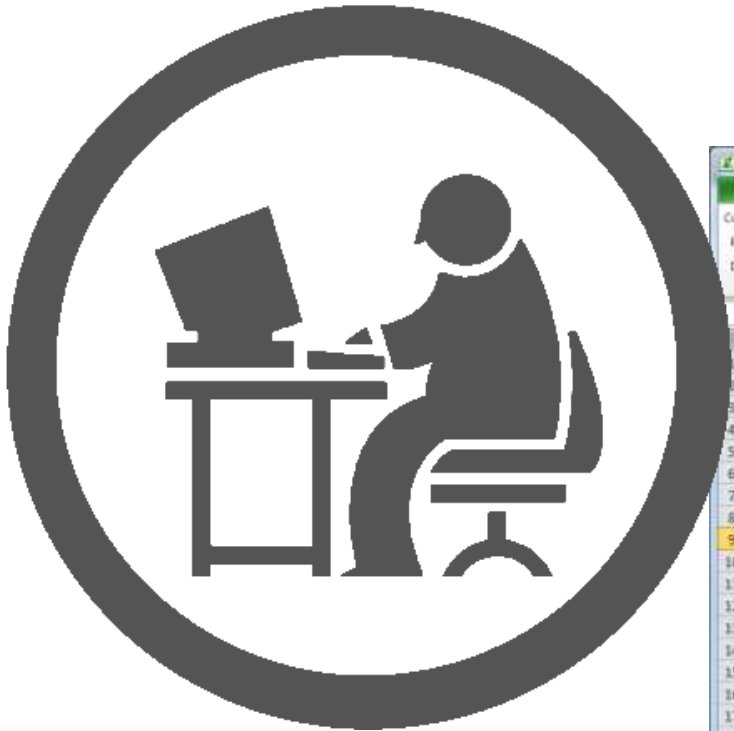
PI AF / PI OLEDB Architecture



AF SDK Roadmap

- Upcoming PI AF features in PI AF 2010 R2:
AF Builder 1.0 – Excel Add-In for Configuration
- Upcoming PI AF features in PI AF 2011
 - Event Frames
 - Configured Analytics
 - PE functions as a Data Reference

AF Builder Excel Add-In Demo



Microsoft Excel - Book1

Current AF Connection: RSystem: CMANHARD6400 Database: NuGreen

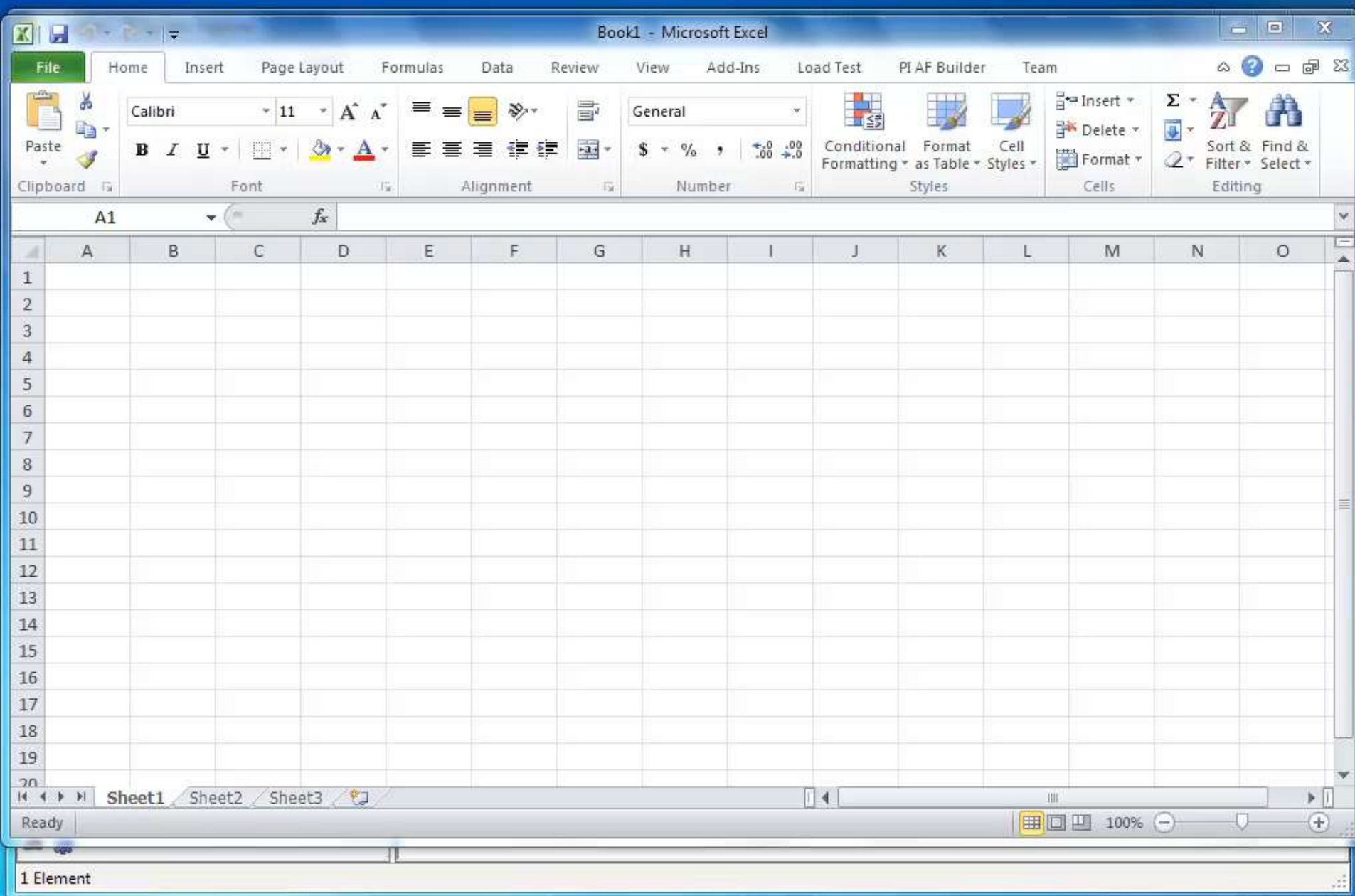
AF Add-In Buttons: Headers, Select All, Delete, Export, Library Elements, Import from AF, Export to AF, About, Help, Resources

Formula Bar: =Formula:A=Process Feedrate;B=Water Flow:[(1000 * B) / A]

Selected(x)	Parent	Name	ObjectType	Description	Template	Water
x	NuGreen\Little Rock\Extruding Process\Equipment	B-045	Element	Boiler B-045 Modify Test	Boiler	=Formula:A=Process Feedrate;B=
x	NuGreen\Tucson\Distilling Process\Equipment	B-117	Element	Boiler B-117	Boiler	=Formula:A=Process Feedrate;B=
x	NuGreen\Little Rock\Distilling Process\Equipment	B-125	Element	Boiler B-125	Boiler	=Formula:A=Process Feedrate;B=
x	NuGreen\Houston\Milling Process\Equipment	B-209	Element	Boiler B-209	Boiler	=Formula:A=Process Feedrate;B=
x	NuGreen\Houston\Cracking Process\Equipment	B-210	Element	Boiler B-210	Boiler	=Formula:A=Process Feedrate;B=
x	NuGreen\Houston\Cracking Process\Equipment	B-235	Element	Boiler B-235	Boiler	=Formula:A=Process Feedrate;B=
x	NuGreen\Tucson\Cracking Process\Equipment	B-309	Element	Boiler B-309	Boiler	=Formula:A=Process Feedrate;B=
x	NuGreen\Wichita\Extruding Process\Equipment	B-334	Element	Boiler B-334	Boiler	=Formula:A=Process Feedrate;B=
x	NuGreen\Wichita\Cracking Process\Equipment	B-352	Element	Boiler B-352	Boiler	=Formula:A=Process Feedrate;B=
x	NuGreen\Wichita\Distilling Process\Equipment	B-459	Element	Boiler B-459	Boiler	=Formula:A=Process Feedrate;B=
x	NuGreen\Wichita\Cracking Process\Equipment	B-481	Element	Boiler B-481	Boiler	=Formula:A=Process Feedrate;B=
x	NuGreen\Houston\Milling Process\Equipment	B-499	Element	Boiler B-499	Boiler	=Formula:A=Process Feedrate;B=
x	NuGreen\Tucson\Cracking Process\Equipment	B-555	Element	Boiler B-555	Boiler	=Formula:A=Process Feedrate;B=
x	NuGreen\Tucson\Milling Process\Equipment	B-737	Element	Boiler B-737	Boiler	=Formula:A=Process Feedrate;B=
x	NuGreen\Houston\Extruding Process\Equipment	B-765	Element	Boiler B-765	Boiler	=Formula:A=Process Feedrate;B=
x	NuGreen\Tucson\Milling Process\Equipment	B-914	Element	Boiler B-914	Boiler	=Formula:A=Process Feedrate;B=

Sheet1 Sheet2 Sheet3

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Thank You!

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Extra

A close-up, grayscale image of a circuit board with various components and traces, serving as a background for the top portion of the slide.

More AF 2010 Enhancements

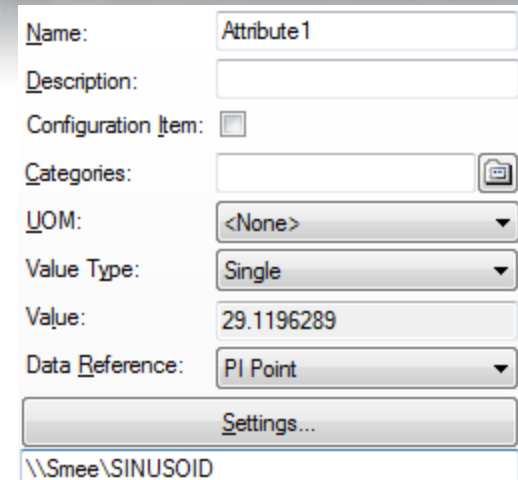
- Default WCF mechanism for connecting to AF Server has changed to use an SPN connection

-
- System Properties
- General
- Name: PISYSTEMSS
- Description: (Not Connected)
- Host: PiSystemsS Port: 5457
- Account: Timeout: 300 seconds
- Version:
- Aliases:
- Extended Properties
- Configure Active Directory... Connect
- OK Cancel Apply




Other Enhancements

- Automatic setting of Attribute Type based on Point Type
- Change of default Attribute Type in PI System Explorer from String to Double
- PI System Admin now has unrestricted access
- Error Recovery during Import



The screenshot shows a configuration window for an attribute. The fields are as follows:

Name:	Attribute1
Description:	
Configuration Item:	<input type="checkbox"/>
Categories:	<input type="text"/> 
UOM:	<None>
Value Type:	Single
Value:	29.1196289
Data Reference:	PI Point
Settings...	
\\Smee\SINUSOID	