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vCAMPUS LIVE! 2010

Where PI geeks meet… to turn challenges into solutions

SERVERS	
Support for Windows Security in PI Server 3.4.380	PI Server 3.4.380 allows Windows users transparent access into PI security via a new identity mapping mechanism. In this lab, you will create a PI Identity that is mapped to an Active Directory (AD) "Security Principal" (username or AD security group). You will then use this PI Identify in place of a traditional PI User or PI Group in the PI Point security configuration. You will also learn how to map a PI Trust to a PI Identity.
Create a Performance Equation Tag	Learn to use PI SMT (System Manager Tools) 3 to easily create a performance equation tag.
Configuring an Element in PI AF	This lab teaches how to create PI AF objects by means of configuration using the PI System Explorer tool.
Element Versioning and Security	In an existing PI AF database configured with elements representing tanks on a production line in your plant, the product in one of the tanks has to be changed. Learn to historize what the current product is and change to the new product by creating a new "version" of that element.
Programming Lab: Basics of PI AF Programming	This lab teaches you how to use the features of the AF SDK, such as hierarchical models and objects versioning. In this lab, you also create elements and element templates, search for elements given a specific query date, and add an element to a model.
Programming Lab: Bulk Loading Objects to Improve PI AF Application Performance	To achieve the best performance from PI AF, load AF SDK objects or attribute values in bulk. The bulk load methods of the AF SDK reduce the number of round trip Remote Procedure Calls (RPCs) to the server. This lab illustrates the use of some of the common bulk operations.
Programming Lab: Basics of Event Frames Programming	Most processes have repeatable time periods, such as downtimes, excursions, batches, and so on. Event Frames is a new framework within PI AF that aids in identifying, storing, organizing, and tracking these "time/event frames" and relating them to the process data. In this lab, you will learn how to programmatically create, manage, and search for these event frames. Note that Event Frames is not yet released as a product; however, it is available for development efforts as a Community Technology Preview (CTP) on OSIsoft vCampus.

ANALYTICS	
Build a Sample Batch	Use our Quick Start Kit to create s single-level batch on the PI Server.
Using PI BatchView	Compare the value of PI System tags during multiple repeatable events.

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NOTIFICATIONS	
Configuring a Notification and Escalation Workflow	This lab will demonstrates the features of PI Notifications, and how to configure the notification trigger mechanism. You will also learn how to create contacts and groups, and the subsequent building of an escalation workflow.
Build a Notification Rule with Multiple Conditions	The procedure is the same as the previous Learning Lab except the condition configuration is more complex.
Customize Notification Message Content	Add custom content to the notification and subscribe to the custom content.
Notification Templates	Notification templates let you build many similar notification rules by creating a notification rule template for a PI AF element template. In this lab, you create a notification template. Specify options for what to do when a new element that uses an element template associated with a notification template is built. Automatically update all notifications when you update the notification template. Manage notification templates (associate existing notifications with a notification template, create a notification template from an existing notification and vice versa, etc.).
Programming Lab: Create a Notification Rule	PI Notifications is an enterprise wide application that provides real-time alarming and alerting capability. In this lab, you will create a notification programmatically using the AF SDK.
Programming Lab: Use the Notification Viewer	Develop an application in Visual Studio (C#) that shows you a list of PI AF assets that have notifications configured.
Programming Lab: Show the Number of Notification Rule Instances	In certain situations, you want to know how many times the trigger for a notification rule has fired within a specified time period, how long they last on average, if they are acknowledged, etc. In this example, you develop an application in Visual Studio (VB.NET) that shows you the number of times the notification trigger has violated since a specified time. Note that some of the steps are similar to those in the previous lab except we carry them out in Visual Basic instead of C#.
Programming Lab: Develop a Custom Delivery Channel for PI Notifications service	Develop a custom delivery channel to write a notification event and its contents to an XML file.

VISUALS	
Build a Display in PI ProcessBook	Use PI ProcessBook to build a simple display mimicking a control room workstation.
ProcessBook 3.2 New Features	In this lab, you will use the new features of PI ProcessBook 3.2. This includes element relative displays that can be created using PI AF elements that switch data context within a given display. A user can also email, instant message, or can see a phone number in Contacts, from within PI ProcessBook using Office Communicator (2005 or 2007) technology. A new toolbar to navigate recently opened and bookmarked displays provides a familiar browsing experience and reduces the time spent searching for a recently used display. Playback functionality has been added to support users who troubleshoot problems by replaying events. Finally, the Statistical Quality Control (SQC) symbol is fully incorporated into PI ProcessBook as a native symbol.
Building AF displays	Create a PI ProcessBook display based on elements contained in an PI AF database.
Create a Simple Report in PI DataLink	Create a simple report that shows the current value, an archived value, and the attribute of PI System tags.
Perform a Calculation in PI DataLink	Use the built-in PI Calculated Data functions in PI DataLink to show the total production, average, minimum and maximum, and standard deviation in a weekly report in Excel.

VISUALS (Continued...)	
New Features of PI WebParts 3.0	In this lab, you will use the new support of querystrings by PI WebParts 3.0. Querystrings provide a way to parameterize an entire SharePoint web part page; to configure the initial appearance of a SharePoin web part page by passing configuration parameters to the page through the URL. This lab demonstrates how querystrings parameters simplify the construction of web part pages by building a template page that can accept parameters and display data for different Units.
Build a Simple Web Part Page	This lab teaches you how to configure PI WebParts and assemble web pages.
Configuring Tabular Web Parts in PI WebParts	A detailed examination of the extended configurability of tabular web parts in PI WeParts, including extended conditional formatting and other column behaviors.
Integrate PI DataLink for Excel Services with PI WebParts	This lab describes how to create a parameterized Excel workbook that retrieves PI System point data, and then how to load this spreadsheet into the Excel Web Access (EWA) web part. PI DataLink for Excel Services maintains the PI server connection and refreshes spreadsheet data in the web part page. Updates are triggered by a time parameter sent from PI WebParts on the same web part page.
Provide PI AF Context to PI DataLink for Excel Services	This lab continues the example above (Integrate PI DataLink for Excel Services with PI WebParts) to examine web part connections between the EWA web part and PI WebParts. You can use web part connections to send module context parameters from web parts such as PI Table or PI TreeView to the EWA web part. The parameters in turn serve as arguments to PI DataLink functions in the spreadsheet, which can display different values based on the transmitted module context.
Programming Lab: Create a custom Web Part	Use Microsoft Visual Studio to create a custom SharePoint Web Part that can interact with OSIsoft's PI WebParts.
Programming Lab: Sync Values to the Trend Cursor using VBA	Use Visual Basic for Applications (VBA) that ships with PI ProcessBook to change the timestamps of all the values on a display to match the timestamp of the current location of the trend cursor.
Programming Lab: .NET add-in to Implement a Custom Dataset	This lab teaches you how to create a custom dataset add-in that accesses external data using .NET with C#. This lab shows you how to install the PI ProcessBook add-in template in Visual Studio 2005, how to create an add-in project, and then how to create the custom dataset by implementing the IDataProvider 3 interface, and how to deploy the add-in once created. The external data that will be accessed by the custom dataset will be a random data generator.
Programming Lab: .NET add-in to Introduce Docking Windows	This lab teaches you how to enhance the PI ProcessBook graphical User Interface (GUI) by creating a Docking window and placing a simple PI Tag search in the Docking window using .NET with C#. You can then drag a PI Tag from the Docking window onto a display to either create a Value symbol or add a trace to an existing Trend symbol. The lab shows you how to install the PB add-in template in Visual Studio 2005, how to create an add-in project, and then how to create the Docking window as well deploy the add-in once created.
Programming Lab: Surface PI Point Data in the SharePoint Business Data Catalog	This lab demonstrates how to author a Business Data Catalog (BDC) application definition file (ADF) compliant with the BDC Metadata Model. Once the ADF is complete and imported to Microsoft Office SharePoint Server (MOSS), you can effectively query your PI Server in SharePoint through the PI OLEDB Provider. PI System points matching the search criteria will surface in the BDC and you can add them to BDC web parts.
Programming Lab: Add PI Point Trend Actions to the BDC	This lab expands on the previous lab (Surface PI Point Data in the SharePoint Business Data Catalog). This time you augment your existing ADF to add more functionality, integrating PI point information with features of PI WebParts. The mechanism to link selected PI System points to a richer display functionality in PI WebParts is a Business Data Action, which in this case displays point data in a separate browser window using a trend.

VISUALS (Continued...)	
Programming Lab: Find and Display PI Points with SharePoint Enterprise Search	This lab expands on the previous lab (Add PI Point Trend Actions to the BDC), increasing the accessibility of PI Server data within the SharePoint environment by making PI Points more searchable. This accelerator requires basic program¬ming skills and SharePoint administration experience.

DATA ACCESS (Continued...)	
PI Web Services	PI Web Services is a product that allows users to access PI System data through Simple Object Access Protocol (SOAP) compliant Web services. The PI Web Services consists of a web service that accesses PI System data in response to Web service queries. In this lab you will create an InfoPath form that can read data from the PI server and on that can write data to the PI server.
PI JDBC Basics, Learn How to Query PI	The objective of this lab is to explore the PI server by using an already installed PI JDBC driver and DBVisualizer.
PI OLEDB Basics, Learn How to Query PI	This tutorial will show how easy it is to get started and provides the minimum SQL knowledge to perform data queries.
Configuring PI Data Services Data Sources and Datasets for PI WebParts	Use relational database data and web services data in PI WebParts (through PI Baseline Services).
View and Edit PI Point Data with InfoPath 2007 Forms	This lab describes the integration of the PI System with Microsoft Office InfoPath 2007. This example relies on PI OLEDB Provider views and the Linked Server feature of Microsoft SQL Server 2005. Microsoft SQL Server Management Studio is used to create the Linked Server and configure it for use with the PI OLEDB Provider. Stored Procedures are used to trans¬mit data to and from InfoPath forms in connection with web services. The accelerator describes each step in the setup process, ending with creation of an InfoPath form template and associated web services you can use to query and write values to your PI Server. This lab requires some experience with basic programming, SQL Server, the PI System, and the PI OLEDB Provider.
Create Reports on the Web Utilizing PI OLEDB	Learn how to create a simple report using the PI OLEDB provider in the MS SQL Server 2005 Reporting Services environment (SSRS).
Programming Lab: Create a Windows application that Reads/Writes PI Data via PI OLEDB	The goal of this lab is to learn how to build an ADO.NET application that executes SQL statements against the PI Server through PI OLEDB.
Programming Lab: General PI SDK Programming Introduction and Best Practices	This lab guides you through some of the most common tasks one would want to perform with the PI SDK, highlighting some of the best practices by comparing multiple approaches when appropriate.

DATA ACCESS (Continued...)	
Programming Lab: Performing Calculations in PI SDK	There are different ways to calculate aggregated values such as averages and totalizations in the PI SDK. We look at a method that allows you to calculate results by passing an expression written with the PI Performance Equation expression syntax. We look at a second method that allows you to choose from pre-defined common calculations such as StDev, Range, Min, Max, Average, Total etc.
Programming Lab: Using Event Pipes in PI SDK	Create an EventPipe object that queues changes to the value of a PI tag. Take values from that queue one at a time, or take all values from the queue at once. Finally, configure an event handler that allows you to trigger the display the new value of the tag when it receives a new snapshot value.
Programming Lab: Building a Web Service that Executes SQL and Returns a Data Set Using PI OLEDB	The goal of this lab is to learn how to build a Web service that executes a SQL statement against the PI Server and returns a Data Set and show the data in a Data Grid (Web service client).
Programming Lab: Programming with PI Web Services	The goal of this lab is to build a simple client application that consumes PI data using standard SOAP web services via PI Web Services. PI Web Services is a new OSIsoft product available as a Community Technology Preview (CTP) on OSIsoft vCampus.
Programming Lab: Programming with PI OPC UA Client	The goal of this lab is to build a simple client application that consumes PI data using standard OPC UA (Unified Architecture) web services exposed by the PI OPC UA Server. The PI OPC UA Server is a new OSIsoft product available as a Community Technology Preview (CTP) on OSIsoft vCampus.