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PI Notifications Service Bus

Executive Summary

The Process Plugins PI Notifications Service Bus is a standardized tool for communication to 3rd party applications. This communication includes such systems as SAP, Maximo, EAM, MP2 and Oracle Maintenance Management to name a few. Using the PI Notifications to trigger communication is the heart of the system for outbound or inbound data packages. The tool is completely user configurable with some training.

Technical Information

PI Notifications Service Bus is a communication system between the PI System and external applications. It accepts web service requests from PI Notifications, transforms the message so that can be understood by the target application, and then forwards it along. Options for external applications include web services, ODBC queries, FTP requests, and emails. PI Notifications Service Bus also handles responses from external applications and can write the results back to the PI System, or transform the response into a new message and send it to a 2nd external system.

PI Notifications Service Bus is fully configurable by the user. The first step is to create a PI Notifications Service. Each PI Notifications Service consists of one or more operations with zero to many input parameters. PI Notifications posts web service requests that invoke these operations and pass in the parameters.

The next step is to define one or more actions for the PI Notifications Service operation to execute. Options include:

SOAP Web Service Request: Requests can be sent to any SOAP web service. Users can create the XML message templates by hand or by importing a WSDL. Web service responses are parsed and results made available.

ODBC Query: All ODBC compliant databases can be used, though drivers must be installed separately. SELECT, INSERT, and UPDATE statements are all supported.

File Transfer: Text, CSV, or XML files are automatically created and transferred. FTP, SFTP, and Windows File System are all supported.

Email: Emails are distributed using an external SMTP server. Text, CSV, or XML files can all be attached.

AF Table Query: Values are written to AF Tables using SQL syntax. SELECT, INSERT, and UPDATE statements are all supported.

Read/Write Value to AF Attributes or PI Points: Value can be written to or read from AF Attributes or PI Points.

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Users can chain together as many actions as necessary. Each action includes an optional condition that controls whether or not the action is executed. Outputs from one action, if applicable, are used in subsequent actions.

After configuring the PI Notifications Service, it must be connected to PI Notifications. Each PI Notifications Service automatically creates its own WSDL which can be read by PI Notifications. Users then specify which AF Attribute values to send to the PI Notifications Service operation when the notification is triggered. These values can then be used as inputs for any action.

PI Notifications Service Bus is comprised of two components: a Windows Service that accepts web service requests from PI Notifications and carries out the series of actions; and a Configuration Utility for configuring and testing each action, as well as the connections to external systems. The configuration is stored in a SQL Server database. Only one instance of the Windows Service is used, but multiple instances of the Configuration Utility can be installed on different machines.

A typical use case for PI Notifications Service Bus is work order creation. The user first configures an Event Frame that is triggered based on real time environment conditions, e.g. a vibration sensor reaching a critical level. The Event Frame then fires off a PI Notification. PI Notifications Service Bus receives the message, transforms it as necessary, and sends it to the organization's 3rd party work order system, e.g. SAP, Maximo, EAM, etc. The work order system responds with the ID and status of the work order, which PI Notifications Service Bus writes to a SQL server table. This SQL server table can be imported into AF and used to ensure the Event Frame does not create duplicate work orders. Finally, PI Notifications Service Bus sends an email to interested parties alerting them the work order has been created and provides the work order ID.

A follow on use case would be to update the status of the work orders in SQL Server. The user configures an Event Frame to trigger periodically. When the Event Frame triggers, PI Notifications Service Bus looks for work orders marked as open the in SQL Server table. The service then queries the 3rd party work order system for the current status of each open work order and updates the SQL Server table accordingly.