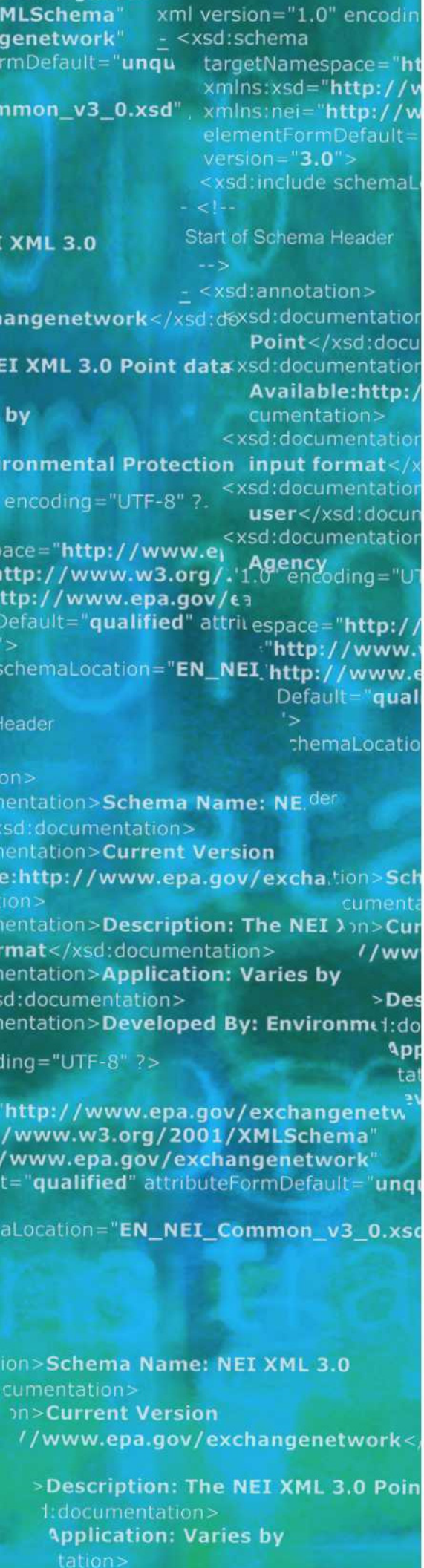

OpenNode2

Pollution Prevention P2R Data Exchange Implementation Guide (.NET)

Revision Date: 7/9/2014

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Environmental Information exchange Network

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Revision History

Date	Author	Changes	Version
9/30/2008	Windsor	Initial release	1.0
11/29/2012	Windsor	Updated for OpenNode2	1.1
7/9/2014	Windsor	Updated Install Plugin section to describe pre-bundled plugin process starting with OpenNode2 v2.6	1.2

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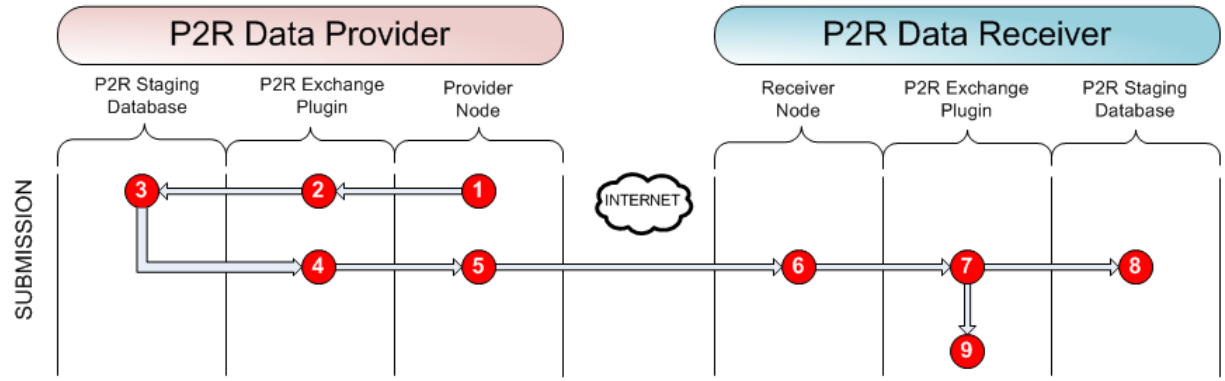
Exchange Overview

The purpose of this document is to detail the proposed design for the National Environmental Information Exchange Network (Network) Pollution Prevention Resource (P2R) data flow.

This document describes the specific configuration of the P2R plug-in for both a sender and receiver environment. Each partner will only need to set up the services that apply to their role in the P2R data exchange.

The following flowchart illustrates the basic exchange of an end-to-end transmission from a P2R data provider to receiver.



1. A scheduled task executes at the set interval, initiating the submittal of P2R data to a predetermined receiver node. The schedule calls the P2R exchange plugin, telling the plugin whether to send "Full Replace" or "Year-XXX" data.
2. The P2R Exchange Plugin connects to the P2R Staging database to retrieve data for submission.
3. The P2R Staging Database returns all data that matches the criteria for the exchange type specified in the schedule. If the schedule is set to only operate for a given year, only projects with a start date occurring in the given year will be included in the returned data.
4. The P2R Exchange Plugin composes a valid P2R_v1 XML file from the data returned and passes the XML file back to the schedule.
5. The node schedule then compresses the file to ZIP format, authenticates to NAAS using the node's runtime NAAS account (embedded in the node configuration) and submits the file to the Node Partner defined in the schedule.
6. The receiving node archives the received P2R XML file to its document repository in the Node database. The transaction status is updated to "Received".
7. The P2R Exchange Plugin sees that a P2R file has been received and invokes the P2R Submit Processor service. This service then validates the file against the P2R schema, parses the XML file, and inserts the P2R data into its staging database.
8. If the submission was a "Full Replace" all data for the Organization ID specified in the file is deleted before the contents is reinserted. If there is a failure, the transaction is rolled back and data is left in its previous state and the transaction status is updated to "Failed". If the submission was for a specific year, all projects with a start date occurring

within the year specified will be purged for the given Organization before inserting data from the submitted file.

9. The P2R Exchange Plugin updates the status of the transaction to "Complete" or "Failed", depending on whether the XML parsing and database update operations encounter errors or not.

Retrieving the status of submissions must be done manually using a Node Client application such as Windsor Solutions' NodeClientLite2[1].

[1] NodeClientLite2 can be downloaded from http://windsorsolutions.com/Products/NodeClient/

Installing the P2R Staging Database

The P2R Exchange Plugin relies on the P2R Staging Database as its repository for reading and writing P2R data. The structure of the P2R Staging Database mirrors the XML schema. Each table matches a major data block of the P2R_v1.0 XML schema. Please see the P2R Plug-in Design Guide for more information.

1. Open SQL Server Enterprise Manager and connect to the SQL Server where the P2R staging database will be stored
2. Create a new database named **P2R_NODE_FLOW**. Set the transaction logging to **Simple**.
3. Execute the **P2RDDL.SQL** script provided by Windsor to create the necessary staging tables in the **P2R_NODE_FLOW** database. The tables will be empty by default.
4. Create a SQL Server login and user named **P2RUser** and assign the login/user **db_datareader** and **db_datawriter** privileges to the **P2R_NODE_FLOW** database. This account will be used by the P2R plug-in to read and write data to the P2R staging database.
5. Load the staging tables with data from the agencies' P2R data source.

Installing and Configuring the P2R Plug-in

This section describes the necessary steps in installing and configuring the P2R plug-in within the Node. The P2R plug-in installation is simplified by utilizing the Node Administration Utility.

A Node Administrator can follow the following steps to complete the installation and configuration of the P2R plug-in.

Create the P2R Exchange

The first step is to create the P2R Exchange using the Node Administration Utility. This step is the same for both senders and receivers of P2R data. In any case, the step must only performed once.

1. After logging into the Node Administration Utility, click the Exchange tab on the top navigation bar.
2. Click the 'Add Exchange' button. The Manage Data Exchange screen will display:

3. Type **P2R** in the 'Name' field.
4. Type **Pollution Prevention Results Exchange** in the 'Description' field.
5. Type **http://www.exchangenetwork.net/exchanges/cross/p2r.htm** in the 'Web Info' field.
6. Check the 'Protected' box. This will require that Exchange Network partners be given specific permissions to submit files to the P2R exchange.
7. Click 'Save' to save the exchange.

Install the P2R Plug-in

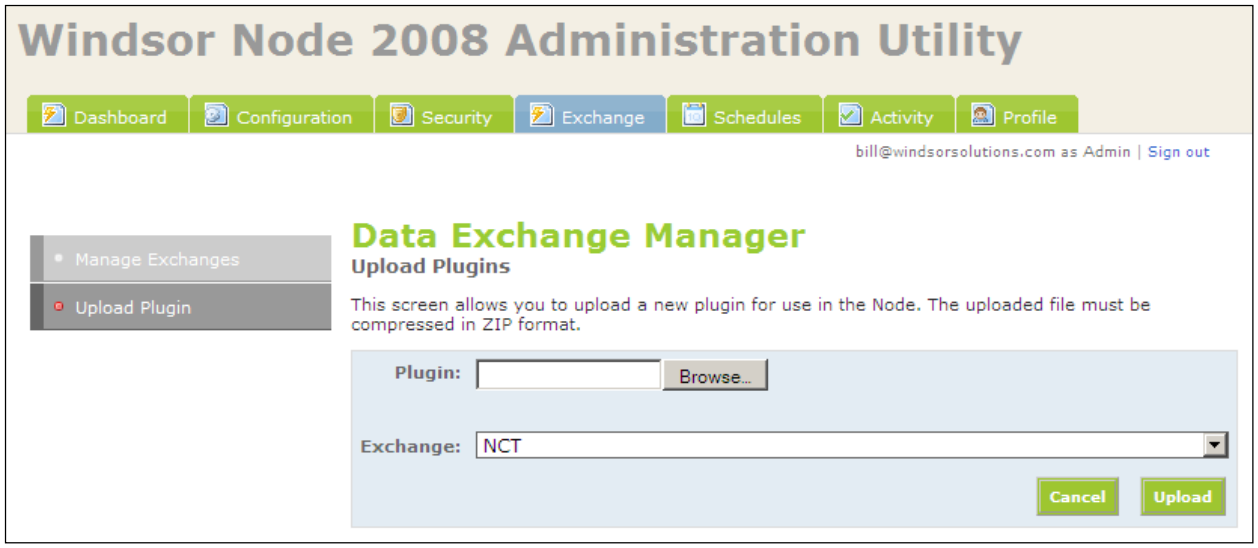
The next step is to upload the P2R plug-in provided by Windsor into the Node plug-in repository using the Node Administration Utility.

Note: If you are using OpenNode2 v2.6 or higher, this step is not necessary. Starting with v2.6, all plugins are pre-installed with the OpenNode2 software installation package. By creating the exchange above, the plugin will automatically be loaded and associated with the exchange. To validate that the plugin was installed automatically, follow the steps below:

1. From the **Exchange** tab, scroll down the list of installed data exchanges until the WQX exchange is located.
2. Click the **Add Service** button located just beneath the WQX data exchange record. If the Implementer drop down box is not empty, then the plugin has been installed successfully.

If the steps above reveal that the plugin is not installed, perform the following steps to install it.

1. Navigate to the plugin directory in the **Plugins\[Flow Name]\[version number]** directory included with the OpenNode2 installation files.
2. Create a new zip file containing the two Windsor.Node2008.WNOSPlugin.[Flow name].dll and .pdb files.



3. From the 'Exchange' tab, click the 'Upload Plugin' button on the left side of the window within the Windsor Node Administrator utility.
4. Click the 'Browse' button which is located to the right of the 'Plug-in' field.
5. Locate and select the P2R file you created in step 2 above.
6. Select **P2R** in the 'Exchange' dropdown box.
7. Click the 'Upload' button to upload the plug-in.

Set up the P2R Data Source

If the node does not already have a data source configured for the P2R staging database, it must be done so now. This step applies to both senders and receivers of P2R data. This step can be skipped if the P2R staging tables have been installed in the same database as staging tables for other, existing flows installed on the node where a Node data source has already been configured.

1. From the Configuration tab, click the Data Sources link on the left side of the window within the Windsor Node Administration utility.
2. Click the Add Data Sources button
3. Type **P2R Data Source** in the 'Name' field.
4. From the 'Provider' drop-down box, select **System.Data.SqlClient**.
5. Type the SQL Server database connection string to the P2R staging database in the 'Connection' box.
6. Click Save to save the Data Source.

Set up the Network Partner (sender nodes only)

If the node will be sending P2R data to another partner, the target partner must be set up on the node.

1. From the Configuration tab, click the Network Partners link on the left side of the window within the Windsor Node Administration utility.
2. Click the Add Partner button
3. In the 'Name' Field, type a plain text name to identify the partner.

4. In the 'Endpoint URL' field, type the URL to the partners Exchange Network node endpoint.
5. In the 'Version' field, choose **Node v1.1** since the exchange is set up to operate on the Node v1.1 specification.
6. Click Save to save the partner.

Set up the P2R Data Services

Submission Processor Service (receiver nodes only)

Next, the P2R plug-in must be configured to parse received P2R files and save the data to the P2R staging database. Please see the P2R plug-in design Document for more information on the specific operation of the submission processor.

Once the submit processor service is installed, it will immediately be ready to act upon any received files, parsing the P2R data into the P2R staging database.

1. From the Exchange tab, scroll down the list of installed Exchanges until the P2R exchange is located.
2. Click the 'Add Service' button located just beneath the P2R exchange entry. The screen will refresh to allow for adding a new service.
3. In the 'Name' field, type an asterisk (*). This tells the plug-in to act upon any and all files submitted to the P2R dataflow.
4. In the 'Implementer' drop-down box, select the **P2RSubmitSubmissionProcessor** entry.
5. In the 'Type' drop-down box, select **Submit**. This will be the only option available
6. Leave the 'Active' checkbox checked.
7. In the Data Sources section, select the data source that connects to the location where the P2R staging tables reside. This process is described in the previous section.
8. Click the 'Save' button to save the service.

Congratulations, the node is now ready to parse and store received P2R data in the staging database.

Set up the Submission Preparer Service (sender nodes only)

The P2R Exchange plug-in contains a service that is used to prepare and submit P2R documents to an external partner. This service only needs to be configured for sender nodes.

Please note that a copy of this service must be set up for each OrgID that will be sent from one node to another since each P2R XML document can only carry data for a single OrgID. See the FCD and Plug-in Design Document for more information.

1. From the Exchange tab, scroll down the list of installed Exchanges until the P2R exchange is located.
2. Click the 'Add Service' button located just beneath the P2R exchange entry. The screen will refresh to allow for adding a new service.
3. In the 'Name' field, type **Submit Data for [OrgID]** where OrgID is the assigned Organization ID for the organization configured for the service.
4. In the 'Implementer' drop-down box, select the **P2RSolicitQuerySubmissionProcessor** entry.

5. In the 'Type' drop-down box, select **Solicit**. This will be the only option available.
6. Leave the 'Active' checkbox checked.

Service Arguments

7. In the 'Author' field, type the name of the Author to be inserted in the XML header. This information is not used by the receiving node, so any entry can be made here.
8. In the 'Contact Info' field, type contact information about the origin of the data. This information is not used by the receiving node, so any entry can be made here.
9. In the 'Identifying Organization' field, type the assigned OrgID that will return data for the service. This OrgID must match an OrgID stored in the P2R Staging databases P2R_ORG table or no data will be returned by the service when it is executed.
10. In the 'Organization' field, type the sender's organization name. This information is inserted into the XML header and is not used by the receiving node.

Service Data Sources

11. In the Data Sources section, select the data source that connects to the location where the P2R staging tables reside. This process is described in the previous section.
12. Click the 'Save' button to save the service.

Repeat this process for each of the OrgIDs that will be sent from the node, substituting the new OrgID in steps 3 and 9 above.

Set up Exchange Schedules (sender nodes only)

Scheduled jobs can be configured to perform automated tasks such as submitting data to external partners or processing received files. This step only applies to nodes that will automate the submission of P2R data from to another agency.

Please note that a copy of this schedule must be set up for each OrgID that will be sent from one node to another since each P2R XML document can only carry data for a single OrgID. See the FCD and Plug-in Design Document for more information.

1. From the Schedules tab, select 'Add Schedule' button.
2. In the 'Name' field, type **Submit [OrgID] P2R Data to [PartnerName],** substituting the OrgID and PartnerName as appropriate.
3. In the 'Exchange' drop-down box, select **P2R.**
4. In the Availability area, select a start and end date for the schedule to run and the desired frequency. These settings are at the discretion of the implementer and subject to the data trading agreement between sender and receiver.

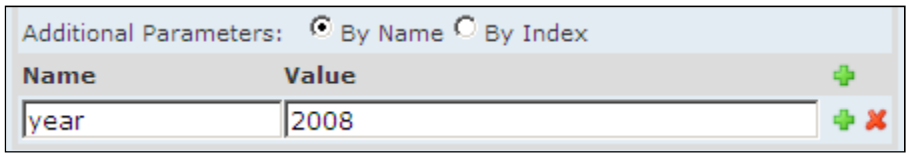
   Note that the schedule will execute immediately upon saving if the start date/time is on or before the current date/time.

Data Source

5. Bullet the choice for "result of local service execution'.
6. In the 'From' drop-down box, choose the **Submit data for [OrgID]** service, as established in the previous section.

Additional Parameters

7. The P2R plug-in can be configured to send a specific year's data or perform a "full replace" function, as specified in the FCD. For a full replace operation, do not add any parameters. If a year-replace function is desired, add a parameter by name where the Name = 'year' and the value is the year to be replaced, as illustrated in the image below.



Result Process

8. Select the radio button for "Submit Result to an Exchange Network Partner'.
9. In the 'To' drop-down box, select the partner that should receive the file.
10. In the 'Exchange' field, set the text to P2R. This is the dataflow that the file will be submitted to.
11. Click the 'Save' button to save the schedule.

Set up Submitter Permissions (receiver nodes only)

Receiver nodes will need to grant Exchange Network partners specific permissions to submit files to the P2R exchange. Please see the Node Admin guide for instructions on granting permissions to the P2R exchange.

Set up Email Notifications (optional)

If desired, the Node administrator may create NAAS accounts for one or more staff members and create notifications for the any node events related to the exchange. Please see the Node Administrators Guide for more information on setting up notifications.

Testing the P2R Exchange

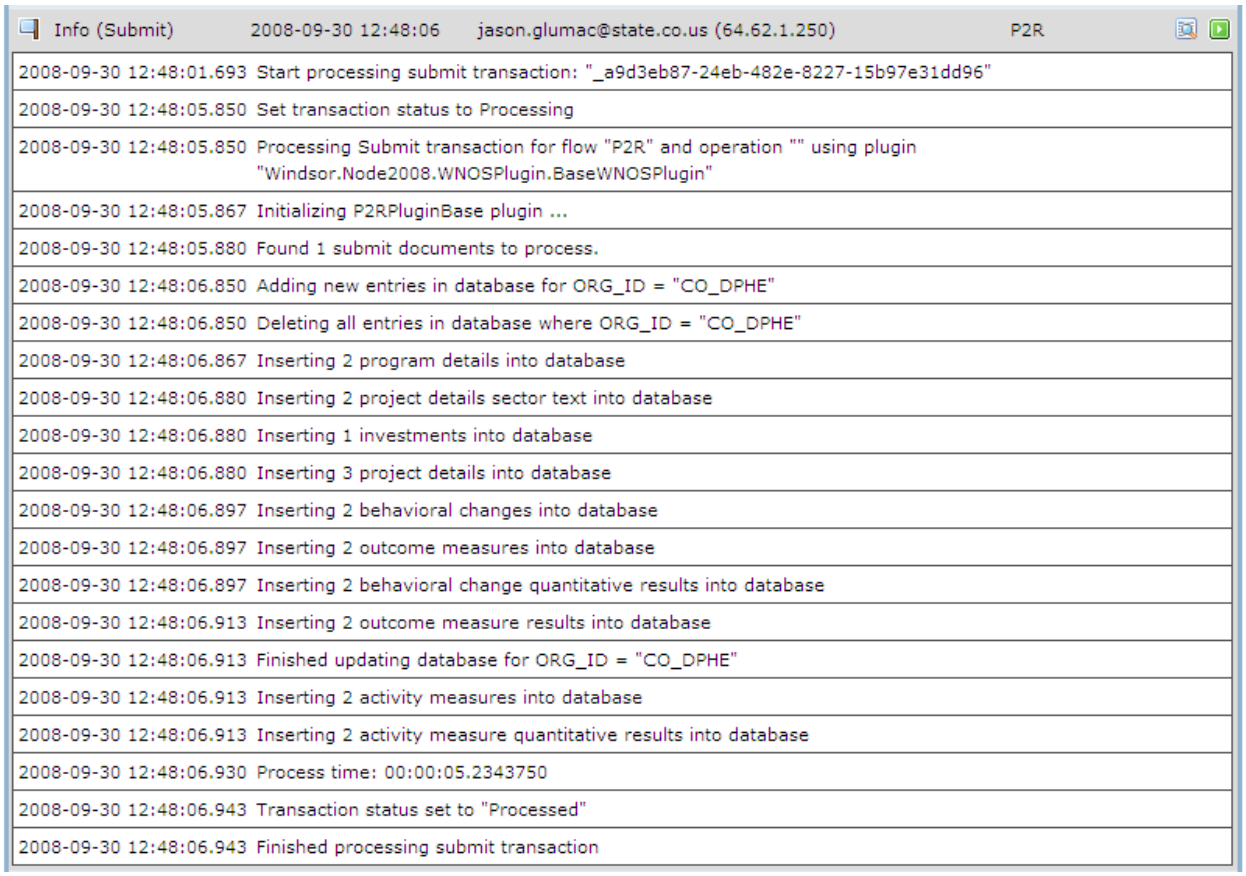
Testing the Sender Exchange

From the sender side, the objective of testing the exchange is to ensure that the P2R plug-in correctly generates the P2R XML file. Follow these steps to test the exchange:

1. Ensure that the P2R staging database is loaded with data from the source system.
2. Create a new schedule as described in the Set up Exchange Schedules section of this document, only set the Results Process step to "none". Set the execution start date/time to any time before the current date/time. Save the schedule.
3. The schedule will execute immediately upon saving.
4. Click the 'Activity' link on the main navigation bar and search the activity log for the most recent transactions. An entry should appear for the most recent schedule execution.
5. Drill into the transaction details using the magnifying glass icon to the right of the log entry.
6. Download the file using the link in the transaction detail screen
7. Examine the XML file to ensure that it contains the P2R data expected to be returned by the schedule.

Testing the Receiver Exchange

1. Obtain a sample P2R file to be used for testing. The result from the test above may be used for this purpose.
2. Using a Node Client application, log into the receiver node using a NAAS account that has been granted submit permissions to the P2R flow.
3. Submit the P2R XML file to the P2R exchange.
4. Log into the Node Admin utility and browse the Activity log, looking for the submission processing information for the transaction. A successful loading of the data should appear similar to the image below:



Info (Submit) 2008-09-30 12:48:06 jason.glumac@state.co.us (64.62.1.250) P2R

2008-09-30 12:48:01.693	Start processing submit transaction: "_a9d3eb87-24eb-482e-8227-15b97e31dd96"
2008-09-30 12:48:05.850	Set transaction status to Processing
2008-09-30 12:48:05.850	Processing Submit transaction for flow "P2R" and operation "" using plugin "Windsor.Node2008.WNOSPlugin.BaseWNOSPlugin"
2008-09-30 12:48:05.867	Initializing P2RPluginBase plugin ...
2008-09-30 12:48:05.880	Found 1 submit documents to process.
2008-09-30 12:48:06.850	Adding new entries in database for ORG_ID = "CO_DPHE"
2008-09-30 12:48:06.850	Deleting all entries in database where ORG_ID = "CO_DPHE"
2008-09-30 12:48:06.867	Inserting 2 program details into database
2008-09-30 12:48:06.880	Inserting 2 project details sector text into database
2008-09-30 12:48:06.880	Inserting 1 investments into database
2008-09-30 12:48:06.880	Inserting 3 project details into database
2008-09-30 12:48:06.897	Inserting 2 behavioral changes into database
2008-09-30 12:48:06.897	Inserting 2 outcome measures into database
2008-09-30 12:48:06.897	Inserting 2 behavioral change quantitative results into database
2008-09-30 12:48:06.913	Inserting 2 outcome measure results into database
2008-09-30 12:48:06.913	Finished updating database for ORG_ID = "CO_DPHE"
2008-09-30 12:48:06.913	Inserting 2 activity measures into database
2008-09-30 12:48:06.913	Inserting 2 activity measure quantitative results into database
2008-09-30 12:48:06.930	Process time: 00:00:05.2343750
2008-09-30 12:48:06.943	Transaction status set to "Processed"
2008-09-30 12:48:06.943	Finished processing submit transaction

5. Open the P2R staging database on the target node's database server and verify that the contents of the file have been added or replaced as expected.