



OpenNode2

Beach Notification (BEACHES) 2.1 Data Exchange Implementation Guide

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Environmental Information
exchange
Network

Revision History

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12/15/2009	Windsor	Initial version	1.0
4/20/2011	Windsor	Now Java-specific since .NET has unique implementation	1.1
9/22/2011	Windsor	Including Plugin Architecture	1.2
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Data Exchange Overview

The purpose of this document is to provide detailed instructions for the installation and configuration of the Exchange Network Beach Notification (BEACHES) data exchange on the Java implementation of the Exchange Network OpenNode2 (OpenNode2).

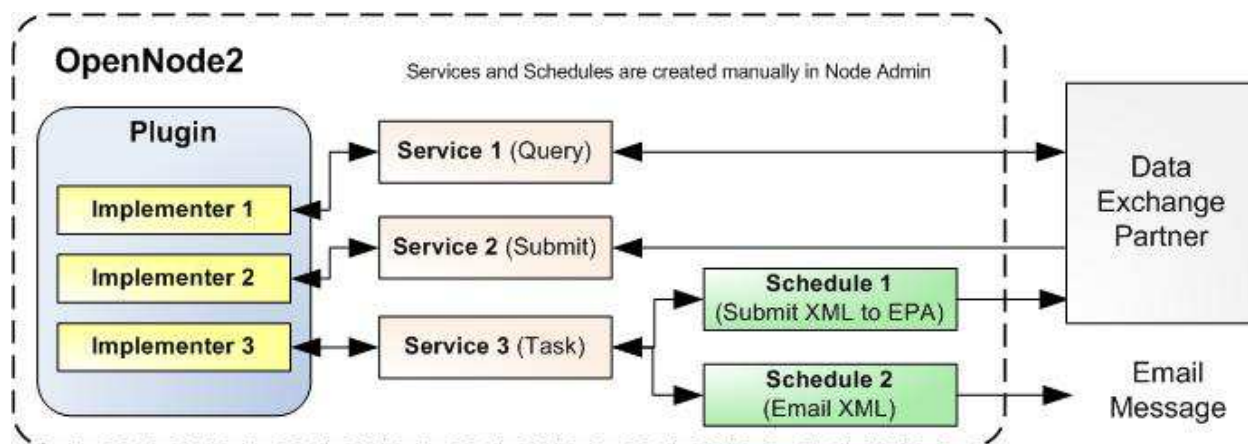
The BEACHES Exchange involves a periodic submittal to EPA for the purposes of updating EPA's PRAWN database which stores beach advisory data. The frequency and content of the each submission can be configured to meet the agency's needs based on monitoring schedules and data management practices, although EPA only requires BEACH Act grant recipients to submit annually.

The BEACHES data exchange processing workflow can be briefly summarized as follows:

1. A scheduled process beach notification data from the State or Tribe's source database and loads it into the OpenNode2 staging database's BEACHES tables. BEACH staging tables are prefixed with "NOTIF_".
2. On a scheduled interval, the BEACHES plugin installed on OpenNode2 will extract all Beach Activity records that have not yet been submitted as indicated in the database where the Sent To EPA flag is set to "N", serialize this into an XML document, and submit the resulting XML file to the EPA CDX Node (or another Network partner). The plugin then updates the records in the staging database to indicate that all records have been sent.
3. The EPA CDX Node validates the XML file, and passes it to the internal BEACHES XML processor.
4. The BEACHES XML processor validates the contents of the XML file against the PRAWN business rules and, if successful, writes the data to the PRAWN database.
5. EPA CDX sends a notification email to the CDX Web user account, notifying the user of the processing status, and any errors encountered.

Plugin Architecture

The diagram below shows the architecture of a typical OpenNode2 plugin and how services that access the plugin's functionality are configured by a node administrator.



A plugin contains one or more **implementers**. Implementers are canned functionality that are specific to the data exchange. An implementer performs some task, such as composing XML from a series of staging tables.

A node administrator exposes the functionality in an implementer by creating **services**. When a service is created, an implementer must be chosen. Each service may have one or more configuration arguments, defined by the implementer. For example, the service may require that a database connection or node partner URL be provided. Services can be made available to external partners in the form of a query or solicit or as an inbound submission processor. "Task" services are internal only and are accessed via a **schedule**. Schedules also can have configuration arguments which are used by the plugin implementer assigned to the schedule.

BEACHES Plugin Implementers

This section describes the different implementers available in the BEACHES plugin, the arguments they require, and how they operate.

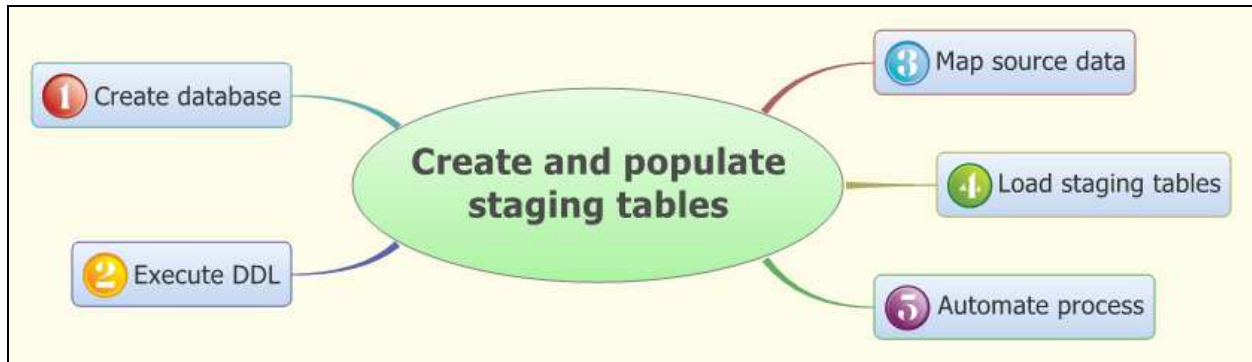
BeachNotificationDocumentGenerator Implementer

Implementer Name:	BeachNotificationDocumentGenerator
Description/Usage:	Generates an XML file conforming to the Beach Notification v2.1 schema using the data in the staging database. Only Beach Activities where SENTTOEPA="N" will be present in the generated file.
Service Parameters:	Source Data Provider: Select the data source for the connection to the staging database where the Beaches staging tables reside. Data sources are configured on the Configuration tab of Node Admin.
Schedule Parameters:	None.

Create and Populate the BEACHES Staging Tables

OpenNode2 uses a plugin-based architecture to support data exchanges with EPA and other Exchange Network partners. Data must first be loaded into a set of staging tables before it can be extracted by the plugin and shared through the BEACHES data exchange. This section outlines the steps required to set up the BEACHES data exchange database staging tables.

The following figure illustrates these steps:



1. The first step is to create the staging database itself if one has not already been established to support another data exchange (typically named NODE_FLOW).
2. Once the staging database is created, a Database Definition Language (DDL) script included in the BEACHES plugin package can be executed to create the staging tables themselves that will be used to store the data being made available through the BEACHES data exchange.
3. With the staging environment established, data must now be mapped from the source database to the equivalent fields in the BEACHES staging tables. The staging tables closely reflect the structure and naming of the BEACHES XML schema, and it is recommended that the Data Exchange Template (DET) published at exchangenetwork.net be used to facilitate this mapping.

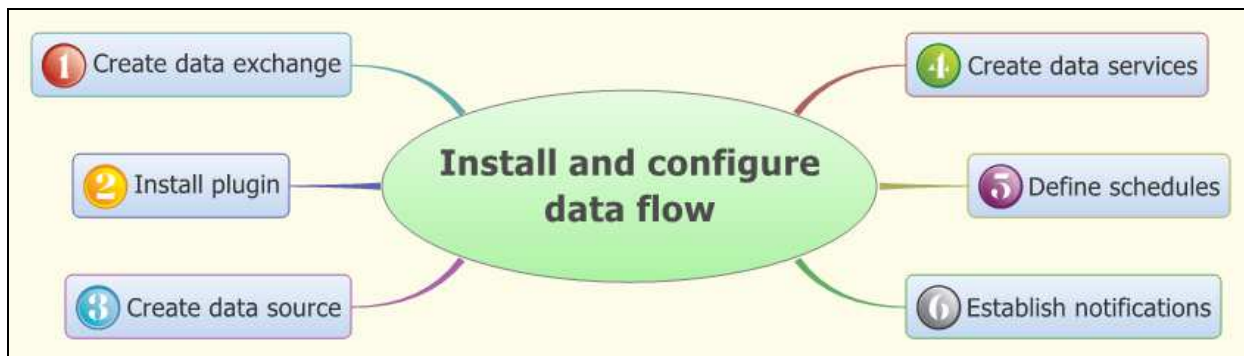
Note: Submission status for each beach activity (advisory) is stored in the SENTTOEPA field in the NOTIF_BEACHACTIVITY table. The ETL routine that populates the staging database should set this field to 'N' by default. The plugin will only retrieve advisories where SENTTOEPA = 'N'. Once the plugin process completes, the field is updated automatically to 'Y'.

4. Once the mapping is complete, a database routine should be developed to populate the tables in the staging database using the mapping prepared during the previous step. This should be a repeatable process that will empty and replace all of the data in the staging tables, or a procedure that will incrementally add, update and remove data as it changes in the source system.
5. Once the data extract process has been developed, it should be automated to execute on a regular schedule as appropriate to the needs of the organization for submissions to EPA.

Install and Configure the BEACHES Data Exchange

This section describes the steps required to install and configure the NEI data exchange on the Java implementation of the OpenNode2 using the Node Administration Web application (Node Admin).

The following figure illustrates these steps:



Create the BEACHES Data Exchange

The first step is to create the BEACHES data exchange using the Node Admin Web application.

1. After logging into the Node Admin, click the **Exchange** tab on the top navigation bar.
2. Click the **Add Exchange** button. The Manage Data Exchange screen will be displayed as follows:

Data Exchange Manager
Manage Data Exchange

This page allows you to configure or add new data flows. You must define a data flow before you will be able to create a data service for that flow.

Name: BEACHES

Contact: bill@windsorsolutions.com

Web Info: http://www.exchangenetwork.net/exchanges/water/beach_notif.i

Protected: ☒ Setting default flow security will require a specific policy for all flow related requests (Query, Solicit, Download etc.)

Cancel **Save**

3. Type “BEACHES” in the **Name** field.
4. Select a user account name from the **Contact** drop down box. Contacts are populated with all accounts that have been set up on the OpenNode2. See the **Security** tab for a list of available accounts.

5. In the **Web Info** field, enter a URL where more information can be found about the BEACHES exchange. It is recommended that the following URL be used for this purpose
http://www.exchangenetwork.net/exchanges/water/beach_notif.htm.
6. It is recommended that the **Protected** box be checked. This will limit external access to the BEACHES data services. External access should not be required at this time given the current purpose of this flow is solely as a means of data submission to EPA.
7. Click the **Save** pushbutton to save the data exchange to the OpenNode2 metadata database.

Install the BEACHES Plugin

Once the data exchange has been created, the next step is to upload the BEACHES plugin into the OpenNode2 plugin repository.

1. Click the **Exchange** tab on the top navigation bar.
2. Click the **Upload Plugin** section on the left navigation bar. The Upload Plugin screen will be displayed as follows:

3. Click the **Browse** button which is located to the right of the **Plugin** field.
4. Locate and select the compressed (zipped) file containing the code component for the BEACHES plugin.
5. Select the data exchange name “BEACHES” created during the previous step from the **Exchange** dropdown box.
6. Click the **Upload Plugin** button to upload the plugin.

The newly uploaded plugin code will be placed in the OpenNode2 plugin repository. Any previous plugin versions will be retained in the repository but won’t be accessible through the Node Admin. Only the latest version of any one plugin is made available during the next step to establish data services.

Create the BEACHES Data Service

Data services are distinct functions provided by a plugin to support a given data exchange. In the case of the BEACHES flow, a single data service is offered that creates the XML submission file from the data in the staging database and returns it to OpenNode2 for further action (typically submission to EPA)

1. From the **Exchange** tab, scroll down the list of installed data exchanges until the BEACHES exchange is located.
2. Click the **Add Service** button located just beneath the BEACHES data exchange record. The following page will be displayed to allow a new data service to be added.

The screenshot shows the 'Data Exchange Manager' interface. On the left, there is a sidebar with two options: 'Manage Exchanges' (selected) and 'Upload Plugin'. The main area is titled 'Data Exchange Manager' and 'Manage Exchange Service'. Below the title, a descriptive text states: 'This screen allows you to configure or add new services for a selected flow. For examples, the service "GetFacilityByChangeDate" will return all facilities for a given state code and change date.' The configuration form includes the following fields: 'Exchange' (set to 'BEACHES'), 'Service Name' (text input with 'SubmitBEACHESData'), 'Implementer' (dropdown menu with 'com.windsor.node.plugin.beachnotif21.BeachNotificationDocumentGer'), 'Type' (dropdown menu with 'Task'), 'Active' (checkbox checked, with a note: 'Making service inactive will prevent it from being accessible using the Web Service interface.'), and 'Data Sources' (Key: 'Source Data Provider' and a dropdown menu with 'NODE_FLOW_IN_NYDOH'). At the bottom right, there are three buttons: 'Cancel', 'Save', and 'Delete'.

3. In the **Service Name** field, type “BEACHESGetSubmission”.

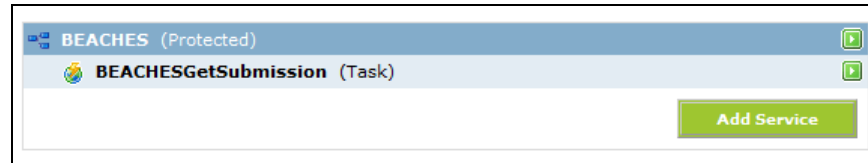
Note: An alternate name can be given if desired. There is no dependency on the Service Name and the plugin functionality.

4. From the **Implementer** drop down box, select the only available value.
5. Java Node Only: Click the **Next** button.

Note: Several additional arguments will appear. The Node Admin application will obtain these properties directly from the BEACHES plugin.

6. From the **Type** drop down box, select “Task”. Tasks are only available to the OpenNode2 scheduler and are never made available to external partners.
7. Enable the service by checking the **Active** checkbox.
8. Set the **DataSource** to the data source that connects to the BEACHES staging tables.
9. Click the **Save** button to save the service.

The **Manage Exchanges** page for the BEACHES data exchange should appear as follows:



Define Data Exchange Schedule

Scheduled jobs can be configured in the OpenNode2 to perform automated tasks such as submitting data to external partners or processing received files. The BEACHES data exchange requires that a single schedule be established using the OpenNode2 Node Admin to trigger the plugin to generate the XML file and then send it to EPA's CDX Node for processing.

Create BEACHESGetSubmission Schedule

1. From the **Schedules** tab, click the **Add Schedule** button.
2. Type "BEACHESGetSubmission" in the **Name** field.
3. Enable the schedule by clicking the **Active** checkbox.
4. Select "BEACHES" from the **Exchange** dropdown list.
5. Set the start date to the first date when you wish the schedule to run.
6. Set the end date to some point after the start date.
7. Set the frequency to the data submission at the desired interval, typically once every 12 months.
8. In the **Data Source** area, check the radio button labeled **Results of local service execution**.
9. In the **Service** dropdown box, select the value "BEACHESGetSubmission". This informs the schedule to use the selected BEACHES service as the data source for the submission.
10. The **Arguments** area can be left blank since there are no parameters for the BEACHES service.
11. In the **Result Process** area, check the radio button labeled **Submit result to an Exchange Network partner**.
12. Select the **CDX Test v1.1** or **CDX Prod v1.1** Endpoint from the target node drop down box, depending on the desired setting

*Note: For testing purposes, you may set the Result Process to **Send compressed result as an Email Attachment** and specify your own email address as the recipient. This will enable you to manually check the file before submitting. If this is done, it will be necessary to manually reset the SENDTOEPA flags in the staging database so that data is retrieved for subsequent schedule executions.*

13. Click the **Save** button to save the schedule.

The BEACHES schedule is now set up correctly to manage the data flow. Please see the OpenNode2 Administration User Guide for more information on scheduling data exchanges.

Contact CDX to Establish Exchange Settings

Contact the EPA CDX Node helpdesk and ask them to perform the following tasks:

1. Authorize the OpenNode2 runtime (operator) NAAS account to submit to the BEACHES data exchange on the EPA systems.
2. Map the OpenNode2 runtime NAAS account to the CDX Web user account that currently administers EPA BEACHES data for the organization. This is required to ensure that the EPA-generated emails are sent to the appropriate person in your organization.

Establish Email Notifications

If desired, the Node administrator may create NAAS accounts for one or more staff members and create notifications for the any OpenNode2 events related to the BEACHES data exchange. Please see the OpenNode2 Administration User Guide for more information on setting up notifications.