OpenNode2

AQS 2.2 Data Exchange Implementation Guide for DrDAS

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Revision History

Date	Author	Changes	Version
4/21/2009	Windsor	Initial version	1.0
5/29/2009	Windsor	Revised to reflect standardization of plugin arguments.	1.1
9/21/2011	Windsor	Updated parameters list.	1.2
5/8/2012	Windsor	Revised to correct applicability and correct minor typographical errors.	1.3
10/9/2013	Windsor	Revised cover page	1.4

Table of Contents

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Data Exchange Overview

The purpose of this document is to provide detailed instructions for the installation and configuration of the Air Quality System (AQS) data exchange on the Java implementation of the Exchange Network OpenNode2 (OpenNode2) using the DrDAS commercial software product.

The AQS data exchange involves a periodic submittal to EPA for the purposes of updating the EPA AQS database that manages ambient air quality monitoring data. The frequency and content of the each submission can be configured to meet specific needs, although submissions are typically made on a quarterly basis.

The AQS data exchange provided with OpenNode2 supports data submissions to AQS and AirNow, as well as general data publishing services, using the commercial software product, ENVIEW 2000 provided by Envitech, Ltd as a data source. This system retrieves and consolidates ambient air quality information from remote monitoring devices and provides data management and reporting capabilities.

In addition to implementing the AQS data exchange plugin on the OpenNode2, in order to support the AQS and AirNow data flows to EPA, the State or Tribe must also implement an additional component called Reporter, provided by DrDAS, a third-party, value-added reseller of the Envitech software. This component provides support for the creation of various types of report from the data contained in the ENVIEW 2000 database.

The AQS data service plugin on the OpenNode2 is scheduled to invoke the Web service methods provided by the Reporter software to retrieve the required information from the ENVIEW 2000 database, and then provide this information to the EPA CDX Node.

The AQS data exchange processing workflow can be summarized as follows:

1. Data for a given reporting period will be prepared in the ENVIEW 2000 database and validated by the State or Tribe air program.

2. Once the data is considered valid by the air program, the program user will request that the Node Administrator execute a scheduled process on the OpenNode2 to initiate the data transfer to EPA CDX over the Exchange Network.

3. The relevant site, monitor, and raw measurement data will be extracted from the ENVIEW 2000 database by the Reporter Web service and packaged as an XML document.

4. The OpenNode2 will then transfer the generated XML document to the EPA CDX Network Node, which in turn will transfer the file to the AQS server.

5. The State or Tribe air program user will then log onto the EPA AQS Web application to complete the remaining steps of loading the data into the AQS database.

The purpose of this document is to describe the steps required to configure the AQS data flow components on the OpenNode2.

Note on Data Exchange Version

The latest version of the Java AQS plugin for DrDAS supports versions 2.0 to 2.2 of the AQS data exchange. This Implementation Guide describes the configuration of this plugin.

Version 2.2a of the AQS data exchange is now available which modifies the data flow configuration but preserves the current version 2.2 of the AQS XML schema. There is currently no support for version 2.2a for the Java OpenNode2.
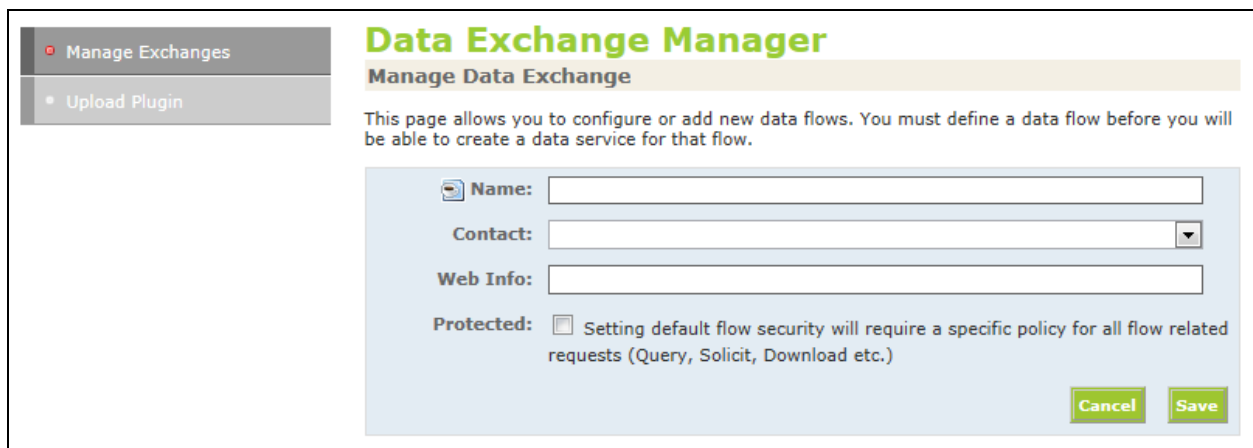
Install and Configure AQS Data Flow

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

Create AQS Data Exchange

The first step to implement the AQS data exchange on the OpenNode2 is to create the data exchange using the Node Admin Data Exchange Manager.

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:

3. Type *AQS* 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. Type any valid URL in the **Web Info** field. Ideally, this will be the page on the Exchange Network Web site that describes the AQS data exchange:

   http://www.exchangenetwork.net/data-exchange/air-quality-system/

6. It is recommended that the **Protected** checkbox remain unchecked. This will enable all authenticated OpenNode2 users to access the AQS data services without needing special data exchange specific security permissions.

7. Click **Save** to save the data exchange.

Install AQS Plugin

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

1. From the **Exchange** tab, click the **Upload Plugin** button on the left navigation block.

2. Click the **Browse** button which is located to the right of the **Plugin** field.

3. Locate and select the compressed (zipped) file containing the code component for the AQS plugin you obtained with the OpenNode2 or developed separately.

4. Select *AQS* from the **Exchange** drop-down menu. If *AQS* is not available, ensure that the previous step was completed (*Create AQS Data Exchange*).

5. Click the **Upload Plugin** button to install the AQS 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 AQS Data Services

Data services are distinct functions provided by a plugin to support a given data exchange. For the AQS data exchange, there are two specific data services provided by the plugin:

– AQDERawData

– AQDEMonitorData

Each of these data services must be created and configured before they can be accessed through the OpenNode2.

1. From the **Exchange** tab, locate the AQS data exchange in the list of available exchanges.

2. Click the **Add Service** button located just beneath the AQS data exchange entry. The following page will be displayed to allow a new data service to be added.

3. In the **Name** field, enter *AQDERawData* or *AQDEMonitorData*.

4. Select the implementer literal from the **Implementer** drop-down menu. This implementer provides the functionality for both of the AQS data services.

   Note: When the implementer is selected, several arguments will appear. The Node Admin will obtain these properties directly from the loaded AQS plugin.

5. From the **Type** drop-down menu, select how you wish to make the services available. The options available will also be obtained by the Node Admin from the plugin itself. It is recommended that the AQS data services allow *Query or Solicit*.

6. Enable the service by checking the **Active** checkbox.

7. For the argument labeled **Reporter URL**, type *http://0.0.0.0/Reporter/AQDEData.asmx* where the four component IP address should correspond to the location of the Dr-DAS Web service on the State or Tribe local network.

   Alternatively if a global variable has been set up to provide this value, check the **Use global value** checkbox and select the appropriate variable name from the drop down box that appears in place of the textbox.

8. For the argument labeled **Schema Version**, type *2.2* to indicate that the Dr-DAS Reporter service should return the XML document using the 2.2 version of the AQS XML schema. A global argument may be used as above.

9. Click the **Save** button to save the service.

Repeat these steps for the AQDEMonitorData data service.

Define Data Exchange Schedules

Scheduled jobs can be configured in the OpenNode2 to perform automated tasks, for example, submitting data to external Exchange Network partners or processing received files.

The AQS data exchange requires a single schedule to be initiated by the Node Administrator on request from the air program when a data submission is ready for a given time period. Typically submissions will be quarterly.

Create AQDERawData Schedule

1. From the **Schedules** tab, click the **Add Schedule** button.

2. Type "AQDERawData" in the **Name** field.

3. Enable the schedule by clicking the **Active** checkbox.

4. Select "AQS" from the **Exchange** dropdown list.

5. Set the start date to the date on which you wish the schedule to run, typically today's date.

6. Set the end date to the same date.

7. Set the frequency to "Once". This schedule will be run on request from the air program one time only for each date period.

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 "AQDERawData". This informs the schedule to use the selected AQS service as the data source for the submission.

10. The **Arguments** area will automatically be populated with the 24 available input parameters for the selected AQDERawData service.

11. Set these required runtime parameter values as follows (blank indicates no value required):

Parameter	Required	Business Rules	Value
1. FileGenerationPurposeCode	Required	Reason for request. Must be either "AQS", "AIRNOW", or "OTHER". This will be used to determine which pollutants and sites should be included in the data set.	"AQS"
2. BeginDate	Required	Used to indicate the starting date for which data collection activities should be retrieved. This will be in the YYYYMMDD format.	Period start date
3. BeginTime	Optional	Used to indicate the starting time (for the supplied Start Date) for which data collection activities should be retrieved. This will be in the HH:MM format. Defaults to midnight (time 00:00, the beginning of the day) if left blank.	"00:00"
4. EndDate	Required	Used to indicate the ending date for which data collection activities should be retrieved. This will be in the YYYYMMDD format.	Period end date
5. EndTime	Optional	Used to indicate the ending time (for the supplied End Date) for which data collection activities should be retrieved. This will be in the HH:MM format. Defaults to the end of the day (time 23:59) if left blank.	"23:59"

Parameter	Required	Business Rules	Value
6. TimeType	Optional	Specifies that both query and return times will be either in "Local" (to the monitor) or "GMT" time. Defaults to Local if null. (This is not included in the AQDE flow)	
7. SampleDuration	Optional	Must be either "HOURLY" or "MINUTE". DEC will provide only 60 minute readings so will always be set to HOURLY.	
8. SubstanceName (pollutants or meteorological data)	Optional	Comma separated listing of substances (including air quality or meteorological). If left blank, then requesting all parameters. This data exchange will use parameter codes that have already been defined by AQS.	
9. MonitorType	Optional	This parameter designates the monitoring network from which to retrieve data. Examples are SLAMS and NAMS. (Null returns data from all networks).	
10. DataValidityCode	Optional	Indicator used to filter out only data that is considered Valid based on the data provider's assessment of the air quality data. If left blank, return assumes "A". Possible values include: - V: returns only valid data - A: Returns all data	"V"
11. DataApprovalIndicator	Optional	Indicates (Y/N) whether the state has approved this raw data result for regulatory purposes or data analysis, usually as a result of additional quality control review procedures. If left blank, assumes "N". - Y: Only return data that has been approved by the state to be used for regulatory review - N: Includes both data that has been approved and not approved.	"Y"
12. StateName	Optional	State code defined by AQS. If SiteIdentifer is provided, State is required (SiteIdentifer is only unique within a county, and CountyCode is only unique within a state).	
13. CountyName	Optional	County code defined by AQS. If SiteIdentifer is provided, CountyCode is required (SiteIdentifer is only unique within a county).	
14. CityName	Optional	City name. If included, the array must also include the state.	
15. TribeName	Optional	Tribe name.	
16. FacilitySiteIdentifier	Optional	Comma separated listing of desired Site identifiers, as defined by AQS. If blank, return all for the state.	
17. MinLatitudeMeasure	Optional	Minimum latitude measure, in decimal degrees, from which to return raw data. If blank, return all for the state	
18. MaxLatitideMeasure	Optional	Maximum latitude measure, in decimal degrees, from which to return raw data. If blank, return all for the state	
19. MinLongitudeMeasure	Optional	Minimum longitude measure (i.e. Western border), in decimal degrees, from which to return raw data. If blank, return all for the state The standard will be to include negative values.	

Parameter	Required	Business Rules	Value
20. MaxLongitudeMeasure	Optional	Maximum longitude measure (i.e. Eastern border), in decimal degrees, from which to return raw data. If blank, return all for the state The standard will be to include negative values.	
21. LastUpdatedDate	Optional	Returns all data that has been updated since the supplied date. If blank, return all data over the date range supplied above.	
22. IncludeMonitorDetails	Optional	If set to "Y", the state will be requested to retrieve additional metadata about the site and monitor. If set to "N", state should only supply site and monitor ID information. If blank, assume "Y"	"N"
23. IncludeEventData	Optional	Valid values "TRUE" and "FALSE". If TRUE, then the output file will include measurements effected by an "exceptional event" such as a volcano or forest fire. Defaults to FALSE.	"FALSE"
24. SchemaVersion	Required	The version of the schema to be used to organize the returned data.	"2.2"

12. In the **Result Process** area, check the radio button labeled **Submit Result to an Exchange Network Partner.**

13. From the **To:** dropdown list select the partner configuration value for the EPA production CDX Node.

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

Please see the OpenNode2 Administration User Guide for more information on scheduling data exchanges.

Contact CDX to Establish Data Exchange Settings

Once the AQS data exchange is installed and configured, 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 AQS data exchange on the EPA systems.

2. Map the OpenNode2 runtime NAAS account to the CDX Web user account that currently administers EPA AQS data for the organization.

Establish Email Notifications

If desired, using the Node Admin, a Node administrator may create NAAS accounts for one or more users and set up email notifications for the any OpenNode2 events related to the AQS data exchange. Please see the OpenNode2 Administration User Guide for more information on creating data exchange email notifications.

Monitor Flow Activity

The OpenNode2 will track all AQS data exchange activity and can be accessed to monitor and debug related flow activities. Please see the OpenNode2 Administration User Guide for more information on accessing and searching the available OpenNode2 activity reports.