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Air Quality System (AQS) Flow Implementation Guide

The Air Quality System (AQS) flow allows state, local, and tribal partners to submit air quality monitoring data to EPA's Air Quality System national database. This data volume is large, with thousands of files submitted by partners intermittently (at least quarterly).

BENEFITS

Automated data flows save time and money

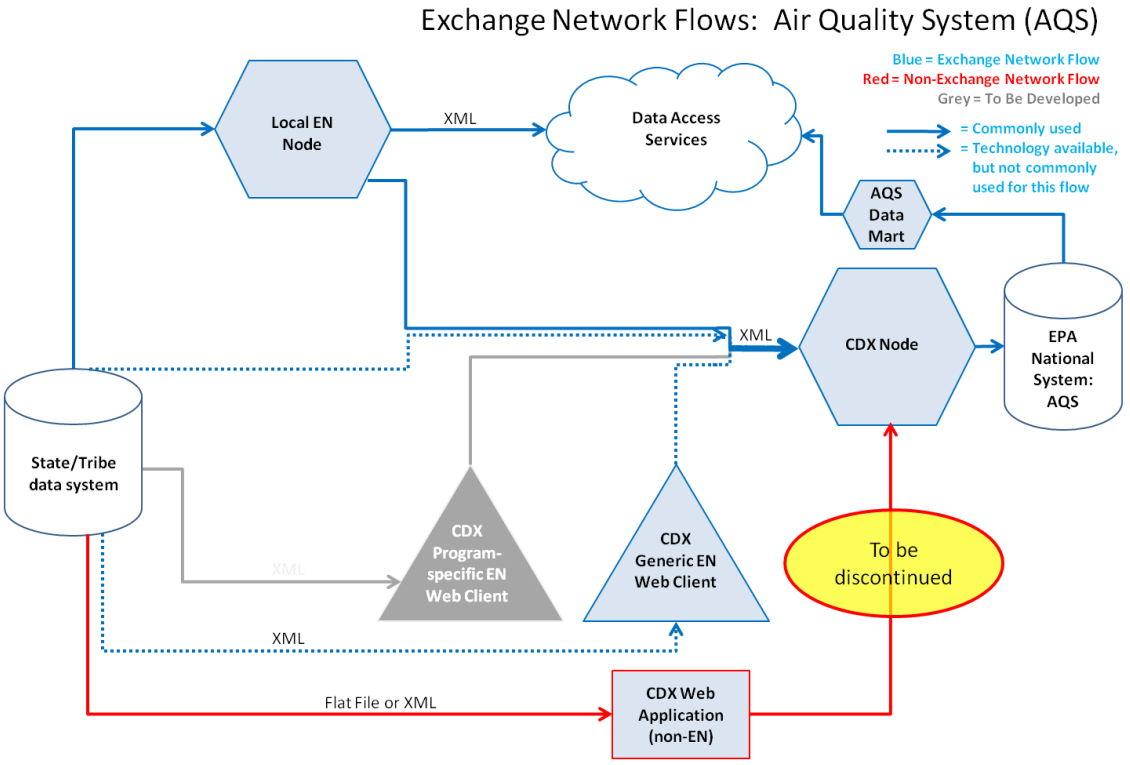
Electronic data in a common format allows integration of air quality data with other media and other jurisdictions—especially when planned data access services are developed

Practical Implementation Advice

- All partners will eventually need to flow data in XML format. Partners currently flowing data via flat files through the CDX Web application would benefit from converting to XML submission in the near term.
- Partners with sufficiently robust systems can automate AQS submissions through their nodes, although they may want to wait until EPA makes the flow fully automated through a planned upgrade to eliminate a manual step for loading data into the National System.
- Partners not planning to use their nodes to submit AQS data would benefit from using a planned program-specific EN Web Client when it is available.

AQS Data Flow Options

The graphic below shows the current options for flowing data. Exchange Network (EN) flow options are shown in blue and non-EN options are shown in red. (Terms are explained in Attachment 1).



EXCHANGE NETWORK (EN) OPTIONS:

- Submit an XML file using a local EN Node
- Submit an XML file through a local Generic EN Client or the CDX Generic EN Client (technically feasible but not commonly used)

NON-EXCHANGE NETWORK OPTIONS:

- Submit a flat file (or XML) to the National System using the non-EN CDX Web Application.

More information on this and other Exchange Network flows is available in the "data exchanges" section of the Exchange Network website: http://exchangenetwork.net/.

Summary of Current Practice

Currently, most partners submit AQS data via the non-EN CDX Web Application in flat file or XML format. Currently, the node flow is not fully automated: once partners have uploaded data into AQS via their node, they must then log in to manually approve the submission to the National System. This manual step reduces the automation benefits of using a node. Also, many reporters prefer "manual" submissions because quality assurance of air monitoring data is not automated on the supplier end.

AQS data is published by EPA through the AQS Data Mart . These services use Exchange Network protocols. Air monitoring data is also published via the Data Mart to the AIRNow air quality index (not displayed in the AQS graphic). States can also submit raw monitoring data to AIRNow in XML.

AQS Flow Status and Milestones

EPA recognizes a number of actions are needed to make the EN more automated, accessible, and value-added for flowing AQS data, including:

- Automating the step for loading data into the National System,
- Improving automated messaging,
- Developing a program-specific EN Web Client for partners that don't need a fully functional node, such as some tribes and local air agencies, and
- Establishing a national standard for data publishing.

EPA must take these actions before EPA stops supporting non-EN submissions through the commonly used non-EN CDX Web Application.

The table below shows institutional responsibilities and target completion dates for each activity. (EPA general criteria for assessing the "readiness" of National System Flows is included as Attachment 2).

Criteria	Status	Actions	Primary Responsibility	Completion Period
Automation Ready	Attention Required	1. Develop software to support automation	AQS staff with CDX support	Q2 2011
Solutions for all partners	Attention Required	2. Design, develop, and deploy refined CDX EN web client	CDX staff	Q4 2010
	Attention Required	3. Provide training and outreach to transition users away from legacy CDX web application to CDX EN web client	AQS with EN staff support	Q2 2011
Access to transaction status	Attention Required	4. Develop transaction messaging	Joint CDX and AQS	Q4 2011
Accessible and stable flow documentation	Done			
Specifications for Data Access Services	Attention Required	5. Create flow documentation for AQS publishing	AQS staff with EN support	Q1 2011
Clear path to eliminate alternatives	Attention Required	6. Eliminate CDX web application	EN/CDX staff	Q4 2011

Attachment 1: Terms

Node: A partner's point of presence on the EN consisting of a server (hardware and software) enabled with web services that allow partners to automatically provide and receive information via the Network and to publish data for use by other EN partners.

EN Client: A stand-alone application (i.e., software code) that lets partners submit data, request data, and receive results from an EN request. Clients differ from nodes in that they cannot respond to queries from other nodes and so cannot publish data. Clients also need more manual (vs. automated) steps, for example, to extract data and generate and review reports before submission.

CDX: EPA's Central Data Exchange. It serves as EPA's centralized electronic report receiving system. It receives data from partners and directs the data to EPA's program-specific National Systems (e.g., AQS, WQX, etc.).

CDX Node: CDX Node is EPA's node on the EN, allowing EPA to receive, send, and provide information via the Network. CDX Node can also publish EPA data for use by other EN partners.

CDX EN Web Clients:

- **Generic**: A client at CDX which receives XML-based data via standard web browsers for many different flows using Exchange Network protocols.
- **Program-Specific**: A client customized for a single National System with an intuitive user interface specific to the business process. Implemented at CDX, the client receives program-specific data in XML format via standard web browsers using Exchange Network protocols (e.g., for authorization and authentication, etc.)

CDX Web (non-EN) Application: A legacy CDX application that receives data (flat file or XML format) via standard web browsers. CDX Web applications are not consistent with EN protocols (e.g., they have a separate authentication and authorization service from the EN) and typically involve more manual steps than a node-to-node exchange of data.

Data Access Services: Using web services to make data available to Network users by querying nodes and returning environmental data in the form of XML documents. Published data can be accessed using a node or clients. Published data can be used in a number of ways, such as populating Web pages, synchronizing data between sites, viewing data in a Web service client, or building new sources of data into an integrated application.

Direct User: A partner entering data directly into a National Data System through a system-specific interface (manual entry).

EPA National Data System: Program-specific data systems at EPA that can receive and publish data via CDX.

Local Data System: A partner's database or series of databases in which environmental data is stored, managed, and manipulated.

XML: e**X**tensible **M**arkup **L**anguage is a flexible language for creating common information formats and sharing both the format and content of data over the Internet and elsewhere. The electronic language that expresses and transports data standards and transaction sets. XML uses an extensible set of tags to describe the meaning of data.

Attachment 2: National System Flow "Ready to Use" Criteria

A focus of Exchange Network (EN) governance has been developing the National System Flows to help partners take advantage of the Network's business value. Governance has identified six criteria for each flow to meet to make these flows "ready to use" by partners:

- Automation-ready flows. Support fully automated node-to-node flows.
- Access to transaction status. Support a fully automated process for reporting transaction status, processing results, and QA results from receipt by CDX through final processing in the National System.
- Accessible and stable flow documentation. Develop and make accessible stable documentation that describes all flow requirements. This includes a complete Flow Configuration Document (FCD) that is in compliance with EN procedures for version management.
- Solutions for all partners. Provide appropriately scaled EN solutions for partners of all sizes, needs, and capabilities. Some partners such as tribes and local clean air authorities may not need a fully functional node. A customized EN client or EN web client should be available to these users.
- Publishing interface. Provide a national standard set of query/solicit services defined in the FCD whether or not data are currently published. Implement a publishing interface where published data are critical to partner business processes (such as NPDES permit information for NetDMR).
- Clear path to eliminate alternatives. Have a clear path to eliminate legacy system alternatives to EN exchanges, including transition support for partners.