

Web Services

What are Web services?

Web services are information sources and application components whose functionality and interfaces are exposed to consumers using emerging Web technology standards including XML, SOAP, WSDL, and HTTP. In contrast to Web sites, Web services are offered computer-to-computer, via defined formats and protocols and are capable of processing large amounts of data across the Internet. Examples of commonly used Web services include those that process on-line credit-card sales, deliver stock quotes, or analyze a customer's needs based on customer-supplied information.

Web services provide programmatic services across the Internet. They make it easier to work both across and within organizations. Web services are based on a universal programming model that facilitates the sharing of functionality and information via the Internet, regardless of operating system, hardware or delivery device, programming language, database or other back-end system. The state environmental agencies and other stakeholders that submit data to the Central Data Exchange (CDX), EPA's Web service node, use a diverse assortment of database systems (Oracle, DB2, SQL Server, Sybase), operating systems (MVS, Unix, Windows, Linux), and programming languages (C/C++, Java, and others). Web services provide a standardized technology that greatly simplifies the exchange and integration of environmental data.

Which Web services are available to CDX participants?

Through a joint EPA-states partnership, CDX has developed Web services specifications and protocols for use on the State/EPA Environmental Information Exchange Network (Exchange Network). These functional specifications outline how to build node-to-node web services/data exchanges with states and other partners. A list of the Web services available to CDX participants are listed below.

Network Security Services:

Authenticate - Provides the capability for the node or user to authenticate with the Network Authentication and Authorization Server (NAAS) and use the obtained Security Token to access services on the Network including data exchanges.

Authorization - determines if the service requestor is entitled to perform the operation, which can range from invoking the Web service to executing a certain part of its functionality (executing a stored procedure, for instance, using the Query method).

Database Services

Query - Provides the capability to perform a database query and return the result in XML format to the requestor. Queries are associated with specific schema/data flows supported by the Network.

Solicit - Provides the capability to perform an asynchronous database query and return the result in XML format to the requestor.

Document Exchange Services

Submit - Provides the capability to send one or multiple payloads (Documents) to the service provider.

Download - Provides the capability to retrieve one or multiple payloads from the service provider.



Transaction Status Services

Get Status - Each data exchange service is associated with a unique transaction. This Web Service provides the capability of querying the current state of the transaction.

Notification Services

Notify - Enables the requestor to notify a node about:

- Document availability
- Status, such as current status of a submission or service request
- Events such as security alerts, shutdown notices, and other network management notes

Administration Services

Node Ping - Provides information about the accessibility of the node.

Get Services - Allows requesters to query services provided by a Network node

What are SOAP, WSDL, and UDDI?

SOAP, WSDL, and UDDI are the basic building blocks of Web services architecture.

Simple Object Access Protocol (SOAP) is the XML-based set of rules that govern the call-and-response communication between Web Services-enabled applications. SOAP ensures reliable delivery of Web services messages, and can be seen as the glue that holds Web services together.

Web Services Description Language (WSDL) is the language that describes the design of a Web service so a client can discover how to invoke and properly use it.

Universal Description, Discovery, and Integration (UDDI) is the directory standard for registering all of the available Web services currently in use. UDDI is like a Web services phone book, which allows a client to locate a particular Web service that has been published by a provider.

How can I find out more about Web services or the Exchange Network?

World Wide Web Consortium

<http://www.w3.org>

Environmental Information Exchange Network

<http://www.exchangenetwork.net>

EPA Central Data Exchange

<http://www.epa.gov/cdx>

EPA Data Standards

<http://www.epa.gov/edr>

EPA Network Grants Program

<http://www.epa.gov/neengprg/>