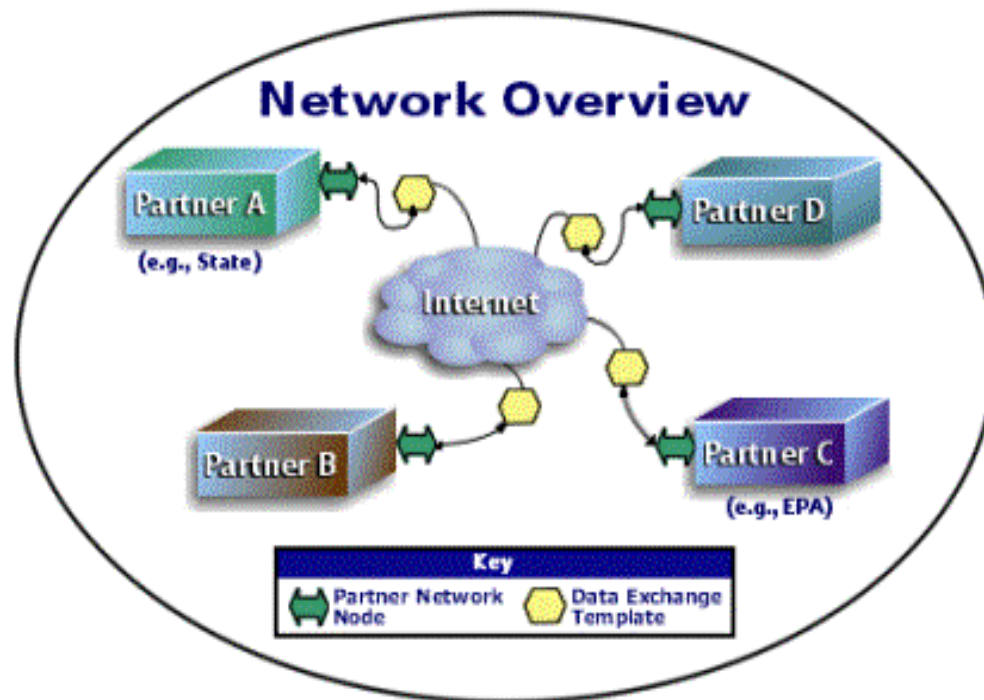


# CDX Network Node Overview

Node Mentoring Workshop  
February 9-10, 2004



# Agenda

- Overview
- Role of CDX Node & NAAS
- Node Architecture
- Platform & Toolkit
- Web Services (DNC)
- Application Services
- Data Flow Services
- Test Tool
- Recommendations

# Overview

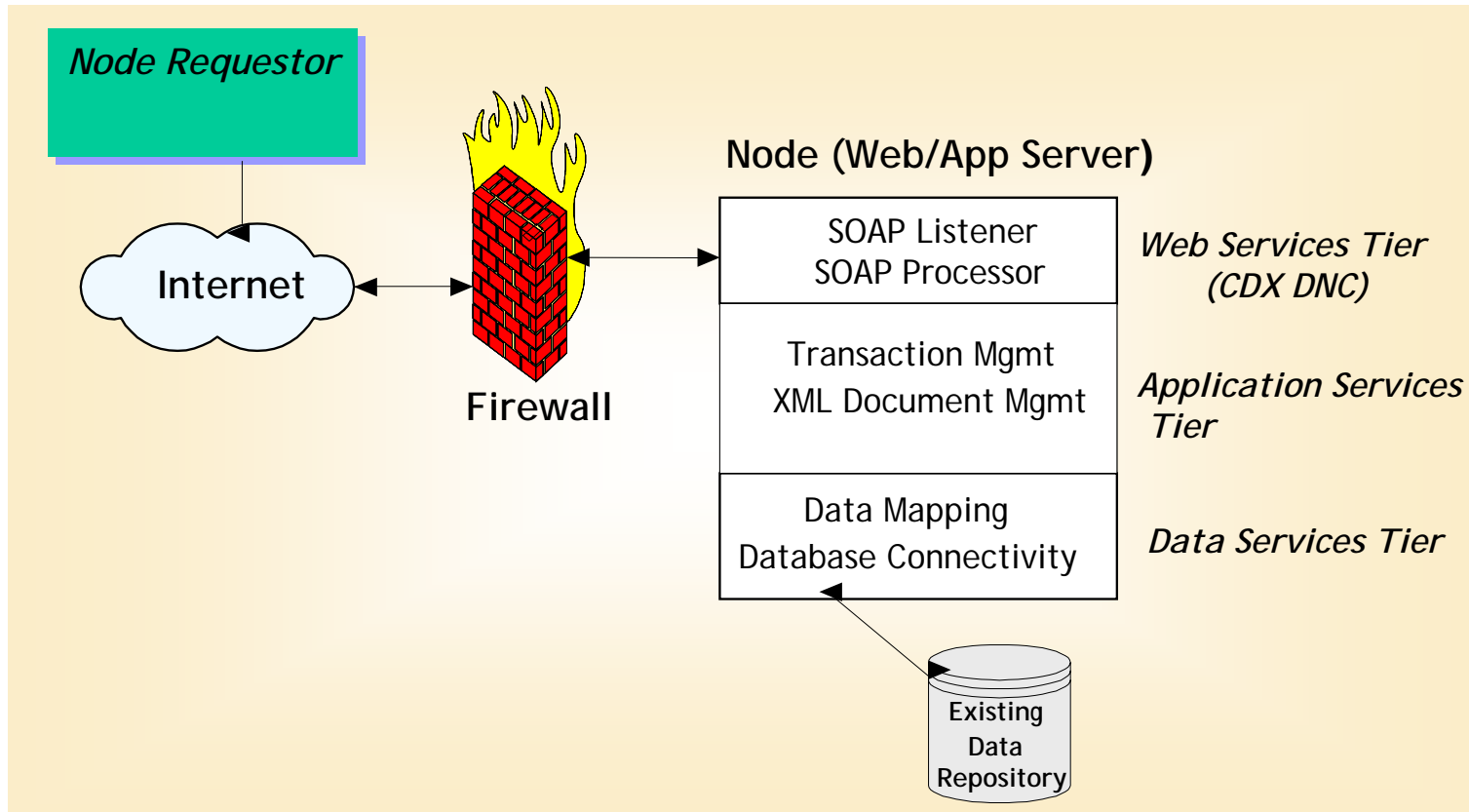
- Provides a technical description of the Central Data Exchange (CDX) Node:
  - Architecture
  - Demonstrated Node Configuration (DNC)
  - Network Authorization & Authentication Services (NAAS)
  - CDX services (Scheduling, Auditing, etc.)
  - Data flow interfaces
- Describes techniques, tools, tips, and strategies for development
- Captures lessons learned during implementation

# Role of CDX & NAAS

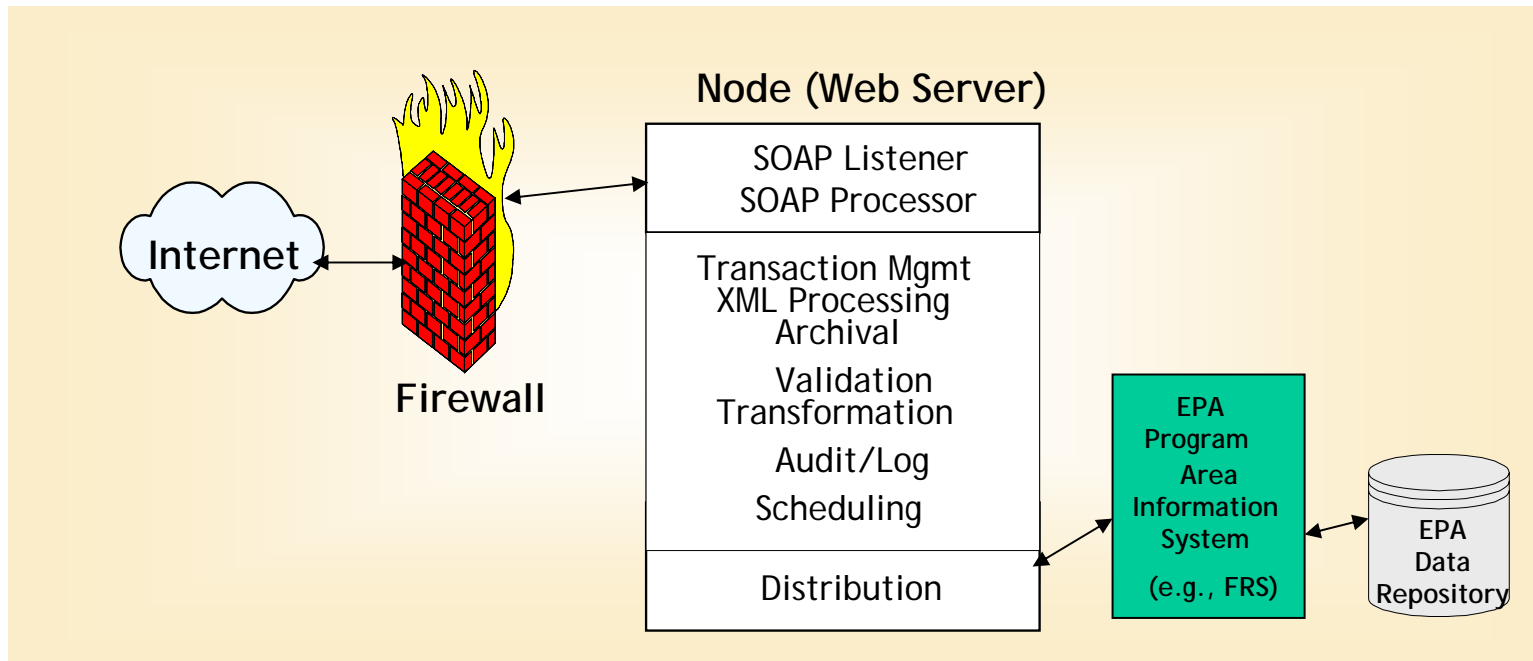
- CDX is the Node on the Exchange Network that acts as the Central Data Exchange for EPA
- CDX interacts with EPA program areas (FRS, etc)
- CDX validates all exchanges against NAAS
- NAAS is a distributed authorization and authentication mechanism
- NAAS includes user and policy management
- All network nodes should use the NAAS to validate exchanges



# Basic Node Architecture



# CDX Node Architecture



# CDX Platform and Toolkit

- CDX is hosted on BEA WebLogic application server
- WebLogic chosen for scalability and reliability
- CDX utilizes Apache Axis as the web services toolkit
- Apache Axis chosen for DIME support and general stability

# CDX Demonstrated Node Configuration

- DNC for other Platforms and Application Servers
  - Unix:
    - J2EE containers: WebLogic, Oracle 9iAS, Web Sphere, JBoss
    - Servlet containers: Tomcat, Jetty
  - Microsoft:
    - All of the above Java Servers, plus IIS
- There are multiple options for toolkits on each platform
  - J2EE container: Apache Axis 1.1, GLUE, etc.
  - IIS: .NET and Web Services Enhancement (WSE 1sp1)
- Must support DIME to be Production
- Our recommendation: Apache Axis or .NET



# Node Building Roadmap

- Choose Web Services platform and Web Services toolkit
- Use reference implementation (DNC) or generate from scratch
- Build Web Services tier
- Integration test against CDX test tool to verify interoperability according to the Network WSDL
- Implement the Application Services tier
- Integration test against CDX test tool, to verify compliance with Node Functional Specification
- Implement the Data Services tier
- Integration test with CDX test tool to validate service requests
- Test actual exchanges with destination Node
- Verify Production-Ready Checklist

# CDX Application Services

- Document Management (Archival)
- Logging and Auditing
- Scheduling of submissions
- Node management
- User & Policy Management

# CDX Application Services Document Management

- Document Management provides:
  - Storage and Retrieval
    - Store in non-corruptible place
    - Retrieve by transaction ID
  - Metadata Validation
    - Check document name and type
    - Dataflow type
    - Uniqueness within a transaction
  - XML Validation/Transformation
    - Well formed-ness
    - Conformity to a schema

# CDX Application Services Logging and Auditing

- Keep track of operations and errors
- Transaction based auditing
- Reports may include status of submissions for a week/month, based on need

**U.S. Environmental Protection Agency**  
**Transaction History Results**

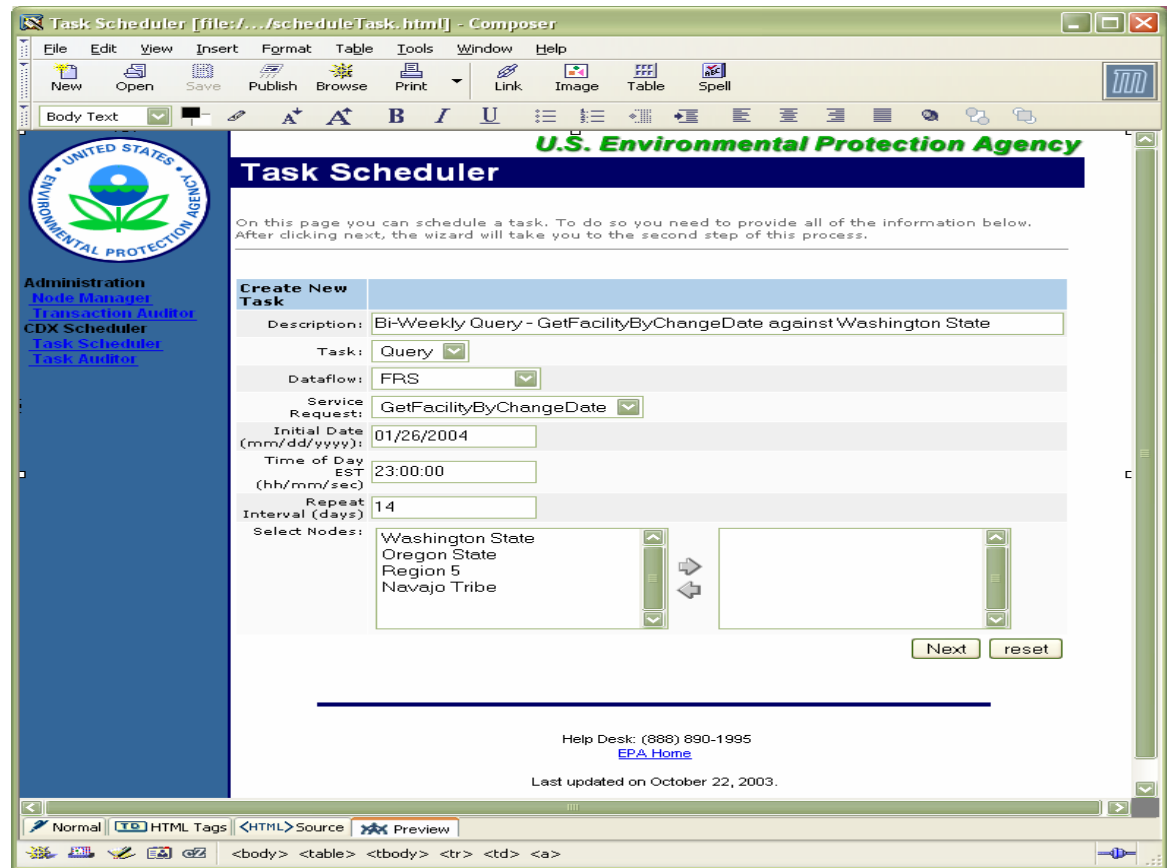
Records found: 6

User Id	Transaction ID	Time	Actor Name	Action	Status	Details
gtamkin@csc.com	<a href="#">1ac79ebf-3a25-4282-b26e-012cd8b6287</a>	2003/11/14 14:08:17	Exchange Network Interface	submit	INFO	<a href="#">Details</a>
epacdxnode@epa.gov	<a href="#">1ac79ebf-3a25-4282-b26e-012cd8b6287</a>	2003/11/14 14:08:18	Distribute Task	createTask	INFO	<a href="#">Details</a>
gtamkin@csc.com	<a href="#">1ac79ebf-3a25-4282-b26e-012cd8b6287</a>	2003/11/14 14:08:18	Exchange Network Interface	submit	SUCCESS	<a href="#">Details</a>
epacdxnode@epa.gov	<a href="#">1ac79ebf-3a25-4282-b26e-012cd8b6287</a>	2003/11/14 14:08:27	Distribute Task	executeTask	INFO	<a href="#">Details</a>
epacdxnode@epa.gov	<a href="#">1ac79ebf-3a25-4282-b26e-012cd8b6287</a>	2003/11/14 14:08:28	EDMR Distributor	getMethodName	INFO	<a href="#">Details</a>
epacdxnode@epa.gov	<a href="#">1ac79ebf-3a25-4282-b26e-012cd8b6287</a>	2003/11/14 14:08:28	Distribute Task	executeTask	SUCCESS	<a href="#">Details</a>

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 Last updated on October 22, 2003.

# CDX Application Services Scheduling of Exchanges

- Scheduling exchanges with partners



# CDX Application Services Node Management

- Configuration of Nodes to schedule exchanges against



# CDX Application Services User & Policy Management

- Administer users and associated policies in NAAS

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## User Policies

Administrator Id: epacdxnode@csc.com  
 User & Policy Management Version: TEST

3 items found, displaying all items.  
 1

User Id	Node	Method	Request	Params	Privilege	Add	Delete
gtamkin@csc.com	CDX	query	getfacilitybyname	bechius farm;ne	permit	+	🗑️
	CDX	submit	any	any	permit	+	🗑️
	CDX	getstatus	any	any	permit	+	🗑️

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Last updated January 13, 2004.

# CDX Data Services

- CDX Data Services tier consists of exchanges with EPA program areas (e.g., Data Flows)
- Performs queries, notification, solicitation, submission, and download depending on TPA
- Data flows in production:
  - Facility Registry System (FRS)
    - File interface via HTTP/S (Web Services later)
  - Electronic Discharge Monitoring Report (e-DMR)
    - File interface via drop-off to CDX Web IDEF application





# Web Services - Integration Testing

- Test tool (see snapshot next page)
  - Manual/Automated tests
  - It will check your compliance to the WSDL
  - Basic tests to determine interoperability
  - Runs over HTTPS (SSL) using 128-bit encryption (1024 key)
  - Uses DIME
  - Uses CDX requestor

# Test Tool

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## All Services Result

User Id: epacdxnode@csc.com  
 Node Address: https://test.epacdxnode.net/cdx/services/NetworkNodePortType\_V10

AllServices has been performed on the Node. The results are as follows:

Service	Description	Result	Request SOAP	Response SOAP
NodePing	Determination of Node availability	Pass	<a href="#">Download</a>	<a href="#">Download</a>
Authenticate	Authentication against Node	Pass	<a href="#">Download</a>	<a href="#">Download</a>
Submit	Submission of document to Node	Pass	<a href="#">Download</a>	<a href="#">Download</a>
GetStatus	Status of previous submission	Pass	<a href="#">Download</a>	<a href="#">Download</a>
Download	Download of previously submitted document	Pass	<a href="#">Download</a>	<a href="#">Download</a>
Query	Synchronous query against Node	Pass	<a href="#">Download</a>	<a href="#">Download</a>
Solicit	Asynchronous query against Node	Pass	<a href="#">Download</a>	<a href="#">Download</a>
Notify	Node notified that document is available	Pass	<a href="#">Download</a>	<a href="#">Download</a>
GetServices	Supported Services	Pass	<a href="#">Download</a>	<a href="#">Download</a>

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# Recommendations

- All Nodes must be developed *strictly* according to the Network WSDL
  - <https://epacdxnode.net/schema/v1.0/cdx.wsdl>
- Use existing DNCs:
  - [https://test.epacdxnode.net/CDX\\_NODE\\_DNC.zip](https://test.epacdxnode.net/CDX_NODE_DNC.zip) (Java)
  - [https://test.epacdxnode.net/CDX\\_DotNet\\_V10.zip](https://test.epacdxnode.net/CDX_DotNet_V10.zip) (.Net/C#)
  - [https://test.epacdxnode.net/CDX\\_VBDotNet\\_V10.zip](https://test.epacdxnode.net/CDX_VBDotNet_V10.zip) (.Net/VB)
  - [https://test.epacdxnode.net/CDX\\_DNC\\_9IAS\\_V10.zip](https://test.epacdxnode.net/CDX_DNC_9IAS_V10.zip) (Oracle)