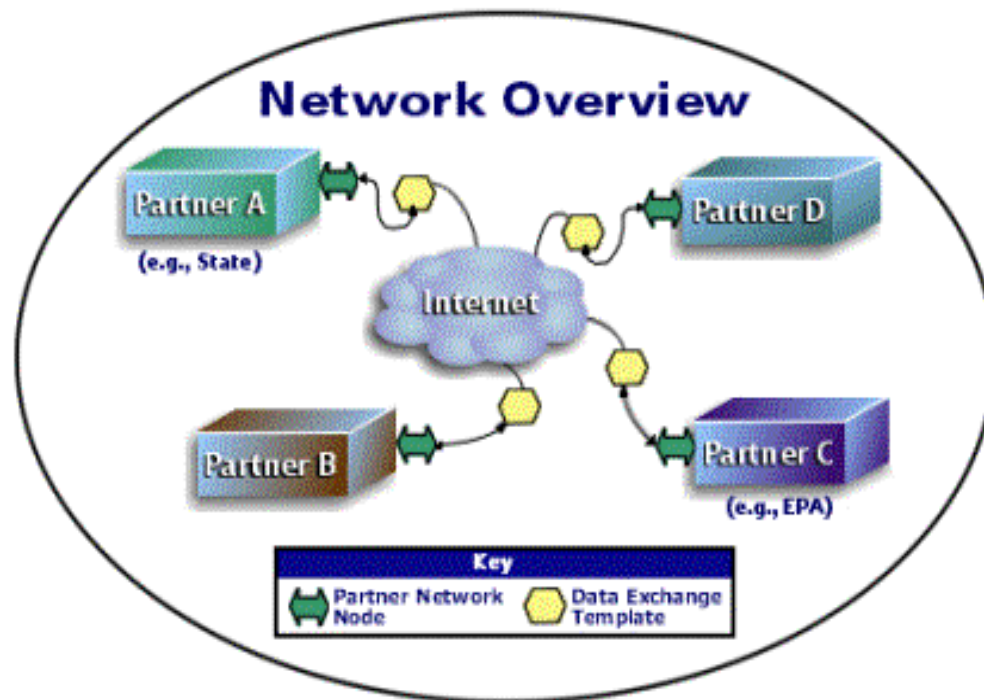


CDX Network Node Overview

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

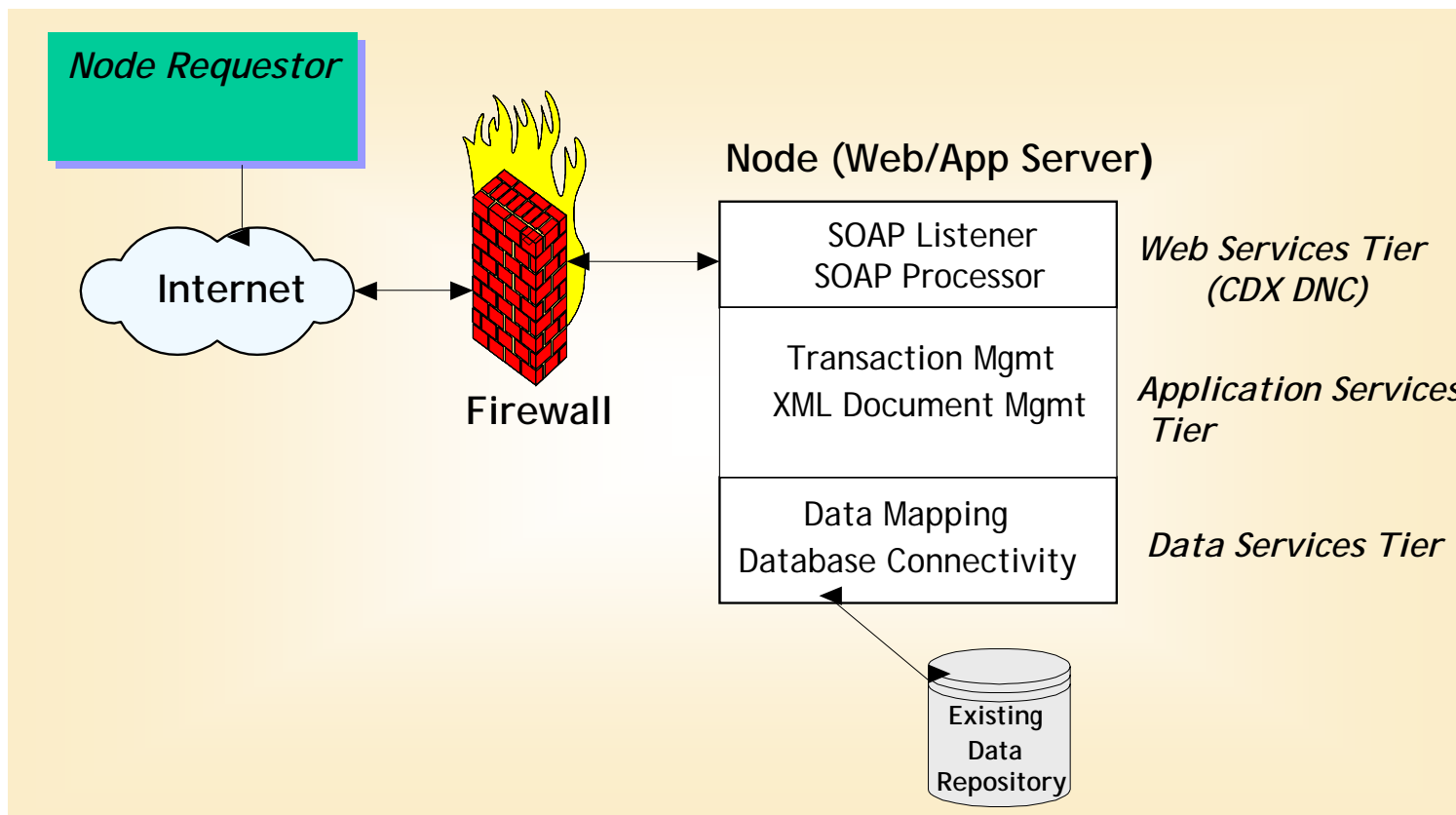
- Provides a technical description of the Central Data Exchange (CDX) Node:
 - Architecture
 - Demonstrated Node Configuration (DNC)
 - Network Authorization & Authentication Services (NAAS)
 - CDX services (Scheduling, Auditing, etc.)
 - Data flow interfaces
- Describes techniques, tools, tips, and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

Role of CDX & NAAS

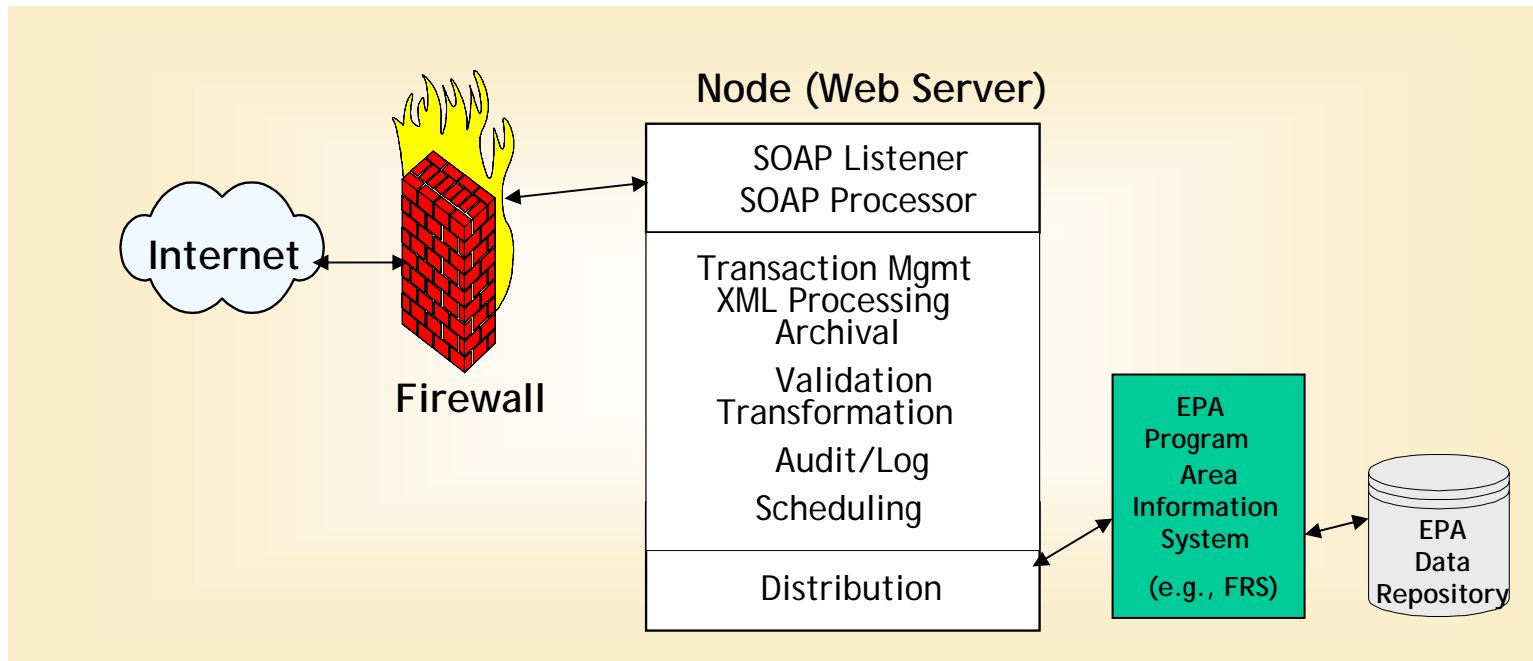
- CDX is the Node on the Exchange Network that acts as the Central Data Exchange for EPA
- CDX interacts with EPA program areas (FRS, etc)
- CDX validates all exchanges against NAAS
- NAAS is a distributed authorization and authentication mechanism
- NAAS includes user and policy management
- All network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

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Transaction History Results

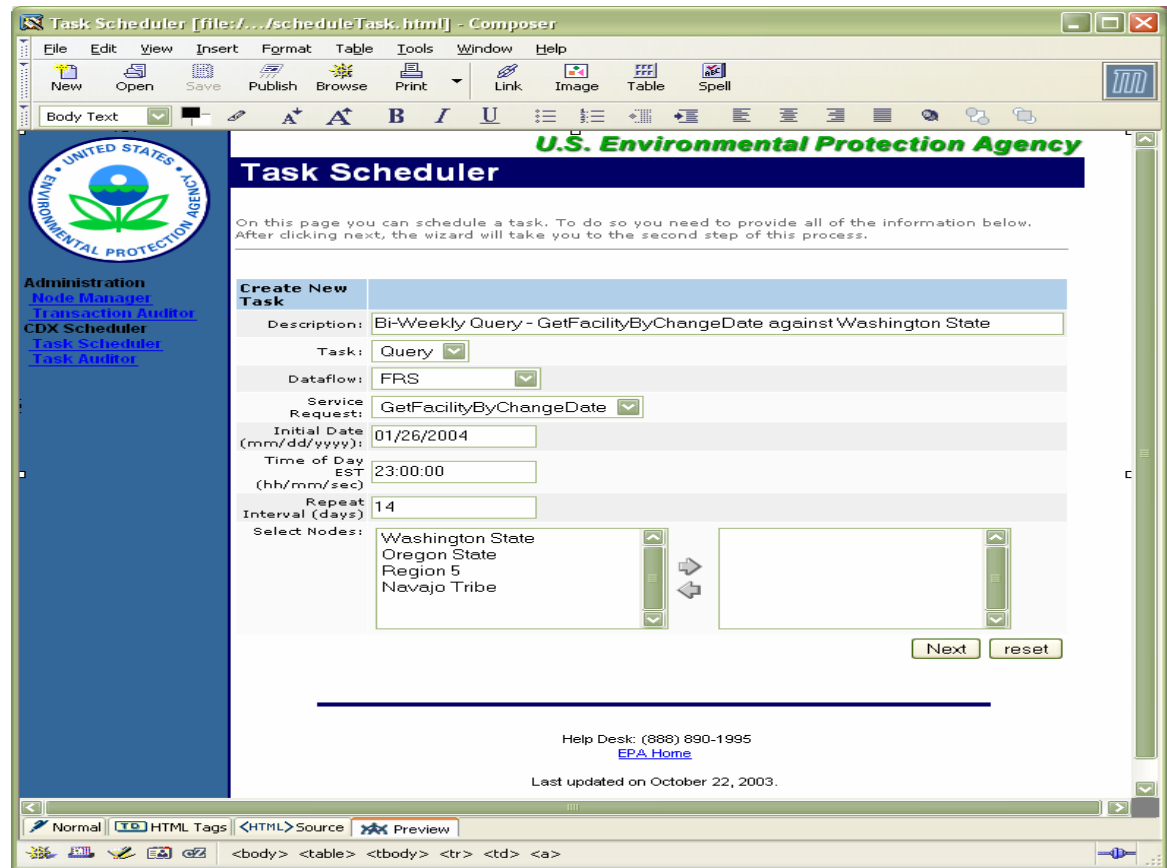
Records found: 6

User Id	Transaction ID	Time	Actor Name	Action	Status	Details
gtamkin@csc.com	1ac79ebf-3a25-4282-b26e-012cd8f6287	2003/11/14 14:08:17	Exchange Network Interface	submit	INFO	Details
epacdxnode@epa.gov	1ac79ebf-3a25-4282-b26e-012cd8f6287	2003/11/14 14:08:18	Distribute Task	createTask	INFO	Details
gtamkin@csc.com	1ac79ebf-3a25-4282-b26e-012cd8f6287	2003/11/14 14:08:18	Exchange Network Interface	submit	SUCCESS	Details
epacdxnode@epa.gov	1ac79ebf-3a25-4282-b26e-012cd8f6287	2003/11/14 14:08:27	Distribute Task	executeTask	INFO	Details
epacdxnode@epa.gov	1ac79ebf-3a25-4282-b26e-012cd8f6287	2003/11/14 14:08:28	EDMR Distributor	getMethodName	INFO	Details
epacdxnode@epa.gov	1ac79ebf-3a25-4282-b26e-012cd8f6287	2003/11/14 14:08:28	Distribute Task	executeTask	SUCCESS	Details

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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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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	Download	Download
Authenticate	Authentication against Node	Pass	Download	Download
Submit	Submission of document to Node	Pass	Download	Download
GetStatus	Status of previous submission	Pass	Download	Download
Download	Download of previously submitted document	Pass	Download	Download
Query	Synchronous query against Node	Pass	Download	Download
Solicit	Asynchronous query against Node	Pass	Download	Download
Notify	Node notified that document is available	Pass	Download	Download
GetServices	Supported Services	Pass	Download	Download

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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 (Java)
 - https://test.epacdxnode.net/CDX_DotNet_V10.zip (.Net/C#)
 - https://test.epacdxnode.net/CDX_VBDotNet_V10.zip (.Net/VB)
 - https://test.epacdxnode.net/CDX_DNC_9IAS_V10.zip (Oracle)