

Central Data Exchange: Overview of Status, Functions, and New Services

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CDX Overview

CDX is EPA's central mechanism for electronic reporting and data exchange, including:

- Enterprise-wide **Portal** for information exchange
- **Node** on the Environmental Information Exchange Network with the States

CDX Business Drivers

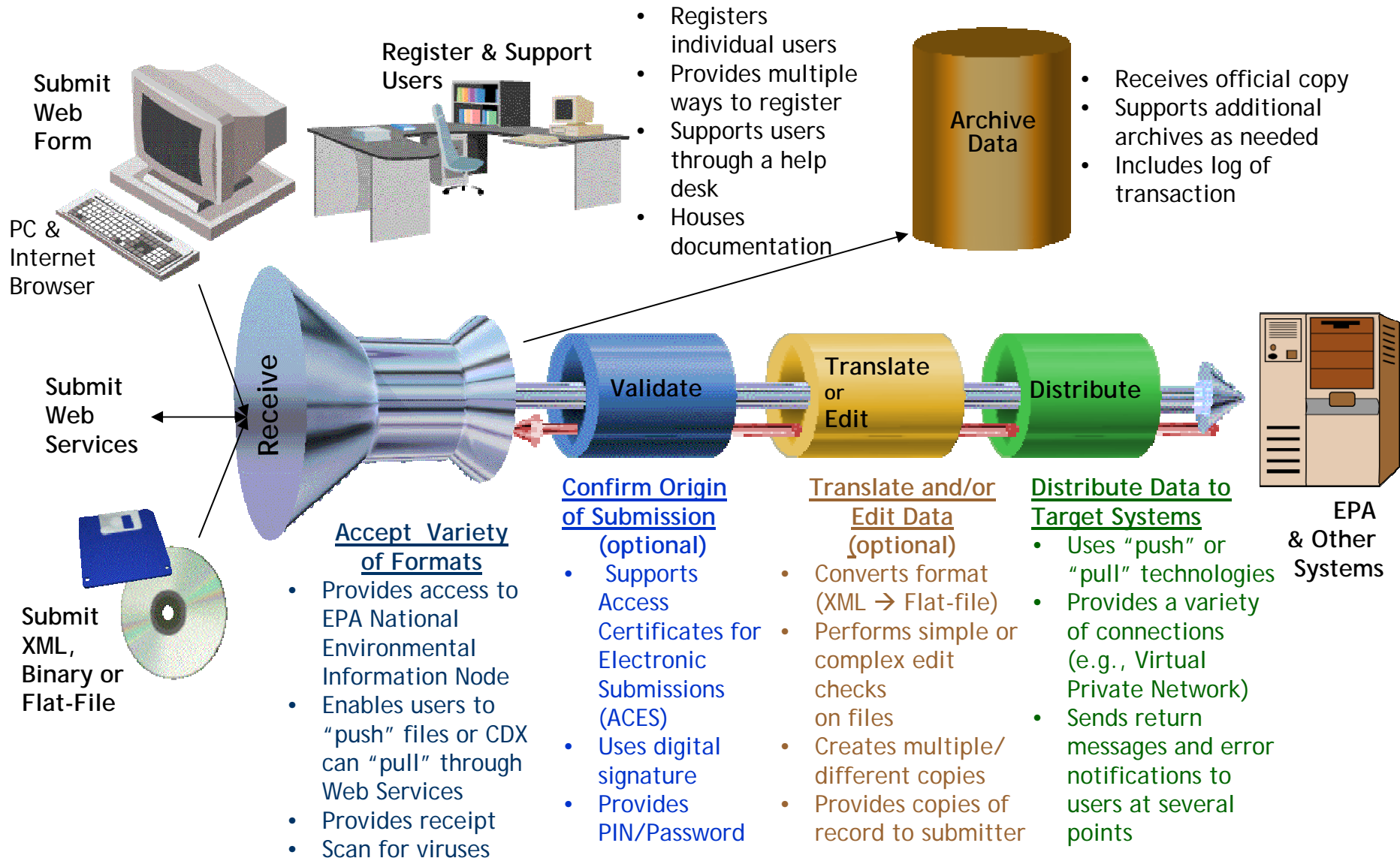
- Higher data quality
- Timely and integrated information
- Reduced data collection costs
- Avoiding redundancy

CDX Design Drivers

- Exchange Network
- President's Management Agenda
- GPEA
- eGov and Federal Reference Models
- EPA Enterprise Target Architecture
- Reusable components



CDX Core Functions



CDX is Open for Business!

General CDX Facts

- Over 9,200 registered users, growing at 190 per month, and receiving data from 38 states
- Current CDX Partners: OAR, OECA, OEI, OPPTS, OSWER, OW, Region 3 (Asbestos), and Region 6 (Superfund)
- Engages an average of 300 State, industry, Program partners each month

Integration Status and operations

- 5 data flows have been successfully implemented and are in Production— NEI, PCS/IDEF, TRI, TSCA HaSD, SDWARS/UCMR
- 6 data flows currently in Development or Test – AQS, FRS, Beaches/STORET, Radionuclide NESHAPs, RCRAInfo, TSCA PMN
- State-of-the-art deployment and test facility at New Carrollton, co-located with RMP and TRI data processing centers
- Production operations and support staff in place at RTP



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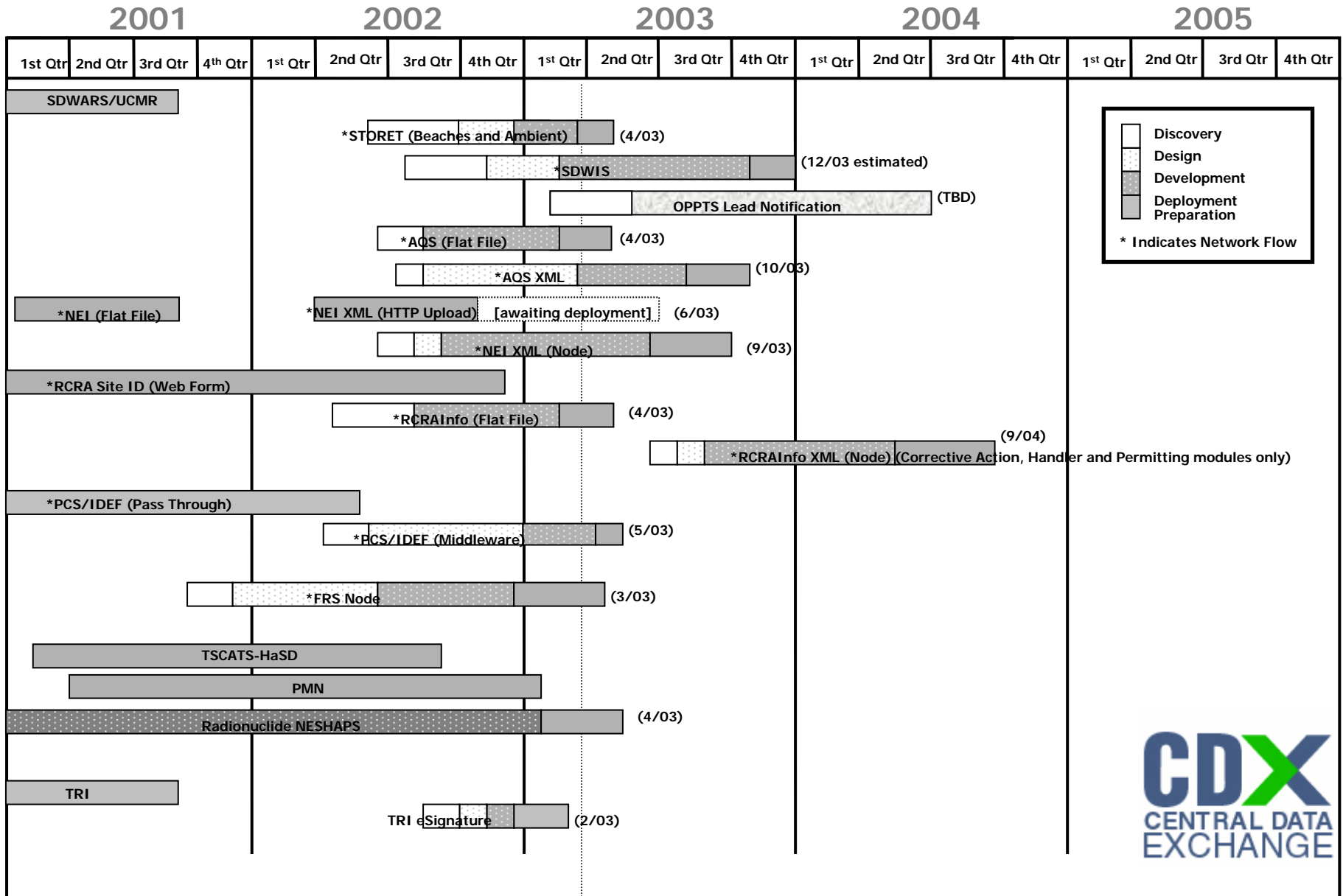
New Developments

- AQS and RCRA flat file began Alpha testing in March
- CDX's Node on the Exchange Network went live in March 2003
- TRI-ME with electronic signature was launched in Spring 2003

Goals for CDX

- By December 2003: Several new systems will go into production
- By December 2004: 13 data flows will be using CDX
- By FY 2005: The major EPA data collections will flow through CDX

CDX Data Flow Development Schedule



Services Provided by CDX

- Basic Data Exchange — Managing data collected from your customers
- Enhanced Data Exchange — Providing a wider range of data management functions
- Document Services — Administering efficient document collection and archiving
- Exchange Support Services — Sharing CDX development, test and production capabilities for cost efficiencies
- Client Support Services — Offering a highly functional customer care operation that includes communications, training and help desk

All the Latest CDX Services

Basic Data Exchange

- Node-Node Data Exchange
 - Transaction Logging
 - Error Handling
 - Naming & Directory Services
 - Security/Access Controls
 - Data Translation
 - Registration/authentication/authorization
 - Backup/recovery
- Web User Data Exchange
 - Portal
 - Transaction Logging
 - Error Handling
 - Naming & Directory Services
 - Security/Access Controls
 - Registration/authentication/authorization
 - Backup/recovery
- Legacy Application Integration
 - Transaction Logging
 - Error Handling
 - Security/Access Controls
 - Registration/authentication/authorization
 - Data Translation
 - Backup/recovery
- Non-repudiation
 - PKI
 - Encryption
 - Archiving
- Auditing
 - Archiving

Enhanced Data Exchange

- Data Reconciliation & Validation
- Notification/Alert
- Messaging
- Reporting Capabilities
- Workflow
- Chat
- PDA/Wireless
- Interfaces to Legacy Systems (EAI Middleware)
- Single Sign-on
- CBI
- CROMERR Compliance

Document Services

- Document Collection
- Data Entry/Data Capture
- Paper & Diskette Processing
- Data Validation, Error Check and Reconciliation
- Data Filing/Storage

Exchange Support Services

- Development Support
 - System specifications and requirements
 - XML Schema
 - Standards Development
 - Test plans and test results
 - Data flow evaluation
 - System HW/SW enhancement
 - Registry/repository
- Transition Planning & Management
- Implementation, Operations & Maintenance
- Disaster Recovery Services
- Security Planning (General support systems, major applications)

Client Support Services

- Hotline technical support
- Customer service tracking and reporting
- User guides, manuals, and handbooks
- Training and Outreach on the CDX System
- Periodic customer surveys
- Client support metrics

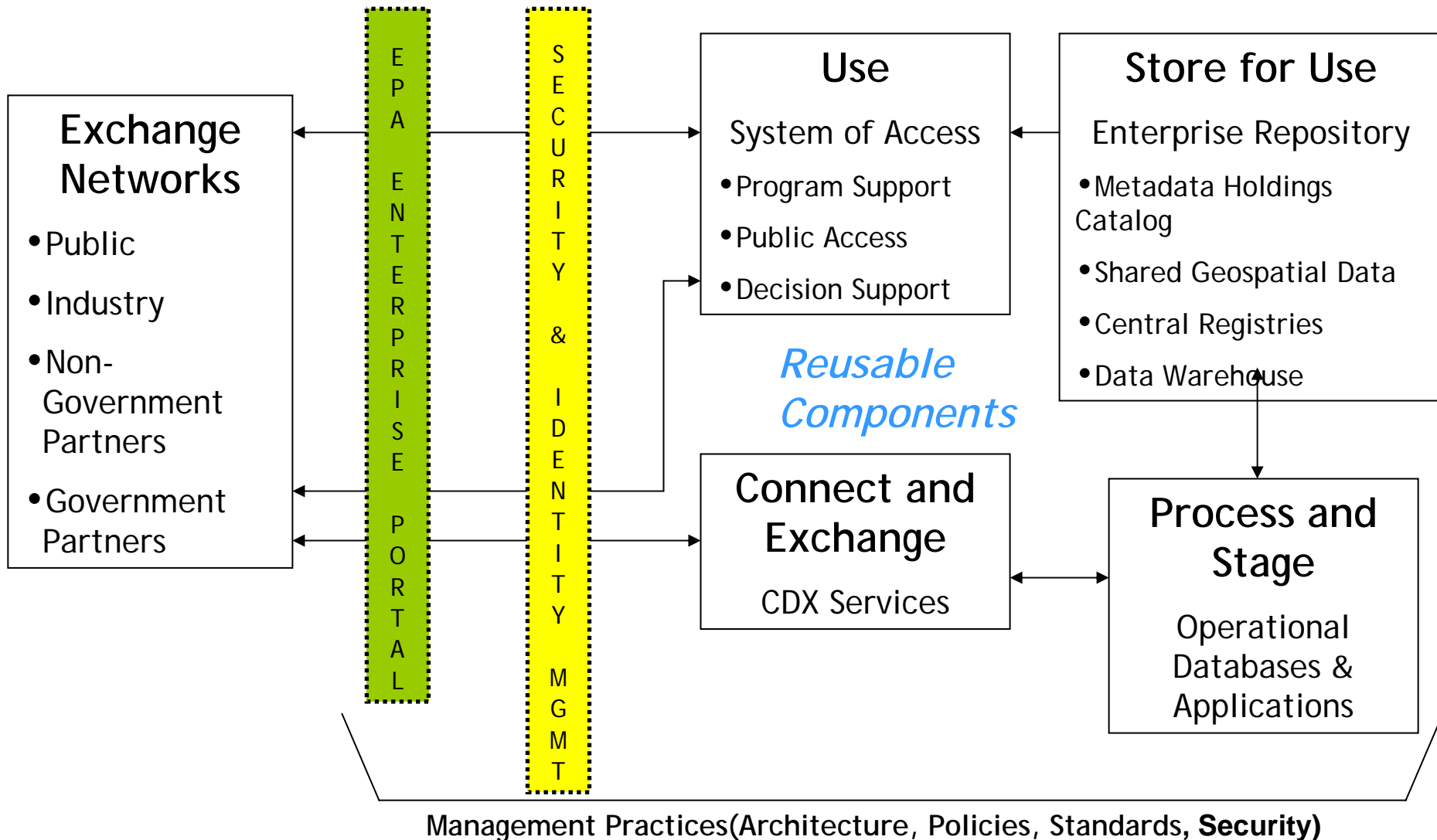
State Benefits

- Accelerate deployment of electronic exchange capabilities
- Facilitate technology transfer
- Eliminate need for re-keying data into EPA systems
- Access to automated features (notifications, file exchange, etc.)
- Better serve needs for reporting and data sharing (EPA programs, other state agencies, industries)
- Improve data quality and integration
- Provide simplified registration, signature and security solutions that comply with federal policy and EPA (CROMERRR) requirements

Business Opportunities and Challenges

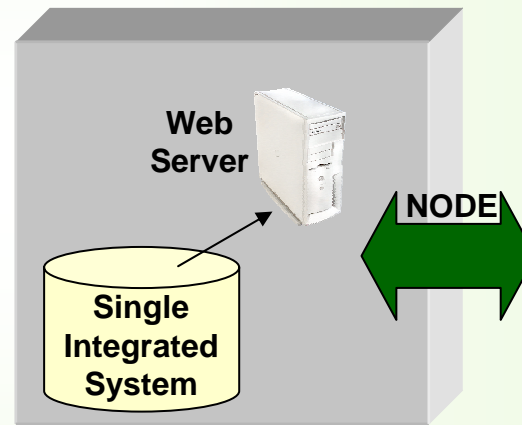
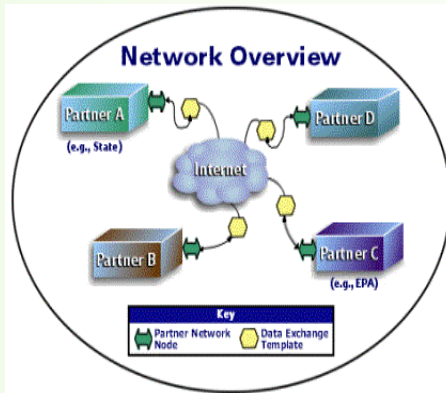
- Changing our institutions' "reporting culture" from batch to real-time
- Working as a partnership
- Sharing services and infrastructure
- Responding to external policies and direction
- Sustaining resources (time and money)

Reusable Components within the EPA Enterprise Architecture Framework



CDX and the Network

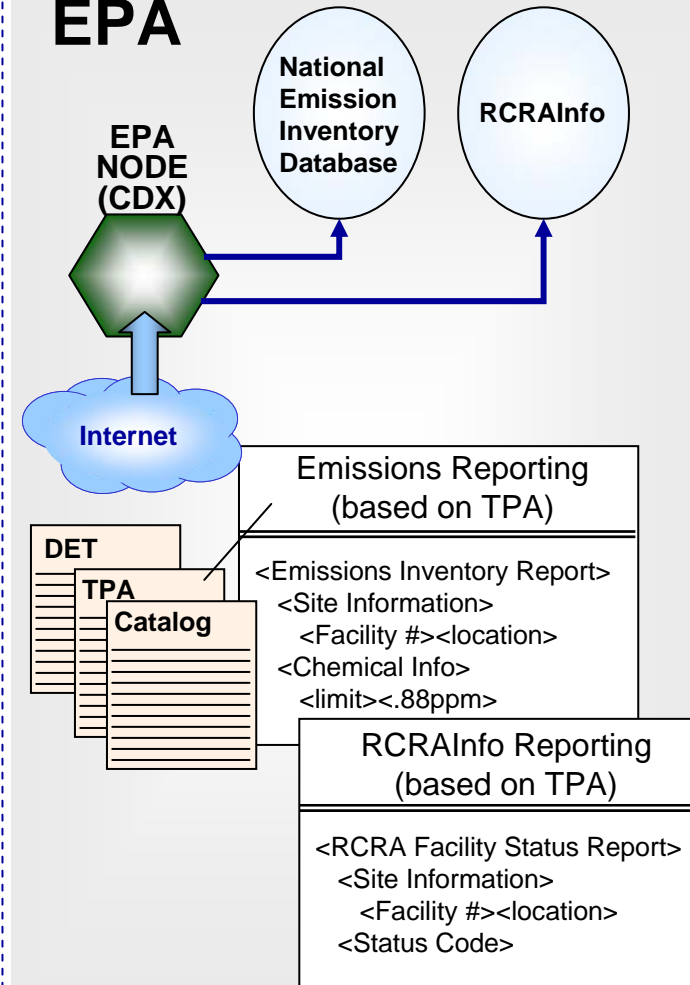
State Environmental Department



Relies on:

- XML web services and schema
- Trading partner agreements
- Data Standards

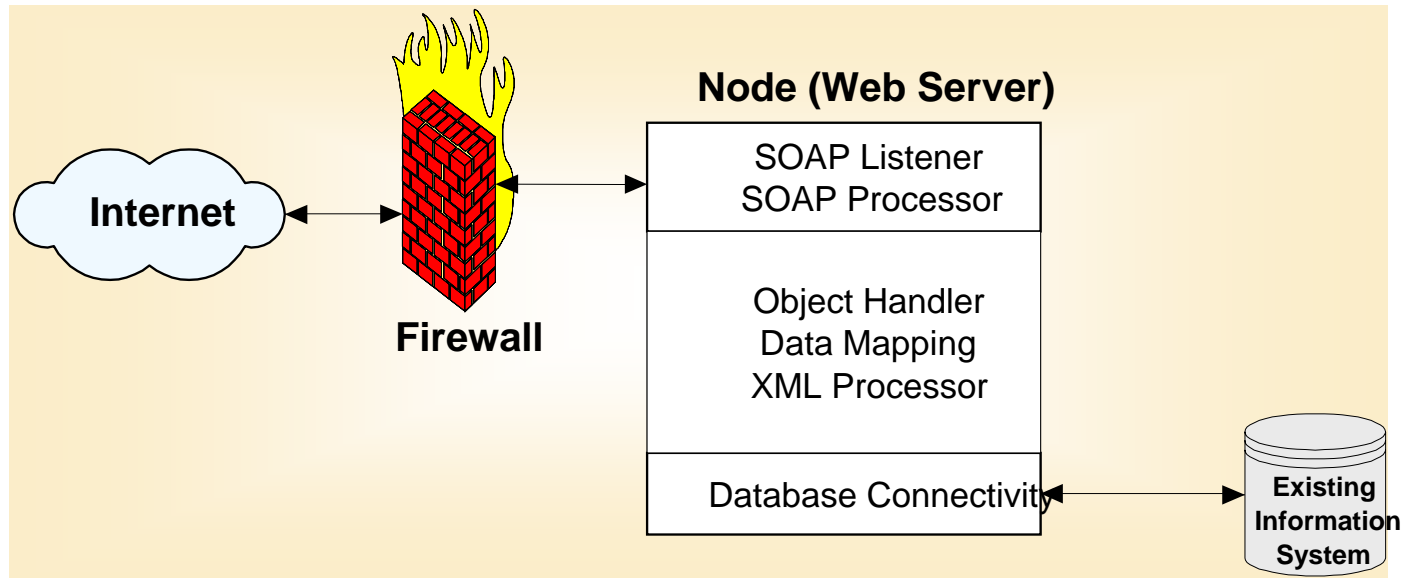
EPA



What is a Network Node?

- A *Network Node* (Node) is a simple Web service that initiates and responds to requests for environmental information
- The requests and responses use common formats expressed in eXtensible Markup Language (XML)

Basic Node Architecture



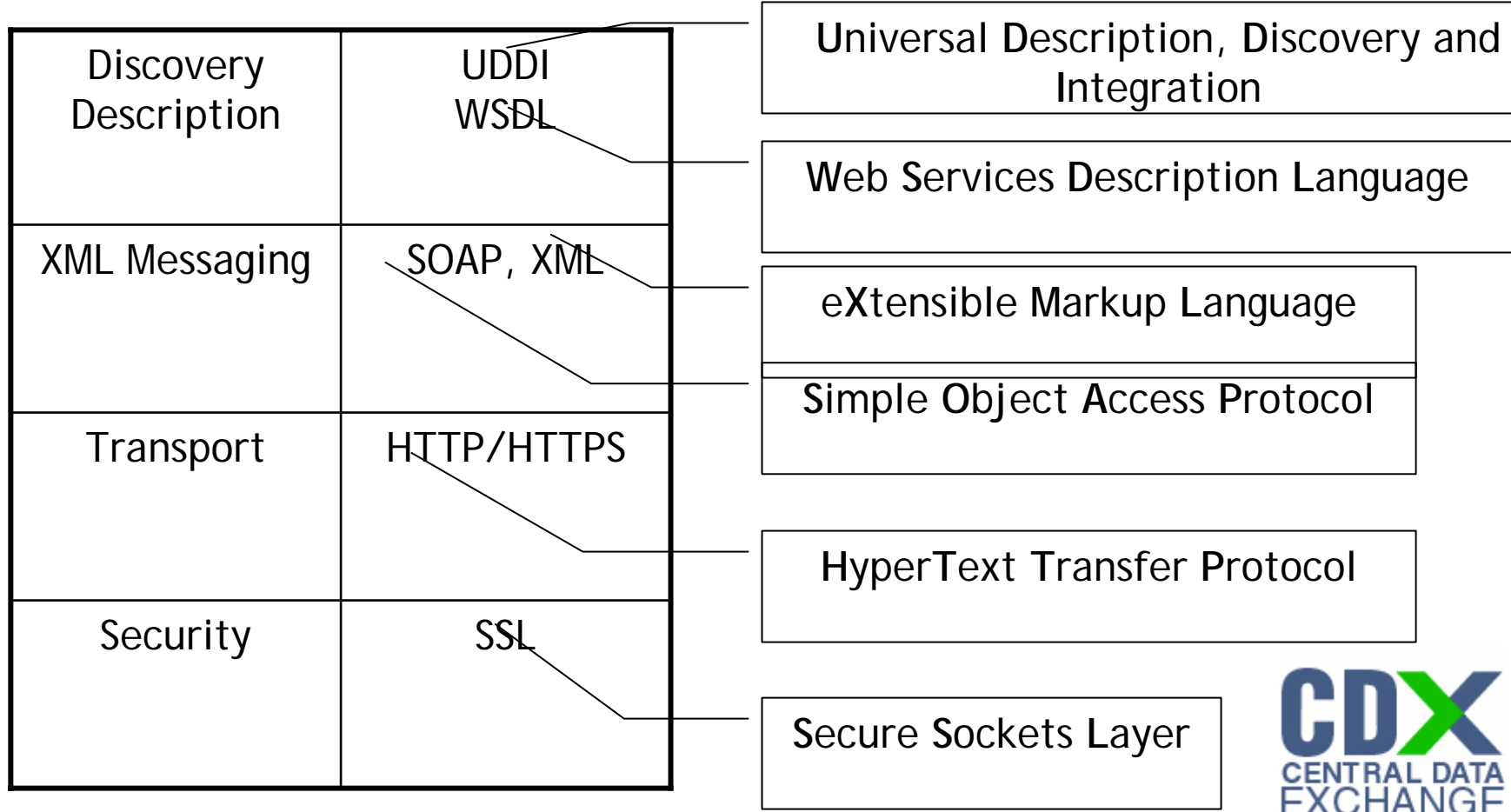
Web Services

- Web services are information sources/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, browser-based interactions or platform-dependent technologies, Web services are services offered computer-to-computer, via defined formats and protocols, in a platform-independent and language-neutral manner

Network Protocols and Specifications

- Network Node Functional Specifications describe
 - Actions performed by the node
 - How node functions are invoked
 - Expected node output
- Network Node Exchange Protocol
 - Defines types of valid messages a Node should receive
 - Describes format for sending messages among nodes
- Expected shelf life of Network Specifications V1.0 is approximately 18-24 months

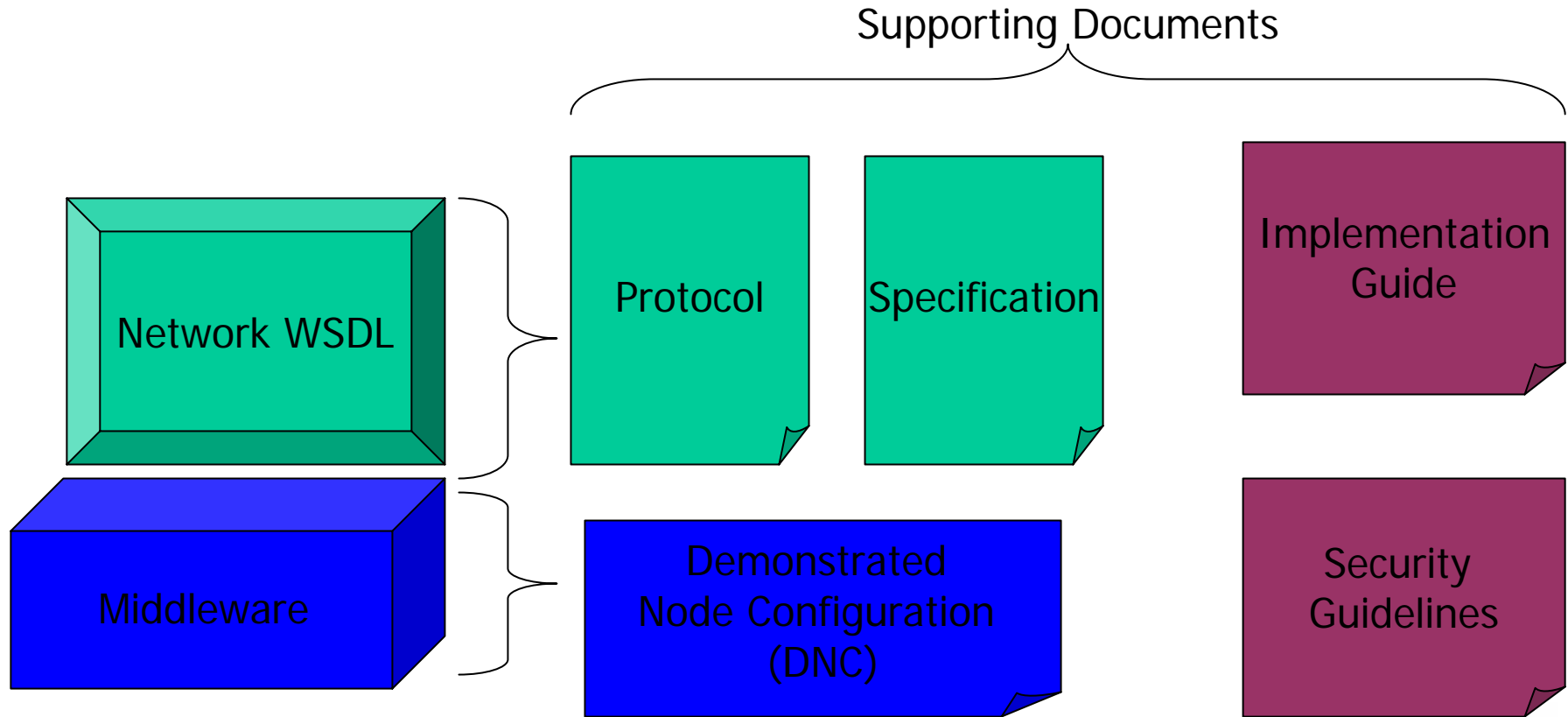
Defining Network Standards and Stack



Methods for Network (hence Node) Operations

Interface	Methods
Administration	NodePing, GetServices
Security	Authenticate
Query	Query, Execute
Sending	Submit, GetStatus
Retrieving	Notify, Download, Solicit

Components of Node Building



Node 1.0: Diverse Database Environments, Hardware and Middleware

State	Database Environment	Hardware	Middleware
DE	SQL Server 2000	Dell PowerEdge Dual Pentium	.NET 1.0
ME	Oracle 9.2	Sun E6500	Oracle 9iAS
MS			.NET 1.0
NH	Oracle 8.0	Compaq Proliant ML370	BizTalk Server 2000
NM	TEMPO	Sun SunFire 280R	WebSphere v4.05
NE	DB/2	Gateway 2000 server	XAware XA-Suite
UT	Oracle 9i	Compaq Proliant server	Sybase EASserver
CDX	Oracle 9i	Dell PowerEdge Dual Pentium	BEA WebLogic

Web Services Definition Language (WSDL) Functions

- Standard Definitions
- Partner Specific Services
- Critical to Interoperability
- Generate Functions Stubs
- Generate Clients
- Node in Box

Security

Network Authentication and Authorization Services (NAAS)

- Network Authentication and Authorization Services (NAAS) are centralized security services. Security tokens and assertions issued by NAAS are trusted and accepted by all network nodes.
- NAAS provides a set of standard web services across the network, which can be easily accessed by network users and services providers.
- All operations defined in NAAS must be conducted over a secure SSL channel using 128 bit encryption.
- CROMERR Security

Node 1.0 Products

Product	Status	Date of Completion
Exchange Protocol	✓	March 14
Functional Specification	✓	March 14
Network WSDL	✓	March 14
Demonstrated Node Configurations	⌚	
Implementation Guide	⌚	
Security Guidelines	⌚	

Technical Challenges

- Vendor Selection
- SOAP Toolkit Selection
- Database Mapping
- Data Synchronization

CDX Approach and Work Products

Lay the Foundation



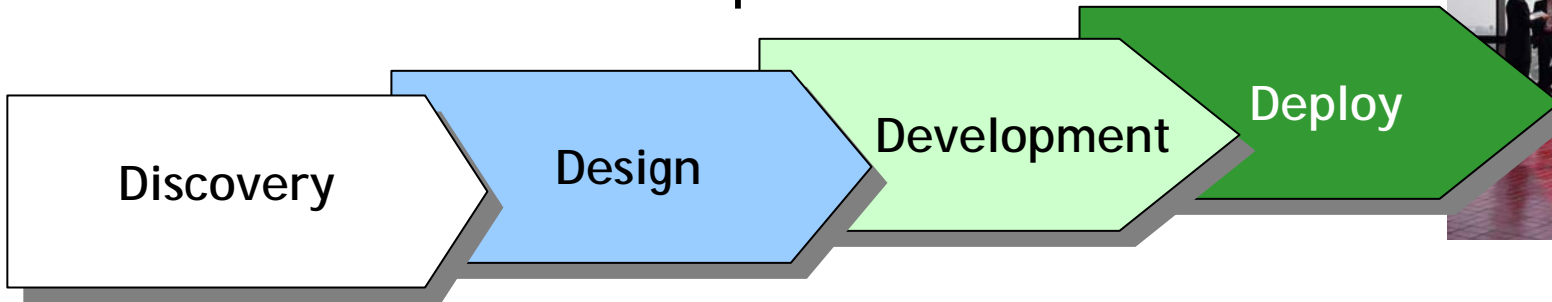
Define the Future State



Migrate to Future State



Realizing Long-Term Improvement



- Collect and review summary documentation for existing data flow
- Summarize key business processes that make up the data flow
- Identify specific data flow requirements
- Develop workplan showing steps to design, develop and deploy the data flow
- Develop cost estimate based on workplan

- Each phase typically lasts 1-3 months
- Phases may change based on size and type of transition



States Using CDX Contract

Two possible ways:

Possibility #1 Funds-out (such as network grants)

- All or part of federal grant \$ would be applied to “in kind services to EPA IAG # DW-47-93939301-0 (GSA Project Number 21476EPM)
- “In kind” service decision must specified in grant award package (i.e. decision memo, commitment notice, 1610 would need to reflect this as “mod to IAG”)
- Need to coordinate in advance w. EPA’s CDX to ensure correct information (mod #, amount, etc.) is on commitment notice, decision memo, etc.



States Using CDX Contract (Continued)

Possibility #2 Funds-in (such as state funding from comptroller):

- Must establish “funds out” inter-governmental agreement between EPA with State entity
- Must specify in “decision memo” awarding agreement to provide “in kind services” to IAG
- State “funds-in’ to EPA finance in Cincinnati, where it would be reprogrammed to federal account
- EPA CDX staff would coordinate w. State/region on adding these “federal” funds to IAG

“In-Kind” Service Justification

Example of justification:

- reduces costs by leveraging existing CDX technical infrastructure and expertise
- expedites grantee’s ability to support the Network by using an existing federal contract as opposed to developing their own
- ensures consistency and standardization by using the same contract staff, methodologies and processes that CDX uses thereby supporting the overall network concept
- leverages State's limited staff and resources by avoiding contract administration and oversight

For More Information

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