CDX Exchange Mechanisms

- **_CDX Web_** – EPA's site for submitting environmental information via standard Web browsers
  - Users submit data via Web-based forms and file uploads (flat file, XML file)
  - Users receive submission confirmation/processing reports
  - ✓ Primary electronic reporting (e-Signature) interface

- **_CDX Node_** – EPA's Web services infrastructure on the Exchange Network   *Cormm*
  - Supports machine-to-machine data exchanges
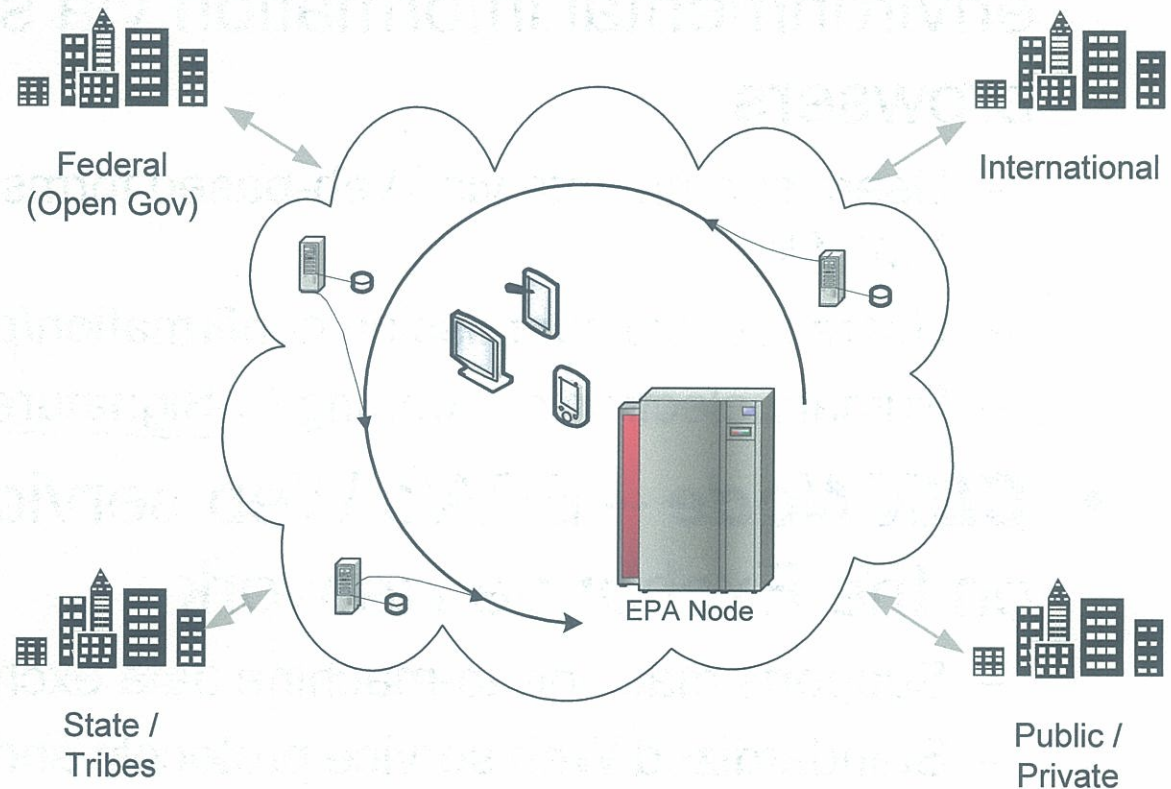 - Standardized Web service protocols and XML schemas used

8

What is Exchange Network?
交換網絡

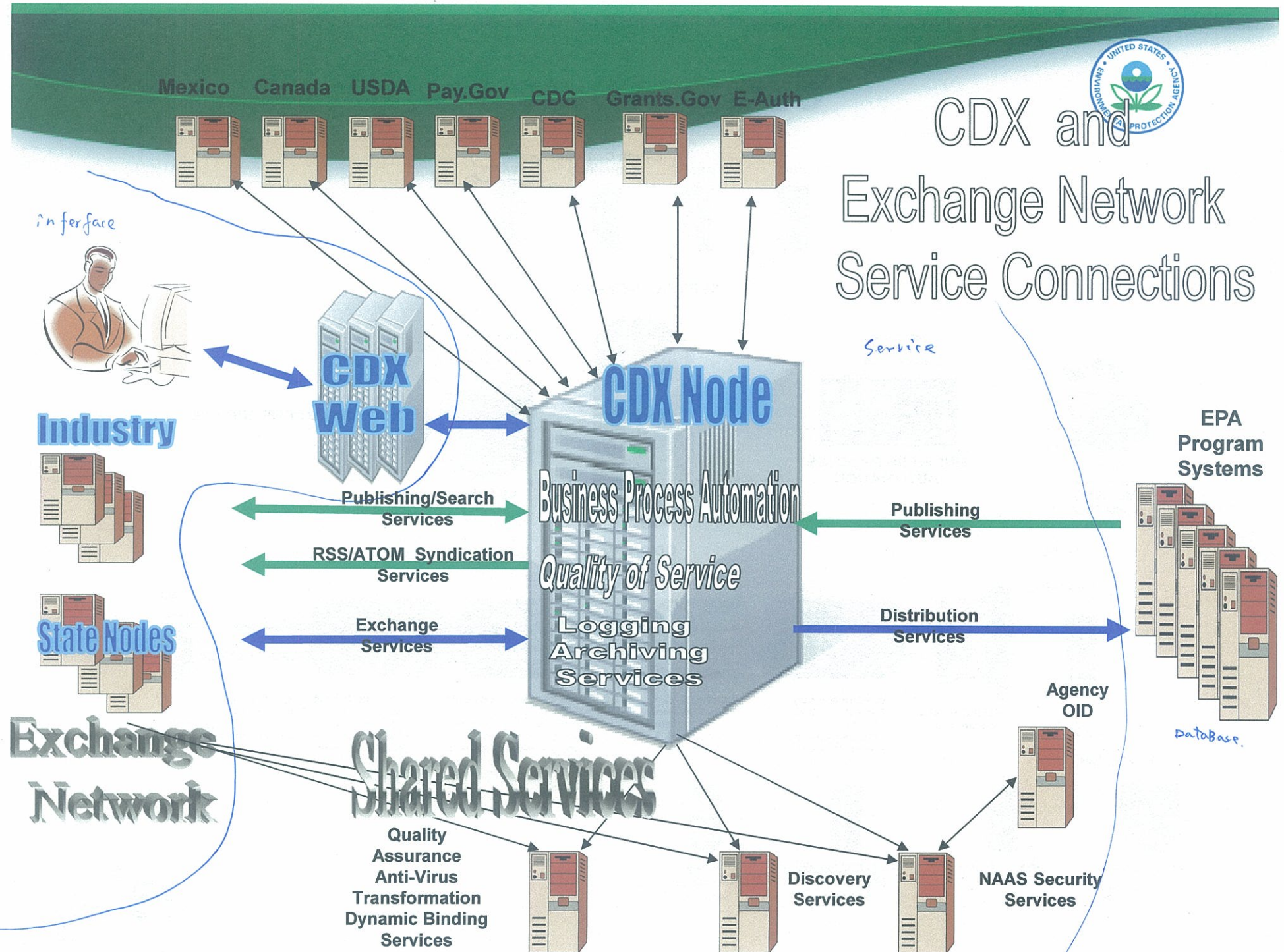A standards-based machine-to-machine approach for exchanging environmental data among trading partners

Key Components
- **Standard Protocols**
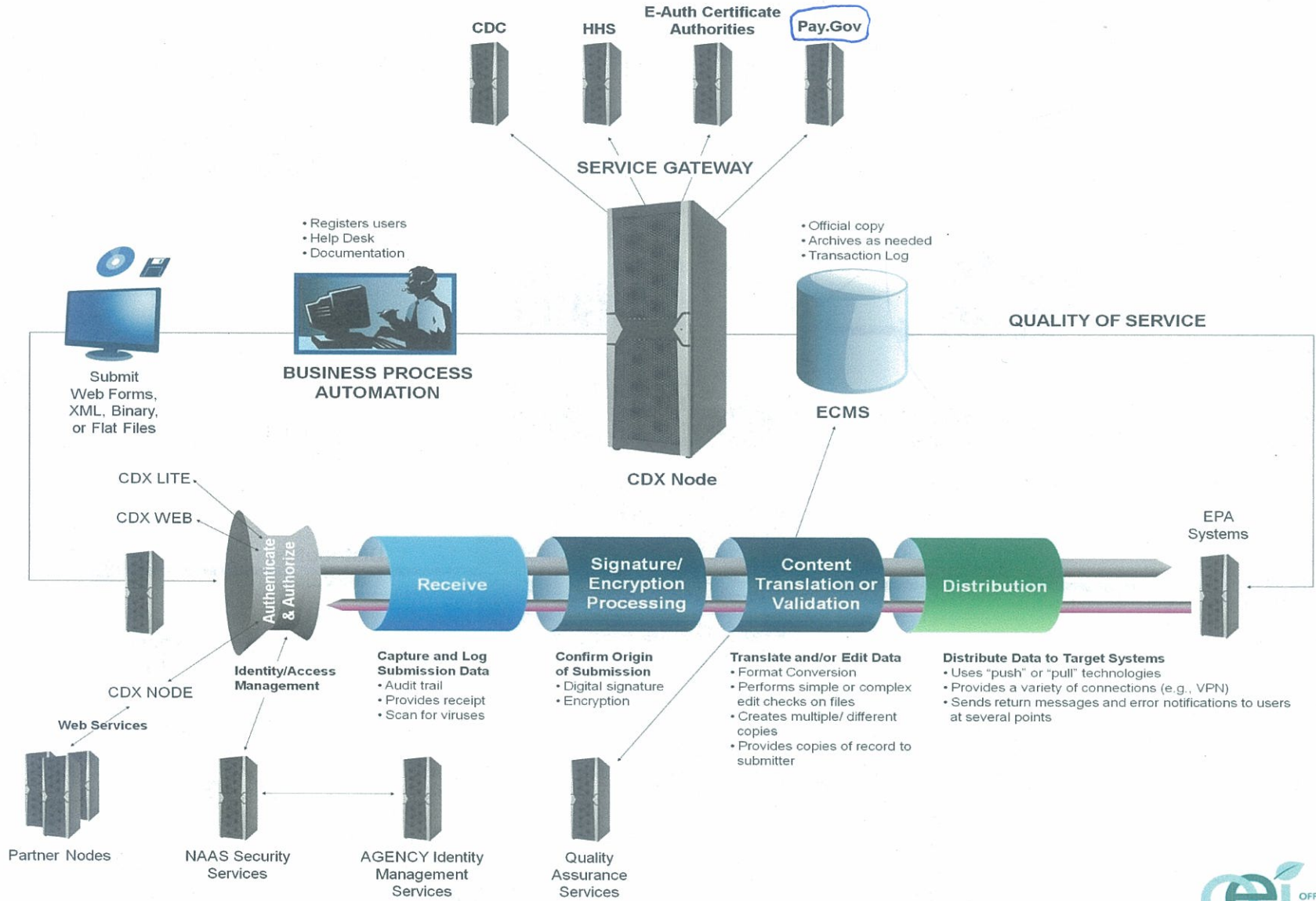- Nodes
- Templates (XML Schema) includes data standards

Federal (Open Gov)

International

State / Tribes

EPA Node

Public / Private

CDX and Exchange Network Service Connections

Mexico Canada USDA Pay.Gov CDC Grants.Gov E-Auth

interface

Service

CDX Web

CDX Node

Industry

Business Process Automation

Publishing/Search Services

Publishing Services

EPA Program Systems

RSS/ATOM Syndication Services

Quality of Service

State Nodes

Exchange Services

Logging Archiving Services

Distribution Services

Agency OID

DataBase

Exchange Network

Shared Services

Quality Assurance Anti-Virus Transformation Dynamic Binding Services

Discovery Services

NAAS Security Services

CDX SERVICES

CDC HHS E-Auth Certificate Authorities Pay.Gov

SERVICE GATEWAY

- Registers users
- Help Desk
- Documentation

BUSINESS PROCESS AUTOMATION

- Official copy
- Archives as needed
- Transaction Log

ECMS

QUALITY OF SERVICE

Submit Web Forms, XML, Binary, or Flat Files

CDX Node

CDX LITE
CDX WEB

Authenticate & Authorize

Receive

Signature/ Encryption Processing

Content Translation or Validation

Distribution

EPA Systems

CDX NODE

Web Services

Partner Nodes

Identity/Access Management

NAAS Security Services

AGENCY Identity Management Services

Quality Assurance Services

Capture and Log Submission Data
- Audit trail
- Provides receipt
- Scan for viruses

Confirm Origin of Submission
- Digital signature
- Encryption

Translate and/or Edit Data
- Format Conversion
- Performs simple or complex edit checks on files
- Creates multiple/ different copies
- Provides copies of record to submitter

Distribute Data to Target Systems
- Uses "push" or "pull" technologies
- Provides a variety of connections (e.g., VPN)
- Sends return messages and error notifications to users at several points

OFFICE OF ENVIRONMENTAL INFORMATION

12

CDX Services

User Registration Services

Authentication & Authorization Services (NAAS)

Web Forms/Uploads

Data Submission Services

QA Services (XML Schema Validation, extended business rules)

Data Transformation Services

Data Distribution Services

PKI/XKMS Security Services

Audit and Logging Services

Data Archiving Services

Data Publishing Services

Messaging Services (status, error)

Industries

Partners

Citizens

Web Browser and Web Services Functions

Agency Systems

GeoData Gateway
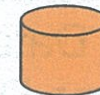
Document Management ECMS

XML

Program Office Data Stores

AQS
Others
WQX
TRIPS
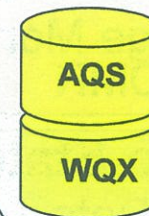
Registries

SRS
FRS

Types of Data Exchanges

State-to-EPA
- Facility Data to FRS
- Water Quality Data to WQX
- Drinking Water Data to SDWIS
- Haz Waste Data to RCRAInfo
- Air Emissions Data to EIS
- Air Monitoring Data to AQS

Industry-to-EPA & States
- TRI Data submissions
- Renewable Fuels to EMTS
- Water Discharge Monitoring Data to NetDMR, eDMR

State-to-State
- Water Quality Data
- Hazardous Waste Transporters
- Air Quality Data
- Homeland Security Data

EPA-to-State
- TRI Data Submissions
- Chemical Data
- Facility Data from FRS
- Air Quality Data

Intrastate
- Environmental Data to Health Departments
- Drinking Water Labs to States
- Homeland Security/ Law Enforcement C
- County Water Data

International
- Hazardous Waste Notices between Canada, Mexico, US

14

Reusable Services

Centralized, Shareable Web Service Components

1. Registration (Network)
2. Authentication and Authorization (NAAS)
3. Secure Document Exchanges
4. Data Reporting
5. Data Querying
6. Messaging (status, error)
7. Quality Assurance (validation)
8. Web Service Management (Monitor Services)
9. Internal Services: Archiving, Logging, Routing, Distributing, etc.

Reusable services access through the Exchange Network Discovery Services (ENDS)

Registry of IT Services

Reusable Component Services

Reusable services, code, data sets, and other tools

- REST Web Services
- SOAP Web Services
- Widgets[1]
- XML Schema
- Code Libraries (APIs)[2]
- Data Sets
- Software Tools   — for it development.
- Data Dictionaries

[1]Small application that can be installed and executed within a web page by an end user
[2] specifications that software programs can follow to communicate with each other. It serves as an interface between different software programs and facilitates their interaction