The Exchange Network
Virtual Node
EN2014
Agenda

- Introductions and Objectives
- Overview of the Virtual Node
- Conceptual Architecture
- Virtual Node Configuration
- Virtual Node REST Services
- Demonstration
Introductions and Objectives

- What organization are you with and what is your role?

- What are you hoping to learn today about the Virtual Node?

- Are you interested in a particular data flow or use case for using the Virtual Node?

- Do you have any upfront questions or concerns about using the Virtual Node?

- What help do you need to get started?
Overview
Path to establishing a Virtual Node platform

- IPT Charter adopted August 28, 2012
- Information collection & IPT requirement sessions (8 states, 4 tribes, multiple vendors)
- IPT Meetings occurred over a period of 5 months
- Recommendations document based on IPT input and feedback created
Overview of the Virtual Node

What is the Virtual Node?

- A central node server that hosts any number of partner nodes: state, tribe, region, agency, etc.

- Each partner node is configured on the Cloud Node Platform by filling out forms in a web application (eliminating partner node HW/SW)

- Each partner node functions like a conventional node only it is easier and cheaper to set up and maintain
Overview of the Virtual Node
What benefits does the Virtual Node provide?

- Provide a Low Cost Node Option for Partners
- Decrease Operations and Maintenance Costs
- Simplify Development and Maintenance
  - New mapping model
Overview of the Virtual Node

Virtual Node Advantages

- **Highly Agile:** A new partner node can be created with a simple configuration form
- **Eliminates Node Maintenance:** Nodes are centrally managed, secured and serviced
- **Common Architecture:** New and approved features will be shared by all nodes (your input is needed)
- **Virtual nodes can inherit services from the ‘base-node’**
- **The Discovery/ENDS service information can be published and maintained automatically**
Virtual Node

REST Services

SOAP

Exchange Network

Admin User Interface Website

Admin Web Service Interface

State Node

Tribal Node

Industry Node

Program Node

Data Sources

State / Tribe... Environment

Node Admin

Configure Nodes

Secure Channel
Configuring the Virtual Node

Program System
- Data Entry
- Quality Assurance
- Submission Preparation

Virtual Node Cloud

Virtual Node Boundary

Internet
HTTP(S)

REST
SOAP

External Trading Partner Infrastructure
(e.g. CDX or other State/Tribal Partner application)

Virtual Node Configured Services

XML Payload Generation or Processing

Extract, Transform, and Load Processing

Node Staging Tables

Opational Data Store(s)

View/Clone (Or) Staging Table
**Virtual Node Administration Platform (VNAP)**

### Services Setup Wizard

#### Node ID / Description:
CWANJ – Clean Water Act NJ Waterways

#### Dataflow:
CWANJ

#### Steps
1. Database
2. Service
3. Template
4. Finish

#### Service Settings

<table>
<thead>
<tr>
<th>Method Type</th>
<th>SQL Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solicit</td>
<td>SELECT * FROM {TABLE} WHERE {FIELD}.{TABLE}</td>
</tr>
</tbody>
</table>

#### Explanation of Fields

- **Method Type**
- **Workflow**
- **Service Status**
- **Service Description**
- **Data Source**
- **SQL Statement**

Please select an existing data source and provide SQL statement to test.
Publishing Models
Business Example: REST Services
Search and display results
Business Example: REST Services
Search and display results
Business Example: REST Services
Pick lists and help text for terminology

Hydraulic Fracturing

Submitted by jsoosiah on Wed, 02/06/2013 - 16:21

Natural gas plays a key role in our nation’s clean energy future. The U.S. has vast reserves of natural gas that are economically viable as a result of advances in horizontal drilling and hydraulic fracturing. Natural gas is found in hydrocarbon-rich areas, such as in the Bakken Formation.

Natural gas
A combustible mixture of methane and other hydrocarbons used chiefly as a fuel.
Business Example: REST Services

“Merging” data geospatially for complete coverage
Virtual Node Demo
REST Service

- Virtual Nodes can create REST type services for publishing your data without additional configuration.

- This is what a REST service URL looks like for a virtual node service:

```text
https://virtualnodetest.epacdxnode.net/nodedataservice?
node={nodename}&
dataflow={dataflowname}&
request={serviceName}&
paramName=paramValue&
token={token}&
rowId={rowId}&
maxRows={maxRows}&
format={format}
```

**GetCountyCode** – actual REST service on my ChrisClark Virtual Node:

**JSON format:**

```text
https://virtualnodetest.epacdxnode.net/nodedataservice?node=ChrisClarkNode&dataflow=GeoServices&request=GetCountyCode&state=Virginia&format=json
```

**XML format:**

```text
https://virtualnodetest.epacdxnode.net/nodedataservice?node=ChrisClarkNode&dataflow=GeoServices&request=GetCountyCode&state=Virginia&format=xml
```
Optimizing Business Processes

- Shared dataflow definitions ("plug-in")
  - Allows you to copy dataflows from a template
  - Current dataflows supported
    - AQS
    - ICIS Air

- Steps to deploy a dataflow
  - Import shared definition
  - Update Notifications, Header and Endpoints
  - Map your native database to the staging tables
  - Set up VPN connection
  - NO CODING – all configuration
ICIS AIR Workflow

- ICIS–AIR Query service
  - retrieves data
  - construct XML document.
- Submit ICIS–AIR XML document (retry if it fails).
- Retrieve processing status (GetStatus)
- Download QA server validation report
- Check ICIS processing status
- Download ICIS–AIR report
- Parse report and record accepted and rejected records in the transaction tracking table
- Remove accepted records from staging tables
- Notify admins and submitters
Documentation

- Virtual Node Administration Guide
- Virtual Node Lab Guide
- ICIS–AIR Setup Guide
- AQS Setup Guide
What use cases are you considering?

Did we miss a question you had?

What help do you need to get started?
Demonstration

» Virtual Node Setup

» Data Flow Configuration

» Question and Answers