

Node Mentoring Workshop “Sharing What We Node”

Middleware Breakout Session .NET

New Orleans, Louisiana
February 9-10, 2004



What are the Drivers for a Network Node?

- Program Drivers
 - EPA requirements
 - Improved data quality
 - Burden reduction
- IT Drivers
 - Streamlined processing of batch flows
 - Technology driven
 - Burden reduction - Maintenance and Support



Mississippi's Drivers

- Burden Reduction - Eliminate duplicate data entry
- Data Quality/Completeness
- Streamlining the flow of data
- Improved timeliness of data
- EPA requirements



Mississippi's Platform and Contractor Selection

- Platform selection
 - Familiarity with product
 - Price
 - Ease of use
- Contractor selection
 - Established relationship
 - Confidence in vendor
 - Product experience

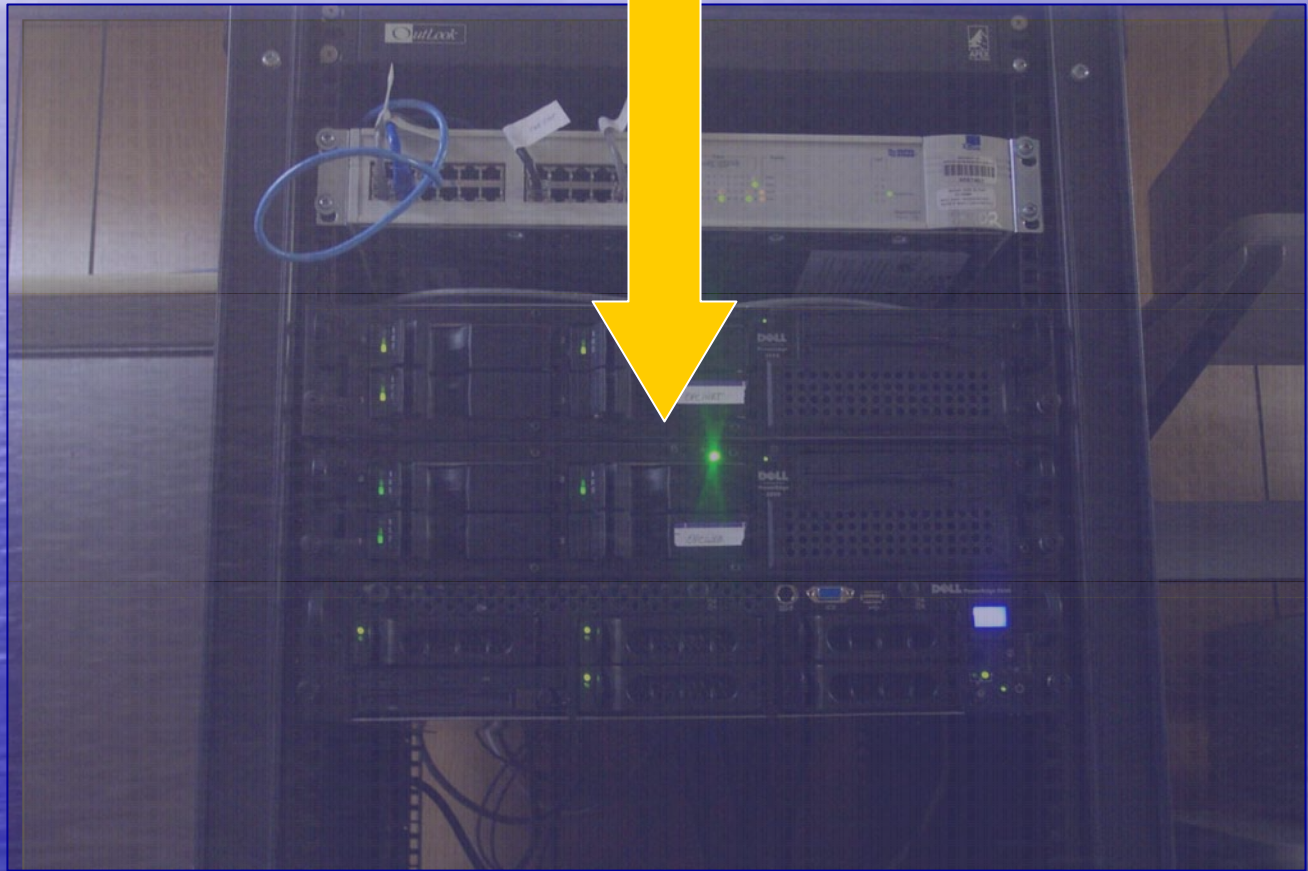


Mississippi's Hardware

- Current hardware platform, operating system, and information systems
 - Node Box:
 - Dell Power Edge 2650 with dual 2.4 GHz Pentium processors running Windows 2000/IIS
 - Backend Database:
 - Sun E4500 running Solaris OS 2.6 with quad 400 MHz processors running Oracle
 - Replicated Database:
 - Sun E4500 running Solaris OS 2.6 with single 400MHz processor running Oracle
 - Soon to be moved to a Sun 280R 900 MHz server



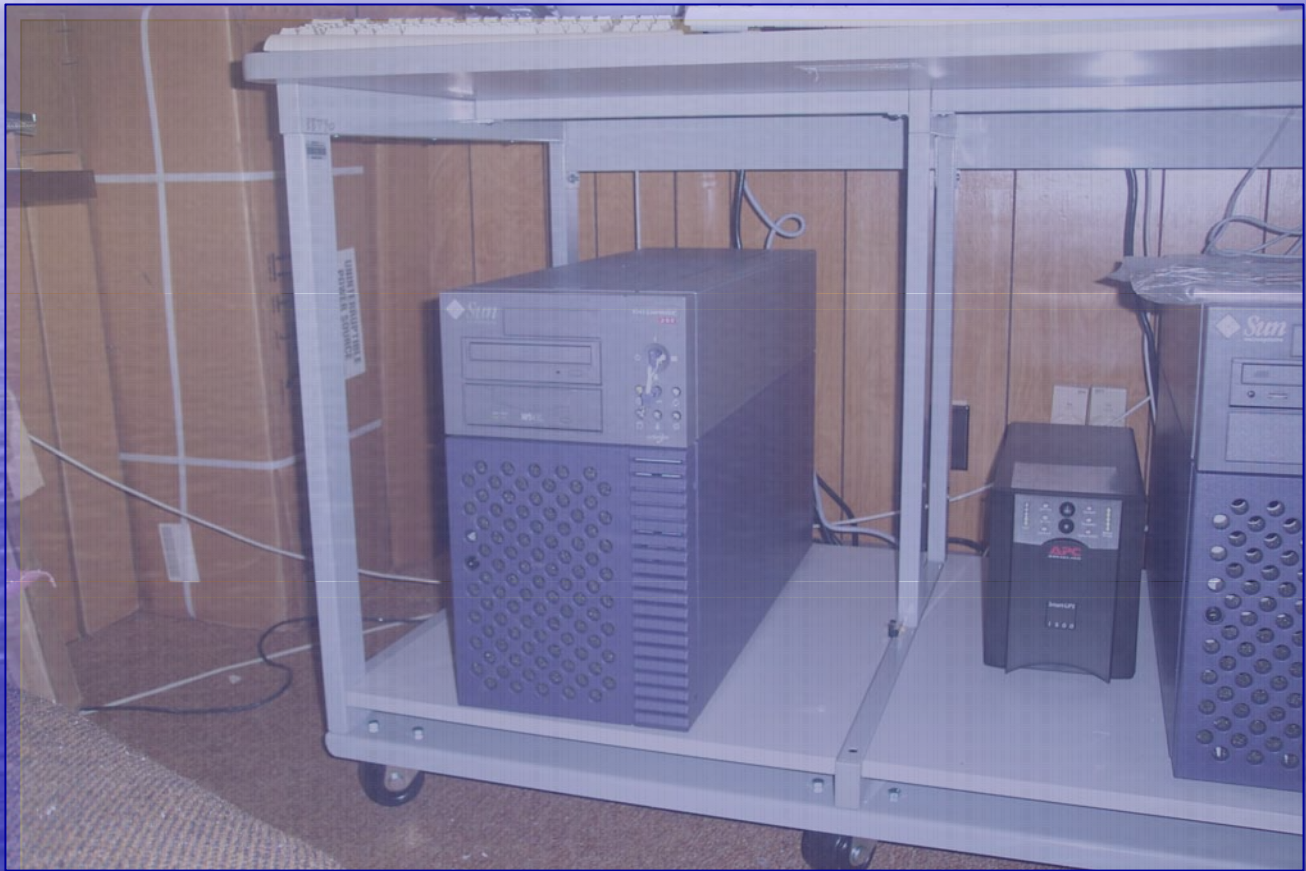
MS Node Server



MS Backend Database Server



MS Node Database Server



Mississippi's Software Setup

- Node Setup
 - Node Box: Configure IIS
 - Node Box: Download and install .Net Framework (latest) and WSE
 - Node Box: Install Node software following DNC
 - Replicated Database: Install Oracle
 - Replicated Database: Migrate selected data from backend

- Total Time
 - Configuration of IIS varies according to familiarity with IIS approx. 10 minutes
 - Download of Framework and WSE plus install 10-30 minutes with a high speed internet connection
 - Installation of Node software 5 minutes
 - Oracle installation 30 minutes
 - Replication varies from 1 hour to 4 (Done every night)



Mississippi's Challenges

- Software installation is easy when the DNC is properly followed.
- Most time consuming process is setting up the views and intermediate tables needed for the various flows of data to CDX on the backend system.
- Configuring .NET DIME Attachments to Interface with CDX Java Implementation.
- Some minor issues making sure output is configured properly to match appropriate schema.
- Data in state system may be aggregated differently than EPA system.



Mississippi's Staffing Requirements

- Staffing Requirements
 - Network Administrator/Hardware Specialist
 - Database Administrator
 - Developer
 - Contractor
- MDEQ Experience
 - Then – minimal ASP.NET and XML
 - Now – Basic working knowledge of C# and XML schema
- Training
 - Hands-on mentoring by Contractor
 - Formal training



How Was the Product Tested?

- Console Application Created to Test Each Component Independently
- .NET Generated HTML Forms Used to Test Web Service Tier
- Test Web Service Created to Test Complex Web Methods
- CDX Test Tools to Verify Compliance – Essential to Test DIME Attachments
- CDX Test Node Used to Test Asynchronous Client



What We Did to Set Up Flows?

- Replicate Production Database to Reporting Database
- Create Oracle Views for Each FRS Schema
- Utilized Oracle Provider for .NET for High Performance Access
- Data Loaded Into XML Data Classes
- XML Data Classes Serialized Into XML Documents



How Did We Map Data to Schema?

- Used .NET Tool to Create XML Data Classes from Schema
- SQL Query Results Loaded into Instance of XML Data Class for Each Schema
- Serialize XML Data Classes to XML Document (File or Memory Stream)
- XML Serialization Directives used to Exclude Data, Alter Element Names and Data Types



.NET Features Not Utilized

- Multiple Languages (VB to COBOL) Available but Only C# Was Used
- Visual Studio .NET allows you to create Stand-Alone, Client Server, Web Applications, and Windows Services
- Smart Controls for Wireless / PDA Devices
- .NET Compact Framework for Windows CE



Was .NET Easy to Use?

- .NET Utilities Creates Web Service Class from WSDL and XML Data Classes from Schemas
- Tiered Architecture Allowed Parallel Development and Independent Testing
- ADO.NET Creates Easy to Use, Disconnect Data Sets
- Visual Studio .NET Debugging Environment is Very Powerful to Isolate Code or Data Problems
- Visual Studio .NET Includes Database Development Tools



What Was CIBER's Experience?

- 25 years IT Experience
- Proficient in both Microsoft and Java Environments as well as Oracle, Microsoft SQL Server and IBM DB2 Databases
- Almost 2 Years Experience with .NET
- 8+ Years Object Oriented Architecture
- Environmental Experience with MDEQ, DOI-OSM, and CDC-ATSDR



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