ebXML Registry Repository

Open Forum 2003 on Metadata Registries
2-3:30 p.m.
21 January 2003

Alan Kotok, DISA
Tony Weida, Apelon
Monica J. Martin, Drake Certivo
Tutorial Outline

- The ebXML Registry and Repository
- Role of ebXML Reg/Rep in Business and Technology
- Basic Implementation Steps
- Implementation Challenges
- The ebXML Reg/Rep Uses in Multiple Architectures
- Implementation Use Cases
  - Automotive: General Motors
  - Cross-industry: DISA DRIve
  - Health Care: SAGE
- Panel Discussion
The ebXML Registry and Repository

- Provides services to enable information sharing.
- Enables business process integration.
- Provides mechanisms to store and retrieve persistent information required by the Registry Services.
Functional View of ebXML Reg/Rep

- Allows business to locate trading partners, capabilities, services, business processes, and objects and artifacts.
  - Links and semantic relationships
  - Publish and discover any content.
  - Content-specific validation and cataloging
  - Arbitrary classification
  - Content-based, ad hoc queries
- Can provide the domain model for and support interoperability for web services.

Source: UN/CEFACT eBusiness Architecture v0.83, 12 December 2002
Role of ebXML Reg/Rep in Business

- As a part of the ebXML vision, enable global trade with proven technologies.
  - Bridge eBusiness and enterprise processes and semantics.
  - Cover many partner interactions.
- Provide uniform methodology/means to register, discover, and retrieve registry objects using standard protocols.
- Provide an effective communication tool for business domain and operations.
## Registry Capabilities

<table>
<thead>
<tr>
<th>Directories</th>
<th>Basic Registries</th>
<th>Advanced Registries / Content Mgmt Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDAP Directory</td>
<td>UDDI Yahoo! Yellow Pages</td>
<td>ebXML Registry</td>
</tr>
</tbody>
</table>

Technical Role of ebXML Reg/Rep

- Event notification
- Content classification
  - User-defined taxonomies
  - Business artifact classification
- Content and knowledge management
  - Content-based publish and subscribe
  - User-defined relationships between content
  - Associations of internal and external classification schemes
- Discovery and retrieval
  - Federated SQL/XML queries
Basic Steps to Implement

- Identify business requirements.
- Identify artifacts, objects, or data.
- Evaluate tools.
- Review and prepare objects for registration.
- Define and set up information model.
- Define registry services.
- Describe associations, relationships between objects.
- Understand processes to support – security, metadata, and use.
Implementation Challenges

- Identifying business needs.
  - Instill confidence.
  - Public or private registry?
- Define registry information model and classify objects.
- Selecting vendors and securing expertise.
- Defining and implementing processes internally and with trading partners to support.
- Defining and implementing access control policies.
- Integrating legacy applications and processes.
ebXML Reg/Rep in an Multiple Architectures

- Achieve agreements and collaborate to store, discover and use:
  - System capabilities
  - A decision-making structure for eGovernment
  - Business entities and services in an eMarketplace
  - Common business processes to enable global trade
  - Business documents for trading partner use

- Enable service decision-making and delivery:
  - Profiles to drive implementations in health care
  - Medical or clinical data to improve diagnosis and health care service delivery
# Implementation Use Cases

<table>
<thead>
<tr>
<th>Project / Standards</th>
<th>Stakeholders</th>
<th>Progress</th>
<th>Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISA - Finance, Mortgage Banking, Standards, Travel, Grocery, etc.</td>
<td>DISA ASC X12 IFX MISMO OTA XML Global</td>
<td>Created registry with MISMO, IFX using NAICS, UN/SPSC. Tests involve CPP and SOAP messaging.</td>
<td>Add new testing features. Add more classifications and objects – registering objects in a more granular manner.</td>
</tr>
<tr>
<td>General Motors – Automotive Software Factory Enabler Project</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ebRS and ebRIM 2.0</td>
<td></td>
<td></td>
<td></td>
</tr>
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</tr>
<tr>
<td>---------------------</td>
<td>--------------</td>
<td>----------</td>
<td>-------</td>
</tr>
</tbody>
</table>
| US Government and Health Care – HL7  
 ebRS and ebRIM 2.1 | HL7  
 NIST  
 Sun Microsystems | For HDF effort, study how to use Reg/Rep to store V2 Conformance Profiles and V3 Templates.  
 Experimental Reg/Rep online | Study HL7 processes and artifacts to understand how to effectively use the ebXML Reg/Rep – metadata, storage, query, retrieval and process integration. In future - MWB Interface and registry host. |
| Health Care – Institutions, Providers - Advanced Technology Program  
 ebRS and ebRIM 2.1 | NIST  
 Apelon, Inc.  
 Mayo Clinic  
 IDX  
 Univ. of NE  
 Univ. of Utah  
 Intermountain Health Care  
 Stanford Medical Informatics | Continue to define standardized shareable clinical guidelines using common vocabularies. | Identify metadata for guidelines and how it is mapped to RIM.  
 Develop a guideline registry, that is web-enabled, to facilitate SAGE. |
## Implementation Use Cases

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</thead>
<tbody>
<tr>
<td>Pacific Rim - KIEC Reg/Rep now REMKO</td>
<td>KIEC Iron and Steel (KISA) Other industry players</td>
<td>Completed v.1.0 and first development stage. <strong>Ten Pacific Rim countries plan to implement ebXML by 2005.</strong></td>
<td>Continue effort with Iron and Steel industry to support their National Central Registry and Repository. Upgrade v3.0 planned. Interconnect NCRR, and Iron and Steel.</td>
</tr>
<tr>
<td>Pacific Rim - KTNET</td>
<td>KTNET (XENI-Global Business Registry, GXML Hub-messaging center) Pan-Asia Alliance (PAA) POSData Innodigital</td>
<td>Launched the XENI RegRep in November 2002, which hosts XML schema, CPP and EDI libraries.</td>
<td>Have plans to participate and/or collaborate with ebXML IIC in test arena. Will promote BPMS Engine adoption.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Implementation Use Cases

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<th>Progress</th>
<th>Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>edRS/RIM 3.0 planned</td>
<td>EDAT: 1.0; XiO: 3.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
General Motors: Software Factory Enabler Project

- Use ebXML to extend the service-oriented architecture and enhance B2B to:
  - Allow loose coupling of components for scalability and extensibility.
  - Improved deployment and execution.
  - Encouraged buy vs. build model.
  - Lowered costs and increase business agility.

- Create a reference implementation that integrated A2A and B2B complex interactions.
GM: Need for ebXML Reg/Rep

- A registry serves multiple needs (for example, search for APIs or trading partner relationships).
- Reg/Rep is the latest evolution in B2B electronic business.
  - Point-to-point $\rightarrow$ B2B Exchanges $\rightarrow$ ebXML Reg/Rep
- Enables publishing and discovery of trading documents.
- Enables businesses to find partners and services.
- Consists of a database of shared information:
  - CPP, core components, schemas, business processes, UML models, business documents, software components, etc.
- Can provide an electronic yellow pages for publication, classification and discovery of businesses, products, services.
- Can provide an electronic bulletin board for dynamic sharing of content.
GM: Reg/Rep Use Case for Reference Implementation

- SubmitMetadata
- SubmitAttachmentDocs
- TaxonomyDiscovery
- ClassificationsDiscovery
- QueryObjects
- GraphAssociations
- CheckAuditTrail
- ProvideSecurity
- RetrieveDocuments
General Motors: Technical View of ebXML Reg/Rep

- Original code donated by Sun.
- Developed in open source.
- Developed entirely in Java and fully compliant with Reg/Rep v.2.0 specification.
- Uses Java 2 Enterprise Edition APIs.
- Uses Java APIs for XML from Sun.
  - JAXP, JAXB, JAX-RPC, JAXM, JAXR
General Motors: Processes

1. Review OAG’s BODs
2. Map CC & BPS to Enterprise SOA Implementation
3. Publish Related Trading Docs (BPS/CC)
5. Transact Business
6. Buy System

GM

Fleet Buying Company

Searches For Business Partners
Download Process Specs and Core Components

Business Registry

Business Process Spec
Core Components

XML
GM: Registry Functionality

- Discovery – How to find trading partners
  - Access Reg/Rep as a Web Service via a URL.
  - Search all “Services” exposed as web services.
  - Search for all trading partners – “Organizations”.
  - Filter the Organizations.
    - Standard Taxonomies Filter
    - Custom Taxonomies (BPSS) Filter

- Explore the trading partner documents.
  - Explore the Documents associated with the BPSS
    - Through the GUI mapping
    - Find document through ad hoc query
  - Download the CPA, BPSS and CC from the Repository.

- Create and submit metadata.
  - GUI browser
  - XML content
GM: Implementation Challenges

- Need for federations to handle multiple GM divisions (Now in ebXML Reg/Rep 3.0).
- Minor issue with digital signature validation (Resolved during development).
- Overall performance concerns with XML (Not specific to ebXML Reg/Rep).
For More Information …

Contact Mike Wheaton
Sun Microsystems
michael.wheaton@sun.com

Thanks to General Motors, AIAG, Sybase and others for their contributions.
DISA Registry Initiative (DRIve)

Open Forum 2003 on Metadata Registries

Alan Kotok
Data Interchange Standards Association

21 January 2003
DISA Registry Initiative (DRIve)

- ebXML-compliant (v 2.0) registry of DISA standards objects
- Allow for interconnections with other registries and services.
- Beginning with vertical industry affiliates
- Registry only, NOT a repository
- Software donated by XML Global.

http://www.disa.org/drive/
Welcome to DRIve: the DISA Registry Initiative

- A registry of standards and specifications of DISA affiliates
- Compliant with ebXML registry specifications
- PLEASE NOTE: All entries shown are for test and demonstration purposes only
- Feel free to browse; registration NOT needed for guest privileges.
- We thank XML Global Technologies for its generous donation of the software.
### Top-Level View of DRIve

#### Browse Lookup
- **Name:**
  - Administration
  - External registries
  - XML.org
  - DISA affiliate standards
  - Cross-industry
    - ASC X12
    - Finance
    - Food/Grocery
    - Manufacturing
    - Travel
  - Organizations
- **Description:**
  - Cross references to other standards
  - XML.org registry operated by DISA
  - Data Interchange Standards
  - Cross-industry standards
  - Accredited Standards Committees
  - Vertical industry standards
  - Financial services industry
  - Food and grocery industries
  - Manufacturing industries
  - Travel industry
  - Organizations registered with DISA
  - Taxonomies for classifying registries
  - North American Industry Classification System
  - UN Standard Products and Service Classification

#### Documentation
- User Guide (HTML)
- User Guide (PDF)
Example: MISMO v.2.1
# Title Req/Rep Metadata (1)

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key</td>
<td>-</td>
</tr>
<tr>
<td>Id</td>
<td>-</td>
</tr>
<tr>
<td>Name</td>
<td>MISMO 2.1, Title Rqst/Resp</td>
</tr>
<tr>
<td>Major Version</td>
<td>1</td>
</tr>
<tr>
<td>Minor Version</td>
<td>1</td>
</tr>
<tr>
<td>User Version</td>
<td>-</td>
</tr>
<tr>
<td>Object Type</td>
<td>-</td>
</tr>
<tr>
<td>Status</td>
<td>Approved</td>
</tr>
<tr>
<td>Description</td>
<td>Title Request and Response, includes DTDs, examples, and data dictionary. For demonstration only.</td>
</tr>
<tr>
<td>Remote Content</td>
<td>true</td>
</tr>
<tr>
<td>Content url</td>
<td><a href="http://www.mismo.org/mismo/docs/dftspcl/Title_v_2_1.zip">http://www.mismo.org/mismo/docs/dftspcl/Title_v_2_1.zip</a></td>
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</table>
### Title Req/Rep Metadata (2)

<table>
<thead>
<tr>
<th>Classifications</th>
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<tbody>
<tr>
<td><strong>Name</strong></td>
</tr>
<tr>
<td>NAICS, 522292</td>
</tr>
<tr>
<td>UNSPSC, 80131700</td>
</tr>
<tr>
<td>Version 2.1</td>
</tr>
<tr>
<td>NAICS, 541191</td>
</tr>
<tr>
<td>UNSPSC, 84121900</td>
</tr>
<tr>
<td>XML.Org, MISMO entry</td>
</tr>
<tr>
<td>NAICS, 52231</td>
</tr>
</tbody>
</table>
Associations: IFX Forum 1.3 Schema

**Crosswalk:** IFX Forum, v 1.3, XML Schema

- Extends IFX Forum v 1.2, XML Schema
- RelatedTo IFX Forum, v 1.3, Documentation
- EquivalentTo IFX Forum, v 1.3, XML DTD
# Business Process/CPP Testing

## Attributes

<table>
<thead>
<tr>
<th>Key</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Id</td>
<td>urn:uuid:6a565b03-3031-4643-4544-244f7c3e5c5b</td>
</tr>
<tr>
<td>Name</td>
<td>Business process for CPPs</td>
</tr>
<tr>
<td>Major Version</td>
<td>1</td>
</tr>
<tr>
<td>Minor Version</td>
<td>1</td>
</tr>
<tr>
<td>Object Type:</td>
<td>Process</td>
</tr>
<tr>
<td>Status</td>
<td>Approved</td>
</tr>
<tr>
<td>Description</td>
<td>Simple BP definition for CPP generation</td>
</tr>
<tr>
<td>Remote Content</td>
<td>false</td>
</tr>
</tbody>
</table>

## Outgoing Associations

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Participant</th>
</tr>
</thead>
</table>

No associations found.
<table>
<thead>
<tr>
<th>Attributes</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key</td>
<td>test_collaboration_protocol_profile</td>
</tr>
<tr>
<td>Id</td>
<td>urn:uuid:03204e09-1c03-6064-7e5d-21133f20257e</td>
</tr>
<tr>
<td>Name</td>
<td>XML Global ebXML testing</td>
</tr>
<tr>
<td>Major Version</td>
<td>1</td>
</tr>
<tr>
<td>Minor Version</td>
<td>0</td>
</tr>
<tr>
<td>User Version</td>
<td></td>
</tr>
<tr>
<td>Object Version</td>
<td></td>
</tr>
<tr>
<td>Object Type</td>
<td>CPP</td>
</tr>
<tr>
<td>Status</td>
<td>Approved</td>
</tr>
<tr>
<td>Description</td>
<td>Test point for ebMS interfacing. Can be used to test ebXML interoperability.</td>
</tr>
<tr>
<td>Remote Content</td>
<td>false</td>
</tr>
</tbody>
</table>
For More Information ...

DRIve site: http://www.disa.org/drive/

or contact Alan Kotok

Data Interchange Standards Association

akotok@disa.org, +1 703-518-4174

http://www.disa.org

<E-Business*Standards*Today/>

Daily news wire: http://www.disa.org/dailywire/
SAGE Clinical Guideline Registry

Open Forum 2003 on Metadata Registries

Tony Weida
Apelon

21 January 2003
Clinical Guidelines

- Capture best practices for providing medical care.

**Type 2 Diabetes**

- **Evaluation**
  - If Needed

- **Needs Stabilization?**
  - **yes**
    - **Initial stabilization for outpatients requiring immediate insulin treatment**
  - **no**

- **Recommend self-management program:**
  - Nutrition therapy
  - Physical Activity
  - Education for self-management
  - Foot care

- **Set individualized treatment goals:**
  - Glycemic control: HbA1c < 7%
  - Lipid levels: LDL < 130 mg/dl
  - BP control: BP < 130/85 mm Hg
  - ASA unless contraindicated
  - Tobacco cessation if indicated

- **Are Treatment Goals Met?**
  - **no**
    - Treatment goals not met:
      - Modify treatment based on appropriate guideline and/or
      - See Glycemic Control Algorithm and/or
      - Consider referral to diabetes health team or specialists
  - **yes**

*Type 2 Diabetes Guideline Flow Diagram, courtesy of Institute for Clinical Systems Improvement (ICSI)*
Organization

- NIST Advanced Technology Program
- Three year grant, $18 million
- Collaboration
  - Apelon
  - IDX (lead)
  - Intermountain Healthcare
  - Mayo Clinic
  - Stanford Medical Informatics
  - University of Nebraska Medical Center
Mission

- Develop the technology infrastructure to enable *computable* clinical guidelines, that will be shareable and interoperable across multiple clinical information system platforms.

Goals

- Author and encode clinical practice guidelines in a standard computable format.
- Deploy those guidelines easily within any standards-conforming clinical information system.
Artifacts

- **Shareable Active Guideline Environment (SAGE)**
  - Interoperable guideline model
  - Interoperable guideline workbench (Protégé)
  - Guideline deployment system
  - Web-based guideline registry
Registry Implementation

- Early prototype
- Developed at Apelon by Derrick Butler.
- Based on ebXML Registry 2.1 specifications
- Using ebxmlrr software from SourceForge
- Integrates Apelon’s Distributed Terminology Server (DTS).
- Now supports submission, basic indexing, and retrieval of guideline packages.
- Aims at robust collaboration and publishing.
Terminology-Powered Registry

- Standard terminology makes guidelines easier to:
  - Author
  - Explain and understand
  - Share
  - Localize
  - Execute

- Similarly for registered guideline metadata
- Generally for other types of registry content
Registration Architecture

Guideline Registry Client

ebXML Registry Server

Apelon DTS Server
Guideline Registry Client
Guideline Package
Guideline Metadata (sample)

![Guideline Editor](image)

- **Title:** cervicalcancerstroke
- **Description:**
- **Rights:**
- **Creator:** tony weida
- **Submitter:** tony weida
- **Date Available:** 2003-01-17 14:06:54.0
- **Date Modified:** 2003-01-17 14:06:57.0
- **MeSH Subject:**
- **Disease/Condition:**
- **Qualifier:**
Metadata Selection via DTS

Select DTS Concept

- SNOMED CT Concept (SNOMED RT+CTV3)
- Attribute (attribute)
- Body structure (body structure)
- Context-dependent categories (context-dependent category)
- Disease (disorder)
- Events (event)
- Finding (finding)

Maximum Results: 250

Search For: cervix

Search Results: Matches Found: 250

- Carcinoma in situ of cervix uteri [233.1] (ICD)
- Carcinoma in situ of endocervix (disorder)
- Carcinoma in situ of exocervix (disorder)
- Carcinoma in situ of uterine cervix (disorder)
- Carcinoma of cervical part of esophagus (disorder)
- Carcinoma of cervix (disorder)
- Carcinoma of cervix stage 0 (disorder)
- Curettage of cervix (procedure)
- Cauterization of cervix (procedure)
- Cauterization of lesion of cervix (procedure)
- Cautery of cervix; cryocautery, initial or repeat [57511] (CPT)
- Cautery of cervix; electro or thermal [57510] (CPT)
- Cautery of cervix; laser ablation [57513] (CPT)
- Central cervical cord injury, without bony injury, C1-4 (disorder)
- Central cervical cord injury, without bony injury, C5-7 (disorder)

Concept Name
- Carcinoma of cervix (disorder)

Concept Code
- D7-F06ED
- 285432005

Concept Roles

Name | Value
--- | ---
Associated morphology (attribute) | Malignant neoplasm of primary, secondary, or uncertain origin (morphologic abnormality)
Associated morphology (attribute) | Malignant neoplasm, primary (morphologic abnormality)
Finding site (attribute) | Cervix uteri structure (body structure)
Pathological process (qualifier value) | Malignant neoplastic process (qualifier value)
Pathological process (qualifier value) | Neoplastic process (qualifier value)

Concept Properties

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNOMED_CODE</td>
<td>D7-F06ED</td>
</tr>
<tr>
<td>SNOMED_DESCRIPTION_ID</td>
<td>424478017</td>
</tr>
<tr>
<td>SNOMED_DESCRIPTION_ID</td>
<td>679434018</td>
</tr>
<tr>
<td>SNOMED_ID</td>
<td>285432005</td>
</tr>
<tr>
<td>SNOMED_PREFERRED_TERM</td>
<td>Carcinoma of cervix</td>
</tr>
<tr>
<td>SNOMED_TERM</td>
<td>Carcinoma of cervix</td>
</tr>
<tr>
<td>SNOMED_PREFERRED_TERM</td>
<td>Carcinoma of cervix (disorder)</td>
</tr>
<tr>
<td>SNOMED_DESCRIPTION</td>
<td>424478017; Carcinoma of cervix [1] 0</td>
</tr>
<tr>
<td>SNOMED_DESCRIPTION</td>
<td>679434018; Carcinoma of cervix (disorder) [3] 0</td>
</tr>
</tbody>
</table>

Select
Workflow Vision - Phase I

- Authoring and publishing
  1. Create guideline with standard terminology.
Workflow Vision - Phase I

- Authoring and publishing
  1. Create guideline with standard terminology
  2. Shareable guideline submitted to registry with metadata chosen from standard terminologies.

Guideline Workbench

Guideline Registry Client

Apelon DTS

Medical Informatics Dept.

ebXML Registry Server
Workflow Vision - Phase II

- Search and retrieval
  1. Browse or query registry for guideline of interest.

```
Hospital System

Guideline Registry Client

Apelon DTS

ebXML Registry Server
```

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Workflow Vision - Phase II

- Search and retrieval
  1. Browse or query registry for guideline of interest.
  2. Select and retrieve guideline.

Hospital System

Guideline Workbench

Guideline Registry Client

Apelon DTS

ebXML Registry Server
Workflow Vision - Phase III

- Localization and deployment
  1. Tailor guideline to local needs and resources.

Guideline Workbench

Apelon DTS

Includes mappings
To local terms

Hospital System
Localization and deployment

1. Tailor guideline to local needs and resources
2. Register localized guideline in local registry.
Localization and deployment

1. Tailor guideline to local needs and resources.
2. Register localized guideline in local registry.
3. Deploy localized guideline in Clinical Information System.
Status and Plans

- Early prototype
- Next steps
  - More elaborate metadata
  - Package dependencies with versioning
  - Terminology service plug-in for registry server
- Long-term goals
  - Validation within SAGE
  - Wider deployment
Guideline Registry Contact

- Tony Weida
  - weida@apelon.com
  - 917-992-9728
- Apelon
  - www.apelon.com
Summary and Questions

- ebXML Registry/Repository is multi-faceted and answers many diverse business needs – process, technical and functional.
- Challenges lie in defining and implementing processes that Reg/Rep supports.
- Record of and plans for adoption and deployment support its utility in the marketplace. Reg/Rep v3.0 functionality makes it even more pervasive.

Questions welcome in panel discussion.
Panel Discussion

- Kathryn Breininger, The Boeing Company
- Alan Kotok, DISA
- Tony Weida, Apelon
- Facilitator-Monica J. Martin, Drake Certivo
For More Information…

NOIE: Victor Pawley, victor.pawley@noie.gov.au
DISA: Alan Kotok, akotok@disa.org
EDAT: David Webber, david.webber@xmlglobal.com
GM: Mike Wheaton, Michael.Wheaton@sun.com
HL7: John Silva, john.silva@philips.com
KIEC (REMKO): Jasmine Jang, jasmine@kiec.or.kr
KTNET: Chaemee Kim, cmkim@ktnet.com
SAGE: Tony Weida, tweida@apelon.com
XiO: Zheng Liang, aheng.liang@mbs.gov.on.ca
General: Monica J. Martin, mmartin@certivo.net
For More Information…

DISA: http://www.disa.org/drive/
EDAT: http://www.xmlglobal.com/cst/customer_cdngovt.jsp
GM: Contact participants.
HL7: http://groups.yahoo.com/group/HL7-Conformance/files/
KIEC (REMKO): http://www.kiec.or.kr/english/index.html
SAGE: Contact Weida.
XiO: Contact Liang.