UDDI: The Web Services Registry Standard

OASIS UDDI Specification Technical Committee

Gartner Application Integration and Web Services Summit
Orlando, 17 November 2004

Agenda

- UDDI Update - Luc Clément, Systinet, Co-chair OASIS UDDI Spec TC
- Case Studies
  - "UDDI at The Hartford" - Ben Moreland, Director - Application Infrastructure Delivery, The Hartford
  - "Schwab UDDI Experiences" - Dylan Lewis, Technical Director, Charles Schwab
- Q&A
- Interoperability Demo: BookWorld Inc.
  - Rick Allen, IBM Software Group
  - Luc Clement, Systinet
  - Daniel Feygin, UnitSpace
  - Claus von Riegen, SAP AG
  - Zhe Wu, Oracle
- Q&A
How UDDI Works

1. SW companies, standards bodies, and programmers populate the registry with descriptions of different types of services.

2. Businesses populate the registry with descriptions of the services they support.

3. UBR assigns a programmatically unique identifier to each service and business registration.

4. Marketplaces, search engines, and business apps query the registry to discover services at other companies.

5. Business uses this data to facilitate easier integration with each other over the Web.

Web Services Registry Protocol

- Universal Description, Discovery and Integration
- UDDI protocol
  - Inquiry, Publish, and Subscription APIs
  - A data model with built-in extensibility using metadata
- Design-time
  - Facilitates visibility and reuse
- Runtime – protocol for an adaptive enterprise
  - Dynamic location
  - Dynamic binding
  - Dynamic discovery

http://www.oasis-open.org
member.services@oasis-open.org
UDDI Specification Evolution

- UDDI v1 Specifications - 2000
  - UDDI Programmer's API 1.0
  - UDDI Data Structure Reference V1.0
- Transition made from:
  - The Web services Standard Registry (i.e. UBR)
  - The Web services Registry Standard

- UDDI v2 specifications – OASIS Standard – Sep 2002
  - UDDI Version 2 API Specification
  - UDDI Version 2 Data Structure
  - UDDI Version 2 Replication Specification

UDDI v3

- Key focus: enterprise readiness
- Key features
  - Information Model Improvements
  - Extended Discovery Features
  - Support for digital signatures
  - Publisher Assigned Keys
    - Support for Multi-Registry Environment
    - Human-friendly, URI-based keys
  - Subscription API
- Submitted to OASIS and formation of the OASIS UDDI Spec TC – July 2002
- UDDI v3 specifications – OASIS Standard by Jan 05
  - UDDI Version 3.0.1 and 3.0.2
  - Extensive vendor and community feedback and interoperability tested version of the spec
Registry Interactions

OASIS

Registry: Foundation for SOA

- Frank Kenney, Gartner Research Analyst
  - “There’s tremendous power for SOA governance if you store process, policy, SLA’s, and related information about services in a registry. Gartner believes that registries will be essential to minimally discover and document services and preferably to enable the governance function.”

- Registry: SOA’s system of record
  - Categorized index of services, interfaces and their metadata
Modeling your enterprise

- Definition of taxonomies to model business services
  - Semantic information that enables reuse of services
  - Lifecycle
    - Lifecycle stages: Design, develop, test, deploy, configure, provision, discover, operate, manage, and maintain services
  - Availability and performance characteristics of the service - QoS
- Essence: Taxonomies key to a semantic rich registry

Why do you need a standard

- Standardization:
  - Interoperability
  - Broad platform support
  - Broad vendor support:
    - Acumen Technology
    - Apache.org
    - BEA
    - Bindingpoint
    - Cape Clear Software
    - Fujitsu
    - IBM
    - IGNIA
    - Microsoft
    - Novell
    - Oracle
    - SAP AG
    - Select Business Solutions
    - Sun Microsystems, Inc
    - Systinet
    - webMethods
  - UDDI is the core and open registry standard for Web services and enterprise SOA
Standards Convergence on UDDI

- Web services specifications are now converging to UDDI
- Several domain specific standards
  - Policy - mapping of WS-policy onto UDDI
  - Orchestration - publication and discovery of BPEL4WS abstract processes
  - Management - publication and discovery of metrics and manageability provider information - WSDM
  - Portal Integration - publication and discovery of WSRP Producer and Portlet services

Next on the agenda

- Case Studies
  - “UDDI at The Hartford” – Ben Moreland, Director - Application Infrastructure Delivery, The Hartford
  - “Schwab UDDI Experiences”– Dylan Lewis, Technical Director, Charles Schwab
  - Q&A

- Interoperability Demo: BookWorld Inc.

- Material: Complete your evaluation forms
UDDI at The Hartford

November 17, 2004

Benjamin Moreland
Director, Application Infrastructure Delivery

The Hartford

- Founded in 1810
- One of the largest investment and insurance companies in the United States.
- 30,000 employees
- Two Operations:
  - Hartford P&C
  - Hartford Life
Outline

- P&C SOA Reference Arch. History
- SEMCI
- UDDI Solution
- Summary

P&C SOA Reference Arch. History

- Implementing SOA since 1999
- Local registries
- 2003 – Began enterprise SOA approach. Purchased SOM and UDDI tools
- 2004 – SOM & UDDI tools in production
P&C SEMCI

- ACORD (1970) sets standards
  - www.acord.com
- Single Entry Multiple Carrier Interface
  - www.semci.org
- A leader since 1997 in the commercial SEMCI space – first app in use
- Real-time request/response XML application (quote, schedule & add)

P&C SEMCI (cont)

- SEMCI request/reply process
  - Accept ACORD XML message
  - Authenticate
  - Validate (rule-based edits)
  - Translate to main frame (AL3)
  - Quote from main frame
  - Translate to XML
  - Echo
  - Respond with ACORD XML message
1 Minute SOA

Find, Bind & Execute

- UDDI Registry
- Service Consumer
- SOM
- Service Provider
- Contract

Find
Publish

Bind & Execute

SOA SEMCI issues

- Multiple versions of ACORD specs
  - AL3, CR 2, 1.0, 1.1, 1.3, 2.0
- Multiple Business Messages
  - Auto, W/C, BOP, Property, GL
  - Add, Quote, Inquiry, Schedule
- Multiple Business Segments (MM, SC)
- Multiple versions of app/service releases
- Multiple environments (Dev, QA, Prod)
- Scalability
- Reduced maintenance
SOA SEMCI Application

The Hartford UDDI Solution (Design Time)

Architect, Developer

Service request

TModel

Service/TModel

← Binding Template [WSDL location]
The Hartford UDDI Solution (Runtime)

Successful SOA

- Technology
  - Reference Architecture, Roadmaps
- Operations
  - Def’n of a service, UDDI, SLAs, Testing, Support
- Organization
  - Support of first two, SOA incentives
UDDI Summary

- **UDDI**
  - Provides versioning capabilities
  - Simplifies design
  - Provides greater flexibility
  - Design time & runtime benefits (reuse, modifiable, manageable, buildable)
  - Reduces maintenance

- **Final Question**
  - What should be in UDDI?

Thank you

Benjamin Moreland
The Hartford Financial Services Group
Director, Application Infrastructure Delivery

Find me on:
https://www.linkedin.com
Schwab UDDI Experiences

Dylan Lewis
Nov 2004

Introduction

• Project Overview
• UDDI Function
• UDDI Implementation
  – Physical Manifestation
  – Best Practices 2 and UDDI Version 3
  – Endpoints
  – Policies
  – Directory Client
• Conclusions
Request Reply Bus

- Reusable Infrastructure to enable any service requester to invoke a service, in any environment, using industry standard mechanisms
- Implementation concentrated on Mainframe and Java providers, .NET and Java requestors using SOAP/HTTP.

Request Reply Bus Architecture

+ Tools and Processes
UDDI Function

- Both runtime and development time usage.
- Development time is 'traditional' service information and WSDL reference.
- Runtime usage allows the rest of the infrastructure to make decisions based almost entirely on directory contents.

UDDI Implementation
Physical Manifestation

- Uses more ‘complete’ mapping.
- Positions for the future w.r.t. to tools e.t.c. and precluded need for migration project.
- Needed to load custom schema and develop custom tools.

UDDI Version 3 Key

- UDDI Version 2 keys are UUIDs
- Version 3 keys are human readable.
- We implemented a mapping web service to allow Applications to use V3 keys.
- Directory Client performs key mapping.
- This will prevent future application changes.

<table>
<thead>
<tr>
<th>V3_KEY</th>
<th>V2_KEY</th>
</tr>
</thead>
<tbody>
<tr>
<td>uddl_schwab.com:service.PerformTrade</td>
<td>621ED516-CF90-3302-AD46-9478E84000E2</td>
</tr>
</tbody>
</table>
Endpoints

- WSDL contains http://null as the endpoint.
- Directory Contains ‘Public’ and ‘Private’ Endpoints
- Client looks up Public Endpoint at runtime.
- Intermediary looks up multiple ‘private’ endpoints and selects one of the URLs

Polices

- Majority of runtime behavior is based on ‘policies’
- E.g. logging policy, various routing policies, security policy e.t.c.
- Policies are attached to ‘service’ or ‘port’ only.
- Most policies are represented by XML referenced by OverviewURLs in UDDI.
- Implemented prior to WS-PolicyAttachment (et al)
Directory Client and Caching

- Components using the UDDI directory, particularly at runtime, use a Schwab built directory client API.
  - Implements a caching scheme
  - Abstracts whether JAX-R, UDDI4J, JAX-RPC, e.t.c. are used to access UDDI
  - Simplifies directory usage for calling components e.g. specialized APIs to return policies.

Data Model
Review

Review 2
Summary/Conclusions

- Remember WSDL/XML is not stored in directory
- Many UDDI APIs to choose from – very confusing picture in recent past.
- Nearly everything is a Tmodel which is simple and complex at the same time.
- Expecting more tooling such as built in policy support.
Interoperability Demo: BookWorld Inc.

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Setting the stage

- The Corporate Purchaser for BookWorld Inc.
  - monitors inventory level
  - buys books on behalf of the entirety of the chain
- Store locations
  - Centralized Outlet Inventory Level Service
  - Flagship store
- Inventory Consolidation and Procurement Service
  - Invokes store inventory level services
  - Invoke BookWorld suppliers’ Supplier Availability and Order Services

Our Goal

- Demonstrate the advantages of registry as a foundation of SOA
  - Transparency
  - Built in flexibility/easy adaptation to meet dynamic business needs
  - Reduce costs of inevitable change/evolution
- UDDI as a standard and implementation is reality:
  - 5 vendors involved in the demo
  - different UDDI registry implementations
  - different UDDI client implementations
Setting the Stage – UDDI Registries and Clients

Made easier with test registries
Initial State

The BookWorld Procurement Client
Start the client and invoke inventory check

Inv & Consolidation Svc Discovers Stores and Suppliers
Store inventory check performed and book orders placed

Flagship Store Inventory Level Service Added
Hosted Outlet Store Inventory Broker Service Added

New Supplier Added
Inventory Check Performed

New stores and suppliers discovered

http://www.oasis-open.org
member.services@oasis-open.org
New store inventories checked and new source of suppliers available

Recap

- Registry as a foundation of SOA
  - Transparency
  - Built in flexibility/easy adaptation to meet dynamic business needs
  - Reduce costs of inevitable change/evolution
- Design-time
  - Facilitates visibility and reuse
- Same infrastructure for runtime and design-time
- Taxonomies - key to a semantic rich registry
- UDDI standard and implementations are realities:
  - UDDI is a mature spec with
    - Proven interoperability
    - broad vendor support for registries and clients
    - Broad platform support
Contact and information

- Presenters:
  - Dylan Lewis, Technical Director, Charles Schwab
  - Ben Moreland, Manager - Application Infrastructure Delivery, The Hartford
  - Rick Allen, IBM Software Group
  - Luc Clément, Systinet
  - Daniel Feygin, UnitSpace
  - Claus von Riegen, SAP AG
  - Zhe Wu, Oracle

- Additional information:
  - Resource Guide
  - White Papers: Executive and Technical WP

- Material: Complete your evaluation forms