Interoperability Through Community

Apache Stonehenge
AMQP & Apache Qpid

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APACHE STONEHENGE

Kent Brown, Product Manager, Microsoft

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73%
## WS-* Core Standards

<table>
<thead>
<tr>
<th>Standard</th>
<th>Type</th>
<th>Date</th>
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<tbody>
<tr>
<td>WS-ReliableMessaging 1.2</td>
<td>OASIS Standard</td>
<td>5 February 2009</td>
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<td>WS-Coordination 1.2</td>
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<tr>
<td>WS-AtomicTransaction 1.2</td>
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<tr>
<td>WS-Security 1.0 / 1.1</td>
<td>OASIS Standard</td>
<td>March 2004 / 1 February 2006</td>
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<td>WS-SecureConversation 1.4</td>
<td>OASIS Standard</td>
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<td>WS-Trust 1.4</td>
<td>OASIS Standard</td>
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<td>WS-Policy 1.5</td>
<td>W3C Recommendation</td>
<td>4 September 2007</td>
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<td>WS-Addressing 1.0</td>
<td>W3C Recommendation</td>
<td>9 May 2006</td>
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<td>SOAP 1.2</td>
<td>W3C Recommendation</td>
<td>24 June 2003*</td>
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<td>WSDL 1.1</td>
<td>W3C Note</td>
<td>15 March 2001</td>
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<td>SOAP MTOM</td>
<td>W3C Recommendation</td>
<td>25 January 2005</td>
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WS-* Specification Process

Step 1
Develop
Specification Published

Step 2
Broader Participation
Feedback and Interop Workshops
Revise spec

Step 3
Standardization
Standards Org

Step 4
Profiling
WS-I, HL7, ACORD, Devices Profile

Step 5
Testing
WS-I, Plugfests, Stonehenge

Increasing Industry Participation

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Project Stonehenge
Stonehenge Goals

- Open, community-driven interoperability testing
- Real-world interoperability scenarios
- Practical interoperability guidance
- The place to go when you are stuck
StockTrader

http://cwiki.apache.org/STONEHENGGE/index.html
Evolution of Stonehenge

- Released M1
  - Got Microsoft and WSO2 versions cleaned up, packaged, tested, and documented
- Sun joined
- Spring Source joined
- Currently finishing M2
  - Added claims-based security
  - Updating to use latest versions of the specs
Claims-based Security in M2

1. Request Web Page
2. Redirect to Bank STS
3. Authenticate
4. Return Token
5. Call Web Service
6. Bank STS Token validated by Broker STS
7. Web service invoked and results returned
Prabath Siriwardena, Rampart/WSS4J, WSO2

DEMO
Stonehenge Future

• Planning M3 – Making Interoperability easier for developers
  – Lightweight micro-samples
  – Targeted How-To documentation
  – Automated test harness
  – Open test results

• Beyond
  – New “Best Practices” sample app(s)
  – REST, AMQP, etc.

• Get Involved:
  http://cwiki.apache.org/STONEHENGE
AMQP & APACHE QPID

David Ingham, Program Manager, Microsoft
Message-oriented Middleware

• Common patterns
  – Message queuing
  – Publish/subscribe
  – Content-based routing

• Advantages
  – Loose coupling
  – Temporal decoupling
  – Load balancing

• Common usages
  – Application asynchrony
  – Integration
  – Event distribution
  – Event-driven architecture
  – Queued file transfer
MOM Interoperability

• Enterprises typically have a mix of technology platforms…
  – …but messaging systems are often targeted to a single platform, e.g., JMS, MSMQ

• Enterprises typically have a range of messaging needs…
  – …but messaging systems often target specific patterns, e.g., queuing or publish/subscribe
MOM Islands
Bridging the Gap

System 1
- Linux
  - Java App
  - JMS API
  - Vendor A's JMS Provider

System 2
- Windows
  - .NET App
  - WCF
  - MSMQ Transport

Bridge
- Vendor A's Proprietary Protocol
- MSMQ Protocol
Technical Challenges

- Connecting the wires
  - Proprietary wire-level formats necessitate application-level bridging

- Mapping the payloads
  - Integrating existing messaging systems typically requires manipulation of the message payload

- Programming abstraction matching
  - Messaging system programming abstractions leak into message payloads and require mapping
Application-level Bridging
Advanced Message Queuing Protocol

- AMQP Working Group set up by JPMorgan in 2006
  - Goal to make Message Oriented Middleware pervasive
  - Make it practical, useful, interoperable
  - Bring together users and vendors to solve the problem

- A standardized binary wire-level protocol for MOM
  - Symmetric – client-to-broker & broker-to-broker

- Scope
  - Queuing with strong delivery assurances
  - Event distribution with flexible routing
  - Large message capability (gigabytes)
  - Global addressing scheme (email-like)
  - Meet common requirements of mission-critical systems

- Allows heterogeneous clients to connect at full fidelity without bridging
Standardizing the Wire
Seamless Connectivity
Under The Covers

System 1

Linux
- Java App
- JMS API
- AMQP-based JMS Provider

AMQP

AMQP-based Broker

System 2

Windows
- .NET App
- WCF
- AMQP Transport

AMQP

AMQP-based Broker

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Symmetric Protocol
Symmetric Protocol
Symmetric Protocol

Integrated System

Linux
- Java App
- JMS API
- AMQP-based JMS Provider

Linux
- Java App
- JMS API
- AMQP-based JMS Provider

Windows
- .NET App
- WCF
- AMQP Transport

Windows
- .NET App
- WCF
- AMQP Transport

AMQP

AMQP-based Broker
Broad Client Support

- Linux
  - Java App
  - JMS API
  - AMQP-based JMS Provider
- Linux
  - Java App
  - JMS API
  - AMQP-based JMS Provider
- Linux
  - Python App
  - Python AMQP Library
- Web Browser
  - AJAX App
  - Javascript AMQP Library
- Windows
  - .NET App
  - WCF
  - AMQP Transport
- Windows
  - .NET App
  - WCF
  - AMQP Transport

Integrated System
Apache Qpid

- Qpid offers full support for the AMQP feature set
  - Supports the latest version of the protocol (v 0-10)
- Project includes
  - 2 brokers
    - Java & C++
  - Client libraries
    - Java, C++, Python, Ruby, ..
- Active and diverse community of developers & users
- Learn more at http://qpid.apache.org

- Key features
  - Range of messaging patterns
  - High performance
  - Transient and durable messaging
  - Large message support
  - Clustering and failover
  - Federation
  - Transactions
  - Security
  - Rich queue semantics
  - Integrated management
Microsoft and AMQP

- Microsoft is a member of AMQP.org
  - Joined in October 2008
  - Working to complete the 1-0 version of the spec

- Microsoft is a contributor to Apache Qpid
  - Windows port of C++ broker and client library
  - WCF channel
  - SQL-based persistence provider
  - Packaging
Summary

• Most enterprises have a mix of technology platforms
  – Dealing with heterogeneity is a critical issue for enterprise IT

• Apache Stonehenge
  – Open Web Services interop forum
  – Check out http://cwiki.apache.org/STONEHENGE/index.html

• AMQP & Apache Qpid
  – Promises to make it easier to deploy enterprise messaging applications in a heterogeneous environment