MANAGEMENT TOOL FOR SEMANTIC ANNOTATIONS IN WSDL

OnTheMove 2009 Workshop
Beyond SAWSDL’09

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Spread of SAWSDL involves existence of a good implementation

- Business needs analysis
- Existing tools comparison
- EasyWSDL presentation
- Performance tests
- Integration in Dragon SOA Governance
Classical needs

- Respect of W3C standards (WSDL 1.1, 2.0, XML Schema and SAWSDL)
- Short handling time (read & write)
- Write/Create valid WSDL descriptions
- Adaptable to other standards (WSMO-Lite, YASA4WSDL...)

Our specific needs

- Java Library
- Permissive license (LGPL or equivalent)
Based on W3C standards/submissions

- **XML Schema**
- **WSDL**
  - 1.1: W3C submission but used in almost all existing system
  - 2.0: W3C standard intended to replace 1.1

Several WSDL annotation languages

- **SAWSDL (W3C)**
- **WSMO-Lite (SOA4All project)**
- **YASA4WSDL (ANR Semeuse project)**
- ...
### Comparison of Existing Tools

<table>
<thead>
<tr>
<th></th>
<th>WSDL4J + SAWSDL4J</th>
<th>Woden + Woden4SAWSDL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development team</td>
<td>IBM + Knoesis</td>
<td>Apache + LSDIS</td>
</tr>
<tr>
<td>WSDL version</td>
<td>1.1</td>
<td>2.0</td>
</tr>
<tr>
<td>XML Schema</td>
<td>No</td>
<td>Other library (Apache-commons)</td>
</tr>
<tr>
<td>Annotations reading</td>
<td>Partial</td>
<td>Full</td>
</tr>
<tr>
<td>Annotations writing</td>
<td>Partial</td>
<td>No</td>
</tr>
<tr>
<td>License</td>
<td>CPL</td>
<td>Apache 2.0</td>
</tr>
<tr>
<td>Uses</td>
<td>-</td>
<td>Axis2, ServiceMix</td>
</tr>
</tbody>
</table>

Do not fit our needs

→ Development of a new SAWSDL parser
EasyWSDL features

- Management of WSDL 1.1, 2.0 and XML Schema standards
- BSD License
- Plug-in system
- Uniform API
- Used in:
  - Petals ESB
  - SOA Dragon governance tool
  - Maestro orchestration (BPEL engine)
Uniform API – WSDL 2.0 oriented
Extension system

- Plug-in based architecture
- Three extensions already available:
  - WSDL4BPEL: Add recognition of partnerLink tag
  - Complex4WSDL: Enable distributed work
  - SAWSDL: Semantic annotation handling (SAWSDL W3C standard)
- Enable multiple extension use

SAWSDL Extension

- Enable CRUD on semantic annotations in all WSDL tags
- Already SAWSDL and WSMO-Lite compliant
- Adjustable to other standards (YASA4WSDL)
## Comparison with Other Libraries

<table>
<thead>
<tr>
<th>Development team</th>
<th>WSDL4J + SAWSDL4J</th>
<th>Woden + Woden4SAWSDL</th>
<th>EasyWSDL + extensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM + Knoesis</td>
<td></td>
<td>Apache + LSDIS</td>
<td>EBM WebSourcing</td>
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<tr>
<td>WSDL version</td>
<td>1.1</td>
<td>2.0</td>
<td>1.1 &amp; 2.0</td>
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<tr>
<td>XML Schema</td>
<td>No</td>
<td>Other library (Apache-commons)</td>
<td>Yes</td>
</tr>
<tr>
<td>Annotations reading</td>
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<td>BSD</td>
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<tr>
<td>Uses</td>
<td>-</td>
<td>Axis2, ServiceMix...</td>
<td>Petals, Dragon...</td>
</tr>
</tbody>
</table>
Tests conditions

- Compared to both existing Java libraries
  - EasyWSDL vs. WSDL4J with WSDL 1.1 definitions
  - EasyWSDL vs. Woden with WSDL 2.0 descriptions

- Large-scale performance test
  - 40.257 WSDL 1.1 from SEEKDA base
  - 38.377 WSDL 2.0 (transformed from WSDL 1.1 files)
  - 894 SAWSDL from SAWSDL-Test Collection

- Noticed points
  - Parsing errors
  - Parsing time
  - Memory leak

- Protocol
  - Only parsing/marshalling for WSDL
  - Parsing, Reading and Result comparison for Semantic Annotations
# EasyWSDL – Performance Tests

## WSDL 1.1: WSDL4J vs. EasyWSDL

<table>
<thead>
<tr>
<th>Java library</th>
<th>WSDL4J</th>
<th>EasyWSDL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested files</td>
<td>40257</td>
<td>40257</td>
</tr>
<tr>
<td>Errors</td>
<td>51</td>
<td>9</td>
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<tr>
<td>% of success</td>
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<td>99.98</td>
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<tr>
<td>Avg. time (ms)</td>
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<td>30</td>
</tr>
<tr>
<td>Memory leak</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

## WSDL 2.0: Woden vs. EasyWSDL

<table>
<thead>
<tr>
<th>Java library</th>
<th>Woden</th>
<th>EasyWSDL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested files</td>
<td>38377</td>
<td>38377</td>
</tr>
<tr>
<td>Errors</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>% of success</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Avg. time (ms)</td>
<td>46</td>
<td>30</td>
</tr>
<tr>
<td>Memory leak</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

**SAWSDL:** No influence on performances  
Same return results in common reading ranges
Dragon SOA Governance

- Open source application under LGPL license
- Service registry
  - Publish/Discovery
  - Service metadata management
  - Dependencies
  - Versioning / Lifecycle
- Contract Manager (SLA)
  - Contract production
  - XML export
  - Workflow
- Execution Environment Integration
  - Monitoring agents
  - Modules and probes
Integration in Dragon

- Add semantic annotations in database (in progress)
- Add semantic information in user interface (in progress)
- Create embedded SAWSDL Editor
  - Semantic Annotation overview
  - Online annotation management

→ Demonstration
CONCLUSION AND FUTURE WORK

EasyWSDL

- Good alternative to existing solutions
  - Complete functionality range
  - Equivalent performances
- Light lack of maturity
  - Young project (10 months)
  - Used in several projects

Dragon

- Integration of semantic database
- Development of dynamic composition functionalities
Questions?