WS-I Profile Conformance Framework

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Notices

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Executive Overview

For a WS-I Profile to meaningfully improve interoperability, it is necessary for it to unambiguously document what its requirements, clarifications and recommendations are, where they apply, and how to advertise conformance to a particular profile.

This document explains the approach to conformance taken in WS-I Profiles and documents different means of claiming conformance to a particular profile or profiles. It should be used as an informative document by both those who wish to understand profile conformance and make conformance claims, and as a normative reference by profiles themselves.

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1 Introduction

For a WS-I profile to meaningfully improve interoperability, it is necessary for it to unambiguously document what its requirements, clarifications and recommendations are, where they apply, and how to advertise conformance to it.

This document explains the approach to conformance taken in WS-I profiles and documents different means of claiming conformance to a particular profile or set of profiles. It is intended to be used as an informative document by both those who wish to understand profile conformance and make conformance claims, and as a normative reference by profiles themselves.

In particular, “Defining Conformance within Profiles” suggests a framework for WS-I profiles to use in stating conformance requirements, and should form the basis of a profile’s conformance section.

“Making Conformance Claims” explains how those who wish to advertise conformance to a particular profile that uses this framework can do so.

1.1 Status of this Document

This document is a Working Group Draft; it has been accepted by the Working Group as reflecting the current state of discussions. It is a work in progress, and should not be considered authoritative or final; other documents may supersede this document.

This document will be updated from time to time to incorporate new conformance annotation mechanisms, conformance claim URIs, and other changes.
2 Defining Conformance within Profiles

Conformance to a profile is defined by adherence to the set of requirements defined for a specific target, within the scope of that profile. This section explains these terms and describes how profiles should define and use conformance.

2.1 Conformance Requirements

Requirements state the criteria for conformance to a profile. They typically refer to an existing specification and embody refinements, interpretations and clarifications to it in order to improve interoperability. All requirements in a profile are considered normative, and those in the specifications it references that are in-scope (see “Conformance Scope”) should likewise be considered normative. When requirements in a profile and its referenced specifications contradict each other, the profile’s requirements take precedence for purposes of profile conformance.

Requirement levels, using RFC2119 language (e.g., MUST, MAY, SHOULD) indicate the nature of the requirement and its impact on conformance. Each requirement is individually identified (e.g., R9999) for convenience.

For example;

R9999 WIDGETs SHOULD be round in shape.

This requirement is identified by “R9999”, applies to the target WIDGET (see below), and places a conditional requirement upon widgets; i.e., although this requirement must be met to maintain conformance in most cases, there are some situations where there may be valid reasons for it not being met (which should be explained in the requirement itself, or in its accompanying text).

Each requirement should have exactly one conformance target and one requirement level, to avoid ambiguity. Additional text may be included in a profile to illuminate requirements or group of requirements (e.g., rationale and examples); however, requirement statements alone should be considered in determining conformance.

2.2 Conformance Targets

Conformance targets identify what artifacts (e.g., SOAP message, WSDL description, UDDI registry data) or parties (e.g., SOAP processor, end-user) requirements apply to.

This allows for the definition of conformance in different contexts, to assure unambiguous interpretation of the applicability of requirements, and to allow conformance testing of artifacts (e.g., SOAP messages and WSDL descriptions) and the behavior of various parties to a Web service (e.g., clients and service instances).

Requirements’ conformance targets should be physical artifacts wherever possible, to simplify testing and avoid ambiguity.

Profiles should carefully and conspicuously enumerate the targets that they use. Where possible, targets previously defined in other profiles should be referenced, rather than redefined.

Profiles should also document what conformance targets are in-scope for each relevant conformance attachment mechanism (see ”Making Conformance Claims”) by referring to this document.
2.3 Conformance Scope

The scope of a profile delineates the technologies that it addresses; in other words, a profile only attempts to improve interoperability within its own scope. Generally, a profile's scope is bounded by the specifications referenced by it.

Every profile should explicitly enumerate the specifications within its scope, and any extensibility points contained therein.

A profile's scope may be further refined by extensibility points. Referenced specifications often provide extension mechanisms and unspecified or open-ended configuration parameters. When identified in a profile as an extensibility point, such a mechanism or parameter is outside the scope of that profile, and its use or non-use is not relevant to profile conformance.

Because the use of extensibility points may impair interoperability, their use should be negotiated or documented in some fashion by the parties to a Web service; for example, this could take the form of an out-of-band agreement.

Note that a profile may still place requirements on the use of an extensibility point. Also, specific uses of extensibility points may be further restricted by other profiles, to improve interoperability when used in conjunction.
3 Making Conformance Claims

To allow advertisement of profile conformance, artifacts can be annotated with *conformance claims*, which use URIs to assert that a particular *claim subject* (e.g., an artifact or a party to a Web service) meets the appropriate requirements in the indicated profile.

The requirements considered in-scope for a particular conformance claim are those placed upon the conformance target(s) associated with the *claim attachment mechanism* by the relevant profile.

Therefore, every profile specifies its own conformance claim URI. Furthermore, every profile documents which of its conformance targets are in-scope for each claim attachment mechanism described in the following sections.

3.1 WSDL 1.1 Claim Attachment Mechanism for Web Services Instances

Conformance claims can be attached to a wsdl:port element in a WSDL 1.1 description as a child of its wsdl:documentation element, using the Conformance Claim Schema (see Appendix A).

Such conformance claims indicate that the associated Web service instance exhibits conformant behavior, as determined by the requirements associated with this attachment mechanism by the referenced profile.

A conformance claim attached to a wsdl:port element also indicates that it itself is a conformant XML construct. Additionally, the same claim is made for all elements recursively referenced by it, based on the transitivity rules described in "WSDL 1.1 Claim Attachment Mechanism for Description Constructs."

For example,

```xml
<wsdl:definitions xmlns:wsdl="http://schemas.xmlsoap.org/wsd1"
    xmlns:tns="http://example.org/myservice"
    xmlns:soapbind="http://schemas.xmlsoap.org/wsdl/soap"
    xmlns:wsi="http://ws-i.org/schemas/conformanceClaim/"
    targetNamespace="http://example.org/myservice">
    <wsdl:portType name="MyPortType">
        ...
    </wsdl:portType>
    <wsdl:binding name="MyBinding" portType="MyPortType">
        ...
    </wsdl:binding>
    <wsdl:service name="MyService">
        <wsdl:port name="MyPort" binding="tns:MyBinding">
            <wsdl:documentation>
                <wsi:Claim
                    conformsTo="http://ws-i.org/profiles/basic/1.0"/>
            </wsdl:documentation>
            <soapbind:address
                location="http://example.org/myservice/myport"/>
        </wsdl:port>
    </wsdl:service>
</wsdl:definitions>
```
3.2 WSDL 1.1 Claim Attachment Mechanism for Description Constructs

Conformance claims can be attached to wsdl:binding, wsdl:portType, wsdl:operation (as a child element of wsdl:portType, but not of wsdl:binding) and wsdl:message elements in a WSDL 1.1 description, using the Conformance Claim Schema (see Appendix A).

A conformance claim attached to any of these elements indicates that it is a conformant XML construct, as determined by the requirements associated with this attachment mechanism by the referenced profile. Additionally, the same claim is made for all elements that it references, based on the following transitivity rules, applied recursively:

- A claim on a wsdl:port element is inherited by the referenced wsdl:binding element
- A claim on a wsdl:binding element is inherited by the referenced wsdl:portType element
- A claim on a wsdl:portType element is inherited by the referenced wsdl:operation elements
- A claim on a wsdl:operation element is inherited by the referenced wsdl:message elements of its child wsdl:output and/or wsdl:input elements

3.3 UDDI Claim Attachment Mechanism for Web Service Registrations

Conformance claims can be attached to a uddi:tModel in a UDDI Version 2 or 3 registry using the appropriate ws-i-org:conformsTo:2002_12 category system tModel (see Appendix B).

A conformance claim attached to a tModel indicates that it is a conformant XML construct, as determined by the requirements associated with this attachment mechanism by the referenced profile.

UDDI:tModels should be constructed so that the conformance claims placed upon them are consistent with the conformance claims made by the wsdl:bindings to which they refer.

The categorization value should correspond to the conformance claim URI for the profile.

An example claim on a tModel is as follows:

```xml
<tModel tModelKey="...">
  <name>BarSOAPService</name>
  <description xml:lang="EN">Bar's SOAP Service</description>
  <overviewDoc>...</overviewDoc>
  <categoryBag>
    <keyedReference
      tModelKey="uuid:65719168-72c6-3f29-8c20-62defb0961c0"
      keyName="ws-i_conformance:BasicProfile1.0"
      keyValue="http://ws-i.org/profiles/basic/1.0" />
  </categoryBag>
</tModel>
```
Here, the tModel with the name “BarSOAPService” claims to conform to the Basic Profile 1.0, as indicated by the keyedReference - the tModelKey references the ws-i-org:conformsTo:2002_12 category system and the keyValue identifies the conformance claim URI for the Basic Profile 1.0.

In UDDI Version 2 registries, uddi:bindingTemplate elements can't be categorized because the UDDI Version 2 XML Schema does not provide a uddi:categoryBag for them. Hence, the conformance claim made by wsdl:port elements can't be documented in their corresponding UDDI Version 2 uddi:bindingTemplates.

3.4 **UDDI Claim Attachment Mechanism for Web Service Instances**

Conformance claims can be attached to a uddi:bindingTemplate in a UDDI Version 3 registry using the ws-i-org:conformsTo:2002_12 category system tModel specified in Appendix B.1. Note that this attachment mechanism is not available in UDDI Version 2 registries.

Such conformance claims indicate that the associated Web service instance exhibits conformant behavior, as determined by the requirements associated with this attachment mechanism by the referenced profile.

A conformance claim attached to a uddi:bindingTemplate also indicates that the tModel itself is a conformant registry construct. Additionally, a claim made for a uddi:bindingTemplate is made for all tModels it references.

An example use of the tModel is as follows:

```xml
<tModel tModelKey="uddi:example.org/myservice">
  <name>BarSOAPServiceDefinition</name>
  <description xml:lang="EN">Bar's SOAP Service Definition</description>
  <overviewDoc>...</overviewDoc>
  <categoryBag>
    <keyedReference
      tModelKey="uddi:65719168-72c6-3f29-8c20-62defb0961c0"
      keyValue="http://ws-i.org/profiles/basic/1.0" />
  </categoryBag>
</tModel>
```

Since UDDI Version 3 allows the categorization of uddi:bindingTemplates, it would be ambiguous if the conformance claim a uddi:bindingTemplate made were not consistent with the claim made by the wsdl:port it represents, when used in combination with a WSDL 1.1 description. Therefore, uddi:bindingTemplates must be constructed so that the conformance claims they make are consistent with any wsdl:ports that they refer to.
An example conformance claim for a bindingTemplate is as follows:

```xml
<bindingTemplate bindingKey="...">
    <description xml:lang="EN">Bar’s SOAP Service</description>
    <accessPoint>http://example.org/myservice/myport</accessPoint>
    <tModelInstanceDetails>
        <tModelInstanceInfo tModelKey="uddi:example.org/myservice" />
    </tModelInstanceDetails>
    <categoryBag>
        <keyedReference
            tModelKey="uddi:65719168-72c6-3f29-8c20-62defb0961c0"
            keyValue="http://ws-i.org/profiles/basic/1.0" />
    </categoryBag>
</bindingTemplate>
```
A Conformance Claim XML Schema

The following schema should be used to make conformance claims where possible (i.e., XML is used, and extensibility is allowed):

```xml
<?xml version="1.0" encoding="UTF-8" >
    xmlns:tns="http://ws-i.org/schemas/conformanceClaim/"
    xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
    elementFormDefault="qualified"
    attributeFormDefault="unqualified" >

<xsd:import namespace="http://schemas.xmlsoap.org/soap/envelope/"
    schemaLocation="http://schemas.xmlsoap.org/soap/envelope/" />

<xsd:element name="Claim" >
    <xsd:complexType>
        <xsd:sequence>
            <xsd:any namespace="##any" processContents="lax"
                minOccurs="0" maxOccurs="unbounded" />
        </xsd:sequence>
        <xsd:attribute name="conformsTo" type="xsd:anyURI" use="required"/>
        <xsd:attribute ref="soap:mustUnderstand" use="prohibited"/>
        <xsd:anyAttribute namespace="##any" processContents="lax"/>
    </xsd:complexType>
</xsd:element>
</xsd:schema>
```

The **Claim** element has a mandatory **conformsTo** attribute, whose value contains the actual conformance claim URI. The conformance claim schema explicitly allows for extensibility elements and attributes.
B. Conformance Claim tModels

B.1 UDDI Version 2

The content for the ws-i-org:conformsTo:2002_12 category system tModel is:

```
<tModel tModelKey="uuid:65719168-72c6-3f29-8c20-62defb0961c0">
  <name>ws-i-org:conformsTo:2002_12</name>
  <description xml:lang="EN">
    Category system used for UDDI entities to point to the WS-I profile to which they conform
  </description>
  <overviewDoc>
    <overviewURL>http://ws-i.org/schemas/conformanceClaim/</overviewURL>
  </overviewDoc>
  <categoryBag>
    <keyedReference
      keyName="uddi-org:types:categorization"
      keyValue="categorization"
      tModelKey="uuid:clacf26d-9672-4404-9d70-39b756e62ab4" />
  </categoryBag>
</tModel>
```

B.2 UDDI Version 3

The following is the UDDI Version 3 ws-i-org:conformsTo:2002_12 category system tModel.

```
<tModel tModelKey="uddi:65719168-72c6-3f29-8c20-62defb0961c0">
  <name>ws-i-org:conformsTo:2002_12</name>
  <description xml:lang="EN">
    Category system used for UDDI entities to point to the WS-I concept to which they conform to
  </description>
  <overviewDoc>
    <overviewURL>
      http://ws-i.org/schemas/conformanceClaim/
    </overviewURL>
  </overviewDoc>
  <categoryBag>
    <keyedReference
      keyName="uddi-org:types:categorization"
      keyValue="categorization"
      tModelKey="uddi:uddi.org:categorization:types" />
  </categoryBag>
</tModel>
```

The Version 3 tModelKey for the ws-i-org:conformsTo:2002_12 tModel is "uddi:65719168-72c6-3f29-8c20-62defb0961c0". In a multi-version registry this results in the correct Version 2 key allowing conformance claims work correctly across versions.
C Known Conformance Claim URIs

The following table lists the URIs that are used to claim conformance to WS-I Profiles. This non-normative table is updated each time a new WS-I Profile is published. Note that the listed conformance claim URIs are actually defined by the corresponding profiles.

<table>
<thead>
<tr>
<th>WS-I Profile</th>
<th>Conformance Claim URI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Profile 1.0</td>
<td><a href="http://ws-i.org/profiles/basic/1.0">http://ws-i.org/profiles/basic/1.0</a></td>
</tr>
</tbody>
</table>