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**Technical Committee:**

OASIS Service Component Architecture / Bindings (SCA-Bindings) TC

**Chair(s):**

Simon Holdsworth, IBM <[simon\\_holdsworth@uk.ibm.com](mailto:simon_holdsworth@uk.ibm.com)>

**Editor(s):**

Simon Holdsworth, IBM <[simon\\_holdsworth@uk.ibm.com](mailto:simon_holdsworth@uk.ibm.com)>  
Anish Karmarkar, Oracle <[Anish.Karmarkar@oracle.com](mailto:Anish.Karmarkar@oracle.com)>

**Related Work:**

This specification replaces or supersedes:

- Service Component Architecture Web Service Binding Specification Version 1.00, March 21 2007  
[http://www.osoa.org/download/attachments/35/SCA\\_WebServiceBinding\\_V100.pdf?version=2](http://www.osoa.org/download/attachments/35/SCA_WebServiceBinding_V100.pdf?version=2)

This specification is related to:

- OASIS Committee Draft 05, "Service Component Architecture Assembly Model Specification Version 1.1", January 2010  
<http://docs.oasis-open.org/opencsa/sca-assembly/sca-assembly-1.1-spec-cd05.pdf>
- OASIS Committee Draft 02, "SCA Policy Framework Version 1.1", February 2009  
<http://docs.oasis-open.org/opencsa/sca-policy/sca-policy-1.1-spec-cd02.pdf>

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<http://docs.oasis-open.org/ns/opencsa/sca/200912>

**Abstract:**

The SCA Web Service binding specified in this document applies to the services and references of an SCA composite [**SCA-Assembly**]. It defines the manner in which a service can be made available as a web service, and in which a reference can invoke a web service.

This binding is a WSDL-based binding; that means it either references an existing WSDL binding or specifies enough information to generate one. When an existing WSDL binding is not referenced, rules defined in this document specify how to generate a WSDL binding.

**Status:**

This document was last revised or approved by the OASIS Service Component Architecture / Bindings (SCA-Bindings) TC on the above date. The level of approval is also listed above. Check the “Latest Version” or “Latest Approved Version” location noted above for possible later revisions of this document.

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# 1 Introduction

The SCA Web Service binding specified in this document applies to the services and references of composites and components [**SCA-Assembly**]. It defines the manner in which a service can be made available as a web service, and in which a reference can invoke a web service.

This binding is a WSDL-based binding; that means it either references an existing WSDL binding or can be configured to specify enough information to generate one. When an existing WSDL binding is not referenced, rules defined in this document specify how to generate a WSDL binding. This specification only defines a binding using WSDL 1.1.

The Web Service binding can point to an existing WSDL [**WSDL11**] document, separately authored, that specifies the details of the WSDL binding to be used to provide or invoke the web service. In this case the SCA web services binding allows anything that is valid in a WSDL binding, including rpc-encoded style and binding extensions. It is the responsibility of the SCA system provider to ensure support for all options specified in the WSDL binding. Interoperation of such services is not guaranteed.

The SCA Web Service binding also provides attributes that can be used to provide the details of a WSDL SOAP binding. This allows a WSDL document to be synthesized in the case that one does not already exist. In this case only WS-I compliant mapping is supported.

The SCA Web Service binding can be further customized through the use of SCA Policy Sets. For example, a requirement to conform to a WS-I profile [**WSI-Profiles**] could be represented with a policy set.

## 1.1 Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [**RFC2119**].

This specification uses predefined namespace prefixes throughout; they are given in the following list. Note that the choice of any namespace prefix is arbitrary and not semantically significant.

<b>Prefix</b>	<b>Namespace</b>	<b>Notes</b>
xs	"http://www.w3.org/2001/XMLSchema"	Defined by XML Schema 1.0 specification
wsa	"http://www.w3.org/2005/08/addressing"	Defined by WS-Addressing 1.0
wsp	"http://www.w3.org/ns/ws-policy"	Defined by WS-Policy 1.5
soap	Can be either "http://schemas.xmlsoap.org/soap/envelope/" or "http://www.w3.org/2003/05/soap-envelope"	Defined by SOAP 1.1 or SOAP 1.2
wsdli	"http://www.w3.org/ns/wsdli-instance"	Defined by WSDL 2.0
wsoap11	"http://schemas.xmlsoap.org/wsdli/soap/"	Defined by WSDL 1.1 [ <b>WSDL11</b> ]
wsoap12	"http://schemas.xmlsoap.org/wsdli/soap12/"	Defined by [ <b>W11-SOAP12</b> ]
sca	"http://docs.oasis-open.org/ns/opencsa/sca/200912"	Defined by the SCA

	specifications
--	----------------

27 *Table 1-1: Prefixes and Namespaces Used in this Specification*

## 28 1.2 Normative References

- 29 **[RFC2119]** S. Bradner, *Key words for use in RFCs to Indicate Requirement Levels*,  
30 <http://www.ietf.org/rfc/rfc2119.txt>, IETF RFC 2119, March 1997.
- 31 **[SCA-Assembly]** OASIS Committee Draft 05, “Service Component Architecture Assembly Model  
32 Specification Version 1.1”, January 2010  
33 [http://docs.oasis-open.org/opencsa/sca-assembly/sca-assembly-1.1-spec-](http://docs.oasis-open.org/opencsa/sca-assembly/sca-assembly-1.1-spec-cd05.pdf)  
34 [cd05.pdf](http://docs.oasis-open.org/opencsa/sca-assembly/sca-assembly-1.1-spec-cd05.pdf)
- 35 **[SCA-Policy]** OASIS Committee Draft 02, “SCA Policy Framework Specification Version 1.1”,  
36 February 2009  
37 <http://docs.oasis-open.org/opencsa/sca-policy/sca-policy-1.1-spec-cd02.pdf>
- 38 **[SCA-JCAA]** OASIS Committee Draft 03, “SCA Java Common Annotations and APIs  
39 Specification Version 1.1”, May 2009  
40 <http://docs.oasis-open.org/opencsa/sca-j/sca-javacaa-1.1-spec-cd03.pdf>
- 41 **[WSDL11]** E. Christensen et al, *Web Service Description Language (WSDL) 1.1*,  
42 <http://www.w3.org/TR/2001/NOTE-wsdl-20010315>, W3C Note, March 15 2001.
- 43 **[WSDL20]** Chinnici et al, *Web Service Description Language (WSDL) Version 2.0 Part 1:*  
44 *Core Language*, <http://www.w3.org/TR/2007/REC-wsdl20-20070626/>, W3C  
45 Recommendation, June 26 2007.
- 46 **[WSI-Profiles]** “Basic Profile Version 1.1” <http://www.ws-i.org/Profiles/BasicProfile-1.1.html>,  
47 “Attachments Profile Version 1.0” [http://www.ws-](http://www.ws-i.org/Profiles/AttachmentsProfile-1.0.html)  
48 [i.org/Profiles/AttachmentsProfile-1.0.html](http://www.ws-i.org/Profiles/AttachmentsProfile-1.0.html),  
49 “Simple SOAP Binding Profile Version 1.0” [http://www.ws-](http://www.ws-i.org/Profiles/SimpleSoapBindingProfile-1.0.html)  
50 [i.org/Profiles/SimpleSoapBindingProfile-1.0.html](http://www.ws-i.org/Profiles/SimpleSoapBindingProfile-1.0.html),  
51 “Basic Security Profile Version 1.0” [http://www.ws-](http://www.ws-i.org/Profiles/BasicSecurityProfile-1.0.html)  
52 [i.org/Profiles/BasicSecurityProfile-1.0.html](http://www.ws-i.org/Profiles/BasicSecurityProfile-1.0.html)
- 53 **[JAX-WS]** “JSR 224: Java™ API for XML-Based Web Services (JAX-WS) 2.0”  
54 <http://jcp.org/en/jsr/detail?id=224>
- 55 **[SOAP11]** Box et al, “Simple Object Access Protocol (SOAP) 1.1”  
56 <http://www.w3.org/TR/2000/NOTE-SOAP-20000508/>, W3C Note May 2000
- 57 **[SOAP]** Gudgin et al, “SOAP Version 1.2 Part 1: Messaging Framework”  
58 <http://www.w3.org/TR/2003/REC-soap12-part1-20030624/>, W3C  
59 Recommendation June 2003; Box et al, “Simple Object Access Protocol (SOAP)  
60 1.1” <http://www.w3.org/TR/2000/NOTE-SOAP-20000508/>, W3C Note May 2000
- 61 **[SOAP12Adjuncts]** Gudgin et al, “SOAP Version 1.2 Part 2: Adjuncts (Second Edition)”  
62 <http://www.w3.org/TR/soap12-part2/>, W3C Recommendation April 2007
- 63 **[WS-Addr]** Gudgin et al, “Web Services Addressing 1.0 – Core”  
64 <http://www.w3.org/TR/2006/REC-ws-addr-core-20060509/>, W3C  
65 Recommendation May 2006
- 66 **[W11-SOAP12]** Angelov et al, “WSDL 1.1 Binding Extension for SOAP 1.2”  
67 <http://www.w3.org/Submission/wsdl11soap12/>, W3C Member Submission April  
68 2006
- 69 **[WS-Addr-SOAP]** Gudgin et al, “Web Services Addressing 1.0 – SOAP Binding”  
70 <http://www.w3.org/TR/2006/REC-ws-addr-soap-20060509/>, W3C  
71 Recommendation May 2006
- 72 **[WS-MC]** OASIS Standard “Web Services Make Connection (WS-MakeConnection)  
73 Version 1.1”, February 2009  
74 <http://docs.oasis-open.org/ws-rx/wsmc/200702/wsmc-1.1-spec-os.doc>

- 75        **[WS-Policy]**        Vedamuthu et al, "Web Services Policy 1.5 – Framework"  
76        <http://www.w3.org/TR/2007/REC-ws-policy-20070904>, W3C Recommendation  
77        September 2007
- 78        **[WS-PA]**        Vedamuthu et al, "Web Services Policy 1.5 – Attachment"  
79        <http://www.w3.org/TR/2007/REC-ws-policy-attach-20070904>, W3C  
80        Recommendation September 2007

### 81        **1.3 Non-Normative References**

- 82        **[WSI-AP]**        "Attachments Profile Version 1.0" [http://www.w3-](http://www.w3.org/Profiles/AttachmentsProfile-1.0.html)  
83        [i.org/Profiles/AttachmentsProfile-1.0.html](http://www.w3.org/Profiles/AttachmentsProfile-1.0.html)
- 84        **[MTOM]**        Gudgin et al, "SOAP Message Transmission Optimization Mechanism"  
85        <http://www.w3.org/TR/2005/REC-soap12-mtom-20050125/>, W3C  
86        Recommendation January 2005
- 87        **[WS-Security]**        Oasis Standard "Web Services Security: SOAP Message Security 1.1 (WS-  
88        Security 2004)" February 2006 [http://docs.oasis-open.org/wss/v1.1/wss-v1.1-](http://docs.oasis-open.org/wss/v1.1/wss-v1.1-spec-os-SOAPMessageSecurity.pdf)  
89        [spec-os-SOAPMessageSecurity.pdf](http://docs.oasis-open.org/wss/v1.1/wss-v1.1-spec-os-SOAPMessageSecurity.pdf)

### 90        **1.4 Naming Conventions**

91        The naming conventions used by artefacts defined in this specification are:

- 92        • The naming conventions defined by section 1.3 of the Assembly Specification **[SCA-Assembly]**.
- 93        • Where the names of elements and attributes consist partially or wholly of acronyms, the letters of the  
94        acronyms use the same case. When the acronym appears at the start of the name of an element or  
95        an attribute, or after a period, it is in lower case. If it appears elsewhere in the name of an element or  
96        an attribute, it is in upper case. For example, an attribute might be named "uri" or "jndiURL".
- 97        • Where the names of types consist partially or wholly of acronyms, the letters of the acronyms are in  
98        all upper case. For example, an XML Schema type might be named "JCABinding" or "MessageID".
- 99        • Values, including local parts of QName values, follow the rules for names of elements and attributes  
100        as stated above, with the exception that the letters of acronyms are in all upper case. For example, a  
101        value might be "JMSDefault" or "namespaceURI".

## 2 Web Service Binding Schema

The Web Service binding element is defined by the pseudo-schema in Snippet 2-1.

```
<binding.ws name="xs:NCName"?
  requires="list of xs:QName"?
  policySets="list of xs:QName"?
  uri="xs:anyURI"?
  wsdlElement="xs:anyURI"?
  wsdl:wsdlLocation="list of xs:anyURI pairs"? >
  <wireFormat ... />?
  <operationSelector ... />?
  <wsa:EndpointReference>...</wsa:EndpointReference>*
</binding.ws>
```

Snippet 2-1: binding.ws Pseudo-Schema

The **binding.ws** element has the attributes:

- **/binding.ws/@name** - as defined in the SCA Assembly Specification [SCA-Assembly].
- **/binding.ws/@requires** - as defined in the SCA Assembly Specification [SCA-Assembly].
- **/binding.ws/@policySets** - as defined in the SCA Assembly Specification [SCA-Assembly].
- **/binding.ws/@uri** - the resolution algorithm of Section 2.2 describes how this attribute is interpreted. For an SCA reference, the @uri attribute MUST be an absolute value. [BWS20001]
- **/binding.ws/@wsdlElement** – when present this attribute specifies the URI of a WSDL element. The value of the @wsdlElement attribute MUST identify an element in an existing WSDL 1.1 document. [BWS20002] The URI can have the following forms:

– Service:

`<WSDL-namespace-URI>#wsdl.service(<service-name>)`

If the binding is for an SCA service, the *wsdlElement* attribute MUST NOT specify the *wsdl.service* form of URI. [BWS20003]

If the binding is for an SCA reference, the set of available ports for the reference consists of the ports in the WSDL service that have portTypes which are compatible supersets of the SCA reference as defined in the SCA Assembly Model specification [SCA-Assembly] and satisfy all the policy constraints of the binding.

If the *wsdl.service* form of *wsdlElement* is used on an SCA reference binding, the set of available ports for that reference binding MUST be non-empty. [BWS20004] The set of available ports represents a single SCA reference binding with respect to the multiplicity of that SCA reference. If the *wsdl.service* form of *wsdlElement* is used on an SCA reference binding, the SCA runtime MUST raise an error if there are no available ports that it supports. [BWS20005] When an invocation is made using an SCA reference binding with the *wsdl.service* form of *wsdlElement*, the SCA runtime MUST use exactly one port from the set of available ports for the reference (with port selection on a per-invocation basis permitted). [BWS20006]

– Port:

`<WSDL-namespace-URI>#wsdl.port(<service-name>/<port-name>)`

If the binding is for an SCA service, the portType associated with the specified WSDL port MUST be compatible with the SCA service interface as defined in section 2.1, and the port MUST satisfy all the policy constraints of the binding. [BWS20007] The SCA runtime MUST expose an endpoint

148 for the specified WSDL port, or raise an error if it does not support the WSDL port. [BWS20008] If  
149 the binding is for an SCA reference, the portType associated with the specified WSDL port MUST  
150 be a compatible superset of the SCA reference interface as defined in the SCA Assembly Model  
151 specification [SCA-Assembly], and the port MUST satisfy all the policy constraints of the binding.  
152 [BWS20009] The SCA runtime MUST use the specified WSDL port for invocations made using  
153 the SCA reference binding, or raise an error if it does not support the WSDL port. [BWS20010]

154 – Binding:

155 <WSDL-namespace-URI>#wsdl.binding(<binding-name>)

156 If the binding is for an SCA service, the portType associated with the specified WSDL binding  
157 MUST be compatible with the SCA service interface as defined in section 2.1, and the WSDL  
158 binding MUST satisfy all the policy constraints of the binding. [BWS20011] The SCA runtime  
159 MUST expose an endpoint for the specified WSDL binding, or raise an error if it does not support  
160 the WSDL binding. [BWS20012]

161 If the binding is for an SCA reference, the portType associated with the specified WSDL binding  
162 MUST be a compatible superset of the SCA reference interface as defined in the SCA Assembly  
163 Model specification [SCA-Assembly], and the WSDL binding MUST satisfy all the policy  
164 constraints of the binding. [BWS20013] The SCA runtime MUST use the specified WSDL binding  
165 for invocations made using the SCA reference binding, or raise an error if it does not support the  
166 WSDL binding. [BWS20014]

167 When the *wsdl.binding* form of *wsdlElement* is used, the endpoint address URI for an SCA  
168 reference MUST be specified by either the *@uri* attribute on the binding or a WS-Addressing  
169 *wsa:EndpointReference* element, except where the SCA Assembly Model specification [SCA-  
170 **Assembly**] states that the *@uri* attribute can be omitted. [BWS20015]

171 • **/binding.ws/@wsdli:wsdlLocation** – when present this attribute specifies the location(s) of the  
172 WSDL document(s) associated with specific namespace(s).

173 The *@wsdli:wsdlLocation* attribute can be used in the event that the <WSDL-namespace-URI> value  
174 in the *@wsdlElement* attribute is not dereferencable, or when the intended WSDL document is to be  
175 found at a different location than the one pointed to by the <WSDL-namespace-URI>. The semantics  
176 of this attribute are specified in Section 7.1 of WSDL 2.0 [WSDL20].

177 If the *@wsdli:wsdlLocation* attribute is used the *@wsdlElement* attribute MUST also be specified.  
178 [BWS20017]

179 The value of the *@wsdli:wsdlLocation* attribute MUST identify an existing WSDL 1.1 document.  
180 [BWS20018]

181 • **/binding.ws/wireFormat** – as defined in the SCA Assembly Specification [SCA-Assembly]. This  
182 specification does not define any new wireFormat elements.

183 • **/binding.ws/operationSelector** – as defined in the SCA Assembly Specification [SCA-Assembly].  
184 This specification does not define any new operationSelector elements.

185 • **/binding.ws/wsa:EndpointReference** – when present this element provides the WS-Addressing  
186 [WS-Addr] *wsa:EndpointReference* that specifies the endpoint for the service or reference.

187 A *binding.ws* element MUST NOT contain more than one of any of the following: the *@uri* attribute; the  
188 *@wsdlElement* attribute referring to a WSDL port or to a WSDL service; the *wsa:EndpointReference*  
189 element. [BWS20019]

190 The endpoint address URI for an SCA service or the callback element of an SCA reference is determined  
191 as specified in section 2.2. For the *callback* element of an SCA service, the binding MUST NOT specify  
192 an endpoint address URI or a WS-Addressing *wsa:EndpointReference*. [BWS20020]

193 The SCA runtime MUST support all the attributes of the <binding.ws> element, namely *@name*, *@uri*,  
194 *@requires*, *@policySets*, *@wsdlElement*, and *@wsdli:wsdlLocation*. [BWS20021]

195 The SCA runtime SHOULD support the element <*wsa:EndpointReference*>. [BWS20022] If an SCA  
196 runtime does not support the element <*wsa:EndpointReference*>, then it MUST reject an SCA WS  
197 Binding XML document (as defined in Section 5.1) that contains the element. [BWS20023]

198 The <binding.ws> element MUST conform to the XML schema defined in sca-binding-webservice-  
199 1.1.xsd. [BWS20024]

## 200 2.1 Compatibility of SCA Service Interfaces and WSDL portTypes

201 A WSDL portType is compatible with an SCA service interface if and only if all of these conditions are  
202 satisfied:

- 203 1. The SCA service interface is remotable.
- 204 2. The operations on the portType are the same as the operations on the SCA service interface, with the  
205 same operation name, same input types (taking order as significant), same output types (taking order  
206 as significant), and same fault/exception types. If the SCA service interface is not a WSDL portType,  
207 it is mapped to a WSDL portType for the purposes of this comparison. The mapping is defined in the  
208 relevant SCA specification for the interface type. If the interface cannot be mapped to WSDL, the  
209 SCA service interface is not compatible with the WSDL portType.
- 210 3. WSDL 1.1 message parts can point either to an XML Schema element declaration or to an XML  
211 Schema type declaration. When determining compatibility between two WSDL operations, a  
212 message part that points to an XML Schema element is considered to be incompatible with a  
213 message part that points to an XML Schema type.
- 214 4. If either the portType or the SCA service interface declares an SCA callback interface, then both the  
215 portType and the SCA service interface declare callback interfaces and these callback interfaces are  
216 compatible according to points 1 through 3 above.

## 217 2.2 Endpoint URI resolution

218 This specification does not mandate any particular way to determine the URI for a web services binding  
219 on an SCA service. An absolute URI can be indicated by the @uri attribute, by the URI in a wsa:Address  
220 element within an wsa:EndpointReference element, or by the URI indicated in a WSDL port via a  
221 @wsdlElement attribute. Implementations can use the specified URI as the service endpoint URI or they  
222 can use a different URI which might include portions of the specified URI. For example, the service  
223 endpoint URI might be produced by modifying any or all of the host name, the port number, and a portion  
224 of the path.

225 Note that if no absolute URI is indicated by any of these elements, implementations can use the structural  
226 URI for the binding as a portion of the URI for the eventual deployed endpoint. In addition, the @uri  
227 attribute value could be relative; implementations are encouraged to combine this value with the structural  
228 URI for the service in determining a deployed URI.

229 The target address for a reference binding is defined as one of:

- 230 A. The value of the @uri attribute
- 231 B. The value of the wsa:Address element of the wsa:EndpointReference element
- 232 C. The value of the address element of the WSDL port referenced by the @wsdlElement attribute
- 233 D. The value of the address element of one of the set of available WSDL ports as specified under the  
234 definition of the @wsdlElement attribute when it references a WSDL service element

235 If there is no target address for a reference binding, the SCA runtime MUST raise an error. [BWS20025]

236 For a reference binding, the SCA runtime MUST use the target address. [BWS20026]

## 237 2.3 Interface mapping

238 When *binding.ws* is used on a service or reference with an interface that is not defined by *interface.wsdl*,  
239 the SCA runtime MUST derive a WSDL portType for the service or reference from the interface using the  
240 WSDL-mapping rules defined for that SCA interface type. [BWS20027]

241 An SCA runtime MUST raise an error if the interface on a service or reference element with a *binding.ws*  
242 element does not map to a WSDL portType. [BWS20028]

243 For example, for *interface.java*, the mapping to a WSDL portType is as defined in the SCA Java Common  
244 Annotations and API Specification **[SCA-JCAA]**.

245 *binding.ws* implementations can use appropriate standards, for example WS-I AP 1.0 **[WSI-AP]** or MTOM  
246 **[MTOM]**, to map interface parameters to binary attachments transparently to the target component.

## 247 **2.4 Production of WSDL description for an SCA service**

248 Any service hosted by an SCA runtime with one or more web service bindings with HTTP endpoints  
249 SHOULD return a WSDL description of the service in response to an HTTP GET request with the “?wsdl”  
250 suffix added to that HTTP endpoint URL. **[BWS20029]**

251 If none of the web service bindings for an SCA service have HTTP endpoints, then the SCA runtime  
252 SHOULD provide some other means of obtaining the WSDL description of the service. **[BWS20030]** This  
253 can include out of band mechanisms, for example publication to a UDDI registry.

254 Refer to section 4 for a detailed definition of the rules that are used for generating the WSDL description  
255 of an SCA service with one or more web service bindings.

## 256 **2.5 Additional binding configuration data**

257 SCA runtime implementations can provide additional metadata that is associated with a web service  
258 binding. This is done by providing extension points in the schema; refer to Appendix A: Web Services  
259 XML Binding Schema for the locations of these extension points.

260 This can be used for example to enable JAX-WS **[JAX-WS]** handlers to be executed as part of the target  
261 component dispatch. The specification of such metadata is SCA runtime-specific and is outside of the  
262 scope of this document.

## 263 **2.6 Web Service Binding and SOAP Intermediaries**

264 The Web Service binding does not provide any direct or explicit support for SOAP  
265 intermediaries **[SOAP]**.

## 266 **2.7 Support for WSDL extensibility**

267 When a binding.ws element uses the @wsdlElement attribute, the details of the binding are specified by  
268 the WSDL element referenced by the value of the attribute. Per the WSDL specification, WSDL allows for  
269 extensibility via elements as well as attributes, and it specifies rules for processing such elements. This  
270 specification does not constrain the use of such extensibility in WSDL and relies on the rules specified in  
271 the WSDL specification for processing such extended elements.

272 An SCA runtime MUST support the WSDL extensions defined in the namespace associated with the  
273 prefix “sca” (as defined in section 1.1). **[BWS20032]**

274 The SCA runtime MUST support the WSDL 1.1 binding extension for SOAP 1.1 over HTTP **[WSDL11]**,  
275 as identified by the WSDL element wsoap11:binding that has the @transport attribute with a value of  
276 “http://schemas.xmlsoap.org/soap/http”. **[BWS20033]**

277 The SCA runtime SHOULD support the WSDL 1.1 binding extension for SOAP 1.2 over HTTP **[W11-**  
278 **SOAP12]**, as identified by the WSDL element wsoap12:binding that has the @transport attribute with a  
279 value of “http://schemas.xmlsoap.org/soap/http”. **[BWS20034]**

280 Because a WSDL document might contain extension elements that cannot be supported by the SCA  
281 runtime, when using the @wsdlElement form of binding.ws it is not possible to determine whether the  
282 binding is supported by the SCA runtime without parsing the referenced WSDL element and its  
283 dependent elements.

## 284 **2.8 Intents listed in the bindingType**

285 This specification places no requirements on the intents **[SCA-Policy]** that are listed as either  
286 @alwaysProvides or @mayProvides in the bindingType for *binding.ws*.

## 287 **2.9 Intents and binding configuration**

288 This binding mandates support for SOAP 1.1 and encourages SOAP 1.2 support. The <bindingType>  
289 element associated with this binding **MUST** include the SOAP.v1\_1 intent in its @mayProvides or  
290 @alwaysProvides attributes. [BWS20035] The <bindingType> element associated with this binding  
291 **SHOULD** include the SOAP.v1\_2 intent in its @mayProvides attribute. [BWS20036] For more details on  
292 the <bindingType> element see [SCA-Policy].

293 The SCA runtime **MUST** raise an error if a web service binding is configured with a policy intent(s) that  
294 conflicts with the binding instance's configuration. [BWS20037]

295 For example, it is an error to use the SOAP policy intent in combination with a WSDL binding that does  
296 not use SOAP.

297

## 3 Web Service Binding Examples

298 The following snippets show the `sca.composite` file for the `MyValueComposite` file containing the service  
299 element for the `MyValueService` and reference element for the `StockQuoteService`. Both the service and  
300 the reference use a Web Service binding.

### 3.1 Example Using WSDL documents

302 Snippet 3-1 shows a service and reference using the SCA Web Service binding, using existing WSDL  
303 documents in both cases. In each case there is a single binding element, whose name defaults to the  
304 service/reference name.

305 The service's binding is defined by the WSDL document associated with the given URI. This service  
306 conforms to WS-I Basic Profile 1.1.

307 The first reference's binding is defined by the specified WSDL service in the WSDL document at the given  
308 location. The reference can use any of the WSDL service's ports to invoke the target service. The  
309 second reference's binding is defined by the specified WSDL binding. The specific endpoint URI to be  
310 invoked is provided via the `@uri` attribute.

311

```
312 <?xml version="1.0" encoding="ASCII"?>
313 <composite xmlns="http://docs.oasis-open.org/ns/opencsa/sca/200912"
314           name="MyValueComposite">
315   <service name="MyValueService">
316     <interface.java interface="services.myvalue.MyValueService"/>
317     <binding.ws wsdlElement="http://www.example.org/MyValueService#
318               wsdl.binding(MyValueService/MyValueServiceSOAP)"/>
319     ...
320   </service>
321
322   ...
323
324   <reference name="StockQuoteReference1">
325     <interface.java interface="services.stockquote.StockQuoteService"/>
326     <binding.ws wsdlElement="http://www.example.org/StockQuoteService#
327               wsdl.service(StockQuoteService)"/>
328     wsdl:wsdlLocation="http://www.example.org/StockQuoteService
329                       http://www.example.org/StockQuoteService.wsdl"/>
330   </reference>
331
332   <reference name="StockQuoteReference2">
333     <interface.java interface="services.stockquote.StockQuoteService"/>
334     <binding.ws wsdlElement="http://www.example.org/StockQuoteService#
335               wsdl.binding(StockQuoteBinding)"/>
336     wsdl:wsdlLocation="http://www.example.org/StockQuoteService
337                       http://www.example.org/StockQuoteService.wsdl"
338                       uri="http://www.example.org/StockQuoteService5"/>
339   </reference>
340 </composite>
```

341 *Snippet 3-1: Example Binding with a WSDL Document*

### 3.2 Examples Without a WSDL Document

343 Snippet 3-2 shows the simplest form of the binding element without WSDL document, assuming all  
344 defaults for portType mapping and SOAP binding synthesis. The service and reference each have a  
345 single binding element, whose name defaults to the service/reference name.

346 The service is to be made available at a location determined by the deployment of this component. It will  
347 have a single port address and SOAP binding, with a simple WS-I BasicProfile 1.1 compliant binding, and  
348 using the default options for mapping the Java interface to a WSDL portType.

349 The reference indicates a service to be invoked which has a SOAP binding and portType that matches  
350 the default options for binding synthesis and interface mapping. One particular use of this case would be  
351 where the reference is to an SCA service with a web service binding which itself uses all the defaults.

352

```
353 <?xml version="1.0" encoding="ASCII"?>
354 <composite xmlns="http://docs.oasis-open.org/ns/opencsa/sca/200912"
355           name="MyValueComposite">
356
357     <service name="MyValueService">
358       <interface.java interface="services.myvalue.MyValueService"/>
359       <binding.ws/>
360       ...
361     </service>
362
363     ...
364
365     <reference name="StockQuoteService">
366       <interface.java interface="services.stockquote.StockQuoteService"/>
367       <binding.ws uri="http://www.example.org/StockQuoteService"/>
368     </reference>
369 </composite>
```

370 *Snippet 3-2: Example Binding without a WSDL Document*

371

372 Snippet 3-3 shows the use of the binding element without a WSDL document, with multiple SOAP  
373 bindings with non-default values. The SOAP 1.2 binding name defaults to the service name, the SOAP  
374 1.1 binding is given an explicit name. The reference has a web service binding which uses SOAP 1.2,  
375 but otherwise uses all the defaults for SOAP binding. The reference binding name defaults to the  
376 reference name.

377

```
378 <?xml version="1.0" encoding="ASCII"?>
379 <composite xmlns="http://docs.oasis-open.org/ns/opencsa/sca/200912"
380           name="MyValueComposite">
381
382     <service name="MyValueService">
383       <interface.java interface="services.myvalue.MyValueService"/>
384       <binding.ws name="MyValueServiceSOAP11" requires="SOAP.v1_1"/>
385       <binding.ws requires="SOAP.v1_2"/>
386       ...
387     </service>
388
389     ...
390
391     <reference name="StockQuoteService">
392       <interface.java interface="services.stockquote.StockQuoteService"/>
393       <binding.ws uri="http://www.example.org/StockQuoteService"
394                 requires="SOAP.v1_2"/>
395     </reference>
396 </composite>
```

397 *Snippet 3-3: Example Binding with Multiple SOAP Bindings*

---

## 398 4 Transport Binding

399 The binding.ws element provides numerous ways to specify exactly how messages ought to be  
400 transmitted from or to the reference or service. Those ways include references to WSDL binding elements  
401 from the @wsdlElement attribute, policy intents, and even vendor extensions within the binding.ws  
402 element. This section describes the defaults to be used if the specific transport details are not otherwise  
403 specified.

### 404 4.1 Intents

405 So as to narrow the range of choices for how messages are carried, these policy intents affect the  
406 transport binding:

- 407 • SOAP

408 When the SOAP intent is required, the SCA runtime MUST transmit and receive messages using  
409 SOAP. One or more SOAP versions can be used. [BWS40001]

- 410 • SOAP.v1\_1

411 When the SOAP.v1\_1 intent is required, the SCA runtime MUST transmit and receive messages  
412 using only SOAP 1.1. [BWS40002]

- 413 • SOAP.v1\_2

414 When the SOAP.v1\_2 intent is required, the SCA runtime MUST transmit and receive messages  
415 using only SOAP 1.2. [BWS40003]

### 416 4.2 Default Transport Binding Rules

#### 417 4.2.1 WS-I Basic Profile Alignment

418 To align to WS-I Basic Profile, the resulting WSDL port needs to be all document-literal, or all rpc-literal  
419 binding (per WS-I Basic Profile 1.1 R2705 [WSI-Profiles]). This means, for any given portType, for all  
420 messages referenced by all operations in that portType, either

- 421 • that every message part references an XML Schema type (rpc-literal pattern)
- 422 • or that every message references exactly zero or one XML Schema elements (document-literal  
423 pattern)

424 For an SCA service or reference element, the portType from the service's or reference's interface or  
425 derived from that interface MUST follow either the rpc-literal pattern or the document-literal pattern.  
426 [BWS40004]

427 The rest of this section assumes the short-hand reference of a "rpc-literal" or "document-literal" pattern,  
428 depending on which of the two bullet points above it matches.

#### 429 4.2.2 Default Transport Binding Rules

430 The **default transport binding rules** for the Web Service binding are:

- 431 • HTTP-based transfer protocol;
- 432 • SOAP 1.1 binding;
- 433 • "literal" format as described in section 3.5 of [WSDL11];
- 434 • Either the document literal or rpc literal pattern, depending on the service or reference interface as  
435 described in section 4.2.1;
  - 436 – For document literal pattern, each message uses "document" style, as per section 3.5 of  
437 [WSDL11];

438 – For rpc-literal pattern, each message uses "rpc" style, as per section 3.5 of **[WSDL11]** and the  
439 child elements of the SOAP Body element are namespace qualified with a non-empty namespace  
440 name;

- 441 • For SOAP 1.1 messages, the SOAPAction HTTP header described in section 6.1.1 of **[SOAP11]**  
442 represents the empty string, in quotes ("");
- 443 • For SOAP 1.2 messages, the SOAP Action feature described in section 6.5 of **[SOAP12Adjuncts]**  
444 does not appear;
- 445 • All WSDL message parts are carried in the SOAP body.

446 In the event that the transport details are not determined by use of the @wsdlElement attribute, @uri  
447 attribute, wsa:EndpointReference element, policy intents, policy sets or extensions to the binding.ws  
448 element, an SCA runtime **MUST** enable the default transport binding rules. **[BWS40005]**

449 When using the default transport binding rules, the SCA runtime can provide additional WSDL bindings,  
450 unless policy is applied that explicitly restricts this.

451 When using the default transport binding rules with the rpc-literal pattern, the SCA runtime **SHOULD** use  
452 the structural URI associated with the binding as the namespace of the child elements of the SOAP body  
453 element. **[BWS40007]**

454

## 5 Implementing SCA Callbacks using Web Services

455

### 5.1 SCA Web Services Callback Protocol

456 This section defines a SOAP- and WS-Addressing-based SCA Web Services callback protocol that can  
457 be used to implement a bidirectional interface **[SCA-Assembly]**. For examples of wire messages  
458 exchanged when using this protocol see Appendix E.

459 The protocol involves two communicating parties: a Service that implements the SCA bidirectional  
460 interface using Web services (WSCB Service) and a client that invokes the SCA bidirectional interface  
461 using Web services (WSCB Client). The WSCB Service implements the forward interface and the WSCB  
462 Client implements the callback interface. SCA Web Services Callback Protocol involves the following  
463 rules.

464 1. Every request message from the WSCB Client that invokes the forward interface MUST contain a  
465 Callback EPR. **[BWS50002]** If the request message contains the `wsa:From` SOAP header block  
466 then the `wsa:From` header block specifies the Callback EPR. If the `wsa:From` header block is not  
467 present then the `wsa:ReplyTo` header block specifies the Callback EPR.

468 If the Callback EPR's [address] value is  
469 "`http://www.w3.org/2005/08/addressing/anonymous`" or  
470 "`http://www.w3.org/2005/08/addressing/none`" then the WSCB Service MUST generate  
471 the Invalid Addressing Header fault as specified in Section 6.4.1 of **[WS-Addr-SOAP]**. **[BWS50004]**  
472 Such a fault can include additional [Subsubcode]  
473 `wsa:OnlyNonAnonymousAddressSupported`.

474 2. A request message that invokes the forward interface can contain the `wsa:MessageID` SOAP  
475 header block. If there is a need to have the callback request message correlated to an individual  
476 forward request message, the `wsa:MessageID` SOAP header block can be used for this purpose.

477 3. When the WSCB Service invokes the callback interface, it MUST use the Callback EPR from a  
478 request message that invoked the forward interface. **[BWS50005]** Once the Callback EPR is  
479 selected, the WSCB Service MUST follow the rules defined in Section 3.3 of **[WS-Addr]** to invoke  
480 operations on the callback interface. **[BWS50006]**

481 When the WSCB Service invokes the callback interface, if the request message from which the Callback  
482 EPR was obtained contained the `wsa:MessageID` SOAP header block, the WSCB Service MUST  
483 include a `wsa:RelatesTo` SOAP header block in the callback message. **[BWS50007]** The  
484 `wsa:RelatesTo` SOAP header block MUST have the relationship type value of  
485 "`http://docs.oasis-open.org/opencsa/sca-bindings/ws/callback`" and the related  
486 message id MUST be the `wsa:MessageID` of the message from which the Callback EPR was obtained.  
487 **[BWS50008]**

488 If the request message from which the Callback EPR was obtained did not contain the `wsa:MessageID`  
489 SOAP header block, the WSCB Service MUST NOT include a `wsa:RelatesTo` SOAP header block with  
490 a relationship type value of "`http://docs.oasis-open.org/opencsa/sca-`  
491 `bindings/ws/callback`" in the callback message. **[BWS50009]**

492 When a service that offers a bidirectional interface is invoked, depending on the semantics and/or  
493 implementation of the service, it is possible that the service might invoke the callback interface before the  
494 forward operation ends. In such cases, it is necessary for the binding on the reference-side to be listening  
495 for callback request(s) from the service, before the forward operation request is sent on the wire to the  
496 service, and continue listening as long as callback requests are expected. It is possible that before the  
497 response to the forward request is sent a response to one or more callback requests are required by the  
498 service.

## 499 5.2 SCA Web Services Callback Protocol with WS-MakeConnection

500 It is possible that the invoker of a service that uses a bidirectional interface has a binding that cannot  
501 accept connections for callbacks from a service (for example, when it has the `noListener` intent [**SCA-**  
502 **Policy**]). When this is the case, it is necessary for the binding to support a polling mechanism. An  
503 example of a polling mechanism is WS-MakeConnection [**WS-MC**]. This section describes the use of the  
504 SCA Web Services Callback Protocol in conjunction with WS-MakeConnection. For examples of wire  
505 messages exchanged when using the SCA Web Services Callback protocol in conjunction with WS-  
506 MakeConnection see Appendix E.1.

507 When the SCA Web Services Callback protocol is implemented in conjunction with WS-MakeConnection,  
508 it has to adhere to the rules described for the SCA Web Services Callback Protocol and also to those of  
509 WS-MakeConnection.

510 The Callback EPR's [address] value present in the request message that invoked the forward interface  
511 follows the form of the MakeConnection Anonymous URI, i.e. "`http://docs.oasis-open.org/ws-  
512 rx/wsmc/200702/anonymous?id={unique-String}`".

513 The unique-String value is a globally unique value such as a UUID, as defined by the WS-  
514 MakeConnection specification.

515 When the service implementation invokes the callback interface, it uses the Callback EPR from a request  
516 message that invoked the forward interface, and the callback request message is sent as the response to  
517 a `wsmc:MakeConnection` message that contains the `wsmc:Address` value that matches the  
518 MakeConnection Anonymous URI in the Callback EPR.

519 When a service that offers a bidirectional interface is invoked using WS-MakeConnection Anonymous  
520 URI as the value for the Callback EPR address, depending on the semantics and/or implementation of  
521 the service, it is possible that the service might invoke the callback interface before the forward operation  
522 ends. In such cases, it is necessary for the binding on the reference-side to start polling for callback  
523 request(s) from the service, before or right after the forward operation request is sent and before a  
524 response is received, and continue polling as long as callback requests are expected. It is possible that  
525 before the response to the forward request is sent a response to one or more callback requests are  
526 required by the service.

## 527 5.3 Policy Assertion for SCA Web Services Callback Protocol

528 WS-Policy Framework [**WS-Policy**] and WS-Policy Attachment [**WS-PA**] collectively define a framework,  
529 model and grammar for expressing the requirements, and general characteristics of entities in an XML  
530 Web services-based system. To enable a Web service client and a Web service to describe their  
531 requirements for implementing SCA Web Services Callback Protocol, this specification defines a single  
532 policy assertion that leverages the WS-Policy framework.

### 533 5.3.1 Assertion Model

534 The WSCallback policy assertion indicates that the WSCB Client and the WSCB Service MUST use SCA  
535 Web Services Callback Protocol to implement callbacks. [**BWS50010**] Specifically, the protocol  
536 determines the requirements on the forward request message, the EPR used for callbacks and the  
537 requirements on the callback request message.

### 538 5.3.2 Normative Outline

539 The normative outline for the WSCallback assertion is:

540

```
541 <sca:WSCallback ...>  
542   ...  
543 </sca:WSCallback>
```

544 *Snippet 5-1: WSCallback Assertion*

545

546 The content model of the WSCallback element is:

- 547 • `/sca:WSCallback`: A policy assertion that specifies that SCA Web Services Callback protocol is  
548 used when sending messages.

### 549 5.3.3 Assertion Attachment

550 The WSCallback policy assertion can have the following Policy Subjects **[WS-PA]**:

- 551 • Endpoint Policy Subject

552 WS-PolicyAttachment defines a set of WSDL/1.1 policy attachment points for each of the above Policy  
553 Subjects. Since a WSCallback policy assertion specifies a concrete behavior, it cannot be attached to the  
554 abstract WSDL policy attachment points.

555 The following is the list of WSDL/1.1 elements whose scope contains the Policy Subjects allowed for a  
556 WSCallback policy assertion but which MUST NOT have WSCallback policy assertions attached:  
557 `wSDL:portType` **[BWS50013]**

558 The following is the list of WSDL/1.1 elements whose scope contains the Policy Subjects allowed for a  
559 WSCallback policy assertion and which can have WSCallback policy assertions attached:

- 560 • `wSDL:port`
- 561 • `wSDL:binding`

### 562 5.3.4 Assertion Example

563 Snippet 5-2 the use of the WSCallback policy assertion in a WSDL document.

564

```
565 (01)<wSDL:definitions  
566 (02)   targetNamespace="example.com"  
567 (03)   xmlns:tns="example.com"  
568 (04)   xmlns:wSDL="http://schemas.xmlsoap.org/wSDL/"  
569 (05)   xmlns:wsp="http://www.w3.org/ns/ws-policy"  
570 (06)   xmlns:sca="http://docs.oasis-open.org/ns/opencsa/sca/200912"  
571 (07)   xmlns:wsu="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-  
572 wssecurity-utility-1.0.xsd">  
573 (08)  
574 (09) <wsp:UsingPolicy wSDL:required="true" />  
575 (10)  
576 (11) <wsp:Policy wsu:Id="MyPolicy" >  
577 (12)   <sca:WSCallback/>  
578 (13) </wsp:Policy>  
579 (14)  
580 (15) <!-- omitted elements -->  
581 (16)  
582 (17) <wSDL:binding name="MyBinding" type="tns:MyPortType" >  
583 (18)   <wsp:PolicyReference URI="#MyPolicy" />  
584 (19)   <!-- omitted elements -->  
585 (20) </wSDL:binding>  
586 (21)  
587 (22)</wSDL:definitions>
```

588 *Snippet 5-2: WSCallback Policy Assertion Used in a WSDL Document*

589

590 Line (09) in Snippet 5-2 indicates that WS-Policy is in use as a required extension. Lines (11-13) are a  
591 policy expression that includes a WSCallback policy assertion (line 12) to indicate that SCA Web Services  
592 Callback protocol is used. Lines (17-20) are a WSDL binding. Line (18) indicates that the policy in lines  
593 (11-13) applies to this binding, specifically indicating that SCA Web Services Callback protocol is used  
594 over all the messages in the binding.

### 595 **5.3.5 Security Considerations**

596 Policies and assertions SHOULD be signed to prevent tampering. [BWS50014] Policies SHOULD NOT  
597 be accepted unless they are signed and have an associated security token to specify the signer has  
598 proper claims for the given policy. [BWS50015] That is, a relying party shouldn't rely on a policy unless  
599 the policy is signed and presented with sufficient claims to pass the relying parties acceptance criteria.

600 Note that the mechanisms described in this document could be secured as part of a SOAP message  
601 using WS-Security [WS-Security] or embedded within other objects using object-specific security  
602 mechanisms.

---

## 603 6 Conformance

604 The XML schema pointed to by the RDDL document at the namespace URI, defined by this specification,  
605 are considered to be authoritative and take precedence over the XML schema defined in the appendix of  
606 this document.

607 This specification defines four targets for conformance:

- 608 a) SCA WS Binding XML Document
- 609 b) Web Service Callback Service (WSCB Service)
- 610 c) Web Service Callback Client (WSCB Client)
- 611 d) SCA Runtime

### 612 6.1 SCA WS Binding XML Document

613 An SCA WS Binding XML document is an SCA Composite Document, or an SCA ComponentType  
614 Document, as defined by the SCA Assembly specification Section 13.1 [**SCA-Assembly**], that uses the  
615 <binding.ws> element.

616 An SCA WS Binding XML document **MUST** be a conformant SCA Composite Document or a SCA  
617 ComponentType Document, as defined by the SCA Assembly specification [**SCA-Assembly**], and **MUST**  
618 comply with all statements in Appendix C: Conformance Items related to elements and attributes in an  
619 SCA WS Binding XML document, notably all "MUST" statements have to be implemented.

### 620 6.2 Web Service Callback Service

621 An implementation that claims to conform to the requirements of a WSCB Service defined in this  
622 specification **MUST** conform to all the statements in Appendix C: Conformance Items related to a WSCB  
623 Service.

### 624 6.3 Web Service Callback Client

625 An implementation that claims to conform to the requirements of a WSCB Client defined in this  
626 specification **MUST** conform to all the statements in Appendix C: Conformance Items related to a WSCB  
627 Client.

### 628 6.4 SCA Runtime

629 An implementation that claims to conform to the requirements of an SCA Runtime defined in this  
630 specification has to meet the following conditions:

- 631 1. The implementation **MUST** comply with all statements in Appendix C: Conformance Items related to  
632 an SCA Runtime, except for those that originate from Section 5, notably all "MUST" statements have  
633 to be implemented.
- 634 2. The implementation **MAY** support the SCA Web Services Callback Protocol. If it does, it **MUST** be a  
635 compliant WSCB Service and WSCB Client.
- 636 3. The implementation **MAY** support the SCA Web Services Callback Protocol in conjunction with WS-  
637 MakeConnection. If it does, it **MUST** be a compliant WSCB Service, WSCB Client, and it **MUST**  
638 comply with the requirements of WS-MakeConnection.
- 639 4. The implementation **MUST** conform to the SCA Assembly Model Specification Version 1.1 [**SCA-**  
640 **Assembly**], and to the SCA Policy Framework Version 1.1 [**SCA-Policy**].
- 641 5. The implementation **MUST** reject a SCA WS Binding XML Document that is not conformant per  
642 Section 6.1.

643 Note that when an SCA Runtime implementation claims to conform to the SCA Web Services Callback  
644 Protocol, the implementation acts as a WSCB Service/Client on behalf of an SCA component. In such a  
645 case the component developer does not have to implement the protocol and can rely on the SCA  
646 Runtime's support of the protocol.

647  
648

## A. Web Services XML Binding Schema: sca-binding- ws-1.1.xsd (Normative)

```
649 <?xml version="1.0" encoding="UTF-8"?>
650 <!-- Copyright(C) OASIS(R) 2005,2010. All Rights Reserved.
651 OASIS trademark, IPR and other policies apply. -->
652 <schema xmlns="http://www.w3.org/2001/XMLSchema"
653 targetNamespace="http://docs.oasis-open.org/ns/opencsa/sca/200912"
654 xmlns:sca="http://docs.oasis-open.org/ns/opencsa/sca/200912"
655 xmlns:wsdli="http://www.w3.org/ns/wsdli-instance"
656 xmlns:wsa="http://www.w3.org/2005/08/addressing"
657 elementFormDefault="qualified">
658
659 <import namespace="http://www.w3.org/ns/wsdli-instance"
660 schemaLocation="http://www.w3.org/2007/05/wsdli/wsdli20-
661 instance.xsd"/>
662 <import namespace="http://www.w3.org/2005/08/addressing"
663 schemaLocation="http://www.w3.org/2006/03/addressing/ws-
664 addr.xsd"/>
665
666 <include schemaLocation="sca-core-1.1-cd05.xsd"/>
667
668 <element name="binding.ws" type="sca:WebServiceBinding"
669 substitutionGroup="sca:binding"/>
670
671 <complexType name="WebServiceBinding">
672 <complexContent>
673 <extension base="sca:Binding">
674 <sequence>
675 <element ref="wsa:EndpointReference"
676 minOccurs="0" maxOccurs="unbounded"/>
677 <element ref="sca:extensions" minOccurs="0" maxOccurs="1"
678 />
679 </sequence>
680 <attribute name="wsdlElement" type="anyURI" use="optional"/>
681 <attribute ref="wsdli:wsdliLocation" use="optional"/>
682 </extension>
683 </complexContent>
684 </complexType>
685 </schema>
```

686  
687  
688

---

## B. SCA Web Services Callback Protocol Policy Assertion XML Schema: sca-binding-webservice- callback-1.1.xsd (Normative)

689  
690  
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695  
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703  
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706  
707

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- (c) Copyright OASIS 2005, 2010. All Rights Reserved.
      OASIS trademark, IPR and other policies apply. -->

<schema xmlns="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://docs.oasis-open.org/ns/opencsa/sca/200912"
  elementFormDefault="qualified">

  <element name="WSCallback">
    <complexType>
      <sequence>
        <any namespace="##other" processContents="lax" minOccurs="0"
          maxOccurs="unbounded"/>
      </sequence>
      <anyAttribute namespace="##any" processContents="lax"/>
    </complexType>
  </element>

</schema>
```

## C. Conformance Items (Normative)

709 This section contains a list of conformance items for the SCA Web Service Binding specification.

Conformance ID	Description
[BWS20001]	For an SCA reference, the @uri attribute MUST be an absolute value.
[BWS20002]	The value of the @wsdlElement attribute MUST identify an element in an existing WSDL 1.1 document.
[BWS20003]	If the binding is for an SCA service, the wsdlElement attribute MUST NOT specify the wsdl.service form of URI.
[BWS20004]	If the wsdl.service form of wsdlElement is used on an SCA reference binding, the set of available ports for that reference binding MUST be non-empty.
[BWS20005]	If the wsdl.service form of wsdlElement is used on an SCA reference binding, the SCA runtime MUST raise an error if there are no available ports that it supports.
[BWS20006]	When an invocation is made using an SCA reference binding with the wsdl.service form of wsdlElement, the SCA runtime MUST use exactly one port from the set of available ports for the reference (with port selection on a per-invocation basis permitted).
[BWS20007]	If the binding is for an SCA service, the portType associated with the specified WSDL port MUST be compatible with the SCA service interface as defined in section 2.1, and the port MUST satisfy all the policy constraints of the binding.
[BWS20008]	The SCA runtime MUST expose an endpoint for the specified WSDL port, or raise an error if it does not support the WSDL port.
[BWS20009]	If the binding is for an SCA reference, the portType associated with the specified WSDL port MUST be a compatible superset of the SCA reference interface as defined in the SCA Assembly Model specification [SCA-Assembly], and the port MUST satisfy all the policy constraints of the binding.
[BWS20010]	The SCA runtime MUST use the specified WSDL port for invocations made using the SCA reference binding, or raise an error if it does not support the WSDL port.
[BWS20011]	If the binding is for an SCA service, the portType associated with the specified WSDL binding MUST be compatible with the SCA service interface as defined in section 2.1, and the WSDL binding MUST satisfy all the policy constraints of the binding.
[BWS20012]	The SCA runtime MUST expose an endpoint for the specified WSDL binding, or raise an error if it does not support the WSDL binding.
[BWS20013]	If the binding is for an SCA reference, the portType associated with the specified WSDL binding MUST be a compatible superset of the SCA reference interface as defined in the SCA Assembly Model specification [SCA-Assembly], and the WSDL binding MUST satisfy all the policy constraints of the binding.
[BWS20014]	The SCA runtime MUST use the specified WSDL binding for invocations made using the SCA reference binding, or raise an error if it does not support the

	WSDL binding.
[BWS20015]	When the <i>wSDL.binding</i> form of <i>wSDL.Element</i> is used, the endpoint address URI for an SCA reference MUST be specified by either the <i>@uri</i> attribute on the binding or a WS-Addressing <i>wsa:EndpointReference</i> element, except where the SCA Assembly Model specification [SCA-Assembly] states that the <i>@uri</i> attribute can be omitted.
[BWS20017]	If the <i>@wsdl:wsdlLocation</i> attribute is used the <i>@wsdlElement</i> attribute MUST also be specified.
[BWS20018]	The value of the <i>@wsdl:wsdlLocation</i> attribute MUST identify an existing WSDL 1.1 document.
[BWS20019]	A <i>binding.ws</i> element MUST NOT contain more than one of any of the following: the <i>@uri</i> attribute; the <i>@wsdlElement</i> attribute referring to a WSDL port or to a WSDL service; the <i>wsa:EndpointReference</i> element.
[BWS20020]	For the <i>callback</i> element of an SCA service, the binding MUST NOT specify an endpoint address URI or a WS-Addressing <i>wsa:EndpointReference</i> .
[BWS20021]	The SCA runtime MUST support all the attributes of the <i>&lt;binding.ws&gt;</i> element, namely <i>@name</i> , <i>@uri</i> , <i>@requires</i> , <i>@policySets</i> , <i>@wsdlElement</i> , and <i>@wsdl:wsdlLocation</i> .
[BWS20022]	The SCA runtime SHOULD support the element <i>&lt;wsa:EndpointReference&gt;</i> .
[BWS20023]	If an SCA runtime does not support the element <i>&lt;wsa:EndpointReference&gt;</i> , then it MUST reject an SCA WS Binding XML document (as defined in Section 5.1) that contains the element.
[BWS20024]	The <i>&lt;binding.ws&gt;</i> element MUST conform to the XML schema defined in <i>sca-binding-webservice-1.1.xsd</i> .
[BWS20025]	If there is no target address for a reference binding, the SCA runtime MUST raise an error.
[BWS20026]	For a reference binding, the SCA runtime MUST use the target address.
[BWS20027]	When <i>binding.ws</i> is used on a service or reference with an interface that is not defined by <i>interface.wSDL</i> , the SCA runtime MUST derive a WSDL portType for the service or reference from the interface using the WSDL-mapping rules defined for that SCA interface type.
[BWS20028]	An SCA runtime MUST raise an error if the interface on a service or reference element with a <i>binding.ws</i> element does not map to a WSDL portType.
[BWS20029]	Any service hosted by an SCA runtime with one or more web service bindings with HTTP endpoints SHOULD return a WSDL description of the service in response to an HTTP GET request with the "?wsdl" suffix added to that HTTP endpoint URL.
[BWS20030]	If none of the web service bindings for an SCA service have HTTP endpoints, then the SCA runtime SHOULD provide some other means of obtaining the WSDL description of the service.
[BWS20032]	An SCA runtime MUST support the WSDL extensions defined in the namespace associated with the prefix "sca" (as defined in section 1.1).
[BWS20033]	The SCA runtime MUST support the WSDL 1.1 binding extension for SOAP 1.1 over HTTP [WSDL11], as identified by the WSDL element

	wsoap11:binding that has the @transport attribute with a value of "http://schemas.xmlsoap.org/soap/http".
[BWS20034]	The SCA runtime SHOULD support the WSDL 1.1 binding extension for SOAP 1.2 over HTTP [W11-SOAP12], as identified by the WSDL element wsoap12:binding that has the @transport attribute with a value of "http://schemas.xmlsoap.org/soap/http".
[BWS20035]	The <bindingType> element associated with this binding MUST include the SOAP.v1_1 intent in its @mayProvides or @alwaysProvides attributes.
[BWS20036]	The <bindingType> element associated with this binding SHOULD include the SOAP.v1_2 intent in its @mayProvides attribute.
[BWS20037]	The SCA runtime MUST raise an error if a web service binding is configured with a policy intent(s) that conflicts with the binding instance's configuration.
[BWS40001]	When the SOAP intent is required, the SCA runtime MUST transmit and receive messages using SOAP. One or more SOAP versions can be used.
[BWS40002]	When the SOAP.v1_1 intent is required, the SCA runtime MUST transmit and receive messages using only SOAP 1.1.
[BWS40003]	When the SOAP.v1_2 intent is required, the SCA runtime MUST transmit and receive messages using only SOAP 1.2.
[BWS40004]	For an SCA service or reference element, the portType from the service's or reference's interface or derived from that interface MUST follow either the rpc-literal pattern or the document-literal pattern.
[BWS40005]	In the event that the transport details are not determined by use of the @wsdlElement attribute, @uri attribute, wsa:EndpointReference element, policy intents, policy sets or extensions to the binding.ws element, an SCA runtime MUST enable the default transport binding rules.
[BWS40007]	When using the default transport binding rules with the rpc-literal pattern, the SCA runtime SHOULD use the structural URI associated with the binding as the namespace of the child elements of the SOAP body element.
[BWS50002]	Every request message from the WSCB Client that invokes the forward interface MUST contain a Callback EPR.
[BWS50004]	If the Callback EPR's [address] value is "http://www.w3.org/2005/08/addressing/anonymous" or "http://www.w3.org/2005/08/addressing/none" then the WSCB Service MUST generate the Invalid Addressing Header fault as specified in Section 6.4.1 of [WS-Addr-SOAP].
[BWS50005]	When the WSCB Service invokes the callback interface, it MUST use the Callback EPR from a request message that invoked the forward interface.
[BWS50006]	Once the Callback EPR is selected, the WSCB Service MUST follow the rules defined in Section 3.3 of [WS-Addr] to invoke operations on the callback interface.
[BWS50007]	When the WSCB Service invokes the callback interface, if the request message from which the Callback EPR was obtained contained the wsa:MessageID SOAP header block, the WSCB Service MUST include a wsa:RelatesTo SOAP header block in the callback message.

[BWS50008]	The <code>wsa:RelatesTo</code> SOAP header block MUST have the relationship type value of " <code>http://docs.oasis-open.org/opencsa/sca-bindings/ws/callback</code> " and the related message id MUST be the <code>wsa:MessageID</code> of the message from which the Callback EPR was obtained.
[BWS50009]	If the request message from which the Callback EPR was obtained did not contain the <code>wsa:MessageID</code> SOAP header block, the WSCB Service MUST NOT include a <code>wsa:RelatesTo</code> SOAP header block with a relationship type value of " <code>http://docs.oasis-open.org/opencsa/sca-bindings/ws/callback</code> " in the callback message.
[BWS50010]	The WSCallback policy assertion indicates that the WSCB Client and the WSCB Service MUST use SCA Web Services Callback Protocol to implement callbacks.
[BWS50013]	The following is the list of WSDL/1.1 elements whose scope contains the Policy Subjects allowed for a WSCallback policy assertion but which MUST NOT have WSCallback policy assertions attached: <code>wsdl:portType</code>
[BWS50014]	Policies and assertions SHOULD be signed to prevent tampering.
[BWS50015]	Policies SHOULD NOT be accepted unless they are signed and have an associated security token to specify the signer has proper claims for the given policy.

710

---

## D. WSDL Generation (Non-Normative)

711 Due to the number of factors that determine how a WSDL might be generated, including compatibility with  
712 existing WSDL uses, precise details cannot be specified. For example, implementation decisions can  
713 affect the way WSDL might be generated. For reference, and consistency, this section suggests non-  
714 normative choices for some of the various details involved in generating WSDL. For brevity, the following  
715 definitions apply:

- 716 • component name = the value of the @name attribute of the component element containing the  
717 binding.ws element
- 718 • service name = the value of the @name attribute of the service element containing the binding.ws  
719 element
- 720 • binding name = the value of @name attribute of the binding.ws element, or the default if no @name  
721 attribute is present
- 722 • SOAP version = either "SOAP11" or "SOAP12" as appropriate

723 With those definitions in place, here are the suggested choices:

- 724 • wsdl:definitions/@name = <component name> + "." + <service name>
- 725 • wsdl:definitions/@targetNamespace = <structural URI for the service>
- 726 • import each WSDL 1.1 portType, rather than putting them inline
- 727 • wsdl:binding/@name = <binding name> + <SOAP version> + "Binding"
- 728 • wsdl:service/@name = <service name>
- 729 • wsdl:port/@name = <binding name> + <SOAP version> + "Port"

730  
731

## E. SCA Web Services Callback Protocol Message Examples (Non-Normative)

732 The message examples in this section are for a configuration that consists of a reference R that is wired  
733 to a Service S. S has a bidirectional interface and the binding used in both directions, forward and  
734 callback, is binding.ws configured for SOAP. The forward interface and the callback interface both contain  
735 a single one-way operation.

736 The following message exchanges take place between R and S:

- 737 1. R invokes the forward operation and sets the callback address to **RC1**. Let's call the message that  
738 invokes the forward operation R1. S then calls the callback operation twice. Let's call the callback  
739 messages S1 and S2
- 740 2. R invokes the forward operation again with the same callback address **RC1**. Let's call the message  
741 that invokes the forward operation R2. S then calls the callback operation once. Let's call the callback  
742 message S3.
- 743 3. R invokes the forward operation yet another time, but this time uses a difference callback address:  
744 **RC2**. Let's call the message that invokes the forward operation R3. S then calls the callback  
745 operation twice. Let's call the callback messages S4 and S5.

746 The messages R1, R2, R3, S1, S2, S3, S4 and S5 are shown. The namespace prefix 'soap' can be  
747 bound to either the SOAP 1.1 or SOAP 1.2 namespace. The 'wsa' prefix is bound to the WS-Addressing  
748 1.0 namespace.

749  
750

### R1:

```
751 <soap:Envelope ...>  
752 <soap:Header>  
753 <wsa:From>  
754 <wsa:Address>http://example.com/callback</wsa:Address>  
755 <wsa:ReferenceProperties>  
756 <myNS:SomeID>1</myNS:SomeID>  
757 </wsa:ReferenceProperties>  
758 </wsa:From>  
759 <wsa:MessageID>urn:uuid:f81d4fae-7dec-11d0-a765-  
760 00a0c91e6bf6</wsa:messageID>  
761 ...  
762 </soap:Header>  
763 <soap:Body>  
764 ...  
765 </soap:Body>  
766 </soap:Envelope>
```

767

### S1, S2:

```
769 <soap:Envelope ...>  
770 <soap:Header>  
771 <wsa:To>http://example.com/callback</wsa:To>  
772 <myNS:SomeID>1</myNS:SomeID>  
773 <wsa:RelatesTo RelationshipType="http://docs.oasis-open.org/opencsa/sca-  
774 bindings/ws/callback">urn:uuid:f81d4fae-7dec-11d0-a765-  
775 00a0c91e6bf6</wsa:RelatesTo>  
776 ...  
777 </soap:Header>  
778 <soap:Body>  
779 ...  
780 </soap:Body>  
781 </soap:Envelope>
```

782

783 **R2:**

```
784 <soap:Envelope ...>
785   <soap:Header>
786     <wsa:From>
787       <wsa:Address>http://example.com/callback</wsa:Address>
788       <wsa:ReferenceProperties>
789         <myNS:SomeID>1</myNS:SomeID>
790       </wsa:ReferenceProperties>
791     </wsa:From>
792     <wsa:MessageID>urn:uuid:f81d4fae-8dec-11d0-a765-
793 00a0c91e6bf6</wsa:messageID>
794     ...
795   </soap:Header>
796   <soap:Body>
797     ...
798   </soap:Body>
799 </soap:Envelope>
```

800

801 **S3:**

```
802 <soap:Envelope ...>
803   <soap:Header>
804     <wsa:To>http://example.com/callback</wsa:To>
805     <myNS:SomeID>1</myNS:SomeID>
806     <wsa:RelatesTo RelationshipType="http://docs.oasis-open.org/opencsa/sca-
807 bindings/ws/callback">
808       urn:uuid:f81d4fae-8dec-11d0-a765-00a0c91e6bf6
809     </wsa:RelatesTo>
810     ...
811   </soap:Header>
812   <soap:Body>
813     ...
814   </soap:Body>
815 </soap:Envelope>
```

816

817 **R3:**

```
818 <soap:Envelope ...>
819   <soap:Header>
820     <wsa:From>
821       <wsa:Address>http://example.com/callback-other</wsa:Address>
822       <wsa:ReferenceProperties>
823         <myNS:SomeID>2</myNS:SomeID>
824       </wsa:ReferenceProperties>
825     </wsa:From>
826     <wsa:MessageID>urn:uuid:f81d4fae-9dec-11d0-a765-
827 00a0c91e6bf6</wsa:messageID>
828     ...
829   </soap:Header>
830   <soap:Body>
831     ...
832   </soap:Body>
833 </soap:Envelope>
```

834

835 **S4, S5:**

```

836 <soap:Envelope ...>
837 <soap:Header>
838   <wsa:To>http://example.com/callback-other</wsa:To>
839   <myNS:SomeID>2</myNS:SomeID>
840   <wsa:RelatesTo RelationshipType="http://docs.oasis-open.org/opencsa/sca-
841   bindings/ws/callback">urn:uuid:f81d4fae-9dec-11d0-a765-
842   00a0c91e6bf6</wsa:RelatesTo>
843   ...
844 </soap:Header>
845 <soap:Body>
846   ...
847 </soap:Body>
848 </soap:Envelope>

```

## 849 E.1 Message Examples Using WS-MakeConnection

850 In this case the reference R cannot host a listener and uses WS-MakeConnection to poll for callback  
851 requests. The interaction between the two consists of reference R sending a forward request R4. When  
852 using HTTP, the HTTP response to R4 contains an empty entity body. This is followed by a  
853 MakeConnection message from the reference to the service. This is a polling message from the reference  
854 and establishes a connection. If the callback request is ready when the connection is established, the  
855 service sends a callback request S6 to the reference in the entity body of the HTTP response.

856

857 **R4:**

```

858 <soap:Envelope ...>
859 <soap:Header>
860   <wsa:From>
861     <wsa:Address>http://docs.oasis-open.org/ws-
862     rx/wsmc/200702/anonymous?id=650e8400-f29b-11d4-a716-446655440010</wsa:Address>
863   </wsa:From>
864   <wsa:MessageID>urn:uuid:f81d4fae-10dec-11d0-a765-
865   00a0c91e6bf6</wsa:messageID>
866   ...
867 </soap:Header>
868 <soap:Body>
869   ...
870 </soap:Body>
871 </soap:Envelope>

```

872

873 **MakeConnection polling message (from R to S):**

```

874 <soap:Envelope ...>
875 <soap:Header>
876   <wsa:Action>http://docs.oasis-open.org/ws-
877   rx/wsmc/200702/MakeConnection</wsa:Action>
878   ...
879 </soap:Header>
880 <soap:Body>
881   <wsmc:MakeConnection>
882     <wsmc:Address>http://docs.oasis-open.org/ws-
883     rx/wsmc/200702/anonymous?id=650e8400-f29b-11d4-a716-
884     446655440010</wsmc:Address>
885   </wsmc:MakeConnection>
886 </soap:Body>
887 </soap:Envelope>

```

888

889 **S6:**

```
890 <soap:Envelope ...>
891   <soap:Header>
892     <wsa:To>http://docs.oasis-open.org/ws-rx/wsmc/200702/anonymous?id=650e8400-
893     f29b-11d4-a716-446655440010</wsa:To>
894     <wsa:RelatesTo RelationshipType="http://docs.oasis-open.org/opencsa/sca-
895     bindings/ws/callback">urn:uuid:f81d4fae-10dec-11d0-a765-
896     00a0c91e6bf6</wsa:RelatesTo>
897     ...
898   </soap:Header>
899   <soap:Body>
900     ...
901   </soap:Body>
902 </soap:Envelope>
```

903

## F. Acknowledgements (Non-Normative)

904 The following individuals have participated in the creation of this specification and are gratefully  
905 acknowledged:

906 **Participants:**

<b>Participant Name</b>	<b>Affiliation</b>
Bryan Aupperle	IBM
Ron Barack	SAP AG
Michael Beisiegel	IBM
Henning Blohm	SAP AG
David Booz	IBM
Martin Chapman	Oracle Corporation
Jean-Sebastien Delfino	IBM
Laurent Domenech	TIBCO Software Inc.
Jacques Durand	Fujitsu Limited
Mike Edwards	IBM
Billy Feng	Primeton Technologies, Inc.
Nimish Hathalia	TIBCO Software Inc.
Simon Holdsworth	IBM
Eric Johnson	TIBCO Software Inc.
Uday Joshi	Oracle Corporation
Khanderao Kand	Oracle Corporation
Anish Karmarkar	Oracle Corporation
Nickolaos Kavantzias	Oracle Corporation
Mark Little	Red Hat
Ashok Malhotra	Oracle Corporation
Jim Marino	Individual
Jeff Mischkinsky	Oracle Corporation
Dale Moberg	Axway Software
Simon Nash	Individual
Sanjay Patil	SAP AG
Plamen Pavlov	SAP AG
Peter Peshev	SAP AG
Piotr Przybylski	IBM
Luciano Resende	IBM
Tom Rutt	Fujitsu Limited
Vladimir Savchenko	SAP AG
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Owen Williams	Avaya, Inc.
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## G. Revision History (Non-Normative)

908 [optional; should not be included in OASIS Standards]

Revision	Date	Editor	Changes Made
1	2007-09-25	Anish Karmarkar	Applied the OASIS template + related changes to the Submission
2	2008-04-02	Anish Karmarkar	<ul style="list-style-type: none"> <li>* Partially applied the resolution of issue 14 in the conformance section.</li> <li>* Applied resolution to issue 9.</li> <li>* Applied resolution to issue 15.</li> <li>* Applied resolution to issue 16.</li> <li>* Applied resolution to issue 10.</li> <li>* Applied resolution to issue 8.</li> <li>* Applied resolution to issue 3.</li> </ul>
3	2008-06-12	Simon Holdsworth	<ul style="list-style-type: none"> <li>* Completed application of resolution to issue 10</li> <li>* Applied most of the editorial changes from Eric Johnson's review</li> </ul>
4	2008-08-13	Anish Karmarkar	<ul style="list-style-type: none"> <li>* Applied rest of Eric Johnson's ed review comments.</li> <li>* Applied resolution of issue 13.</li> <li>* Reapplied resolution of issue 15 (it was not applied correctly before)</li> <li>* Applied resolution of issue 19.</li> <li>* Applied resolution of issue 30.</li> <li>* Applied resolution of issue 32.</li> <li>* Applied resolution of issue 36.</li> <li>* Applied resolution of issue 38.</li> </ul>
cd01-rev1	2008-10-16	Simon Holdsworth	Applied resolution of issue 41.
cd01-rev2	2008-10-20	Anish Karmarkar	Added rfc2119 statements.
cd01-rev3	2008-11-19	Anish Karmarkar	Incorporated feedback from Bryan, Eric & Dave
cd01-rev3	2008-12-02	Anish Karmarkar	Removed 'required' word associated with description of pseudo-schema + changed section 2.6 (wsdl extensibility) per the TC decision. Both of these were associated with issue 51 (2119 stmts)
cd01-rev5	2009-02-06	Simon Holdsworth	<ul style="list-style-type: none"> <li>Applied resolution of issue 11</li> <li>Applied resolution of issue 49</li> <li>Applied action item 20080904-1</li> </ul>
cd02	2009-02-16	Simon Holdsworth	Renamed, applied editorial issues

cd02-rev1	2009-06-02	Anish Karmarkar	<ul style="list-style-type: none"> <li>* Applied resolution of issue 61 by using the document at <a href="http://www.oasis-open.org/apps/org/workgroup/sca-bindings/download.php/32160/sca-binding-ws-1.1-spec-cd02-issue61-rev3.doc">http://www.oasis-open.org/apps/org/workgroup/sca-bindings/download.php/32160/sca-binding-ws-1.1-spec-cd02-issue61-rev3.doc</a> as the base document.</li> <li>* Updated NS URI (Applied action item 20090311-2).</li> <li>* Updated Copyright statement in various places.</li> <li>* Updated schema per <a href="http://lists.oasis-open.org/archives/sca-bindings/200903/msg00057.html">http://lists.oasis-open.org/archives/sca-bindings/200903/msg00057.html</a> (Applied action item 20090312-1).</li> <li>* Applied resolution of issue 23, 25, 43, 54, 55, 64.</li> <li>* Replaced 3 occurrences of 'required' with 'specified'.</li> <li>* Recreated all bookmarks, cross-references, and conformance item table.</li> </ul>
cd02-rev2	2009-06-09	Anish Karmarkar	Ed. fixes. Changed the way the crossrefs/bookmarks for RFC2119 keywords work. Fixed a few references.
cd02-rev3	2009-06-11	Anish Karmarkar	<ul style="list-style-type: none"> <li>* Removed ':' from 40005, reformatted 40006/40007.</li> <li>* minor ed changes pointed out by SimonN.</li> <li>* minor formatting changes.</li> <li>* modified BWS20018 to remove the first sentence.</li> </ul>
cd02-rev4	2009-06-17	Anish Karmarkar	<ul style="list-style-type: none"> <li>* Not fixed in this rev, but issue 57 resolution was applied in previous rev.</li> <li>* Added list of participants in the Ack section.</li> <li>* Ed changes pointed out by Eric.</li> </ul>
cd02-rev5	2009-06-22	Anish Karmarkar	* Port of the fix made in JMS/JCA binding for issues 74/75. Specifically SCA WS Binding XML document requirements were made less vague (by referring to attributes/elements)
cd02-rev6	2009-06-24	Anish Karmarkar	<ul style="list-style-type: none"> <li>* Applied resolution of issue 76, 79, 82.</li> <li>* Some very minor ed changes.</li> <li>* Reverted the document naming scheme to the old scheme.</li> </ul>
cd02-rev7	2009-07-01	Simon Holdsworth	<ul style="list-style-type: none"> <li>* Applied resolution of issue 2</li> <li>* Fixed application of resolution of issue 76</li> </ul>
cd03	2009-07-01	Simon Holdsworth	Renamed for cd03
cd03-rev1	2010-02-07	Bryan	Added table #, snippet #, etc.

cd03-rev2	2010-03-10	Anish Karmarkar	<ul style="list-style-type: none"> <li>* Updated 'Notices' section for trademarks</li> <li>* Applied resolution of issue 99 points 9, 10, 16</li> <li>* Added references per <a href="http://lists.oasis-open.org/archives/sca-bindings/200912/msg00013.html">http://lists.oasis-open.org/archives/sca-bindings/200912/msg00013.html</a></li> <li>* Applied resolution of issue 84, 86, 91, 92, 116, 117, 118, 119</li> <li>* Updated NS URI from 200903 to 200912</li> </ul>
cd03-rev3	2010-03-31	Anish Karmarkar	<ul style="list-style-type: none"> <li>* Updated schema appendix title to include "1.1"</li> <li>* Applied resolution of issue 124</li> <li>* Ed changes associated with issue 124 resolution</li> </ul>
cd03-rev4	2010-04-22	Anish Karmarkar	<ul style="list-style-type: none"> <li>* Fixed ed issues pointed out at <a href="http://lists.oasis-open.org/archives/sca-bindings/201004/msg00004.html">http://lists.oasis-open.org/archives/sca-bindings/201004/msg00004.html</a></li> </ul>
cd03-rev5	2010-05-06	Anish Karmarkar	<ul style="list-style-type: none"> <li>* Updated reference to assembly</li> <li>* Minor ed tweaks in the namespace prefix table</li> <li>* Applied resolution of issue 127</li> </ul>
cd04	2010-05-14	Simon Holdsworth	Fix up for publication

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