



Service Component Architecture Web Service Binding Specification Version 1.1

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Abstract:

The SCA Web Service binding specified in this document applies to the services and references of an SCA composites. 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 allows one to specify enough information to generate one. When an existing WSDL binding is not referenced, rules defined in this document allow one to generate a WSDL binding.

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1 Introduction

The SCA Web Service binding specified in this document applies to the services and references of composites [1]. 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 allows one to specify enough information to generate one. When an existing WSDL binding is not referenced, rules defined in this document allow one to generate a WSDL binding.

The Web Service binding can point to an existing WSDL [2] document, separately authored, that specifies the details of the WSDL binding and portType schema 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 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.

In most cases it is expected that a binding applied to a composite's reference will point to an existing WSDL document that describes the web service to be invoked. The binding applied to a composite's service may use either approach.

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 [3] 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].

1.2 Normative References

[RFC2119] S. Bradner, *Key words for use in RFCs to Indicate Requirement Levels*, <http://www.ietf.org/rfc/rfc2119.txt>, IETF RFC 2119, March 1997.

[1] SCA Assembly Model Specification

<http://www.osoa.org/display/Main/Service+Component+Architecture+Specifications>

[2] WSDL Specification

WSDL 1.1: <http://www.w3.org/TR/wsd>

WSDL 2.0: <http://www.w3.org/TR/wsdI20/>

[3] WS-I Profiles

<http://www.ws-i.org/Profiles/BasicProfile-1.1.html>

<http://www.ws-i.org/Profiles/AttachmentsProfile-1.0.html>

<http://www.ws-i.org/Profiles/SimpleSoapBindingProfile-1.0.html>

41 <http://www.ws-i.org/Profiles/BasicSecurityProfile-1.0.html>
42 [4] JAX-WS Specification
43 <http://jcp.org/en/jsr/detail?id=224>
44 [5] SOAP specification
45 <http://www.w3.org/TR/2003/REC-soap12-part1-20030624/>
46 <http://www.w3.org/TR/2000/NOTE-SOAP-20000508/>
47 [6] Web Services Addressing 1.0 – Core
48 <http://www.w3.org/TR/2006/REC-ws-addr-core-20060509/>
49
50 **TBD** **TBD**

51 **1.3 Non-Normative References**

52 **TB** **TBD**

2 Web Service Binding Schema

The Web Service binding element is defined by the following pseudo-schema.

```
<binding.ws wsdlElement="xs:anyURI"?  
            wsdl:wsdlLocation="list of xs:anyURI"?  
            ...>  
  <wsa:EndpointReference>...</wsa:EndpointReference>*  
  ...  
</binding.ws>
```

- ***/binding.ws/@wsdlElement*** – optional attribute that specifies the URI of a WSDL element. The use of this attribute indicates that the SCA binding points to the specified element in an existing WSDL document. The URI can have the following forms:
 - Service:
`<WSDL-namespace-URI>#wsdl.service(<service-name>)`
In this case, all the endpoints in the WSDL Service that have equivalent PortTypes with the SCA service or reference must be available to the SCA service or reference.
 - Port (WSDL 1.1):
`<WSDL-namespace-URI>#wsdl.port(<service-name>/<port-name>)`
In this case, the identified port in the WSDL 1.1 Service must have an equivalent PortType with the SCA service or reference.
 - Endpoint (WSDL 2.0):
`<WSDL-namespace-URI>#wsdl.endpoint(<service-name>/<endpoint-name>)`
In this case, the identified endpoint in the WSDL 2.0 Service must have an equivalent PortType with the SCA service or reference.
 - Binding:
`<WSDL-namespace-URI>#wsdl.binding(<binding-name>)`
In this case, the identified WSDL binding must have an equivalent PortType with the SCA service or reference. In this case the endpoint address URI for the SCA service or reference must be provided via the URI attribute on the binding.
- ***/binding.ws/@wsdl:wsdlLocation*** – optional attribute that specifies the location of the WSDL document. This attribute can be specified in the event that the `<WSDL-namespace-URI>` in the 'endpoint' attribute is not dereferencable, or when the intended WSDL document is to be found at a different location than the one pointed to by the `<WSDL-namespace-URI>`. The use of this attribute indicates that the WSDL binding points to an existing WSDL document.
- ***/binding.ws/wsa:EndpointReference*** – optional WS-Addressing [6] EndpointReference that specifies the endpoint for the service or reference. When this element is present along with the `wsdlElement` attribute on the parent element, the `wsdlElement` attribute value MUST be of the 'Binding' form as specified above, i.e. `<WSDL-namespace-URI>#wsdl.binding(<binding-name>)`.

- 95 • */binding.ws/@{any}* - this is an extensibility mechanism to allow extensibility via
96 attributes.
- 97 • */binding.ws/any* – this is an extensibility mechanism to allow extensibility via
98 elements.

99 **2.1 Endpoint URI resolution**

100 The rules for resolving the URI at which an SCA service is hosted, or SCA reference
101 targets, when used with binding.ws (in precedence order) are:

- 102 1. The URIs in the endpoint(s) of the referenced WSDL
103 or
104 The URI specified by the wsa:Address element of the wsa:EndpointReference,
105 2. The explicitly stated URI in the "uri" attribute of the binding.ws element, which
106 may be relative,
107 3. The implicit URI as defined by the Assembly specification

108 The URI in the WSDL endpoint or in the wsa:Address of an EPR may be a relative URI, in
109 which case it is relative to the URI defined in (2) or (3). The wsa:Address element can
110 be the empty relative URI, in which case it uses the URI defined in (2) or (3) directly.
111 This allows the EPR writer to specify reference parameters, metadata and other EPR
112 contents while allowing the URI to be chosen by the deployer.

113 To reference a WSDL document and also specify an EPR, the wsdlElement attribute must
114 refer to a binding element in the WSDL and not an endpoint or service.

115 **2.2 Interface mapping**

116 When binding.ws is used on a service or reference with an interface that is not defined
117 by interface.wsdl, then a WSDL interface for the service or reference is derived from the
118 interface by the rules defined for that interface type.

119 For example, for interface.java, the mapping to a WSDL portType is as defined in the
120 SCA Assembly Specification [1].

121 Binding.ws implementations may use appropriate standards, for example WS-I AP 1.0 or
122 MTOM, to map interface parameters to binary attachments transparently to the target
123 component.

124

125 **2.3 Production of WSDL description for an SCA service**

126 Any service with one or more web service bindings with HTTP endpoints SHOULD return
127 a WSDL description of the service in response to an HTTP GET request with the “?wsdl”
128 suffix to that HTTP endpoint. If none of the web service bindings have HTTP endpoints,
129 then some other means of obtaining the WSDL description of the service should be
130 provided. This may include out of band mechanisms, for example publication to a UDDI
131 registry.

132 Refer to section 2.3 for a detailed definition of the rules that SHOULD be used for
133 generating the WSDL description of an SCA service with one or more web service
134 bindings.

135

136 **2.4 Additional binding configuration data**

137 SCA runtime implementations may provide additional metadata that is associated with a
138 web service binding, for example to enable JAX-WS [4] handlers to be executed as part
139 of the target component dispatch. The specification of such metadata is SCA runtime-
140 specific and is outside of the scope of this document.

141

142 **2.5 Web Service Binding and SOAP Intermediaries**

143 The Web Service binding does not provide any direct or explicit support for SOAP
144 intermediaries [5].

145

146 **2.6 Support for WSDL extensibility**

147 When a Web Service binding is specified using the wsdlElement attribute, the details of
148 the binding are specified by the WSDL element referenced by the value of the attribute.
149 WSDL elements allow for extensibility via elements as well as attribute. The Web Service
150 binding does not curtail the use of such extensibility in WSDL. Note that as a
151 consequence of this, when using this form of Web Service binding, it is not possible to
152 determine whether the binding is supported by the SCA runtime without parsing the
153 referenced WSDL element and its dependent elements.

154

3 Web Service Binding Examples

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

3.1 Example Using WSDL documents

This example shows a service and reference using the SCA Web Service binding, using existing WSDL documents in both cases. In each case there is a single binding element, whose name defaults to the service/reference name.

The service's binding is defined by the WSDL document associated with the given URI. This service must be conformant with the WS-I basic profile 1.1.

The reference's first binding is defined by the specified WSDL service in the WSDL document at the given location. The reference may use any of the WSDL service's ports/endpoints to invoke the target service. The reference's second binding is defined by the specified WSDL binding. The specific endpoint URI to be invoked is provided via the URI attribute.

```
<?xml version="1.0" encoding="ASCII"?>
<composite xmlns="http://www.oesa.org/xmlns/sca/1.0" name="MyValueComposite">
  <service name="MyValueService">
    <interface.java interface="services.myvalue.MyValueService"/>
    <binding.ws wsdlElement="http://www.myvalue.org/MyValueService#
wsdl.endpoint(MyValueService/MyValueServiceSOAP)"/>
    ...
  </service>
  ...
  <reference name="StockQuoteReference1">
    <interface.java interface="services.stockquote.StockQuoteService"/>
    <binding.ws wsdlElement="http://www.stockquote.org/StockQuoteService#
wsdl.service(StockQuoteService)"
wsdli:wsdlLocation="http://www.stockquote.org/StockQuoteService
http://www.stockquote.org/StockQuoteService.wsdl"/>
  </reference>
  <reference name="StockQuoteReference2">
    <interface.java interface="services.stockquote.StockQuoteService"/>
    <binding.ws wsdlElement="http://www.stockquote.org/StockQuoteService#
wsdl.binding(StockQuoteBinding)"
wsdli:wsdlLocation="http://www.stockquote.org/StockQuoteService
http://www.stockquote.org/StockQuoteService.wsdl"/>
    uri="http://www.stockquote.org/StockQuoteService5"/>
  </reference>
</composite>
```

206 3.2 Examples Without a WSDL Document

207 The next example shows the simplest form of the binding element without WSDL
208 document, assuming all defaults for portType mapping and SOAP binding synthesis. The
209 service and reference each have a single binding element, whose name defaults to the
210 service/reference name.

211 The service is to be made available at a location determined by the deployment of this
212 component. It will have a single port address and SOAP binding, with a simple WS-I BP
213 1.1 compliant binding, and using the default options for mapping the Java interface to a
214 WSDL port type.

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

219

```
220 <?xml version="1.0" encoding="ASCII"?>
221 <composite xmlns="http://www.oesa.org/xmlns/sca/1.0"
222           name="MyValueComposite">
223
224   <service name="MyValueService">
225     <interface.java interface="services.myvalue.MyValueService"/>
226     <binding.ws/>
227     ...
228   </service>
229
230   ...
231
232   <reference name="StockQuoteService">
233     <interface.java interface="services.stockquote.StockQuoteService"/>
234     <binding.ws uri="http://www.sqs.com/StockQuoteService"/>
235   </reference>
236 </composite>
```

237 The next example shows the use of the binding element without a WSDL document, with
238 multiple SOAP bindings with non-default values. The SOAP 1.2 binding name defaults to
239 the service name, the SOAP 1.1 binding is given an explicit name. The reference has a
240 web service binding which uses SOAP 1.2, but otherwise uses all the defaults for SOAP
241 binding. The reference binding name defaults to the reference name.

243

```
244 <?xml version="1.0" encoding="ASCII"?>
245 <composite xmlns="http://www.oesa.org/xmlns/sca/1.0"
246           name="MyValueComposite">
247
248   <service name="MyValueService">
249     <interface.java interface="services.myvalue.MyValueService"/>
250     <binding.ws name="MyValueServiceSOAP11" requires="soap/1.1"/>
251     <binding.ws requires="soap/1.2"/>
252     ...
253   </service>
254
255   ...
256
257   <reference name="StockQuoteService">
258     <interface.java interface="services.stockquote.StockQuoteService"/>
259     <binding.ws uri="http://www.sqs.com/StockQuoteService"
260                 requires="soap/1.2"/>
261   </reference>
```

262 </composite>

263

264 3.3 Example PolicySet Providing The Conversation Intent

265 This policy set applies to binding.ws and provides the conversation intent. The
266 conversation intent is provided by using WS-ReliableMessaging protocol which has a
267 concept of a Sequence. This Sequence (which appears as a wsrmp:Sequence SOAP
268 header in the message) is used as a correlation mechanism, on the wire, to implement
269 conversational semantics.

```
270 <policySet name="WSRM-Sequence-based-conversation"  
271           provides="sca:conversation"  
272           appliesTo="sca:binding.ws">  
273   <wsp:Policy>  
274     <wsrmp:RMAssertion  
275       xmlns:wsrmp="http://docs.oasis-open.org/ws-rx/wsrmp/200608"/>  
276   </wsp:Policy>  
277 </policySet>
```

278

279 4 WSDL Generation

280 This section defines the rules that SHOULD be used for generation of a WSDL document
281 that describes an SCA service with one or more web service bindings that require a
282 SOAP binding.

283 A WSDL document may be generated for an SCA service with non-SOAP web service
284 bindings, or other bindings. For non-SOAP web service bindings that do not refer to an
285 existing WSDL document, or non-web service bindings, the generation rules below may
286 be considered a template, and a similar approach taken.

287

288 4.1 Intents

289 The following intents affect WSDL generation:

- 290 • soap
291 This indicates that a SOAP binding is required. The SOAP binding may be of any
292 SOAP version, including multiple versions.
- 293 • soap.1_1
294 A SOAP 1.1 binding only is required.
- 295 • soap.1_2
296 A SOAP 1.2 binding only is required.

297

298 4.2 WSDL Service and Ports

299 A separate WSDL document is generated for each SCA service. Each has its own unique
300 target namespace. This is to ensure that bindings on different services of the same
301 component do not clash. The WSDL service has one or more ports for each web service
302 binding on the SCA service that has a SOAP requirement, or that refers to an existing
303 WSDL binding, depending on the requirements of the web service binding. Each of
304 those ports has a single binding.

305 Additional ports and bindings may be generated in this WSDL document for non-web
306 service bindings, or web service bindings with non-SOAP requirements. The manner in
307 which that is done is undefined.

308 The binding elements themselves may be generated as defined below, or may be
309 imported from existing WSDL documents in the case that the web service binding refers
310 to the binding element of such a document.

311 The target namespace of the WSDL document, and of the service, ports and generated
312 binding elements is:

313 Base System URI for HTTP / Component Name / Service Name

314

315 4.3 WSDL Bindings

316 The binding elements in the generated WSDL document are either defined within the
317 document, derived from the requirements of the binding, or are imported from existing
318 WSDL documents.

- 319 Generated bindings have the following fixed assumptions:
- 320 • use="literal" for input and output messages
 - 321 • style="document" for the binding
 - 322 • All faults map to soap:faults
 - 323 • No header or headerFault elements are generated
 - 324 • The transport is "http://schemas.xmlsoap.org/soap/http", unless the system
325 provides intents for alternative transports
 - 326 • The soap version is determined from the soap intents as defined above

327

328 4.3.1 SOAP versions

329 Where a web service binding requires a specific SOAP version, then a single WSDL port
330 and SOAP binding of the appropriate version is generated.

331 Where no specific SOAP version is required, then one or more WSDL ports with
332 associated SOAP bindings may be generated, depending on the level(s) supported in the
333 target runtime.

334

335 4.4 WSDL PortType

336 An SCA service has a single interface. This interface is always imported into the
337 generated WSDL document. This may be done directly for WSDL-defined interfaces, or
338 indirectly via a WSDL generated from the interface type for the service.

339

340 4.5 WSDL Generation Rules

341 The following is the formal definition of the generation of a WSDL document from an
342 SCA service with one or more web service bindings, with either a SOAP requirement or
343 existing WSDL document:

```
344 <?xml version="1.0" encoding="UTF-8"?>
345 <definitions name="componentName/serviceName"
346     targetNamespace="HTTP Base URI/componentName/serviceName"
347     {(if any bindings require SOAP 1.1)
348     xmlns:soap11="http://schemas.xmlsoap.org/wsdl/soap/"
349     }
350     {(if any bindings require SOAP 1.2)
351     [xmlns:soap12="http://schemas.xmlsoap.org/wsdl/soap12/"]
352     }
353     xmlns:wSDL="http://schemas.xmlsoap.org/wsdl/"
354     xmlns="http://schemas.xmlsoap.org/wsdl/">
355
356     <import namespace="SCA service interface namespace"
357           location="SCA service interface location"/>
358
359     {(for each binding.ws element in the service with a WSDL, do the following:)
360     <import namespace="existing WSDL binding namespace"
361           location="existing WSDL binding location"/>
362     }
363
```

```

364      {(for each binding.ws element in the service without a WSDL, do the
365 following
366     for each SOAP version required:)
367     <binding name="/service/binding.ws[n]/@name+[/soapVersionPrefix]+'Binding' "
368         type="SCA service interface portType name">
369         <soapVersionPrefix:binding
370 transport="http://schemas.xmlsoap.org/soap/http"/>
371         {(for each operation in the interface do the following:)
372         <operation name="name-of-the-operation">
373             <soapVersionPrefix:operation/>
374             <input>
375                 <soapVersionPrefix:body use="literal"/>
376             </input>
377             {(if there is an output)
378             <output>
379                 <soapVersionPrefix:body use="literal"/>
380             </output>
381             }
382             {(if there is a fault)
383             <fault>
384                 <soapVersionPrefix:fault name="name-of-the-fault"/>
385             </fault>
386             }
387         </operation>
388         }
389     </binding>
390     }
391
392     <service name="/service/@name">
393         {(for each binding.ws element in the service do the following for each
394 SOAP
395         version required:)
396         <port name="/service/binding.ws[n]/@name+[/soapVersionPrefix]+'Port' "
397
398 binding="/service/binding.ws[n]/@name+[/soapVersionPrefix]+'Binding' ">
399         <soapVersionPrefix:address location="/service/binding.ws[n]/@uri"/>
400         </port>
401         }
402     </service>
403 </definitions>

```

404

405

A. Web Services Binding Schema

```
406 <?xml version="1.0" encoding="UTF-8"?>
407 <!-- (c) Copyright SCA Collaboration 2006 -->
408 <schema xmlns="http://www.w3.org/2001/XMLSchema"
409         targetNamespace="http://www.oesa.org/xmlns/sca/1.0"
410         xmlns:sca="http://www.oesa.org/xmlns/sca/1.0"
411         xmlns:wsdli="http://www.w3.org/2004/08/wsdli-instance"
412         xmlns:wsa="http://www.w3.org/2004/12/addressing"
413         elementFormDefault="qualified">
414
415     <import namespace="http://www.w3.org/2004/08/wsdli-instance"
416             schemaLocation="wsdli.xsd" />
417     <import namespace="http://www.w3.org/2004/12/addressing"
418             schemaLocation="ws-addr.xsd" />
419     <include schemaLocation="sca-core.xsd" />
420
421     <element name="binding.ws" type="sca:WebServiceBinding"
422             substitutionGroup="sca:binding" />
423     <complexType name="WebServiceBinding">
424         <complexContent>
425             <extension base="sca:Binding">
426                 <sequence>
427                     <element ref="wsa:EndpointReference" minOccurs="0"
428                             maxOccurs="unbounded" />
429                     <any namespace="##other" processContents="lax"
430 minOccurs="0"
431                             maxOccurs="unbounded" />
432                 </sequence>
433                 <attribute name="wsdlElement" type="anyURI" use="optional" />
434                 <attribute ref="wsdli:wsdlLocation" use="optional" />
435                 <anyAttribute namespace="##any" processContents="lax" />
436             </extension>
437         </complexContent>
438     </complexType>
439 </schema>
```

440

441 **B. Acknowledgements**

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

444 **Participants:**

445 [Participant Name, Affiliation | Individual Member]

446 [Participant Name, Affiliation | Individual Member]

447

C. Non-Normative Text

449

D. Revision History

450

[optional; should not be included in OASIS Standards]

451

Revision	Date	Editor	Changes Made
1	2007-09-25	Anish Karmarkar	Applied the OASIS template + related changes to the Submission

452

453