



Web Services Resource 1.2 (WS-Resource)

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Abstract:

This specification defines a WS-Resource, which describes the relationship between a Web service and a resource in the WS-Resource Framework. This document also defines the pattern by which resources are accessed through Web services, and the means by which WS-Resources are referenced.

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52 1 Introduction

53 This specification defines a WS-Resource, which describes the relationship between a Web
54 service and a resource in the WS-Resource Framework. This document also defines the pattern
55 by which resources are accessed through Web services, and the means by which WS-Resources
56 are referenced.

57 1.1 Goals and Requirements

58 The goal of WS-Resource is to standardize the terminology and concepts needed to express the
59 relationship between Web services and resources.

60 1.1.1 Requirements

61 In meeting this goal, the specification MUST address the following specific requirements:

- 62 • Define the term “resource.”
- 63 • Define the term “WS-Resource”, describing the relationship between Web services and
64 resources.
- 65 • Define the means by which a resource can be distinguished in a message exchange between
66 a requestor and a Web service.
- 67 • Define the means by which a WS-Resource is referenced.

68 1.2 Terminology

69 The keywords "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD",
70 "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be
71 interpreted as described in [RFC 2119].

72 When describing abstract data models, this specification uses the notational convention used by
73 the [XML Infoset]. Specifically, abstract property names always appear in square brackets (e.g.,
74 [some property]).

75 This specification uses a notational convention, referred to as “Pseudo-schemas” in a fashion
76 similar to the WSDL 2.0 Part 1 specification. A Pseudo-schema uses a BNF-style convention to
77 describe attributes and elements:

- 78 • '?' denotes optionality (i.e. zero or one occurrences),
- 79 • '*' denotes zero or more occurrences,
- 80 • '+' one or more occurrences,
- 81 • '[' and ']' are used to form groups,
- 82 • '|' represents choice.

83 Attributes are conventionally assigned values which correspond to their types, as defined in the
84 normative schema.

85 <!-- sample pseudo-schema -->

```

86 <element
87   required_attribute_of_type_QName="xs:QName"
88   optional_attribute_of_type_string="xs:string"? >
89   <required_element />
90   <optional_element />?
91   <one_or_more_of_these_elements />+
92   [ <choice_1 /> | <choice_2 /> ]*
93 </element>

```

94

95 Where there is disagreement between the separate XML schema and WSDL files describing the
96 messages defined by this specification and the normative descriptive text (excluding any pseudo-
97 schema) in this document, the normative descriptive text will take precedence over the separate
98 files. The separate files take precedence over any pseudo-schema and over any schema and
99 WSDL included in the appendices.

100

101 1.3 Namespaces

102 The following namespaces are used in this document:

Prefix	Namespace
s11	http://schemas.xmlsoap.org/soap/envelope/
xs	http://www.w3.org/2001/XMLSchema
wsa	http://www.w3.org/2005/08/addressing
wSDL	http://schemas.xmlsoap.org/wSDL
wsrf-r	http://docs.oasis-open.org/wsr/r-2
wsrf-rw	http://docs.oasis-open.org/wsr/rw-2
wsrf-bf	http://docs.oasis-open.org/wsr/bf-2

103

104 1.4 Fault Definitions

105 All faults generated by a WS-Resource SHOULD be compliant with the WS-BaseFaults [WS-
106 BaseFaults] specification.

107 All faults defined by this specification MUST use the following wsa:Action URI:

108 <http://docs.oasis-open.org/wsr/fault>

109

110 2 WS-Resource Terminology

111 The following terms are important in defining the relationship between a Web service and one or
112 more resources.

113 2.1 Resource

114 A resource is a logical entity that has the following characteristics:

- 115 • It MUST be identifiable.
- 116 • It MUST have a set of zero or more properties, which are expressible in XML Infoset.
- 117 • It MAY have lifecycle.

118 2.2 WS-Resource

119 A WS-Resource is the composition of a resource and a Web service through which the resource
120 can be accessed. A WS-Resource is further defined as follows:

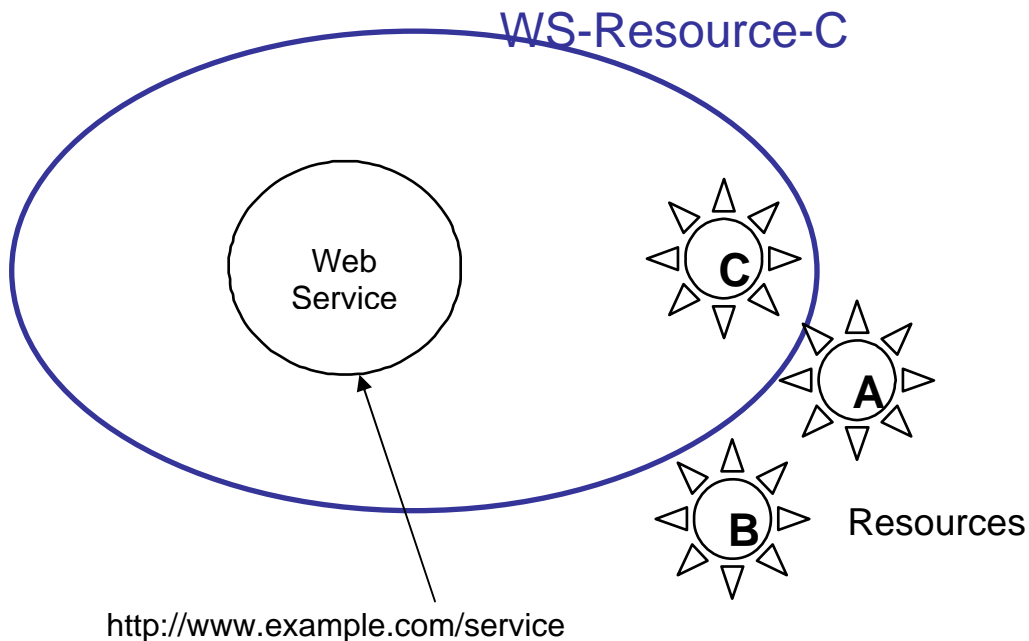
- 121 • A reference to a WS-Resource is represented by an endpoint reference (EPR), or more
122 precisely an XML element whose type is, or is derived (by extension), from the
123 complexType named EndpointReferenceType defined by the [WS-Addressing]
124 specification. Such EPRs MUST reference exactly one WS-Resource.
- 125 • The set of properties of the resource MUST be expressed using an XML Infoset
126 described by XML schema. The WS-Resource MUST support accessing resource
127 properties through message exchanges defined by the WS-Resource Properties
128 specification [WS-ResourceProperties].
- 129 • A WS-Resource MAY support the message exchanges defined by the WS-Resource
130 Lifetime specification [WS-ResourceLifetime].

131 For a given WS-Resource there may be many references. The way two references are compared
132 for equality is implementation-specific and not defined by this specification.

133 2.2.1 Example SOAP encoding of a message to a WS-Resource

134 The following diagram illustrates an example set of components that comprise a small collection
135 of WS-Resources:

136



137
138
139

140 In the example above, there is one Web service that has a URL address of
141 "http://www.example.com/service". This Web service provides access to three resources,
142 identified as "A", "B" and "C". WS-Resource-C is the composition of the Web service and the
143 resource identified by "C" and a reference to WS-Resource-C might appear as follows:

144

```

145 <wsa:EndpointReference>
146   <wsa:Address>
147     http://www.example.com/service?res=C
148   </wsa:Address>
149   ...
150 </wsa:EndpointReference>

```

151 A message to the WS-Resource, so referenced, that uses a SOAP 1.1 binding would look as
152 follows:

153

```

154 <s11:Envelope...>
155   <s11:Header>
156     <wsa:To>http://www.example.com/service?res=C</wsa:To>
157     ...
158   </s11:Header>
159   <s11:Body>
160     ...

```

161
162

```
</s11:Body>  
</s11:Envelope>
```

163 3 Faults

164 A WS-Resource may respond to any message with the following fault message:

165

166 **wsrf-rw:ResourceUnknownFault**

167 The resource identified in the message is not known to the Web service. The fault may
168 contain additional resource- or application-specific information in it.

169 **wsrf-rw:ResourceUnavailableFault**

170 The resource identified in the message is unavailable. This fault SHOULD indicate a
171 transient condition. A requester might respond to this fault by resending the message.

172

4 References

173

4.1 Normative

174

[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.

175

176

177

[WS-Addressing]

WS-Addressing 1.0, <http://www.w3.org/TR/ws-addr-core/>

178

[WSDL 1.1]

Web Services Description Language (WSDL) 1.1,

179

<http://www.w3.org/TR/wsdl>

180

[WS-ResourceLifetime]

Web Services Resource Lifetime 1.2 (WS-ResourceLifetime),

181

[http://docs.oasis-open.org/wsrf/wsrf-ws_resource_lifetime-1.2-](http://docs.oasis-open.org/wsrf/wsrf-ws_resource_lifetime-1.2-spec-cs-01.pdf)

182

[spec-cs-01.pdf](http://docs.oasis-open.org/wsrf/wsrf-ws_resource_lifetime-1.2-spec-cs-01.pdf)

183

[WS-ResourceProperties]

Web Services Resource Properties 1.2 (WS-

184

ResourceProperties), [http://docs.oasis-open.org/wsrf/wsrf-](http://docs.oasis-open.org/wsrf/wsrf-ws_resource_properties-1.2-spec-cs-01.pdf)

185

[ws_resource_properties-1.2-spec-cs-01.pdf](http://docs.oasis-open.org/wsrf/wsrf-ws_resource_properties-1.2-spec-cs-01.pdf)

186

[XML-Infoset]

XML Information Set (Second Edition),

187

<http://www.w3.org/TR/xml-infoset/>

188

189

190

4.2 Non-Normative

191

[WSA-SOAP]

WS-Addressing 1.0 – SOAP Binding,

192

<http://www.w3.org/TR/ws-addr-soap/>

193

[WS-I Basic Profile 1.1]

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

194

195

196

197

Appendix A. Acknowledgments

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199 specification:

200

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219

Appendix B. XML Schema

220 The XML types and elements used in this specification are included here for convenience. The
221 authoritative version of this schema document is available at: [http://docs.oasis-open.org/wsrf/r-](http://docs.oasis-open.org/wsrf/r-2.xsd)
222 [2.xsd](http://docs.oasis-open.org/wsrf/r-2.xsd)

223

224

```
<?xml version="1.0" encoding="UTF-8"?>
```

225

```
<!--
```

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-->
<xsd:schema
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:wsrf-r="http://docs.oasis-open.org/wsrf/r-2"
  xmlns:wsrf-bf="http://docs.oasis-open.org/wsrf/bf-2"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  elementFormDefault="qualified" attributeFormDefault="unqualified"
  targetNamespace="http://docs.oasis-open.org/wsrf/r-2"
>

  <xsd:import
    namespace=
    "http://docs.oasis-open.org/wsrf/bf-2"
    schemaLocation="http://docs.oasis-open.org/wsrf/bf-2.xsd"
  />

  <!-- ===== WS-Resource fault types ===== -->

    <xsd:complexType name="ResourceUnknownFaultType">
      <xsd:complexContent>
        <xsd:extension base="wsrf-bf:BaseFaultType"/>
      </xsd:complexContent>
    </xsd:complexType>
    <xsd:element name="ResourceUnknownFault"
      type="wsrf-r:ResourceUnknownFaultType"/>

    <xsd:complexType name="ResourceUnavailableFaultType">
      <xsd:complexContent>
        <xsd:extension base="wsrf-bf:BaseFaultType"/>
      </xsd:complexContent>
    </xsd:complexType>
    <xsd:element name="ResourceUnavailableFault"
      type="wsrf-r:ResourceUnavailableFaultType"/>

</xsd:schema>
```

305

Appendix C. WSDL 1.1

306 The WSDL 1.1 for the Web service methods described in this specification is compliant with [WS-
307 I Basic Profile 1.1] and is included here for convenience. The authoritative version of this WSDL
308 is available at: <http://docs.oasis-open.org/wsrf/rw-2.wsdl>

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310 <?xml version="1.0" encoding="utf-8"?>
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-->

<wsdl:definitions name="WS-Resource"
  xmlns="http://schemas.xmlsoap.org/wsdl/"
  xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:wsrf-r="http://docs.oasis-open.org/wsrf/r-2"
  xmlns:wsrf-rw="http://docs.oasis-open.org/wsrf/rw-2"
  targetNamespace="http://docs.oasis-open.org/wsrf/rw-2"
>

<!-- ===== Types Definitions ===== -->
<wsdl:types>
  <xsd:schema
    xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    targetNamespace="http://docs.oasis-open.org/wsrf/rw-2"
    elementFormDefault="qualified"
    attributeFormDefault="unqualified">

    <xsd:import
      namespace="http://docs.oasis-open.org/wsrf/r-2"
      schemaLocation="http://docs.oasis-open.org/wsrf/r-2.xsd"
    />

  </xsd:schema>
</wsdl:types>

<!-- ===== WS-Resource faults ===== -->
<wsdl:message name="ResourceUnknownFault">
  <part name="ResourceUnknownFault"
    element="wsrf-r:ResourceUnknownFault" />
</wsdl:message>

<wsdl:message name="ResourceUnavailableFault">
  <part name="ResourceUnavailableFault"
    element="wsrf-r:ResourceUnavailableFault" />
</wsdl:message>
</wsdl:definitions>
```

Appendix D. Revision History

Rev	Date	By Whom	What
wd-01	2004-08-27	Steve Graham	Initial version created based on 08/23 and 08/24 meeting amongst the authors.
wd-02	2004-09-02	sgg	Modifications per feedback on 09/01 telecon, and email from Anish and Igor.
wd-01.a-f	Various	sgg	Reflected various progress
wd-01g	2004-09-29	sgg	Reflected final agreements
wd-02a	2004-10-07	ir	Editorial and TC issues
Wd-02.b	2004-11-22	sgg	Resolved WSRF75 and WSRF76
Wd-02	2004-12-09	ir	Editorial
wd-03.a	2005-02-17	ir	Issues 50, 62, 77, 81, 86, 93, 96
Wd-03.b	2005-03-08	Jem Treadwell	Fixed minor typos.
Wd-03.c	2005-04-19	ir	Added reference to WS-I in 5.1.
Wd-04	2005-05-10	ir	Issues: 91, 92, 99, 101
wd-05	2005-05-16	ir	Issue WSRF 100
wd-06	2005-05-18	ir	Issues WSRF109, 113, 114, 116
pr-01	2005-06-10	ir	Change status to PR
wd-07	2005-09-06	ir	127
wd-08	2005-09-15	ir	Issues 141, 152, 148, 147
wd-09	2005-09-15	ir	TC review comments
pr-02.a	2005-11-05	ir	156 - PR-02 comments
pr-02.b	2005-11-21	ir	Editorial corrections

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