



# 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 term WS-Resource Access Pattern, the concept of how resources are accessed through Web services, and the means by which WS-Resources are referenced.

**Status:**

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# 55 1 Introduction

56 This specification defines a WS-Resource, which describes the relationship between a Web  
57 service and a resource in the WS-Resource Framework. This document also defines the term  
58 WS-Resource Access Pattern, the abstract concept of how resources are accessed through Web  
59 services, and the means by which WS-Resources are referenced.

## 60 1.1 Goals and Requirements

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

### 63 1.1.1 Requirements

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

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

## 71 1.2 Terminology

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

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

78

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

- 82 • '?' denotes optionality (i.e. zero or one occurrences),
- 83 • '\*' denotes zero or more occurrences,
- 84 • '+' one or more occurrences,
- 85 • '[' and ']' are used to form groups,
- 86 • '|' represents choice.
- 87 • Attributes are conventionally assigned a value which corresponds to their type, as  
88 defined in the normative schema.

```
89 <!-- sample pseudo-schema -->  
90 <element  
91   required_attribute_of_type_QName="xs:QName"  
92   optional_attribute_of_type_string="xs:string"? >  
93   <required_element />
```

94 <optional\_element />?  
95 <one\_or\_more\_of\_these\_elements />+  
96 [ <choice\_1 /> | <choice\_2 /> ]\*  
97 </element>

98  
99 Where there is disagreement between the separate xml schema and wsdl files describing the  
100 messages defined by this specification and the normative descriptive text (excluding any pseudo-  
101 schema) in this document, the normative descriptive text will take precedence over the separate  
102 files. The separate files take precedence over any pseudo-schema and over any schema and  
103 wsdl included in the appendices.

104

## 105 1.3 Namespaces

106 The following namespaces are used in this document:

Prefix	Namespace
s11	<a href="http://schemas.xmlsoap.org/soap/envelope">http://schemas.xmlsoap.org/soap/envelope</a>
xs	<a href="http://www.w3.org/2001/XMLSchema">http://www.w3.org/2001/XMLSchema</a>
wsa	<a href="http://www.w3.org/2005/03/addressing">http://www.w3.org/2005/03/addressing</a>
wsdl	<a href="http://schemas.xmlsoap.org/wsdl">http://schemas.xmlsoap.org/wsdl</a>
wsrf-r	<a href="http://docs.oasis-open.org/wsrf/r-1">http://docs.oasis-open.org/wsrf/r-1</a>
wsrf-rw	<a href="http://docs.oasis-open.org/wsrf/rw-1">http://docs.oasis-open.org/wsrf/rw-1</a>
wsrf-bf	<a href="http://docs.oasis-open.org/wsrf/bf-1">http://docs.oasis-open.org/wsrf/bf-1</a>

107

## 108 1.4 Fault Definitions

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

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

112 <http://docs.oasis-open.org/wsrf/fault>

113

---

## 114 2 WS-Resource Terminology

115 The following terms are important to define the relationship between a Web service and one or  
116 more resources.

### 117 2.1 Resource

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

- 119 • It **MUST** be identifiable; a resource has at least one resource identifier (see Section 2.2).
- 120 • It **MUST** have a set of zero or more properties, which are expressible in XML Infoset.
- 121 • It **MAY** have lifecycle.

### 122 2.2 Resource Identifier

123 A resource identifier embodies sufficient information required to distinguish one resource from all  
124 other resources within its scope of identification.

### 125 2.3 WS-Resource

126 A WS-Resource is a Web service through which a resource can be accessed. A WS-Resource is  
127 further defined as follows:

- 128 • An identifier of the resource **MUST** appear as part of any message to a WS-Resource to  
129 allow the WS-Resource to disambiguate the resource targeted by the message. We refer  
130 to this pattern of access as the “**WS-Resource Access Pattern**” (WS-RAP).
- 131 • The set of properties of the resource **MUST** be expressed using an XML Infoset  
132 described by XML schema. The WS-Resource **MUST** support accessing resource  
133 properties through message exchanges defined by the WS-Resource Properties  
134 specification [WSRF-RP].
- 135 • If access to the lifecycle of the resource is exposed through the WS-Resource, the WS-  
136 Resource **MAY** support the message exchanges defined by the WS-Resource Lifetime  
137 specification [WSRF-RL].

138 Note: there are circumstances under which the resource identifier of the resource also appears as  
139 application data in the message. A message which otherwise satisfies the WS-Resource Access  
140 Pattern, and in which a resource identifier *also* appears in the message does not violate the WS-  
141 Resource Access Pattern.

### 142 2.4 WS-Resource Reference

143 A WS-Resource reference (or just reference) is a construct through which a single WS-Resource  
144 can be accessed. It is represented by an endpoint reference, or more precisely an XML element  
145 whose type is, or is derived (by extension) from the complexType named EndpointReferenceType  
146 defined by the [WS-Addressing] specification. The address of the Web service endpoint part of  
147 the WS-Resource is contained in the `wsa:Address` element information item of the endpoint  
148 reference. The resource identifier may appear either in the contents of the  
149 `wsa:ReferenceParameter` element information item of the endpoint reference or embedded as  
150 part of the `wsa:Address` element information item of the endpoint reference.

151 For a given resource identifier there may be many references. The way two references are  
152 compared for equality is implementation-specific and not defined by this specification.



---

154 **3 Faults**

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

156

157 **wsrf-rw:ResourceUnknownFault**

158       The resource identified in the message (which follows the WS-Resource Access Pattern)  
159       is not known to the Web service. The fault may contain additional application-specific  
160       information in it

161

---

162 **4 References**

163 **4.1 Normative**

- 164 [RFC2119] S. Bradner, *Key words for use in RFCs to Indicate Requirement*  
165 *Levels*, <http://www.ietf.org/rfc/rfc2119.txt>, IETF RFC 2119, March  
166 1997.
- 167 [URI] T. Berners-Lee, R. Fielding, L. Masinter, "Uniform Resource  
168 Identifiers (URI): Generic Syntax," RFC 2396, MIT/LCS, U.C.  
169 Irvine, Xerox Corporation, August 1998.
- 170 [WSA] **WS-Addressing 1.0**, <http://www.w3.org/TR/ws-addr-core/>  
171 [WSDL 1.1] <http://www.w3.org/TR/wsd/>  
172 [WS-Basic Profile 1.1] <http://www.ws-i.org/Profiles/BasicProfile-1.1.html>  
173 [WS-ResourceLifetime] [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-cd-01.pdf)  
174 [spec-cd-01.pdf](http://docs.oasis-open.org/wsrf/wsrf-ws_resource_lifetime-1.2-spec-cd-01.pdf)  
175 [WS-ResourceProperties] [http://docs.oasis-open.org/wsrf/wsrf-ws\\_resource\\_properties-1.2-](http://docs.oasis-open.org/wsrf/wsrf-ws_resource_properties-1.2-spec-cd-01.pdf)  
176 [spec-cd-01.pdf](http://docs.oasis-open.org/wsrf/wsrf-ws_resource_properties-1.2-spec-cd-01.pdf)  
177 [XML-Infoset] <http://www.w3.org/TR/xml-infoset/>  
178

179 **4.2 Non-normative**

- 180 [SOAP ] <http://www.w3.org/TR/2000/NOTE-SOAP-20000508/>  
181



---

## 182 **Appendix A. Acknowledgments**

183 The following individuals were members of the committee during the development of this  
184 specification:

185

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201

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203

## Appendix B. XML Schema

204

The XML types and elements used in this specification are included here for convenience. The authoritative version of this schema document is available at: <http://docs.oasis-open.org/wsrf/r-1>

205

206

207

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

208

```
<!--
```

209

210

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```
-->
```

253

```
<xsd:schema
```

254

```
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
```

255

```
  xmlns:wsrf-r="http://docs.oasis-open.org/wsrf/r-1"
```

256

```
  xmlns:wsrf-bf="http://docs.oasis-open.org/wsrf/bf-1"
```

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```
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
elementFormDefault="qualified" attributeFormDefault="unqualified"
targetNamespace="http://docs.oasis-open.org/wsr/r-1"
>
<xsd:import
  namespace=
  "http://docs.oasis-open.org/wsr/bf-1"
  schemaLocation="http://docs.oasis-open.org/wsr/bf-1"
/>
<! ===== WS-Resource fault types ===== -->
    <xsd:complexContent>
      <xsd:extension bas
    </xsd:complexContent>
  </xsd:complexType>
  <xsd:element name="      eUnknownFault"
                type="wsrf-r:ResourceUnknownFaultType"/>
</xsd:schema>
```

280

## Appendix C. WSDL 1.1

281 The WSDL 1.1 for the Web service methods described in this specification is compliant with [WS-  
282 I Basic Profile 1.1] and is included here for convenience. The authoritative version of this WSDL  
283 is available at: <http://docs.oasis-open.org/wsrf/rw-1>

284

285

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

286

```
<!--
```

287

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329

```
-->
```

331

```
<wsdl:definitions name="WS-Resource"  
  xmlns="http://schemas.xmlsoap.org/wsdl/"
```

333

```
334     xmlns:wSDL="http://schemas.xmlsoap.org/wSDL/"
335     xmlns:xsd="http://www.w3.org/2001/XMLSchema"
336     xmlns:wSrf-r="http://docs.oasis-open.org/wSrf/r-1"
337     xmlns:wSrf-rw="http://docs.oasis-open.org/wSrf/rw-1"
338     targetNamespace="http://docs.oasis-open.org/wSrf/rw-1"
339 >
340
341 <!-- ===== Types Definitions ===== -->
342 <wSDL:types>
343   <xsd:schema
344     xmlns:xsd="http://www.w3.org/2001/XMLSchema"
345     targetNamespace="http://docs.oasis-open.org/wSrf/rw-1"
346     elementFormDefault="qualified"
347     attributeFormDefault="unqualified">
348
349     <xsd:import
350       namespace="http://docs.oasis-open.org/wSrf/r-1"
351       schemaLocation="http://docs.oasis-open.org/wSrf/r-1"
352     />
353
354   </xsd:schema>
355 </wSDL:types>
356
357 <!-- ===== WS-Resource faults ===== -->
358 <wSDL:message name="ResourceUnknownFault">
359   <part name="ResourceUnknownFault"
360     element="wSrf-r:ResourceUnknownFault" />
361 </wSDL:message>
362
363 </wSDL:definitions>
```

364  
365  
366  
367  
368

## 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

371

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