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# 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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**Status:**
This document is an OASIS Standard.

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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, refered 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/wsrf/r-2 |
| wsrf-rw | http://docs.oasis-open.org/wsrf/rw-2 |
| wsrf-bf | http://docs.oasis-open.org/wsrf/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/wsrf/fault

109

# 2  WS-Resource Terminology

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

## 2.1 Resource

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

- It MUST be identifiable.
- It MUST have a set of zero or more properties, which are expressible in XML infoset.
- It MAY have lifecycle.

## 2.2 WS-Resource

A WS-Resource is the composition of a resource and a Web service through which the resource can be accessed. A WS-Resource is further defined as follows:
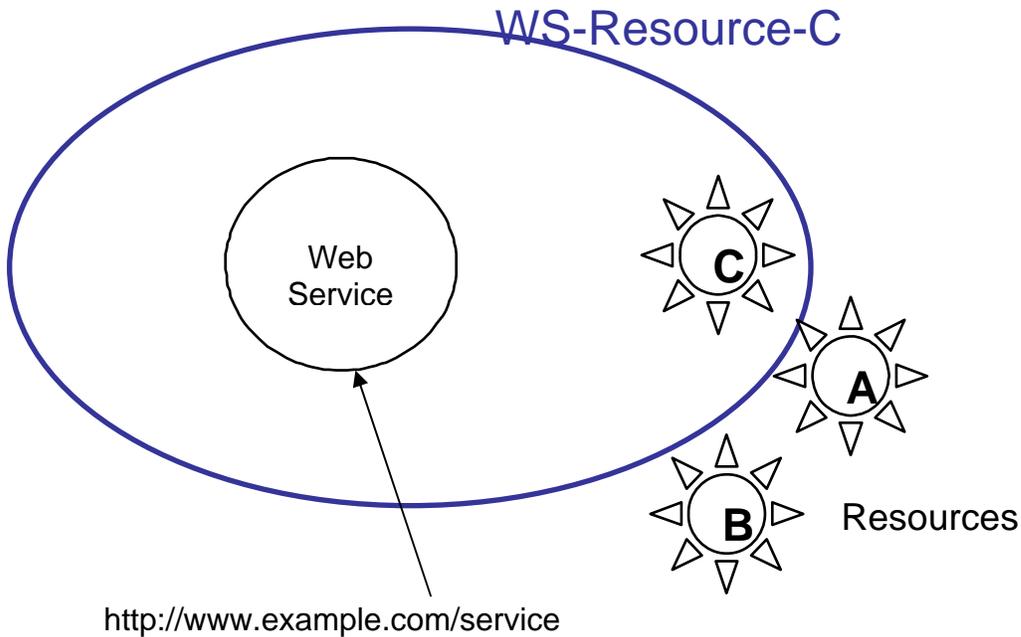
- A reference to a WS-Resource is represented by an endpoint reference (EPR), or more precisely an XML element whose type is, or is derived (by extension), from the complexType named EndpointReferenceType defined by the [WS-Addressing] specification. Such EPRs MUST reference exactly one WS-Resource.
- The set of properties of the resource MUST be expressed using an XML Infoset described by XML schema. The WS-Resource MUST support accessing resource properties through message exchanges defined by the WS-Resource Properties specification [WS-ResourceProperties].
- A WS-Resource MAY support the message exchanges defined by the WS-Resource Lifetime specification [WS-ResourceLifetime].

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

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

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

WS-Resource-C

Web
Service

C

A

B    Resources

http://www.example.com/service

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      </s11:Body>
```

162        `</s11:Envelope>`

# 3 Faults

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

**wsrf-rw:ResourceUnknownFault**

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

**wsrf-rw:ResourceUnavailableFault**

The resource identified in the message is unavailable. This fault SHOULD indicate a 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*
175 *Levels*, http://www.ietf.org/rfc/rfc2119.txt, IETF RFC 2119, March
176 1997.

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-
182 spec-os.pdf

183 **[WS-ResourceProperties]** **Web Services Resource Properties 1.2 (WS-**
184 **ResourceProperties),** http://docs.oasis-open.org/wsrf/wsrf-
185 ws_resource_properties-1.2-spec-os.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

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# Appendix A. Acknowledgments

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# Appendix B. XML Schema

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-2.xsd

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

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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>
```

# Appendix C. WSDL 1.1

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

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352      INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED
353      WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.
354
355      -->
356
357      <wsdl:definitions name="WS-Resource"
358        xmlns="http://schemas.xmlsoap.org/wsdl/"
359        xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
360        xmlns:xsd="http://www.w3.org/2001/XMLSchema"
361        xmlns:wsrf-r="http://docs.oasis-open.org/wsrf/r-2"
362        xmlns:wsrf-rw="http://docs.oasis-open.org/wsrf/rw-2"
363        targetNamespace="http://docs.oasis-open.org/wsrf/rw-2"
364      >
365
366      <!-- ===================== Types Definitions ====================== -->
367         <wsdl:types>
368           <xsd:schema
369               xmlns:xsd="http://www.w3.org/2001/XMLSchema"
370               targetNamespace="http://docs.oasis-open.org/wsrf/rw-2"
371               elementFormDefault="qualified"
372               attributeFormDefault="unqualified">
373
374             <xsd:import
375                namespace="http://docs.oasis-open.org/wsrf/r-2"
376                schemaLocation="http://docs.oasis-open.org/wsrf/r-2.xsd"
377             />
378
379           </xsd:schema>
380         </wsdl:types>
381
382      <!-- ================= WS-Resource faults ========================= -->
383        <wsdl:message name="ResourceUnknownFault">
384           <part name="ResourceUnknownFault"
385                 element="wsrf-r:ResourceUnknownFault" />
386        </wsdl:message>
387
388        <wsdl:message name="ResourceUnavailableFault">
389           <part name="ResourceUnavailableFault"
390                 element="wsrf-r:ResourceUnavailableFault" />
391        </wsdl:message>
392
393      </wsdl:definitions>
```

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# Appendix D. Revision History

399

| 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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