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2 **Web Services ReliableMessaging Policy**  
3 **Assertion**  
4 **(WS-RM Policy)**

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16 **Abstract:**

17       This specification describes a domain-specific policy assertion for WS-ReliableMessaging [[WS-](#)  
18       [RM](#)] that that can be specified within a policy alternative as defined in WS-Policy Framework [[WS-](#)  
19       [Policy](#)].

20       By using the XML [[XML](#)], SOAP [[SOAP 1.1](#)], [[SOAP 1.2](#)] and WSDL [[WSDL 1.1](#)] extensibility  
21       models, the WS\* specifications are designed to be composed with each other to provide a rich  
22       Web services environment. This by itself does not provide a negotiation solution for Web services.  
23       This is a building block that is used in conjunction with other Web service and application-specific  
24       protocols to accommodate a wide variety of policy exchange models.

25 **Status:**

26       This document is a work in progress and will be updated to reflect issues as they are resolved by  
27       the Web Services Reliable Exchange (WS-RX) Technical Committee.

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# 48 1 Introduction

49 This specification defines a domain-specific policy assertion for reliable messaging for use with WS-Policy  
50 [\[WS-Policy\]](#) and WS-ReliableMessaging [\[WS-RM\]](#).

## 51 1.1 Goals and Requirements

### 52 1.1.1 Requirements

## 53 1.2 Notational Conventions

54 The keywords "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD  
55 NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described  
56 in RFC 2119 [\[KEYWORDS\]](#).

57 This specification uses the following syntax to define normative outlines for messages:

- 58 • The syntax appears as an XML instance, but values in italics indicate data types instead of values.
- 59 • Characters are appended to elements and attributes to indicate cardinality:
  - 60 ○ "?" (0 or 1)
  - 61 ○ "\*" (0 or more)
  - 62 ○ "+" (1 or more)
- 63 • The character "|" is used to indicate a choice between alternatives.
- 64 • The characters "[" and "]" are used to indicate that contained items are to be treated as a group  
65 with respect to cardinality or choice.
- 66 • An ellipsis (i.e. "...") indicates a point of extensibility that allows other child, or attribute, content.  
67 Additional children and/or attributes MAY be added at the indicated extension points but MUST  
68 NOT contradict the semantics of the parent and/or owner, respectively. If an extension is not  
69 recognized it SHOULD be ignored.
- 70 • XML namespace prefixes (See Section [Namespace](#)) are used to indicate the namespace of the  
71 element being defined.

## 72 1.3 Namespace

73 The XML namespace [\[XML-ns\]](#) URI that MUST be used by implementations of this specification is:

74 `http://docs.oasis-open.org/ws-rx/wsrmp/200510`

75 Table 1 lists the XML namespaces that are used in this specification. The choice of any namespace prefix  
76 is arbitrary and not semantically significant.

77 The following namespaces are used in this document:

78 *Table 1*

Prefix	Namespace	Specification
wsp	<a href="http://schemas.xmlsoap.org/ws/2004/09/policy">http://schemas.xmlsoap.org/ws/2004/09/policy</a>	<a href="#">[WS-Policy]</a>
wsrmp	<a href="http://docs.oasis-open.org/ws-rx/wsrmp/200510">http://docs.oasis-open.org/ws-rx/wsrmp/200510</a>	This specification.

79 **1.4 Compliance**

80 An implementation is not compliant with this specification if it fails to satisfy one or more of the MUST or  
81 REQUIRED level requirements defined herein. A SOAP Node MUST NOT use the XML namespace  
82 identifier for this specification (listed in Section [Namespace](#)) within SOAP Envelopes unless it is compliant  
83 with this specification.

84 Normative text within this specification takes precedence over normative outlines, which in turn take  
85 precedence over the XML Schema [[XML-Schema Part1](#), [XML-Schema Part2](#)] descriptions.

## 86 2 RM Policy Assertions

87 WS-Policy Framework [WS-Policy] and WS-Policy Attachment [WS-PolicyAttachment] collectively define  
88 a framework, model and grammar for expressing the requirements, and general characteristics of entities  
89 in an XML Web services-based system. To enable an RM Destination and an RM Source to describe their  
90 requirements for a given Sequence, this specification defines a single RM policy assertion that leverages  
91 the WS-Policy framework.

### 92 2.1 Assertion Model

93 The RM policy assertion indicates that the RM Source and RM Destination MUST use WS-  
94 ReliableMessaging [WS-RM] to ensure reliable delivery of messages. Specifically, the WS-  
95 ReliableMessaging protocol determines invariants maintained by the reliable messaging endpoints and  
96 the directives used to track and manage the delivery of a Sequence of messages.

97 The assertion defines a maximum message number parameter that the RM Destination MAY include to  
98 indicate the maximum message number the RM Destination will accept. This is useful for RM Destinations  
99 that may be running in constrained environments that can not accept values as large as the default value  
100 of a maximum unsigned long.

101 Finally, this assertion defines an acknowledgement interval parameter that the RM Destination MAY  
102 include. Per WS-ReliableMessaging [WS-RM], acknowledgements are sent on return messages or sent  
103 stand-alone. If a return message is not available to send an acknowledgement, an RM Destination MAY  
104 wait for up to the acknowledgement interval before sending a stand-alone acknowledgement. If there are  
105 no unacknowledged messages, the RM Destination MAY choose not to send an acknowledgement. This  
106 parameter does not alter the formulation of messages or acknowledgements as transmitted; it does not  
107 alter the meaning of the wsrmp:AckRequested directive. Its purpose is to communicate the timing of  
108 acknowledgements so that the RM Source may tune appropriately.

109 The RM assertion parameters do not affect the messages which are sent on the wire.

### 110 2.2 Normative Outline

111 The normative outline for the RM version assertion is:

```
112 <wsrmp:RMAssertion [wsp:Optional="true"]? ... >  
113   <wsrmp:AcknowledgementInterval Milliseconds="xs:unsignedLong" ... /> ?  
114   <wsrmp:MaxMessageNumber Number="xs:unsignedLong" ... /> ?  
115   ...  
116 </wsrmp:RMAssertion>
```

117 The following describes additional, normative constraints on the outline listed above:

118 /wsrmp:RMAssertion

119 A policy assertion that specifies that WS-ReliableMessaging [WS-RM] protocol MUST be used for  
120 a Sequence.

121 /wsrmp:RMAssertion/@wsp:Optional="true"

122 Per WS-Policy [WS-Policy], this is compact notation for two policy alternatives, one with and one  
123 without the assertion. The intuition is that the behavior indicated by the assertion is optional, or in  
124 this case, that WS-ReliableMessaging MAY be used.

125 /wsrmp:RMAssertion/wsrmp:AcknowledgementInterval

126 A parameter that specifies the duration after which the RM Destination will transmit an  
 127 acknowledgement. If omitted, there is no implied value.

128 /wsrmp:RMAssertion/wsrmp:AcknowledgementInterval/@Milliseconds  
 129 The acknowledgement interval, specified in milliseconds.

130 /wsrmp:RMAssertion/wsrmp:MaxMessageNumber  
 131 A parameter that specifies the maximum message number that the RM Destination will accept. If  
 132 omitted, the default value of the maximum unsigned long will be assumed.

133 /wsrmp:RMAssertion/wsrmp:MaxMessageNumber/@Number  
 134 The maximum message number.

### 135 2.3 Assertion Attachment

136 Because the RM policy assertion indicates endpoint behavior over an RM Sequence, the assertion has  
 137 Endpoint Policy Subject [[WS-PolicyAttachment](#)].

138 WS-PolicyAttachment defines three WSDL [[WSDL 1.1](#)] policy attachment points with Endpoint Policy  
 139 Subject:

- 140 • wsdl:portType – A policy expression containing the RM policy assertion MUST NOT be attached to  
 141 a wsdl:portType; the RM policy assertion specifies a concrete behavior whereas the wsdl:portType is an  
 142 abstract construct.
- 143 • wsdl:binding – A policy expression containing the RM policy assertion SHOULD be attached to a  
 144 wsdl:binding.
- 145 • wsdl:port – A policy expression containing the RM policy assertion MAY be attached to a wsdl:port.

146 If the RM policy assertion appears in a policy expression attached to both a wsdl:port and its  
 147 corresponding wsdl:binding, the parameters in the former MUST be used and the latter ignored.

### 148 2.4 Assertion Example

149 Table 2 lists an example use of the RM policy assertion.

150 Table 2: Example policy with RM policy assertion

```

151 (01) <wsdl:definitions
152 (02)   targetNamespace="example.com"
153 (03)   xmlns:tns="example.com"
154 (04)   xmlns:wSDL="http://schemas.xmlsoap.org/wSDL/"
155 (05)   xmlns:wsp="http://schemas.xmlsoap.org/ws/2004/09/policy"
156 (06)   xmlns:wsrmp="http://docs.oasis-open.org/ws-rx/wsrmp/200510"
157 (07)   xmlns:wssu="http://docs.oasis-open.org/wss/2004/01/oasis-200401-
158 wss-wssecurity-utility-1.0.xsd">
159 (08)
160 (09) <wsp:UsingPolicy wsdl:required="true" />
161 (10)
162 (11) <wsp:Policy wsu:Id="MyPolicy" >
163 (12)   <wsrmp:RMAssertion>
164 (13)     <wsrmp:AcknowledgementInterval Milliseconds="200" />
165 (14)   </wsrmp:RMAssertion>
166 (15)   <!-- omitted assertions -->
167 (16) </wsp:Policy>
168 (17)
169 (18) <!-- omitted elements -->

```

```
170 (19)
171 (20) <wsdl:binding name="MyBinding" type="tns:MyPortType" >
172 (21)   <wsp:PolicyReference URI="#MyPolicy" />
173 (22)   <!-- omitted elements -->
174 (23) </wsdl:binding>
175 (24)
176 (25)</wsdl:definitions>
```

177 Line (09) in Table 2 indicates that WS-Policy [[WS-Policy](#)] is in use as a required extension.

178 Lines (11-16) are a policy expression that includes a RM policy assertion (Lines 12-14) to indicate that  
179 WS-ReliableMessaging [[WS-RM](#)] must be used. Line (13) indicates the RM Destination may buffer  
180 acknowledgements for up to two-tenths of a second.

181 Lines (20-23) are a WSDL [[WSDL 1.1](#)] binding. Line (21) indicates that the policy in Lines (11-16) applies  
182 to this binding, specifically indicating that WS-ReliableMessaging must be used over all the messages in  
183 the binding.

### 184 **3 Security Considerations**

185 It is strongly RECOMMENDED that policies and assertions be signed to prevent tampering.

186 It is RECOMMENDED that policies SHOULD NOT be accepted unless they are signed and have an  
187 associated security token to specify the signer has proper claims for the given policy. That is, a relying  
188 party shouldn't rely on a policy unless the policy is signed and presented with sufficient claims to pass the  
189 relying parties acceptance criteria.

190 It should be noted that the mechanisms described in this document could be secured as part of a SOAP  
191 message using WS-Security [[WSS](#)] or embedded within other objects using object-specific security  
192 mechanisms.

## 193 **4 References**

### 194 **4.1 Normative**

#### 195 **[KEYWORDS]**

196 S. Bradner, "Key words for use in RFCs to Indicate Requirement Levels," RFC 2119, Harvard University,  
197 March 1997.

#### 198 **[SOAP 1.1]**

199 W3C Note, "SOAP: Simple Object Access Protocol 1.1" 08 May 2000.

#### 200 **[SOAP 1.2]**

201 W3C Recommendation, "[SOAP Version 1.2 Part 1: Messaging Framework](#)" June 2003.

#### 202 **[URI]**

203 T. Berners-Lee, R. Fielding, L. Masinter, "Uniform Resource Identifiers (URI): Generic Syntax," RFC 2396,  
204 MIT/LCS, U.C. Irvine, Xerox Corporation, August 1998.

#### 205 **[WS-RM]**

206 OASIS WS-RX Technical Committee Draft, "Web Services Reliable Messaging (WS-ReliableMessaging),"  
207 September 2005.

#### 208 **[WS-Policy]**

209 D. Box, et al, "Web Services Policy Framework (WS-Policy)," September 2004.

#### 210 **[WS-PolicyAttachment]**

211 D. Box, et al, "Web Services Policy Attachment (WS-PolicyAttachment)," September 2004.

#### 212 **[WSDL 1.1]**

213 W3C Note, "Web Services Description Language (WSDL 1.1)," 15 March 2001.

#### 214 **[XML]**

215 W3C Recommendation, "[Extensible Markup Language \(XML\) 1.0 \(Second Edition\)](#)", October 2000.

#### 216 **[XML-ns]**

217 W3C Recommendation, "Namespaces in XML," 14 January 1999.

#### 218 **[XML-Schema Part1]**

219 W3C Recommendation, "XML Schema Part 1: Structures," 2 May 2001.

#### 220 **[XML-Schema Part2]**

221 W3C Recommendation, "XML Schema Part 2: Datatypes," 2 May 2001.

### 222 **4.2 Non Normative**

#### 223 **[WSS]**

224 OASIS Web Services Security: SOAP Message Security 1.0 (WS-Security 2004)", Chris Kaler, Phillip  
225 Hallam-Baker, Ronald Monzillo, eds, OASIS Standard 200401, March 2004.

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242 TBD

## 243 B. XML Schema

244 A normative copy of the XML Schema [XML-Schema Part1, XML-Schema Part2] description for this  
245 specification may be retrieved from the following address:

246 <http://docs.oasis-open.org/ws-rx/wsrmp/200510/wsrmp-1.1-schema-200510.xsd>

247 The following copy is provided for reference.

```
248 <?xml version="1.0" encoding="UTF-8"?>
249 <xs:schema
250     targetNamespace="http://docs.oasis-open.org/ws-rx/wsrmp/200510"
251     xmlns:tns="http://docs.oasis-open.org/ws-rx/wsrmp/200510"
252     xmlns:xs="http://www.w3.org/2001/XMLSchema"
253     elementFormDefault="qualified"
254     attributeFormDefault="unqualified">
255
256     <xs:element name="RMAssertion" >
257         <xs:complexType>
258             <xs:sequence>
259                 <xs:element name="AcknowledgementInterval" minOccurs="0" >
260                     <xs:complexType>
261                         <xs:attribute name="Milliseconds"
262                             type="xs:unsignedLong"
263                             use="required" />
264                         <xs:anyAttribute namespace="##any" processContents="lax" />
265                     </xs:complexType>
266                 </xs:element>
267                 <xs:element name="MaxMessageNumber" minOccurs="0" >
268                     <xs:complexType>
269                         <xs:attribute name="Number"
270                             type="xs:unsignedLong"
271                             use="required" />
272                         <xs:anyAttribute namespace="##any" processContents="lax" />
273                     </xs:complexType>
274                 </xs:element>
275                 <xs:any namespace="##other"
276                     processContents="lax"
277                     minOccurs="0"
278                     maxOccurs="unbounded" />
279             </xs:sequence>
280             <xs:anyAttribute namespace="##any" processContents="lax" />
281         </xs:complexType>
282     </xs:element>
283 </xs:schema>
```

## C. Revision History

Revision	Date	By Whom	What
wd-01.doc	2005-07-06	Ümit Yalçinalp	Initial version created based on submission by the authors.
1.0-wd-01.swx	2005-09-01	Ümit Yalçinalp	Reformatted using Open Office
1.1-wd-01.swx	2005-09-18	Ümit Yalçinalp	Applied resolution i001 Applied resolution i015/16 (doc identifier) Partial application of i017, final yyyy/mm required, changed doc URI to TBD pending yyyy/mm Deleted original copyright section
1.1-wd-01.swx	2005-10-02	Anish Karmarkar	Applied resolution of i013 + minor editorial changes + fixed resolution of i017
1.1-wd-01.swx	2005-10-04	Ümit Yalçinalp	Applied actual value for yyyy/mm. Added resolution of i009
1.1-wd-01.swx	2005-10-06	Ümit Yalçinalp	Editorial fixes suggested by Anish Updated wd draft date to October 6th
1.1-wd-01.swx	2005-10-19	Ümit Yalçinalp	Editorial change to remove .swx suffix from doc id
wd-02	2005-11-03	Gilbert Pilz	Start wd-02 by changing title page from cd-01.
wd-02	2005-11-30	Gilbert Pilz	i072 – editorial nits
wd-02	2005-11-30	Gilbert Pilz	i074 - Use of [tcShortName] in artifact locations namespaces, etc
wd-02	2005-12-01	Gilbert Pilz	Updated fix to i074 to remove trailing '/' from wsrmp namespace.
wd-02	2005-12-01	Anish Karmarkar	Applied resolution for i022
wd-02	2005-12-01	Anish Karmarkar	Applied resolution for i024
wd-02	2005-12-01	Anish Karmarkar	Applied resolution for i054
wd-02	2005-12-01	Anish Karmarkar	Applied resolution of i073
wd-2	2005-12-05	Anish Karmarkar	Applied resolution of i055
wd-2	2005-12-05	Ümit Yalçinalp	Changed fixed date in footer to current date
wd-3	2005-12-21	Doug Davis	Added i050
wd-3	2005-12-23	Ümit Yalçinalp	i057 resolution
wd-3	2005-12-23	Ümit Yalçinalp	Changed the ref to WS-RM to the WS-RX committee

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			draft instead of original version Fixed Dug's email address
wd-3	2005-12-23	Ümit Yalçinalp	I060 resolution
wd-03	2005-12-27	Gilbert Pilz	Remove schema example and put it in its own artifact (wsrmp-1.1-schema-200510.xsd). Convert source file to OpenDocument format. Make line numbers all the same style.
wd-03	2005-12-28	Anish Karmarkar	Included a section link to c:\temp\wsrmp-1.1-schema-200510.xsd
wd-03	2006-01-04	Gilbert Pilz	Fixed formatting of included section.

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