



Web Services ReliableMessaging Policy Assertion (WS-RM Policy)

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Abstract:

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

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

Status:

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

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1 Introduction

This specification defines a domain-specific policy assertion for reliable messaging for use with WS-Policy [WS-Policy] and WS-ReliableMessaging [WS-RM].

1.1 Goals and Requirements

1.1.1 Requirements

1.2 Notational Conventions

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

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

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

1.3 Namespace

The XML namespace [XML-ns] URI that MUST be used by implementations of this specification is:

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

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

The following namespaces are used in this document:

78 Table 1

Prefix	Namespace	Specification
wsp	http://schemas.xmlsoap.org/ws/2004/09/policy	[WS-Policy]
wsrmp	http://docs.oasis-open.org/ws-rx/wsrmp/200510	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.

2 RM Policy Assertions

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

2.1 Assertion Model

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

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

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

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

2.2 Normative Outline

The normative outline for the RM version assertion is:

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

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

/wsrmp:RMAssertion

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

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

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

/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:wsu="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.

3 Security Considerations

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

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

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

4 References

4.1 Normative

[KEYWORDS]

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

[SOAP 1.1]

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

[SOAP 1.2]

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

[URI]

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

[WS-RM]

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

[WS-Policy]

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

[WS-PolicyAttachment]

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

[WSDL 1.1]

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

[XML]

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

[XML-ns]

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

[XML-Schema Part1]

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

[XML-Schema Part2]

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

4.2 Non Normative

[WSS]

OASIS Web Services Security: SOAP Message Security 1.0 (WS-Security 2004)", Chris Kaler, Phillip 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 Yalçınalp	Initial version created based on submission by the authors.
1.0-wd-01.swx	2005-09-01	Ümit Yalçınalp	Reformatted using Open Office
1.1-wd-01.swx	2005-09-18	Ümit Yalçınalp	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 Yalçınalp	Applied actual value for yyyy/mm. Added resolution of i009
1.1-wd-01.swx	2005-10-06	Ümit Yalçınalp	Editorial fixes suggested by Anish Updated wd draft date to October 6th
1.1-wd-01.swx	2005-10-19	Ümit Yalçınalp	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 Yalçınalp	Changed fixed date in footer to current date
wd-3	2005-12-21	Doug Davis	Added i050
wd-3	2005-12-23	Ümit Yalçınalp	i057 resolution
wd-3	2005-12-23	Ümit Yalçınalp	Changed the ref to WS-RM to the WS-RX committee

Revision	Date	By Whom	What
			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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