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 Committee Draft.

This document was last revised or approved by the OASIS WS-RX Technical Committee on the above date. The level of approval is also listed above. Check the current location noted above for possible later revisions of this document.

For information on whether any patents have been disclosed that may be essential to implementing this specification and any offers of patent licensing terms please refer to the Intellectual Property Rights section of the Technical Committee web page (http://www.oasis-open.org/committees/ws-rx/ipr.php).
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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:
### Table 1

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Namespace</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>wsrmp</td>
<td><a href="http://docs.oasis-open.org/ws-rx/wsrmp/200510">http://docs.oasis-open.org/ws-rx/wsrmp/200510</a></td>
<td>This specification.</td>
</tr>
</tbody>
</table>

### 1.4 Compliance

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

Normative text within this specification takes precedence over normative outlines, which in turn take 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:

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

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

/wrmp:RMAssertion

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

/wrmp: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.

/wrmp:RMAssertion/wrmp:AcknowledgementInterval
A parameter that specifies the duration after which the RM Destination will transmit an acknowledgement. If omitted, there is no implied value.

\[wsrmp:RMAssertion/wsrm:AcknowledgementInterval/@Milliseconds\]

The acknowledgement interval, specified in milliseconds.

\[wsrmp:RMAssertion/wsrm:MaxMessageNumber\]

A parameter that specifies the maximum message number that the RM Destination will accept. If omitted, the default value of the maximum unsigned long will be assumed.

\[wsrmp:RMAssertion/wsrm:MaxMessageNumber/@Number\]

The maximum message number.

### 2.3 Assertion Attachment

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

WS-PolicyAttachment defines three WSDL [WSDL 1.1] policy attachment points with Endpoint Policy Subject:

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

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

### 2.4 Assertion Example

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

<table>
<thead>
<tr>
<th>Table 2: Example policy with RM policy assertion</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>01</code>&lt;wsdl:definitions</td>
</tr>
<tr>
<td><code>02</code>    targetNamespace=&quot;example.com&quot;</td>
</tr>
<tr>
<td><code>03</code>    xmlns:tns=&quot;example.com&quot;</td>
</tr>
<tr>
<td><code>04</code>    xmlns:wsdl=&quot;<a href="http://schemas.xmlsoap.org/wsd/">http://schemas.xmlsoap.org/wsd/</a>&quot;</td>
</tr>
</tbody>
</table>
| `05`    xmlns:wsu="http://docs.oasis-open.org/ws-01/0401-
|     wssecurity-utility-1.0.xsd">                            |
| `06`    <wsp:UsingPolicy wsdl:required="true" />             |
| `07`    <wsp:Policy wsu:Id="MyPolicy" >                      |
| `08`    <wsrp:RMAssertion>                                   |
| `09`    <wsrp:AcknowledgementInterval Milliseconds="200" />|
| `10`    </wsp:RMAssertion>                                   |
| `11`    <!-- omitted assertions -->                         |
| `12`    </wsp:Policy>                                       |
| `13`    </wsdl:definitions                                  |

<table>
<thead>
<tr>
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</table>
Line (09) in Table 2 indicates that WS-Policy [WS-Policy] is in use as a required extension.

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

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

```xml
(19)
(20) <wsdl:binding name="MyBinding" type="tns:MyPortType" >
(21)     <wsp:PolicyReference URI="#MyPolicy" />
(22)     <!-- omitted elements -->
(23)   </wsdl:binding>
(24)
(25)</wsdl:definitions>
```
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]

[SOAP 1.2]

[URI]

[WS-RM]

[WS-Policy]

[WS-PolicyAttachment]

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

[XML]

[XML-ns]

[XML-Schema Part1]

[XML-Schema Part2]

4.2 Non Normative

[WSS]
A. Acknowledgments

This document is based on initial contribution to OASIS WS-RX Technical Committee by the following authors: Stefan Batres, Microsoft (Editor), Ruslan Bilorusets, BEA, Don Box, Microsoft, Luis Felipe Cabrera, Microsoft, Derek Collison, TIBCO Software, Donald Ferguson, IBM, Christopher Ferris, IBM (Editor), Tom Freund, IBM, Mary Ann Hondo, IBM, John Ibbotson, IBM, Lei Jin, BEA, Chris Kaler, Microsoft, David Langworthy, Microsoft, Amelia Lewis, TIBCO Software, Rodney Limprecht, Microsoft, Steve Lucco, Microsoft, Don Mullen, TIBCO Software, Anthony Nadalin, IBM, Mark Nottingham, BEA, David Orchard, BEA, Shivajee Samdarshi, TIBCO Software, John Shewchuk, Microsoft, Tony Storey, IBM.

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

TBD
B. XML Schema

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

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

The following copy is provided for reference.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!--
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MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.
-->
<xs:schema xmlns:tns="http://docs.oasis-open.org/ws-rx/wsrmp/200510"
xmlns:xs="http://www.w3.org/2001/XMLSchema"
targetNamespace="http://docs.oasis-open.org/ws-rx/wsrmp/200510"
elementFormDefault="qualified" attributeFormDefault="unqualified">
  <xs:element name="RMAssertion">
    <xs:complexType>
      <xs:sequence>
        <xs:element
          name="AcknowledgementInterval" minOccurs="0">
          <xs:complexType>
            <xs:attribute
              name="Milliseconds" type="xs:unsignedLong" use="required"/>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```
<xs:element name="MaxMessageNumber"
 minOccurs="0">
  <xs:complexType>
    <xs:attribute
      name="Number" type="xs:unsignedLong" use="required"/>
  </xs:complexType>
</xs:element>

<xs:sequence>
  <xs:element
    processContents="lax" minOccurs="0"
    namespace="##any" processContents="lax"/>
  <xs:complexType>
    <xs:attribute
      name="Number" type="xs:unsignedLong" use="required"/>
    <xs:anyAttribute
      namespace="##any" processContents="lax"/>
  </xs:complexType>
</xs:element>
</xs:sequence>

<xs:any namespace="##other"
 processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
<xs:anyAttribute namespace="##any" processContents="lax"/>
</xs:complexType>
</xs:element>
</xs:schema>
## C. Revision History

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<th>By Whom</th>
<th>What</th>
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<td>2006-01-13</td>
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<td>Titles, boilerplate, etc. for cd-02</td>
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