



1

2

3 Web Services Resource Lifetime 1.2 4 (WS-ResourceLifetime)

5 Working Draft 04, 29 November 2004

6

7 **Document identifier:**

8 wsrf-WS-ResourceLifetime-1.2-draft-04

9 **Location:**

10 <http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-ResourceLifetime-1.2-draft-04.pdf>

11 **Editors:**

12 Latha Srinivasan, Hewlett Packard Company <Latha.Srinivasan@hp.com>

13 Tim Banks, IBM <Tim_Banks@uk.ibm.com>

14 **Abstract:**

15 This specification defines message exchanges to standardize the means by which a WS-
16 Resource may be destroyed, and resource properties [WS-ResourceProperties] that may
17 be used to inspect and monitor the lifetime of a WS-Resource. This specification defines
18 two means of destroying a WS-Resource: immediate destruction and time-based,
19 scheduled destruction. The definition of a WS-Resource, which is expressed in terms of a
20 stateful resource and its relationship with a Web service, is defined in the document titled
21 "WS-Resource 1.2" [WS-RAP].

22

23 **Status:**

24 This document and associated schema are published by this TC as "working drafts". It is
25 possible that it may change significantly during this process, but should nevertheless
26 provide a stable reference for discussion and early adopters' implementations.

27

28 Committee members should send comments on this specification to the wsrf@lists.oasis-
29 open.org list. Others should subscribe to and send comments to the wsrf-
30 comment@lists.oasis-open.org list. To subscribe, send an email message to wsrf-
31 comment-subscribe@lists.oasis-open.org with the word "subscribe" as the body of the
32 message.

33

34 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

35 the Intellectual Property Rights section of the WSRF TC web page (<http://www.oasis-open.org/committees/wsrf/>).
36

37

Table of Contents

39	1 Introduction	4
40	1.1 Goals and Requirements	4
41	1.1.1 Requirements	4
42	1.1.2 Non-Goals.....	5
43	1.2 Terminology	5
44	1.3 Namespaces	6
45	2 Terminology and Concepts	7
46	3 Example	8
47	4 Immediate Destruction	10
48	4.1 Example SOAP Encoding of the Destroy Message Exchange.....	10
49	5 Scheduled Destruction.....	12
50	5.1 Regarding Time	12
51	5.2 Querying Current Time.....	12
52	5.3 Determining Current Termination Time.....	13
53	5.4 Requesting Change to Termination Time.....	13
54	5.5 Example SOAP Encoding of the SetTerminationTime Message Exchange	15
55	5.6 Termination Time Expiration.....	16
56	6 Notification of Resource Destruction	17
57	7 Security Considerations	18
58	7.1 Securing the Message Exchanges	18
59	7.2 Securing Resource Destruction	19
60	8 References	20
61	Appendix A.	21
62	Appendix B.	22
63	Appendix C. WSDL 1.1	24
64	Appendix D. Revision History	29
65	Appendix E. Notices.....	30
66		

67 1 Introduction

68 In this document, we consider a distributed computing environment consisting of WS-Resources.
69 The definition of WS-Resource, in terms of its relationship with a Web service, is detailed in "Web
70 Services Resource 1.2" [WS-RAP].

71 The lifetime of a WS-Resource is defined as the period between its instantiation and its
72 destruction. The WS-ResourceLifetime specification standardizes the means by which a WS-
73 Resource can be destroyed. The specification also defines the means by which the lifetime of a
74 WS-Resource can be monitored. However, this specification does not prescribe (nor proscribe)
75 the means by which a WS-Resource is created.

76 Normally, a service requestor's interest in a WS-Resource is for some period of time - rarely is it
77 indefinite. In many scenarios, it is appropriate for clients of a WS-Resource to cause its
78 immediate destruction. The immediate destruction of a WS-Resource may be accomplished using
79 the message exchanges defined in this specification.

80 In addition, this specification defines the means by which a resource may be destroyed after a
81 period of time. In a distributed computing environment, a client may become disconnected from
82 the service provider's endpoint and therefore may be unable to, or unwilling to, cause the
83 immediate destruction of the WS-Resource. This specification defines the means by which any
84 client of a WS-Resource may establish and extend the scheduled termination time of a WS-
85 Resource. If that time expires, the WS-Resource may *self-destruct* without the need for an explicit
86 destroy request message from a client. Periodically extending the termination time of a WS-
87 Resource can serve to extend its lifetime. WS-ResourceLifetime defines a standard message
88 exchange by which a service requestor can establish and renew a scheduled termination time for
89 the WS-Resource, and defines the circumstances under which a service requestor can determine
90 that this termination time has elapsed.

91 A service requestor may want to determine the current time and the termination time of a WS-
92 Resource. WS-ResourceLifetime defines resource properties, as defined in [WS-
93 ResourceProperties], for accessing this information.

94 WS-ResourceLifetime is inspired by a portion of the Global Grid Forum's "Open Grid Services
95 Infrastructure (OGSI) Version 1.0" specification [OGSI].

96 1.1 Goals and Requirements

97 The goal of WS-ResourceLifetime is to standardize the terminology, concepts, message
98 exchanges, WSDL and XML needed to monitor the lifetime of, and destroy, WS-Resources as
99 defined in [WS-RAP].

100 1.1.1 Requirements

101 This specification intends to meet the following requirements:

- 102 • Define the standard message exchange by which a requestor can request the immediate
103 destruction of a WS-Resource.
- 104 • Define the means by which a service requestor can set an initial termination time for the
105 scheduled termination of a WS-Resource.
- 106 • Define the means by which a service requestor can update the termination time
107 associated with a WS-Resource that is scheduled for termination.

- 108 • Define the means by which a service requestor can determine the current termination
109 time as known by a WS-Resource.

110 This specification MUST NOT require entities in the system to share synchronized clocks.

111 **1.1.2 Non-Goals**

112 The following topics are outside the scope of this specification:

- 113 • It is not an objective of this specification to define the message exchanges representing
114 the function of a WS-Resource factory. Factory requirements are too varied to allow a
115 general-purpose factory message exchange to be usefully defined.

116 **1.2 Terminology**

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

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

123

124 This specification uses a notational convention, referred to as "Pseudo-schemas" in a fashion
125 similar to the WSDL 2.0 Part 1 specification [WSDL 2.0]. A Pseudo-schema uses a BNF-style
126 convention to describe attributes and elements:

- 127 • `?' denotes optionality (i.e. zero or one occurrences),
128 • `*' denotes zero or more occurrences,
129 • `+' one or more occurrences,
130 • `[' and `]' are used to form groups,
131 • `|' represents choice.
132 • Attributes are conventionally assigned a value which corresponds to their type, as
133 defined in the normative schema.

```
134 <!-- sample pseudo-schema -->
135 <element
136   required_attribute_of_type_QName="xs:QName"
137   optional_attribute_of_type_string="xs:string"? >
138   <required_element />
139   <optional_element />?
140   <one_or_more_of_these_elements />+
141   [ <choice_1 /> | <choice_2 /> ]*
142 </element>
```

143

145 **1.3 Namespaces**

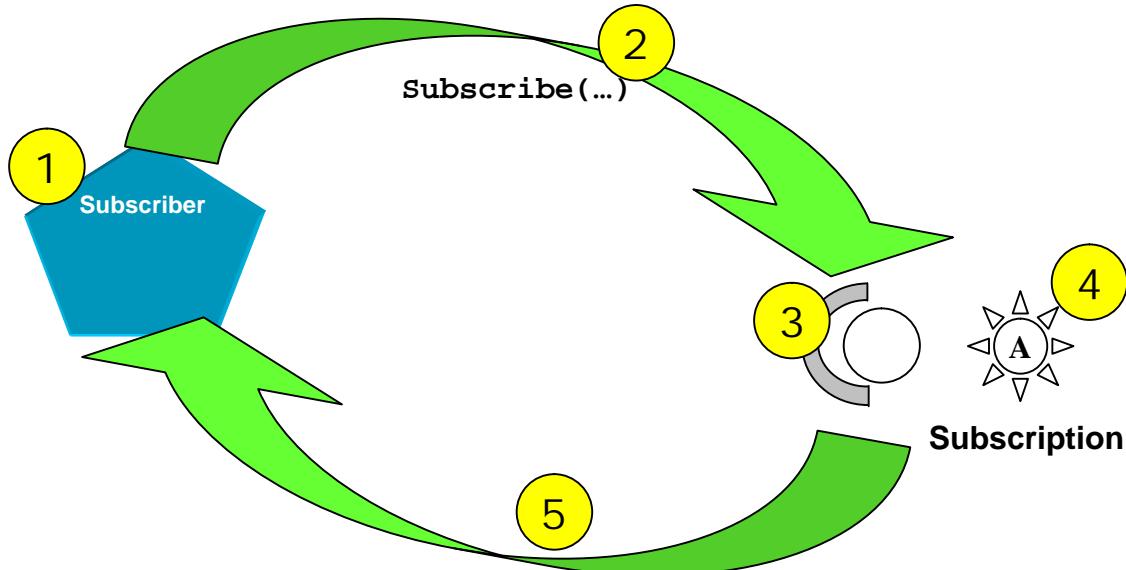
146 The following namespaces are used in this document:

Prefix	Namespace
s12	http://www.w3.org/2003/05/soap-envelope
wsa	http://schemas.xmlsoap.org/ws/2004/08/addressing/
wsrf-rp	http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-ResourceProperties-1.2-draft-05.xsd
wsrf-rpw	http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-ResourceProperties-1.2-draft-05.wsdl
wsrf-bfw	http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-BaseFaults-1.2-draft-03.wsdl
wsrf-bf	http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-BaseFaults-1.2-draft-03.xsd
wsrf-rl	http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-ResourceLifetime-1.2-draft-04.xsd
wsrf-rlw	http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-ResourceLifetime-1.2-draft-04.wsdl
wstop	http://docs.oasis-open.org/wsn/2004/06/wsn-WS-Topics-1.2-draft-01.xsd
xsd	http://www.w3.org/2001/XMLSchema
xsi	http://www.w3.org/2001/XMLSchema-instance

-
- 147 **2 Terminology and Concepts**
- 148 This section specifies the notations, namespaces, and terminology used in this specification.
- 149
- 150 For definitions of the terms WS-Resource, WS-Resource Reference and WS-Resource Access
151 Pattern, please refer to the document titled “Web Services Reference 1.2 [WS-RAP]”.
- 152
- 153 For definitions of the terms Resource Property, Resource Properties Document, Resource
154 Property Element and Resource Property Value, please refer to the WSRF-Resource Properties
155 [WS-ResourceProperties] specification.
- 156 .

157 3 Example

158 Consider the case of a subscription entity within a notification system such as WS-
159 BaseNotification [WS-BaseNotification]. This situation is depicted in the following figure:



160 *Figure 1 - Example WS-Resource Creation*

161 A service requestor (1), playing the role of a subscriber, sends a subscribe message (2) to a
162 NotificationProducer (3) because it wishes to receive notifications related to a particular situation
163 such as a failure of a component. A subscription WS-Resource (4) is created as a result of the
164 subscribe message, and a WS-Resource Reference (5) [WS-RAP] is returned to the requestor.
165 As part of the application-specific understanding of the subscribe message exchange, both the
166 requestor and provider understand that part of the semantics of processing a subscribe message
167 is the creation (usually for a limited period of time) of a subscription WS-Resource. The subscribe
168 request message contains the initial scheduled termination time of the subscription WS-
169 Resource.

170 The reference that is returned as a result of the subscribe message is a WS-Resource Reference
171 as described in [WS-RAP]. It contains a reference that refers to the newly-created subscription
172 state represented by the WS-Resource. The endpoint reference (as enumerated by the WS-
173 Addressing embodiment) also contains the address of the Web service component of the WS-
174 Resource that implements the message exchanges defined by WS-BaseNotification's
175 SubscriptionManager interface.

176 Subsequent to the creation of the subscription WS-Resource, the application-specific behavior of
177 delivering notifications continues. Occasionally, the subscriber may examine the subscription WS-
178 Resource using standard WS-ResourceLifetime resource properties to inquire about the
179 remaining time before the subscription WS-Resource may be destroyed. If the subscriber wishes
180 to extend the lifetime of the subscription WS-Resource beyond its scheduled termination time, it

181 sends a specific WS-ResourceLifetime message to the subscription WS-Resource referenced by
182 its WS-Resource Reference, prior to the expiration of its current scheduled termination time. The
183 response to this message contains the (potentially unchanged) termination time associated with
184 the subscription WS-Resource.

185 When the subscriber no longer wishes to receive notifications, it may cause the immediate
186 destruction of the subscription WS-Resource by sending another WS-ResourceLifetime message
187 to the WS-Resource through use of its WS-Resource Reference. As another option, it may simply
188 allow the termination time of the subscription WS-Resource to expire, at which time the
189 subscription WS-Resource may be destroyed.

190 4 Immediate Destruction

191 A WS-Resource MAY support a message exchange pattern that allows a service requestor to
192 request its immediate destruction.

193 The format of the destroy request message is:

```
194 ...
195   <wsrf-rl:Destroy/>
196 ...
```

197 The Destroy message MUST follow the resource access pattern, as defined in [WS-RAP]. If a
198 SOAPAction URI is included in the transport portion of the Destroy message, it MUST contain the
199 URI: "<http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-ResourceLifetime-1.2-draft-04.wsdl#ImmediateResourceTermination/DestroyRequest>".

200 If the WS-Resource accepts the DestroyRequest message, upon receipt of this message the WS-
201 Resource MUST either (1) destroy the resource component of the WS-Resource and return the
202 following DestroyResponse message to acknowledge successful destruction, or (2) return a fault
203 message indicating failure. Note that the destruction of the resource component of the WS-
204 Resource effectively destroys the WS-Resource.

```
205 ...
206 ...
207   <wsrf-rl:DestroyResponse />
208 ...
```

209 The receipt of the DestroyResponse message serves as a confirmation of the destruction of the
210 WS-Resource. Once it has sent a DestroyResponse message, any further message exchanges
211 directed at the subject WS-Resource MUST respond with a fault. In the absence of any other fault
212 conditions that may take precedence this MUST be the "ResourceUnknown" fault message.

213 If the WS-Resource does not respond to the DestroyRequest message with the
214 DestroyResponse message, then it MUST send one of the following fault messages:

- 215 • ResourceUnknownFault
 - 216 ○ The WS-Resource identified in the message is not known to the Web service.
- 217 • ResourceNotDestroyedFault
 - 218 ○ The WS-Resource could not be destroyed for some reason.
- 219 • Others tbd.

220 If a SOAPAction URI is included in the transport portion of the DestroyResponse message, it
221 MUST contain the URI: "<http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-ResourceLifetime-1.2-draft-04.wsdl#ImmediateResourceTermination/DestroyResponse>".

223

224 Note: All faults generated must be compliant with the WS-BaseFaults [WS-BaseFaults]
225 specification.

226 4.1 Example SOAP Encoding of the Destroy Message Exchange

227 The following is a non-normative example of a DestroyRequest message using SOAP 1.2 [SOAP
228 1.2]:

```
229 <s12:Envelope
230   xmlns:s12="http://www.w3.org/2003/05/soap-envelope"
```

wsrf-WS-ResourceLifetime-1.2-draft-04.pdf

11/29/2004

Copyright © OASIS Open 2004. All Rights Reserved.

Page 10 of 30

```

231     xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing"
232     xmlns:wsrf-rl=
233     "http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-ResourceLifetime-
234     1.2-draft-04.xsd"
235     xmlns:ex="http://example.com/exampleNS">
236     <s12:Header>
237     <wsa:Action>
238         http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-
239     ResourceLifetime-1.2-draft-
240     04.wsdl/ImmediateResourceTermination/DestroyRequest
241     </wsa:Action>
242     <wsa:To s12:mustUnderstand="1">
243         http://www.provider.org/ProviderEndpoint
244     </wsa:To>
245     <ex:ResourceDisambiguator>
246         uuid:84dec55-7d3f-65ad-ac44-675d9fce5d22
247     </ex:ResourceDisambiguator>
248     </s12:Header>
249     <s12:Body>
250         <wsrf-rl:Destroy />
251     </s12:Body>
252 </s12:Envelope>
```

253 The following is an example DestroyResponse message using SOAP 1.2 [SOAP 1.2]:

```

254 <s12:Envelope
255     xmlns:s12="http://www.w3.org/2003/05/soap-envelope"
256     xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing"
257     xmlns:wsrf-rl=
258     " http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-ResourceLifetime-
259     1.2-draft-04.xsd"
260     xmlns:resp="http://www.other.org/otherNS">
261     <s12:Header>
262     <wsa:Action>
263         http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-
264     ResourceLifetime-1.2-draft-
265     04.wsdl/ImmediateResourceTermination/DestroyResponse
266     </wsa:Action>
267     <wsa:To s12:mustUnderstand="1">
268         http://www.requestor.org/someEndpoint
269     </wsa:To>
270     <resp:SomeResourceReference>
271         uuid:9fef5fec-6dc3-44a2-ba32-8680cace43f9
272     </resp:SomeResourceReference>
273     </s12:Header>
274     <s12:Body>
275         <wsrf-rl:DestroyResponse />
276     </s12:Body>
277 </s12:Envelope>
```

278 5 Scheduled Destruction

279 A time-based approach MAY be used for managing the destruction of a WS-Resource. In this
280 case, the WS-Resource has an associated termination time that defines the time after which the
281 WS-Resource is expected to be destroyed and thus before which the WS-Resource can
282 reasonably be expected to be available. As defined in the following subsections, a WS-
283 Resource's termination time may be inspected through the TerminationTime resource property,
284 and may be changed using the SetTerminationTime request message.

285 Typical use of scheduled destruction is to allow a service requestor to keep a WS-Resource
286 active by adjusting the WS-Resource's termination time to some appropriate point in time using
287 the SetTerminationTime request message.

288 Note that termination time is not required to monotonically increase, nor is a service required to
289 accept a requested termination time. An implementation MAY refuse a request to adjust
290 termination time for various reasons, including, for example, to enforce a policy that allows
291 termination time to only change monotonically.

292 If a WS-Resource wishes to provide support for scheduled WS-Resource destruction, it MUST
293 support all of the message exchanges and resource properties specified in this section.

294 5.1 Regarding Time

295 This specification assumes that services and clients use the UTC global time standard,
296 expressed as type dateTime from XML Schema. Note that xsd:dateTime includes an optional
297 designation of a time zone. The use of the time zone designation is RECOMMENDED. In the
298 absence of the time zone designation, the xsd:dateTime value MUST be interpreted as universal
299 time (UTC).

300 The approach allows operations and resource properties to refer unambiguously to absolute
301 times. However, assuming the GMT time standard to represent time does *not* imply any particular
302 level of clock synchronization between clients and services. No specific accuracy of
303 synchronization is specified or expected by this specification, as this is a service-quality issue.

304 The scheduled destruction operations and resource properties have been designed to allow for
305 tolerance of lack of clock synchronization between clients and services. The CurrentTime
306 resource property may be used by a client to determine the clock skew between the client and the
307 service, within a margin of error determined by the round-trip latency of the message exchange to
308 retrieve that value. This clock skew and margin of error can then be factored into subsequent
309 decisions of when to send subsequent requests to change the termination time, and what
310 termination times to request. The skew can also be monitored and adjusted with each
311 SetTerminationTime message exchange, based on the CurrentTime that is returned from this
312 request. This approach can also be used, to a limited extent, to accommodate clocks that "jump"
313 either forward or backward in time.

314 5.2 Querying Current Time

315 In order to assist the service requestor in inspecting and setting a WS-Resource's termination
316 time without requiring a specific accuracy of clock synchronization between the service requestor
317 and the service provider, the WS-Resource MUST provide a resource property element that
318 provides the current time as it is known by the WS-Resource. The form of this resource property
319 element is:

320 ...

321 <wsrf-rl:CurrentTime>xsd:dateTime</wsrf-rl:CurrentTime>
322 ...
323 The resource properties definition of the WS-Resource MUST contain exactly one element of
324 QName wsrf-rl:CurrentTime. The constraints on this element are as follows:
325 /wsrf-rl:CurrentTime
326 A WS-Resource MUST NOT allow the CurrentTime resource property to be modified by a
327 SetResourceProperties request message as defined in [WS-ResourceProperties].
328 If the element does not include the time zone designation, the value of the element MUST be
329 interpreted as universal time (UTC).

330 5.3 Determining Current Termination Time

331 In order to allow the service requestor to determine the current termination time of a WS-
332 Resource, the WS-Resource MUST provide a resource property element that indicates the
333 current termination time of the WS-Resource. The form of this resource property element is:

334 ...
335 <wsrf-rl:TerminationTime xsi:nil="xsd:boolean"?>xsd:dateTime</wsrf-
336 rl:TerminationTime>
337 ...

338 The resource properties definition of the WS-Resource MUST contain exactly one element of
339 QName wsrf-rl:TerminationTime. The constraints on this element are as follows:

340 /wsrf-rl:TerminationTime
341 The time, relative to the time source used by the WS-Resource, after which the WS-
342 Resource MAY be destroyed.
343 If the value of this resource property element contains the xsi:nil attribute with value "true"
344 then the lifetime of the WS-Resource is considered to be *indefinite*; that is, there is no
345 scheduled destruction time.
346 A WS-Resource MUST NOT allow the TerminationTime resource property to be modified
347 by a SetResourceProperties request message as defined in [WS-ResourceProperties].
348 If the element does not include the time zone designation, the value of the element MUST
349 be interpreted as universal time (UTC).

350 5.4 Requesting Change to Termination Time

351 The SetTerminationTimeRequest message MUST be implemented by a WS-Resource supporting
352 scheduled destruction in order to allow a requestor to change its scheduled termination time. The
353 form of the SetTerminationTime message is:

354 <wsrf-rl:SetTerminationTime>
355 <wsrf-rl:RequestedTerminationTime xsi:nil="xsd:boolean"?>
356 xsd:dateTime
357 </wsrf-rl:RequestedTerminationTime>
358 </wsrf-rl:SetTerminationTime>

359 The SetTerminationTime message MUST follow the WS-Resource Access Pattern, as defined in
360 [WS-RAP]. If a SOAPAction URI is included in the transport portion of the SetTerminationTime
361 message, it MUST contain the following URI: . "<http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-ResourceLifetime-1.2-draft-04.wsdl/ScheduledResourceTermination/SetTerminationTimeRequest>".
363

364 Further constraints on the processing of the SetTerminationTimeRequest message are as
 365 follows:
 366 /wsrf-rl:SetTerminationTime/wsrf-rl:RequestedTerminationTime
 367 This is the new WS-Resource termination time that is being requested by the client. This
 368 value is interpreted relative to the time source known to the WS-Resource. If the element
 369 does not include the time zone designation, the value of the element MUST be interpreted
 370 as universal time (UTC).
 371 If the value is “in the past” relative to the current time as known by the WS-Resource, then
 372 the WS-Resource MAY be destroyed immediately. This facility provides the ability to support
 373 an asynchronous form of immediate destruction.
 374 If the value is xsi:nil, then the intent of the service requestor is to specify there is no
 375 scheduled termination time for the WS-Resource. In such situations it is RECOMMENDED
 376 that the WS-Resource support the immediate WS-Resource destruction operations
 377 described in Section 4.
 378 A WS-Resource that receives this message MAY reject the request to change the WS-
 379 Resource’s termination time for any reason (e.g. policy). In this case, a fault message MUST be
 380 returned to the service requestor.
 381 If a WS-Resource accepts the request to set the WS-Resource’s termination time, it MUST
 382 update the TerminationTime resource property of the WS-Resource to the value specified in the
 383 message or to a value “in the future” relative to the requested time. If the SetTerminationTime
 384 request message is accepted, the WS-Resource MUST respond with the following message:
 385 <wsrf-rl:SetTerminationTimeResponse>
 386 <wsrf-rl>NewTerminationTime xsi:nil="xsd:boolean"?>
 387 xsd:dateTime
 388 </wsrf-rl>NewTerminationTime>
 389 <wsrf-rl>CurrentTime>
 390 xsd:dateTime
 391 </wsrf-rl>CurrentTime>
 392 </wsrf-rl:SetTerminationTimeResponse>
 393 Further constraints on the SetTerminationTimeResponse message are as follows:
 394 /wsrf-rl:SetTerminationTimeResponse/wsrf-rl>NewTerminationTime
 395 This value MAY be “in the future” relative to the xsd:dateTime requested by the service
 396 requestor in the SetTerminationTime request message.
 397 This value reflects the new date and time at which the WS-Resource is scheduled to be
 398 destroyed. If the value is xsi:nil, it implies that the resource will not be destroyed for an
 399 indefinite period of time. In such situations, it is RECOMMENDED that the WS-Resource
 400 support the immediate WS-Resource destruction operations outlined in Section 4.
 401 This value MUST also be reflected through the value of the TerminationTime resource
 402 property.
 403 /wsrf-rl:SetTerminationTimeResponse/wsrf-rl>CurrentTime
 404 This value MUST be the time, as it is known by the WS-Resource, at which the WS-
 405 Resource processed this SetTerminationTimeRequest.
 406 If the WS-Resource does not respond to the SetTerminationTimeRequest message with the
 407 SetTerminationTimeResponse message, then it MUST send one of the following fault messages :
 408 • ResourceUnknownFault

- 409 ○ The stateful resource identified in the message (which follows the WS-Resource
 410 Access Pattern) is not known to the Web service.
 411 • UnableToSetTerminationTimeFault
 412 ○ The request for termination time could not be changed for some reason.
 413 • TerminationTimeChangeRejectedFault
 414 ○ In the case where a WS-Resource is willing to update its termination time, but only
 415 with a value “in the past” relative to the requested termination time, then the WS-
 416 Resource MAY include a “hint” in the TerminationTimeUnchangedFault message
 417 indicating the time to which it is willing to extend TerminationTime.

418 If a SOAPAction URI is included in the transport portion of the SetTerminationTimeResponse
 419 message, it MUST contain the following URI: "<http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-ResourceLifetime-1.2-draft-04.wsdl/ScheduledResourceTermination/SetTerminationTimeResponse>".

422 Note: All faults generated MUST be compliant with the WS-BaseFaults [WS-BaseFaults]
 423 specification.

424

425 **5.5 Example SOAP Encoding of the SetTerminationTime 426 Message Exchange**

427 The following is a non-normative example of a SetTerminationTime request message using
 428 SOAP 1.2 [SOAP 1.2]:

```
429 <s12:Envelope  

430   xmlns:s12="http://www.w3.org/2003/05/soap-envelope"  

431   xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing"  

432   xmlns:wsrf-rl=  

433     "http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-ResourceLifetime-  

434     1.2-draft-04.xsd"  

435   xmlns:ex="http://example.com/exampleNS">  

436   <s12:Header>  

437     <wsa:Action>  

438       http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-  

439     ResourceLifetime-1.2-draft-  

440     04.wsdl/ScheduledResourceTermination/SetTerminationTimeRequest  

441     </wsa:Action>  

442     <wsa:To s12:mustUnderstand="1">  

443       http://www.provider.org/ProviderEndpoint  

444     </wsa:To>  

445     <ex:ResourceDisambiguator>  

446       uuid:9fef5fec-6dc3-44a2-ba32-8680cace43f9  

447     </ex:ResourceDisambiguator>  

448   </s12:Header>  

449   <s12:Body>  

450     <wsrf-rl:SetTerminationTime>  

451       <wsrf-rl:RequestedTerminationTime>  

452         2001-12-31T12:00:00Z  

453       </wsrf-rl:RequestedTerminationTime>  

454     </wsrf-rl:SetTerminationTime>  

455   </s12:Body>
```

```

456  </s12:Envelope>
457  The following is an example SetTerminationTimeResponse message using SOAP 1.2 [SOAP
458  1.2]:
459  <s12:Envelope
460      xmlns:s12="http://www.w3.org/2003/05/soap-envelope"
461      xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing"
462      xmlns:wsrf-rl=
463          " http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-ResourceLifetime-
464          1.2-draft-04.xsd"
465      xmlns:resp="http://www.other.org/otherNS">
466      <s12:Header>
467          <wsa:Action>
468              http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-
469              ResourceLifetime-1.2-draft-
470              04.wsdl/ScheduledResourceTermination/SetTerminationTimeResponse
471          </wsa:Action>
472          <wsa:To s12:mustUnderstand="1">
473              http://www.requestor.org/someEndpoint
474          </wsa:To>
475          <resp:SomeResourceReference>
476              Disk_3
477          </resp:SomeResourceReference>
478      </s12:Header>
479      <s12:Body>
480          <wsrf-rl:SetTerminationTimeResponse>
481              <wsrf-rl>NewTerminationTime>
482                  2001-12-31T12:00:00Z
483              </wsrf-rl>NewTerminationTime>
484              <wsrf-rl>CurrentTime>
485                  2001-12-31T11:00:00Z
486              </wsrf-rl>CurrentTime>
487          </wsrf-rl:SetTerminationTimeResponse>
488      </s12:Body>
489  </s12:Envelope>

```

490 5.6 Termination Time Expiration

491 If the service requestor fails to successfully update the termination time of a WS-Resource before
492 the termination time expires, the WS-Resource MAY be destroyed and therefore no longer be
493 accessible. Termination time has expired when the termination time of the WS-Resource (as
494 reflected by the value of the WS-Resource's TerminationTime resource property element) is "in
495 the past" relative to the current time as expressed in the value of the WS-Resource's CurrentTime
496 resource property element.

497 The specific mechanisms employed to destroy the WS-Resource after termination time has
498 expired is implementation dependent. An implementation MAY delay destruction of the WS-
499 Resource at its own discretion. The requestor MUST NOT depend on the destruction of the WS-
500 Resource occurring at termination time expiration but SHOULD assume that the WS-Resource is
501 no longer accessible after termination time has expired.

502

503

6 Notification of Resource Destruction

504 A WS-Resource MAY choose to support the pattern of notifying interested parties when it is
 505 destroyed. If a WS-Resource chooses to support this pattern and if the WS-Resource uses WS-
 506 BaseNotification [WS-BaseNotification] to implement this pattern, then it MUST follow the
 507 approach described in this section. An implementation MAY choose to not support this pattern, or
 508 it MAY choose to do so using some means other than WS-BaseNotification; in such
 509 circumstances, the implementation MAY ignore the approach described in this section.

510 If the WS-Resource is also a NotificationProducer, according to the WS-BaseNotification
 511 specification [WS-BaseNotification], then it SHOULD provide a topic [WS-Topics] to allow
 512 requestors to subscribe for notification of its destruction. The notification applies to both
 513 immediate and scheduled destruction. The form of the topic is:

```
514 <wstop:TopicSpace name="ResourceLifetime"
515   targetNamespace=
516     "http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-ResourceLifetime-
517     1.2-draft-04.xsd"
518 ...
519   <wstop:Topic name="ResourceTermination" ...>
520     <wstop:MessagePattern>
521       <wsrf-rp:QueryExpression
522         dialect="http://www.w3.org/TR/1999/REC-xpath-19991116" >
523           boolean(//*[TerminationNotification])
524         </wsrf-rp:QueryExpression>
525       </wstop:MessagePattern>
526     </wstop:Topic>
527   </wstop:TopicSpace>
```

529 The value of /wstop:Topic/@MessageTypes is implementation-dependent; this specification does
 530 not define the exact content of the notification messages produced on this topic. However, the
 531 notification message associated with this topic MUST contain the following element:

```
532 <wsrf-rl:TerminationNotification>
533   <wsrf-rl:TerminationTime xsi:nil="xsd:boolean"?>xsd:dateTime</wsrf-
534   rl:TerminationTime>
535   <wsrf-rl:TerminationReason>xsd:any</wsrf-rl:TerminationReason>?
536 </wsrf-rl:TerminationNotification>
```

537 This constraint is specified in the /wstop:Topic/wstop:MessagePattern element. The
 538 TerminationNotification element is further constrained as follows:

539 /wsrf-rl:TerminationTime

540 This element contains the date and time when the WS-Resource was destroyed.

541 /wsrf-rl:TerminationReason

542 This OPTIONAL element contains an explanation of the situation surrounding the
 543 destruction of the WS-Resource. This element is specific to the type of the WS-Resource
 544 that was destroyed.

545 A requestor would send a subscribe request message, following the WS-BaseNotification
 546 specification, specifying the “ResourceTermination” topic and referencing a chosen WS-Resource
 547 using a WS-Resource Reference [WS-RAP].

548 7 Security Considerations

549 This specification defines the message exchanges used to request the destruction of a WS-
550 Resource, or to obtain information about the termination time of the WS-Resource. In this context,
551 there are two categories of security aspects that need to be considered: (a) securing the
552 message exchanges and (b) securing the operations that perform the WS-Resource destruction.

553 7.1 Securing the Message Exchanges

554 When messages are exchanged between a requestor and a WS-Resource in order to access or
555 act upon the resource properties, it is strongly RECOMMENDED that the communication
556 between them be secured using the mechanisms described in WS-Security. In order to properly
557 secure messages, the body and all relevant headers need to be included in the digital signature
558 so as to prove the integrity of the message. In addition the reference properties within a WS-
559 Resource Reference may be encrypted to ensure their privacy. In the event that a requestor
560 communicates with a WS-Resource to access its resource properties, either directly through a
561 query or indirectly through a notification of resource property state change, it is RECOMMENDED
562 that a security context be established using the mechanisms described in WS-Trust [WS-Trust]
563 and WS-SecureConversation [WS-SecureConversation].

564 It is common for communication between requestors and WS-Resources to exchange multiple
565 messages. As a result, the usage profile is such that it is susceptible to key attacks. For this
566 reason it is strongly RECOMMENDED that the keys used to secure the channel be changed
567 frequently. This "re-keying" can be effected a number of ways. The following list outlines four
568 common techniques:

- 569 • Attaching a nonce to each message and using it in a derived key function with the shared
570 secret
- 571 • Using a derived key sequence and switch "generations"
- 572 • Closing and re-establishing a security context
- 573 • Exchanging new secrets between the parties

574 It should be noted that the mechanisms listed above are independent of the security context
575 token (SCT) and secret returned when subscribed the first time. That is, the keys used to secure
576 the channel during notifications may be independent of the key used to prove the right to
577 subscribe with a NotificationSource.

578 The security context MAY be re-established using the mechanisms described in WS-Trust and
579 WS-SecureConversation. Similarly, secrets can be exchanged using the mechanisms described
580 in WS-Trust. Note, however, that the current shared secret SHOULD NOT be used to encrypt the
581 new shared secret. Derived keys, the preferred solution from this list, can be specified using the
582 mechanisms described in WS-SecureConversation.

583 The following list summarizes common classes of attacks that apply to this protocol and identifies
584 the mechanism to prevent/mitigate the attacks:

- 585 • **Message alteration** – Alteration is prevented by including signatures of the message
586 information using WS-Security.
- 587 • **Message disclosure** – Confidentiality is preserved by encrypting sensitive data using WS-
588 Security.

- 589 • **Key integrity** – Key integrity is maintained by using the strongest algorithms possible (by
590 comparing secured policies – see WS-Policy and WS-SecurityPolicy).
- 591 • **Authentication** – Authentication is established using the mechanisms described in WS-
592 Security and WS-Trust. Each message is authenticated using the mechanisms described in
593 WS-Security.
- 594 • **Accountability** – Accountability is a function of the type of and string of the key and
595 algorithms being used. In many cases, a strong symmetric key provides sufficient
596 accountability. However, in some environments, strong PKI signatures are required.
- 597 • **Availability** – Many services are subject to a variety of availability attacks. Replay is a
598 common attack and it is RECOMMENDED that this be addressed as described in the
599 “Replay” item below. Other attacks, such as network-level denial of service attacks are
600 harder to avoid and are outside the scope of this specification. That said, care should be
601 taken to ensure that minimal processing be performed prior to any authenticating sequences.
- 602 • **Replay** – Messages may be replayed for a variety of reasons. To detect and eliminate this
603 attack, mechanisms should be used to identify replayed messages such as the
604 timestamp/nonce outlined in WS-Security and the sequences outlined in WS-
605 ReliableMessaging.

606 7.2 Securing Resource Destruction

607 Given that WS-ResourceLifetime defines a mechanism to destroy WS-Resources, security
608 policies should be established to ensure that only authorized requestors can destroy a WS-
609 Resource. Authorization policies should be defined so that the implications of destroying a WS-
610 Resource either through immediate requests or by setting termination time, are considered. The
611 two approaches for destruction may be considered equivalent for authorization reasons. In other
612 words, an authorization policy that describes the ability to perform a Destroy operation on a WS-
613 Resource, conforming to the ImmediateResourceTermination portType, may also need to be
614 applied when the SetTerminationTime operation is performed on the same resource.

615 It should be noted that this specification does not allow modifications to the CurrentTime and
616 TerminationTime resource properties through the SetResourceProperty request message of WS-
617 ResourceProperties. Therefore, there should be no authorization enforcement performed when
618 these resource properties are accessed using the Set request message; however, it should be
619 left to the runtime to enforce the requirement as specified. Given a requestor can subscribe for
620 notification of the destruction of the resource using “ResourceLifetime” topic, the security
621 considerations specified in WS-BaseNotification specification are applicable to this topic.

622

623 8 References

624 [OGSI]

625 GGF GFD.15 “Open Grid Services Infrastructure (OGSI) Version 1.0”. Available at
626 <http://forge.gridforum.org/projects/ogsi-wg>

627 [WS-RAP]

628 <http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-Resource-1.2-draft-02.pdf>

629 [WS-Addressing]

630 <http://www.w3.org/Submission/2004/SUBM-ws-addressing-20040810/>

631 [WS-BaseNotification]

632 <http://docs.oasis-open.org/wsn/2004/06/wsn-WS-BaseNotification-1.2-draft-03.pdf>

633 [WS-BaseFaults]

634 <http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-BaseFaults-1.2-draft-03.pdf>

635 [WS-ResourceProperties]

636 <http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-ResourceProperties-1.2-draft-05.pdf>

637 [WS-SecureConversation]

638 <http://www-106.ibm.com/developerworks/library/ws-secon/>

639 [WS-Security]

640 <http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-soap-message-security-1.0.pdf>

642 [WS-Topics]

643 <http://docs.oasis-open.org/wsn/2004/06/wsn-WS-Topics-1.2-draft-01.pdf>

644 [WS-Trust]

645 <http://www-106.ibm.com/developerworks/library/ws-trust/>

646 [XML-InfoSet]

647 <http://www.w3.org/TR/xml-infoset/>

648 [XML]

649 <http://www.w3.org/TR/REC-xml>

651 Appendix A. Acknowledgments

652 Special thanks to the Global Grid Forum's Open Grid Services Infrastructure working group,
653 which defined the OGSI v1.0 [OGSI] specification which was a large inspiration for the ideas
654 expressed in this specification.

655

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

658

659 Akhil Arora (Sun Microsystems), Tim Banks (IBM), Jeff Bohren (OpenNetwork), Conor Cahill
660 (AOL), Fred Carter (AmberPoint), Martin Chapman (Oracle), Glen Daniels (Sonic Software),
661 Thomas Freund (IBM), Stephen Graham (IBM), Anish Karmarkar (Oracle), Hideharu Kato
662 (Hitachi), David Levine (IBM), Paul Lipton (Computer Associates), Mark Little (Arjuna
663 Technologies Limited), Lily Liu (WebMethods, Inc.), Tom Maguire (IBM), Susan Malaika (IBM),
664 David Martin (IBM), Samuel Meder (Argonne National Laboratory), Jeff Mischkinsky (Oracle),
665 Bryan Murray (Hewlett-Packard), Dave Orchard (BEA Systems, Inc.), Savas Parastatidis
666 (Individual), Greg Pavlik (Oracle), Mark Peel (Novell), Alain Regnier (Ricoh Company, Ltd.), Ian
667 Robinson (IBM), Junaid Saiyed (Sun Microsystems), Igor Sedukhin (Computer Associates),
668 Hitoshi Sekine (Ricoh Company, Ltd.), Frank Siebenlist (Argonne National Laboratory), David
669 Snelling (Fujitsu), Latha Srinivasan (Hewlett-Packard), John Tollefsrud (Sun Microsystems), Jem
670 Treadwell (Hewlett-Packard), Steve Tuecke (Argonne National Laboratory), William Vambenepe
671 (Hewlett-Packard), Katy Warr (IBM), Alan Weissberger (NEC Corporation), and Pete Wenzel
672 (SeeBeyond Technology Corporation)

673

674 In addition, the following people made contributions to this specification:

675

676 Karl Czajkowski (Globus / USC/ISI), Donald F Ferguson (IBM), Ian Foster (Globus /
677 Argonne), Jeffrey Frey (IBM), Frank Leymann (IBM), Nataraj Nagaratnam (IBM), Martin Nally
678 (IBM), Tony Storey (IBM), Sanjiva Weerawarana (IBM)
679

680 Appendix B. XML Schema

681 The XML types and elements used in this specification are defined in the following XML Schema:

```
682 <?xml version="1.0" encoding="UTF-8"?>
683 <!--
684
685 OASIS takes no position regarding the validity or scope of any
686 intellectual property or other rights that might be claimed to pertain
687 to the implementation or use of the technology described in this
688 document or the extent to which any license under such rights might or
689 might not be available; neither does it represent that it has made any
690 effort to identify any such rights. Information on OASIS's procedures
691 with respect to rights in OASIS specifications can be found at the
692 OASIS website. Copies of claims of rights made available for
693 publication and any assurances of licenses to be made available, or the
694 result of an attempt made to obtain a general license or permission for
695 the use of such proprietary rights by implementors or users of this
696 specification, can be obtained from the OASIS Executive Director.
697
698 OASIS invites any interested party to bring to its attention any
699 copyrights, patents or patent applications, or other proprietary rights
700 which may cover technology that may be required to implement this
701 specification. Please address the information to the OASIS Executive
702 Director.
703
704 Copyright (C) OASIS Open (2004). All Rights Reserved.
705
706 This document and translations of it may be copied and furnished to
707 others, and derivative works that comment on or otherwise explain it or
708 assist in its implementation may be prepared, copied, published and
709 distributed, in whole or in part, without restriction of any kind,
710 provided that the above copyright notice and this paragraph are
711 included on all such copies and derivative works. However, this
712 document itself may not be modified in any way, such as by removing the
713 copyright notice or references to OASIS, except as needed for the
714 purpose of developing OASIS specifications, in which case the
715 procedures for copyrights defined in the OASIS Intellectual Property
716 Rights document must be followed, or as required to translate it into
717 languages other than English.
718
719 The limited permissions granted above are perpetual and will not be
720 revoked by OASIS or its successors or assigns.
721
722 This document and the information contained herein is provided on an
723 "AS IS" basis and OASIS DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED,
724 INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE
725 INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED
726 WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.
727
728 -->
729 <xsd:schema xmlns="http://www.w3.org/2001/XMLSchema"
730   xmlns:xsd="http://www.w3.org/2001/XMLSchema"
731   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:wsrf-
732   rrl="http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-ResourceLifetime-
733   1.2-draft-04.xsd"
734   elementFormDefault="qualified" attributeFormDefault="unqualified"
735   targetNamespace=" http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-
736   ResourceLifetime-1.2-draft-04.xsd">
```

```
737 <!--
738 ===== Resource Property Related =====
739 -->
740 <!--
741
742
743 ===== Resource Properties for ScheduledResourceTermination ====
744 -->
745 <xsd:element name="CurrentTime" type="xsd:dateTime" />
746 <xsd:element name="TerminationTime" nillable="true"
747 type="xsd:dateTime" />
748 <!--
749
750 ===== Notification Message Related =====
751
752 -->
753 <xsd:element name="TerminationNotification">
754   <xsd:complexType>
755     <xsd:sequence>
756       <xsd:element name="TerminationTime" type="xsd:dateTime"
757       minOccurs="1" maxOccurs="1" nillable="true"/>
758       <xsd:element name="TerminationReason" type="xsd:anyType"
759       minOccurs="0" maxOccurs="1" />
760     </xsd:sequence>
761   </xsd:complexType>
762 </xsd:element>
763 </xsd:schema>
```

764

Appendix C. WSDL 1.1

765
766

The following illustrates the WSDL 1.1 for the Web service methods described in this specification:

767
768
769
770
771
772
773
774
775
776
777
778
779
780
781

```
<?xml version="1.0" encoding="utf-8"?>
<!--
OASIS takes no position regarding the validity or scope of any
intellectual property or other rights that might be claimed to pertain
to the implementation or use of the technology described in this
document or the extent to which any license under such rights might or
might not be available; neither does it represent that it has made any
effort to identify any such rights. Information on OASIS's procedures
with respect to rights in OASIS specifications can be found at the
OASIS website. Copies of claims of rights made available for
publication and any assurances of licenses to be made available, or the
result of an attempt made to obtain a general license or permission for
the use of such proprietary rights by implementors or users of this
specification, can be obtained from the OASIS Executive Director.
```

782
783
784
785
786
787

```
OASIS invites any interested party to bring to its attention any
copyrights, patents or patent applications, or other proprietary rights
which may cover technology that may be required to implement this
specification. Please address the information to the OASIS Executive
Director.
```

788
789

```
Copyright (C) OASIS Open (2004). All Rights Reserved.

This document and translations of it may be copied and furnished to
others, and derivative works that comment on or otherwise explain it or
assist in its implementation may be prepared, copied, published and
distributed, in whole or in part, without restriction of any kind,
provided that the above copyright notice and this paragraph are
included on all such copies and derivative works. However, this
document itself may not be modified in any way, such as by removing the
copyright notice or references to OASIS, except as needed for the
purpose of developing OASIS specifications, in which case the
procedures for copyrights defined in the OASIS Intellectual Property
Rights document must be followed, or as required to translate it into
languages other than English.
```

802
803
804
805

```
The limited permissions granted above are perpetual and will not be
revoked by OASIS or its successors or assigns.
```

806
807
808
809
810
811
812
813

```
This document and the information contained herein is provided on an
"AS IS" basis and OASIS DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED,
INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE
INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED
WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.
```

```
-->
```

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

```

816     xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
817     xmlns:xsd="http://www.w3.org/2001/XMLSchema"
818     xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
819     xmlns:wsrf-bf=
820         "http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-BaseFaults-1.2-
821 draft-03.xsd"
822     xmlns:wsrf-rp=
823         "http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-ResourceProperties-
824 1.2-draft-05.xsd"
825     xmlns:wsrf-rl=
826         "http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-
827 ResourceLifetime-1.2-draft-04.xsd"
828     xmlns:wsrf-rlw=
829         "http://docs.oasis-open.org/wsrf/2004/011/wsrf-WS-
830 ResourceLifetime-1.2-draft-04.wsdl"
831     targetNamespace=
832         "http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-
833 ResourceLifetime-1.2-draft-04.wsdl">
834
835 <!-- ===== Types Definitions ===== -->
836 <wsdl:types>
837     <xsd:schema
838         xmlns="http://www.w3.org/2001/XMLSchema"
839         targetNamespace=
840             "http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-ResourceLifetime-
841 1.2-draft-04.xsd"
842         elementFormDefault="qualified" attributeFormDefault="unqualified"
843     >
844
845     <xsd:include
846         schemaLocation=
847             "http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-
848 ResourceLifetime-1.2-draft-04.xsd"
849     />
850
851     <xsd:import
852         namespace=
853             "http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-BaseFaults-1.2-
854 draft-03.xsd"
855         schemaLocation=
856             "http://docs.oasis-open.org/wsrf/2004/11/wsrf-WS-BaseFaults-1.2-
857 draft-03.xsd"
858     />
859
860 <!-- ===== Resource Properties for ScheduledResourceTermination ===== -->
861     <xsd:element name="ScheduledResourceTerminationRP" >
862         <xsd:complexType>
863             <xsd:sequence>
864                 <xsd:element ref="wsrf-rl:CurrentTime"
865                     minOccurs="1" maxOccurs="1" />
866                 <xsd:element ref="wsrf-rl:TerminationTime"
867                     minOccurs="1" maxOccurs="1" />
868             </xsd:sequence>
869         </xsd:complexType>
870     </xsd:element>
871
872 <!-- ===== Message Types for ImmediateResourceTermination ===== -->
873

```

```

874     <xsd:element name="Destroy">
875         <xsd:complexType />
876     </xsd:element>
877
878     <xsd:element name="DestroyResponse" >
879         <xsd:complexType />
880     </xsd:element>
881
882     <xsd:complexType name="ResourceUnknownFaultType">
883         <xsd:complexContent>
884             <xsd:extension base="wsrf-bf:BaseFaultType"/>
885         </xsd:complexContent>
886     </xsd:complexType>
887     <xsd:element name="ResourceUnknownFault"
888                 type="wsrf-rl:ResourceUnknownFaultType"/>
889
890     <xsd:complexType name="ResourceNotDestroyedFaultType">
891         <xsd:complexContent>
892             <xsd:extension base="wsrf-bf:BaseFaultType"/>
893         </xsd:complexContent>
894     </xsd:complexType>
895     <xsd:element name="ResourceNotDestroyedFault"
896                 type="wsrf-rl:ResourceNotDestroyedFaultType"/>
897
898     <!-- ===== Message Types for ScheduledResourceTermination ===== -->
899
900     <xsd:element name="SetTerminationTime">
901         <xsd:complexType>
902             <xsd:sequence>
903                 <xsd:element name="RequestedTerminationTime"
904                     nillable="true"
905                     type="xsd:dateTime" />
906             </xsd:sequence>
907         </xsd:complexType>
908     </xsd:element>
909
910     <xsd:element name="SetTerminationTimeResponse">
911         <xsd:complexType>
912             <xsd:sequence>
913                 <xsd:element name="NewTerminationTime"
914                     nillable="true"
915                     type="xsd:dateTime" />
916                 <xsd:element name="CurrentTime"
917                     type="xsd:dateTime" />
918             </xsd:sequence>
919         </xsd:complexType>
920     </xsd:element>
921
922     <xsd:complexType name="UnableToSetTerminationTimeFaultType">
923         <xsd:complexContent>
924             <xsd:extension base="wsrf-bf:BaseFaultType"/>
925         </xsd:complexContent>
926     </xsd:complexType>
927     <xsd:element name="UnableToSetTerminationTimeFault"
928                 type="wsrf-rl:UnableToSetTerminationTimeFaultType"/>
929
930     <xsd:complexType name="TerminationTimeChangeRejectedFaultType">
931         <xsd:complexContent>
932             <xsd:extension base="wsrf-bf:BaseFaultType" />

```

```

933         </xsd:complexContent>
934     </xsd:complexType>
935     <xsd:element name="TerminationTimeChangeRejectedFault"
936                 type="wsrf-
937                 r1:TerminationTimeChangeRejectedFaultType" />
938
939
940     </xsd:schema>
941   </wsdl:types>
942
943   <!-- ===== Message Definitions for Destroy =====
944       Destroy()
945       returns: empty
946   -->
947   <wsdl:message name="DestroyRequest">
948     <wsdl:part name="DestroyRequest"
949       element="wsrf-rl:Destroy" />
950   </wsdl:message>
951
952   <wsdl:message name="DestroyResponse">
953     <wsdl:part name="DestroyResponse"
954       element="wsrf-rl:DestroyResponse" />
955   </wsdl:message>
956
957   <wsdl:message name="ResourceUnknownFault">
958     <wsdl:part name="ResourceUnknownFault"
959       element="wsrf-rl:ResourceUnknownFault" />
960   </wsdl:message>
961
962   <wsdl:message name="ResourceNotDestroyedFault">
963     <wsdl:part name="ResourceNotDestroyedFault"
964       element="wsrf-rl:ResourceNotDestroyedFault" />
965   </wsdl:message>
966
967   <!-- ===== SetTerminationTime =====
968       SetTerminationTime(xsd:dateTime)
969       returns: xsd:dateTime
970   -->
971
972   <wsdl:message name="SetTerminationTimeRequest">
973     <wsdl:part name="SetTerminationTimeRequest"
974       element="wsrf-rl:SetTerminationTime" />
975   </wsdl:message>
976
977   <wsdl:message name="SetTerminationTimeResponse">
978     <wsdl:part name="SetTerminationTimeResponse"
979       element="wsrf-rl:SetTerminationTimeResponse" />
980   </wsdl:message>
981
982   <wsdl:message name="UnableToSetTerminationTimeFault">
983     <wsdl:part name="UnableToSetTerminationTimeFault"
984       element="wsrf-rl:UnableToSetTerminationTimeFault" />
985   </wsdl:message>
986
987   <wsdl:message name="TerminationTimeChangeRejectedFault">
988     <wsdl:part name="TerminationTimeChangeRejectedFault"
989       element="wsrf-rl:TerminationTimeChangeRejectedFault" />
990   </wsdl:message>
991

```

```

992 <!-- ===== PortType Definitions ===== -->
993   <wsdl:portType name="ImmediateResourceTermination">
994     <wsdl:operation name="Destroy">
995       <wsdl:input message="wsrf-rlw:DestroyRequest" />
996       <wsdl:output message="wsrf-rlw:DestroyResponse" />
997       <wsdl:fault name="ResourceUnknownFault"
998         message="wsrf-rlw:ResourceUnknownFault" />
999       <wsdl:fault name="ResourceNotDestroyedFault"
1000         message="wsrf-rlw:ResourceNotDestroyedFault" />
1001     </wsdl:operation>
1002   </wsdl:portType>
1003
1004   <wsdl:portType name="ScheduledResourceTermination"
1005     wsrf-rp:ResourceProperties = "wsrf-
1006     rl:ScheduledResourceTerminationRP">
1007     <wsdl:operation name="SetTerminationTime">
1008       <wsdl:input message="wsrf-rlw:SetTerminationTimeRequest" />
1009       <wsdl:output message="wsrf-rlw:SetTerminationTimeResponse" />
1010       <wsdl:fault name="ResourceUnknownFault"
1011         message="wsrf-rlw:ResourceUnknownFault" />
1012       <wsdl:fault name="UnableToSetTerminationTimeFault"
1013         message="wsrf-rlw:UnableToSetTerminationTimeFault" />
1014       <wsdl:fault name="TerminationTimeChangeRejectedFault"
1015         message="wsrf-rlw:TerminationTimeChangeRejectedFault"
1016     />
1017     </wsdl:operation>
1018   </wsdl:portType>
1019
1020 </wsdl:definitions>
1021

```

1022

1023

Appendix D. Revision History

1024

[This appendix is optional, but helpful. It should be removed for specifications that are at OASIS Standard level.]

Rev	Date	By Whom	What
wd-01	2004-05-21	Latha Srinivasan	Initial version created from submission by contributing companies. Minor modifications made to reflect OASIS formatting and the following issues: WSRF2, WSRF3, WSRF14, WSRF33.
wd-02	2004-06-01	Latha Srinivasan	Modification to Acknowledgments section to reflect TC list as per WS-RP draft spec. v 1.2
Wd-03	2004-06-08	Latha Srinivasan	Fixed namespaces to reflect 2004/06; replaced rogue verdana fonts with Arial; updated Acknowledgments section; added ElementFormDefault and attributeFormDefault to schema and XSD files; updated references to point to pdf versions of files; Fixed reference for WS-BaseNotification and replaced references to "lifecycle" with lifetime
wd-04	2004-11-04	Latha Srinivasan	Addressed issues WSRF6, WSRF30, WSRF43, WSRF49, WSRF53 and WSRF56 in addition to changes suggested by Ian Robinson in email dated Nov 6, 2004

1026

1027

Appendix E. Notices

1028 OASIS takes no position regarding the validity or scope of any intellectual property or other rights
1029 that might be claimed to pertain to the implementation or use of the technology described in this
1030 document or the extent to which any license under such rights might or might not be available;
1031 neither does it represent that it has made any effort to identify any such rights. Information on
1032 OASIS's procedures with respect to rights in OASIS specifications can be found at the OASIS
1033 website. Copies of claims of rights made available for publication and any assurances of licenses
1034 to be made available, or the result of an attempt made to obtain a general license or permission
1035 for the use of such proprietary rights by implementors or users of this specification, can be
1036 obtained from the OASIS Executive Director.

1037

1038 OASIS invites any interested party to bring to its attention any copyrights, patents or patent
1039 applications, or other proprietary rights which may cover technology that may be required to
1040 implement this specification. Please address the information to the OASIS Executive Director.

1041

1042 Copyright (C) OASIS Open (2004). All Rights Reserved.

1043

1044 This document and translations of it may be copied and furnished to others, and derivative works
1045 that comment on or otherwise explain it or assist in its implementation may be prepared, copied,
1046 published and distributed, in whole or in part, without restriction of any kind, provided that the
1047 above copyright notice and this paragraph are included on all such copies and derivative works.
1048 However, this document itself may not be modified in any way, such as by removing the copyright
1049 notice or references to OASIS, except as needed for the purpose of developing OASIS
1050 specifications, in which case the procedures for copyrights defined in the OASIS Intellectual
1051 Property Rights document must be followed, or as required to translate it into languages other
1052 than English.

1053

1054 The limited permissions granted above are perpetual and will not be revoked by OASIS or its
1055 successors or assigns.

1056

1057 This document and the information contained herein is provided on an "AS IS" basis and OASIS
1058 DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO
1059 ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE
1060 ANY RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A
1061 PARTICULAR PURPOSE.