

## RNS 1.1 OGSA WSRF Basic Profile Rendering 1.0

### Status of This Document

This document provides information to the Grid community on a simple higher-level naming grid service that allows users to associate human-readable names to WS-Addressing **[WS-Addressing]** Endpoint Reference Types. Distribution is unlimited.

### Copyright Notice

Copyright © Open Grid Forum (2006-2009). All Rights Reserved.

### Trademark

OGSA is a registered trademark and service mark of the Open Grid Forum.

### Abstract

In their 2002 book, “Distributed Systems: Principles and Paradigms”, Andrew Tannenbaum and Martin van Steen describe in great detail the properties, function, and benefit of naming schemes in distributed systems **[Tannenbaum]**. Specifically, they describe a typical three-layer naming scheme whereby human readable names map to location-independent names or identifiers, which in turn map to location-dependent addresses. This three-tiered approach is instrumental in providing both usability for clients, as well as many of the classic distributed systems “transparencies” like fault and location transparency. WS-Naming **[WS-Naming]** provides the mapping between location-independent names (in the form of *EndpointIdentifiers*) and location-dependent addresses (i.e., WS-Addressing EPRs). In this specification we describe the Resource Namespace Service (RNS), a grid port type that allows clients to manipulate and retrieve mappings from human-readable strings to WS-Addressing Endpoint Reference Types<sup>1</sup>, thus providing the higher level mapping described by Tannenbaum and van Steen.

### Contents

Abstract .....	1
1. Introduction .....	3
1.1 Terminology .....	3
1.2 Namespaces .....	3
2. Iterators .....	3
3. RNS Properties .....	3
4. RNS Message Faults .....	4
5. Security Considerations .....	4
6. Author Information .....	4
7. Contributors and Acknowledgements .....	5
8. Intellectual Property Statement .....	5
9. Disclaimer .....	5
10. Full Copyright Notice .....	5
11. References .....	6

---

<sup>1</sup> Of course, since WS-Naming compliant endpoints are merely extensions on WS-Addressing EPRs, RNS can map to either.

GWD-TYPE  
Category: TYPE  
NAME\_OF\_WG\_OR\_RG

Author-1, Institution  
Author-2, Institution  
DATE  
[if applicable: Revised DATE]

Appendix A. RNS XML Schema ..... 8  
Appendix B. RNS WSDL ..... 13

## 1. Introduction

This document is the normative description of the RNS 1.1 specification in terms of the OGSA WSRF Basic Profile 1.0 **[WSRFProfileDoc]**. The RNS Draft Recommendation Document **[RNS1.1]** describes most operations in detail and where possible, information from that document is not repeated here. In addition to information contained within this document, all implementations of the OGSA WSRF Basic Profile 1.0 rendering of the RNS specification MUST conform to the requirements contained within the OGSA WSRF Basic Profile 1.0 document **[WSRFProfileDoc]**.

### 1.1 Terminology

The key words ‘MUST,’ ‘MUST NOT,’ ‘REQUIRED,’ ‘SHALL,’ ‘SHALL NOT,’ ‘SHOULD,’ ‘SHOULD NOT,’ ‘RECOMMENDED,’ ‘MAY,’ and ‘OPTIONAL’ are to be interpreted as described in RFC 2119 **[RFC2119]**.

In addition to the terms introduced in **[RFC2119]**, additional terms commonly used in this document are defined in the Glossary in the back.

When describing abstract data models, this specification uses the notational convention used by the **[XML-Infoset]**.

When describing concrete XML schemas, this specification uses the notational convention of **[WS-Security]**. Specifically, each member of an element’s **[children]** or **[attributes]** property is described using an Xpath-like **[XPATH]** notation (e.g., `/x:MyHeader/x:SomeProperty@value1`). The use of `{any}` indicates the presence of an element wildcard (`<xsd:any/>`). The use of `@{any}` indicates the presence of an attribute wildcard (`<xsd:anyAttribute/>`).

### 1.2 Namespaces

The following namespaces are used in this document:

Prefix	Namespace
s11	<a href="http://schemas.xmlsoap.org/soap/envelope">http://schemas.xmlsoap.org/soap/envelope</a>
xsd	<a href="http://www.w3.org/2001/XMLSchema">http://www.w3.org/2001/XMLSchema</a>
wsa	<a href="http://www.w3.org/2005/08/addressing">http://www.w3.org/2005/08/addressing</a>
iterator	<a href="http://schemas.ogf.org/ws-iterator/2008/06/iterator">http://schemas.ogf.org/ws-iterator/2008/06/iterator</a>
rns	<a href="http://schemas.ogf.org/rns/2009/12/rns">http://schemas.ogf.org/rns/2009/12/rns</a>
wsbf	<a href="http://docs.oasis-open.org/wsrf/bf-2">http://docs.oasis-open.org/wsrf/bf-2</a>

## 2. Iterators

As per the RNS Draft Recommendation document, response messages to RNS lookup operations MAY contain the **WS-Addressing EndpointReferenceType** of a valid iterator for iterating through long lists of entry endpoints. If an iterator is returned from the lookup operation on an OGSA WSRF Basic Profile 1.0 rendering of the RNS port type, then that iterator MUST support the **WS-Iterator** specification as defined in **[WS-Iterator]** as this port types defines an OGSA WSRF Basic Profile compliant implementation.

## 3. RNS Properties

In order to satisfy the “properties” requirements given in the RNS Draft Recommendation document **[RNS1.1]**, the Resource Properties Document (as described by **[WS-**

**ResourceProperties**) for a RNS implementation MUST include a reference to the following resource property elements<sup>2</sup>:

```

...
targetNamespace="http://schemas.ogf.org/rns/2009/12/rns"
...
<xsd:element name="elementCount" type="xsd:unsignedLong"
nillable="false"/>
<xsd:element name="createTime" type="xsd:dateTime"
nillable="true"/>
<xsd:element name="accessTime" type="xsd:dateTime"
nillable="true"/>
<xsd:element name="modificationTime" type="xsd:dateTime"
nillable="true"/>

```

These Resource Property elements are constrained as indicated in the RNS Draft Recommendation Document **[RNS1.1]**.

#### 4. RNS Message Faults

The RNS Draft Recommendation Document clearly identifies the faults or exceptions that may be generated during the normal operation of the RNS port type. The OGSA WSRF Basic Profile 1.0 rendering of these faults MUST be completely conformant with faulting mechanisms described therein (i.e., they will rely on WS-BaseFaults **[WS-BaseFaults]**). The schema for the faults are described as follows.

```

<xsd:complexType name="ReadNotPermittedFaultType">
  <xsd:complexContent>
    <xsd:extension base="wsbf:BaseFaultType"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:element name="ReadNotPermittedFault"
type="rns:ReadNotPermittedFaultType"/>

<xsd:complexType name="WriteNotPermittedFaultType">
  <xsd:complexContent>
    <xsd:extension base="wsbf:BaseFaultType"/>
  </xsd:complexContent>
</xsd:complexType>

```

#### 5. Security Considerations

In addition to security considerations given in the RNS Draft Recommendation Document, OGSA WSRF Basic Profile 1.0 Renderings of the RNS specification MUST be fully compliant with all security sections indicated in the OGSA WSRF Basic Profile 1.0 document.

#### 6. Author Information

Mark Morgan  
University of Virginia, Department of Computer Science  
151 Engineer's Way

<sup>2</sup> This is in addition to any resource properties required by the OGSA WSRF Basic Profile 1.0 or any other included and referenced specifications.

P.O. Box 400740  
Charlottesville, VA. 22904-4740  
Phone: +1 (434) 243-2175  
E-mail: mmm2a@virginia.edu

Osamu Tatebe  
University of Tsukuba, Department of Computer Science  
1-1-1 Tennodai  
Tsukuba, Ibaraki 3058573 Japan  
E-mail: tatebe@cs.tsukuba.ac.jp

## **7. Contributors and Acknowledgements**

We greatly acknowledge the contributions made to this document by Hideo Matsuda, Takuya Ishibashi, Masahiro Nakamura and all people who provided constructive and valuable input in the group discussion.

## **8. Intellectual Property Statement**

The OGF 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. 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 implementers or users of this specification can be obtained from the OGF Secretariat.

The OGF 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 practice this recommendation. Please address the information to the OGF Executive Director.

## **9. Disclaimer**

This document and the information contained herein is provided on an "As Is" basis and the OGF 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.

## **10. Full Copyright Notice**

Copyright (C) Open Grid Forum (2006-2009). 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 the OGF or other organizations, except as needed for the purpose of developing Grid Recommendations in which case the procedures for copyrights defined in the OGF Document process must be followed, or as required to translate it into languages other than English.

The limited permissions granted above are perpetual and will not be revoked by the OGF or its successors or assignees.

## 11. References

- [WSRFProfileDoc]** I. Foster, T. Maguire, D. Snelling, OGSA WSRF Basic Profile 1.0, <https://forge.gridforum.org/projects/ogsa-wg/document/draft-ggf-ogsa-wsrf-basic-profile/en/15>, GWS-R (draft-ggf-ogsa-wsrf-basic-profile-021), 2005.
- [RFC2119]** S. Bradner, Key words for use in RFCs to Indicate Requirement Levels, <http://www.ietf.org/rfc/rfc2991.txt>, IETF RFC 2119, 1997.
- [XML-Infoset]** J. Cowan, Richard Tobin, XML Information Set (Second Edition), <http://www.w3.org/TR/xml-infoset/>, 2004
- [XPath]** J. Clark, S. DeRose, XML Path Language (XPath) Version 1.0, <http://www.w3.org/TR/xpath>, 1999
- [WS-Addressing]** M. Gudgin, M. Hadley, and T. Rogers (ed.), Web Services Addressing 1.0 – Core (WS-Addressing), <http://www.w3.org/TR/2006/REC-ws-addr-core-20060509>, 2006
- [WS-Enumeration]** J. Alexander, D. Box, L. F. Cabrera, D. Chappell, G. Daniels, C. Kaler, D. Orchard, I. Sedukhin, M. Simek, M. Theimer, Web Services Enumeration (WS-Enumeration), <http://www.w3.org/Submission/WS-Enumeration/>, 2006
- [ByteIOSpec]** M. Morgan (ed.), ByteIO Specification 1.0, <http://www.ggf.org/documents/GFD.88.pdf>, GFD.88, 31 October 2006.
- [Tannenbaum]** Tannenbaum, A. and van Steen, M., Distributed Systems: Principles and Paradigms, Prentice Hall, 2002. p. 184-210.
- [ByteIOWSRFRend]** M. Morgan (ed.), ByteIO OGSA WSRF Basic Profile Rendering 1.0, <http://www.ggf.org/documents/GFD.87.pdf>, GFD.87, 31 October 2006.
- [BES]** I. Foster, A. Grimshaw, P. Lane, W. Lee, M. Morgan, S. Newhouse, S. Pickles, D. Pulsipher, C. Smith, M. Theimer, OGSA® Basic Execution Service Version 1.0, <http://www.ggf.org/documents/GFD.108.pdf>, GFD.108, 2007
- [WS-Naming]** A. Grimshaw, D. Snelling, WS-Naming Specification, <http://www.ggf.org/documents/GFD.109.pdf>, GFD.109, 2007
- [RNS1.1]** M. Morgan, A. Grimshaw, O. Tatebe, RNS Specification 1.1, Open Grid Forum (to appear)
- [WS-Iterator]** M. Morgan, WS-Iterator 1.0, Open Grid Forum (to appear)
- [WS-ResourceProperties]** S. Graham, J. Treadwell, Web Services Resource Properties 1.2 (WS-ResourceProperties), Working Draft 04, <http://docs.oasis-open.org/wsrf/2004/06/wsrf-WS-ResourceProperties-1.2-draft-04.pdf>, 2004

**[WS-BaseFaults]**

S. Tuecke, L. Liu, S. Meder, Web Services Base Faults 1.2 (WS-BaseFaults), Working Draft 02, <http://docs.oasis-open.org/wsr/2004/06/wsr-WS-BaseFaults-1.2-draft-02.pdf>, 2004

**[SOAP1.1]**

D. Box, D. Ehnebuske, G. Kakivaya, A. Layman, N. Mendelsohn, H. F. Nielsen, S. Thatte, D. Winer, Simple Object Access Protocol (SOAP) 1.1, <http://www.w3.org/TR/soap11>, 2000

**Appendix A. RNS XML Schema**

```

<?xml version="1.0" encoding="UTF-8"?>
<!--
The OGF 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. 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 implementers or users of this specification
can be obtained from the OGF Secretariat.

The OGF 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
practice this recommendation. Please address the information to the OGF Executive
Director.

Disclaimer

This document and the information contained herein is provided on an "As Is" basis and the
OGF 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.

Full Copyright Notice

Copyright (C) Open Grid Forum (2006-2009). 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 the OGF or other organizations, except as
needed for the purpose of developing Grid Recommendations in which case the procedures
for copyrights defined in the OGF Document process must be followed, or as required to
translate it into languages other than English.

The limited permissions granted above are perpetual and will not be revoked by the OGF or
its successors or assignees.
-->
<xsd:schema
  xmlns="http://schemas.ogf.org/rns/2009/12/rns"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:rns="http://schemas.ogf.org/rns/2009/12/rns"
  xmlns:wsa="http://www.w3.org/2005/08/addressing"
  xmlns:wsbf="http://docs.oasis-open.org/wsrf/bf-2"
  targetNamespace="http://schemas.ogf.org/rns/2009/12/rns"
  elementFormDefault="qualified"
  attributeFormDefault="unqualified">

  <xsd:import
    namespace="http://docs.oasis-open.org/wsrf/bf-2"
    schemaLocation="http://docs.oasis-open.org/wsrf/bf-2.xsd"/>

```



```

<xsd:import
  namespace="http://www.w3.org/2005/08/addressing"
  schemaLocation="http://www.w3.org/2005/08/addressing/ws-addr.xsd"/>

<!-- Faults -->
<xsd:complexType name="ReadNotPermittedFaultType">
  <xsd:complexContent>
    <xsd:extension base="wsbf:BaseFaultType"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:element name="ReadNotPermittedFault"
  type="rns:ReadNotPermittedFaultType"/>

<xsd:complexType name="WriteNotPermittedFaultType">
  <xsd:complexContent>
    <xsd:extension base="wsbf:BaseFaultType"/>
  </xsd:complexContent>
</xsd:complexType>
<xsd:element name="WriteNotPermittedFault"
  type="rns:WriteNotPermittedFaultType"/>

<xsd:complexType name="RNSEntryExistsFaultType">
  <xsd:complexContent>
    <xsd:extension base="wsbf:BaseFaultType">
      <xsd:sequence>
        <xsd:element name="entry-name" type="xsd:string"
          minOccurs="1" maxOccurs="1"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:element name="RNSEntryExistsFault"
  type="rns:RNSEntryExistsFaultType"/>

<xsd:complexType name="RNSEntryDoesNotExistFaultType">
  <xsd:complexContent>
    <xsd:extension base="wsbf:BaseFaultType">
      <xsd:sequence>
        <xsd:element name="entry-name" type="xsd:string"
          minOccurs="1" maxOccurs="1"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:element name="RNSEntryDoesNotExistFault"
  type="rns:RNSEntryDoesNotExistFaultType"/>

<!-- Resource Properties -->
<xsd:element name="elementCount" type="xsd:unsignedLong"
  nillable="false"/>
<xsd:element name="createTime" type="xsd:dateTime"
  nillable="true"/>
<xsd:element name="accessTime" type="xsd:dateTime"
  nillable="true"/>
<xsd:element name="modificationTime" type="xsd:dateTime"

```

```

        nillable="true"/>
<xsd:element name="readable" type="xsd:boolean"
    nillable="false"/>
<xsd:element name="writable" type="xsd:boolean"
    nillable="false"/>

<!-- Helper Types -->
<xsd:simpleType name="EntryNameType">
    <xsd:restriction base="xsd:string"/>
</xsd:simpleType>

<xsd:simpleType name="RNSSupportType">
    <xsd:restriction base="xsd:string">
        <xsd:enumeration value="true"/>
        <xsd:enumeration value="false"/>
        <xsd:enumeration value="unknown"/>
    </xsd:restriction>
</xsd:simpleType>

<xsd:complexType name="SupportsRNSType">
    <xsd:attribute name="value" type="rns:RNSSupportType"
        use="required"/>
</xsd:complexType>

<xsd:complexType name="RNSMetadataType">
    <xsd:sequence>
        <xsd:element name="supports-rns" type="rns:SupportsRNSType"
            minOccurs="1" maxOccurs="1"/>
        <xsd:any namespace="##other" processContents="lax"
            minOccurs="0" maxOccurs="unbounded"/>
    </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="RNSEntryType">
    <xsd:sequence>
        <xsd:element name="endpoint" type="wsa:EndpointReferenceType"
            minOccurs="0" maxOccurs="1" nillable="true"/>
        <xsd:element name="metadata" type="rns:RNSMetadataType"
            minOccurs="0" maxOccurs="1" nillable="true"/>
    </xsd:sequence>
    <xsd:attribute name="entry-name" type="rns:EntryNameType"
        use="required"/>
</xsd:complexType>

<xsd:complexType name="RNSEntryResponseType">
    <xsd:sequence>
        <xsd:element name="endpoint" type="wsa:EndpointReferenceType"
            minOccurs="0" maxOccurs="1"/>
        <xsd:element name="metadata" type="rns:RNSMetadataType"
            minOccurs="0" maxOccurs="1" nillable="true"/>
        <xsd:element name="fault" type="wsbf:BaseFaultType"
            minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
    <xsd:attribute name="entry-name" type="rns:EntryNameType"
        use="required"/>
</xsd:complexType>

```

```

<xsd:complexType name="NameMappingType">
  <xsd:attribute name="source-name" type="rns:EntryNameType"
    use="required"/>
  <xsd:attribute name="target-name" type="rns:EntryNameType"
    use="required"/>
</xsd:complexType>

<xsd:complexType name="MetadataMappingType">
  <xsd:complexContent>
    <xsd:extension base="rns:RNSMetadataType">
      <xsd:attribute name="entry-name"
        type="rns:EntryNameType" use="required"/>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>

<!-- Messages -->
<xsd:complexType name="AddRequestType">
  <xsd:sequence>
    <xsd:element name="entry" type="rns:RNSEntryType"
      minOccurs="1" maxOccurs="unbounded" nillable="false"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:element name="AddRequest" type="rns:AddRequestType"/>

<xsd:complexType name="AddResponseType">
  <xsd:sequence>
    <xsd:element name="entry-response"
      type="rns:RNSEntryResponseType"
      minOccurs="1" maxOccurs="unbounded" nillable="false"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:element name="AddResponse" type="rns:AddResponseType"/>

<xsd:complexType name="LookupRequestType">
  <xsd:sequence>
    <xsd:element name="entry-name" type="rns:EntryNameType"
      minOccurs="0" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:element name="LookupRequest" type="rns:LookupRequestType"/>

<xsd:complexType name="LookupResponseType">
  <xsd:sequence>
    <xsd:element name="entry-response"
      type="rns:RNSEntryResponseType"
      minOccurs="0" maxOccurs="unbounded"/>
    <xsd:element name="iterator" type="wsa:EndpointReferenceType"
      minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:element name="LookupResponse" type="rns:LookupResponseType"/>

<xsd:complexType name="RemoveRequestType">
  <xsd:sequence>

```

```

        <xsd:element name="entry-name" type="rns:EntryNameType"
            minOccurs="1" maxOccurs="unbounded" nillable="false"/>
    </xsd:sequence>
</xsd:complexType>
<xsd:element name="RemoveRequest" type="rns:RemoveRequestType"/>

<xsd:complexType name="RemoveResponseType">
    <xsd:sequence>
        <xsd:element name="entry-response"
            type="rns:RNSEntryResponseType"
            minOccurs="1" maxOccurs="unbounded"/>
    </xsd:sequence>
</xsd:complexType>
<xsd:element name="RemoveResponse" type="rns:RemoveResponseType"/>

<xsd:complexType name="RenameRequestType">
    <xsd:sequence>
        <xsd:element name="rename-request"
            type="rns:NameMappingType"
            minOccurs="1" maxOccurs="unbounded"/>
    </xsd:sequence>
</xsd:complexType>
<xsd:element name="RenameRequest" type="rns:RenameRequestType"/>

<xsd:complexType name="RenameResponseType">
    <xsd:sequence>
        <xsd:element name="entry-response"
            type="rns:RNSEntryResponseType"
            minOccurs="1" maxOccurs="unbounded"/>
    </xsd:sequence>
</xsd:complexType>
<xsd:element name="RenameResponse" type="rns:RenameResponseType"/>

<xsd:complexType name="SetMetadataRequestType">
    <xsd:sequence>
        <xsd:element name="set-metadata-request"
            type="rns:MetadataMappingType"
            minOccurs="1" maxOccurs="unbounded"/>
    </xsd:sequence>
</xsd:complexType>
<xsd:element name="SetMetadataRequest" type="rns:SetMetadataRequestType"/>

<xsd:complexType name="SetMetadataResponseType">
    <xsd:sequence>
        <xsd:element name="entry-response"
            type="rns:RNSEntryResponseType"
            minOccurs="1" maxOccurs="unbounded"/>
    </xsd:sequence>
</xsd:complexType>
<xsd:element name="SetMetadataResponse"
type="rns:SetMetadataResponseType"/>
</xsd:schema>

```

**Appendix B. RNS WSDL**

```

<?xml version="1.0" encoding="UTF-8"?>
<!--
The OGF 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. 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 implementers or users of this specification
can be obtained from the OGF Secretariat.

The OGF 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
practice this recommendation. Please address the information to the OGF Executive
Director.

Disclaimer

This document and the information contained herein is provided on an "As Is" basis and the
OGF 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.

Full Copyright Notice

Copyright (C) Open Grid Forum (2006-2009). 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 the OGF or other organizations, except as
needed for the purpose of developing Grid Recommendations in which case the procedures
for copyrights defined in the OGF Document process must be followed, or as required to
translate it into languages other than English.

The limited permissions granted above are perpetual and will not be revoked by the OGF or
its successors or assignees.
-->
<wsdl:definitions name="RNS"
  xmlns="http://schemas.xmlsoap.org/wsdl/"
  xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:wsa="http://www.w3.org/2005/08/addressing"
  xmlns:rns="http://schemas.ogf.org/rns/2009/12/rns"
  xmlns:wsrp="http://docs.oasis-open.org/wsrp/rp-2"
  xmlns:wsrpw="http://docs.oasis-open.org/wsrp/rpw-2"
  xmlns:wsbf="http://docs.oasis-open.org/wsrp/bf-2"
  targetNamespace="http://schemas.ogf.org/rns/2009/12/rns">

```

```

<wsdl:import
  namespace="http://docs.oasis-open.org/wsrf/rw-2"
  location="http://docs.oasis-open.org/wsrf/rw-2.wsdl"/>

<wsdl:import
  namespace="http://docs.oasis-open.org/wsrf/rpw-2"
  location="http://docs.oasis-open.org/wsrf/rpw-2.wsdl"/>

<wsdl:import
  namespace="http://docs.oasis-open.org/wsrf/rlw-2"
  location="http://docs.oasis-open.org/wsrf/rlw-2.wsdl"/>

<wsdl:types>
  <xsd:schema
    xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    attributeFormDefault="unqualified"
    elementFormDefault="qualified"
    targetNamespace="http://schemas.ogf.org/rns/2009/12/rns">

    <xsd:include schemaLocation="rns.xsd"/>

    <xsd:import
      namespace="http://docs.oasis-open.org/wsrf/bf-2"
      schemaLocation="http://docs.oasis-open.org/wsrf/bf-2.xsd"/>

    <xsd:import
      namespace="http://docs.oasis-open.org/wsrf/rp-2"
      schemaLocation="http://docs.oasis-open.org/wsrf/rp-2.xsd"/>

    <xsd:import
      namespace="http://docs.oasis-open.org/wsrf/rl-2"
      schemaLocation="http://docs.oasis-open.org/wsrf/rl-2.xsd"/>

    <!-- == Resource Property Related == -->
    <xsd:element name="RNSRP">
      <xsd:complexType>
        <xsd:sequence>
          <xsd:any namespace="##other"
            minOccurs="0"
            maxOccurs="unbounded"/>
          <xsd:element ref="rns:elementCount"
            minOccurs="1" maxOccurs="1"/>
          <xsd:element ref="rns:createTime"
            minOccurs="0" maxOccurs="1"/>
          <xsd:element ref="rns:accessTime"
            minOccurs="0" maxOccurs="1"/>
          <xsd:element ref="rns:modificationTime"
            minOccurs="0" maxOccurs="1"/>
          <xsd:element ref="rns:readable"
            minOccurs="1" maxOccurs="1"/>
          <xsd:element ref="rns:writable"
            minOccurs="1" maxOccurs="1"/>
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>
  </xsd:schema>

```

```
</wsdl:types>

<wsdl:message name="AddRequest">
  <wsdl:part name="AddRequest"
    element="rns:AddRequest"/>
</wsdl:message>

<wsdl:message name="AddResponse">
  <wsdl:part name="AddResponse"
    element="rns:AddResponse"/>
</wsdl:message>

<wsdl:message name="LookupRequest">
  <wsdl:part name="LookupRequest"
    element="rns:LookupRequest"/>
</wsdl:message>

<wsdl:message name="LookupResponse">
  <wsdl:part name="LookupResponse"
    element="rns:LookupResponse"/>
</wsdl:message>

<wsdl:message name="RemoveRequest">
  <wsdl:part name="RemoveRequest"
    element="rns:RemoveRequest"/>
</wsdl:message>

<wsdl:message name="RemoveResponse">
  <wsdl:part name="RemoveResponse"
    element="rns:RemoveResponse"/>
</wsdl:message>

<wsdl:message name="RenameRequest">
  <wsdl:part name="RenameRequest"
    element="rns:RenameRequest"/>
</wsdl:message>

<wsdl:message name="RenameResponse">
  <wsdl:part name="RenameResponse"
    element="rns:RenameResponse"/>
</wsdl:message>

<wsdl:message name="SetMetadataRequest">
  <wsdl:part name="SetMetadataRequest"
    element="rns:SetMetadataRequest"/>
</wsdl:message>

<wsdl:message name="SetMetadataResponse">
  <wsdl:part name="SetMetadataResponse"
    element="rns:SetMetadataResponse"/>
</wsdl:message>

<wsdl:message name="ReadNotPermittedFault">
  <wsdl:part name="ReadNotPermittedFault"
    element="rns:ReadNotPermittedFault"/>
</wsdl:message>
```

```

<wsdl:message name="WriteNotPermittedFault">
  <wsdl:part name="WriteNotPermittedFault"
    element="rns:WriteNotPermittedFault"/>
</wsdl:message>

```

```

<wsdl:portType name="RNSPortType"
  wsrp:ResourceProperties="rns:RNSRP">

```

<!-- Strictly speaking one would insert here operations that were being "imported" from other port types (specifically, those required by the OGSA WSRF Base Profile 1.0). However, doing so would tremendously bloat and obfuscate the material relevant to this document and as such I merely introduce via comments the other port types that should be added. There are a few mechanisms for doing this such as Globus' wsdlpp:extends element and the Genesis II genii-ext:extend element. However, since neither of these mechanisms is standard and each grid provider currently has its own methods for accomplishing this, we resort simply to comments here. -->

<!-- extends wsrpw:ResourceProperties-->

<!-- extends wsrw:ImmediateTerminate-->

<!-- extends wsrw:ScheduledTermination-->

```

  <wsdl:operation name="add">
    <wsdl:input message="rns:AddRequest"/>
    <wsdl:output message="rns:AddResponse"/>
    <wsdl:fault name="WriteNotPermittedFault"
      message="rns:WriteNotPermittedFault"/>
  </wsdl:operation>

```

```

  <wsdl:operation name="lookup">
    <wsdl:input message="rns:LookupRequest"/>
    <wsdl:output message="rns:LookupResponse"/>
    <wsdl:fault name="ReadNotPermittedFault"
      message="rns:ReadNotPermittedFault"/>
  </wsdl:operation>

```

```

  <wsdl:operation name="rename">
    <wsdl:input message="rns:RenameRequest"/>
    <wsdl:output message="rns:RenameResponse"/>
    <wsdl:fault name="WriteNotPermittedFault"
      message="rns:WriteNotPermittedFault"/>
  </wsdl:operation>

```

```

  <wsdl:operation name="remove">
    <wsdl:input message="rns:RemoveRequest"/>
    <wsdl:output message="rns:RemoveResponse"/>
    <wsdl:fault name="WriteNotPermittedFault"
      message="rns:WriteNotPermittedFault"/>
  </wsdl:operation>

```

```

  <wsdl:operation name="setMetadata">
    <wsdl:input message="rns:SetMetadataRequest"/>
    <wsdl:output message="rns:SetMetadataResponse"/>
    <wsdl:fault name="WriteNotPermittedFault"
      message="rns:WriteNotPermittedFault"/>
  </wsdl:operation>

```

```

</wsdl:portType>

```



```
</wsdl:definitions>
```