

G-lambda

GNS-WSI version 3

(Grid Network Service – Web Services
Interface, version 3)

Appendices

DRAFT

PRELIMINARY INFORMATION

The G-lambda project <http://www.g-lambda.net/>

Oct. 27 2008

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Appendix A. ReservationFactory WSDL

```
<?xml version="1.0" encoding="UTF-8"?>
<wsdl:definitions name="ReservationFactoryService"
    targetNamespace="http://schemas.glambda.net/gnswsi3/2008/10/reservationfactory"
    xmlns:tns="http://schemas.glambda.net/gnswsi3/2008/10/reservationfactory"
    xmlns:types="http://schemas.glambda.net/gnswsi3/2008/10/reservationfactory/types"
    xmlns:rdl="http://schemas.glambda.net/gnswsi3/2008/10/rdl"
    xmlns:desc="http://schemas.glambda.net/gnswsi3/2008/10/description"
    xmlns:wsa="http://www.w3.org/2005/08/addressing"
    xmlns:wsbf="http://docs.oasis-open.org/wsrf/bf-2"
    xmlns:wSDL="http://schemas.xmlsoap.org/wsdl/"
    xmlns:wSDLpp="http://www.globus.org/namespaces/2004/10/WSDLPreprocessor"
    xmlns:wsrp="http://docs.oasis-open.org/wsrf/rp-2"
    xmlns:wsrpw="http://docs.oasis-open.org/wsrf/rpw-2">

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

    <!--=====
                                     T Y P E S
    =====>

    <wsdl:types>
        <xsd:schema targetNamespace="http://schemas.glambda.net/gnswsi3/2008/10/reservationfactory/types"
            xmlns:xsd="http://www.w3.org/2001/XMLSchema">

            <xsd:import
                namespace="http://schemas.glambda.net/gnswsi3/2008/10/rdl"
                schemaLocation="rdl.xsd"/>

            <xsd:import
                namespace="http://schemas.glambda.net/gnswsi3/2008/10/ndl"
                schemaLocation="ndl.xsd"/>

            <xsd:import
                namespace="http://schemas.glambda.net/gnswsi3/2008/10/cdl"
                schemaLocation="cdl.xsd"/>

            <xsd:element name="createRequest">
```

```

        <desc:description>Request for creating a resource</desc:description>
        <xsd:complexType>
            <xsd:sequence>
                <xsd:element maxOccurs="1" minOccurs="0" ref="rdl:DistinguishedName"/>
            </xsd:sequence>
        </xsd:complexType>
    </xsd:element>
    <xsd:element name="createResponse">
        <desc:description>Response against a createRequest</desc:description>
        <xsd:complexType>
            <xsd:sequence>
                <xsd:element maxOccurs="1" minOccurs="1" ref="rdl:ReservationEPR"/>
            </xsd:sequence>
        </xsd:complexType>
    </xsd:element>

    <xsd:element name="getAvailableResourcesRequest">
        <desc:description>Request for discovering available resources</desc:description>
        <xsd:complexType>
            <xsd:sequence>
                <xsd:element maxOccurs="1" minOccurs="0" ref="rdl:DistinguishedName"/>
                <xsd:element ref="rdl:AvailableResourceQuery" maxOccurs="unbounded"
minOccurs="1"/>
            </xsd:sequence>
        </xsd:complexType>
    </xsd:element>
    <xsd:element name="getAvailableResourcesResponse">
        <desc:description>Response against a getAvailableRequest</desc:description>
        <xsd:complexType>
            <xsd:sequence>
                <xsd:element ref="rdl:AvailableResourceQueryResult" maxOccurs="unbounded"
minOccurs="0"/>
            </xsd:sequence>
        </xsd:complexType>
    </xsd:element>

```

```

    <xsd:element name="checkResourceAvailabilityRequest">
      <desc:description>Request for checking resource availability</desc:description>
      <xsd:complexType>
        <xsd:sequence>
          <xsd:element maxOccurs="1" minOccurs="0" ref="rdl:DistinguishedName"/>
          <xsd:element ref="rdl:ReservationResources" maxOccurs="unbounded"
minOccurs="1"/>
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>
    <xsd:element name="checkResourceAvailabilityResponse">
      <desc:description>Response against a checkResourceAvailabilityRequest</desc:description>
      <xsd:complexType>
        <xsd:sequence>
          <xsd:element ref="rdl:ResourceStatus" maxOccurs="unbounded" minOccurs="1"/>
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>
  </xsd:schema>
</wsdl:types>

<!--=====
                                     M E S S A G E S
=====-->
<wsdl:message name="createInputMessage">
  <wsdl:part element="types:createRequest" name="parameters"/>
</wsdl:message>
<wsdl:message name="createOutputMessage">
  <wsdl:part element="types:createResponse" name="parameters"/>
</wsdl:message>

<wsdl:message name="getAvailableResourcesInputMessage">
  <wsdl:part element="types:getAvailableResourcesRequest" name="parameters"/>

```

```

</wsdl:message>
<wsdl:message name="getAvailableResourcesOutputMessage">
  <wsdl:part element="types:getAvailableResourcesResponse" name="parameters"/>
</wsdl:message>

<wsdl:message name="checkResourceAvailabilityInputMessage">
  <wsdl:part element="types:checkResourceAvailabilityRequest" name="parameters"/>
</wsdl:message>
<wsdl:message name="checkResourceAvailabilityOutputMessage">
  <wsdl:part element="types:checkResourceAvailabilityResponse" name="parameters"/>
</wsdl:message>

<wsdl:message name="reservationFactoryFaultMessage">
  <wsdl:part element="rdl:ReservationFactoryFault" name="fault"/>
</wsdl:message>

<!--=====
                                     P O R T T Y P E
=====-->
<wsdl:portType name="ReservationFactoryPortType">

  <wsdl:operation name="create">
    <wsdl:input message="tns:createInputMessage"/>
    <wsdl:output message="tns:createOutputMessage"/>
    <wsdl:fault message="tns:reservationFactoryFaultMessage" name="reservationFactoryFault"/>
    <desc:description></desc:description>
  </wsdl:operation>

  <wsdl:operation name="getAvailableResources">
    <wsdl:input message="tns:getAvailableResourcesInputMessage"/>
    <wsdl:output message="tns:getAvailableResourcesOutputMessage"/>
    <wsdl:fault message="tns:reservationFactoryFaultMessage" name="reservationFactoryFault"/>
    <desc:description></desc:description>
  </wsdl:operation>

```

```
<wsdl:operation name="checkResourceAvailability">
  <wsdl:input message="tns:checkResourceAvailabilityInputMessage"/>
  <wsdl:output message="tns:checkResourceAvailabilityOutputMessage"/>
  <wsdl:fault message="tns:reservationFactoryFaultMessage" name="reservationFactoryFault"/>
  <desc:description></desc:description>
</wsdl:operation>

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



```

<wsdl:types>
  <xsd:schema      targetNamespace="http://schemas.glambda.net/gnswsi3/2008/10/reservation/types"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">

    <xsd:import      namespace="http://schemas.glambda.net/gnswsi3/2008/10/rdl"
schemaLocation="rdl.xsd"/>
    <xsd:import      namespace="http://schemas.glambda.net/gnswsi3/2008/10/ndl"
schemaLocation="ndl.xsd"/>
    <xsd:import      namespace="http://schemas.glambda.net/gnswsi3/2008/10/cdl"
schemaLocation="cdl.xsd"/>

    <xsd:element name="ReservationResourceProperties">
      <desc:description>Properties of reserved resource</desc:description>
      <xsd:complexType>
        <xsd:sequence>
          <xsd:element ref="rdl:DistinguishedName" minOccurs="0" maxOccurs="1"/>
          <xsd:element ref="rdl:ReservationStatus" maxOccurs="1" minOccurs="1"/>
          <xsd:element      ref="rdl:ResourceInformation"      maxOccurs="unbounded"
minOccurs="0"/>
          <xsd:element      ref="rdl:ReservationCommandHistory"      maxOccurs="unbounded"
minOccurs="0"/>
          <xsd:element ref="rdl:ErrorInfo" maxOccurs="1" minOccurs="0"/>
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>

    <xsd:element name="reserveRequest">
      <desc:description>Request for reserving a resource</desc:description>
      <xsd:complexType>
        <xsd:sequence>
          <xsd:element maxOccurs="1" minOccurs="1" ref="rdl:ResourceRequirements"/>
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>

    <xsd:element name="reserveResponse">
      <desc:description>Response against a reserveRequest</desc:description>

```

```

    <xsd:complexType>
      <xsd:sequence>
        <xsd:element maxOccurs="1" minOccurs="1" ref="rdl:ReservationCommandEPR"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>

  <xsd:element name="modifyRequest">
    <desc:description>Request for modifying specified reservation resources</desc:description>
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element maxOccurs="1" minOccurs="1" ref="rdl:ResourceRequirements"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>

  <xsd:element name="modifyResponse">
    <desc:description>Response against a modifyRequest</desc:description>
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element maxOccurs="1" minOccurs="1" ref="rdl:ReservationCommandEPR"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>

  <xsd:element name="modifyAllRequest">
    <desc:description>Request for modifying all reservation resources</desc:description>
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element maxOccurs="1" minOccurs="1" ref="rdl:Timeframe"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>

  <xsd:element name="modifyAllResponse">
    <desc:description>Response against a modifyAllRequest</desc:description>
    <xsd:complexType>
      <xsd:sequence>

```

```

        <xsd:element maxOccurs="1" minOccurs="1" ref="rdl:ReservationCommandEPR"/>
    </xsd:sequence>
</xsd:complexType>
</xsd:element>

<xsd:element name="releaseRequest">
    <desc:description>Request for releasing specified reservation resources</desc:description>
    <xsd:complexType>
        <xsd:sequence>
            <xsd:element minOccurs="1" maxOccurs="unbounded" ref="rdl:ReservationID"/>
        </xsd:sequence>
    </xsd:complexType>
</xsd:element>

<xsd:element name="releaseResponse">
    <desc:description>Response against a releaseRequest</desc:description>
    <xsd:complexType>
        <xsd:sequence>
            <xsd:element maxOccurs="1" minOccurs="1" ref="rdl:ReservationCommandEPR"/>
        </xsd:sequence>
    </xsd:complexType>
</xsd:element>

<xsd:element name="releaseAllRequest">
    <desc:description>Request for releasing all reservation resources</desc:description>
    <xsd:complexType/>
</xsd:element>

<xsd:element name="releaseAllResponse">
    <desc:description>Response against a releaseAllRequest</desc:description>
    <xsd:complexType>
        <xsd:sequence>
            <xsd:element maxOccurs="1" minOccurs="1" ref="rdl:ReservationCommandEPR"/>
        </xsd:sequence>
    </xsd:complexType>
</xsd:element>

<xsd:element name="getReservationStatusRequest">

```

```

        <desc:description>Request to check a specified ReservationResource
property</desc:description>
        <xsd:complexType/>
    </xsd:element>
    <xsd:element name="getReservationStatusResponse">
        <desc:description>Response against a getReservationStatusRequest</desc:description>
        <xsd:complexType>
            <xsd:sequence>
                <xsd:element maxOccurs="1" minOccurs="1" ref="rdl:ReservationStatus"/>
            </xsd:sequence>
        </xsd:complexType>
    </xsd:element>

    <!-- Notification Message -->
    <xsd:element name="StatusChangeNotificationMessage"
type="types:StatusChangeNotificationMessageType">
        <desc:description>Current reservation status for a reservation request</desc:description>
    </xsd:element>
    <xsd:complexType name="StatusChangeNotificationMessageType">
        <desc:description>Notification to inform of the status change of a specified
ReservationResource against the corresponding client</desc:description>
        <xsd:sequence>
            <xsd:element name="status" ref="rdl:ReservationStatus" minOccurs="1" maxOccurs="1"/>
        </xsd:sequence>
    </xsd:complexType>
    <xsd:complexType name="StatusChangeNotificationMessageWrapperType">
        <desc:description>Notification to inform of the status change of a specified
ReservationResource against the corresponding client via a wrapper middleware</desc:description>
        <xsd:sequence>
            <xsd:element ref="types:StatusChangeNotificationMessage"/>
        </xsd:sequence>
    </xsd:complexType>

    <!--
        <xsd:element name="getAccountRequest">
            <xsd:complexType/>

```

```

        </xsd:element>
        <xsd:element name="getAccountResponse">
            <xsd:complexType>
                <xsd:sequence>
                    <xsd:element ref="types:Account" minOccurs="0"
maxOccurs="unbounded" />
                </xsd:sequence>
            </xsd:complexType>
        </xsd:element>

        <xsd:simpleType name="unit_Type">
            <xsd:restriction base="xsd:string">
                <xsd:enumeration value="JPY"/>
                <xsd:enumeration value="USD"/>
                <xsd:enumeration value="EUR"/>
            </xsd:restriction>
        </xsd:simpleType>

        <xsd:element name="Account">
            <xsd:complexType>
                <xsd:sequence>
                    <xsd:element name="ReservationID" type="xsd:string"
minOccurs="0"
maxOccurs="1"/>
                    <xsd:element name="Unit" type="types:unit_Type"
minOccurs="0"
maxOccurs="1"/>
                    <xsd:element name="Account" type="xsd:string"
minOccurs="0"
maxOccurs="1"/>
                </xsd:sequence>
            </xsd:complexType>
        </xsd:element>
    ->
    </xsd:schema>
</wsdl:types>

```

```
<!--=====
                                     M E S S A G E S
=====-->

<wsdl:message name="reserveInputMessage">
  <wsdl:part element="types:reserveRequest" name="parameters"/>
</wsdl:message>

<wsdl:message name="reserveOutputMessage">
  <wsdl:part element="types:reserveResponse" name="parameters"/>
</wsdl:message>

<wsdl:message name="modifyInputMessage">
  <wsdl:part element="types:modifyRequest" name="parameters"/>
</wsdl:message>

<wsdl:message name="modifyOutputMessage">
  <wsdl:part element="types:modifyResponse" name="parameters"/>
</wsdl:message>

<wsdl:message name="modifyAllInputMessage">
  <wsdl:part element="types:modifyAllRequest" name="parameters"/>
</wsdl:message>

<wsdl:message name="modifyAllOutputMessage">
  <wsdl:part element="types:modifyAllResponse" name="parameters"/>
</wsdl:message>

<wsdl:message name="releaseInputMessage">
  <wsdl:part element="types:releaseRequest" name="parameters"/>
</wsdl:message>

<wsdl:message name="releaseOutputMessage">
  <wsdl:part element="types:releaseResponse" name="parameters"/>
</wsdl:message>

<wsdl:message name="releaseAllInputMessage">
  <wsdl:part element="types:releaseAllRequest" name="parameters"/>
</wsdl:message>
```

```
<wsdl:message name="releaseAllOutputMessage">
  <wsdl:part element="types:releaseAllResponse" name="parameters"/>
</wsdl:message>

<wsdl:message name="getReservationStatusInputMessage">
  <wsdl:part element="types:getReservationStatusRequest" name="parameters"/>
</wsdl:message>

<wsdl:message name="getReservationStatusOutputMessage">
  <wsdl:part element="types:getReservationStatusResponse" name="parameters"/>
</wsdl:message>

<!--
<wsdl:message name="getAccountInputMessage">
  <wsdl:part element="types:getAccountRequest" name="parameters"/>
</wsdl:message>
<wsdl:message name="getAccountOutputMessage">
  <wsdl:part element="types:getAccountResponse" name="parameters"/>
</wsdl:message>
-->

<wsdl:message name="reservationFaultMessage">
  <wsdl:part element="rdl:ReservationFault" name="fault"/>
</wsdl:message>

<!--=====
                                     P O R T T Y P E
=====-->

<wsdl:portType name="ReservationPortType"
  wsdlpp:extends="wsrpw:GetResourceProperty
                                     wsrpw:GetMultipleResourceProperties
                                     wsrlw:ScheduledResourceTermination
                                     wsrlw:ImmediateResourceTermination
                                     wsntw:NotificationProducer
                                     wsntw:SubscriptionManager"
  wsrp:ResourceProperties="types:ReservationResourceProperties">
```

```
<wsdl:operation name="reserve">
  <wsdl:input message="tns:reserveInputMessage"/>
  <wsdl:output message="tns:reserveOutputMessage"/>
  <wsdl:fault message="tns:reservationFaultMessage" name="reservationFault"/>
  <desc:description></desc:description>
</wsdl:operation>

<wsdl:operation name="modify">
  <wsdl:input message="tns:modifyInputMessage"/>
  <wsdl:output message="tns:modifyOutputMessage"/>
  <wsdl:fault message="tns:reservationFaultMessage" name="reservationFault"/>
  <desc:description></desc:description>
</wsdl:operation>

<wsdl:operation name="modifyAll">
  <wsdl:input message="tns:modifyAllInputMessage"/>
  <wsdl:output message="tns:modifyAllOutputMessage"/>
  <wsdl:fault message="tns:reservationFaultMessage" name="reservationFault"/>
  <desc:description></desc:description>
</wsdl:operation>

<wsdl:operation name="release">
  <wsdl:input message="tns:releaseInputMessage"/>
  <wsdl:output message="tns:releaseOutputMessage"/>
  <wsdl:fault message="tns:reservationFaultMessage" name="reservationFault"/>
  <desc:description></desc:description>
</wsdl:operation>

<wsdl:operation name="releaseAll">
  <wsdl:input message="tns:releaseAllInputMessage"/>
  <wsdl:output message="tns:releaseAllOutputMessage"/>
  <wsdl:fault message="tns:reservationFaultMessage" name="reservationFault"/>
  <desc:description></desc:description>
</wsdl:operation>

<wsdl:operation name="getReservationStatus">
```



```
<wsdl:input message="tns:getReservationStatusInputMessage"/>
<wsdl:output message="tns:getReservationStatusOutputMessage"/>
<wsdl:fault message="tns:reservationFaultMessage" name="reservationFault"/>
<desc:description></desc:description>
</wsdl:operation>

<!--
  <wsdl:operation name="getAccount">
    <wsdl:input message="tns:getAccountInputMessage"/>
    <wsdl:output message="tns:getAccountOutputMessage"/>
    <wsdl:fault message="tns:reservationFaultMessage" name="reservationFault"/>
    <desc:description></desc:description>

  </wsdl:operation>
-->

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

Appendix C. ReservationCommand WSDL

```
<?xml version="1.0" encoding="UTF-8"?>
<wsdl:definitions name="ReservationCommandService"
  targetNamespace="http://schemas.glambda.net/gnswsi3/2008/10/reservationcommand"
  xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
  xmlns:tns="http://schemas.glambda.net/gnswsi3/2008/10/reservationcommand"
  xmlns:types="http://schemas.glambda.net/gnswsi3/2008/10/reservationcommand/types"
  xmlns:rdl="http://schemas.glambda.net/gnswsi3/2008/10/rdl"
  xmlns:desc="http://schemas.glambda.net/gnswsi3/2008/10/description"
  xmlns:wsa="http://www.w3.org/2005/08/addressing"
  xmlns:wsdpp="http://www.globus.org/namespaces/2004/10/WSDLPreprocessor"
  xmlns:wsrp="http://docs.oasis-open.org/wsrp/rp-2"
  xmlns:wsrpw="http://docs.oasis-open.org/wsrp/rpw-2"
  xmlns:wsr="http://docs.oasis-open.org/wsrp/rl-2"
  xmlns:wsrw="http://docs.oasis-open.org/wsrp/rlw-2"
  xmlns:wsn="http://docs.oasis-open.org/wsn/bw-2">

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

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

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

  <!--=====
                                     T Y P E S
  =====>

  <wsdl:types>
    <xsd:schema
```

```

targetNamespace="http://schemas.glambda.net/gnswsi3/2008/10/reservationcommand/types"
  xmlns="http://schemas.glambda.net/gnswsi3/2008/10/reservationcommand/types"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">

  <xsd:import
    namespace="http://schemas.glambda.net/gnswsi3/2008/10/reservation/rdl"
    schemaLocation="rdl.xsd"/>

  <xsd:element name="ReservationCommandResourceProperties">
    <desc:description>A set of properties related to a
ReservationCommandResource.</desc:description>
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element maxOccurs="1" minOccurs="1" ref="rdl:CommandStatus"/>
        <xsd:element maxOccurs="1" minOccurs="0" ref="rdl:ErrorInfo"/>
        <xsd:element maxOccurs="1" minOccurs="1" ref="rdl:ReservationResourceKey"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>

  <xsd:element name="commitRequest">
    <desc:description>A request to commit the operation
(reserve/modify/release).</desc:description>
    <xsd:complexType/>
  </xsd:element>

  <xsd:element name="commitResponse">
    <desc:description>A response against a commitRequest.</desc:description>
    <xsd:complexType/>
  </xsd:element>

  <xsd:element name="abortRequest">
    <desc:description>A request to abort the operation (reserve/modify/release).</desc:description>
    <xsd:complexType/>
  </xsd:element>

  <xsd:element name="abortResponse">
    <desc:description>A response against an abortRequest.</desc:description>
    <xsd:complexType/>

```

```

</xsd:element>

<xsd:element name="getCommandStatusRequest">
  <desc:description>A request to obtain the status of the
ReservationCommandResource.</desc:description>
  <xsd:complexType/>
</xsd:element>
<xsd:element name="getCommandStatusResponse">
  <desc:description>A response against a getCommandStatusRequest.</desc:description>
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element maxOccurs="1" minOccurs="1" ref="rdl:CommandStatus"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>

<!-- Notification Message -->
<xsd:element name="CommandStatusChangeNotificationMessage"
type="types:CommandStatusChangeNotificationMessageType">
  <desc:description>A message to notify clients of changing the status of the
ReservationCommandResource.</desc:description>
</xsd:element>
<xsd:complexType name="CommandStatusChangeNotificationMessageType">
  <desc:description>A message to notify clients of changing the status of the
ReservationCommandResource.</desc:description>
  <xsd:sequence>
    <xsd:element name="status" ref="rdl:CommandStatus" minOccurs="1" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="CommandStatusChangeNotificationMessageWrapperType">
  <desc:description>A wrapper for a notification operation.</desc:description>
  <xsd:sequence>
    <xsd:element ref="types:CommandStatusChangeNotificationMessage"/>
  </xsd:sequence>
</xsd:complexType>

```



```

<wsdl:portType name="ReservationCommandPortType"
    wsdlpp:extends="wsrpw:GetResourceProperty
        wsrpw:GetMultipleResourceProperties
        wsrlw:ScheduledResourceTermination
        wsrlw:ImmediateResourceTermination
        wsntw:NotificationProducer
        wsntw:SubscriptionManager"
    wsrp:ResourceProperties="types:ReservationCommandResourceProperties">

    <wsdl:operation name="commit">
        <wsdl:input message="tns:commitInputMessage"/>
        <wsdl:output message="tns:commitOutputMessage"/>
        <wsdl:fault
            message="tns:reservationCommandFaultMessage"
name="reservationCommandFault"/>
    </wsdl:operation>

    <wsdl:operation name="abort">
        <wsdl:input message="tns:abortInputMessage"/>
        <wsdl:output message="tns:abortOutputMessage"/>
        <wsdl:fault
            message="tns:reservationCommandFaultMessage"
name="reservationCommandFault"/>
    </wsdl:operation>

    <wsdl:operation name="getCommandStatus">
        <wsdl:input message="tns:getCommandStatusInputMessage"/>
        <wsdl:output message="tns:getCommandStatusOutputMessage"/>
        <wsdl:fault
            message="tns:reservationCommandFaultMessage"
name="reservationCommandFault"/>
    </wsdl:operation>

</wsdl:portType>
</wsdl:definitions>

```

Appendix D. Reservation-related Data Types

```
<?xml version="1.0" encoding="UTF-8" ?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://schemas.glambda.net/gnswsi3/2008/10/rdl"
  xmlns:rdl="http://schemas.glambda.net/gnswsi3/2008/10/rdl"
  xmlns:desc="http://schemas.glambda.net/gnswsi3/2008/10/description"
  xmlns:wsa="http://www.w3.org/2005/08/addressing"
  xmlns:wsbf="http://docs.oasis-open.org/wsrf/bf-2"
  attributeFormDefault="unqualified" elementFormDefault="qualified">

  <xsd:import namespace="http://www.w3.org/2005/08/addressing"
    schemaLocation="../ws/addressing/ws-addr.xsd"/>
  <xsd:import namespace="http://docs.oasis-open.org/wsrf/bf-2"
    schemaLocation="../wsrf/faults/bf-2.xsd"/>

  <!-- ===== -->
  <!-- ===== -->

  <xsd:element name="ReservationEPR" type="wsa:EndpointReferenceType">
    <desc:description>An end point reference for the ReservationResource</desc:description>
  </xsd:element>
  <xsd:element name="ReservationCommandEPR" type="wsa:EndpointReferenceType">
    <desc:description>An end point reference for the ReservationCommandResource</desc:description>
  </xsd:element>
  <xsd:element name="ReservationFactoryFault" type="wsbf:BaseFaultType">
    <desc:description>Fault type of ReservationFactory service</desc:description>
  </xsd:element>
  <xsd:element name="ReservationFault" type="wsbf:BaseFaultType">
    <desc:description>Fault tyep of Reservation service</desc:description>
  </xsd:element>
  <xsd:element name="ReservationCommandFault" type="wsbf:BaseFaultType">
    <desc:description>Fault type of ReservationCommand service</desc:description>
  </xsd:element>
```

```

<xsd:element name="ResourceInformation" type="rdl:ResourceInformation_Type">
  <desc:description>Category for resources, for example computing or network
resource</desc:description>
</xsd:element>
<xsd:element name="ReservationResources" type="rdl:ReservationResources_Type">
  <desc:description>Reservation resources, each of which includes the reservation ID and the time
specification</desc:description>
</xsd:element>
<xsd:element name="AvailableResourceQuery" type="rdl:AvailableResourceQuery_Type">
  <desc:description>Query to discover available resources</desc:description>
</xsd:element>
<xsd:element name="AvailableResourceQueryResult" type="rdl:AvailableResourceQueryResult_Type">
  <desc:description>Result of getAvailableResourceQuery, which includes available reservation
resources</desc:description>
</xsd:element>
<xsd:element name="ResourceStatus" type="rdl:ResourceStatus_Type">
  <desc:description>Status of a specified resource. The order should be the same of
ReservationResources</desc:description>
</xsd:element>
<xsd:element name="SLADocument" type="rdl:SLADocument_Type">
  <desc:description>Searvice Level Agreement (SLA) document</desc:description>
</xsd:element>
<xsd:element name="ResourceRequirements" type="rdl:ResourceRequirements_Type">
  <desc:description>Information including resource requirements, time resources, and
DistinguishedName</desc:description>
</xsd:element>
<xsd:element name="CoallocationTimeframe" type="rdl:CoallocationTimeframe_Type">
  <desc:description>Coallocation time frame</desc:description>
</xsd:element>
<xsd:element name="DistinguishedName" type="xsd:string">
  <desc:description>A character string containing a user name who reserved this resource. When the
DistinguishedName is null, the operation is processed as an anonymous user</desc:description>
</xsd:element>
<xsd:element name="ReservationStatus" type="rdl:ReservationStatus_Type">
  <desc:description>Current reservation status for a reservation request</desc:description>

```



```
</xsd:element>
<xsd:element name="ReservationCommandHistory" type="rdl:ReservationCommandHistory_Type">
  <desc:description>History of user request information</desc:description>
</xsd:element>
<xsd:element name="Timestamp" type="xsd:dateTime">
  <desc:description>Time stamp</desc:description>
</xsd:element>
<xsd:element name="OperationName" type="xsd:string">
  <desc:description>Name of an operation</desc:description>
</xsd:element>
<xsd:element name="OperationArg" type="xsd:string">
  <desc:description>Argument of an operation</desc:description>
</xsd:element>
<xsd:element name="FinalCommandStatus" type="rdl:CommandStatus_Type">
  <desc:description>Final CommandStatus</desc:description>
</xsd:element>
<xsd:element name="CommandStatus" type="rdl:CommandStatus_Type">
  <desc:description>Status of a command</desc:description>
</xsd:element>
<xsd:element name="ErrorInfo" type="wsbf:BaseFaultType">
  <desc:description>Reason when ResourceStatus / CommandStatus becomes an error</desc:description>
</xsd:element>
<xsd:element name="ReservationResourceKey" type="xsd:string">
  <desc:description>Key of a ReservationResource</desc:description>
</xsd:element>

<xsd:element name="TimeSpecification" type="rdl:TimeSpecification_Type">
  <desc:description>Time specification</desc:description>
</xsd:element>
<xsd:element name="Timeframe" type="rdl:Timeframe_Type">
  <desc:description>Time frame of a reservation</desc:description>
</xsd:element>
<xsd:element name="Exact" type="rdl:Exact_Type">
  <desc:description>Exact time frame type</desc:description>
</xsd:element>
<xsd:element name="Range" type="rdl:Range_Type">
```

```
<desc:description>Ranged time frame type</desc:description>
</xsd:element>
<xsd:element name="CoallocationTimeframeID" type="xsd:string">
  <desc:description>Coallocation time frame ID</desc:description>
</xsd:element>
<xsd:element name="StartTime" type="xsd:dateTime">
  <desc:description>Start time of a reservation</desc:description>
</xsd:element>
<xsd:element name="EndTime" type="xsd:dateTime">
  <desc:description>End time of a reservation</desc:description>
</xsd:element>
<xsd:element name="EarliestStartTime" type="xsd:dateTime">
  <desc:description>Earliest start time of a reservation</desc:description>
</xsd:element>
<xsd:element name="LatestStartTime" type="xsd:dateTime">
  <desc:description>Latest start time of a reservation</desc:description>
</xsd:element>
<xsd:element name="Duration" type="rdl:Duration_Type">
  <desc:description>Duration</desc:description>
</xsd:element>
<xsd:element name="DurationValue" type="xsd:long">
  <desc:description>A value of duration</desc:description>
</xsd:element>
<xsd:element name="TimeUnit" type="rdl:TimeUnit_Type">
  <desc:description>A unit of time</desc:description>
</xsd:element>

<xsd:element name="ReservationID" type="xsd:string">
  <desc:description>ReservationID is used to identify a set of requested or reserved resources which is
  requested by a reserve operation. ReservationID is generated by the requestee of the reserve
  operation.</desc:description>
</xsd:element>

<!-- EPR? -->

<!-- ===== -->
```

```
<xsd:complexType name="ResourceInformation_Type">
  <xsd:sequence>
    <xsd:element ref="rdl:ReservationResources" minOccurs="0" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

```
<xsd:complexType name="ReservationResources_Type">
  <xsd:sequence>
    <xsd:element ref="rdl:ReservationID" minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="rdl:TimeSpecification" minOccurs="1" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
```

```
<xsd:complexType name="AvailableResourceQuery_Type">
  <xsd:sequence>
    <xsd:element ref="rdl:ReservationResources" minOccurs="1" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
```

```
<xsd:complexType name="AvailableResourceQueryResult_Type">
  <xsd:sequence>
    <xsd:element ref="rdl:ReservationResources" minOccurs="0" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

```
<xsd:simpleType name="ResourceStatus_Type">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Available">
      <desc:description>Resource is available</desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="NotAvailable">
      <desc:description>Resource is not available</desc:description>
    </xsd:enumeration>
  </xsd:restriction>
</xsd:simpleType>
```

```
<xsd:complexType name="SLADocument_Type">
```

```
  <xsd:sequence>
```

```
    <xsd:element ref="rdl:Timestamp" minOccurs="1" maxOccurs="unbounded"/>
```

```
  </xsd:sequence>
```

```
</xsd:complexType>
```

```
<xsd:complexType name="ResourceRequirements_Type">
```

```
  <xsd:sequence>
```

```
    <xsd:element ref="rdl:CoallocationTimeframe" minOccurs="0" maxOccurs="unbounded"/>
```

```
    <xsd:element ref="rdl:ReservationResources" minOccurs="1" maxOccurs="unbounded"/>
```

```
  </xsd:sequence>
```

```
</xsd:complexType>
```

```
<xsd:complexType name="CoallocationTimeframe_Type">
```

```
  <xsd:sequence>
```

```
    <xsd:element ref="rdl:Timeframe" minOccurs="1" maxOccurs="1"/>
```

```
    <xsd:element ref="rdl:CoallocationTimeframeID" minOccurs="1" maxOccurs="1"/>
```

```
  </xsd:sequence>
```

```
</xsd:complexType>
```

```
<xsd:simpleType name="ReservationStatus_Type">
```

```
  <xsd:restriction base="xsd:string">
```

```
    <xsd:enumeration value="Created">
```

```
      <desc:description>A registration request is accepted (ReservationResource is create)</desc:description>
```

```
    </xsd:enumeration>
```

```
    <xsd:enumeration value="Reserved">
```

```
      <desc:description>The requested resource is booked</desc:description>
```

```
    </xsd:enumeration>
```

```
    <xsd:enumeration value="Activated">
```

```
      <desc:description>The resource is activated</desc:description>
```

```
    </xsd:enumeration>
```

```
    <xsd:enumeration value="Released">
```

```
      <desc:description>The resource is released</desc:description>
```

```
    </xsd:enumeration>
```

```
<xsd:enumeration value="Error">
  <desc:description>Errors have occurred</desc:description>
</xsd:enumeration>
</xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="CommandStatus_Type">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Initial">
      <desc:description>A reserve / modify / release command has been sent to an actual resource
manager</desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="Prepared">
      <desc:description>The requested command has been prepared</desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="Aborted">
      <desc:description>The requested resources are not available or the pre-command has
expired</desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="Committed">
      <desc:description>The requested command has been completed</desc:description>
    </xsd:enumeration>
  </xsd:restriction>
</xsd:simpleType>

<xsd:complexType name="ReservationCommandHistory_Type">
  <xsd:sequence>
    <xsd:element maxOccurs="1" minOccurs="1" ref="rdl:Timestamp"/>
    <xsd:element maxOccurs="1" minOccurs="1" ref="rdl:ReservationCommandEPR"/>
    <xsd:element maxOccurs="1" minOccurs="1" ref="rdl:OperationName"/>
    <xsd:element maxOccurs="1" minOccurs="0" ref="rdl:OperationArg"/>
    <xsd:element maxOccurs="1" minOccurs="0" ref="rdl:FinalCommandStatus"/>
  </xsd:sequence>
</xsd:complexType>

<!--
```

```

<xsd:element name="ChildResources" type="rdl:ChildResources_Type"/>
<xsd:complexType name="ChildResources_Type">
  <desc:description>Information of sub-resources, which comprise of a reserved
resource</desc:description>
  <xsd:sequence>
    <xsd:element ref="rdl:ReservationResources" minOccurs="1" maxOccurs="1"/>
    <xsd:element ref="rdl:ReservationEPR" minOccurs="1" maxOccurs="1"/>
    <xsd:element ref="rdl:ReservationCommandEPR" minOccurs="1" maxOccurs="unbounded"/>
    <xsd:element ref="rdl:ReservationStatus" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>
-->

<xsd:complexType name="TimeSpecification_Type">
  <xsd:sequence>
    <xsd:element ref="rdl:Timeframe" minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="rdl:CoallocationTimeframeID" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="Timeframe_Type">
  <xsd:sequence>
    <xsd:element ref="rdl:Exact" minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="rdl:Range" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="Exact_Type">
  <xsd:sequence>
    <xsd:element ref="rdl:StartTime" minOccurs="1" maxOccurs="1"/>
    <xsd:element ref="rdl:EndTime" minOccurs="1" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>

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

```

```
<xsd:element ref="rdl:Duration" minOccurs="1" maxOccurs="1"/>
<xsd:element ref="rdl:EarliestStartTime" minOccurs="0" maxOccurs="1"/>
<xsd:element ref="rdl:LatestStartTime" minOccurs="0" maxOccurs="1"/>
</xsd:sequence>
</xsd:complexType>

<xsd:complexType name="Duration_Type">
  <xsd:sequence>
    <xsd:element ref="rdl:DurationValue" minOccurs="1" maxOccurs="1"/>
    <xsd:element ref="rdl:TimeUnit" minOccurs="1" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:simpleType name="TimeUnit_Type">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="MILLISECOND">
      <desc:description>Millisecond</desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="SECOND">
      <desc:description>Second</desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="MINUTE">
      <desc:description>Minute</desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="HOUR">
      <desc:description>Hour</desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="DAY">
      <desc:description>Day</desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="WEEK">
      <desc:description>Week</desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="MONTH">
      <desc:description>Month</desc:description>
    </xsd:enumeration>
  </xsd:restriction>
</xsd:simpleType>
```

```
<xsd:enumeration value="YEAR">
  <desc:description>Year</desc:description>
</xsd:enumeration>
</xsd:restriction>
</xsd:simpleType>
</xsd:schema>
```


Appendix E. Network Resource-related Data Types

```
<?xml version="1.0" encoding="UTF-8" ?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://schemas.glambda.net/gnswsi3/2008/10/ndl"
  xmlns:ndl="http://schemas.glambda.net/gnswsi3/2008/10/ndl"
  xmlns:rdl="http://schemas.glambda.net/gnswsi3/2008/10/rdl"
  xmlns:desc="http://schemas.glambda.net/gnswsi3/2008/10/description"
  attributeFormDefault="unqualified" elementFormDefault="qualified">

  <xsd:import namespace="http://schemas.glambda.net/gnswsi3/2008/10/rdl" schemaLocation="rdl.xsd"/>

  <!-- ===== -->

  <xsd:element name="NetworkResources" type="ndl:NetworkResources_Type">
    <desc:description>A set of network resource information.</desc:description>
  </xsd:element>

  <xsd:element name="Path" type="ndl:Path_Type">
    <desc:description>A pair of logical network endpoints. When a path allocates over different domains, a
    path may contain sub-paths.</desc:description>
  </xsd:element>

  <xsd:element name="Route" type="ndl:Route_Type">
    <desc:description>A list of subsets of the path.</desc:description>
  </xsd:element>

  <xsd:element name="SubPath" type="ndl:SubPath_Type">
    <desc:description>A pair of logical network endpoints. An NRM handling a sub-path may be different
    domain from the domain of the NRM handling a path.</desc:description>
  </xsd:element>

  <xsd:element name="Nrm" type="ndl:Nrm_Type">
    <desc:description>An NRM information handling a sub-path.</desc:description>
  </xsd:element>

  <xsd:element name="NrmName" type="xsd:string">
    <desc:description>A name of NRM.</desc:description>
  </xsd:element>

  <xsd:element name="NrmUrl" type="xsd:string">
```

```
<desc:description>A URL of NRM.</desc:description>
</xsd:element>

<xsd:element name="APoint" type="ndl:Endpoint_Type">
  <desc:description>An endpoint in a path. An APoint must be paired with a ZPoint.</desc:description>
</xsd:element>
<xsd:element name="ZPoint" type="ndl:Endpoint_Type">
  <desc:description>An endpoint in a path. A ZPoint must be paired with an APoint.</desc:description>
</xsd:element>
<xsd:element name="Endpoint" type="ndl:Endpoint_Type">
  <desc:description>A termination site of a path or sub-path. An endpoint may contain termination points
of connections.</desc:description>
</xsd:element>
<xsd:element name="DomainName" type="xsd:string">
  <desc:description>A name of a domain, which is a network administrated by a telecommunication
carrier, internet service provider, organization, group, or some other type of authority.</desc:description>
</xsd:element>
<xsd:element name="TerminationPoint" type="ndl:TerminationPoint_Type">
  <desc:description>A physical or logical termination point of a connection.</desc:description>
</xsd:element>
<xsd:element name="TerminationPointName" type="xsd:string">
  <desc:description>A name of a termination point.</desc:description>
</xsd:element>

<xsd:element name="Availability" type="xsd:float">
  <desc:description>The ratio of the total time that a path is capable of being used in a
year.</desc:description>
  <desc:unit>%</desc:unit>
</xsd:element>
<xsd:element name="Bandwidth" type="ndl:Bandwidth_Type">
  <desc:description>An abstracted element of a requesting and assigned bandwidth.</desc:description>
</xsd:element>
<xsd:element name="TransmissionDelay" type="xsd:int">
  <desc:description>The acceptable one-way time to transfer between an APoint and a ZPoint. This
parameter doesn't include a forwarding delay in switches or routers.</desc:description>
  <desc:unit>msec</desc:unit>
```

</xsd:element>

<xsd:element name="RequestedBW" type="ndl:RequestedBW_Type">

<desc:description>A requesting bandwidth by an application, user or other NRM to be guaranteed.</desc:description>

</xsd:element>

<xsd:element name="ReservedBW" type="ndl:ReservedBW_Type">

<desc:description>An assigned bandwidth by the NRM.</desc:description>

</xsd:element>

<xsd:element name="MinimumBW" type="ndl:GeneralBW_Type">

<desc:description>An acceptable minimum bandwidth requesting from an application, user or other NRM to be guaranteed. The guaranteed bandwidth must not be assigned below the value of this parameter. When a MaximumBW is given, NRM decides the assigned bandwidth between a MinimumBW and a MaximumBW.</desc:description>

</xsd:element>

<xsd:element name="MaximumBW" type="ndl:GeneralBW_Type">

<desc:description>An acceptable maximum bandwidth requesting from an application, user or other NRM to be guaranteed. In a commercial network, clients can pay within the value of this parameter. NRM decides the assigned bandwidth between a MinimumBW and a MaximumBW. This parameter must be requested with a MinimumBW.</desc:description>

</xsd:element>

<xsd:element name="PeakBW" type="ndl:GeneralBW_Type">

<desc:description>A requesting bandwidth without guarantee. The value of this parameter should be equal to or less than the rate of the physical network interface.</desc:description>

</xsd:element>

<xsd:element name="GuaranteedBW" type="ndl:GeneralBW_Type">

<desc:description>An assigned bandwidth with guarantee.</desc:description>

</xsd:element>

<xsd:element name="Rate" type="xsd:int">

<desc:description>The number of bits that are transferred per unit of time.</desc:description>

</xsd:element>

<xsd:element name="BWUnit" type="ndl:BWUnit_Type">

<desc:description>An unit of data transfer rate.</desc:description>

</xsd:element>

<xsd:element name="PathProperties" type="ndl:PathProperties_Type">

```

    <desc:description>A set of a path information.</desc:description>
  </xsd:element>
  <xsd:element name="MediaType" type="ndl:MediaType_Type">
    <desc:description>A media type of a termination point.</desc:description>
  </xsd:element>
  <xsd:element name="MediaTypeName" type="ndl:MediaTypeName_Type">
    <desc:description>A name of the interface media defined as media attachment units
[IANA-MAU-MIB].</desc:description>
  </xsd:element>
  <xsd:element name="OtherMediaType" type="xsd:string">
    <desc:description>A name of the other media type.</desc:description>
  </xsd:element>
  <xsd:element name="SwitchingScheme" type="ndl:SwitchingScheme_Type">
    <desc:description>A switching/routing scheme in a path.</desc:description>
  </xsd:element>
  <xsd:element name="EthernetParameters" type="ndl:EthernetParameters_Type">
    <desc:description>A set of Ethernet related information.</desc:description>
  </xsd:element>
  <xsd:element name="MPLSParameters" type="ndl:MPLSParameters_Type">
    <desc:description>A set of MPLS related information.</desc:description>
  </xsd:element>
  <xsd:element name="IPParameters" type="ndl:IPParameters_Type">
    <desc:description>A set of IP related information.</desc:description>
  </xsd:element>

  <xsd:element name="MTU" type="xsd:int">
    <desc:description>A requested/allowable MTU.</desc:description>
    <desc:unit>Byte</desc:unit>
  </xsd:element>
  <xsd:element name="VLANTagID" type="xsd:int">
    <desc:description>A parameter for configuring virtual LANs in the IEEE 802.1Q
header.</desc:description>
  </xsd:element>
  <xsd:element name="CoS" type="xsd:int">
    <desc:description>A parameter to differentiate traffic in the Ethernet frame header.</desc:description>
  </xsd:element>

```

```

<xsd:element name="LSPID" type="xsd:string">
  <desc:description>A parameter to create a label switched path (LSP) in MPLS
networking.</desc:description>
</xsd:element>
<xsd:element name="Exp" type="xsd:int">
  <desc:description>A parameter to differentiate traffic in the MPLS header.</desc:description>
</xsd:element>
<xsd:element name="PacketLossRate" type="xsd:float">
  <desc:description>The ratio of total lost IP packet outcomes to total transmitted IP packets in a
population of interest. The detailed definition is described at [Y.1540] as IPLR (IP Loss Rate).</desc:description>
  <desc:unit>%</desc:unit>
</xsd:element>
<xsd:element name="PacketErrorRate" type="xsd:float">
  <desc:description>The ratio of total errored IP packet outcomes to the total of successful IP packet
transfer outcomes plus errored IP packet outcomes in a population of interest. The detailed definition is described
at [Y.1540] as IPER (IP Error Rate).</desc:description>
  <desc:unit>%</desc:unit>
</xsd:element>
<xsd:element name="AverageJitter" type="xsd:int">
  <desc:description>The average variation of the end-to-end delay from a packet to the next
packet.</desc:description>
  <desc:unit>msec</desc:unit>
</xsd:element>
<xsd:element name="MaximumJitter" type="xsd:int">
  <desc:description>The maximum variation of the end-to-end delay from a packet to the next
packet.</desc:description>
  <desc:unit>msec</desc:unit>
</xsd:element>
<xsd:element name="Latency" type="xsd:int">
  <desc:description>The average one-way IP packet transfer time for a population of interest between an
APoint and a ZPoint with forwarding delays at switches and routers. The detailed definition is described at
[Y.1540] as IPTD (IP Transfer Delay).</desc:description>
  <desc:unit>msec</desc:unit>
</xsd:element>
<xsd:element name="LatencyVariation" type="xsd:int">
  <desc:description>The variation of a one-way latency within a stream of packets. The detailed definition

```

```

is described at [Y.1540] as IPDV (IP Delay Variation).</desc:description>

    <desc:unit>msec</desc:unit>
</xsd:element>
<xsd:element name="PacketReordering" type="xsd:boolean">
    <desc:description>NRM provides the guarantee to transfer packets in order or not.</desc:description>
</xsd:element>
<xsd:element name="ToS" type="xsd:int">
    <desc:description>A parameter reserved for the service type in the IPv4 header.</desc:description>
</xsd:element>

<xsd:element name="NetworkResourceSLADocument" type="ndl:NetworkResourceSLADocument_Type">
    <desc:description>A set of information related to network service level agreement
(SLA).</desc:description>
</xsd:element>
<xsd:element name="SLAAvailability" type="xsd:float">
    <desc:description>The ratio of the total time that an NRM is capable of being used in a
year.</desc:description>
    <desc:unit>%</desc:unit>
</xsd:element>
<xsd:element name="ProvisioningDelay" type="rdl:Duration_Type">
    <desc:description>The maximum time to activate an assigned path.</desc:description>
</xsd:element>
<xsd:element name="FailureReportDelay" type="rdl:Duration_Type">
    <desc:description>The maximum time to notify clients of failures.</desc:description>
</xsd:element>
<xsd:element name="Redundancy" type="xsd:string">
    <desc:description>The configuration to ensure the path continues under the
failure(s).</desc:description>
</xsd:element>

<!-- ===== -->

<xsd:complexType name="NetworkResources_Type">
    <xsd:complexContent>
        <xsd:extension base="rdl:ReservationResources_Type">
            <xsd:sequence>

```

```

        <xsd:element ref="ndl:Path" minOccurs="0" maxOccurs="1"/>
        <xsd:element ref="rdl:SLADocument" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
</xsd:extension>
</xsd:complexContent>
</xsd:complexType>

<xsd:complexType name="Path_Type">
    <xsd:sequence>
        <xsd:element ref="ndl:APoint" minOccurs="1" maxOccurs="1"/>
        <xsd:element ref="ndl:ZPoint" minOccurs="1" maxOccurs="1"/>
        <xsd:element ref="ndl:Route" minOccurs="0" maxOccurs="1"/>
        <xsd:element ref="ndl:Bandwidth" minOccurs="1" maxOccurs="1"/>
        <xsd:element ref="ndl:PathProperties" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="Endpoint_Type">
    <xsd:sequence>
        <xsd:element ref="ndl:DomainName" minOccurs="0" maxOccurs="1"/>
        <xsd:element ref="ndl:TerminationPoint" minOccurs="0" maxOccurs="unbounded"/>
    </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="TerminationPoint_Type">
    <xsd:sequence>
        <xsd:element ref="ndl:TerminationPointName" minOccurs="0"/>
        <xsd:element ref="ndl:MediaType" minOccurs="0" maxOccurs="1"/>
        <!-- IANA-MAU-MIB -->
    </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="Route_Type">
    <xsd:sequence>
        <xsd:element ref="ndl:SubPath" minOccurs="1" maxOccurs="unbounded"/>
    </xsd:sequence>

```

```
</xsd:complexType>
```

```
<xsd:complexType name="SubPath_Type">
```

```
  <xsd:sequence>
```

```
    <xsd:element ref="ndl:APoint" minOccurs="1" maxOccurs="1"/>
```

```
    <xsd:element ref="ndl:ZPoint" minOccurs="1" maxOccurs="1"/>
```

```
    <xsd:element ref="ndl:Nrm" minOccurs="1" maxOccurs="1"/>
```

```
  </xsd:sequence>
```

```
</xsd:complexType>
```

```
<xsd:complexType name="Nrm_Type">
```

```
  <xsd:sequence>
```

```
    <xsd:element ref="ndl:NrmName" minOccurs="1" maxOccurs="1"/>
```

```
    <xsd:element ref="ndl:NrmUrl" minOccurs="1" maxOccurs="1"/>
```

```
  </xsd:sequence>
```

```
</xsd:complexType>
```

```
<xsd:complexType name="Bandwidth_Type">
```

```
  <xsd:sequence>
```

```
    <xsd:element ref="ndl:RequestedBW" minOccurs="0" maxOccurs="1" />
```

```
    <xsd:element ref="ndl:ReservedBW" minOccurs="0" maxOccurs="1" />
```

```
  </xsd:sequence>
```

```
</xsd:complexType>
```

```
<xsd:complexType name="RequestedBW_Type">
```

```
  <xsd:sequence>
```

```
    <xsd:element ref="ndl:MinimumBW" minOccurs="1" maxOccurs="1" />
```

```
    <xsd:element ref="ndl:MaximumBW" minOccurs="0" maxOccurs="1" />
```

```
    <xsd:element ref="ndl:PeakBW" minOccurs="0" maxOccurs="1" />
```

```
  </xsd:sequence>
```

```
</xsd:complexType>
```

```
<xsd:complexType name="ReservedBW_Type">
```

```
  <xsd:sequence>
```

```
    <xsd:element ref="ndl:GuaranteedBW" minOccurs="1" maxOccurs="1" />
```

```
    <xsd:element ref="ndl:PeakBW" minOccurs="0" maxOccurs="1" />
```



```
</xsd:sequence>
</xsd:complexType>

<xsd:complexType name="GeneralBW_Type">
  <xsd:sequence>
    <xsd:element ref="ndl:Rate" minOccurs="1" maxOccurs="1" />
    <xsd:element ref="ndl:BWUnit" minOccurs="1" maxOccurs="1" />
  </xsd:sequence>
</xsd:complexType>

<xsd:simpleType name="BWUnit_Type">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="Pbps">
      <desc:description>A unit of data transfer rate equal to 1,000 Tbps.</desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="Tbps">
      <desc:description>A unit of data transfer rate equal to 1,000 Gbps.</desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="Gbps">
      <desc:description>A unit of data transfer rate equal to 1,000 Mbps.</desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="Mbps">
      <desc:description>A unit of data transfer rate equal to 1,000 kbps.</desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="kbps">
      <desc:description>A unit of data transfer rate equal to 1,000 bits per
seconds.</desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="bps">
      <desc:description></desc:description>
    </xsd:enumeration>
  </xsd:restriction>
</xsd:simpleType>

<xsd:complexType name="PathProperties_Type">
  <xsd:sequence>
```

```

<xsd:element ref="ndl:Availability" minOccurs="0" maxOccurs="1"/>
<xsd:element ref="ndl:TransmissionDelay" minOccurs="0" maxOccurs="1"/>
  <!-- msec -->
<xsd:element ref="ndl:SwitchingScheme" minOccurs="0" maxOccurs="1"/>
<xsd:element ref="ndl:EthernetParameters" minOccurs="0" maxOccurs="1"/>
<xsd:element ref="ndl:MPLSParameters" minOccurs="0" maxOccurs="1"/>
<xsd:element ref="ndl:IPParameters" minOccurs="0" maxOccurs="1"/>
</xsd:sequence>
</xsd:complexType>

<xsd:complexType name="MediaType_Type">
  <xsd:sequence>
    <xsd:choice>
      <xsd:element ref="ndl:MediaTypeName" minOccurs="0" maxOccurs="1"/>
      <xsd:element ref="ndl:OtherMediaType" minOccurs="0" maxOccurs="1"/>
    </xsd:choice>
  </xsd:sequence>
</xsd:complexType>

<xsd:simpleType name="MediaTypeName_Type">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="bOther">
      <desc:description>other or unknown</desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="bAUI">
      <desc:description>AUI</desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="b10base5">
      <desc:description>10BASE-5</desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="bFoirl">
      <desc:description>FOIRL</desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="b10base2">
      <desc:description>10BASE-2</desc:description>
    </xsd:enumeration>
  </xsd:restriction>

```

```
<xsd:enumeration value="b10baseT">
  <desc:description>10BASE-T duplex mode unknown</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b10baseFP">
  <desc:description>10BASE-FP</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b10baseFB">
  <desc:description>10BASE-FB</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b10baseFL">
  <desc:description>10BASE-FL duplex mode unknown</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b10broad36">
  <desc:description>10BROAD36</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b10baseTHD">
  <desc:description>10BASE-T half duplex mode</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b10baseTFD">
  <desc:description>10BASE-T full duplex mode</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b10baseFLHD">
  <desc:description>10BASE-FL half duplex mode</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b10baseFLFD">
  <desc:description>10BASE-FL full duplex mode</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b100baseT4">
  <desc:description>100BASE-T4</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b100baseTXHD">
  <desc:description>100BASE-TX half duplex mode</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b100baseTXFD">
  <desc:description>100BASE-TX full duplex mode</desc:description>
</xsd:enumeration>
```

```
<xsd:enumeration value="b100baseFXHD">
  <desc:description>100BASE-FX half duplex mode</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b100baseFXFD">
  <desc:description>100BASE-FX full duplex mode</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b100baseT2HD">
  <desc:description>100BASE-T2 half duplex mode</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b100baseT2FD">
  <desc:description>100BASE-T2 full duplex mode</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b1000baseXHD">
  <desc:description>1000BASE-X half duplex mode</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b1000baseXFD">
  <desc:description>1000BASE-X full duplex mode</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b1000baseLXHD">
  <desc:description>1000BASE-LX half duplex mode</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b1000baseLXFD">
  <desc:description>1000BASE-LX full duplex mode</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b1000baseSXHD">
  <desc:description>1000BASE-SX half duplex mode</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b1000baseSXFD">
  <desc:description>1000BASE-SX full duplex mode</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b1000baseCXHD">
  <desc:description>1000BASE-CX half duplex mode</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b1000baseCXFD">
  <desc:description>1000BASE-CX full duplex mode</desc:description>
</xsd:enumeration>
```

```
<xsd:enumeration value="b1000baseTHD">
  <desc:description>1000BASE-T half duplex mode</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b1000baseTFD">
  <desc:description>1000BASE-T full duplex mode</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b10GbaseX">
  <desc:description>10GBASE-X</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b10GbaseLX4">
  <desc:description>10GBASE-LX4</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b10GbaseR">
  <desc:description>10GBASE-R</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b10GbaseER">
  <desc:description>10GBASE-ER</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b10GbaseLR">
  <desc:description>10GBASE-LR</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b10GbaseSR">
  <desc:description>10GBASE-SR</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b10GbaseW">
  <desc:description>10GBASE-W</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b10GbaseEW">
  <desc:description>10GBASE-EW</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b10GbaseLW">
  <desc:description>10GBASE-LW</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b10GbaseSW">
  <desc:description>10GBASE-SW</desc:description>
</xsd:enumeration>
```

```
<xsd:enumeration value="b10GbaseCX4">
  <desc:description>10GBASE-CX4</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b2BaseTL">
  <desc:description>2BASE-TL</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b10PassTS">
  <desc:description>10PASS-TS</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b100BaseBX10D">
  <desc:description>100BASE-BX10D</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b100BaseBX10U">
  <desc:description>100BASE-BX10U</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b100BaseLX10">
  <desc:description>100BASE-LX10</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b1000BaseBX10D">
  <desc:description>1000BASE-BX10D</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b1000BaseBX10U">
  <desc:description>1000BASE-BX10U</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b1000BaseLX10">
  <desc:description>1000BASE-LX10</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b1000BasePX10D">
  <desc:description>1000BASE-PX10D</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b1000BasePX10U">
  <desc:description>1000BASE-PX10U</desc:description>
</xsd:enumeration>
<xsd:enumeration value="b1000BasePX20D">
  <desc:description>1000BASE-PX20D</desc:description>
</xsd:enumeration>
```

```
<xsd:enumeration value="b1000BasePX20U">
  <desc:description>1000BASE-PX20U</desc:description>
</xsd:enumeration>
</xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="SwitchingScheme_Type">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="LAMBDA">
      <desc:description></desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="ETHERNET">
      <desc:description></desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="ATM">
      <desc:description></desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="MPLS">
      <desc:description></desc:description>
    </xsd:enumeration>
    <xsd:enumeration value="IP">
      <desc:description></desc:description>
    </xsd:enumeration>
  </xsd:restriction>
</xsd:simpleType>

<xsd:complexType name="EthernetParameters_Type">
  <xsd:sequence>
    <xsd:element ref="ndl:MTU" minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="ndl:VLANTagID" minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="ndl:CoS" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="MPLSPParameters_Type">
  <xsd:sequence>
```

```
<xsd:element ref="ndl:LSPID" minOccurs="0" maxOccurs="1"/>
<xsd:element ref="ndl:Exp" minOccurs="0" maxOccurs="1"/>
</xsd:sequence>
</xsd:complexType>

<xsd:complexType name="IPParameters_Type">
  <xsd:sequence>
    <xsd:element ref="ndl:PacketLossRate" minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="ndl:PacketErrorRate" minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="ndl:AverageJitter" minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="ndl:MaximumJitter" minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="ndl:Latency" minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="ndl:LatencyVariation" minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="ndl:PacketReordering" minOccurs="0" maxOccurs="1"/>
    <xsd:element ref="ndl:ToS" type="xsd:int" minOccurs="0" maxOccurs="1"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="NetworkResourceSLADocument_Type">
  <xsd:complexContent>
    <xsd:extension base="rdl:SLADocument_Type">
      <xsd:sequence>
        <xsd:element ref="ndl:SLAAvailability" minOccurs="0" maxOccurs="1"/>
        <xsd:element ref="ndl:ProvisioningDelay" minOccurs="0" maxOccurs="1"/>
        <xsd:element ref="ndl:FailureReportDelay" minOccurs="0" maxOccurs="1"/>
        <xsd:element ref="ndl:Redundancy" minOccurs="0" maxOccurs="1"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>

</xsd:schema>
```


Appendix F. Compute Resource-related Data Types

```
<?xml version="1.0" encoding="UTF-8" ?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  targetNamespace="http://schemas.glambda.net/gnswsi3/2008/10/cdl"
  xmlns:cdl="http://schemas.glambda.net/gnswsi3/2008/10/cdl"
  xmlns:jsdl="http://schemas.ggf.org/jsdl/2005/11/jsdl"
  xmlns:rdl="http://schemas.glambda.net/gnswsi3/2008/10/rdl"
  xmlns:desc="http://schemas.glambda.net/gnswsi3/2008/10/description"
  attributeFormDefault="unqualified" elementFormDefault="qualified">

  <xsd:import namespace="http://schemas.glambda.net/gnswsi3/2008/10/rdl" schemaLocation="rdl.xsd"/>
  <xsd:import namespace="http://schemas.ggf.org/jsdl/2005/11/jsdl" schemaLocation="jsdl.xsd"/>

  <!-- ===== -->

  <xsd:element name="ComputeResources" type="cdl:ComputeResources_Type">
    <desc:description>Compute resources</desc:description>
  </xsd:element>

  <xsd:element name="ComputeResourceSLADocument" type="cdl:ComputeResourceSLADocument_Type">
    <desc:description>SLA Document of compute resources</desc:description>
  </xsd:element>

  <xsd:element name="Site" type="xsd:string">
    <desc:description>A site name</desc:description>
  </xsd:element>

  <xsd:element name="ResourceAttribute" type="cdl:ResourceAttribute_Type">
    <desc:description>The compute resource is related to zero or more attributes</desc:description>
  </xsd:element>

  <xsd:element name="Key" type="xsd:string">
    <desc:description>An attribute name</desc:description>
  </xsd:element>

  <xsd:element name="Value" type="xsd:string">
    <desc:description>A value for the attribute</desc:description>
  </xsd:element>

  <xsd:element name="Description" type="xsd:string">
```

```

    <desc:description>An SLA document description</desc:description>
  </xsd:element>

  <!-- ===== -->

  <xsd:complexType name="ComputeResources_Type">
    <xsd:complexContent>
      <xsd:extension base="rdl:ReservationResources_Type">
        <xsd:sequence>
          <xsd:element ref="cdl:Site" minOccurs="0" maxOccurs="1"/>
          <xsd:element ref="jsdl:Resources" minOccurs="0" maxOccurs="1"/>
          <xsd:element ref="cdl:ResourceAttribute" minOccurs="0" maxOccurs="unbounded"/>
          <!-- mpi etc. -->
        </xsd:sequence>
      </xsd:extension>
    </xsd:complexContent>
  </xsd:complexType>

  <xsd:complexType name="ResourceAttribute_Type">
    <xsd:sequence>
      <xsd:element ref="cdl:Key" minOccurs="1" maxOccurs="1"/>
      <xsd:element ref="cdl:Value" minOccurs="1" maxOccurs="1"/>
    </xsd:sequence>
  </xsd:complexType>

  <xsd:complexType name="ComputeResourceSLADocument_Type">
    <xsd:complexContent>
      <xsd:extension base="rdl:SLADocument_Type">
        <xsd:sequence>
          <xsd:element ref="cdl:Description" minOccurs="0" maxOccurs="1"/>
        </xsd:sequence>
      </xsd:extension>
    </xsd:complexContent>
  </xsd:complexType>
</xsd:schema>

```