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GLUE v. 2.0 – Reference Realizations to Concrete Data Models

Status of This Document

This document provides information to the Grid community regarding the realization of the GLUE information model (v.2.0) as XML Schema, SQL Schema and LDAP Schema. Distribution is unlimited. The realizations are derived from the specification document version 42 as available in the GLUE Working Group document repository. The LDAP Schema is an evolving realization.

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Abstract

The GLUE specification is an information model for Grid entities described in natural language enriched with a graphical representation using UML Class Diagrams. This document presents a realization of this information model as XML Schema, LDAP Schema and SQL Schema.

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1. Introduction

The GLUE 2.0 Information model defined in [glue-2] is a conceptual model of Grid entities. In order to be adopted by Grid middlewares, a realization in terms of a concrete data model is needed.

This document provides the normative realization of the GLUE 2.0 conceptual model in terms of an XML Schema. The approach followed to map the entities and relationships in the conceptual model to the concrete data model are also described.

2. Notational Conventions

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 (see <http://www.ietf.org/rfc/rfc2119.txt>).

3. XML Schema Realization

3.1 Approach

There are many approaches to realize the GLUE conceptual model as an XML Schema. Depending on the aspects that are privileged, a different realization occurs. In this work, we decided to facilitate the writing queries.

3.1.1 Elements vs. Attributes

When defining data types in an XML Schema, two main options are available. A data can be described in term of an XML Element or an XML Attribute. Each class modeled in the conceptual model maps into an XML Element definition. Each attribute of a class in the conceptual model maps into an XML Attribute definition (this is a general rule and applies also to both ID and LocalID attributes). Exception is made for the attributes CreationTime and Validity of the Entity class. Since they can be considered as metadata about GLUE-based description of entities, they are modeled as XML attributes.

The multi-value properties of a class defined in the conceptual model are represented by using a separate XML element for each value.

Timestamp-related properties are modeled using the `xsd:dateTime` simple type. Every timestamp MUST be expressed using GMT Timezone: `yyyy '-' mm '-' dd 'T' hh ':' mm ':' ss Z`.

3.1.2 Namespace

The Open Grid Forum published a document with guidelines for identifying names uniquely and uniform in the GGF/OGF domain [ogf-ns]. Based on this document, we propose the following namespace for the XML Schema realization of GLUE 2.0:

GLUE-XSD-NS ::= ‘`http://schemas.ogf.org/glue/`’ YYYY ‘/’ MM ‘/spec_2.0’ [‘_d’ DD]? (‘_r’ RR)

- YYYY: year of the normative document of the GLUE 2.0 specification
- MM: month of the normative document of the GLUE 2.0 specification

- `_dDD`: optional component to be used for XSD realization of the draft specification of GLUE 2.0; DD is the number of the draft
- `_rRR`: component to be used to specify the revision number of the XSD realization; this number is relative to each conceptual model and should be increased every time that a new non-backwards compatible version is published

As a non-normative example, the namespace for the first release of the XSD realizing the GLUE 2.0 specification draft 42 is:

http://schemas.ogf.org/glue/2008/05/spec_2.0_d42_r01

3.1.3 Enumerations

In the GLUE specification, among the property types, several enumerations are defined. They belong to two main categories: closed enumerations and open enumerations.

In a closed enumeration, a list of values is defined. The value of the property **MUST** belongs to the set of defined values

In an open enumeration, a list of values is defined. The value of the property **MAY** belongs to the set of defined values. The main goal of the open enumeration is to offer a not complete list of values among which to choose. They also provide hints on how new values can be defined.

As regards the XSD realization, a closed enumeration can be modeled by restriction on a string base type. By using the element `<enumeration>`, each value can be defined. An element which type is a restricted string type in terms of a set of values is valid if and only if the value matches one of those defined. In the following XSD fragment, we show the definition of the enumeration of for the `Endpoint.HealthState` attribute:

```
<simpleType name="EndpointHealthState_t">
  <restriction base="string">
    <enumeration value="ok"/>
    <enumeration value="warning"/>
    <enumeration value="critical"/>
    <enumeration value="unknown"/>
    <enumeration value="other"/>
  </restriction>
</simpleType>
```

Concerning the open enumeration, the natural approach would be to use the `union` capability of XSD [xsd-oe, xsd-ap]. Unfortunately, this is not well supported in current implementations, therefore we decide to model them by using the `annotation` element; each enumeration value is represented by an `appinfo` sub-element. A software validating an XML document according to the defined XSD for GLUE 2 **SHOULD** be instrumented in order to consider these values. In the following XSD fragment, we show the definition of the open enumeration for the `ComputingEndpoint.Staging` attribute:

```
<simpleType name="Staging_t">
  <restriction base="string">
    <annotation>
      <appinfo>
        <enumeration value="none"/>
        <enumeration value="stagingin"/>
        <enumeration value="stagingout"/>
        <enumeration value="staginginout"/>
      </appinfo>
    </annotation>
  </restriction>
</simpleType>
```

3.1.4 Associations

In the conceptual model, several associations are represented. They can be classified in terms of the multiplicity (one-to-one, one-to-many, many-to-many), in terms of the navigability (directed, undirected) or in terms of the association type (binary, aggregation, composition, association class).

We propose realizations of the associations in XSD as follows:

- one-to-one: modeled by parent-child relationships
 - e.g.: an AdminDomain class has a directed association to a Location class; this is represented as an AdminDomain element having a child Location element
- one-to-many: modeled by parent-child relationships; the “one” is the parent, while the “many” are the children
 - e.g.: an Service class has a one-to-many association to an Endpoint class; this is represented as a Service element having zero or more child Endpoint elements
 - if the class participating in the “many” side of the relationship has other associations, then the relationship is modeled using the many-to-many approach (see the relationship among ComputingActivity and ComputingEndpoint)
- many-to-many: for each class instance involved in the association, the ‘association end’ (i.e., identifier of the class instance that participates in the association in the other side) is represented as a sub-element; each set of ‘association end’ elements are grouped by an Associations element.
 - e.g.: a ComputingEndpoint class has a many-to-many association to a ComputingShare class; this is represented as follows

```
<ComputingEndpoint>
  <ID>urn:myendpoint</ID>
  <Associations>
    <ComputingShareLocalID>share_id1</ComputingShareLocalID>
    <ComputingShareLocalID>share_id2</ComputingShareLocalID>
    ...
    <ComputingActivityID>urn:mycompact_1</ComputingActivityID>
  </Associations>
</ComputingEndpoint>
<ComputingShare>
  <LocalID>share_id1</LocalID>
  <Associations>
    <ComputingEndpointID>urn:myendpoint</ComputingEndpointID>
    ...
  </Associations>
</ComputingShare>
```

Notice that the Associations element groups all the ‘association ends’ of the related class instance.

An exception to the above rules is made for the association between the AccessPolicy/MappingPolicy with the UserDomain. Since the Policy entities contain the Rule property which implicitly identify the UserDomains to which they apply, the association between UserDomain and Policy entities is not explicitly represented. The association between AccessPolicy and Endpoint and between MappingPolicy and Share fall in the category of one-to-many relationship and are represented according to the rules above.

3.1.5 XML Document Structure

Each XML document valid with respect to the GLUE 2.0 XSD realization MUST have Domains as root element.

```

<glue:Domains
  xmlns:glue=" http://schemas.ogf.org/glue/2008/05/spec_2.0_d41_r01"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://schemas.ogf.org/glue/2008/05/spec_2.0_d41_r01 path/to/GLUE2.xsd">
  ...
</glue:Domains>

```

The children elements of the root element can be either `AdminDomain` or `UserDomain`.

In order to enable a potential client to query each type of source for information with the same query, we decide to have a fixed document structure that **MUST** be always used. A fixed structure is enforced by the XSD, that means it is not possible to validate just an XML fragment representing a `Service`. The ancestors `AdminDomain` and `glue:Domains` must be present as well as their mandatory elements. In the following XML document, we present a simple example of the XML document structure:

```

<glue:Domains>
  <AdminDomain>
    <ID>A</ID>
    <Services>
      <Service>
        <ID>urn:myservice1</ID>
        ...
      </Service>
      <Service>
        <ID>urn:myservice2</ID>
        ...
      </Service>
    </Services>
  </AdminDomain>
  ...
  <UserDomain>
    ...
  </UserDomain>
  ...
</glue:Domains>

```

The XML document of GLUE 2.0 related information can be published by many sources and aggregated by intermediate services. The primary sources may not know all the values for all the attributes (e.g., an OGSA-BES service may not know the ID of the `AdminDomain` to which it belongs to). In these cases, the mandatory attributes **MUST** be published with the UNKNOWN placeholder. High-level aggregator services will perform the merge and will complete the missing information.

3.1.6 Grouping

For elements which can have siblings of the same type in the order of $O(10)$, we decide to introduce grouping elements.

For instance, an `AdminDomain` can contain tens of services, therefore we introduce the `Services` element (see above XML Document Structure).

The current XML Schema realization defines the following grouping elements:

- `Services`
- `Activities`
- `ComputingShares`
- `ComputingActivities`
- `StorageShares`
- `ApplicationEnvironments`
- `Extensions`
- `Associations`

3.1.7 Inheritance

In the GLUE conceptual model, there are concepts which derive from other concepts by specialization. For instance both the `ComputingService` and the `StorageService` inherit from the `Service` class. In order to enable to query by the super-class, for all XML elements which represent classes involved in a generalization/specialization, we introduce an XML attribute called `BaseType` which value is fixed and equals to the name of the super-class.

For instance, both `ComputingService` and `StorageService` are a specialization of a `Service`; the elements representing them will have the `BaseType` attribute equals to `Service`. See the following example:

```
<glue:Domains>
  <AdminDomain>
    <ID>A</ID>
    <Services>
      <Service BaseType="Service">
        <ID>urn:myservice1</ID>
        ...
      </Service>
      <ComputingService BaseType="Service">
        <ID>urn:myservice2</ID>
        ...
      </ComputingService>
      <StorageService BaseType="Service">
        <ID>urn:myservice3</ID>
        ...
      </StorageService>
    </Services>
  </AdminDomain>
  ...
</glue:Domains>
```

3.1.8 Extensibility

The GLUE conceptual model defines two main “hooks” for extending the current modeled concepts and properties: the `Extension` class and the `OtherInfo` property.

Each class can be associated to instances of the `Extension` class, which carries key,value pairs. For instance, given the `ExecutionEnvironment` class, if there is the need to advertise the property “GPUModel” and “CoreLib” which are not captured by the conceptual model, this can be achieved as follows:

```
...
<ExecutionEnvironment BaseType="Resource">
  <ID>urn:myexecenv1</ID>
  ...
  <Extensions>
    <Extention Key="GPUModel">GeForge 7</Extention>
    <Extention Key="CoreLib">glibc:3.4.9</Extention>
    <Extention Key="CoreLib">libthread:2.4</Extention>
    <Extention Key="CoreLib">libpam:0.81</Extention>
  </Extensions>
</ExecutionEnvironment>
```

Some class has the property “OtherInfo” which type is string and multiplicity is multi-value. This can be used to advertise a flat list of values.

The above extension hooks are defined in the conceptual model. At the XSD level, there is the possibility of adding hooks for extensibility based on a flexible mechanism that enables content models to be extended by any elements and attributes belonging to specified namespaces. We refer to the `lax` value for the `processContent` attribute of an `xsd:any` element definition. This

option is currently not adopted. It MAY be added in a future release of the realization upon request from the community.

3.2 The Normative XML Schema Realization of GLUE 2.0

```
<?xml version="1.0" encoding="UTF-8"?>

<schema targetNamespace="http://schemas.opengis.org/glue/2008/05/spec_2.0_d42_r01"
  xmlns="http://www.w3.org/2001/XMLSchema"
  xmlns:glue="http://schemas.opengis.org/glue/2008/05/spec_2.0_d42_r01">

  <!-- BEGIN MAIN ENTITIES -->
  <complexType name="Entity">
    <attribute name="CreationTime" type="dateTime"/>
    <attribute name="Validity" type="unsignedLong"/>
  </complexType>

  <complexType name="Extension_t">
    <simpleContent>
      <extension base="string">
        <attribute name="Key" type="string"/>
      </extension>
    </simpleContent>
  </complexType>

  <complexType name="Extensions_t">
    <sequence>
      <element name="Extension" type="glue:Extension_t" minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
  </complexType>

  <element name="Domains" type="glue:Domains_t"/>

  <complexType name="Domains_t">
    <complexContent>
      <extension base="glue:Entity">
        <sequence>
          <element name="AdminDomain" type="glue:AdminDomain_t" minOccurs="0" maxOccurs="unbounded"/>
          <element name="UserDomain" type="glue:UserDomain_t" minOccurs="0" maxOccurs="unbounded"/>
        </sequence>
      </extension>
    </complexContent>
  </complexType>

  <complexType name="Location_t">
    <complexContent>
      <extension base="glue:Entity">
        <sequence>
          <element name="LocalID" type="glue:LocalID_t"/>
          <element name="Name" type="string"/>
          <element name="Address" type="string" minOccurs="0"/>
          <element name="Place" type="string" minOccurs="0"/>
          <element name="Country" type="string" minOccurs="0"/>
          <element name="PostCode" type="string" minOccurs="0"/>
          <element name="Latitude" type="glue:Latitude_t" minOccurs="0"/>
          <element name="Longitude" type="glue:Longitude_t" minOccurs="0"/>
          <element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
        </sequence>
      </extension>
    </complexContent>
  </complexType>

  <complexType name="Contact_t">
    <complexContent>
      <extension base="glue:Entity">
        <sequence>
          <element name="LocalID" type="glue:LocalID_t"/>
          <element name="URL" type="anyURI"/>
          <element name="Type" type="string">
            <annotation>
              <appinfo>general</appinfo>
              <appinfo>usersupport</appinfo>
              <appinfo>sysadmin</appinfo>
            </annotation>
          </element>
          <element name="OtherInfo" type="string" minOccurs="0" maxOccurs="unbounded"/>
          <element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
        </sequence>
      </extension>
    </complexContent>
  </complexType>

  <!-- END MAIN ENTITIES -->
</schema>
```



```

    </complexContent>
  </complexType>

  <complexType abstract="true" name="Domain_t">
    <complexContent>
      <extension base="glue:Entity">
        <sequence>
          <element name="ID" type="glue:ID_t"/>
          <element name="Name" type="string" minOccurs="0"/>
          <element name="Description" type="string" minOccurs="0"/>
          <element name="WWW" type="anyURI" minOccurs="0" maxOccurs="unbounded"/>
          <element name="OtherInfo" type="string" minOccurs="0" maxOccurs="unbounded"/>
        </sequence>
        <attribute name="BaseType" fixed="Domain" use="required"/>
      </extension>
    </complexContent>
  </complexType>

  <complexType name="AdminDomain_t">
    <complexContent>
      <extension base="glue:Domain_t">
        <sequence>
          <element name="Distributed" type="boolean" minOccurs="0"/>
          <element name="Owner" type="string" minOccurs="0" maxOccurs="unbounded"/>
          <element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
          <element name="Location" type="glue:Location_t" minOccurs="0"/>
          <element name="Contact" type="glue:Contact_t" minOccurs="0" maxOccurs="unbounded"/>
          <element name="Services" minOccurs="0">
            <complexType>
              <sequence>
                <element name="Service" type="glue:Service_t" minOccurs="0" maxOccurs="unbounded"/>
                <element name="ComputingService" type="glue:ComputingService_t" minOccurs="0" maxOccurs="unbounded"/>
                <element name="StorageService" type="glue:StorageService_t" minOccurs="0" maxOccurs="unbounded"/>
              </sequence>
            </complexType>
          </element>
          <element name="Associations" minOccurs="0">
            <complexType>
              <sequence>
                <element name="AdminDomainID" type="glue:ID_t" minOccurs="0" maxOccurs="unbounded"/>
              </sequence>
            </complexType>
          </element>
        </sequence>
      </extension>
    </complexContent>
  </complexType>

  <complexType name="UserDomain_t">
    <complexContent>
      <extension base="glue:Domain_t">
        <sequence>
          <element name="Level" type="unsignedInt" minOccurs="0"/>
          <element name="UserManager" type="anyURI" minOccurs="0"/>
          <element name="Member" type="string" minOccurs="0" maxOccurs="unbounded"/>
          <element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
          <element name="Associations" minOccurs="0">
            <complexType>
              <sequence>
                <element name="UserDomainID" type="glue:ID_t" minOccurs="0" maxOccurs="unbounded"/>
              </sequence>
            </complexType>
          </element>
        </sequence>
      </extension>
    </complexContent>
  </complexType>

  <complexType name="ServiceProperties_t">
    <complexContent>
      <extension base="glue:Entity">
        <sequence>
          <element name="ID" type="glue:ID_t"/>
          <element name="Name" type="string" minOccurs="0"/>
          <element name="Capability" type="glue:Capability_t" minOccurs="0" maxOccurs="unbounded"/>
          <element name="Type" type="glue:ServiceType_t"/>
          <element name="QualityLevel" type="glue:QualityLevel_t"/>
          <element name="StatusPage" type="anyURI" minOccurs="0" maxOccurs="unbounded"/>
          <element name="Complexity" type="string" minOccurs="0"/>
        </sequence>
      </extension>
    </complexContent>
  </complexType>

```

```

        <element name="OtherInfo" type="string" minOccurs="0" maxOccurs="unbounded"/>
      </sequence>
      <attribute name="BaseType" fixed="Service" use="required"/>
    </extension>
  </complexContent>
</complexType>

<complexType name="Service_t">
  <complexContent>
    <extension base="glue:ServiceProperties_t">
      <sequence>
        <element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
        <element name="Location" type="glue:Location_t" minOccurs="0"/>
        <element name="Contact" type="glue:Contact_t" minOccurs="0" maxOccurs="unbounded"/>
        <element name="Endpoint" type="glue:Endpoint_t" minOccurs="0" maxOccurs="unbounded"/>
        <element name="Activities" minOccurs="0">
          <complexType>
            <sequence>
              <element name="Activity" type="glue:Activity_t" minOccurs="0" maxOccurs="unbounded"/>
            </sequence>
          </complexType>
        </element>
        <element name="Associations" minOccurs="0">
          <complexType>
            <sequence>
              <element name="ServiceID" type="glue:ID_t" minOccurs="0" maxOccurs="unbounded"/>
            </sequence>
          </complexType>
        </element>
      </sequence>
    </extension>
  </complexContent>
</complexType>

<complexType name="EndpointProperties_t">
  <complexContent>
    <extension base="glue:Entity">
      <sequence>
        <element name="ID" type="glue:ID_t"/>
        <element name="Name" type="string" minOccurs="0"/>
        <element name="URL" type="anyURI"/>
        <element name="Capability" type="glue:Capability_t" minOccurs="0" maxOccurs="unbounded"/>
        <element name="Technology" type="glue:EndpointTechnology_t"/>
        <element name="Interface" type="anyURI" minOccurs="0"/>
        <element name="InterfaceExtension" type="anyURI" minOccurs="0" maxOccurs="unbounded"/>
        <element name="WSDL" type="anyURI" minOccurs="0" maxOccurs="unbounded"/>
        <element name="SupportedProfile" type="anyURI" minOccurs="0" maxOccurs="unbounded"/>
        <element name="Semantics" type="anyURI" minOccurs="0" maxOccurs="unbounded"/>
        <element name="Implementor" type="string" minOccurs="0"/>
        <element name="ImplementationName" type="string" minOccurs="0"/>
        <element name="ImplementationVersion" type="string" minOccurs="0"/>
        <element name="QualityLevel" type="glue:QualityLevel_t"/>
        <element name="HealthState" type="glue:EndpointHealthState_t"/>
        <element name="HealthStateInfo" type="string" minOccurs="0"/>
        <element name="ServingState" type="glue:ServingState_t"/>
        <element name="StartTime" type="dateTime" minOccurs="0"/>
        <element name="IssuerCA" type="glue:DN_t" minOccurs="0"/>
        <element name="TrustedCA" type="glue:DN_t" minOccurs="0" maxOccurs="unbounded"/>
        <element name="DowntimeAnnounce" type="dateTime" minOccurs="0"/>
        <element name="DowntimeStart" type="dateTime" minOccurs="0"/>
        <element name="DowntimeEnd" type="dateTime" minOccurs="0"/>
        <element name="DowntimeInfo" type="string" minOccurs="0" maxOccurs="unbounded"/>
      </sequence>
      <attribute name="BaseType" fixed="Endpoint" use="required"/>
    </extension>
  </complexContent>
</complexType>

<complexType name="Endpoint_t">
  <complexContent>
    <extension base="glue:EndpointProperties_t">
      <sequence>
        <element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
        <element name="AccessPolicy" type="glue:AccessPolicy_t" minOccurs="0" maxOccurs="unbounded"/>
        <element name="Associations" minOccurs="0">
          <complexType>
            <sequence>
              <element name="ActivityID" type="glue:ID_t" minOccurs="0" maxOccurs="unbounded"/>
            </sequence>
          </complexType>
        </element>
      </sequence>
    </extension>
  </complexContent>
</complexType>

```

```

        </complexType>
      </element>
    </sequence>
  </extension>
</complexContent>
</complexType>

<complexType abstract="true" name="Share_t">
  <complexContent>
    <extension base="glue:Entity">
      <sequence>
        <element name="LocalID" type="glue:LocalID_t"/>
        <element name="Name" type="string" minOccurs="0"/>
        <element name="Description" type="string" minOccurs="0"/>
      </sequence>
      <attribute name="BaseType" fixed="Share" use="required"/>
    </extension>
  </complexContent>
</complexType>

<complexType abstract="true" name="Manager_t">
  <complexContent>
    <extension base="glue:Entity">
      <sequence>
        <element name="ID" type="glue:ID_t"/>
        <element name="Name" type="string" minOccurs="0"/>
      </sequence>
      <attribute name="BaseType" fixed="Manager" use="required"/>
    </extension>
  </complexContent>
</complexType>

<complexType abstract="true" name="Resource_t">
  <complexContent>
    <extension base="glue:Entity">
      <sequence>
        <element name="ID" type="glue:ID_t"/>
        <element name="Name" type="string" minOccurs="0"/>
      </sequence>
      <attribute name="BaseType" fixed="Resource" use="required"/>
    </extension>
  </complexContent>
</complexType>

<complexType name="ActivityProperties_t">
  <complexContent>
    <extension base="glue:Entity">
      <sequence>
        <element name="ID" type="glue:ID_t"/>
      </sequence>
      <attribute name="BaseType" fixed="Activity" use="required"/>
    </extension>
  </complexContent>
</complexType>

<complexType name="Activity_t">
  <complexContent>
    <extension base="glue:ActivityProperties_t">
      <sequence>
        <element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
        <element name="Associations" minOccurs="0">
          <complexType>
            <sequence>
              <element name="EndpointID" type="glue:ID_t" minOccurs="0" maxOccurs="unbounded"/>
              <element name="UserDomainID" type="glue:ID_t" minOccurs="0" maxOccurs="unbounded"/>
              <element name="ActivityID" type="glue:ID_t" minOccurs="0" maxOccurs="unbounded"/>
            </sequence>
          </complexType>
        </element>
      </sequence>
    </extension>
  </complexContent>
</complexType>

<complexType abstract="true" name="Policy_t">
  <complexContent>
    <extension base="glue:Entity">
      <sequence>
        <element name="LocalID" type="glue:LocalID_t"/>
        <element name="Scheme" type="glue:PolicyScheme_t"/>
        <element name="Rule" type="glue:PolicyRule_t" minOccurs="1" maxOccurs="unbounded"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>

```

```

        </sequence>
        <attribute name="BaseType" fixed="Policy" use="required"/>
    </extension>
</complexContent>
</complexType>

<complexType name="AccessPolicy_t">
    <complexContent>
        <extension base="glue:Policy_t"/>
    </complexContent>
</complexType>

<complexType name="MappingPolicy_t">
    <complexContent>
        <extension base="glue:Policy_t"> </extension>
    </complexContent>
</complexType>
<!-- END MAIN ENTITIES -->

<!-- BEGIN COMPUTING ENTITIES -->
<complexType name="ComputingService_t">
    <complexContent>
        <extension base="glue:ServiceProperties_t">
            <sequence>
                <element name="TotalJobs" type="unsignedInt" minOccurs="0"/>
                <element name="RunningJobs" type="unsignedInt" minOccurs="0"/>
                <element name="WaitingJobs" type="unsignedInt" minOccurs="0"/>
                <element name="StagingJobs" type="unsignedInt" minOccurs="0"/>
                <element name="SuspendedJobs" type="unsignedInt" minOccurs="0"/>
                <element name="PreLRMSWaitingJobs" type="unsignedInt" minOccurs="0"/>
                <element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
                <element name="Location" type="glue:Location_t" minOccurs="0"/>
                <element name="Contact" type="glue:Contact_t" minOccurs="0" maxOccurs="unbounded"/>
                <element name="ComputingEndpoint" type="glue:ComputingEndpoint_t" minOccurs="0"
                    maxOccurs="unbounded"/>
                <element name="ComputingShares" minOccurs="0">
                    <complexType>
                        <sequence>
                            <element name="ComputingShare" type="glue:ComputingShare_t" minOccurs="0"
                                maxOccurs="unbounded"/>
                        </sequence>
                    </complexType>
                </element>
                <element name="ComputingManager" type="glue:ComputingManager_t" minOccurs="0"
                    maxOccurs="unbounded"/>
                <element name="ToStorageService" type="glue:ToStorageService_t" minOccurs="0"
                    maxOccurs="unbounded"/>
                <element name="ComputingActivitites" minOccurs="0">
                    <complexType>
                        <sequence>
                            <element name="ComputingActivitiy" type="glue:ComputingActivity_t" minOccurs="0"
                                maxOccurs="unbounded"/>
                        </sequence>
                    </complexType>
                </element>
                <element name="Associations" minOccurs="0">
                    <complexType>
                        <sequence>
                            <element name="ServiceID" type="glue:ID_t" minOccurs="0" maxOccurs="unbounded"/>
                        </sequence>
                    </complexType>
                </element>
            </sequence>
        </extension>
    </complexContent>
</complexType>

<complexType name="ComputingEndpoint_t">
    <complexContent>
        <extension base="glue:EndpointProperties_t">
            <sequence>
                <element name="Staging" type="glue:Staging_t" minOccurs="0"/>
                <element name="JobDescription" type="glue:JobDescription_t" minOccurs="0"
                    maxOccurs="unbounded"/>
                <element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
                <element name="AccessPolicy" type="glue:AccessPolicy_t" minOccurs="0"
                    maxOccurs="unbounded"/>
                <element name="Associations" minOccurs="0">
                    <complexType>

```

```

    <sequence>
      <element name="ComputingShareLocalID" type="string" minOccurs="0"
        maxOccurs="unbounded" />
      <element name="ComputingActivityID" type="glue:ID_t" minOccurs="0"
        maxOccurs="unbounded" />
    </sequence>
  </complexType>
</element>
</sequence>
</extension>
</complexContent>
</complexType>

<complexType name="ComputingShare_t">
  <complexContent>
    <extension base="glue:Share_t">
      <sequence>
        <element name="MappingQueue" type="string" minOccurs="0"/>
        <element name="MaxWallTime" type="unsignedLong" minOccurs="0"/>
        <element name="MaxTotalWallTime" type="unsignedLong" minOccurs="0"/>
        <element name="MinWallTime" type="unsignedLong" minOccurs="0"/>
        <element name="DefaultWallTime" type="unsignedLong" minOccurs="0"/>
        <element name="MaxCPUTime" type="unsignedLong" minOccurs="0"/>
        <element name="MaxTotalCPUTime" type="unsignedLong" minOccurs="0"/>
        <element name="MaxCPUsTime" type="unsignedLong" minOccurs="0"/>
        <element name="MinCPUTime" type="unsignedLong" minOccurs="0"/>
        <element name="DefaultCPUTime" type="unsignedLong" minOccurs="0"/>
        <element name="MaxTotalJobs" type="unsignedInt" minOccurs="0"/>
        <element name="MaxRunningJobs" type="unsignedInt" minOccurs="0"/>
        <element name="MaxWaitingJobs" type="unsignedInt" minOccurs="0"/>
        <element name="MaxPreLRMSWaitingJobs" type="unsignedInt" minOccurs="0"/>
        <element name="MaxUserRunningJobs" type="unsignedInt" minOccurs="0"/>
        <element name="MaxSlotsPerJob" type="unsignedInt" minOccurs="0"/>
        <element name="MaxStateInStreams" type="unsignedInt" minOccurs="0"/>
        <element name="MaxStageOutStreams" type="unsignedInt" minOccurs="0"/>
        <element name="SchedulingPolicy" type="glue:SchedulingPolicy_t" minOccurs="0"/>
        <element name="MaxMemory" type="unsignedLong" minOccurs="0"/>
        <element name="MaxDiskSpace" type="unsignedLong" minOccurs="0"/>
        <element name="DefaultStorageService" type="anyURI" minOccurs="0"/>
        <element name="Preemption" type="boolean" minOccurs="0"/>
        <element name="ServingState" type="glue:ServingState_t"/>
        <element name="TotalJobs" type="unsignedInt" minOccurs="0"/>
        <element name="RunningJobs" type="unsignedInt" minOccurs="0"/>
        <element name="LocalRunningJobs" type="unsignedInt" minOccurs="0"/>
        <element name="WaitingJobs" type="unsignedInt" minOccurs="0"/>
        <element name="LocalWaitingJobs" type="unsignedInt" minOccurs="0"/>
        <element name="StagingJobs" type="unsignedInt" minOccurs="0"/>
        <element name="SuspendedJobs" type="unsignedInt" minOccurs="0"/>
        <element name="PreLRMSWaitingJobs" type="unsignedInt" minOccurs="0"/>
        <element name="EstimatedAverageWaitingTime" type="unsignedLong" minOccurs="0"/>
        <element name="EstimatedWorstWaitingTime" type="unsignedLong" minOccurs="0"/>
        <element name="FreeSlots" type="unsignedInt" minOccurs="0"/>
        <element name="FreeSlotsWithDuration" type="string" minOccurs="0"/>
        <element name="UsedSlots" type="unsignedInt" minOccurs="0"/>
        <element name="RequestedSlots" type="unsignedInt" minOccurs="0"/>
        <element name="ReservationPolicy" type="glue:ReservationPolicy_t" minOccurs="0"/>
        <element name="Tag" type="string" minOccurs="0" maxOccurs="unbounded"/>
        <element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
        <element name="Associations" minOccurs="0">
          <complexType>
            <sequence>
              <element name="ComputingEndpointID" type="string" minOccurs="0"
                maxOccurs="unbounded" />
              <element name="ExecutionEnvironmentLocalID" type="string" minOccurs="0"
                maxOccurs="unbounded" />
              <element name="ComputingActivityID" type="glue:ID_t" minOccurs="0"
                maxOccurs="unbounded" />
            </sequence>
          </complexType>
        </element>
      </sequence>
    </extension>
  </complexContent>
</complexType>

<complexType name="ComputingManager_t">
  <complexContent>
    <extension base="glue:Manager_t">
      <sequence>
        <element name="Type" type="glue:ComputingManagerType_t" minOccurs="0"/>
        <element name="Version" type="string" minOccurs="0"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>

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```

<element name="Reservation" type="boolean" minOccurs="0"/>
<element name="BulkSubmission" type="boolean" minOccurs="0"/>
<element name="TotalPhysicalCPUs" type="unsignedInt" minOccurs="0"/>
<element name="TotalLogicalCPUs" type="unsignedInt" minOccurs="0"/>
<element name="TotalSlots" type="unsignedInt" minOccurs="0"/>
<element name="SlotsUsedByLocalJobs" type="unsignedInt" minOccurs="0"/>
<element name="SlotsUsedByGridJobs" type="unsignedInt" minOccurs="0"/>
<element name="Homogeneity" type="boolean" minOccurs="0"/>
<element name="NetworkInfo" type="glue:NetworkInfo_t" minOccurs="0"/>
<element name="LogicalCPUDistribution" type="string" minOccurs="0"/>
<element name="WorkignAreaShared" type="boolean" minOccurs="0"/>
<element name="WorkignAreaTotal" type="unsignedLong" minOccurs="0"/>
<element name="WorkingAreaFree" type="unsignedLong" minOccurs="0"/>
<element name="WorkingAreaLifeTime" type="unsignedLong" minOccurs="0"/>
<element name="CacheTotal" type="unsignedLong" minOccurs="0"/>
<element name="CacheFree" type="unsignedLong" minOccurs="0"/>
<element name="TmpDir" type="string" minOccurs="0"/>
<element name="ScratchDir" type="string" minOccurs="0"/>
<element name="ApplicationDir" type="string" minOccurs="0"/>
<element name="OtherInfo" type="string" minOccurs="0"/>
<element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
<element name="Benchmark" type="glue:Benchmark_t" minOccurs="0" maxOccurs="unbounded"/>
<element name="ExecutionEnvironment" type="glue:ExecutionEnvironment_t" minOccurs="0"
  maxOccurs="unbounded"/>
<element name="ApplicationEnvironments" minOccurs="0">
  <complexType>
    <sequence>
      <element name="ApplicationEnvironment" type="glue:ApplicationEnvironment_t"
        minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
  </complexType>
</element>
</sequence>
</extension>
</complexContent>
</complexType>

<complexType name="Benchmark_t">
  <sequence>
    <element name="LocalID" type="glue:LocalID_t"/>
    <element name="Type" type="glue:BenchmarkType_t"/>
    <element name="Value" type="int"/>
  </sequence>
</complexType>

<complexType name="ExecutionEnvironment_t">
  <complexContent>
    <extension base="glue:Resource_t">
      <sequence>
        <element name="Platform" type="glue:Platform_t"/>
        <element name="VirtualMachine" type="boolean" minOccurs="0"/>
        <element name="TotalInstances" type="unsignedInt" minOccurs="0"/>
        <element name="UsedInstances" type="unsignedInt" minOccurs="0"/>
        <element name="UnavailableInstances" type="unsignedInt" minOccurs="0"/>
        <element name="PhysicalCPUs" type="unsignedInt" minOccurs="0"/>
        <element name="LogicalCPUs" type="unsignedInt" minOccurs="0"/>
        <element name="CPUMultiplicity" type="glue:CPUMultiplicity_t" minOccurs="0"/>
        <element name="CPUVendor" type="string" minOccurs="0"/>
        <element name="CPUModel" type="string" minOccurs="0"/>
        <element name="CPUVersion" type="string" minOccurs="0"/>
        <element name="CPUClockSpeed" type="unsignedInt" minOccurs="0"/>
        <element name="CPUTimeScalingFactor" type="float" minOccurs="0"/>
        <element name="WallTimeScalingFactor" type="float" minOccurs="0"/>
        <element name="MainMemorySize" type="unsignedLong" minOccurs="0"/>
        <element name="VirtualMemorySize" type="unsignedLong" minOccurs="0"/>
        <element name="OSFamily" type="glue:OSFamily_t" minOccurs="0"/>
        <element name="OSName" type="glue:OSName_t" minOccurs="0"/>
        <element name="OSVersion" type="string" minOccurs="0"/>
        <element name="ConnectivityIn" type="boolean" minOccurs="0"/>
        <element name="ConnectivityOut" type="boolean" minOccurs="0"/>
        <element name="NetworkInfo" type="glue:NetworkInfo_t" minOccurs="0"/>
        <element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
        <element name="Benchmark" type="glue:Benchmark_t" minOccurs="0" maxOccurs="unbounded"/>
        <element name="Associations" minOccurs="0">
          <complexType>
            <sequence>
              <element name="ComputingShareLocalID" type="string" minOccurs="0"
                maxOccurs="unbounded"/>
              <element name="ApplicationEnvironmentLocalID" type="string" minOccurs="0"
                maxOccurs="unbounded"/>
              <element name="ComputingActivityID" type="glue:ID_t" minOccurs="0"
            </sequence>
          </complexType>
        </element>
      </sequence>
    </extension>
  </complexContent>
</complexType>

```

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        maxOccurs="unbounded" />
      </sequence>
    </complexType>
  </element>
</sequence>
</extension>
</complexContent>
</complexType>

<complexType name="ApplicationEnvironment_t">
  <complexContent>
    <extension base="glue:Entity">
      <sequence>
        <element name="LocalID" type="glue:LocalID_t" />
        <element name="Name" type="string" />
        <element name="Version" type="string" minOccurs="0" />
        <element name="Repository" type="anyURI" minOccurs="0" />
        <element name="State" type="glue:AppEnvState_t" minOccurs="0" />
        <element name="RemovalDate" type="dateTime" minOccurs="0" />
        <element name="License" type="glue:License_t" minOccurs="0" />
        <element name="Description" type="string" minOccurs="0" />
        <element name="BestBenchmark" type="glue:BenchmarkType_t" minOccurs="0" />
        <element name="ParallelSupport" type="glue:ParallelSupport_t" minOccurs="0" />
        <element name="MaxSlots" type="unsignedInt" minOccurs="0" />
        <element name="MaxJobs" type="unsignedInt" minOccurs="0" />
        <element name="MaxUserSeats" type="unsignedInt" minOccurs="0" />
        <element name="FreeSlots" type="unsignedInt" minOccurs="0" />
        <element name="FreeJobs" type="unsignedInt" minOccurs="0" />
        <element name="FreeUserSeats" type="unsignedInt" minOccurs="0" />
        <element name="Extensions" type="glue:Extensions_t" minOccurs="0" />
        <element name="ApplicationHandle" type="glue:ApplicationHandle_t" minOccurs="0"
          maxOccurs="unbounded" />
        <element name="Associations" minOccurs="0">
          <complexType>
            <sequence>
              <element name="ExecutionEnvironmentLocalID" type="string" minOccurs="0"
                maxOccurs="unbounded" />
            </sequence>
          </complexType>
        </element>
      </sequence>
    </extension>
  </complexContent>
</complexType>

<complexType name="ApplicationHandle_t">
  <sequence>
    <element name="LocalID" type="string" />
    <element name="Type" type="glue:ApplicationHandleType_t" />
    <element name="Value" type="string" />
    <element name="Extensions" type="glue:Extensions_t" minOccurs="0" />
  </sequence>
</complexType>

<complexType name="ComputingActivity_t">
  <complexContent>
    <extension base="glue:ActivityProperties_t">
      <sequence>
        <element name="Name" type="string" minOccurs="0" />
        <element name="Type" type="glue:ComputingActivityType_t" minOccurs="0" />
        <element name="IDFromEndpoint" type="anyURI" />
        <element name="LocalIDFromManager" type="string" minOccurs="0" />
        <element name="JobDescription" type="glue:JobDescription_t" />
        <element name="State" type="glue:ComputingActivityState_t" />
        <element name="RestartState" type="glue:ComputingActivityState_t" minOccurs="0" />
        <element name="ExitCode" type="int" minOccurs="0" />
        <element name="ComputingManagerExitCode" type="string" minOccurs="0" />
        <element name="Error" type="string" minOccurs="0" maxOccurs="unbounded" />
        <element name="WaitingPosition" type="unsignedInt" minOccurs="0" />
        <element name="UserDomain" type="string" minOccurs="0" />
        <element name="Owner" type="string" />
        <element name="LocalOwner" type="string" minOccurs="0" />
        <element name="RequestedTotalWallTime" type="unsignedLong" minOccurs="0" />
        <element name="RequestedTotalCPUTime" type="unsignedLong" minOccurs="0" />
        <element name="RequestedSlots" type="unsignedInt" minOccurs="0" />
        <element name="RequestedApplicationEnvironment" type="string" minOccurs="0"
          maxOccurs="unbounded" />
        <element name="StdIn" type="string" minOccurs="0" />
        <element name="StdOut" type="string" minOccurs="0" />
        <element name="StdErr" type="string" minOccurs="0" />
      </sequence>
    </extension>
  </complexContent>
</complexType>

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```

<element name="LogDir" type="string" minOccurs="0"/>
<element name="ExecutionNode" type="string" minOccurs="0" maxOccurs="unbounded"/>
<element name="Queue" type="string" minOccurs="0"/>
<element name="UsedTotalWallTime" type="unsignedLong" minOccurs="0"/>
<element name="UsedTotalCPUTime" type="unsignedLong" minOccurs="0"/>
<element name="UsedMainMemory" type="unsignedLong" minOccurs="0"/>
<element name="SubmissionTime" type="dateTime" minOccurs="0"/>
<element name="ComputingManagerSubmissionTime" type="dateTime" minOccurs="0"/>
<element name="StartTime" type="dateTime" minOccurs="0"/>
<element name="ComputingManagerEndTime" type="dateTime" minOccurs="0"/>
<element name="EndTime" type="dateTime" minOccurs="0"/>
<element name="WorkingAreaEraseTime" type="dateTime" minOccurs="0"/>
<element name="ProxyExpirationTime" type="dateTime" minOccurs="0"/>
<element name="SubmissionHost" type="string" minOccurs="0"/>
<element name="SubmissionClientName" type="string" minOccurs="0"/>
<element name="OtherMessages" type="string" minOccurs="0" maxOccurs="unbounded"/>
<element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
<element name="Associations" minOccurs="0">
  <complexType>
    <sequence>
      <element name="ComputingEndpointID" type="anyURI" minOccurs="0"/>
      <element name="ComputingShareLocalID" type="string" minOccurs="0"/>
      <element name="ExecutionEnvironmentLocalID" type="string" minOccurs="0"/>
      <element name="UserDomainID" type="anyURI" minOccurs="0"/>
      <element name="ActivityID" type="anyURI" minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
  </complexType>
</element>
</sequence>
</extension>
</complexContent>
</complexType>

<complexType name="ToStorageService_t">
  <complexContent>
    <extension base="glue:Entity">
      <sequence>
        <element name="LocalID" type="string"/>
        <element name="LocalPath" type="string"/>
        <element name="RemotePath" type="string"/>
        <element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
        <element name="Associations" minOccurs="0">
          <complexType>
            <sequence>
              <element name="ComputingServiceID" type="anyURI"/>
              <element name="StorageServiceID" type="anyURI"/>
            </sequence>
          </complexType>
        </element>
      </sequence>
    </extension>
  </complexContent>
</complexType>

<!-- END COMPUTING ENTITIES -->

<!-- BEGIN STORAGE ENTITIES -->
<complexType name="StorageService_t">
  <complexContent>
    <extension base="glue:ServiceProperties_t">
      <sequence>
        <element name="StorageServiceCapacity" type="glue:StorageServiceCapacity_t" minOccurs="0"
          maxOccurs="unbounded"/>
        <element name="StorageAccessProtocol" type="glue:StorageAccessProtocol_t" minOccurs="0"
          maxOccurs="unbounded"/>
        <element name="StorageEndpoint" type="glue:StorageEndpoint_t" minOccurs="0"
          maxOccurs="unbounded"/>
        <element name="StorageShares" minOccurs="0">
          <complexType>
            <sequence>
              <element name="StorageShare" type="glue:StorageShare_t" minOccurs="0"
                maxOccurs="unbounded"/>
            </sequence>
          </complexType>
        </element>
        <element name="StorageManager" type="glue:StorageManager_t" minOccurs="0"
          maxOccurs="unbounded"/>
        <element name="ToComputingService" type="glue:ToComputingService_t" minOccurs="0"
          maxOccurs="unbounded"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>

```



```

    </sequence>
  </extension>
</complexContent>
</complexType>

<complexType name="StorageServiceCapacity_t">
  <complexContent>
    <extension base="glue:Entity">
      <sequence>
        <element name="LocalID" type="string"/>
        <element name="Type" type="string"/>
        <element name="TotalSize" type="unsignedLong" minOccurs="0"/>
        <element name="FreeSize" type="unsignedLong" minOccurs="0"/>
        <element name="UsedSize" type="unsignedLong" minOccurs="0"/>
        <element name="ReservedSize" type="unsignedLong" minOccurs="0"/>
        <element name="OtherInfo" type="string" minOccurs="0" maxOccurs="unbounded"/>
        <element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>

<complexType name="StorageAccessProtocol_t">
  <complexContent>
    <extension base="glue:Entity">
      <sequence>
        <element name="LocalID" type="string"/>
        <element name="Type" type="glue:StorageAccessProtocolType_t" minOccurs="0"/>
        <element name="Version" type="string"/>
        <element name="MaxStreams" type="int" minOccurs="0"/>
        <element name="OtherInfo" type="string" minOccurs="0" maxOccurs="unbounded"/>
        <element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
      </sequence>
    </extension>
  </complexContent>
</complexType>

<complexType name="StorageEndpoint_t">
  <complexContent>
    <extension base="glue:EndpointProperties_t">
      <sequence>
        <element name="OtherInfo" type="string" minOccurs="0" maxOccurs="unbounded"/>
        <element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
        <element name="AccessPolicy" type="glue:AccessPolicy_t" minOccurs="0"
          maxOccurs="unbounded"/>
        <element name="Associations" minOccurs="0">
          <complexType>
            <sequence>
              <element name="StorageShareLocalID" type="glue:ID_t" minOccurs="0"
                maxOccurs="unbounded"/>
            </sequence>
          </complexType>
        </element>
      </sequence>
    </extension>
  </complexContent>
</complexType>

<complexType name="StorageShare_t">
  <complexContent>
    <extension base="glue:Share_t">
      <sequence>
        <element name="ServingState" type="glue:ServingState_t"/>
        <element name="Path" type="string"/>
        <element name="SharingID" type="glue:LocalID_t"/>
        <element name="AccessLatency" type="glue:AccessLatency_t"/>
        <element name="RetentionPolicy" type="glue:RetentionPolicy_t" minOccurs="0"
          maxOccurs="unbounded"/>
        <element name="ExpirationMode" type="glue:ExpirationMode_t" minOccurs="0" maxOccurs="3"/>
        <element name="DefaultLifeTime" type="unsignedInt" minOccurs="0"/>
        <element name="MaximumLifeTime" type="unsignedInt" minOccurs="0"/>
        <element name="Tag" type="string" minOccurs="0"/>
        <element name="OtherInfo" type="string" minOccurs="0" maxOccurs="unbounded"/>
        <element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
        <element name="MappingPolicy" type="glue:MappingPolicy_t" minOccurs="0"
          maxOccurs="unbounded"/>
        <element name="StorageShareCapacity" type="glue:StorageShareCapacity_t" minOccurs="0"
          maxOccurs="unbounded"/>
        <element name="Associations" minOccurs="0">
          <complexType>
            <sequence>

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```

        <element name="StorageEndpointID" type="glue:ID_t" minOccurs="0"
            maxOccurs="unbounded" />
        <element name="StorageResourceID" type="glue:ID_t" minOccurs="0"
            maxOccurs="unbounded" />
    </sequence>
</complexType>
</element>
</sequence>
</extension>
</complexContent>
</complexType>

<complexType name="StorageShareCapacity_t">
    <complexContent>
        <extension base="glue:Entity">
            <sequence>
                <element name="LocalID" type="glue:LocalID_t"/>
                <element name="Type" type="glue:StorageCapacity_t"/>
                <element name="TotalSize" type="unsignedLong" minOccurs="0"/>
                <element name="FreeSize" type="unsignedLong" minOccurs="0"/>
                <element name="UsedSize" type="unsignedLong" minOccurs="0"/>
                <element name="ReservedSize" type="unsignedLong" minOccurs="0"/>
                <element name="OtherInfo" type="string" minOccurs="0" maxOccurs="unbounded"/>
                <element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
            </sequence>
        </extension>
    </complexContent>
</complexType>

<complexType name="StorageManager_t">
    <complexContent>
        <extension base="glue:Manager_t">
            <sequence>
                <element name="Type" type="glue:StorageManagerType_t"/>
                <element name="Version" type="string" minOccurs="0"/>
                <element name="OtherInfo" type="string" minOccurs="0" maxOccurs="unbounded"/>
                <element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
                <element name="StorageResource" type="glue:StorageResource_t" minOccurs="0"
                    maxOccurs="unbounded" />
            </sequence>
        </extension>
    </complexContent>
</complexType>

<complexType name="StorageResource_t">
    <complexContent>
        <extension base="glue:Resource_t">
            <sequence>
                <element name="Type" type="glue:StorageResourceType_t"/>
                <element name="Latency" type="glue:AccessLatency_t"/>
                <element name="TotalSize" type="unsignedLong" minOccurs="0"/>
                <element name="FreeSize" type="unsignedLong" minOccurs="0"/>
                <element name="UsedSize" type="unsignedLong" minOccurs="0"/>
                <element name="ReservedSize" type="unsignedLong" minOccurs="0"/>
                <element name="OtherInfo" type="string" minOccurs="0" maxOccurs="unbounded"/>
                <element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
                <element name="Associations" minOccurs="0">
                    <complexType>
                        <sequence>
                            <element name="StorageShareLocalID" type="glue:ID_t" minOccurs="0"
                                maxOccurs="unbounded" />
                        </sequence>
                    </complexType>
                </element>
            </sequence>
        </extension>
    </complexContent>
</complexType>

<complexType name="ToComputingService_t">
    <complexContent>
        <extension base="glue:Entity">
            <sequence>
                <element name="LocalID" type="glue:LocalID_t"/>
                <element name="NetworkInfo" type="glue:NetworkInfo_t" minOccurs="0"/>
                <element name="Bandwidth" type="unsignedInt" minOccurs="0"/>
                <element name="OtherInfo" type="string" minOccurs="0" maxOccurs="unbounded"/>
                <element name="Extensions" type="glue:Extensions_t" minOccurs="0"/>
                <element name="Associations" minOccurs="0">

```

```

    <complexType>
      <sequence>
        <element name="StorageAccessProtocolLocalID" type="glue:ID_t" minOccurs="0"
          maxOccurs="unbounded" />
        <element name="ComputingServiceID" type="anyURI" />
        <element name="StorageServiceID" type="anyURI" />
      </sequence>
    </complexType>
  </element>
</sequence>
</extension>
</complexContent>
</complexType>
<!-- END STORAGE ENTITIES -->

<!-- BEGIN DATA TYPES -->
<simpleType name="Latitude_t">
  <restriction base="float">
    <minInclusive value="-90"/>
    <maxInclusive value="90"/>
  </restriction>
</simpleType>

<simpleType name="Longitude_t">
  <restriction base="float">
    <minInclusive value="-180"/>
    <maxInclusive value="180"/>
  </restriction>
</simpleType>

<simpleType name="ActivityType_t">
  <restriction base="string"/>
</simpleType>

<simpleType name="PolicyScheme_t">
  <restriction base="string">
    <annotation>
      <appinfo>basic</appinfo>
      <appinfo>gacl</appinfo>
    </annotation>
  </restriction>
</simpleType>

<simpleType name="PolicyRule_t">
  <restriction base="string"/>
</simpleType>

<simpleType name="EndpointTechnology_t">
  <restriction base="string">
    <annotation>
      <appinfo>webservice</appinfo>
      <appinfo>jndi</appinfo>
      <appinfo>legacy</appinfo>
    </annotation>
  </restriction>
</simpleType>

<simpleType name="EndpointHealthState_t">
  <restriction base="string">
    <enumeration value="ok"/>
    <enumeration value="warning"/>
    <enumeration value="critical"/>
    <enumeration value="unknown"/>
    <enumeration value="other"/>
  </restriction>
</simpleType>

<simpleType name="QualityLevel_t">
  <restriction base="string">
    <enumeration value="production"/>
    <enumeration value="pre-production"/>
    <enumeration value="testing"/>
    <enumeration value="development"/>
  </restriction>
</simpleType>

<simpleType name="ServiceType_t">
  <restriction base="string">
    <annotation>
      <appinfo>
        <enumeration value="org.glite.wms"/>
      </appinfo>
    </annotation>
  </restriction>
</simpleType>

```

```

        <enumeration value="org.glite.lb"/>
        <enumeration value="org.glite.lb"/>
    </appinfo>
    </annotation>
</restriction>
</simpleType>

<simpleType name="Capability_t">
    <restriction base="string">
        <enumeration value="security.authentication"/>
        <enumeration value="security.credentialstorage"/>
        <enumeration value="security.delegation"/>
        <enumeration value="security.authorization"/>
        <enumeration value="security.identitymapping"/>
        <enumeration value="security.attributeauthority"/>
        <enumeration value="security.accounting"/>
        <enumeration value="data.transfer"/>
        <enumeration value="data.management.transfer"/>
        <enumeration value="data.management.replica"/>
        <enumeration value="data.management.storage"/>
        <enumeration value="data.naming.resolver"/>
        <enumeration value="data.naming.scheme"/>
        <enumeration value="data.access.relational"/>
        <enumeration value="data.access.xml"/>
        <enumeration value="data.access.flatfiles"/>
        <enumeration value="information.model"/>
        <enumeration value="information.discovery"/>
        <enumeration value="information.logging"/>
        <enumeration value="information.monitoring"/>
        <enumeration value="information.provenance"/>
        <enumeration value="executionmanagement.jobexecution"/>
        <enumeration value="executionmanagement.jobdescription"/>
        <enumeration value="executionmanagement.jobmanager"/>
        <enumeration value="executionmanagement.executionandplanning"/>
        <enumeration value="executionmanagement.candidatesetgenerator"/>
        <enumeration value="executionmanagement.reservation"/>
    </restriction>
</simpleType>

<simpleType name="ServingState_t">
    <restriction base="string">
        <enumeration value="production"/>
        <enumeration value="draining"/>
        <enumeration value="queuing"/>
        <enumeration value="closed"/>
    </restriction>
</simpleType>

<simpleType name="DN_t">
    <restriction base="string"/>
</simpleType>

<simpleType name="ID_t">
    <restriction base="anyURI"/>
</simpleType>

<simpleType name="LocalID_t">
    <restriction base="string"/>
</simpleType>

<simpleType name="Staging_t">
    <restriction base="string">
        <annotation>
            <appinfo>
                <enumeration value="none"/>
                <enumeration value="stagingin"/>
                <enumeration value="stagingout"/>
                <enumeration value="staginginout"/>
            </appinfo>
        </annotation>
    </restriction>
</simpleType>

<simpleType name="JobDescription_t">
    <restriction base="string">
        <annotation>
            <appinfo>
                <enumeration value="ogf:jsdl:1.0"/>
                <enumeration value="egee:jdl"/>
                <enumeration value="nordugrid:xrsi"/>
                <enumeration value="globus:rs1"/>
            </appinfo>
        </annotation>
    </restriction>
</simpleType>

```

```

        <enumeration value="condor"/>
    </appinfo>
</annotation>
</restriction>
</simpleType>

<simpleType name="SchedulingPolicy_t">
    <restriction base="string">
        <annotation>
            <appinfo>
                <enumeration value="fairshare"/>
                <enumeration value="fifo"/>
                <enumeration value="random"/>
            </appinfo>
        </annotation>
    </restriction>
</simpleType>

<simpleType name="ReservationPolicy_t">
    <restriction base="string">
        <enumeration value="none"/>
        <enumeration value="mandatory"/>
        <enumeration value="optional"/>
    </restriction>
</simpleType>

<simpleType name="BenchmarkType_t">
    <restriction base="string">
        <annotation>
            <appinfo>
                <enumeration value="specint2000"/>
                <enumeration value="specfp2000"/>
                <enumeration value="cint2006"/>
                <enumeration value="cfp2006"/>
                <enumeration value="bogomips"/>
                <enumeration value="linpack"/>
            </appinfo>
        </annotation>
    </restriction>
</simpleType>

<simpleType name="Platform_t">
    <restriction base="string">
        <annotation>
            <appinfo>
                <enumeration value="i386"/>
                <enumeration value="amd64"/>
                <enumeration value="itanium"/>
                <enumeration value="powerpc"/>
                <enumeration value="sparc"/>
            </appinfo>
        </annotation>
    </restriction>
</simpleType>

<simpleType name="CPUMultiplicity_t">
    <restriction base="string">
        <enumeration value="singlecpu-singlecore"/>
        <enumeration value="singlecpu-multicore"/>
        <enumeration value="multicpu-singlecore"/>
        <enumeration value="multicpu-multicore"/>
    </restriction>
</simpleType>

<simpleType name="OSFamily_t">
    <restriction base="string">
        <annotation>
            <appinfo>
                <enumeration value="linux"/>
                <enumeration value="macosx"/>
                <enumeration value="windows"/>
                <enumeration value="solaris"/>
            </appinfo>
        </annotation>
    </restriction>
</simpleType>

<simpleType name="OSName_t">
    <restriction base="string">

```

```

    <annotation>
      <appinfo>
        <enumeration value="scientificlinux"/>
        <enumeration value="scientificlinuxcern"/>
        <enumeration value="ubuntu"/>
        <enumeration value="debian"/>
        <enumeration value="centos"/>
        <enumeration value="fedora"/>
        <enumeration value="rhcs"/>
        <enumeration value="mandrake"/>
        <enumeration value="suse"/>
        <enumeration value="leopard"/>
        <enumeration value="windowsxp"/>
        <enumeration value="windowsvista"/>
      </appinfo>
    </annotation>
  </restriction>
</simpleType>

<simpleType name="ApplicationHandleType_t">
  <restriction base="string">
    <annotation>
      <appinfo>
        <enumeration value="module"/>
        <enumeration value="softenv"/>
        <enumeration value="path"/>
        <enumeration value="executable"/>
      </appinfo>
    </annotation>
  </restriction>
</simpleType>

<simpleType name="License_t">
  <restriction base="string">
    <enumeration value="opensource"/>
    <enumeration value="commercial"/>
    <enumeration value="unknown"/>
  </restriction>
</simpleType>

<simpleType name="ComputingManagerType_t">
  <restriction base="string">
    <annotation>
      <appinfo>
        <enumeration value="lsf"/>
        <enumeration value="sungridengine"/>
        <enumeration value="openpbs"/>
        <enumeration value="torque"/>
        <enumeration value="torquemaui"/>
        <enumeration value="bqs"/>
        <enumeration value="condor"/>
        <enumeration value="loadleveler"/>
        <enumeration value="forkl"/>
      </appinfo>
    </annotation>
  </restriction>
</simpleType>

<simpleType name="NetworkInfo_t">
  <restriction base="string">
    <annotation>
      <appinfo>
        <enumeration value="100megabitethernet"/>
        <enumeration value="gigabitethernet"/>
        <enumeration value="myrinet"/>
        <enumeration value="infiniband"/>
      </appinfo>
    </annotation>
  </restriction>
</simpleType>

<simpleType name="ExecEnv_t">
  <restriction base="string"> </restriction>
</simpleType>

<simpleType name="AppEnvState_t">
  <restriction base="string">
    <annotation>
      <appinfo>

```

```

        <enumeration value="notinstallable"/>
        <enumeration value="installable"/>
        <enumeration value="installingmanually"/>
        <enumeration value="installingautomatically"/>
        <enumeration value="installationfailed"/>
        <enumeration value="installednotverified"/>
        <enumeration value="installedverified"/>
        <enumeration value="installedbroken"/>
        <enumeration value="pendingremoval"/>
        <enumeration value="removing"/>
    </appinfo>
</annotation>
</restriction>
</simpleType>

<simpleType name="ParallelSupport_t">
    <restriction base="string">
        <annotation>
            <appinfo>
                <enumeration value="mpi"/>
                <enumeration value="opennmp"/>
                <enumeration value="none"/>
            </appinfo>
        </annotation>
    </restriction>
</simpleType>

<simpleType name="ComputingActivityType_t">
    <restriction base="string">
        <enumeration value="single"/>
        <enumeration value="collectionelement"/>
        <enumeration value="parallelelement"/>
        <enumeration value="workflownode"/>
    </restriction>
</simpleType>

<simpleType name="ComputingActivityState_t">
    <restriction base="string">
        <annotation>
            <appinfo>
                <enumeration value="bes:pending"/>
                <enumeration value="bes:running"/>
                <enumeration value="bes:finished"/>
                <enumeration value="bes:failed"/>
                <enumeration value="bes:terminated"/>
            </appinfo>
        </annotation>
    </restriction>
</simpleType>

<simpleType name="StorageCapacity_t">
    <restriction base="string">
        <annotation>
            <appinfo>
                <enumeration value="online"/>
                <enumeration value="nearline"/>
                <enumeration value="offline"/>
                <enumeration value="cache"/>
            </appinfo>
        </annotation>
    </restriction>
</simpleType>

<simpleType name="StorageAccessProtocolType_t">
    <restriction base="string">
        <annotation>
            <appinfo>
                <enumeration value="gsiftp"/>
                <enumeration value="file"/>
                <enumeration value="nfs"/>
                <enumeration value="afs"/>
                <enumeration value="rfio"/>
                <enumeration value="gsirfio"/>
                <enumeration value="dcap"/>
                <enumeration value="gsidcap"/>
                <enumeration value="root"/>
                <enumeration value="https"/>
                <enumeration value="http"/>
            </appinfo>
        </annotation>
    </restriction>

```

```

</simpleType>

<simpleType name="AccessLatency_t">
  <restriction base="string">
    <enumeration value="online"/>
    <enumeration value="nearline"/>
    <enumeration value="offline"/>
  </restriction>
</simpleType>

<simpleType name="RetentionPolicy_t">
  <restriction base="string">
    <enumeration value="custodial"/>
    <enumeration value="output"/>
    <enumeration value="replica"/>
  </restriction>
</simpleType>

<simpleType name="ExpirationMode_t">
  <restriction base="string">
    <enumeration value="neverexpire"/>
    <enumeration value="warnwhenexpired"/>
    <enumeration value="releasewhenexpired"/>
  </restriction>
</simpleType>

<simpleType name="StorageManagerType_t">
  <restriction base="string">
    <annotation>
      <appinfo>
        <enumeration value="castor"/>
        <enumeration value="gpfs"/>
        <enumeration value="dcache"/>
        <enumeration value="tsm"/>
        <enumeration value="sse"/>
        <enumeration value="enstore"/>
      </appinfo>
    </annotation>
  </restriction>
</simpleType>

<simpleType name="StorageResourceType_t">
  <restriction base="string">
    <annotation>
      <appinfo>
        <enumeration value="disk"/>
        <enumeration value="tape"/>
        <enumeration value="optical"/>
      </appinfo>
    </annotation>
  </restriction>
</simpleType>
<!-- END DATA TYPES -->
</schema>

```


4. SQL Schema Realization

4.1 Approach

The present rendering of the GLUE 2.0 uses the following concepts:

- Primary key concepts to ensure uniqueness and **fast data access**
- Foreign key relationships¹ between tables to ensure **data integrity**, some with 'on delete' constraints which ensure that data is deleted properly.
- CHECK² constraints for **closed enumeration** types
- An **AttributeType** table containing all multi-valued attribute names from all entities with a numerical id field. These are provided as INSERT statements.
- An **EntryTypes** table containing all table names with a numerical id field which are used in this schema. These are provided as INSERT statements.
- Multi-valued attributes of an entity from the GLUE schema are stored in a table named like the entity, additionally ending with '_MVA' (MultiValuedAttribute). The attribute type is determined by referring to an entry in the AttributeType table.
- The *Extention* concept is realized by adding the key as a new entry into the AttributeType table and the value into the multi-valued table of the related entity. Consequently, the *attributeTypeID* of the sub table entry must be the (numerical) id of the previously added AttributeType table entry
- Table views are used to get information more easily. However, they should not be used excessively (e.g. as sub queries) since they may have great impact on database performance. Table view names must have 'V_' as a prefix.

4.1.1 String lengths

The maximum length of string columns are 255 characters. Below you find an exempt from the most common used attributes and their string length.

Attributename	SQL92 Datatype
ID	VARCHAR (255)
LocalID_t	VARCHAR (128)
Name	VARCHAR (255)
OtherInfo	VARCHAR (255)
Description	VARCHAR (255)
Version	VARCHAR (16)

4.1.2 Schema Document Information

The present relational database schema has been developed using open source software *DIA* [dia] and *tedia2sql* [tedia2sql]. The diagram is therefore not a typical ERD but for tedia2sql tailored UML diagram.

4.1.3 Data Insert Order

The order of information insert is based on the foreign key constraints which ensure data integrity within the table entries. Columns which are defined as such require that the related value in the corresponding table is present.

In the following listings the multi-valued tables are left out for better readability.

4.1.4 Computing

1. UserDomain / AdminDomain
2. UserDomain.Location, UserContact, AdminDomain.Location, AdminContact

¹ Not supported in SQLite ≤ version 3.5.9

² Not supported in MySQL ≤ version 4.1

3. ComputingService
4. ComputingService.Location, ComputingService.Contact, ComputingManager
5. ApplicationEnvironment, Endpoint, ExecutionEnvironment
6. ComputingEndpoint, ApplicationHandle
7. CServiceSService - provided that data from step 1 and 2 of section [4.3.2](#) have been inserted, AppEnvExecEnv
8. ComputingShare, Benchmark
9. ComputingActivity, CShareExecEnv, EndpointShare_LNK, ComputingMappingPolicy

4.1.5 Storage

1. UserDomain / AdminDomain
2. UserDomain.Location, UserContact, AdminDomain.Location, AdminContact
3. StorageService
4. StorageService.Location, StorageService.Contact, StorageAccessProtocol
5. StorageManager, StorageServiceCapacity, StorageEndpoint
6. StorageResource
7. StorageShare
8. StorageShareCapacity, SShareSResource, StorageMappingPolicy

4.1.6 Endpoint Table

The Endpoint table is shared among the computing endpoint and storage endpoint entries since both entities from the GLUE schema differ only on two attributes. The link from an endpoint to its Share(s) is realized by the *EndpointShare_LNK* table (please see [4.5](#)).

Whenever a row in the *Endpoint* table is deleted, it must be ensured that the corresponding entry in the *EndpointShare_LNK* table is removed as well.

4.1.7 Schema Constraints

The present schema has been developed regardless of versions of underlying database systems but in respect on compliance with the SQL92 standard. However, data integrity concepts such as foreign key relationships are supported by most database implementations.

The **EndpointShare_LNK** table serves as a look-up table to map Share entries to Endpoint entries. It is only allowed to insert value pairs which combination reflects a relationship between ComputingShare and ComputingEndpoint or StorageShare and StorageEndpoint. The information from the Benchmark table which is used for ExecutionEnvironment and ComputingManager may be fetched also from its views (*V_CManagerBenchmark* and *V_ExecEnvBenchmark*).

4.2 The Normative SQL Schema Realization of GLUE 2.0

```
-- =====
--  oracle SQL DDL Script File
--  =====

--  =====
--
--  Generated by:      tedia2sql -- v1.2.12
--                    See http://tedia2sql.tigris.org/AUTHORS.html for tedia2sql author information
--
--  Target Database:  oracle
--  Generated at:     Mon May 19 15:54:24 2008
--  Input Files:      GLUE20_41_2.dia
--
--  =====

-- Generated SQL Constraints Drop statements
-- =====
--  Target Database:  oracle
--  SQL Generator:    tedia2sql -- v1.2.12
```

```
--      Generated at:      Mon May 19 15:54:21 2008
--      Input Files:      GLUE20_41_2.dia

drop index uidx_AttType_name;
drop index idx_name;
drop index uidx_Endpoint;
drop index uidx_EntryTypes_name;
drop index idx_UD_name;
drop index idx_uniqueKey;
drop index uidx_SShare;
drop index uidx_SShareCapacity;
drop index uidx_AccessProt;
alter table ComputingServiceLoc drop constraint fk_CServiceLocID ;
alter table AccessPolicy drop constraint fk_UserEndpoint ;
alter table AccessPolicy drop constraint fk_EndpointAccess ;
alter table MappingPolicy drop constraint fk_UserShare ;
alter table ApplicationEnvironment drop constraint fk_CManagerAppEnv ;
alter table EndpointShare_LNK drop constraint fk_EndpointShare ;
alter table ComputingManager drop constraint fk_CServiceCManager ;
alter table ComputingActivity drop constraint fk_CServiceCActivity ;
alter table ComputingActivity drop constraint fk_CManagerCActivity ;
alter table ComputingActivity drop constraint fk_CShareCActivity ;
alter table StorageMappingPolicy drop constraint fk_UserDomainSShare ;
alter table StorageMappingPolicy drop constraint fk_SShareUserDomain ;
alter table StorageShare drop constraint fk_SServiceSShare ;
alter table StorageService drop constraint fk_AdminStorageService ;
alter table StorageAccessProtocol drop constraint fk_SServiceAccessProt ;
alter table ComputingService drop constraint fk_AdminCService ;
alter table ExecutionEnvironment drop constraint fk_ExecEnvCManager ;
alter table Benchmark drop constraint fk_CBenchmarkEntryTypes ;
alter table CService_SService drop constraint fk_CS_CSSS ;
alter table CService_SService drop constraint fk_SS_CSSS ;
alter table StorageShareCapacity drop constraint fk_SShareSCapacity ;
alter table StorageServiceCapacity drop constraint fk_SServiceSCap ;
alter table ComputingMappingPolicy drop constraint fk_UserComputingShare ;
alter table ComputingEndpoint drop constraint fk_EndpointCEndpoint ;
alter table ComputingEndpoint drop constraint fk_CServiceCEndpoint ;
alter table StorageEndpoint drop constraint fk_EndpointSEndpoint ;
alter table StorageEndpoint drop constraint fk_SServiceSEndpoint ;
alter table StorageResource drop constraint fk_SManagerSResource ;
alter table StorageManager drop constraint fk_SServiceSManager ;
alter table ComputingShare drop constraint fk_CShareSService ;
alter table ComputingActivity drop constraint fk_ExecEnvCActivity ;
alter table SShareSResource drop constraint shrSRsrc_fk_StrgShrServiceID ;
alter table SShareSResource drop constraint shrSRsrc_fk_StorageResourceID ;
alter table AppEnvExecEnv drop constraint apnvxcnv_fk_AplctnvrnmntSrvcd ;
alter table AppEnvExecEnv drop constraint apnvxcnv_fk_ExecnvrnmntID ;
alter table CShareExecEnv drop constraint cShrxcnv_fk_CmptngShrServiceID ;
alter table CShareExecEnv drop constraint cShrxcnv_fk_ExecnvrnmntID ;
alter table ComputingService_MVA drop constraint fk_CSMVA_AtType ;
alter table ComputingManager_MVA drop constraint fk_CMMVA_AtType ;
alter table ComputingShare_MVA drop constraint fk_CShareMVA_AtType ;
alter table CShareCapacity_MVA drop constraint fk_CCMVA_AtType ;
alter table ExecutionEnvironment_MVA drop constraint fk_ExecEnv_AtType ;
alter table ApplicationEnvironment_MVA drop constraint fk_AppEnvMVA_AtType ;
alter table ComputingActivity_MVA drop constraint fk_CAMVA_AtType ;
alter table Endpoint_MVA drop constraint fk_Endpoint_AtType ;
alter table StorageShare_MVA drop constraint fk_SShareMVA_AtType ;
alter table SShareCapacity_MVA drop constraint fk_SCMVA_AtType ;
alter table SAccessPolicy_MVA drop constraint fk_SAPMVA_AtType ;
alter table StorageResource_MVA drop constraint fk_SMMVA_AtType ;
alter table StorageManager_MVA drop constraint fk_SMVMA_AtType ;
alter table StorageService_MVA drop constraint fk_SSMVA_AtType ;
alter table UserContact drop constraint fk_UserDomUserContact ;
alter table AdminContact drop constraint fk_AdminDomAdminContact ;
alter table AdminDomainLocation drop constraint fk_AdminDomAdminLoc ;
alter table UserDomainLocation drop constraint fk_UserDomUserLoc ;
alter table StorageServiceLoc drop constraint fk_SServiceLocSService ;
alter table ComputingShare drop constraint fk_CServiceCShare ;
alter table ApplicationHandle drop constraint fk_AppEnvHandleCService ;
alter table ApplicationHandle drop constraint fk_AppEnv ;
```

```
-- Generated Permissions Drops
```

```
-- -----
--      Target Database:   oracle
--      SQL Generator:     tedia2sql -- v1.2.12
--      Generated at:      Mon May 19 15:54:21 2008
--      Input Files:      GLUE20_41_2.dia
```

```
-- Generated SQL View Drop Statements
-----
--      Target Database:  oracle
--      SQL Generator:    tedia2sql -- v1.2.12
--      Generated at:     Mon May 19 15:54:21 2008
--      Input Files:      GLUE20_41_2.dia

drop view GLUE20.V_ExecEnvBenchmark cascade constraints ;
drop view GLUE20.V_CManagerBenchmark cascade constraints ;

-- Generated SQL Schema Drop statements
-----
--      Target Database:  oracle
--      SQL Generator:    tedia2sql -- v1.2.12
--      Generated at:     Mon May 19 15:54:21 2008
--      Input Files:      GLUE20_41_2.dia

drop table GLUE20.SShareSResource cascade constraints ;
drop table GLUE20.AppEnvExecEnv cascade constraints ;
drop table GLUE20.CShareExecEnv cascade constraints ;
drop table GLUE20.AttributeTypes cascade constraints ;
drop table GLUE20.AdminDomain cascade constraints ;
drop table GLUE20.Endpoint cascade constraints ;
drop table GLUE20.EntryTypes cascade constraints ;
drop table GLUE20.UserDomain cascade constraints ;
drop table GLUE20.AccessPolicy cascade constraints ;
drop table GLUE20.MappingPolicy cascade constraints ;
drop table GLUE20.ComputingService cascade constraints ;
drop table GLUE20.ComputingManager cascade constraints ;
drop table GLUE20.ComputingShare cascade constraints ;
drop table GLUE20.ApplicationEnvironment cascade constraints ;
drop table GLUE20.EndpointShare_LNK cascade constraints ;
drop table GLUE20.Benchmark cascade constraints ;
drop table GLUE20.ComputingActivity cascade constraints ;
drop table GLUE20.StorageService cascade constraints ;
drop table GLUE20.StorageShare cascade constraints ;
drop table GLUE20.StorageShareCapacity cascade constraints ;
drop table GLUE20.StorageMappingPolicy cascade constraints ;
drop table GLUE20.StorageAccessProtocol cascade constraints ;
drop table GLUE20.ExecutionEnvironment cascade constraints ;
drop table GLUE20.CService_SService cascade constraints ;
drop table GLUE20.StorageServiceCapacity cascade constraints ;
drop table GLUE20.ComputingMappingPolicy cascade constraints ;
drop table GLUE20.ComputingEndpoint cascade constraints ;
drop table GLUE20.StorageEndpoint cascade constraints ;
drop table GLUE20.StorageManager cascade constraints ;
drop table GLUE20.StorageResource cascade constraints ;
drop table GLUE20.Endpoint_MVA cascade constraints ;
drop table GLUE20.ComputingService_MVA cascade constraints ;
drop table GLUE20.StorageService_MVA cascade constraints ;
drop table GLUE20.ComputingShare_MVA cascade constraints ;
drop table GLUE20.StorageShare_MVA cascade constraints ;
drop table GLUE20.ComputingManager_MVA cascade constraints ;
drop table GLUE20.ExecutionEnvironment_MVA cascade constraints ;
drop table GLUE20.ApplicationEnvironment_MVA cascade constraints ;
drop table GLUE20.ComputingActivity_MVA cascade constraints ;
drop table GLUE20.SShareCapacity_MVA cascade constraints ;
drop table GLUE20.CShareCapacity_MVA cascade constraints ;
drop table GLUE20.SAccessPolicy_MVA cascade constraints ;
drop table GLUE20.StorageManager_MVA cascade constraints ;
drop table GLUE20.StorageResource_MVA cascade constraints ;
drop table GLUE20.UserContact cascade constraints ;
drop table GLUE20.AdminContact cascade constraints ;
drop table GLUE20.AdminDomainLocation cascade constraints ;
drop table GLUE20.UserDomainLocation cascade constraints ;
drop table GLUE20.ComputingServiceLoc cascade constraints ;
drop table GLUE20.StorageServiceLoc cascade constraints ;
drop table GLUE20.ApplicationHandle cascade constraints ;

-- Generated SQL Schema
-----
--      Target Database:  oracle
--      SQL Generator:    tedia2sql -- v1.2.12
--      Generated at:     Mon May 19 15:54:21 2008
--      Input Files:      GLUE20_41_2.dia
```

```

-- SShareSResource
-- Association between StorageShare and StorageResource
create table GLUE20.SShareSResource (
  storageShareServiceID    varchar (255) not null,
  storageShareLocalID      varchar (128) not null,
  storageResourceID        varchar (255) not null,
  constraint pk_SShareSResource primary key
  (storageShareServiceID,storageShareLocalID,storageResourceID)
) ;

-- AppEnvExecEnv
-- Association between ApplicationEnvironment and ExecutionEnvironment
create table GLUE20.AppEnvExecEnv (
  aplctnvrnmntServiceID    varchar (255) not null,
  applicationEnvironmentLocalID varchar (255) not null,
  executionEnvironmentID    varchar (255) not null,
  constraint pk_AppEnvExecEnv primary key
  (aplctnvrnmntServiceID,applicationEnvironmentLocalID,executionEnvironmentID)
) ;

-- CShareExecEnv
-- Association between ComputingShare and ExecutionEnvironment
create table GLUE20.CShareExecEnv (
  computingShareServiceID   varchar (255) not null,
  computingShareLocalID     varchar (128) not null,
  executionEnvironmentID    varchar (255) not null,
  constraint pk_CShareExecEnv primary key
  (computingShareServiceID,computingShareLocalID,executionEnvironmentID)
) ;

-- AttributeTypes
create table GLUE20.AttributeTypes (
  id            integer not null,      -- The ID of the type.
  name          varchar (255) not null, -- The name of the type.
  constraint pk_AttributeTypes primary key (id)
) ;

-- AdminDomain
create table GLUE20.AdminDomain (
  ID            varchar (255) not null,
  name          varchar (255),
  description    varchar (255),
  distributed    integer (1),
  adminDomainID varchar (255), -- The ID of another AdminDomain entry to express the
participation of this entry into the higher level one.
  constraint pk_AdminDomain primary key (ID)
) ;

-- Endpoint
-- Used for Computing and Storage Endpoints. For now, both (computing
-- and storage) endpoints differ by only one additional attribute. It is
-- more feasible to keep the schema simpler and store the differing
-- attribute values in the ValueTable than creating two new tables.
create table GLUE20.Endpoint (
  serviceID      varchar (255) not null, -- The ID of the service it belongs to
  ID             varchar (255) not null,
  name           varchar (255), -- The name of the Endpoint
  url            varchar (255) not null, -- The Endpoint URL
  technology     varchar (255) not null, -- EndpointTechnology_t
  interface      varchar (255) not null,
  implementor    varchar (255),
  implementationName varchar (255),
  implementationVersion varchar (255),
  qualityLevel   varchar (32) not null,
  healthState    varchar (32) not null, -- The state of the Endpoint
  healthStateInfo varchar (255), -- EndpointState
  servingState   varchar (255) not null, -- ServingState_t
  startTime      date, -- DateTime_t, The timestamp for the start time of the endpoint
  issuerCA       varchar (255) not null, -- DN_t
  downTimeAnnounce date, -- DateTime_t, The timestamp for the announcement of the next
scheduled downtime
  downTimeStart  date, -- DateTime_t, The starting timestamp of the next scheduled downtime
  downTimeEnd    date, -- DateTime_t, The ending timestamp of the next scheduled downtime
  downTimeInfo   varchar (255), -- Description of the next scheduled downtime
  check          (qualitylevel in ( 'development', 'testing', 'pre-production',
'production')),
  check          (healthstate in ('ok', 'warning', 'critical', 'unknown', 'other')),
  check          (servingstate in ('production', 'draining', 'queueing', 'closed')),
  constraint pk_Endpoint primary key (ID)
) ;

```

```

-- EntryTypes
create table GLUE20.EntryTypes (
  id                integer not null,
  name              varchar (255) not null,
  constraint pk_EntryTypes primary key (id)
) ;

-- UserDomain
create table GLUE20.UserDomain (
  ID                varchar (255) not null,
  name              varchar (255),
  description        varchar (255),
  level             integer,
  userDomainID      varchar (255), -- The ID of another UserDomain entry to express the
participation of this entry into the higher level one.
  constraint pk_UserDomain primary key (ID)
) ;

-- AccessPolicy
create table GLUE20.AccessPolicy (
  serviceID          varchar (255) not null, -- The ID of the service this access policy applies
to (same as endpoint)
  localID            varchar (128) not null, -- LocalID_t. Identifier local to the service of
the endpoint.
  userdomainID       varchar (255) not null, -- The ID of the UserDomain
  endpointID          varchar (255) not null, -- The ID of the Endpoint this UserDomain may access
  scheme             varchar (30) not null,
  constraint pk_AccessPolicy primary key (serviceID,localID)
) ;

-- MappingPolicy
create table GLUE20.MappingPolicy (
  userDomainID       varchar (255) not null, -- The User Domain ID
  shareID            varchar (128) not null, -- The ID of the Share the UserDomain may utilize
  serviceID          varchar (255) not null, -- The ID of the service the share belongs to
  scheme             varchar (30) not null,
  Rule               varchar (128),
  constraint pk_MappingPolicy primary key (userDomainID,shareID,serviceID,scheme)
) ;

-- ComputingService
-- Table to store information about Computing Service. Multivalued
-- attributes: - Statuspage - OtherInfo
create table GLUE20.ComputingService (
  ID                varchar (255) not null, -- A system wide uniqueID
  name              varchar (255),
  type              varchar(128) not null, -- ServiceType_t
  qualityLevel      varchar (32) not null, -- QualityLevel_t
  complexity        varchar (64),
  totalJobs         integer, -- [job]
  runningJobs       integer, -- [job]
  waitingJobs       integer, -- [job]
  stagingJobs       integer, -- [job]
  suspendedJobs     integer, -- [job]
  preLRMSWaitingJobs integer, -- [job]
  domainID          varchar (255) not null, -- The (foreign) key to its AdminDomain
  constraint pk_ComputingService primary key (ID)
) ;

-- ComputingManager
create table GLUE20.ComputingManager (
  serviceID          varchar (255) not null, -- The service it belongs to
  ID                varchar (255) not null,
  name              varchar (128),
  type              varchar (64) not null, -- ComputingManagerType_t
  version           varchar (16),
  reservation       integer (1), -- Boolean
  bulkSubmission     integer (1), -- Boolean
  totalPhysicalCPU   integer,
  totalLogicalCPUs   integer,
  totalSlots         integer, -- [slot]
  slotsUsedByLocalJobs integer, -- [slot]
  slotsUsedByGridJobs integer, -- [slot]
  homogeneity        integer, -- Boolean
  networkInfo        varchar (255), -- NetworkInfo_t
  localCpuDistribution varchar (255),
  workingAreaShared  integer (1), -- Boolean
  workingAreaTotal   integer, -- [GB]
  workingAreaFree    integer, -- [GB]
  workingAreaLifeTime integer, -- [sec]
  cacheTotal         integer, -- [GB]

```

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cacheFree                integer,          -- [GB]
tmpDir                   varchar (255),
scratchDir               varchar (255),
applicationDir           varchar (255),
envLocalID               varchar (128) not null, -- LocalID_t
applicationEnvID          integer not null,    -- The application environment ID
constraint pk_ComputingManager primary key (ID)
) ;

-- ComputingShare
create table GLUE20.ComputingShare (
  serviceID               varchar (255) not null, -- The ID of the Service it belongs to
  localID                 varchar (128) not null, -- LocalID_t, A local identifier in the scope of
the service
  name                    varchar (255),
  description              varchar(255),
  mappingQueue            varchar(128),
  maxWallTime             integer,          -- [sec]
  maxTotalWallTime        integer,          -- [sec]
  minWallTime             integer,          -- [sec]
  defaultWallTime         integer,          -- [sec]
  maxCPUTime              integer,          -- [sec]
  maxTotalCPUTim          integer,          -- [sec]
  minCPUTime              integer,          -- [sec]
  defaultCPUTime          integer,          -- [sec]
  maxTotalJobs            integer,          -- [job]
  maxRunningJobs          integer,          -- [job]
  maxWaitingJobs          integer,          -- [job]
  maxPreLRMSWaitingJobs   integer,          -- [job]
  maxUserRunningJobs      integer,          -- [job]
  maxSlotsPerJobs         integer,          -- [job]
  maxStageInStreams       integer,          -- [stream]
  maxStageOutStreams      integer,          -- [stream]
  schedulingPolicy         varchar (32),    -- schedulingPolicy_t
  maxMemory               integer,          -- [MB]
  maxDiskSpace            integer,          -- [GB]
  preemption              integer (1),      -- Boolean
  servingstate            varchar (32) not null, -- servingState_t
  totalJobs               integer,          -- [job]
  runningJobs             integer,          -- [job]
  localRunningJobs        integer,          -- [job]
  waitingJobs             integer,          -- [job]
  localWaitingJobs        integer,          -- [job]
  stagingJobs             integer,          -- [job]
  suspendedJobs           integer,          -- [job]
  preLRMSWaitingJobs      integer,          -- [job]
  estimatedAverageWaitingTime integer,      -- [sec]
  estimatedWorstWaitingTime integer,        -- [sec]
  freeSlots               integer,          -- [slot]
  freeSlotsWithDuration   integer,          -- [slot]
  usedSlots               integer,          -- [slot]
  requestedSlots          integer,          -- [slot]
  reservationPolicy        varchar (64),    -- ReservationPolicy_t
  defaultSService         varchar (255),    -- The ID of the default Storage Service to use
  check                   (reservationpolicy in ('none', 'mandatory', 'optional')),
  constraint pk_ComputingShare primary key (serviceID,localID)
) ;

-- ApplicationEnvironment
-- This Table also includes the 'Application Handle ' object Attributes
create table GLUE20.ApplicationEnvironment (
  serviceID               varchar (255) not null, -- The ID of the service this
ApplicationEnvironment belongs to
  localID                 varchar (255) not null, -- LocalID_t, A local identifier in the scope of
the service
  name                    varchar (255) not null,
  version                 varchar (16),
  repository              varchar (255),
  state                   varchar (100),    -- AppEnvState_t
  removalDate             datetime,        -- DateTime_t
  license                 varchar (128),    -- License_t
  description             varchar (255),
  parallelSupport         varchar (16),
  maxSlots                integer,          -- [slot]
  maxJobs                 integer,          -- [job]
  maxUserSeats            integer,          -- [user seat]
  freeSlots               integer,          -- [slot]
  freeJobs                integer,          -- [job]
  freeUserSeats           integer,          -- [user seat]
  cManagerID              varchar (255) not null, -- The ID of the computing manager where this
application environment belongs to (and may be used by)

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        check                (license in ('opensource', 'commercial', 'other', 'unknown')),
        constraint pk_ApplicationEnvironment primary key (serviceID,localID)
    ) ;

-- EndpointShare_LNK
-- Lookup table to associate an Endpoint with a Share (Computing and
-- Storage)
create table GLUE20.EndpointShare_LNK (
    endpointID                varchar (255) not null, -- The primary key from the endpoint table.
    shareID                   varchar (128) not null, -- The primary key from the Share
    serviceID                 varchar (255) not null, -- The ID of the service the endpoint and share
    belong to
    constraint pk_EndpointShare_LNK primary key (endpointID,shareID,serviceID)
) ;

-- Benchmark
-- The Benchmark table is used by ComputingManager and
-- ExecutionEnvironment. Therefore each data set must be identified by
-- the 'type' id from the entrytypes table.
create table GLUE20.Benchmark (
    parentID                  varchar (255) not null, -- the uniqueID of the parent (
    ExecutionEnvironment or ComputingManager)
    parentType                integer not null,      -- the type of the parent entry (foreign key to
    EntryType table) for ComputingManager or ExecutionEnvironment
    localID                   varchar (128) not null, -- LocalID_t, local to ComputingService
    type                      varchar (32) not null,  -- Benchmark_t
    value                     float not null,
    check                     (parenttype in (102 108)), -- ComputingManager, ExecutionEnvironement
) ;

-- ComputingActivity
create table GLUE20.ComputingActivity (
    serviceID                 varchar (255) not null, -- The ID of the service which manages this
    activity
    ID                        varchar (255) not null,
    name                      varchar (255),
    type                      varchar (32), -- ComputingActivityType_t
    idFromEndpoint            varchar (255),
    localIdFromManager        varchar (255),
    jobDescription             varchar (128), -- JobDescription_t
    state                     varchar (32) not null, -- ComputingActivityState_t
    restartState              varchar (32), -- ComputingActivityState_t
    exitCode                  integer,
    computingManagerExitCode   varchar (64),
    waititingPosition          integer,
    userDomain                varchar (255),
    owner                     varchar (128) not null,
    localOwner                varchar (128),
    requestedTotalWallTime     integer, -- [sec]
    requestedTotalCPUtime      integer, -- [sec]
    requestedSlots             integer, -- [slot]
    stdIn                     varchar (128),
    stdOut                    varchar (128),
    stdErr                    varchar (128),
    logDir                    varchar (128),
    queue                     varchar (255),
    usedTotalWallTime          integer, -- [sec]
    usedTotalCPUtime           integer, -- [sec]
    usedMainMemory             integer, -- [MB]
    submissionTime             date, -- DateTime_t
    cmSubmissionTime           datetime, -- DateTime_t, ComputingManagerSubmissionTime
    startTime                 date, -- DateTime_t
    cmEndTime                 date, -- DateTime_t
    endTime                   date, -- DateTime_t
    workingAreaEraseTime       date, -- DateTime_t
    proxyExpirationTime        date, -- DateTime_t
    submissionHost             varchar (255),
    submissionClientName       varchar (128),
    endpointID                 varchar (255), -- The ID of the ComputingEndpoint this activity has been
    submitted by
    cManagerID                 varchar(255), -- The ID of the ComputingManager this activity is assigned
    to
    shareID                   varchar (128), -- The ID of the share this activity is mapped to
    executionEnvID            varchar (255), -- The ID of the environment this activity is executed in
    check                     (type in ('single', 'collectionelement', 'parallelelement',
    'workflownode')),
    constraint pk_ComputingActivity primary key (ID)
) ;

-- StorageService
create table GLUE20.StorageService (

```



```

        ID                varchar (255) not null,
        name              varchar (255),
        type              varchar (128) not null, -- ServiceType_t
        qualityLevel      varchar (32) not null, -- QualityLevel_t
        complexity        varchar (64),
        domainID          varchar (255) not null, -- The ID of the Domain where this Service belongs
    to
        locationID        integer,
        constraint pk_StorageService primary key (ID)
    ) ;

-- StorageShare
create table GLUE20.StorageShare (
    serviceID             varchar (255) not null,
    localID              varchar (128) not null, -- LocalID_t
    name                 varchar (255),
    description          varchar (255),
    servingState         varchar (32) not null, -- servingState_t
    path                 varchar (255),
    sharingID            varchar (128) not null, -- LocalID_t common to the storage shares which use
the same storage share capacities
    accessLatency        varchar (64) not null, -- AccessLatency_t
    defaultLifeTime      integer, -- [sec]
    maximumLifeTime      integer, -- [sec]
    tag                 varchar (255),
    check                (accesslatency in ('online', 'nearline', 'offline')),
    constraint pk_StorageShare primary key (serviceID,localID)
) ;

-- StorageShareCapacity
create table GLUE20.StorageShareCapacity (
    localID              varchar (128) not null, -- LocalID_t
    serviceID            varchar (255) not null, -- The ID of the service this capacity in in the
scope of
    shareID              varchar (255) not null, -- The ID of the related parent entry
    type                 varchar (64) not null, -- StorageCapacity_t
    totalSize            integer, -- [GB]
    usedSize             integer, -- [GB]
    freeSize             integer, -- [GB]
    reservedSize         integer, -- [GB]
    constraint pk_StorageShareCapacity primary key (serviceID,shareID)
) ;

-- StorageMappingPolicy
-- Maps a UserDomain to StorageShare(s) it may utilize.
create table GLUE20.StorageMappingPolicy (
    userDomainID         varchar (255) not null, -- The ID which references the user domain where
this rule applies to.
    shareID              varchar (128) not null, -- The ID of the Share this UserDomain may utilize
    serviceID            varchar (255) not null,
    localID              varchar (128) not null,
    rule                 varchar (128),
    scheme               varchar (128), -- policyScheme_t
    constraint pk_StorageMappingPolicy primary key (userDomainID,shareID,serviceID,localID)
) ;

-- StorageAccessProtocol
create table GLUE20.StorageAccessProtocol (
    serviceID            varchar (255) not null, -- The ID of the StorageService which offers these
access protocols.
    localID              varchar (128) not null, -- A local identifier within the scope of the
StorageService
    type                 varchar (16) not null, -- StorageAccessProtocol_t
    version              varchar (20),
    maxStreams           integer,
    constraint pk_StorageAccessProtocol primary key (serviceID,localID)
) ;

-- ExecutionEnvironment
create table GLUE20.ExecutionEnvironment (
    serviceID            varchar (255) not null, -- The ID of the service this execution environment
belongs to
    ID                   varchar (255) not null,
    platform             varchar (32) not null, -- PlatformType_t
    virtualMachine       integer, -- Boolean
    totalInstances       integer,
    usedInstances        integer,
    unavailableInstances  integer,
    physicalCPUs         integer,
    logicalCPUs          integer,
    cpuMultiplicity      varchar (128), -- CPUMultiplicity_t

```

```

cpuVendor          varchar (32),
cpuModel           varchar (64),
cpuVersion         varchar (16),
cpuClockSpeed      integer,          -- [MHz]
cpuTimeScalingFactor float,
wallTimeScalingFactor float,
mainMemorySize     integer not null, -- [MB]
virtualMemorySize  integer,          -- [MB]
osFamily          varchar (32) not null, -- OSFamily_t
osName            varchar (64), -- OSName_t
osVersion         varchar (16),
connectivityIn     integer not null, -- Boolean
connectivityOut    integer not null, -- Boolean
cManagerID        varchar (255) not null, -- ComputingManagerID
check             (cpumultiplicity in ('singlecpu-singlecore', 'singlecpu-multicore',
'multicpu-singlecore','multicpu-multicore')),
constraint pk_ExecutionEnvironment primary key (ID)
) ;

-- CService_SService
create table GLUE20.CService_SService (
localID          varchar (128) not null, -- LocalID_t
localPath        varchar (255) not null,
remotePath       varchar (255) not null,
cServiceID       varchar (255) not null, -- The ID of the related computing service
sServiceID       varchar (255) not null -- The ID of the related storage service
) ;

-- StorageServiceCapacity
create table GLUE20.StorageServiceCapacity (
localID          varchar (128) not null, -- LocalID_t
serviceID        varchar (255) not null, -- The ID of the related parent entry
type            varchar (64) not null, -- StorageCapacity_t
totalSize        integer,          -- [GB]
usedSize         integer,          -- [GB]
freeSize         integer,          -- [GB]
reservedSize     integer,          -- [GB]
constraint pk_StorageServiceCapacity primary key (localID,serviceID)
) ;

-- ComputingMappingPolicy
-- Maps a UserDomain to ComputingShare(s) it may utilize.
create table GLUE20.ComputingMappingPolicy (
userDomainID     varchar (255) not null, -- The ID which references the user domain where
this rule applies to.
serviceID        varchar (255) not null, -- The serviceID of the share and of the mapping
policy
shareID          varchar (128) not null, -- LocalID_t, The localID of the Share this
UserDomain may utilize
localID          varchar (100) not null, -- LocalID_t, the localID of the mapping policy
scheme           varchar (100), -- policyScheme_t
rule            varchar (100),
constraint pk_ComputingMappingPolicy primary key (userDomainID,serviceID,shareID,localID)
) ;

-- ComputingEndpoint
-- This table links the computing service to a computing endpoint. The
-- table contains a column which needs to be an ID of the general
-- endpoint table.
create table GLUE20.ComputingEndpoint (
endpointID       varchar (255) not null, -- The ID of the Endpoint entry
cServiceID       varchar (255) not null, -- The ID of the computing service
staging         varchar (32), -- Staging_t
constraint pk_ComputingEndpoint primary key (endpointID,cServiceID)
) ;

-- StorageEndpoint
-- This table links the computing service to a computing endpoint. The
-- table contains a column which needs to be an ID of the general
-- endpoint table. Through this we enable to extract storage and
-- computing endpoint common attributes but allow to have individual
-- attributes by adding columns to this table.
create table GLUE20.StorageEndpoint (
endpointID       varchar (255) not null, -- The ID of the Endpoint entry
sServiceID       varchar (255) not null, -- The ID of the computing service
constraint pk_StorageEndpoint primary key (endpointID,sServiceID)
) ;

-- StorageManager
create table GLUE20.StorageManager (
ID              varchar (255) not null,

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```

        type                varchar (64) not null, -- StorageManager_t
        version              varchar (16),
        sServiceID           varchar (255) not null, -- The ID of the service this manager participates
in
    constraint pk_StorageManager primary key (ID)
) ;

-- StorageResource
create table GLUE20.StorageResource (
    ID                varchar (255) not null,
    name              varchar (255),
    type              varchar (32) not null, -- StorageResourceType_t
    latency           varchar (32) not null, -- AccessLatency_t
    totalSize         integer, -- [GB]
    freeSize          integer, -- [GB]
    usedSize          integer, -- [GB]
    sManagerID        varchar (255) not null, -- The ID of the storage manager entry
    check             (accesslatency in ('online', 'nearline', 'offline')),
    constraint pk_StorageResource primary key (ID)
) ;

-- Endpoint_MVA
-- This table keeps multivalued attribute values for Endpoint entries:
-- InterfaceExtension WSDL SupportedProfile Semantics TrustedCA [DN_t]
create table GLUE20.Endpoint_MVA (
    endpointID        varchar (255) not null,
    attributeType      integer, -- InterfaceExtension, WSDL, SupportedProfile, Semantics,
TrustedCA [DN_t]
    value             varchar (255) not null
) ;

-- ComputingService_MVA
-- This table keeps multivalued attribute values for ComputingService
-- entries: - Capability - StatusPage - OtherInfo
create table GLUE20.ComputingService_MVA (
    endpointID        varchar (255) not null,
    attributeType      integer,
    value             varchar (255) not null
) ;

-- StorageService_MVA
-- This table keeps multivalued attribute values for StorageService
-- entries: Capability_t StatusPage OtherInfo
create table GLUE20.StorageService_MVA (
    endpointID        varchar (255) not null,
    attributeType      integer, -- OtherInfo, StatusPage, Capability_t
    value             varchar (255) not null
) ;

-- ComputingShare_MVA
-- This table keeps multivalued attribute values for ComputingShare
-- entries: Tag
create table GLUE20.ComputingShare_MVA (
    endpointID        varchar (255) not null,
    attributeType      integer, -- Tag
    value             varchar (255) not null
) ;

-- StorageShare_MVA
-- This table keeps multivalued attribute values for StorageShare
-- entries: RetentionPolicy ExpirationMode OtherInfo
create table GLUE20.StorageShare_MVA (
    endpointID        varchar (255) not null,
    attributeType      integer, -- OtherInfo, ExpirationMode, RetentionPolicy
    value             varchar (255) not null
) ;

-- ComputingManager_MVA
-- This table keeps multivalued attribute values for ComputingManager
-- entries: - OtherInfo
create table GLUE20.ComputingManager_MVA (
    endpointID        varchar (255) not null,
    attributeType      integer, -- OtherInfo
    value             varchar (255) not null
) ;

-- ExecutionEnvironment_MVA
-- This table keeps multivalued attribute values for
-- ExecutionEnvironment entries: NetworkInfo_t
create table GLUE20.ExecutionEnvironment_MVA (
    endpointID        varchar (255) not null,

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        attributeType      integer,          -- NetworkInfo_t
        value               varchar (255) not null
    ) ;

-- ApplicationEnvironment_MVA
-- This table keeps multivalued attribute values for
-- ApplicationEnvironment entries: BestBenchmark_t
create table GLUE20.ApplicationEnvironment_MVA (
    endpointID             varchar (255) not null,
    attributeType           integer,          -- BestBenchmark_t
    value                  varchar (255) not null
) ;

-- ComputingActivity_MVA
-- This table keeps multivalued attribute values for ComputingActivity
-- entries: Error RequestedApplicationEnvironment - ExecutionNode -
-- OtherMessages
create table GLUE20.ComputingActivity_MVA (
    endpointID             varchar (255) not null,
    attributeType           integer,          -- Error, RequestedApplicationEnvironment, ExecutionNode,
    OtherMessages
    value                  varchar (255) not null
) ;

-- SShareCapacity_MVA
-- This table keeps multivalued attribute values for
-- StorageShareCapacity entries: OtherInfo
create table GLUE20.SShareCapacity_MVA (
    endpointID             varchar (255) not null,
    attributeType           integer,          -- OtherInfo
    value                  varchar (255) not null
) ;

-- CShareCapacity_MVA
-- This table keeps multivalued attribute values for
-- ComputingShareCapacity entries: OtherInfo
create table GLUE20.CShareCapacity_MVA (
    endpointID             varchar (255) not null,
    attributeType           integer,          -- OtherInfo
    value                  varchar (255) not null
) ;

-- SAccessPolicy_MVA
-- This table keeps multivalued attribute values for StorageAccessPolicy
-- entries: OtherInfo
create table GLUE20.SAccessPolicy_MVA (
    endpointID             varchar (255) not null,
    attributeType           integer,          -- OtherInfo
    value                  varchar (255) not null
) ;

-- StorageManager_MVA
-- This table keeps multivalued attribute values for StorageManager
-- entries: OtherInfo
create table GLUE20.StorageManager_MVA (
    endpointID             varchar (255) not null,
    attributeType           integer,          -- OtherInfo
    value                  varchar (255) not null
) ;

-- StorageResource_MVA
-- This table keeps multivalued attribute values for StorageResource
-- entries: OtherInfo
create table GLUE20.StorageResource_MVA (
    endpointID             varchar (255) not null,
    attributeType           integer,          -- OtherInfo
    value                  varchar (255) not null
) ;

-- UserContact
-- Table to keep UserDomain Contact entries.
create table GLUE20.UserContact (
    userDomainID           varchar (255) not null,
    localID                varchar(128) not null, -- LocalID_t
    url                    varchar(255) not null,
    type                   varchar(50) not null, -- ContactType_t
    constraint pk_UserContact primary key (userDomainID,localID)
) ;

-- AdminContact
-- Table to keep AdminDomain Contact entries.

```

```

create table GLUE20.AdminContact (
    adminDomainID      varchar (255) not null,
    localID             varchar(128) not null, -- LocalID_t
    url                 varchar(255) not null,
    type                varchar(50) not null, -- ContactType_t
    constraint pk_AdminContact primary key (adminDomainID,localID)
) ;

-- AdminDomainLocation
-- Table to keep AdminDomain Location entries.
create table GLUE20.AdminDomainLocation (
    adminDomainID      varchar (255) not null, -- The ID of the parent entry
    localID             varchar (128) not null,
    name               varchar(255) not null,
    address             varchar (128),
    place              varchar (64),
    country             varchar (32),
    postcode           varchar (16),
    longitude           float,
    latitude            float,
    constraint pk_AdminDomainLocation primary key (adminDomainID,localID)
) ;

-- UserDomainLocation
-- Table to keep UserDomain Location entries.
create table GLUE20.UserDomainLocation (
    userDomainID       varchar (255) not null, -- The ID of the parent entry
    localID             varchar (128) not null,
    name               varchar(255) not null,
    address             varchar (128),
    place              varchar (64),
    country             varchar (32),
    postcode           varchar (16),
    longitude           float,
    latitude            float,
    constraint pk_UserDomainLocation primary key (userDomainID,localID)
) ;

-- ComputingServiceLoc
-- Table to keep ComputingService Location entries.
create table GLUE20.ComputingServiceLoc (
    computingServiceID  varchar (255) not null, -- The ID of the parent entry
    localID             varchar (128) not null,
    name               varchar(255) not null,
    address             varchar (128),
    place              varchar (64),
    country             varchar (32),
    postcode           varchar (16),
    longitude           float,
    latitude            float,
    constraint pk_ComputingServiceLoc primary key (computingServiceID,localID)
) ;

-- StorageServiceLoc
-- Table to keep StorageService Location entries.
create table GLUE20.StorageServiceLoc (
    storageServiceID    varchar (255) not null, -- The ID of the parent entry
    localID             varchar (128) not null,
    name               varchar(255) not null,
    address             varchar (128),
    place              varchar (64),
    country             varchar (32),
    postcode           varchar (16),
    longitude           float,
    latitude            float,
    constraint pk_StorageServiceLoc primary key (storageServiceID,localID)
) ;

-- ApplicationHandle
-- The table which keeps ApplicationHandle entries.
create table GLUE20.ApplicationHandle (
    serviceID           varchar (255) not null, -- The ID of the computing service where the
    application handle is managed by.
    localID             varchar (128) not null, -- LocalID_t, A local identifier opaque to the
    Computing Service
    type                varchar (32) not null, -- ApplicationHandle_t
    value               varchar (255) not null,
    appEnvLocalID       varchar (128) not null -- LocalID_t, the localID from the application
    environment it gives additional information to.
) ;

```

```
-- Generated SQL Views
-----
--      Target Database:  oracle
--      SQL Generator:    tedia2sql -- v1.2.12
--      Generated at:     Mon May 19 15:54:21 2008
--      Input Files:      GLUE20_41_2.dia

-- V_ExecEnvBenchmark
-- A View which filters the Benchmark entries for the
-- ExecutionEnvironment.
create view GLUE20.V_ExecEnvBenchmark as
  select parentID, parentType, localID, type, value
  from Benchmark
  where parentType = 108
;

-- V_CManagerBenchmark
-- A View which filters the Benchmark entries for the ComputingManager.
create view GLUE20.V_CManagerBenchmark as
  select parentID, parentType, localID, type, value
  from Benchmark
  where parentType = 102
;

-- Generated Permissions
-----
--      Target Database:  oracle
--      SQL Generator:    tedia2sql -- v1.2.12
--      Generated at:     Mon May 19 15:54:21 2008
--      Input Files:      GLUE20_41_2.dia

-- Generated SQL Insert statements
-----
--      Target Database:  oracle
--      SQL Generator:    tedia2sql -- v1.2.12
--      Generated at:     Mon May 19 15:54:21 2008
--      Input Files:      GLUE20_41_2.dia

-- inserts for EntryTypes
insert into EntryTypes values ( 1, 'ValueTable' ) ;
insert into EntryTypes values ( 2, 'AttributeTypes' ) ;
insert into EntryTypes values ( 3, 'EntryTypes' ) ;
insert into EntryTypes values ( 4, 'AdminDomain' ) ;
insert into EntryTypes values ( 5, 'UserDomain' ) ;
insert into EntryTypes values ( 6, 'Location' ) ;
insert into EntryTypes values ( 7, 'Contact' ) ;
insert into EntryTypes values ( 8, 'Endpoint' ) ;
insert into EntryTypes values ( 9, 'MappingPolicy' ) ;
insert into EntryTypes values ( 10, 'AccessPolicy' ) ;
insert into EntryTypes values ( 11, 'ManagementPolicy' ) ;
insert into EntryTypes values ( 100, 'ComputingService' ) ;
insert into EntryTypes values ( 101, 'ComputingShare' ) ;
insert into EntryTypes values ( 102, 'ComputingManager' ) ;
insert into EntryTypes values ( 103, 'ComputingActivity' ) ;
insert into EntryTypes values ( 104, 'ComputingEndpoint' ) ;
insert into EntryTypes values ( 105, 'Benchmark' ) ;
insert into EntryTypes values ( 106, 'ApplicationEnvironment' ) ;
insert into EntryTypes values ( 107, 'ApplicationHandle' ) ;
insert into EntryTypes values ( 108, 'ExecutionEnvironment' ) ;
insert into EntryTypes values ( 200, 'StorageService' ) ;
insert into EntryTypes values ( 201, 'StorageShare' ) ;
insert into EntryTypes values ( 202, 'StorageResource' ) ;
insert into EntryTypes values ( 203, 'StorageEnvironment' ) ;
insert into EntryTypes values ( 204, 'StorageAccessProtocol' ) ;
insert into EntryTypes values ( 205, 'StorageMappingPolicy' ) ;
insert into EntryTypes values ( 206, 'StorageEndpoint' ) ;

-- inserts for AttributeTypes
insert into AttributeTypes values ( 1, 'OtherInfo' ) ;
insert into AttributeTypes values ( 2, 'WWW' ) ;
insert into AttributeTypes values ( 3, 'Owner' ) ;
insert into AttributeTypes values ( 4, 'ManagerEndpoint' ) ;
insert into AttributeTypes values ( 5, 'ServiceCapability' ) ;
insert into AttributeTypes values ( 6, 'StatusPage' ) ;
```

```

insert into AttributeTypes values ( 7, 'Capability' ) ;
insert into AttributeTypes values ( 8, 'WSDL' ) ;
insert into AttributeTypes values ( 9, 'SupportedProfile' ) ;
insert into AttributeTypes values ( 10, 'Semantics' ) ;
insert into AttributeTypes values ( 11, 'Rule' ) ;
insert into AttributeTypes values ( 12, 'TrustedCA' ) ;
insert into AttributeTypes values ( 13, 'NetworkInfo' ) ;
insert into AttributeTypes values ( 14, 'Error' ) ;
insert into AttributeTypes values ( 15, 'RequestedApplicationEnvironment' ) ;
insert into AttributeTypes values ( 16, 'OtherMessages' ) ;
insert into AttributeTypes values ( 17, 'ExpirationMode' ) ;
insert into AttributeTypes values ( 18, 'Tag' ) ;
insert into AttributeTypes values ( 19, 'InterfaceExtension' ) ;
insert into AttributeTypes values ( 20, 'JobDescription' ) ;
insert into AttributeTypes values ( 21, 'RetentionPolicy' ) ;
insert into AttributeTypes values ( 22, 'BestBenchmark' ) ;
insert into AttributeTypes values ( 23, 'ExecutionHost' ) ;

-- Generated SQL Constraints
-- -----
--      Target Database:      oracle
--      SQL Generator:        tedia2sql -- vl.2.12
--      Generated at:         Mon May 19 15:54:21 2008
--      Input Files:          GLUE20_41_2.dia

create unique index uidx_AttType_name on GLUE20.AttributeTypes (name) ;
create index idx_name on GLUE20.AdminDomain (name) ;
create unique index uidx_Endpoint on GLUE20.Endpoint (serviceID,ID) ;
create unique index uidx_EntryTypes_name on GLUE20.EntryTypes (name) ;
create index idx_UD_name on GLUE20.UserDomain (name) ;
create unique index idx_uniqueKey on GLUE20.AccessPolicy (localID,endpointID,userdomainID) ;
create unique index uidx_SShare on GLUE20.StorageShare (localID,serviceID) ;
create unique index uidx_SShareCapacity on GLUE20.StorageShareCapacity (serviceID,shareID,type) ;
create unique index uidx_AccessProt on GLUE20.StorageAccessProtocol (serviceID,localID) ;
alter table GLUE20.ComputingServiceLoc add constraint fk_CServiceLocID
foreign key (computingServiceID)
references ComputingService (ID) on delete cascade ;
alter table GLUE20.AccessPolicy add constraint fk_UserEndpoint
foreign key (userdomainID)
references UserDomain (ID) on delete cascade ;
alter table GLUE20.AccessPolicy add constraint fk_EndpointAccess
foreign key (endpointID)
references Endpoint (ID) on delete cascade ;
alter table GLUE20.MappingPolicy add constraint fk_UserShare
foreign key (userDomainID)
references UserDomain (ID) ;
alter table GLUE20.ApplicationEnvironment add constraint fk_CManagerAppEnv
foreign key (cManagerID)
references ComputingManager (ID) on delete cascade ;
alter table GLUE20.EndpointShare_LNK add constraint fk_EndpointShare
foreign key (endpointID)
references Endpoint (ID) ;
alter table GLUE20.ComputingManager add constraint fk_CServiceCManager
foreign key (serviceID)
references ComputingService (ID) on delete cascade ;
alter table GLUE20.ComputingActivity add constraint fk_CServiceCActivity
foreign key (serviceID)
references ComputingService (ID) ;
alter table GLUE20.ComputingActivity add constraint fk_CManagerCActivity
foreign key (cManagerID)
references ComputingManager (ID) ;
alter table GLUE20.ComputingActivity add constraint fk_CShareCActvty
foreign key (serviceID,shareID)
references ComputingShare (serviceID,localID) ;
alter table GLUE20.StorageMappingPolicy add constraint fk_UserDomainSShare
foreign key (userDomainID)
references UserDomain (ID) on delete cascade ;
alter table GLUE20.StorageMappingPolicy add constraint fk_SShareUserDomain
foreign key (serviceID,shareID)
references StorageShare (serviceID,localID) on delete cascade ;
alter table GLUE20.StorageShare add constraint fk_SServiceSShare
foreign key (serviceID)
references StorageService (ID) on delete cascade ;
alter table GLUE20.StorageService add constraint fk_AdminStorageService
foreign key (domainID)
references AdminDomain (ID) on delete cascade ;
alter table GLUE20.StorageAccessProtocol add constraint fk_SServiceAccessProt
foreign key (serviceID)
references StorageService (ID) on delete cascade ;
alter table GLUE20.ComputingService add constraint fk_AdminCService

```

```

foreign key (domainID)
references AdminDomain (ID) on delete cascade ;
alter table GLUE20.ExecutionEnvironment add constraint fk_ExecEnvCManager
foreign key (cManagerID)
references ComputingManager (ID) on delete cascade ;
alter table GLUE20.Benchmark add constraint fk_CBenchmarkEntryTypes
foreign key (parentType)
references EntryTypes (id) ;
alter table GLUE20.CService_SService add constraint fk_CS_CSSS
foreign key (cServiceID)
references ComputingService (ID) on delete cascade ;
alter table GLUE20.CService_SService add constraint fk_SS_CSSS
foreign key (sServiceID)
references StorageService (ID) on delete cascade ;
alter table GLUE20.StorageShareCapacity add constraint fk_SShareSCapacity
foreign key (serviceID,shareID)
references StorageShare (serviceID,localID) on delete cascade ;
alter table GLUE20.StorageServiceCapacity add constraint fk_SServiceSCap
foreign key (serviceID)
references StorageService (ID) on delete cascade ;
alter table GLUE20.ComputingMappingPolicy add constraint fk_UserComputingShare
foreign key (userDomainID)
references UserDomain (ID) on delete cascade ;
alter table GLUE20.ComputingEndpoint add constraint fk_EndpointCEndpoint
foreign key (endpointID)
references Endpoint (ID) on delete cascade ;
alter table GLUE20.ComputingEndpoint add constraint fk_CServiceCEndpoint
foreign key (cServiceID)
references ComputingService (ID) on delete cascade ;
alter table GLUE20.StorageEndpoint add constraint fk_EndpointSEndpoint
foreign key (endpointID)
references Endpoint (ID) ;
alter table GLUE20.StorageEndpoint add constraint fk_SServiceSEndpoint
foreign key (sServiceID)
references StorageService (ID) on delete cascade ;
alter table GLUE20.StorageResource add constraint fk_SManagerSResource
foreign key (sManagerID)
references StorageManager (ID) on delete cascade ;
alter table GLUE20.StorageManager add constraint fk_SServiceSManager
foreign key (sServiceID)
references StorageService (ID) on delete cascade ;
alter table GLUE20.ComputingShare add constraint fk_CShareSService
foreign key (defaultSService)
references StorageService (ID) ;
alter table GLUE20.ComputingActivity add constraint fk_ExecEnvCActivity
foreign key (executionEnvID)
references ExecutionEnvironment (ID) ;
alter table GLUE20.SShareSResource add constraint shrSRsrc_fk_StrgShrServiceID
foreign key (storageShareServiceID,storageShareLocalID)
references StorageShare (serviceID,localID) on delete cascade ;
alter table GLUE20.SShareSResource add constraint shrSRsrc_fk_StorageResourceID
foreign key (storageResourceID)
references StorageResource (ID) on delete cascade ;
alter table GLUE20.AppEnvExecEnv add constraint apnvxcnv_fk_AplctnvrnmntSrvcd
foreign key (aplctnvrnmntServiceID,applicationEnvironmentLocalID)
references ApplicationEnvironment (serviceID,localID) on delete cascade ;
alter table GLUE20.AppEnvExecEnv add constraint apnvxcnv_fk_ExctnvrnmntID
foreign key (executionEnvironmentID)
references ExecutionEnvironment (ID) on delete cascade ;
alter table GLUE20.CShareExecEnv add constraint cShrxcnv_fk_CmptngShrServiceID
foreign key (computingShareServiceID,computingShareLocalID)
references ComputingShare (serviceID,localID) on delete cascade ;
alter table GLUE20.CShareExecEnv add constraint cShrxcnv_fk_ExctnvrnmntID
foreign key (executionEnvironmentID)
references ExecutionEnvironment (ID) on delete cascade ;
alter table GLUE20.ComputingService_MVA add constraint fk_CSMVA_AttributeType
foreign key (attributeType)
references AttributeTypes (id) ;
alter table GLUE20.ComputingManager_MVA add constraint fk_CMMVA_AttributeType
foreign key (attributeType)
references AttributeTypes (id) ;
alter table GLUE20.ComputingShare_MVA add constraint fk_CShareMVA_AttributeType
foreign key (attributeType)
references AttributeTypes (id) ;
alter table GLUE20.CShareCapacity_MVA add constraint fk_CCMVA_AttributeType
foreign key (attributeType)
references AttributeTypes (id) ;
alter table GLUE20.ExecutionEnvironment_MVA add constraint fk_ExecEnv_AttributeType
foreign key (attributeType)
references AttributeTypes (id) ;
alter table GLUE20.ApplicationEnvironment_MVA add constraint fk_AppEnvMVA_AttributeType

```



```

foreign key (attributeType)
references AttributeTypes (id) ;
alter table GLUE20.ComputingActivity_MVA add constraint fk_CAMVA_AttributeType
foreign key (attributeType)
references AttributeTypes (id) ;
alter table GLUE20.Endpoint_MVA add constraint fk_Endpoint_AttributeType
foreign key (attributeType)
references AttributeTypes (id) ;
alter table GLUE20.StorageShare_MVA add constraint fk_SShareMVA_AttributeType
foreign key (attributeType)
references AttributeTypes (id) ;
alter table GLUE20.SShareCapacity_MVA add constraint fk_SCMVA_AttributeType
foreign key (attributeType)
references AttributeTypes (id) ;
alter table GLUE20.SAccessPolicy_MVA add constraint fk_SAPMVA_AttributeType
foreign key (attributeType)
references AttributeTypes (id) ;
alter table GLUE20.StorageResource_MVA add constraint fk_SMMVA_AttributeType
foreign key (attributeType)
references AttributeTypes (id) ;
alter table GLUE20.StorageManager_MVA add constraint fk_SMVMA_AttributeType
foreign key (attributeType)
references AttributeTypes (id) ;
alter table GLUE20.StorageService_MVA add constraint fk_SSMVA_AttributeType
foreign key (attributeType)
references AttributeTypes (id) ;
alter table GLUE20.UserContact add constraint fk_UserDomUserContact
foreign key (userDomainID)
references UserDomain (ID) on delete cascade ;
alter table GLUE20.AdminContact add constraint fk_AdminDomAdminContact
foreign key (adminDomainID)
references AdminDomain (ID) on delete cascade ;
alter table GLUE20.AdminDomainLocation add constraint fk_AdminDomAdminLoc
foreign key (adminDomainID)
references AdminDomain (ID) on delete cascade ;
alter table GLUE20.UserDomainLocation add constraint fk_UserDomUserLoc
foreign key (userDomainID)
references UserDomain (ID) on delete cascade ;
alter table GLUE20.StorageServiceLoc add constraint fk_SServiceLocSService
foreign key (storageServiceID)
references StorageService (ID) on delete cascade ;
alter table GLUE20.ComputingShare add constraint fk_CServiceCShare
foreign key (serviceID)
references ComputingService (ID) on delete cascade ;
alter table GLUE20.ApplicationHandle add constraint fk_AppEnvHandleCService
foreign key (serviceID)
references ComputingService (ID) on delete cascade ;
alter table GLUE20.ApplicationHandle add constraint fk_AppEnv
foreign key (serviceID,appEnvLocalID)
references ApplicationEnvironment (serviceID,localID) ;

-- oracle requires a special 'quit' command
quit

```

5. LDAP Schema Realization

5.1 Approach

The GLUE LDAP rendering maps an entity in the GLUE information model to a specific LDAP entry which utilizes a single objectclass. As a result there is one to one correspondence between GLUE LDAP entries and GLUE objectclasses. The GLUE LDAP rendering makes use of the Glue namespace, the objectclass and attribute names starts with the Glue prefix.

5.1.1 OID Assignment

The GLUE LDAP rendering utilizes the sub tree of 1.3.6.1.4.1.6757 which is assigned to the Global Grid Forum. An overview of the main use of the sub tree is given in tables 1, 2 and 3 representing the main entities, computing entities and storage entities respectively.

OID	Entity
1.3.6.1.4.1.6757.100.1.1.1	GlueDomain
1.3.6.1.4.1.6757.100.1.1.2	GlueLocation
1.3.6.1.4.1.6757.100.1.1.3	GlueContact
1.3.6.1.4.1.6757.100.1.1.4	GlueAdminDomain
1.3.6.1.4.1.6757.100.1.1.5	GlueUserDomain
1.3.6.1.4.1.6757.100.1.1.6	GlueService
1.3.6.1.4.1.6757.100.1.1.7	GlueServiceEndpoint

Table 1 Main Entities

OID	Entity
1.3.6.1.4.1.6757.100.1.1.20	GlueComputingService
1.3.6.1.4.1.6757.100.1.1.21	GlueComputingEndpoint
1.3.6.1.4.1.6757.100.1.1.22	GlueComputingShare
1.3.6.1.4.1.6757.100.1.1.23	GlueComputingManager
1.3.6.1.4.1.6757.100.1.1.24	GlueComputingBenchmark
1.3.6.1.4.1.6757.100.1.1.25	GlueComputingExecutionEnvironment
1.3.6.1.4.1.6757.100.1.1.26	GlueComputingApplicationEnvironment
1.3.6.1.4.1.6757.100.1.1.27	GlueComputingApplicationHandle
1.3.6.1.4.1.6757.100.1.1.28	GlueComputingActivity
1.3.6.1.4.1.6757.100.1.1.29	ComputingService2StorageService

Table 2 Computing Service

OID	Entity
1.3.6.1.4.1.6757.100.1.1.30	GlueStorageServiceCapacity
1.3.6.1.4.1.6757.100.1.1.31	GlueStorageServiceAccessProtocol
1.3.6.1.4.1.6757.100.1.1.32	GlueStorageShare
1.3.6.1.4.1.6757.100.1.1.33	GlueStorageShareCapacity
1.3.6.1.4.1.6757.100.1.1.34	GlueStorageManager
1.3.6.1.4.1.6757.100.1.1.35	GlueStorageResource
1.3.6.1.4.1.6757.100.1.1.36	GlueStorage2Computing

Table 3 Storage Service

5.1.2 Directory Information Tree Definition

The LDAP DN is constructed following the hierarchical relationships that exist between entities in the Glue information model. The resulting DIT is shown in figure 1 and SHOULD be used as a guide when constructing the DN. The top of the DN is the abstract object o=top. Below this there MAY be any number of domain entities which represent the hierarchical nature of the domains in the grid environment. For example a computing center C, participating in a national grid infrastructure N, which is part of a wider international infrastructure I SHOULD constructed the following DN.

dn: GlueDomainID=C, GlueDomainID=N, GlueDomainID=I, o=top

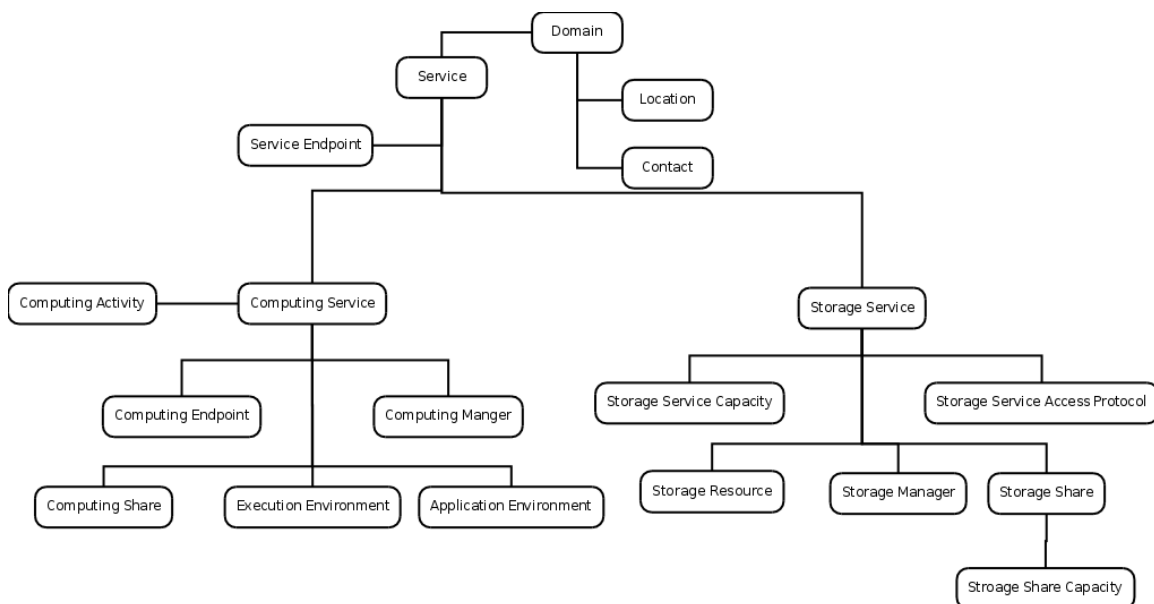


Figure 1. The GLUE LDAP DIT

5.2 The Normative LDAP Schema Realization of GLUE 2.0

```

# Start GlueDomain

attributetype ( 1.3.6.1.4.1.6757.100.1.1.1.2.1
    NAME 'GlueDomainUniqueID'
    DESC 'A global unique ID'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.1.2.2
    NAME 'GlueDomainName'
    DESC 'Human-readable name'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
  )

```

```

        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.1.2.3
        NAME 'GlueDomainDescription'
        DESC 'A description of the domain'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.1.2.4
        NAME 'GlueDomainWWW'
        DESC 'The URL identifying a web page with more information about the domain'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.1.2.5
        NAME 'GlueDomainOtherInfo'
        DESC 'Placeholder to publish info that does not fit in any other attribute. Free-form string,
comma-separated tags, (name, value ) pair are example of syntax'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    objectclass ( 1.3.6.1.4.1.6757.100.1.1.1
        NAME 'GlueDomain'
        DESC 'A collection of actors that can be assigned with roles and privileges to entities via
policies. A domain may have relationships to other domains.'
        STRUCTURAL
        MUST GlueDomainUniqueID
        MAY ( GlueDomainDescription $ GlueDomainName $ GlueDomainOtherInfo $ GlueDomainWWW )
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.2.2.1
        NAME 'GlueLocationLocalID'
        DESC 'An opaque identifier local to the associated Service or Domain'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.2.2.2
        NAME 'GlueLocationName'
        DESC 'A human-readable name '
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.2.2.3
        NAME 'GlueLocationAddress'
        DESC 'Street address'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.2.2.4
        NAME 'GlueLocationPlace'
        DESC 'Name of town/city'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.2.2.5
        NAME 'GlueLocationCountry'
        DESC 'Country name'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
    )

```

```

        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

attributetype ( 1.3.6.1.4.1.6757.100.1.1.2.2.6
    NAME 'GlueLocationPostCode'
    DESC 'Postal code'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.2.2.7
    NAME 'GlueLocationLatitude'
    DESC 'The position of a place north or south of the equator measured from -90° to +90° with
positive values going north and negative values going south'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.2.2.8
    NAME 'GlueLocationLongitude'
    DESC 'The position of a place east or west of Greenwich, England measured from -180° to
+180° with positive values going east and negative values going west'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.3.2.1
    NAME 'GlueContactLocalID'
    DESC 'An opaque identifier local to the associated Service or Domain'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.3.2.2
    NAME 'GlueContactURL'
    DESC 'URL embedding the contact information. The syntax of URI depends on the communication
channel'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.3.2.3
    NAME 'GlueContactType'
    DESC 'Type of contact'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.3.2.4
    NAME 'GlueContactOtherInfo'
    DESC 'Placeholder to publish info that does not fit in any other attribute. Free-form string,
comma-separated tags, (name, value ) pair are example of syntax'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.4.2.1
    NAME 'GlueAdminDomainDistributed'
    DESC 'True if the services managed by the adminDomain are considered geographically
distributed by the administrators themselves.'
    EQUALITY booleanMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.7
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.4.2.2

```

```

        NAME 'GlueAdminDomainOwner'
        DESC 'Owner of the managed resources'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

attributetype ( 1.3.6.1.4.1.6757.100.1.1.5.2.1
    NAME 'GlueUserDomainLevel'
    DESC 'The number of hops to reach the root for hierarchically organized domains described by
the composed by association (0 is for the root).'
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.5.2.2
    NAME 'GlueUserDomainManagerEndpoint'
    DESC 'The Endpoint ID managing the users part of the domain and the related attributes such as
groups or roles'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

objectclass ( 1.3.6.1.4.1.8005.100
    NAME 'GlueTop'
    DESC 'Base class for the Glue Schema'
    SUP 'Top'
    ABSTRACT )

objectclass ( 1.3.6.1.4.1.6757.100.1.1.2
    NAME 'GlueLocation'
    DESC 'A geographical position'
    STRUCTURAL
    MUST GlueLocationLocalID
    MAY ( GlueLocationAddress $ GlueLocationCountry $ GlueLocationLongitude $ GlueLocationPostCode
$ GlueLocationName $ GlueLocationPlace $ GlueLocationLatitude )
)

objectclass ( 1.3.6.1.4.1.6757.100.1.1.3
    NAME 'GlueContact'
    DESC 'Information enabling to establish a communication with a person or group of persons
part of a domain'
    STRUCTURAL
    MUST GlueContactLocalID
    MAY ( GlueContactOtherInfo $ GlueContactType $ GlueContactURL )
)

objectclass ( 1.3.6.1.4.1.6757.100.1.1.4
    NAME 'GlueAdminDomain'
    DESC 'A collection of actors that can be assigned with administrative roles and privileges to
services via policies. An AdminDomain manages services that can be geographically distributed,
nevertheless a primary location should be identified.'
    STRUCTURAL
    MUST GlueDomainUniqueID
    MAY ( GlueLocationPostcode $ GlueAdminDomainDistributed $ GlueAdminDomainOwner $
GlueDomainDescription $ GlueDomainName $ GlueDomainOtherInfo $ GlueDomainWWW )
)

objectclass ( 1.3.6.1.4.1.6757.100.1.1.5
    NAME 'GlueUserDomain'
    DESC 'A collection of actors that can be assigned with user roles and privileges to services
or shares via policies'
    STRUCTURAL
    MUST GlueDomainUniqueID
    MAY ( GlueUserDomainLevel $ GlueUserDomainManagerEndpoint $ GlueDomainDescription $
GlueDomainOtherInfo $ GlueDomainName $ GlueDomainWWW )
)

# Start Glue Service Attributes

attributetype ( 1.3.6.1.4.1.6757.100.1.1.6.2.1
    NAME 'GlueServiceUniqueID'
    DESC 'A global unique ID'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26

```

```

        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.6.2.2
        NAME 'GlueServiceName'
        DESC 'Human-readable name'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.6.2.3
        NAME 'GlueServiceCapability'
        DESC 'The provided capability according to the OGSA architecture (it is given by the sum of
all the capabilities provided by the related endpoints)'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.6.2.4
        NAME 'GlueServiceType'
        DESC 'The type of service according to a middleware classification'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.6.2.5
        NAME 'GlueServiceQualityLevel'
        DESC 'Maturity of the service in terms of quality of the software components'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.6.2.6
        NAME 'GlueServiceStatusPage'
        DESC 'Web page providing additional information like monitoring aspects'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.6.2.7
        NAME 'GlueServiceComplexity'
        DESC 'Human-readable summary description of the complexity in terms of the number of endpoint
types, shares and resources. The syntax should be: endpointType=X, share=Y, resource=Z.'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.6.2.8
        NAME 'GlueServiceOtherInfo'
        DESC 'Placeholder to publish info that does not fit in any other attribute. Free-form string,
comma-separated tags, (name, value ) pair are example of syntax'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    objectclass ( 1.3.6.1.4.1.6757.100.1.1.6
        NAME 'GlueService'
        DESC 'An abstracted, logical view of actual software components that participate in the
creation of an entity providing one or more functionalities useful in a Grid environment. A service
exposes zero or more endpoints having well-defined interfaces, zero or more shares and zero or more
managers and the related resources. The service is autonomous and denotes a weak aggregation among
endpoints, the underlying managers and the related resources, and the defined shares. The service
enables to identify the whole set of entities providing the functionality with a persistent name.'
        STRUCTURAL
        MUST GlueServiceUniqueID
    )

```

```

    MAY ( GlueServiceName $ GlueServiceCapability $ GlueServiceType $ GlueServiceQualityLevel $
    GlueServiceStatusPage $ GlueServiceComplexity $ GlueServiceOtherInfo )
)

# Start of Endpoint

attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.1
    NAME 'GlueServiceEndpointUniqueID'
    DESC 'A global unique ID'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.2
    NAME 'GlueServiceEndpointName'
    DESC 'Human-readable name'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.3
    NAME 'GlueServiceEndpointURI'
    DESC 'Network location of the endpoint to contact the related service'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.4
    NAME 'GlueServiceEndpointCapability'
    DESC 'The provided capability according to the OGSA architecture'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.5
    NAME 'GlueServiceEndpointTechnology'
    DESC 'Technology used to implement the endpoint'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.6
    NAME 'GlueServiceEndpointInterface'
    DESC 'Identification of a type and version of the interface'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.7
    NAME 'GlueServiceEndpointInterfaceExtension'
    DESC 'Identification of an extension to the interface'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.8
    NAME 'GlueServiceEndpointWSDL'
    DESC 'URL of the WSDL document describing the offered interface (applies to Web Services
endpoint)'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.9
    NAME 'GlueServiceEndpointSupportedProfile'

```



```

        DESC 'URI identifying a supported profile'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.10
        NAME 'GlueServiceEndpointSemantics'
        DESC 'URI of a document providing a human-readable description of the semantics of the
endpoint functionalities'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.11
        NAME 'GlueServiceEndpointImplementor'
        DESC 'Main organization implementing this software component'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.12
        NAME 'GlueServiceEndpointImplementationName'
        DESC 'Name of the implementation'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.13
        NAME 'GlueServiceEndpointImplementationVersion'
        DESC 'Version of the implementation (e.g., major version.minor version.patch version)'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.14
        NAME 'GlueServiceEndpointQualityLevel'
        DESC 'Maturity of the endpoint in terms of quality of the software components'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.15
        NAME 'GlueServiceEndpointHealthState'
        DESC 'A state representing the health of the endpoint in terms of its capability of properly
delivering the functionalities'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.16
        NAME 'GlueServiceEndpointHealthStateInfo'
        DESC 'Textual explanation of the state endpoint'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.17
        NAME 'GlueServiceEndpointServingState'
        DESC 'A state specifying if the endpoint is accepting new requests and if it is serving the
already accepted requests '
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

```

```

attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.18
  NAME 'GlueServiceEndpointStartTime'
  DESC 'The timestamp for the start time of the endpoint'
  EQUALITY caseIgnoreIA5Match
  SUBSTR caseIgnoreIA5SubstringsMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.19
  NAME 'GlueServiceEndpointIssuerCA'
  DESC 'Distinguished name of Certification Authority issuing the certificate for the endpoint'
  EQUALITY caseIgnoreIA5Match
  SUBSTR caseIgnoreIA5SubstringsMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.20
  NAME 'GlueServiceEndpointTrustedCA'
  DESC 'Distinguished name of the trusted Certification Authority'
  EQUALITY caseIgnoreIA5Match
  SUBSTR caseIgnoreIA5SubstringsMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.21
  NAME 'GlueServiceEndpointDowntimeAnnounce'
  DESC 'The timestamp for the announcement of the next scheduled downtime'
  EQUALITY caseIgnoreIA5Match
  SUBSTR caseIgnoreIA5SubstringsMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.22
  NAME 'GlueServiceEndpointDowntimeStart'
  DESC 'The starting timestamp of the next scheduled downtime'
  EQUALITY caseIgnoreIA5Match
  SUBSTR caseIgnoreIA5SubstringsMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.23
  NAME 'GlueServiceEndpointDowntimeEnd'
  DESC 'The ending timestamp of the next scheduled downtime'
  EQUALITY caseIgnoreIA5Match
  SUBSTR caseIgnoreIA5SubstringsMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.7.2.24
  NAME 'GlueServiceEndpointDowntimeInfo'
  DESC 'Description of the next scheduled downtime'
  EQUALITY caseIgnoreIA5Match
  SUBSTR caseIgnoreIA5SubstringsMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
  SINGLE-VALUE
)

objectclass ( 1.3.6.1.4.1.6757.100.1.1.7
  NAME 'GlueServiceEndpoint'
  DESC 'A network location having a well-defined interface and exposing the service
functionalities'
  STRUCTURAL
  MUST GlueServiceEndpointUniqueID
  MAY ( GlueServiceEndpointName $ GlueServiceEndpointURI $ GlueServiceEndpointCapability $
GlueServiceEndpointTechnology $ GlueServiceEndpointInterface $ GlueServiceEndpointInterfaceExtension $
GlueServiceEndpointWSDL $ GlueServiceEndpointSupportedProfile $ GlueServiceEndpointSemantics $
GlueServiceEndpointImplementor $ GlueServiceEndpointImplementationName $
GlueServiceEndpointImplementationVersion $ GlueServiceEndpointQualityLevel $
GlueServiceEndpointHealthState $ GlueServiceEndpointHealthStateInfo $ GlueServiceEndpointServingState
$ GlueServiceEndpointStartTime $ GlueServiceEndpointIssuerCA $ GlueServiceEndpointTrustedCA $
GlueServiceEndpointDowntimeAnnounce $ GlueServiceEndpointDowntimeStart $
GlueServiceEndpointDowntimeEnd $ GlueServiceEndpointDowntimeInfo )
)

```

```

# Start Share

attributetype ( 1.3.6.1.4.1.6757.100.1.1.8.2.1
    NAME 'GlueShareLocalID'
    DESC 'An opaque identifier local to the associated Service'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.8.2.2
    NAME 'GlueShareName'
    DESC 'Human-readable name'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.8.2.3
    NAME 'GlueShareDescription'
    DESC 'Description of this share'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

# Start Manager

attributetype ( 1.3.6.1.4.1.6757.100.1.1.9.2.1
    NAME 'GlueManagerUniqueID'
    DESC 'A global unique ID'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.9.2.2
    NAME 'GlueManagerName'
    DESC 'Human-readable name'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

#Start Resource

attributetype ( 1.3.6.1.4.1.6757.100.1.1.10.2.1
    NAME 'GlueResourceUniqueID'
    DESC 'A global unique ID'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.10.2.2
    NAME 'GlueResourceName'
    DESC 'Human-readable name'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

# Start Activity

attributetype ( 1.3.6.1.4.1.6757.100.1.1.11.2.1
    NAME 'GlueActivityUniqueID'
    DESC 'A global unique ID'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

```

```

# Start Policy

attributetype ( 1.3.6.1.4.1.6757.100.1.1.12.2.1
    NAME 'GluePolicyLocalID'
    DESC 'An opaque identifier local to the associated Service'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.12.2.2
    NAME 'GluePolicyScheme'
    DESC 'Scheme adopted to define the policy rules'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.12.2.3
    NAME 'GluePolicyRule'
    DESC 'A policy rule (for the basic policy scheme, syntax is provide in the Appendix)'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.20.2.1
    NAME 'GlueComputingServiceTotalJobs'
    DESC 'Number of total jobs'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.20.2.2
    NAME 'GlueComputingServiceRunningJobs'
    DESC 'Number of running jobs'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.20.2.3
    NAME 'GlueComputingServiceWaitingJobs'
    DESC 'Number of jobs waiting in the underlying computing managers (i.e., Local Resource
Manager System or LRMS's) '
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.20.2.4
    NAME 'GlueComputingServiceatStagingJobs'
    DESC 'Number of jobs that are staging files in/out'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.20.2.5
    NAME 'GlueComputingServiceSuspendedJobs'
    DESC 'Number of jobs which started their execution, but are suspended (e.g., for preemption)'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.20.2.6
    NAME 'GlueComputingServicePreLRMSWaitingJobs'
    DESC 'Number of jobs that are in the Grid layer waiting to be passed to the underlying
computing manager (i.e., LRMS)'
    EQUALITY integerMatch

```

```

ORDERING    integerOrderingMatch
SYNTAX      1.3.6.1.4.1.1466.115.121.1.27
SINGLE-VALUE
)

objectclass ( 1.3.6.1.4.1.6757.100.1.1.20
  NAME 'GlueComputingService'
  DESC 'The computing service is autonomous and denotes a weak aggregation among computing
endpoints, the underlying computing managers and related execution environments, and the defined
computing shares. The computing service enables to identify the whole set of entities providing the
computing functionality with a persistent name.'
  STRUCTURAL
  MUST GlueServiceUniqueID
  MAY ( GlueComputingServiceTotalJobs $ GlueComputingServiceRunningJobs $
GlueComputingServiceWaitingJobs $ GlueComputingServiceatStagingJobs $
GlueComputingServiceSuspendedJobs $ GlueComputingServicePreLRMSWaitingJobs )
)

# Start GlueComputingEndpoint

attributetype ( 1.3.6.1.4.1.6757.100.1.1.21.2.1
  NAME 'GlueComputingEndpointStaging'
  DESC 'Supported staging functionalities'
  EQUALITY caseIgnoreIA5Match
  SUBSTR caseIgnoreIA5SubstringsMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.21.2.2
  NAME 'GlueComputingEndpointJobDescription'
  DESC 'Supported type of job description language'
  EQUALITY caseIgnoreIA5Match
  SUBSTR caseIgnoreIA5SubstringsMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
  SINGLE-VALUE
)

objectclass ( 1.3.6.1.4.1.6757.100.1.1.21
  NAME 'GlueComputingEndpoint'
  DESC 'Endpoint for creating, monitoring, and controlling computational activities called jobs;
it can be used to expose also complementary capabilities (e.g., reservation, proxy manipulation)'
  STRUCTURAL
  MUST GlueServiceEndpointUniqueID
  MAY ( GlueComputingEndpointStaging $ GlueComputingEndpointJobDescription )
)

# Start GlueComputingShare

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.1
  NAME 'GlueComputingShareMappingQueue'
  DESC 'Name of a queue available in the underlying computing manager (i.e., LRMS) where jobs of
this share are submitted (different shares can be mapped into the same queue; it is not foreseen that
a single share can be mapped into many different queues)'
  EQUALITY caseIgnoreIA5Match
  SUBSTR caseIgnoreIA5SubstringsMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.2
  NAME 'GlueComputingShareMaxWallTime'
  DESC 'The maximum obtainable wall clock time per slot that can be granted to the job upon user
request (unnormalized value)'
  EQUALITY integerMatch
  ORDERING integerOrderingMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.3
  NAME 'GlueComputingShareMaxTotalWallTime'
  DESC 'The maximum obtainable total wall clock time that can be granted to the job upon user
request; this property is a limit for the sum of the wall clock time used in all the slots occupied by
a multi-slot job (unnormalized value)'
  EQUALITY integerMatch
  ORDERING integerOrderingMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
  SINGLE-VALUE
)

```

```

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.4
    NAME 'GlueComputingShareMinWallTime'
    DESC 'The minimum wall clock time per slot for a job (unnormalized value); if a job
requests a lower time, than it can be rejected; if a job requests at least this value, but runs for a
shorter time, than it might be accounted for this value'
    EQUALITY    integerMatch
    ORDERING    integerOrderingMatch
    SYNTAX      1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.5
    NAME 'GlueComputingShareDefaultWallTime'
    DESC 'The default wall clock time per slot allowed to a job by the computing manager (i.e.,
LRMS) if no limit is requested in the job submission description. Once this time is expired the job
will most likely be killed or removed from the queue (unnormalized value)'
    EQUALITY    integerMatch
    ORDERING    integerOrderingMatch
    SYNTAX      1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.6
    NAME 'GlueComputingShareMaxCPUTime'
    DESC 'The maximum obtainable CPU time that can be granted to the job upon user request per
slot (unnormalized value)'
    EQUALITY    integerMatch
    ORDERING    integerOrderingMatch
    SYNTAX      1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.7
    NAME 'GlueComputingShareMaxTotalCPUTime'
    DESC 'The maximum obtainable CPU time that can be granted to the job upon user request across
all assigned slots; this property is a limit for the sum of the CPU time used in all the slots
occupied by a multi-slot job (unnormalized value)'
    EQUALITY    integerMatch
    ORDERING    integerOrderingMatch
    SYNTAX      1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.8
    NAME 'GlueComputingShareMinCPUTime'
    DESC 'The minimum CPU time per slot for a job (unnormalized value); if a job requests a lower
time, than it can be rejected; if a job requests at least this value, but uses the CPU for a shorter
time, than it might be accounted for this value'
    EQUALITY    integerMatch
    ORDERING    integerOrderingMatch
    SYNTAX      1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.9
    NAME 'GlueComputingShareDefaultCPUTime'
    DESC 'The default CPU time per slot allowed to each job by the computing manager (i.e., LRMS )
if no limit is requested in the job submission description (unnormalized value)'
    EQUALITY    integerMatch
    ORDERING    integerOrderingMatch
    SYNTAX      1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.10
    NAME 'GlueComputingShareMaxTotalJobs'
    DESC 'The maximum allowed number of jobs in this share'
    EQUALITY    integerMatch
    ORDERING    integerOrderingMatch
    SYNTAX      1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.11
    NAME 'GlueComputingShareMaxRunningJobs'
    DESC 'The maximum allowed number of jobs in running state in this share'
    EQUALITY    integerMatch
    ORDERING    integerOrderingMatch
    SYNTAX      1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

```

```

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.12
    NAME 'GlueComputingShareMaxWaitingJobs'
    DESC 'The maximum allowed number of jobs in waiting state in this share'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.13
    NAME 'GlueComputingShareMaxPreLRMSWaitingJobs'
    DESC 'The maximum allowed number of jobs that are in the Grid layer waiting to be passed to
the underlying computing manager (i.e., LRMS) for this share'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.14
    NAME 'GlueComputingShareMaxUserRunningJobs'
    DESC 'The maximum allowed number of jobs in running state per Grid user in this share'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.15
    NAME 'GlueComputingShareMaxSlotsPerJob'
    DESC 'The maximum number of slots which could be allocated to a single job (defined to be 1
for a computing service accepting only single-slot jobs)'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.16
    NAME 'GlueComputingShareMaxStageInStreams'
    DESC 'The maximum number of streams to stage files in'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.17
    NAME 'GlueComputingShareMaxStageOutStreams'
    DESC 'The maximum number of streams to stage files out'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.18
    NAME 'GlueComputingShareSchedulingPolicy'
    DESC 'Implied scheduling policy of the share'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.19
    NAME 'GlueComputingShareMaxMemory'
    DESC 'The maximum RAM that a job can use'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.20
    NAME 'GlueComputingShareMaxDiskSpace'
    DESC 'The maximum disk space that a job can use excluding shared area such as cache'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

```

```

)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.21
    NAME 'GlueComputingShareDefaultStorageService'
    DESC 'ID of the default Storage Service to be used to store files by jobs in case no
destination Storage Service is explicitly stated'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.22
    NAME 'GlueComputingSharePreemption'
    DESC 'True if the computing manager (i.e., LRMS) enables preemption of jobs; a preempted job
is supposed to be automatically resumed'
    EQUALITY booleanMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.7
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.23
    NAME 'GlueComputingShareServingState'
    DESC 'A state specifying if the share is open to place new requests and if it is open to offer
the already present requests for execution'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.24
    NAME 'GlueComputingShareTotalJobs'
    DESC 'Number of total jobs in any state'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.25
    NAME 'GlueComputingShareRunningJobs'
    DESC 'Number of running jobs submitted via any type of interface (local and Grid)'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.26
    NAME 'GlueComputingShareLocalRunningJobs'
    DESC 'Number of running jobs submitted via a local interface'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.27
    NAME 'GlueComputingShareWaitingJobs'
    DESC 'Number of jobs waiting in the underlying computing managers (i.e., LRMS's) submitted via
any type of interface (local and Grid)'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.28
    NAME 'GlueComputingShareLocalWaitingJobs'
    DESC 'Number of jobs waiting in the underlying computing managers (i.e., LRMS's) submitted via
a local interface'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.29
    NAME 'GlueComputingShareStagingJobs'
    DESC 'Number of jobs that are staging files in/out'

```



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        EQUALITY      integerMatch
        ORDERING      integerOrderingMatch
        SYNTAX        1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.30
        NAME 'GlueComputingShareSuspendedJobs'
        DESC 'Number of jobs which started their execution, but are suspended (e.g., for preemption)'
        EQUALITY      integerMatch
        ORDERING      integerOrderingMatch
        SYNTAX        1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.31
        NAME 'GlueComputingSharePreLRMSWaitingJobs'
        DESC 'Number of jobs that are in the Grid layer waiting to be passed to the underlying
computing manager (i.e., LRMS)'
        EQUALITY      integerMatch
        ORDERING      integerOrderingMatch
        SYNTAX        1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.32
        NAME 'GlueComputingShareEstimatedAverageWaitingTime'
        DESC 'Estimated time to last for a new job from the acceptance to the start of its execution'
        EQUALITY      integerMatch
        ORDERING      integerOrderingMatch
        SYNTAX        1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.33
        NAME 'GlueComputingShareEstimatedWorstWaitingTime'
        DESC 'Estimated worst waiting time assuming that all jobs run for the maximum wall time'
        EQUALITY      integerMatch
        ORDERING      integerOrderingMatch
        SYNTAX        1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.34
        NAME 'GlueComputingShareFreeSlots'
        DESC 'Number of free slots'
        EQUALITY      integerMatch
        ORDERING      integerOrderingMatch
        SYNTAX        1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.35
        NAME 'GlueComputingShareFreeSlotsWithDuration'
        DESC 'Number of free slots with their time limits. Syntax: ns[:t] [ns:t]* where the pair ns:t
means that there are ns free slots for the duration of t (expressed in seconds); the time limit
information is optional'
        EQUALITY      caseIgnoreIA5Match
        SUBSTR         caseIgnoreIA5SubstringsMatch
        SYNTAX        1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.36
        NAME 'GlueComputingShareUsedSlots'
        DESC 'Number of slots used by running jobs'
        EQUALITY      integerMatch
        ORDERING      integerOrderingMatch
        SYNTAX        1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.37
        NAME 'GlueComputingShareRequestedSlots'
        DESC 'Number of slots which are needed to execute all waiting and staging jobs'
        EQUALITY      integerMatch
        ORDERING      integerOrderingMatch
        SYNTAX        1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

```

```

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.38
    NAME 'GlueComputingShareReservationPolicy'
    DESC 'Type of reservation policy'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.22.2.39
    NAME 'GlueComputingShareTag'
    DESC 'UserDomain-defined tag (the values SHOULD use namespace to avoid collision)'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

objectclass ( 1.3.6.1.4.1.6757.100.1.1.22
    NAME 'GlueComputingShare'
    DESC 'A utilization target for a set of execution environments defined by a set of
configuration parameters and characterized by status information'
    STRUCTURAL
    MUST GlueShareLocalID
    MAY ( GlueComputingShareMappingQueue $GlueComputingShareMaxWallTime $
GlueComputingShareMaxTotalWallTime $ GlueComputingShareMinWallTime $ GlueComputingShareDefaultWallTime $
$ GlueComputingShareMaxCPUTime $ GlueComputingShareMaxTotalCPUTime $ GlueComputingShareMinCPUTime $
GlueComputingShareDefaultCPUTime $ GlueComputingShareMaxTotalJobs $ GlueComputingShareMaxRunningJobs $
GlueComputingShareMaxWaitingJobs $ GlueComputingShareMaxPreLRMSWaitingJobs $
GlueComputingShareMaxUserRunningJobs $ GlueComputingShareMaxSlotsPerJob $
GlueComputingShareMaxStageInStreams $ GlueComputingShareMaxStageOutStreams $
GlueComputingShareSchedulingPolicy $ GlueComputingShareMaxMemory $ GlueComputingShareMaxDiskSpace $
GlueComputingShareDefaultStorageService $ GlueComputingSharePreemption $
GlueComputingShareServingState $ GlueComputingShareTotalJobs $ GlueComputingShareRunningJobs $
GlueComputingShareLocalRunningJobs $ GlueComputingShareWaitingJobs $
GlueComputingShareLocalWaitingJobs $ GlueComputingShareStagingJobs $ GlueComputingShareSuspendedJobs $
GlueComputingSharePreLRMSWaitingJobs $ GlueComputingShareEstimatedAverageWaitingTime $
GlueComputingShareEstimatedWorstWaitingTime $ GlueComputingShareFreeSlots $
GlueComputingShareFreeSlotsWithDuration $ GlueComputingShareUsedSlots $
GlueComputingShareRequestedSlots $ GlueComputingShareReservationPolicy $GlueComputingShareTag )
)

# Start ComputingManager

attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.1
    NAME 'GlueComputingManagerType'
    DESC 'Type of the computing manager (i.e., LRMS)'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.2
    NAME 'GlueComputingManagerVersion'
    DESC 'Version of the computing manager (i.e., LRMS)'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.3
    NAME 'GlueComputingManagerReservation'
    DESC 'True if the computing manager (i.e., LRMS) supports advance reservation'
    EQUALITY booleanMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.7
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.4
    NAME 'GlueComputingManagerBulkSubmission'
    DESC 'True if the computing manager (i.e., LRMS) supports the bulk submission'
    EQUALITY booleanMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.7
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.5
    NAME 'GlueComputingManagerTotalPhysicalCPUs'

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        DESC 'Number of managed physical CPUs accessible via any of the available endpoints (there is
one physical CPU per socket)'
        EQUALITY      integerMatch
        ORDERING      integerOrderingMatch
        SYNTAX        1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.6
        NAME 'GlueComputingManagerTotalLogicalCPUs'
        DESC 'Number of managed logical CPUs accessible via any of the available endpoints (a logical
CPU corresponds to a CPU visible to the operating system)'
        EQUALITY      integerMatch
        ORDERING      integerOrderingMatch
        SYNTAX        1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.7
        NAME 'GlueComputingManagerTotalSlots'
        DESC 'Number of managed slots'
        EQUALITY      integerMatch
        ORDERING      integerOrderingMatch
        SYNTAX        1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.8
        NAME 'GlueComputingManagerSlotsUsedByLocalJobs'
        DESC 'Number of slots used by jobs submitted via local interface'
        EQUALITY      integerMatch
        ORDERING      integerOrderingMatch
        SYNTAX        1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.9
        NAME 'GlueComputingManagerSlotsUsedByGridJobs'
        DESC 'Number of slots used by jobs submitted via a Grid interface'
        EQUALITY      integerMatch
        ORDERING      integerOrderingMatch
        SYNTAX        1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.10
        NAME 'GlueComputingManagerHomogeneity'
        DESC 'True if the computing manager has only one type of execution environment'
        EQUALITY      booleanMatch
        SYNTAX        1.3.6.1.4.1.1466.115.121.1.7
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.11
        NAME 'GlueComputingManagerNetworkInfo'
        DESC 'Type of internal network available among all the managed execution environment
instances'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.12
        NAME 'GlueComputingManagerLogicalCPUDistribution'
        DESC 'Syntax: X1:Y1, ..., Xn:Yn where Xi is the number of logical CPUs and Yi is the number of
boxes for the execution environment i'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.13
        NAME 'GlueComputingManagerWorkingAreaShared'
        DESC 'A working area is an allocated storage extent that holds the home directories of the
Grid jobs; this property is true if the working area is shared across different execution environment
instances (i.e., cluster nodes)'
        EQUALITY      booleanMatch
        SYNTAX        1.3.6.1.4.1.1466.115.121.1.7
        SINGLE-VALUE
    )

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```

)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.14
    NAME 'GlueComputingManagerWorkingAreaTotal'
    DESC 'Total size of working area available to all the Grid jobs either as a shared area across
all the execution environments (WorkingAreaShared is true) or local to a certain execution environment
(WorkingAreaShared is false); even if individual quota per job is enforced, this is not advertised'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.15
    NAME 'GlueComputingManagerWorkingAreaFree'
    DESC 'Free size of working area available to all the Grid jobs either as a shared area across
all the execution environments (WorkingAreaShared is true) or local to a certain execution environment
(WorkingAreaShared is false); (even if individual quota per job is enforced, this is not advertised)'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.16
    NAME 'GlueComputingManagerWorkingAreaLifeTime'
    DESC 'Lifetime of the Grid job files present in the working area; the lifetime is related to
the end time of the job'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.17
    NAME 'GlueComputingManagerCacheTotal'
    DESC 'Total size of a temporary storage area where frequently accessed data can be stored for
rapid access by consequent Grid jobs'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.18
    NAME 'GlueComputingManagerCacheFree'
    DESC 'Free size of a temporary storage area where frequently accessed data can be stored for
rapid access by consequent Grid jobs; in the computation of the free size, files which are not claimed
by any job can be considered as deleted'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.19
    NAME 'GlueComputingManagerTmpDir'
    DESC 'The absolute path of a temporary directory local to an execution environment instance
(i.e., worker node). This directory must be available to programs using the normal file access
primitives (open/read/write/close)'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.20
    NAME 'GlueComputingManagerScratchDir'
    DESC 'The absolute path for a shared directory available for application data. Typically a
POSIX accessible transient disk space shared between the execution environment instances. It may be
used by MPI applications or to store intermediate files that need further processing by local jobs or
as staging area, specially if the execution environment instances have no internet connectivity'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.21
    NAME 'GlueComputingManagerApplicationDir'

```

```

DESC 'The path of the directory available for application installation. Typically a PO-SIX
accessible disk space with transient to permanent allocation to the users'
EQUALITY caseIgnoreIA5Match
SUBSTR caseIgnoreIA5SubstringsMatch
SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.23.2.22
NAME 'GlueComputingManagerOtherInfo'
DESC 'Placeholder to publish info that does not fit in any other attribute. Free-form string,
comma-separated tags, (name, value) pair are example of syntax'
EQUALITY caseIgnoreIA5Match
SUBSTR caseIgnoreIA5SubstringsMatch
SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
SINGLE-VALUE
)

objectclass ( 1.3.6.1.4.1.6757.100.1.1.23
NAME 'GlueComputingManager'
DESC 'A software component locally managing one or more execution environments. It can
describe also aggregated information about the managed resources. The computing manager is also known
as Local Resource Management System (LRMS).'
STRUCTURAL
MUST GlueManagerUniqueID
MAY (GlueComputingManagerType $ GlueComputingManagerVersion $
GlueComputingManagerReservation $ GlueComputingManagerBulkSubmission $
GlueComputingManagerTotalPhysicalCPUs $ GlueComputingManagerTotalLogicalCPUs $
GlueComputingManagerTotalSlots $ GlueComputingManagerSlotsUsedByLocalJobs $
GlueComputingManagerSlotsUsedByGridJobs $ GlueComputingManagerHomogeneity $
GlueComputingManagerNetworkInfo $ GlueComputingManagerLogicalCPUDistribution $
GlueComputingManagerWorkingAreaShared $ GlueComputingManagerWorkingAreaTotal $
GlueComputingManagerWorkingAreaFree $ GlueComputingManagerWorkingAreaLifeTime $
GlueComputingManagerCacheTotal $ GlueComputingManagerCacheFree $ GlueComputingManagerTmpDir $
GlueComputingManagerScratchDir $ GlueComputingManagerApplicationDir $ GlueComputingManagerOtherInfo )
)

# Start Benchmark

attributetype ( 1.3.6.1.4.1.6757.100.1.1.24.2.1
NAME 'GlueComputingBenchmarkLocalID'
DESC 'An opaque identifier local to the Computing Service'
EQUALITY caseIgnoreIA5Match
SUBSTR caseIgnoreIA5SubstringsMatch
SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.24.2.2
NAME 'GlueComputingBenchmarkType'
DESC 'Type of benchmark'
EQUALITY caseIgnoreIA5Match
SUBSTR caseIgnoreIA5SubstringsMatch
SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.24.2.3
NAME 'GlueComputingBenchmarkValue'
DESC 'Value'
EQUALITY integerMatch
ORDERING integerOrderingMatch
SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
SINGLE-VALUE
)

objectclass ( 1.3.6.1.4.1.6757.100.1.1.24
NAME 'GlueComputingBenchmark'
DESC 'Benchmark information about an entity providing computing capacity'
STRUCTURAL
MUST GlueComputingBenchmarkLocalID
MAY ( GlueComputingBenchmarkType $ GlueComputingBenchmarkValue )
)

# Start ExecutionEnvironment

attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.1
NAME 'GlueComputingExecutionEnvironmentLocalID'
DESC 'An opaque identifier local to the Computing Service'
EQUALITY caseIgnoreIA5Match

```

```

SUBSTR caseIgnoreIA5SubstringsMatch
SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.2
  NAME 'GlueComputingExecutionEnvironmentPlatform'
  DESC 'The architecture platform of this execution environment'
  EQUALITY integerMatch
  ORDERING integerOrderingMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.3
  NAME 'GlueComputingExecutionEnvironmentVirtualMachine'
  DESC 'True if the execution environment is based on a virtual machine (in this case, the
values of the other attributes are related to the virtualized environment and not to the hosting
environment)'
  EQUALITY booleanMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.7
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.4
  NAME 'GlueComputingExecutionEnvironmentTotalInstances'
  DESC 'Number of execution environment instances'
  EQUALITY integerMatch
  ORDERING integerOrderingMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.5
  NAME 'GlueComputingExecutionEnvironmentUsedInstances'
  DESC 'Number of used execution environment instances; an instance is used when, according to
the policies of the Computing Manager (i.e., LRMS), it cannot accept new jobs because it already runs
the maximum number of allowed jobs'
  EQUALITY integerMatch
  ORDERING integerOrderingMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.6
  NAME 'GlueComputingExecutionEnvironmentUnavailableInstances'
  DESC 'Number of unavailable execution environment instances because of failures or
maintenance'
  EQUALITY integerMatch
  ORDERING integerOrderingMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.7
  NAME 'GlueComputingExecutionEnvironmentPhysicalCPUs'
  DESC 'Number of physical CPUs in an execution environment instance'
  EQUALITY integerMatch
  ORDERING integerOrderingMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.8
  NAME 'GlueComputingExecutionEnvironmentLogicalCPUs'
  DESC 'Number of logical CPUs in an execution environment instance'
  EQUALITY integerMatch
  ORDERING integerOrderingMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.9
  NAME 'GlueComputingExecutionEnvironmentCPUMultiplicity'
  DESC 'Information about the multiplicity of both physical CPUs and cores available in an
execution environment instance'
  EQUALITY integerMatch
  ORDERING integerOrderingMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
  SINGLE-VALUE
)

```

```

attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.10
    NAME 'GlueComputingExecutionEnvironmentCPUVendor'
    DESC 'Name of the physical CPU vendor'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.11
    NAME 'GlueComputingExecutionEnvironmentCPUModel'
    DESC 'Physical CPU model as defined by the vendor'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.12
    NAME 'GlueComputingExecutionEnvironmentCPUVersion'
    DESC 'Physical CPU version as defined by the vendor'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.13
    NAME 'GlueComputingExecutionEnvironmentCPClockSpeed'
    DESC 'Nominal clock speed of the physical CPU'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.14
    NAME 'GlueComputingExecutionEnvironmentCPUTimeScalingFactor'
    DESC 'Factor used by the Computing Manager (i.e., LRMS) to scale the CPU time (CPU Time
divided by CPUTimeScalingFactor); for the reference execution environment, this attribute is equal to
1'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.15
    NAME 'GlueComputingExecutionEnvironmentWallTimeScalingFactor'
    DESC 'Factor used by the Computing Manager (i.e., LRMS) to scale the Wall time (Wall Time
divided by WallTimeScalingFactor)'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.16
    NAME 'GlueComputingExecutionEnvironmentMainMemorySize'
    DESC 'Amount of RAM (if many jobs run in the same execution environment, they compete for the
total RAM)'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.17
    NAME 'GlueComputingExecutionEnvironmentVirtualMemorySize'
    DESC 'The amount of Virtual Memory (RAM+Swap)'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.18
    NAME 'GlueComputingExecutionEnvironmentOSFamily'
    DESC 'Family of the operating system'
    EQUALITY integerMatch

```

```

        ORDERING      integerOrderingMatch
        SYNTAX         1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.19
        NAME 'GlueComputingExecutionEnvironmentOSName'
        DESC 'Name of the operating system'
        EQUALITY      integerMatch
        ORDERING      integerOrderingMatch
        SYNTAX         1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.20
        NAME 'GlueComputingExecutionEnvironmentOSVersion'
        DESC 'Version of the operating system'
        EQUALITY      integerMatch
        ORDERING      integerOrderingMatch
        SYNTAX         1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.21
        NAME 'GlueComputingExecutionEnvironmentConnectivityIn'
        DESC 'Permission for direct inbound connectivity, even if limited'
        EQUALITY      booleanMatch
        SYNTAX         1.3.6.1.4.1.1466.115.121.1.7
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.22
        NAME 'GlueComputingExecutionEnvironmentConnectivityOut'
        DESC 'Permission for direct outbound connectivity, even if limited'
        EQUALITY      booleanMatch
        SYNTAX         1.3.6.1.4.1.1466.115.121.1.7
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.25.2.23
        NAME 'GlueComputingExecutionEnvironmentNetworkInfo'
        DESC 'Type of internal network available among the execution environment instances'
        EQUALITY      integerMatch
        ORDERING      integerOrderingMatch
        SYNTAX         1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    objectclass ( 1.3.6.1.4.1.6757.100.1.1.25
        NAME 'GlueComputingExecutionEnvironment'
        DESC 'A description of hardware, operating system and network characteristics that defines the
        environment available to and requestable by a Grid job when submitted to a Computing Service via a
        Computing Endpoint; the description also includes information about the total/available/used instances
        of the execution environment'
        STRUCTURAL
        MUST GlueComputingExecutionEnvironmentLocalID
        MAY ( GlueComputingExecutionEnvironmentPlatform $
        GlueComputingExecutionEnvironmentVirtualMachine $ GlueComputingExecutionEnvironmentTotalInstances $
        GlueComputingExecutionEnvironmentUsedInstances $ GlueComputingExecutionEnvironmentUnavailableInstances
        $ GlueComputingExecutionEnvironmentPhysicalCPUs $ GlueComputingExecutionEnvironmentLogicalCPUs $
        GlueComputingExecutionEnvironmentCPUMultiplicity $ GlueComputingExecutionEnvironmentCPUVendor $
        GlueComputingExecutionEnvironmentCPUModel $ GlueComputingExecutionEnvironmentCPUVersion $
        GlueComputingExecutionEnvironmentCPUClockSpeed $ GlueComputingExecutionEnvironmentCPUTimeScalingFactor
        $ GlueComputingExecutionEnvironmentWallTimeScalingFactor $
        GlueComputingExecutionEnvironmentMainMemorySize $ GlueComputingExecutionEnvironmentVirtualMemorySize $
        GlueComputingExecutionEnvironmentOSFamily $ GlueComputingExecutionEnvironmentOSName $
        GlueComputingExecutionEnvironmentOSVersion $ GlueComputingExecutionEnvironmentConnectivityIn $
        GlueComputingExecutionEnvironmentConnectivityOut $ GlueComputingExecutionEnvironmentNetworkInfo )
    )

    # Start Application Environment

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.26.2.1
        NAME 'GlueComputingApplicationEnvironmentLocalID'
        DESC 'An opaque identifier local to the Computing Service'
        EQUALITY      caseIgnoreIA5Match
        SUBSTR         caseIgnoreIA5SubstringsMatch
        SYNTAX         1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

```



```

attributetype ( 1.3.6.1.4.1.6757.100.1.1.26.2.2
    NAME 'GlueComputingApplicationEnvironmentName'
    DESC 'Name of the application environment'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.26.2.3
    NAME 'GlueComputingApplicationEnvironmentVersion'
    DESC 'Version of the application environment'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.26.2.4
    NAME 'GlueComputingApplicationEnvironmentRepository'
    DESC 'URL of a service which offers a repository and/or a name service for this application
environment'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.26.2.5
    NAME 'GlueComputingApplicationEnvironmentState'
    DESC 'State about the installation'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.26.2.6
    NAME 'GlueComputingApplicationEnvironmentRemovalDate'
    DESC 'Date and time after which the application can be removed'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.26.2.7
    NAME 'GlueComputingApplicationEnvironmentLicense'
    DESC 'The type of license'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.26.2.8
    NAME 'GlueComputingApplicationEnvironmentDescription'
    DESC 'The description of this application environment'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.26.2.9
    NAME 'GlueComputingApplicationEnvironmentBestBenchmark'
    DESC 'Type of benchmark which best identify the sensitivity of this application to the
performance aspect'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.26.2.10
    NAME 'GlueComputingApplicationEnvironmentParallelSupport'
    DESC 'The type of supported parallel execution framework'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

```

```

)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.26.2.11
    NAME 'GlueComputingApplicationEnvironmentMaxSlots'
    DESC 'Maximum number of slots that can be used to run jobs using the application environment
at the same time'
    EQUALITY      integerMatch
    ORDERING      integerOrderingMatch
    SYNTAX        1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.26.2.12
    NAME 'GlueComputingApplicationEnvironmentMaxJobs'
    DESC 'Maximum number of jobs that can use the application environment at the same time'
    EQUALITY      integerMatch
    ORDERING      integerOrderingMatch
    SYNTAX        1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.26.2.13
    NAME 'GlueComputingApplicationEnvironmentMaxUserSeats'
    DESC 'Maximum number of user seats that can use the application environment at the same time'
    EQUALITY      integerMatch
    ORDERING      integerOrderingMatch
    SYNTAX        1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.26.2.14
    NAME 'GlueComputingApplicationEnvironmentFreeSlots'
    DESC 'Available number slots that can be used to run jobs using the application environment at
the same time'
    EQUALITY      integerMatch
    ORDERING      integerOrderingMatch
    SYNTAX        1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.26.2.15
    NAME 'GlueComputingApplicationEnvironmentFreeJobs'
    DESC 'Number of new jobs that could start their execution and use the application environment
at the same time'
    EQUALITY      integerMatch
    ORDERING      integerOrderingMatch
    SYNTAX        1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.26.2.16
    NAME 'GlueComputingApplicationEnvironmentFreeUserSeats'
    DESC 'Free seats for additional users that can use the application environment at the same
time'
    EQUALITY      integerMatch
    ORDERING      integerOrderingMatch
    SYNTAX        1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

objectclass ( 1.3.6.1.4.1.6757.100.1.1.26
    NAME 'GlueComputingApplicationEnvironment'
    DESC 'Description of the application software or environment characteristic available within
one or more execution environments'
    STRUCTURAL
    MUST GlueComputingApplicationEnvironmentLocalID
    MAY ( GlueComputingApplicationEnvironmentName $ GlueComputingApplicationEnvironmentVersion
$ GlueComputingApplicationEnvironmentRepository $ GlueComputingApplicationEnvironmentState $
GlueComputingApplicationEnvironmentRemovalDate $ GlueComputingApplicationEnvironmentLicense $
GlueComputingApplicationEnvironmentDescription $ GlueComputingApplicationEnvironmentBestBenchmark $
GlueComputingApplicationEnvironmentParallelSupport $ GlueComputingApplicationEnvironmentMaxSlots $
GlueComputingApplicationEnvironmentMaxJobs $ GlueComputingApplicationEnvironmentMaxUserSeats $
GlueComputingApplicationEnvironmentFreeSlots $ GlueComputingApplicationEnvironmentFreeJobs $
GlueComputingApplicationEnvironmentFreeUserSeats )
)

# Start Application Handle

attributetype ( 1.3.6.1.4.1.6757.100.1.1.27.2.1
    NAME 'GlueComputingApplicationHandleLocalID'
    DESC 'An opaque identifier local to the Computing Service'

```

```

    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.27.2.2
    NAME 'GlueComputingApplicationHandleType'
    DESC 'Type of handle for an application environment'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.27.2.3
    NAME 'GlueComputingApplicationHandleValue'
    DESC 'Actionable value to trigger the handle method'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

objectclass ( 1.3.6.1.4.1.6757.100.1.1.27
    NAME 'GlueComputingApplicationHandle'
    DESC 'Technique for bootstrapping and/or accessing the application'
    STRUCTURAL
    MUST GlueComputingApplicationHandleLocalID
    MAY ( GlueComputingApplicationHandleType $ GlueComputingApplicationHandleValue )
)

# Start Computing Activity

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.1
    NAME 'GlueComputingActivityUniqueID'
    DESC 'A global unique ID'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.2
    NAME 'GlueComputingActivityName'
    DESC 'Human-readable name as specified by the user in the job description document'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.3
    NAME 'GlueComputingActivityType'
    DESC 'Type of computing activity'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.4
    NAME 'GlueComputingActivityIDFromEndpoint'
    DESC 'The job ID as assigned by the computing endpoint'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.5
    NAME 'GlueComputingActivityLocalIDFromManager'
    DESC 'The local ID of the job as assigned by the computing manager (i.e., LRMS)'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.6
    NAME 'GlueComputingActivityJobDescription'

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        DESC 'Job description language used to specify the job request'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.7
    NAME 'GlueComputingActivityState'
    DESC 'The state of the job according to the Grid state model for jobs'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.8
    NAME 'GlueComputingActivityRestartState'
    DESC 'The state from which a failed job can restart upon a client request'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.9
    NAME 'GlueComputingActivityExitCode'
    DESC 'The exit code as returned by the executable of the job'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.10
    NAME 'GlueComputingActivityComputingManagerExitCode'
    DESC 'The exit code provided by the computing manager (i.e., LRMS)'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.11
    NAME 'GlueComputingActivityError'
    DESC 'Error messages as provided by the software components involved in the management of the
job'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.12
    NAME 'GlueComputingActivityWaitingPosition'
    DESC 'For a waiting job in the computing manager (i.e., LRMS), the position of the job in the
queue'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.13
    NAME 'GlueComputingActivityUserDomain'
    DESC 'User domain selected by the job owner in the job submission request (an owner can belong
to several user domains, it should decide which one to choose when submitting a job)'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.14
    NAME 'GlueComputingActivityOwner'
    DESC 'The Grid identity of the job's owner; in case of anonymity is required, the value
CONFIDENTIAL should be advertised'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

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)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.15
    NAME 'GlueComputingActivityLocalOwner'
    DESC 'The local user name to which the job's owner is mapped into'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.16
    NAME 'GlueComputingActivityRequestedTotalWallTime'
    DESC 'The total wall clock time requested by the job; for multi-slot jobs, it represents the
sum of wall clock time needed in each required slot'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.17
    NAME 'GlueComputingActivityRequestedTotalCPUTime'
    DESC 'The total CPU time requested by the job for multi-slot jobs, it represents the sum of
CPU time needed in each required slot'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.18
    NAME 'GlueComputingActivityRequestedSlots'
    DESC 'The number of requested slots'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.19
    NAME 'GlueComputingActivityRequestedApplicationEnvironment'
    DESC 'Serialization of the Name and Version of the requested Application Environment to match
the Name and Version properties of the Application Environment (the serialization of the Name and
Version is delegated to the implementers)'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.20
    NAME 'GlueComputingActivityStdIn'
    DESC 'The name of the file which is used as the standard input of the job'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.21
    NAME 'GlueComputingActivityStdOut'
    DESC 'The name of the file which contains the standard output of the job'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.22
    NAME 'GlueComputingActivityStdErr'
    DESC 'The name of the file which contains the standard error of the job'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.23
    NAME 'GlueComputingActivityLogDir'

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        DESC 'The name of the directory which contains the logs related to the job and generated by
the Grid layer (usually the directory is private to the job)'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.24
        NAME 'GlueComputingActivityExecutionNode'
        DESC 'Hostname associated to the execution environment instance (i.e., worker node) running
the job; multi-node jobs are described by several instances of this attribute'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.25
        NAME 'GlueComputingActivityQueue'
        DESC 'The name of the Computing Manager (i.e., LRMS) queue to which this job was queued'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.26
        NAME 'GlueComputingActivityUsedTotalWallTime'
        DESC 'The totally consumed wall clock time by the job (in case of multi-slot jobs, this value
refers to the sum of the wall clock time consumed in each slot)'
        EQUALITY integerMatch
        ORDERING integerOrderingMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.27
        NAME 'GlueComputingActivityUsedTotalCPUTime'
        DESC 'The totally consumed CPU time by the job (in case of multi-slot jobs, this value refers
to the sum of the consumed CPU time in each slot)'
        EQUALITY integerMatch
        ORDERING integerOrderingMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.28
        NAME 'GlueComputingActivityUsedMainMemory'
        DESC 'The RAM used by the job'
        EQUALITY integerMatch
        ORDERING integerOrderingMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.29
        NAME 'GlueComputingActivitySubmissionTime'
        DESC 'Time when the job was submitted to a computing endpoint'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.30
        NAME 'GlueComputingActivityComputingManagerSubmissionTime'
        DESC 'Time when the job was submitted to the Computing Manager (i.e., LRMS) by the Grid layer'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.31
        NAME 'GlueComputingActivityStartTime'
        DESC 'Time when the job entered in the Computing Manager (i.e., LRMS) running state'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26

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        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.32
        NAME 'GlueComputingActivityComputingManagerEndTime'
        DESC 'Time when the job entered its final Computing Manager (i.e., LRMS) state'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.33
        NAME 'GlueComputingActivityEndTime'
        DESC 'Time when the job entered its final Grid state'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.34
        NAME 'GlueComputingActivityWorkingAreaEraseTime'
        DESC 'A working area is an allocated storage extent that holds the home directories of the
Grid jobs; the time when the dedicated working area of this job will be removed'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.35
        NAME 'GlueComputingActivityProxyExpirationTime'
        DESC 'The expiration time of the proxy related to the job'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.36
        NAME 'GlueComputingActivitySubmissionHost'
        DESC 'The name of the host from which the job was submitted (e.g., IP address, port and host
name)'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.37
        NAME 'GlueComputingActivitySubmissionClientName'
        DESC 'The name of the software client which was used to submit the job'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.28.2.38
        NAME 'GlueComputingActivityOtherMessages'
        DESC 'Optional job messages provided by either the Grid Layer or the Computing Manager (i.e.,
LRMS)'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    objectclass ( 1.3.6.1.4.1.6757.100.1.1.28
        NAME 'GlueComputingActivity'
        DESC 'An activity managed by an OGSA execution capability service (the computing activity is
traditionally called job)'
        STRUCTURAL
        MUST GlueComputingActivityUniqueID
        MAY ( GlueComputingActivityName $ GlueComputingActivityType $
GlueComputingActivityIDFromEndpoint $ GlueComputingActivityLocalIDFromManager $
GlueComputingActivityJobDescription $ GlueComputingActivityState $ GlueComputingActivityRestartState $
GlueComputingActivityExitCode $ GlueComputingActivityComputingManagerExitCode $
GlueComputingActivityError $ GlueComputingActivityWaitingPosition $ GlueComputingActivityUserDomain $
GlueComputingActivityOwner $ GlueComputingActivityLocalOwner $

```

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GlueComputingActivityRequestedTotalWallTime $ GlueComputingActivityRequestedTotalCPUTime $
GlueComputingActivityRequestedSlots $ GlueComputingActivityRequestedApplicationEnvironment $
GlueComputingActivityStdIn $ GlueComputingActivityStdOut $ GlueComputingActivityStdErr $
GlueComputingActivityLogDir $ GlueComputingActivityExecutionNode $ GlueComputingActivityQueue $
GlueComputingActivityUsedTotalWallTime $ GlueComputingActivityUsedTotalCPUTime $
GlueComputingActivityUsedMainMemory $ GlueComputingActivitySubmissionTime $
GlueComputingActivityComputingManagerSubmissionTime $ GlueComputingActivityStartTime $
GlueComputingActivityComputingManagerEndTime $ GlueComputingActivityEndTime $
GlueComputingActivityWorkingAreaEraseTime $ GlueComputingActivityProxyExpirationTime $
GlueComputingActivitySubmissionHost $ GlueComputingActivitySubmissionClientName $
GlueComputingActivityOtherMessages )
)

# Start Computing2Storage

attributetype ( 1.3.6.1.4.1.6757.100.1.1.29.2.1
    NAME 'GlueComputingStorageLocalPath'
    DESC 'The local path of the computing service enabling to access a remote path in the
associated storage service (this is typically an NFS mount point)'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.29.2.2
    NAME 'GlueComputingStorageRemotePath'
    DESC 'The remote path in the storage service which is associated the local path in the
computing service (this is typically an NFS exported directory)'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

objectclass ( 1.3.6.1.4.1.6757.100.1.1.29
    NAME 'ComputingService2StorageService'
    DESC 'Description of a POSIX access via a file system technology enabling the computing
service to access the associated storage service'
    STRUCTURAL
    MAY ( GlueComputingStorageLocalPath $ GlueComputingStorageRemotePath )
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.30.2.1
    NAME 'GlueStorageServiceCapacityLocalID'
    DESC 'An opaque identifier local to the Storage Service'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.30.2.2
    NAME 'GlueStorageServiceCapacityType'
    DESC 'Type of storage capacity'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.30.2.3
    NAME 'GlueStorageServiceCapacityTotalSize'
    DESC 'Size of dedicated storage extent'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.30.2.4
    NAME 'GlueStorageServiceCapacityFreeSize'
    DESC 'Size of free storage extent'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.30.2.5

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        NAME 'GlueStorageServiceCapacityUsedSize'
        DESC 'Size of used storage extent'
        EQUALITY integerMatch
        ORDERING integerOrderingMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.30.2.6
        NAME 'GlueStorageServiceCapacityReservedSize'
        DESC 'Size of reserved storage extent'
        EQUALITY integerMatch
        ORDERING integerOrderingMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.30.2.7
        NAME 'GlueStorageServiceCapacityOtherInfo'
        DESC 'Placeholder to publish info that does not fit in any other attribute. Free-form string,
        comma-separated tags, (name, value ) pair are example of syntax'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    objectclass ( 1.3.6.1.4.1.6757.100.1.1.30
        NAME 'GlueStorageServiceCapacity'
        DESC 'Description of the size and state of an homogenous storage extent'
        STRUCTURAL
        MUST GlueStorageServiceCapacityLocalID
        MAY ( GlueStorageServiceCapacityType $ GlueStorageServiceCapacityTotalSize $
        GlueStorageServiceCapacityFreeSize $ GlueStorageServiceCapacityUsedSize $
        GlueStorageServiceCapacityReservedSize $ GlueStorageServiceCapacityOtherInfo )
    )

    #Start StorageAccessProtocol

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.31.2.1
        NAME 'GlueStorageAccessProtocolLocalID'
        DESC 'An opaque identifier local to the Storage Service'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.31.2.2
        NAME 'GlueStorageServiceAccessPotocolType'
        DESC 'The name of the protocol'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.31.2.3
        NAME 'GlueStorageServiceAccessProtocolVersion'
        DESC 'The version of the protocol'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.31.2.4
        NAME 'GlueStorageServiceAccessProtocolMaxStreams'
        DESC 'The number of parallel streams this protocol supports'
        EQUALITY integerMatch
        ORDERING integerOrderingMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.31.2.5
        NAME 'GlueStorageServiceAccessProtocolOtherInfo'
        DESC 'Placeholder to publish info that does not fit in any other attribute. Free-form string,
        comma-separated tags, (name, value ) pair are example of syntax'
        EQUALITY caseIgnoreIA5Match

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        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

objectclass ( 1.3.6.1.4.1.6757.100.1.1.31
    NAME 'GlueStorageServiceAccessProtocol'
    DESC 'A type of protocol available to access the available storage capacities '
    STRUCTURAL
    MUST GlueStorageAccessProtocolLocalID
    MAY ( GlueStorageServiceAccessPotocolType $ GlueStorageServiceAccessProtocolVersion $
    GlueStorageServiceAccessProtocolMaxStreams $ GlueStorageServiceAccessProtocolOtherInfo )
)

#Start StorageShare

attributetype ( 1.3.6.1.4.1.6757.100.1.1.32.2.1
    NAME 'GlueStorageShareLocalID'
    DESC 'An opaque identifier local to the associated Service'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.32.2.2
    NAME 'GlueStorageShareName'
    DESC 'Human-readable name'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.32.2.3
    NAME 'GlueStorageShareDescription'
    DESC 'Description of this share'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.32.2.4
    NAME 'GlueStorageShareServingState'
    DESC 'A state specifying if the share is open to place new requests and if it is open to offer
the already present requests for execution'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.32.2.5
    NAME 'GlueStorageSharePath'
    DESC 'A namespace where files are logically assigned to when they are stored into this share'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.32.2.6
    NAME 'GlueStorageShareSharingID'
    DESC 'Local ID common to the storage shares which use the same storage share capacities
('dedicated' is a reserved term and means that the storage share capacities are not shared with other
storage share capacities part of different storage shares)'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.32.2.7
    NAME 'GlueStorageShareAccessLatency'
    DESC 'The maximum latency category for a file stored in this share to be made available for
reading'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

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)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.32.2.8
    NAME 'GlueStorageShareRetentionPolicy'
    DESC 'The quality of retention, which indicates the probability of the storage system losing a
file'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.32.2.9
    NAME 'GlueStorageShareExpirationMode'
    DESC 'Support for files with infinite and/or finite lifetimes, and what actions the storage
service may take upon the expiration of a file'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.32.2.10
    NAME 'GlueStorageShareDefaultLifeTime'
    DESC 'The default lifetime assigned to the file if no explicit lifetime is specified'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.32.2.11
    NAME 'GlueStorageShareMaximumLifeTime'
    DESC 'The maximum lifetime that can be requested for a file'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.32.2.12
    NAME 'GlueStorageShareTag'
    DESC 'A user defined tag for additional information'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.32.2.13
    NAME 'GlueStorageShareOtherInfo'
    DESC 'Placeholder to publish info that does not fit in any other attribute. Free-form string,
comma-separated tags, (name, value ) pair are example of syntax'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

objectclass ( 1.3.6.1.4.1.6757.100.1.1.32
    NAME 'GlueStorageShare'
    DESC 'A utilization target for a set of storage resources defined by a set of configuration
parameters and characterized by status information'
    STRUCTURAL
    MUST GlueStorageShareLocalID
    MAY ( GlueStorageShareName $ GlueStorageShareDescription $ GlueStorageShareServingState $
GlueStorageSharePath $ GlueStorageShareSharingID $ GlueStorageShareAccessLatency $
GlueStorageShareRetentionPolicy $ GlueStorageShareExpirationMode $ GlueStorageShareDefaultLifeTime $
GlueStorageShareMaximumLifeTime $ GlueStorageShareTag $ GlueStorageShareOtherInfo )
)

# Start StorageShareCapacity

attributetype ( 1.3.6.1.4.1.6757.100.1.1.33.2.1
    NAME 'GlueStorageShareCapacityLocalID'
    DESC 'An opaque identifier local to the Storage Service'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

```

```

attributetype ( 1.3.6.1.4.1.6757.100.1.1.33.2.2
  NAME 'GlueStorageShareCapacityType'
  DESC 'Type of storage capacity'
  EQUALITY caseIgnoreIA5Match
  SUBSTR caseIgnoreIA5SubstringsMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.33.2.3
  NAME 'GlueStorageShareCapacityTotalSize'
  DESC 'Size of dedicated storage extent'
  EQUALITY integerMatch
  ORDERING integerOrderingMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.33.2.4
  NAME 'GlueStorageShareCapacityFreeSize'
  DESC 'Size of free storage extent'
  EQUALITY integerMatch
  ORDERING integerOrderingMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.33.2.5
  NAME 'GlueStorageShareCapacityUsedSize'
  DESC 'Size of used storage extent'
  EQUALITY integerMatch
  ORDERING integerOrderingMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.33.2.6
  NAME 'GlueStorageShareCapacityReservedSize'
  DESC 'Size of reserved storage extent'
  EQUALITY integerMatch
  ORDERING integerOrderingMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.33.2.7
  NAME 'GlueStorageShareCapacityOtherInfo'
  DESC 'Placeholder to publish info that does not fit in any other attribute. Free-form string,
comma-separated tags, (name, value ) pair are example of syntax'
  EQUALITY caseIgnoreIA5Match
  SUBSTR caseIgnoreIA5SubstringsMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
  SINGLE-VALUE
)

objectclass ( 1.3.6.1.4.1.6757.100.1.1.33
  NAME 'GlueStorageShareCapacity'
  DESC 'Description of the size and state of an homogenous storage extent'
  STRUCTURAL
  MUST GlueStorageShareCapacityLocalID
  MAY ( GlueStorageShareCapacityType $ GlueStorageShareCapacityTotalSize $
GlueStorageShareCapacityFreeSize $ GlueStorageShareCapacityUsedSize $
GlueStorageShareCapacityReservedSize $ GlueStorageShareCapacityOtherInfo )
)

# Start StorageManager

attributetype ( 1.3.6.1.4.1.6757.100.1.1.34.2.1
  NAME 'GlueStorageManagerUniqueID'
  DESC 'A global unique ID '
  EQUALITY caseIgnoreIA5Match
  SUBSTR caseIgnoreIA5SubstringsMatch
  SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
  SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.34.2.2
  NAME 'GlueStorageManagerName'
  DESC 'Human-readable name'
  EQUALITY caseIgnoreIA5Match

```

```

        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.34.2.3
        NAME 'GlueStorageManagerType'
        DESC 'Type of storage manager'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.34.2.4
        NAME 'GlueStorageManagerVersion'
        DESC 'ersion of the storage manager'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.34.2.5
        NAME 'GlueStorageManagerOtherInfo'
        DESC 'Placeholder to publish info that does not fit in any other attribute. Free-form string,
        comma-separated tags, (name, value ) pair are example of syntax'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    objectclass ( 1.3.6.1.4.1.6757.100.1.1.34
        NAME 'GlueStorageManager'
        DESC 'The primary software component locally managing one or more storage resources. It can
        describe also aggregated information about the managed resources.'
        STRUCTURAL
        MUST GlueStorageManagerUniqueID
        MAY ( GlueStorageManagerName $ GlueStorageManagerType $ GlueStorageManagerVersion $
        GlueStorageManagerOtherInfo )
    )

    # Start StorageResource

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.35.2.1
        NAME 'GlueStorageResourceUniqueID'
        DESC 'A global unique ID'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.35.2.2
        NAME 'GlueStorageResourceName'
        DESC 'Human-readable name'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.35.2.3
        NAME 'GlueStorageResourceType'
        DESC 'Type of storage resource'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

    attributetype ( 1.3.6.1.4.1.6757.100.1.1.35.2.4
        NAME 'GlueStorageResourceLatency'
        DESC 'The maximum latency category for a file stored in this resource to be made available for
        reading'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

```

```

attributetype ( 1.3.6.1.4.1.6757.100.1.1.35.2.5
    NAME 'GlueStorageResourceTotalSize'
    DESC 'Size of storage extent'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.35.2.6
    NAME 'GlueStorageResourceFreeSize'
    DESC 'Size of free storage extent '
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.35.2.7
    NAME 'GlueStorageResourceUsedSize'
    DESC 'Size of used storage extent'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.35.2.8
    NAME 'GlueStorageResourceOtherInfo'
    DESC 'Placeholder to publish info that does not fit in any other attribute. Free-form string,
comma-separated tags, (name, value ) pair are example of syntax'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

objectclass ( 1.3.6.1.4.1.6757.100.1.1.35
    NAME 'GlueStorageResource'
    DESC 'Abstracted of a sufficiently homogeneous storage device providing a storage capacity,
managed by a local software component (storage manager), part of a storage service, reachable via one
or more endpoints and having one or more shares defined on it. A storage resource refers to a category
with summary information on the capacity'
    STRUCTURAL
    MUST GlueStorageResourceUniqueID
    MAY ( GlueStorageResourceName $ GlueStorageResourceType $ GlueStorageResourceLatency $
GlueStorageResourceTotalSize $ GlueStorageResourceFreeSize $ GlueStorageResourceUsedSize
$GlueStorageResourceOtherInfo )
)

# Start Storage2Computing

attributetype ( 1.3.6.1.4.1.6757.100.1.1.36.2.1
    NAME 'GlueStorage2ComputingLocalID'
    DESC 'An opaque identifier local to the Storage Service'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.36.2.2
    NAME 'GlueStorage2ComputingNetworkInfo'
    DESC 'Type of network available among the storage service and computing service'
    EQUALITY caseIgnoreIA5Match
    SUBSTR caseIgnoreIA5SubstringsMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.36.2.3
    NAME 'GlueStorage2ComputingBandwidth'
    DESC 'The nominal bandwidth available between the storage service and computing service'
    EQUALITY integerMatch
    ORDERING integerOrderingMatch
    SYNTAX 1.3.6.1.4.1.1466.115.121.1.27
    SINGLE-VALUE
)

attributetype ( 1.3.6.1.4.1.6757.100.1.1.36.2.4

```

```

        NAME 'GlueStorage2ComputingOtherInfo'
        DESC 'Placeholder to publish info that does not fit in any other attribute. Free-form string,
comma-separated tags, (name, value ) pair are example of syntax'
        EQUALITY caseIgnoreIA5Match
        SUBSTR caseIgnoreIA5SubstringsMatch
        SYNTAX 1.3.6.1.4.1.1466.115.121.1.26
        SINGLE-VALUE
    )

objectclass ( 1.3.6.1.4.1.6757.100.1.1.36
    NAME 'GlueStorage2Computing'
    DESC 'Description of the network link quality of a storage service to a computing service'
    STRUCTURAL
    MUST GlueStorage2ComputingLocalID
    MAY ( GlueStorage2ComputingNetworkInfo $ GlueStorage2ComputingBandwidth $
GlueStorage2ComputingOtherInfo )
)

```

5.3 Security Considerations

Please refer to RFC 3552 (<http://www.ietf.org/rfc/rfc3552.txt>) for guidance on writing a security considerations section. This section is required in all documents, and should not just say “there are no security considerations.” Quoting from the RFC:

“Most people speak of security as if it were a single monolithic property of a protocol or system, however, upon reflection, one realizes that it is clearly not true. Rather, security is a series of related but somewhat independent properties. Not all of these properties are required for every application.

We can loosely divide security goals into those related to protecting communications (COMMUNICATION SECURITY, also known as COMSEC) and those relating to protecting systems (ADMINISTRATIVE SECURITY or SYSTEM SECURITY). Since communications are carried out by systems and access to systems is through communications channels, these goals obviously interlock, but they can also be independently provided.”

6. Author Information

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7. Contributors & Acknowledgements

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