

GRID SERVICE - I

6.3 GRID SERVICE: NAMING AND CHANGE MANAGEMENT RECOMMENDATIONS

This is a critical area in distributed systems where a service may undergo changes, including the publicly available interface and/or implementation, over some specified period of time. Let us now explore how these changes are handled in OGSi Grid services, and what best practices one should adhere to when dealing with such dynamics.

One should contend with the semantics of grid services as follows:

- The semantic of a grid service instance must be well defined by its interface definition; a combination of portTypes, operations, messages, types, and service data declarations.
- The implementation semantics must be consistent with the interface semantics; otherwise, it may confuse the client and may result in wayward behavior.

Based on the previous observations, here are some important best practices to consider:

- Service interfaces and implementations should agree on the semantics of the service.
- If there is a change to the interface (e.g., syntax and/or semantics) it is recommended to provide a new interface to the client, as opposed to changing the existing interface.
- All the elements of a grid service element must be immutable. This means that the QName of the portType, operation, message, service data declaration, and associated types are immutable. Any changes in any of these should result in a new interface portType.
- New interfaces should always be created using a new portType QName (i.e., a local name and a namespace combination).
- Grid Service Instance Handles, References, and Usage Models

Every grid service implemented utilizing the OGSi specification should adhere to certain practices, which are important to the overall integrity of the service.

One or more GSHs must be unique. This is key due to the fact that these handles uniquely identify a grid service instance that is valid for the entire life of a service. However, handles do not carry enough information to allow a client to communicate directly with the service instance.

The service's GSH is based on a URI scheme (e.g., `http://`) and the specific information (e.g., `abc.com/myInstance`).

A client must resolve the GSH information to a service specific to the GSR discussed in the next section, in one of three ways: by itself, by using the mechanisms provided from the service provider (e.g., a `HandleResolver` service, which implements a `Handle-Resolver portType`), or by delegating to a third-party handle resolving service.

One or more GSRs are key to access integrity. A client can access a grid service through the use of a GSR, which can be treated as a pointer to a specific grid service instance. A GSR is a remote service "reference" and contains all the information to access the service. The format of a GSR is specific to the binding mechanism used by the client to communicate with the service.

Some examples of these binding formats include the following:

- Interoperable object reference (IOR) for clients utilizing the Remote Method Invocation/Internet Inter-ORB Protocol (RMI/IIOP)
- WSDL for clients utilizing the SOAP protocol
- .NET remoting reference

A grid service instance may have one or more GSRs available to it. The GSRs are associated with a lifecycle that is different from the service lifecycle. When the GSR is no longer valid, the client should get a reference to the service using an available GSH. It is important to note that the specification recommends a WSDL encoding of a GSR for a service. Thus, we may find that most of the grid service implementers will support WSDL encoding as the default encoding, and based upon the performance and quality, can switch to other encoding.

Listing 6.1. OGSi schema definition for GSR.

```
targetNamespace = "http://www.gridforum.org/namespaces/2003/03/OGSI"
<xsd:element name="reference" type="ogsi:ReferenceType"/>
<xsd:complexType name="ReferenceType" abstract="true">
  <xsd:attribute ref="ogsi:goodFrom" use="optional"/>
  <xsd:attribute ref="ogsi:goodUntil" use="optional"/>
</xsd:complexType>
```