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OGC[®] Testbed-10 Service Integration Engineering Report

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Preface

For many years OGC has been developing a suite of web services for geospatial processing. The suite includes a web map service (WMS), a web map tiling service (WMTS), a web feature service (WFS), a web coverage service (WCS), a web catalogue service, etc. These services have, more or less, been developed independently of one another resulting in isolation and poor integration among them. For example, consider a map generated by a WMS; it is not easily possible to determine which source data was used to create the map and how to download that source data through an OGC data service such as WFS or WCS. Furthermore when one considers the Publish-Find-Bind paradigm, OGC can only partially support the full potential of this paradigm because OGC catalogues can only register services in isolation of other related services and cannot automatically determine the relationships among services and the resources they offer. The purpose of this document is to provide a technical description of changes to the OGC web service architecture baseline to support better integration among OGC web services that would allow better automated publishing and richer discovery of those services and related resources.

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OGC® Testbed-10 Service Integration Engineering Report

1 Introduction

1.1 Scope

This document specifies technical changes to the OGC web service architecture baseline to support better integration among the services. Although integration may be achieved in a number of ways and using a number of other technologies, the goal of this document is to achieve this integration within the current OGC service framework in order to leverage existing investments in OGC web services infrastructure.

Two groups of use cases have been developed to illustrate the needs of an integrated suite of OGC web services: (a) catalogue use cases and (b) direct client-server use cases. The catalogue use cases include the following:

- Service identification use case
- Service discovery use case
- Service harvesting use case
- Rich discovery use case

The direct client-service use cases include the following:

- Efficient data navigation use case
- Rendering use case
- Cascading use case
- Data download use case

This document establishes a new service, called the **Web Integration Service (WIS)**, which allows for the discovery and access to integrated sets of OGC web services deployed at an endpoint.

This document specifies a means of discovering and describing associations between web resources (both OGC and non-OGC). The discovery of associations is accomplished by means a new operation named GetAssociations. The description or representation of

associations is accomplished by the definition of an XML Schema for expressing associations in XML. As mentioned earlier, the scope of this document is limited to the existing OGC web service framework, which predominantly uses XML. However, it is anticipated that over time the association schemas defined in this document will be extended to provide a JSON expression, which is a rapidly emerging encoding both within and outside the OGC.

For the purpose of catalogue harvesting it would be very useful to have a unique service identifier for each service instance. This document also specifies changes to the existing OGC Capabilities document schema to include a “ServiceId” element whose value is a UUID (see IETF RFC 4122) that uniquely identifies an OGC web service instance.

Currently, OGC catalogues can harvest the capabilities document of an OGC web service, register that service, register the existence of the individual data items that the service offers and also register the association between the service and the data it offers. Thus, the entire harvesting process is focused on a single OGC web service. There is currently no defined method that allows a catalogue to determine and harvest associations that might exist between the service being harvested and other services and other data offerings. This document also specifies changes to the current OGC web service baseline to support the harvesting of this richer set of metadata by providing the means for a catalogue to register a service, the data the service offers and also all the associations between the service, its data, other OGC web resources (i.e. other OGC services and data offerings) and other non-OGC web resources. A component of this enhanced harvesting capability is the definition of a CSW-ebRIM package that defines ebRIM object types, associations and classifications that support the description of integrated OGC web services and their artifacts within the catalogue.

Having defined the methods and apparatus for harvesting a richer set of metadata about OGC web services, this document also specifies how this metadata can be discovered once it has been registered in a catalogue. For example, a client should be able to find the description of feature data in a catalogue and then be able to find the WFS that offer that data, a WMS that renders those features into a map, a WMTS that has a tiled representation of that data, etc. This enhanced discovery capability is provided by a set of stored queries defined in a CSW-ebRIM package specified in this document to support the description of integrated OGC web services.

The association between web resources described in this document will also have an impact and use for the OWS Context document (see OGC 12-084). An OGC Web Services Context Document (OWS Context) lists a set of configured information resources in a single document. The information resources are primarily OGC services but it also supports inline content. Resources such as OGC Web Feature Service (WFS), Web Map Service (WMS), Web Map Tile Service (WMTS), Web Coverage Service (WCS) or configured processing services defined as a Web Processing Service (WPS) can be listed side by side with GML objects or to offer a “common operating picture”.

An OWS Context Document presents a list of items and not necessarily a list of services. An item can have one or more services associated and thus allowing the client to select the preferred end-point and encoding of the information represented in the item. A catalogue or an application producing OWS Context Documents has to obtain those associations and be able to aggregate them as the same item accessed by different services.

Moreover, as in for the catalogue harvesting mentioned above, the OWS Context Document offers no method to define associations that might exist between the different items. It is expected that the association defined in this document will support OWS Context clients in organizing and managing the different information items.

1.2 Document contributor contact points

All questions regarding this document should be directed to the editor or the contributors:

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1.3 Future work

Although any OGC web service can participate as part of an integrated suite of OGC services, this document primarily focuses its discussion and examples of the “classical” OGC web service of WMS, WMTS, WFS, WCS, WPS and CSW. Future revisions would expand the examples and discussion to include a broader range of OGC service including the SOS suite of services.

The data structures defined in this document are primarily encoded using XML. In the future a JSON encoding will also be required as JSON is quickly emerging as the preferred encoding and serialization of data exchanged on the web.

1.4 Forward

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The Open Geospatial Consortium shall not be held responsible for identifying any or all such patent rights.

Recipients of this document are requested to submit, with their comments, notification of any relevant patent claims or other intellectual property rights of which they may be aware that might be infringed by any implementation of the standard set forth in this document, and to provide supporting documentation.

2 References

The following documents are referenced in this document. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. For undated references, the latest edition of the normative document referred to applies.

IETF RFC 3986, *Uniform Resource Identifier (URI): Generic Syntax*

IETF RFC 4122, *A Universally Unique Identifier (UUID) URN Namespace*

IETF RFC 5988, *Web Linking*

OASIS regrep-rim-3.0-os, *ebXML Registry Information Model, Version 3.0*

OGC 12-084r2, *OWS Context Atom Encoding*

OGC 12-080, *OWS Context Conceptual Model*

OGC 10-069r2, *OWS-7 Engineering Report - Geosynchronization service*

OGC 09-025r1, *OpenGIS Web Feature Service 2.0 Interface Standard (also ISO 19142)*

OGC 07-110r4, *CSW-ebRIM Registry Service - Part 1: ebRIM profile of CSW*

OGC 07-144r4, *CSW-ebRIM Registry Service - Part 2: Basic extension package*

OGC 07-057r7, *OpenGIS Web Map Tile Service Implementation Standard*

OGC 07-006r1, *OpenGIS Catalogue Service Implementation Specification*

OGC 06-121r9, *OGC[®] Web Services Common Standard*

OGC 06-042, *OpenGIS Web Map Service (WMS) Implementation Specification*

OGC 05-076, *OpenGIS Web Coverage Service (WCS) Implementation Specification*

In addition to this document, this report includes several XML Schema Document files as specified in Annex A and Annex B.

3 Terms and definitions

For the purposes of this report, the definitions specified in Clause 4 of the OWS Common Implementation Standard [OGC 06-121r3] shall apply. In addition, the following terms and definitions apply.

3.1**attribute**

<XML>

name-value pair contained in an element

[ISO 19136:2007]

Note: In this document an attribute is an XML attribute unless otherwise specified.

3.2**association**

named or typed connection between two web resources

3.3**baseURL**

URL to which parameters of the GetCapabilities operation are appended to form a valid request

NOTE: assuming that the name of root element of the capabilities document is

“root_element” the XPath expression for getting the baseURL is:

/root_element/OperationsMetadata/Operation[name="GetCapabilities"]/DCP/HTTP/Get/@xlink.href

3.4**client**

software component that can invoke an operation from a server

[ISO 19128:2005]

3.5**coordinate**

one of a sequence on n numbers designating the position of a point in n-dimensional space

[ISO 19111:2007]

3.6**coordinate reference system**

coordinate system that is related to an object by a datum

[ISO 19111:2007]

3.7**coordinate system**

set of mathematical rules for specifying how coordinate are to be assigned to points

[ISO 19111:2007]

3.8**element**

<XML>

basic information item of an XML document containing child elements, attributes and character data

[ISO 19136:2007]

3.9

feature

abstraction of real world phenomena

[ISO 19010:2002]

NOTE: A feature can occur as a type or an instance. The term “feature type” or “feature instance” should be used when only one is meant.

3.10

feature identifier

identifier that uniquely designates a feature instance

3.11

filter expression

predicate expression encoded using XML

[ISO 19143]

3.12

Harvest operation

an operation defined by the CSW standard that may be used to automatically register resources (e.g. services) with the catalogue

3.13

interface

named set of operations that characterize the behavior of an entity

3.14

link

synonym for association

3.15

link relation

identifies the semantics of a link

NOTE: Typically specified using the “rel” attribute of a link or association

3.16

namespace

<XML>

collection of names, identifier by a URI reference which are used in XML documents as element names and attribute names

[W3C XML Namespaces]

3.17

operation

specification of a transformation or query that an object may be called to execute

[ISO 19119:2005]

3.18**OGC web service resource**

resource that is accessible through an OGC web service

NOTE: Examples of OGC web service resource include WMS layer, WFS feature type & WCS coverage. Essentially any resource that you can only access through a OGC service API is an “OGC web service resource”

3.19**property**

face or attribute of an object, referenced by name

[ISO 19143]

3.20**response**

result of an operation returned from a server to a client

[ISO 19128:2005]

3.21**server**

particular instance of a service

[ISO 19128:2005]

3.22**service**

distinct part of the functionality that is provided by an entity through interfaces

[ISO 19119:2005]

3.23**service metadata**

metadata describing the operations and geographic information available at a server

[ISO 19128:2005]

3.24**Uniform Resource Identifier**

unique identifier for a resource, structured in conformance with IETF RFC 3986

[ISO 19136:2007] and

NOTE: The generate syntax is <scheme>::<scheme-specified-part>. The hierarchical syntax with a namespace is <scheme>://<authority><path>?<query>

3.25**web resource**

referent of any uniform resource identifier (see RFC 3986), or internationalized resource identifier (see RFC 3987).

4 Conventions

4.1 Abbreviated terms

API	Application Program Interface
CSW	Catalogue Service Web
CSW-ebRIM	ebRIM profile of Catalogue Service Web
GSS	GeoSynchronization Service
URL	Uniform Resource Location
URI	Uniform Resource Identifier
WMS	Web Map Service
WMTS	Web Map Tiling Service
WFS	Web Feature Service
WCS	Web Coverage Service
UUID	Universally Unique Identifier

4.2 UML notation

Most diagrams that appear in this standard are presented using the Unified Modeling Language (UML) static structure diagram, as described in Subclause 5.2 of [OGC 06-121r3].

5 Use cases

5.1 Introduction

This clause describes a number of use cases used to guide the development of this engineering report.

5.2 Catalogue use cases

5.2.1 Service identification use case

In order to prevent duplicate harvesting, a catalogue should be able to determine if an OGC web service, arrived at by a variety of different paths, is indeed the same service. It is not trivial, for example, for a catalogue to determine that a WFS arrived at using the URL:

```
http://www.somecorp.com/wfs?service=WFS&version=2.0&request=GetCapabilities
```

is in fact the same WFS arrived at using the URL:

```
http://www.somecorp.com/wfs?REQUEST=GetCapabilities&version=2.0.0&service=wfs&vendorId=somecorp
```

5.2.2 Service discovery use case

A common deployment pattern for OGC web services is to have a suite of OGC web services deployed on top of one more spatial data repositories. For example, an enterprise may have one or more databases containing spatial data and several OGC web services are deployed on top of those data resources. The problem is that these services, although notionally deployed as a suite of services, stand in isolation because there is no means of discovering which set of OGC web services are deployed at an endpoint. Enabling the discovery use case this allows clients to discover the set or suite of OGC web services available at an endpoint.

5.2.3 Service harvesting use case

OGC catalogues can automatically harvest the capabilities document of OGC web services in order to register the service, the data that the service offers and the association between the two (e.g. wfs X offers feature type y). However, OGC catalogues cannot automatically discover and create other associations that might exist between the service being harvested and other resources. Enabling the harvesting use case allows a catalogue to not only harvest an OGC web service and its offering but also allows the catalogue to automatically discover and harvest any associations with other OGC and non-OGC resources.

5.2.4 Rich discovery use case

Because a catalogue can currently only discover a very limited set of associations -- typically isolated to a single OGC web service -- the ability for rich discovery is severely curtailed. The discover use case enables a client to search an OGC catalogue for rich associations between a service, its offerings and other OGC and non-OGC resource. An example of such rich discovery would be to search an OGC catalogue and find some feature data. A client should then be able to discover not only the WFS that offers that data (something that is currently possible) but also find a WMS that renders those features onto a map or a WMTS that has a tiled representation of that data thus enabling quick visual navigation of the data.

5.3 Direct client-server use cases

5.3.1 Efficient navigation use case

The efficient navigation use case allows rendering software to determine if there is a faster and more efficient service available for rendering map data. For example, a client

should be able to interrogate the WMS providing that map layer and determine if there is a WMTS layer that might be used instead to more efficiently render the map.

5.3.2 Rendering use case

Given a WFS feature type or WCS coverage, a client should be able to interrogate the corresponding service to determine if there is an available WMS/WMTS layer that renders that data as a map.

5.3.3 Cascading use case

Given a cascaded resource a client should be able to interrogate the service to determine the source server of the resource so that the client can decide to bypass the cascading service and access the source service directly.

5.3.4 Data download use case

The data download use case allows a client to interactively create a map and then, by interrogating the services used to render the map (e.g. WMS or WMTS) be able to download the underlying source data for the map. This use case typically requires the association between WMS or WMTS layers and WFS feature types or WCS coverages to be established.

6 Elements of the solution

6.1 Introduction

This clause described at a high level some of the elements of the proposed service integration solution presented in this engineering report.

6.2 Evolutionary refinement

During the last 18 years, substantial funding resources have been allocated by OGC and its member organizations across the world to define and implement the current suite of OGC web services. For this reason, a primary requirement of the integration solution presented in this engineering report is that it works within the context of the existing suite of OGC web services. To the extent possible solutions sought by this project reuse existing structures (e.g. capabilities document) that can be easily deployed to enhance existing implementations and significantly improve integration among OGC web services.

6.3 Auto-discovery

Auto-discovery is the automated discovery of OGC services at a specified endpoint. Put another way, given a URL endpoint, an agent should be able to determine which OGC services (WMS, WFS, WCS, WMTS, etc.) are being offered at that endpoint.

6.4 Auto-description

OGC services are already partially self-describing in that they provide metadata in the form of a capabilities document obtained using the GetCapabilities operation that all OGC web services must implement. The OGC capabilities document contains metadata that describes what kind of service is being offered, who is offering the service, what content is being offered and optionally what kind of query capabilities the service offers.

This information is useful and important but it only relates to a single service. In order to have a richer description of a suite of OGC web services, there is a requirement that additional metadata must be published that not only describes a specific service and its offerings but also describes relationships or associations between that service, its offerings and other OGC and non-OGC resources. For example, a WMS would know that a particular layer that it offers is rendered from source feature data offered by a particular WFS. The kind of internal knowledge (e.g. the association between a WMS layer and a WFS feature type) needs to be externalized thus becoming harvestable and discoverable using an OGC catalogue.

6.5 Cataloging

Currently OGC catalogues support the registration of OGC services and the contents that they offer. Because each service is harvested in isolation of other services and resources, only limited discovery is supported allowing a client to, for example, discover a data resource and then find the service that offers that resource (or visa-versa).

An integrated OGC web service environment, however, requires that OGC catalogues be extended to harvest and make discoverable a richer set of linked OGC and non-OGC resources. A catalogue should be able to automatically register services found at an endpoint as well as register all known associations among those services, their offerings and other OGC and non-OGC resources. This involves harvesting a service's capabilities document to determine what content the service offers but it also involves further interrogating the service to determine of what (if any) other associations it is aware.

Thus, part of the solution proposed in the engineering report involved extending the catalogue information model to be able to describe richly linked OGC and non-OGC resources.

7 Web Integration Service

7.1 Introduction

The Web Integration Service (WIS) is an aggregation service whose only purpose is to provide a list of references to a suite of other, perhaps related OGC services available at an endpoint.

In keeping with the evolutionary refinement and reuse goal stated in Clause 6.1, the web integration service only defines a single operation, *GetCapabilities*, and responds using a standard OGC capabilities document whose content section lists the available services accessible at that end point.

A web integration service shall implement the KVP-encoding of the *GetCapabilities* operation.

A web integration service may optionally implement the XML-encoding of the *GetCapabilities* operation.

7.2 *GetCapabilities* operation

7.2.1 Request

7.2.1.1 UML

Figure 1 defines the schema of the *GetCapabilities* request.

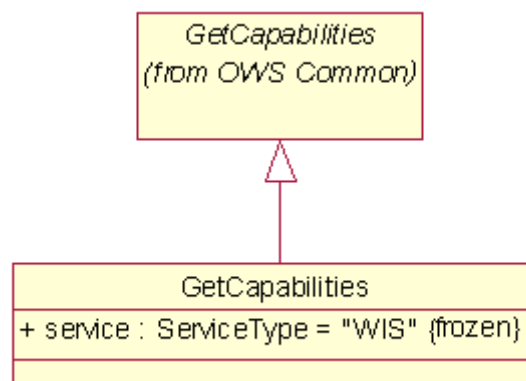


Figure 1 – UML for *GetCapabilities* request

7.2.1.2 KVP encoding

The KVP encoding of the *GetCapabilities* request shall be as specified in OGC 06-121r3:2009, 7.2.2. The value of the service parameter shall be fixed to “WIS”.

7.2.1.3 XML encoding

The following XML Schema fragment defines the XML-encoding of the GetCapabilities request.

```
<xsd:element name="GetCapabilities" type="wfs:GetCapabilitiesType"/>
<xsd:complexType name="GetCapabilitiesType">
  <xsd:complexContent>
    <xsd:extension base="ows:GetCapabilitiesType">
      <xsd:attribute name="service" type="ows:ServiceType"
        use="required" fixed="WIS"/>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
```

7.2.2 Response

7.2.2.1 UML

The following UML diagram defines the schema for the response of a WIS. The response is essentially a standard OGC capabilities document with a content section composed of zero or more ows:ServiceIdentification sections each describing one OGC web service available at the endpoint.

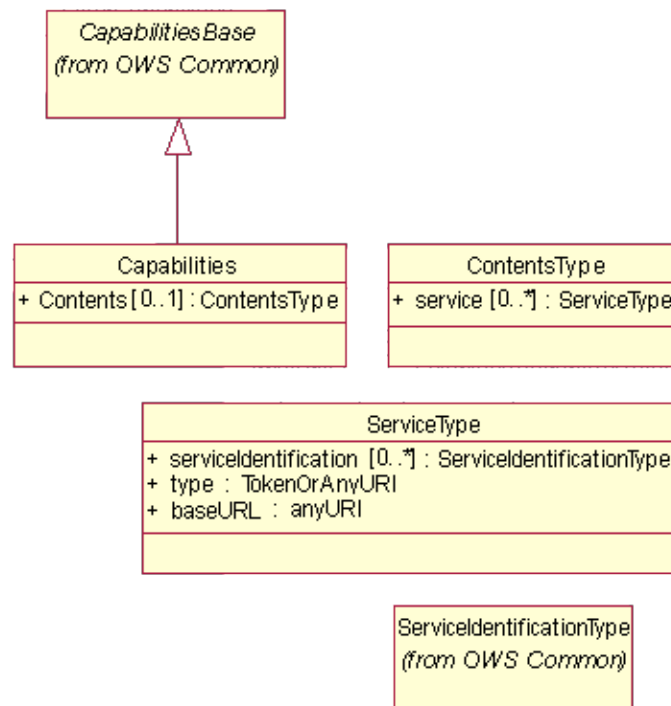


Figure 2 – UML for GetCapabilities response

Each service is characterized by its type (i.e. WMS, WMTS, WFS, etc.), the base URL of the service and the standard ServiceIdentification description of the service from Web Service Common (see OGC 06-121r9).

The value of the “type” parameter can be a token – such as the three letter acronyms commonly used by OGC – or a URI identifier for the service (see Table 1).

The value of the “baseUrl” parameter is the service URL to which GetCapabilities request (see 06-121r9, Clause 7) parameters are appended to form a valid request URL.

7.2.2.2 XML encoding

The following XML Schema fragment defines the schema for the XML-encoded response to a WIS GetCapabilities request.

```

<xsd:element name="Capabilities" type="wis:WIS_CapabilitiesType"/>
<xsd:complexType name="WIS_CapabilitiesType">
  <xsd:complexContent>
    <xsd:extension base="ows:CapabilitiesBaseType">
      <xsd:sequence>
        <xsd:element ref="wis:Contents"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>

<xsd:element name="Contents" type="wis:ContentsType"/>
<xsd:complexType name="ContentsType">
  <xsd:sequence>
    <xsd:element ref="wis:Service" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:element name="Service" type="wis:ServiceType"/>
<xsd:complexType name="ServiceType">
  <xsd:sequence>
    <xsd:element ref="ows:ServiceIdentification"/>
  </xsd:sequence>
  <xsd:attribute name="type"
    type="wis:TokenOrAnyURI" use="required"/>
  <xsd:attribute name="baseUrl" type="xsd:anyURI" use="required"/>
</xsd:complexType>

<xsd:simpleType name="TokenOrAnyURI">
  <xsd:union memberTypes="xsd:token xsd:anyURI"/>
</xsd:simpleType>

```

7.3 NoOp operation

This engineering report defines an additional WIS operation named “NoOp” that all clients shall ignore. The NoOp operation only exists to satisfy XML validation requirements for capabilities documents imposed by the Web Service Common standard (see OGC 06-121r9, 7.4.6) which requires that OGC web services implement the GetCapabilities operation plus one additional operation. Clearly, the web service common standard did not anticipate the usefulness of a service that only implements the GetCapabilities request. A change request has been posted against OGC 06-121r9 to remove this requirement.

7.4 Example

In response to the following request:

```
http://www.somcorp.com/wis?service=WIS&request=GetCapabilities
```

a web integration service might generate the following capabilities document:

```
<?xml version="1.0"?>
<Capabilities version="1.0.0"
  xmlns="http://www.opengis.net/wis/1.0"
  xmlns:ows="http://www.opengis.net/ows/2.0"
  xmlns:xlink="http://www.w3.org/1999/xlink"
  xmlns:xml="http://www.w3.org/XML/1998/namespace"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.opengis.net/wis/1.0 wis.xsd">
  <ows:ServiceIdentification>
    <ows:Title>SomeSERV</ows:Title>
    <ows:Abstract xml:lang="en">A suite of OGC web services by Some
Corp.</ows:Abstract>
    <ows:ServiceType>SomeSERV</ows:ServiceType>
    <ows:ServiceTypeVersion>7.0.1</ows:ServiceTypeVersion>
  </ows:ServiceIdentification>
  <ows:ServiceProvider>
    <ows:ProviderName>Some Corp.</ows:ProviderName>
    <ows:ProviderSite xlink:href="http://www.somecorp.com"/>
    <ows:ServiceContact>
      <ows:IndividualName>John Smith</ows:IndividualName>
      <ows:PositionName>Senior Developer</ows:PositionName>
      <ows:ContactInfo>
        <ows:Phone>
          <ows:Voice>+1-416-555-1234</ows:Voice>
          <ows:Facsimile>+1-416-555-5678</ows:Facsimile>
        </ows:Phone>
        <ows:Address>
          <ows:DeliveryPoint>1 Main St., Suite
1</ows:DeliveryPoint>
          <ows:City>SomeCity</ows:City>
        <ows:AdministrativeArea>SomeProvince</ows:AdministrativeArea>
          <ows:PostalCode>X1X 2Y2</ows:PostalCode>
```

```

        <ows:Country>Canada</ows:Country>
<ows:ElectronicMailAddress>jsmith@somecorp.com</ows:ElectronicMailAddress>
</ows:Address>
    </ows:ContactInfo>
</ows:ServiceContact>
</ows:ServiceProvider>
<ows:OperationsMetadata>
    <ows:Operation name="GetCapabilities">
        <ows:DCP>
            <ows:HTTP>
                <ows:Get
xlink:href="http://portal.somecorp.com/somecorp/projects/ows9/someserv.
cgi?">
                    <ows:Constraint name="GetEncoding">
                        <ows:AllowedValues>
                            <ows:Value>KVP</ows:Value>
                        </ows:AllowedValues>
                    </ows:Constraint>
                </ows:Get>
            </ows:HTTP>
        </ows:DCP>
        <ows:Parameter name="Format">
            <ows:AllowedValues>
                <ows:Value>application/xml</ows:Value>
                <ows:Value>application/x-bxml</ows:Value>
            </ows:AllowedValues>
        </ows:Parameter>
    </ows:Operation>
    <!-- Clients shall ignore the following operation. -->
    <ows:Operation name="NoOp">
        <ows:DCP>
            <ows:HTTP>
                <ows:Get
xlink:href="http://portal.somecorp.com/somecorp/projects/ows9/someserv.
cgi?">
                    </ows:Get>
                </ows:HTTP>
            </ows:DCP>
        </ows:Operation>
    </ows:OperationsMetadata>
</Contents>
    <Service type="WMS"
baseUrl="http://portal.somecorp.com/somecorp/projects/ows9/someserv.cgi"
">
        <ows:ServiceIdentification>
            <ows:Title>SomeSERV WMS</ows:Title>
            <ows:Abstract xml:lang="en">OGC-compliant cascading web map
server (WMS) by Some Corp.</ows:Abstract>
            <ows:ServiceType>WMS</ows:ServiceType>
            <ows:ServiceTypeVersion>1.3.2</ows:ServiceTypeVersion>
            <ows:ServiceTypeVersion>1.3.1</ows:ServiceTypeVersion>
            <ows:ServiceTypeVersion>1.3.0</ows:ServiceTypeVersion>
            <ows:ServiceTypeVersion>1.1.1</ows:ServiceTypeVersion>
            <ows:ServiceTypeVersion>1.1.0</ows:ServiceTypeVersion>

```

```

    <ows:ServiceTypeVersion>1.0.0</ows:ServiceTypeVersion>
  </ows:ServiceIdentification>
</Service>
<Service type="WFS"
baseUrl="http://portal.somecorp.com/somecorp/projects/ows9/someserv.cgi
?DATASTORE=OWS9">
  <ows:ServiceIdentification>
    <ows:Title>The USGS National Map Web Feature Service
(subset)</ows:Title>
    <ows:Abstract>This web feature service offers a subset of
the USGS National Map. The National Map is a collaborative effort among
the USGS and other Federal, State, and local partners to improve and
deliver topographic information for the Nation. The geographic
information available from The National Map includes hydrography,
boundaries, transportation, structures, and land cover. Other types of
geographic information can be added within the viewer or brought in
with The National Map data into a Geographic Information System to
create specific types of maps or map views. The National Map is a
significant contribution to the National Spatial Data Infrastructure
(NSDI) and currently is being transformed to better serve the
geospatial community by providing high quality, integrated geospatial
data and improved products and services including new generation
digital topographic maps.</ows:Abstract>
    <ows:Keywords>
      <ows:Keyword>WFS</ows:Keyword>
      <ows:Keyword>USGS</ows:Keyword>
      <ows:Keyword>TNM</ows:Keyword>
      <ows:Keyword>Web</ows:Keyword>
      <ows:Keyword>Feature</ows:Keyword>
      <ows:Keyword>Service</ows:Keyword>
      <ows:Keyword>hydrography</ows:Keyword>
      <ows:Keyword>boundaries</ows:Keyword>
      <ows:Keyword>transportation</ows:Keyword>
      <ows:Keyword>structures</ows:Keyword>
      <ows:Keyword>land</ows:Keyword>
      <ows:Keyword>cover</ows:Keyword>
    </ows:Keywords>
    <ows:ServiceType>WFS</ows:ServiceType>
    <ows:ServiceTypeVersion>2.0.0</ows:ServiceTypeVersion>
    <ows:ServiceTypeVersion>1.1.0</ows:ServiceTypeVersion>
    <ows:ServiceTypeVersion>1.0.0</ows:ServiceTypeVersion>
    <ows:Fees>None</ows:Fees>
    <ows:AccessConstraints>None</ows:AccessConstraints>
  </ows:ServiceIdentification>
</Service>
<Service type="WFS"
baseUrl="http://portal.somecorp.com/somecorp/projects/ows9/someserv.cgi
?DATASTORE=STDS">
  <ows:ServiceIdentification>
    <ows:Title>The USGS National Map Web Feature Service
(subset)</ows:Title>
    <ows:Abstract>This web feature service offers a subset of
the USGS National Map. The National Map is a collaborative effort among
the USGS and other Federal, State, and local partners to improve and
deliver topographic information for the Nation. The geographic
information available from The National Map includes hydrography,

```

boundaries, transportation, structures, and land cover. Other types of geographic information can be added within the viewer or brought in with The National Map data into a Geographic Information System to create specific types of maps or map views. The National Map is a significant contribution to the National Spatial Data Infrastructure (NSDI) and currently is being transformed to better serve the geospatial community by providing high quality, integrated geospatial data and improved products and services including new generation digital topographic maps.</ows:Abstract>

```

    <ows:Keywords>
      <ows:Keyword>WFS</ows:Keyword>
      <ows:Keyword>USGS</ows:Keyword>
      <ows:Keyword>TNM</ows:Keyword>
      <ows:Keyword>Web</ows:Keyword>
      <ows:Keyword>Feature</ows:Keyword>
      <ows:Keyword>Service</ows:Keyword>
      <ows:Keyword>hydrography</ows:Keyword>
      <ows:Keyword>boundaries</ows:Keyword>
      <ows:Keyword>transportation</ows:Keyword>
      <ows:Keyword>structures</ows:Keyword>
      <ows:Keyword>land</ows:Keyword>
      <ows:Keyword>cover</ows:Keyword>
    </ows:Keywords>
    <ows:ServiceType>WFS</ows:ServiceType>
    <ows:ServiceTypeVersion>2.0.0</ows:ServiceTypeVersion>
    <ows:ServiceTypeVersion>1.1.0</ows:ServiceTypeVersion>
    <ows:ServiceTypeVersion>1.0.0</ows:ServiceTypeVersion>
    <ows:Fees>None</ows:Fees>
    <ows:AccessConstraints>None</ows:AccessConstraints>
  </ows:ServiceIdentification>
</Service>
<Service type="WCS"
baseUrl="http://portal.somecorp.com/somecorp/projects/ows9/someserv.cgi
?DATASTORE=OWS9">
  <ows:ServiceIdentification>
    <ows:Title>SomeSERV WCS - OWS9</ows:Title>
    <ows:Abstract xml:lang="en">OGC-compliant web coverage
server (WCS) by Some Corp.</ows:Abstract>
    <ows:ServiceType>WCS</ows:ServiceType>
    <ows:ServiceTypeVersion>1.1.2</ows:ServiceTypeVersion>
    <ows:ServiceTypeVersion>1.1.1</ows:ServiceTypeVersion>
    <ows:ServiceTypeVersion>1.0.0</ows:ServiceTypeVersion>
  </ows:ServiceIdentification>
</Service>
<Service type="WCS"
baseUrl="http://portal.somecorp.com/somecorp/projects/ows9/someserv.cgi
?DATASTORE=STDS">
  <ows:ServiceIdentification>
    <ows:Title>SomeSERV WCS - STDS</ows:Title>
    <ows:Abstract xml:lang="en">OGC-compliant web coverage
server (WCS) by Some Corp.</ows:Abstract>
    <ows:ServiceType>WCS</ows:ServiceType>
    <ows:ServiceTypeVersion>1.1.2</ows:ServiceTypeVersion>
    <ows:ServiceTypeVersion>1.1.1</ows:ServiceTypeVersion>
    <ows:ServiceTypeVersion>1.0.0</ows:ServiceTypeVersion>
  </ows:ServiceIdentification>

```



```

    </ows:ServiceIdentification>
  </Service>
  <Service type="CSW"
baseUrl="http://portal.somecorp.com/somecorp/projects/ows9/someserv.cgi
">
    <ows:ServiceIdentification>
      <ows:Title xml:lang="en-CA">Catalogue Service Web (CSW) by
Some Corp.</ows:Title>
      <ows:Abstract xml:lang="en">The Some Corp. Catalog Service
Web (CSW) implements a web registry service that complies to the Open
Geospatial Consortium Inc.'s Catalogue Service implementation
specification V2.0.2 (see 07-006r1) which specifies the interfaces,
bindings, and a framework for defining application profiles required to
publish and access digital catalogues of metadata for geospatial data,
services, and related resource information. Metadata act as generalized
properties that can be queried and returned through catalogue services
for resource evaluation and invocation or retrieval of the referenced
resource.</ows:Abstract>
      <ows:Keywords>
        <ows:Keyword xml:lang="en-CA">catalogue</ows:Keyword>
      </ows:Keywords>
      <ows:ServiceType>CSW</ows:ServiceType>
      <ows:ServiceTypeVersion>2.0.2</ows:ServiceTypeVersion>
      <ows:Fees>none</ows:Fees>
      <ows:AccessConstraints>none</ows:AccessConstraints>
    </ows:ServiceIdentification>
  </Service>
</Contents>
</Capabilities>

```

Since this capabilities document is composed mostly of standard OGC components it is an easy task to extend an OGC catalogue to consume this document. The catalogue can then automatically determine which services are offered by this provider and harvest each one in turn also maintaining the associations between the web integration service and its child services.

8 Associations and the GetAssociations operation

8.1 Introduction

When a service provider deploys a suite of OGC web services each component service typically exists in isolation and external clients are unaware of the relationships that might exist between these services, their offerings and other OGC and non-OGC web resources. The services themselves, however, typically have much more internal knowledge about such relationships or associations. Services know what data sources where accessed to provide their offerings; they know what other representations might exist, etc. For example, a WMS knows if the source data for a layer it offers is a SHAPE file, or a WFS feature type, or another WMS layer (i.e. cascading), or if a WMTS layer exists that renders the same information more efficiently. In short OGC web services have a lot of internal association knowledge that is currently inaccessible to client

applications, especially catalogues. A great deal of added value can be derived if this internal association knowledge can be externalized.

Thus, the scope of this clause is to define methods and apparatus to allow OGC web services to externalize this internal association knowledge. This clause describes how associations between OGC and non-OGC resource can be represented in XML. This clause further defines a new operation; named GetAssociations, that existing OGC web services can implement to allow client applications to interrogate an OGC web service about its internal association knowledge.

8.2 Associations

8.2.1 Introduction

This clause defines a general XML Schema for representation associations between two resources.

An association is logically of the form “SOURCE REL TARGET” where the SOURCE resource is the subject of a directional RELationship of the specified type with the TARGET resource (e.g. layer X renders feature type Y).

8.2.2 Types of association resources

This engineering report distinguishes two types of resources that may participate in an association:

- OGC web service resources
- URL-addressable resources

OGC web service resources are resources that are only accessible from within an OGC web service. The classic set of OGC resources -- WMS map, WFS feature type and WCS coverage -- are examples of OGC web service resources since the only way to access instances of each is through the services that offer them. Thus, OGC web service resources are not addressable using a URL alone.

URL-addressable resources are resources which can be accessed directly via URL. Many OGC resources are URL-addressable. Examples include OGC web services, which are accessible via their base URL (see 3.3) or symbology encoding documents stored in some web-accessible location. For the purposes of this engineering report the only recognized URL-addressable OGC resources are those for which an identifier has been registered with the OGC Naming Authority (OGC NA).

OGC web service resources are distinguished from URL-addressable resources because two components are required for access; the base URL (see 3.3) of the OGC web service

offering the resource and the service-specific identifier which locates the resource within the service.

Example: A WMS layer named Foundation”INWATER_1M and served by an OGC WMS would be identified using the following two components:

- baseURL of the WMS: http://www.somecorp.com/wms
- service-specific identifier: Foundation.INWATERA_1M

Interaction with an OGC web service can only commence once the base URL (see 3.3) of the service has been discovered. Communication with the OGC web service commences with the client obtaining the capabilities document of the service by appending the appropriate GetCapabilities request parameters to the previously-discovered base URL of the service. The service-specific identifiers for the OGC web service resources the service offers can then be obtained from the capabilities document’s content section.

8.2.3 UML

The following UML diagram defines the schema of an association.

T.B.D.

8.2.4 XML-encoding

The following XML Schema fragments defines the XML-encoding for an association.

```
<element name="Association">
  <complexType>
    <sequence>
      <element name="Source" type="as:ResourceType"/>
      <element name="Target" type="as:ResourceType"/>
    </sequence>
    <attribute name="rel" type="as:TokenOrAnyURI" use="required"/>
  </complexType>
</element>
```

The “Source” parameter shall identify the source resource of the association.

The “Target” parameter shall identify the target resource of the association.

The “rel” parameter shall be used to specify the association type.

The canonical value of the rel attribute shall either be a token taken from the [IANA Link Relations registry](#) (see RFC 5988) or it shall be a URI registered with the OGC Naming Authority.

Vendor or domain specific “rel” values may also be used. However, this engineering report does not assign any specified meaning or interpretation to these values.

Parsers shall not fail on unrecognized “rel” values and are free to ignore associations that specify an unrecognized value.

The following XML fragment defines a reference to a resource that participates as the source or target of an association.

```
<complexType name="ResourceType">
  <sequence>
    <element ref="as:Identifier" minOccurs="0"/>
  </sequence>
  <attribute name="type" type="as:TokenOrAnyURI" use="required"/>
  <attribute ref="xlink:href" use="required"/>
</complexType>
<element name="Identifier">
  <complexType>
    <simpleContent>
      <extension base="string">
        <attribute name="namespace" type="anyURI"/>
      </extension>
    </simpleContent>
  </complexType>
</element>
<simpleType name="TokenOrAnyURI">
  <union memberTypes="token anyURI"/>
</simpleType>
```

If the resource is a URL-addressable resource (see 8.2.2) then its URL shall be specified using the “xlink:href” parameter and its type shall be specified using the “type” parameter. The “Identifier” parameter shall be omitted in this case.

If the resource is an OGC web service resource (see 8.2.2), then its base URL (see 3.3) shall be specified using the “xlink:href” parameter, its type shall be specified using the “type” parameter and the service-specific identifier that locates the resource within the OGC service offering the resource shall be specified using the “Identifier” parameter. If the service-specific resource identifier within the OGC web service is scoped then its namespace shall be specified using the “namespace” parameter. The OGC service type serving the resource shall be deduced from the specified resource type. For example, a WMS layer resource is served by a WMS while a WFS feature type resource is served by a WFS.

8.2.5 Associations container

The following XML Schema fragment defines a container for a set of associations.

```
<element name="Associations">
  <complexType>
    <sequence>
      <element ref="as:Association"
        minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
  </complexType>
</element>
```

```

    <attribute name="version" type="string"
              use="required" fixed="1.0.0"/>
  </complexType>
</element>

```

The Associations element is a container for zero or more Association elements (see 8.2.3).

8.2.6 MIME type

This engineering report defines the following MIME type to represent an XML document that encodes a set of associations: application/ogc-as+xml

8.3 Standard identifiers

The following tables define standard identifiers for resources and association types used by OGC. This is by no means a comprehensive list but represents the main set of OGC web services and their resources.

Table 1 – Service Type Identifiers

Title	Description	HTTP-URI
Web Integration Service	An OGC service whose only function is to identify a collection of other OGC services.	http://www.opengis.net/def/serviceType/ogc/0/wis
Web Feature Service	An OGC service for serving and managing features.	http://www.opengis.net/def/serviceType/ogc/0/wfs
Web Map Service	An OGC service that serves maps.	http://www.opengis.net/def/serviceType/ogc/0/wms
Web Map Tiling Service	An OGC service that serves map tiles.	http://www.opengis.net/def/serviceType/ogc/0/wmts
Web Processing Service	An OGC service that exposes Web Processing Services	http://www.opengis.net/def/serviceType/ogc/0/wps
Web Coverage Service	An OGC service that serves coverages.	http://www.opengis.net/def/serviceType/ogc/0/wcs
Catalogue Service	An OGC catalogue service.	http://www.opengis.net/def/serviceType/ogc/0/csw
Web Registry Service	A profile of an OGC catalogue service that uses ebRIM as its information model.	http://www.opengis.net/def/serviceType/ogc/0/csw-ebRIM
Geosynchronization Service	An OGC service supporting data crowdsourcing.	http://www.opengis.net/def/serviceType/ogc/0/gss

Table 2 – Object Type Identifiers

Title	Description	HTTP-URI
WFS Feature Type	A feature type served by an OGC Web Feature Service.	http://www.opengis.net/def/objectType/ogc/0/wfs/featureType
WMS Theme	A collection of WMS layers.	http://www.opengis.net/def/objectType/ogc/0/wms/theme
WMS Layer	A map layer served by an OGC Web Map Service.	http://www.opengis.net/def/objectType/ogc/0/wms/layer
WMTS Theme	A collection of WMTS layers.	http://www.opengis.net/def/objectType/ogc/0/wmts/theme
WMTS Layer	A tiles map layer served by an OGC Web Map Tiling Service	http://www.opengis.net/def/objectType/ogc/0/wmts/layer
WPS Process	A processing service served by an OGC Web Processing Service	http://www.opengis.net/def/objectType/ogc/0/wps/process
WCS Theme	A collection of WCS coverages	http://www.opengis.net/def/objectType/ogc/0/wcs/theme
WCS Coverage	A coverage served by an OGC Web Coverage Service	http://www.opengis.net/def/objectType/ogc/0/wcs/coverage
Metadata	A document, conforming to a well-known standard that contains metadata about the resource.	http://www.opengis.net/def/objectType/ogc/0/metadata
Dublin Core Metadata	Metadata about a resource that uses the Dublin Core set of elements.	http://www.opengis.net/def/objectType/ogc/0/metadata/dublinCore
Symbology Encoding Document	A document that encodes symbology in a machine readable format.	http://www.opengis.net/def/objectType/ogc/0/document/symbologyEncoding

Table 3 – Association Type Identifiers

Title	Description	HTTP-URI
Renders	Associates two resources where one resource renders another resources	http://www.opengis.net/def/associationType/ogc/0/renderers

	(e.g. a WMS layer that renders a WFS feature type)	
Tiled By	Associated two resource where one resource is a tiled representation of the other resource (e.g. a WMTS layers that is a tiles representation of a WMS layer).	http://www.opengis.net/def/associationType/ogc/0/tiledBy
ParentOf	Associates two resources where one resource is the parent of the other resource. This is typically used to register a nested hierarchy of resources.	http://www.opengis.net/def/associationType/ogc/0/parentOf
Cascades	Associates two services where one OGC service is using the other OGC service as a data source. For examples where one WMS "cascades" a number of other WMS's.	http://www.opengis.net/def/associationType/ogc/0/cascades
CreatedBy	Associates two services where one is responsible for the other creation	http://www.opengis.net/def/associationType/ogc/0/createdBy
Symbolizes	Associates the symbology encoding document with a WFS Feature Type.	http://www.opengis.net/def/associationType/ogc/0/symbolizes
OperatesOn	Associates two resources where one operates on the other.	http://www.opengis.net/def/associationType/ogc/0/operatesOn
DescribedBy	Associates two resources where one resource is a description of the other using some metadata standard.	http://www.opengis.net/def/associationType/ogc/0/describedBy

8.4 GetAssociations operation

8.4.1 Introduction

As previously discussed, OGC web services have internal knowledge about what associations exist between the service, its offerings and other OGC and non-OGC resources. The GetAssociations operation is the means by which an OGC web service may be interrogated about the associations of which it is aware.

Once externalized in this way, this association information can be automatically harvested and made discoverable from OGC catalogues creating a richer environment for discovery.

It is anticipated that existing OGC web services, wishing to participate as part of an integrated suite of OGC web services, would implement this operation as an add-on to the existing set of operations that the service implements.

It is further anticipated that this operation shall eventually be defined as a mandatory operation for all OGC web services in the OGC Web Services Common standard (see OGC 06-121r9). The document shall be posted as a change request against OGC 06-121r9.

8.4.2 UML

The following UML diagram defines the request and response for the GetAssociations operation.

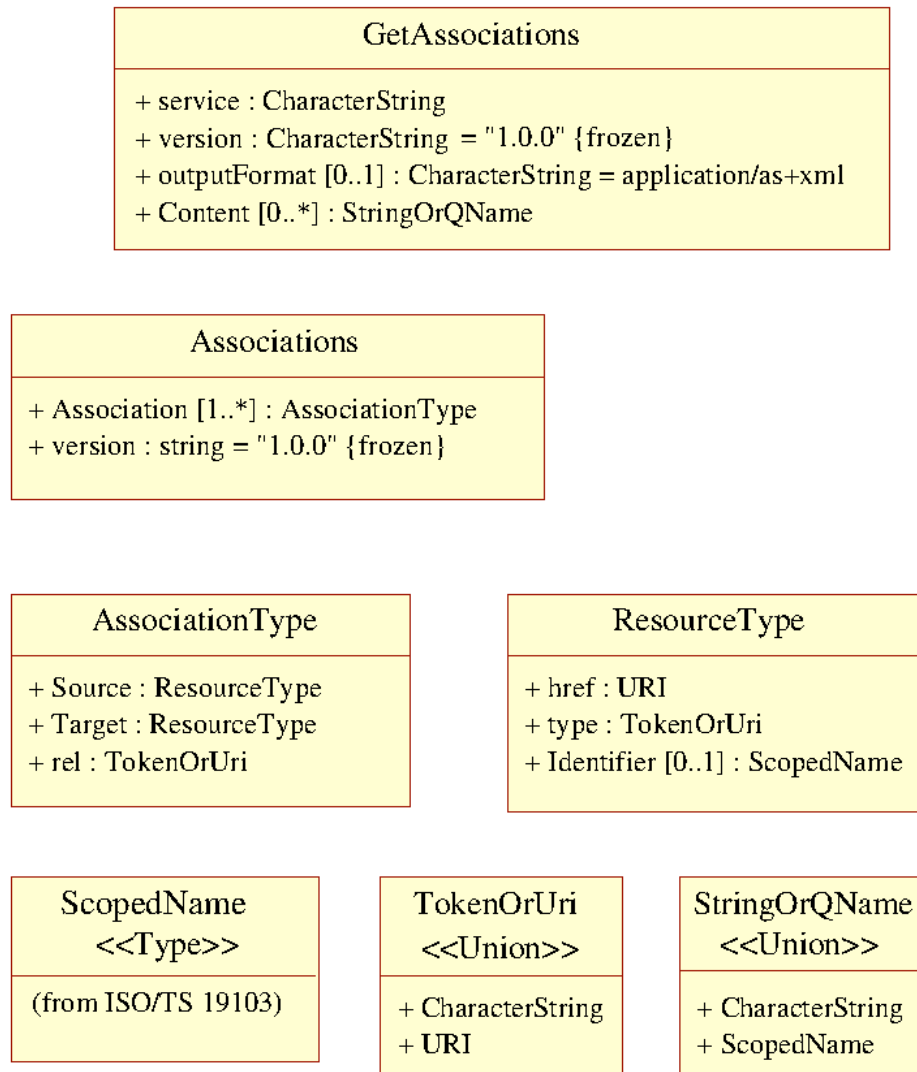


Figure 3 - Request & response UML for GetAssociations operation

The mandatory service parameter of the GetAssociations operation shall encode the service identifier of the service being invoked to execute the operation.

The mandatory version parameter of the GetAssociations operation shall be the fixed values of “1.0.0”.

The optional contents parameter may be used to interrogate the known association of a specified subset of resources that a service offers. If the parameter is omitted the response document shall contains all knows associations.

The optional `outputFormat` parameter may be used to request the response in a specific format. The default value is `application/ogc-as+xml` (see 8.3.5). Other output format values are allowed (e.g. a JSON response) to which this engineering report does not assign any meaning.

8.4.3 KVP-encoding

The following table defines the KVP-encoding for the `GetAssociations` operation.

Table 4 – GetAssociations KVP encoding

URL Component	O/M ^a	Description
REQUEST	M	Fixed value of <code>GetAssociations</code>
SERVICE	M	Identifier for the service invoking the operation
VERSION	M	Fixed value of 1.0.0
CONTENTS	O	A comma separated list of service-specific resource identifiers for which the known associations will be returned in the response. If the parameter is omitted then all known associations are returned in the response.
OUTPUTFORMAT	O	The response format of the operation. The default values is <code>application/ogc-as+xml</code> .
^a O = Optional, M = Mandatory		

8.4.4 XML-encoding

The following XML Schema fragment defines the XML-encoding for the `GetAssociations` operation.

```
<xsd:element name="GetAssociations" type="as:GetAssociationsType"/>
<xsd:complexType name="GetAssociationsType">
  <xsd:sequence>
    <xsd:element name="Content" type="as:StringOrQName"
      minOccurs="0" maxOccurs="unbounded"/>
  </xsd:sequence>
  <xsd:attribute name="service"
    type="ows:ServiceType" use="required"/>
  <xsd:attribute name="version" type="xsd:string"
    use="required" fixed="1.0.0"/>
  <xsd:attribute name="outputFormat"
    type="xsd:string" default="application/as+xml"/>
</xsd:complexType>
<xsd:simpleType name="StringOrQName">
  <xsd:union memberTypes="xsd:string xsd:QName"/>
</xsd:simpleType>
```

8.4.5 Response

The response to a GetAssociations operation, when the output format is the default value application/ogc-as+xml, shall be a set of associations encoded as an XML document that validates against the schema describe is clause 8.2.4.

8.4.6 Example

In response to the following request:

```
<?xml version="1.0"?>
<as:GetAssociations
  service="WMS"
  version="1.0.0"
  outputFormat="application/ogc-as+xml"
  xmlns:as="http://www.opengis.net/as/1.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.opengis.net/as/1.0 association.xsd">
</as:GetAssociations>
```

an OGC web map service might generate the following response:

```
<?xml version="1.0"?>
<Associations xmlns="http://www.opengis.net/as/1.0"
  xmlns:xlink="http://www.w3.org/1999/xlink"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.opengis.net/as/1.0
  ../owsGetAssociations.xsd"
  version="1.0.0">
  <Association
rel="http://www.opengis.net/def/associationType/0/cascades">
    <Source type="http://www.opengis.net/def/objectType/ogc/0/wms"
      xlink:href="https://onestop.somecorp.com/somecorp/srvr"/>
    <Target type="http://www.opengis.net/def/objectType/ogc/0/wms"
      xlink:href="https://demo.somecorp.com/srvr"/>
    </Association>
  <Association
rel="http://www.opengis.net/def/associationType/0/cascades">
    <Source
type="http://www.opengis.net/def/objectType/ogc/0/wms/layer"
      xlink:href="https://onestop.somecorp.com/srvr">
      <Identifier>Demo.Foundation.aerofacp_lm</Identifier>
    </Source>
    <Target
type="http://www.opengis.net/def/objectType/ogc/0/wms/layer"
      xlink:href="https://demo.somecorp.com/srvr">
      <Identifier>Foundation.aerofacp_lm</Identifier>
    </Target>
    </Association>
  <Association
rel="http://www.opengis.net/def/associationType/0/tiledBy">
    <Source
type="http://www.opengis.net/def/objectType/ogc/0/wms/layer"
      xlink:href="https://onestop.somecorp.com/srvr">
```

```

        <Identifier>Demo.Foundation.aerofacp_lm</Identifier>
    </Source>
    <Target
type="http://www.opengis.net/def/objectType/ogc/0/wmts/layer"
    xlink:href="https://demo.somecorp.com/somecorp/srvr">
        <Identifier>Foundation.aerofacp_lm</Identifier>
    </Target>
</Association>
<Association
rel="http://www.opengis.net/def/associationType/0/renders">
    <Source
type="http://www.opengis.net/def/objectType/ogc/0/wms/layer"
    xlink:href="https://onestop.somecorp.com/srvr">
        <Identifier>Demo.Foundation.aerofacp_lm</Identifier>
    </Source>
    <Target
type="http://www.opengis.net/def/objectType/ogc/0/wfs/featureType"
xlink:href="https://demo.somecorp.com/srvr?DATASTORE=Foundation">
        <Identifier
namespace="http://www.somecorp.com/ns">aerofacp_lm</Identifier>
    </Target>
    </Association>
<Association
rel="http://www.opengis.net/def/associationType/0/renders">
    <Source
type="http://www.opengis.net/def/objectType/ogc/0/wms/layer"
    xlink:href="https://onestop.somecorp.com/srvr">
        <Identifier>Demo.Foundation.etopo2</Identifier>
    </Source>
    <Target
type="http://www.opengis.net/def/objectType/ogc/wcs/coverage"
xlink:href="https://demo.somecorp.com/srvr?DATASTORE=Foundation">
        <Identifier>etopo2</Identifier>
    </Target>
    </Association>
</Associations>

```

9 Catalogue extensions

9.1 Introduction

A central component of a deployed suite of integrated OGC web services is a catalogue. The catalogue encapsulates the knowledge of the system making the resources that the system offers and the associations between those resources discoverable to both internal components of the system as well as external clients.

For this OWS-10 work item, the CSW-ebRIM profile (see OGC 07-110r4), a profile of the OGC catalogue (see OGC 07-006r1) that uses ebRIM (see OASIS regrep-rim-3.0-os), is chosen as the primary catalogue. This choice is motivated by the fact that ebRIM is a flexible meta-model that already includes structures to register resources and the

associations between them as well as allow resource to be classified using internal as well as external classification schemes.

The primary means of harvesting or registering an OGC web service into a CSW-ebRIM catalogue is to use the Harvest operation (see OGC 07-110r4, Clause 14) to read the service’s capabilities document and then map that document into the catalogue’s ebRIM information model.

This clause defines a service integration ebRIM package that encapsulates all the identifiers, associations and classification schemes necessary to allow an OGC CSW-ebRIM catalogue to register OGC web services, the resource those services offer and the associations between those services, their offerings and other OGC and non-OGC resources.

9.2 Identifiers

9.2.1 Introduction

This clause defines a set of identifiers that shall be used to map the capabilities document of an OGC web service into the ebRIM information model of an OGC web registry service (see OGC 07-110r4).

9.3 Identifiers for OGC web services for ebRIM

The following table lists a set of identifiers for classification nodes within the ebRIM model that allow ebRIM Service records to be classified according to the type of service being represented. These identifiers are used to define a canonical ebRIM service type classification scheme (see Annex B).

These identifiers may also be used as the name of a slot, named “resourceType” (see Table 11) that may also be used to tag a service record with the type of OGC web service it represents.

Table 5 – OGC Service Type Identifiers for ebRIM

prefix¹: urn:ogc:def:serviceType:OGC-CSW-ebRIM::	
Identifier	Description
wis	Web Integration Service
wfs	Web Feature Service
wms	Web Map Service
wmts	Web Map Tiling Service

wps	Web Processing Service
wcs	Web Coverage Service
csw	Catalogue Service Web
csw-ebRIM	Web Registry Service
gss	Geosynchronization Service
1. The complete identifier is formed by appending this prefix to the value in the <i>Identifier</i> column.	

9.4 Identifier for the content of OGC web services for ebRIM

The following table lists a set of identifiers that may be used as the value of the “objectType” parameter within ebRIM to identify the type of OGC web service content being represented by the catalogue record. These identifiers are used to extend the canonical ebRIM object type classification scheme.

Table 6 – OGC Object Type Identifiers (content) for ebRIM

prefix¹: urn:ogc:def:objectType:OGC-CSW-ebRIM::	
Identifier	Description
wfs:featureType	A feature type offered by a WFS.
wms:theme	A theme offered by a WMS.
wms:layer	A map layer offered by a WMS.
wmts:theme	A theme offered by a WMTS.
wmts:layer	A map layer offered by a WMTS.
wps:process	A process being offers by a WPS.
wcs:theme	A theme offered by a WCS.
wcs:coverage	A coverage offered by a WCS.
1. The complete identifier is formed by appending this prefix to the value in the <i>Identifier</i> column.	

9.5 Identifiers for OGC documents for ebRIM

The following table lists a set of identifiers for OGC and non-OGC document types commonly used to describe OGC resources. These identifiers are used to define a canonical ebRIM classification scheme named HarvestResourceType (see Annex B).

Table 7 – OGC Object Type Identifiers (document) for ebRIM

prefix¹: urn:ogc:def:objectType:OGC-CSW-ebRIM::document:	
Identifier	Description
capabilities:wis	WIS capabilities document
capabilities:wfs	WFS capabilities document
capabilities:wms	WMS capabilities document
capabilities:wmts	WMTS capabilities document
capabilities:wcs	WCS capabilities document
fgdc	Metadata document conforming to the FGDC standard.
anzlic	Metadata document conforming to the ANZLIC standard.
iso19139	Metadata document conforming to the ISO 19139 standard.
iso19119	Metadata document conforming to the ISO 19119 standard.
iso19115	Metadata document conforming to the ISO 19115 standard.
classificationScheme	A metadata document containing an ebRIM classification scheme.
symbologyEncoding	A symbology encoding document.
xmlSchema	An XML schema document.
1. The complete identifier is formed by appending this prefix to the value in the <i>Identifier</i> column.	

Harvesting OGC web service is accomplished by reading and mapping the service's capabilities document into the information model of the CSW-ebRIM catalogue. A

service’s capabilities document can be identified by a client providing the complete URL to the capabilities document (e.g. <http://www.someserver.com/wfs?service=WFS&request=GetCapabilities>) or by providing the baseURL of the OGC web service and letting the catalogue form the necessary GetCapabilities request. The latter case gives the catalogue server more control about what to harvest especially in the case of a suite of OGC web services offered through a WIS. The following set of identifiers may be used in the latter case to identify that a base URL is being used to identify the capabilities document of the OGC web service – and thus the catalogue needs to formulate a complete GetCapabilities request in order to obtain the capabilities document. These identifiers will typically be used as the values of the “resourceType” parameter of the CSW Harvest operation.

Table 8 – Identifiers for Service Base URLs for ebRIM

Identifier	Description
urn:ogc:def:objectType:OGC-CSW-ebRIM::baseUrl:wis	WIS base URL.
urn:ogc:def:objectType:OGC-CSW-ebRIM::baseUrl:wfs	WFS base URL.
urn:ogc:def:objectType:OGC-CSW-ebRIM::baseUrl:wms	WMS base URL.
urn:ogc:def:objectType:OGC-CSW-ebRIM::baseUrl:wmts	WMTS base URL.
urn:ogc:def:objectType:OGC-CSW-ebRIM::baseUrl:wps	WPS base URL.
urn:ogc:def:objectType:OGC-CSW-ebRIM::baseUrl:csw	CSW base URL.
urn:ogc:def:objectType:OGC-CSW-ebRIM::baseUrl:csw-ebRIM	WRS base URL.
urn:ogc:def:objectType:OGC-CSW-ebRIM::baseUrl:gss	GSS base URL.

9.6 Identifiers for associations for ebRIM

The following table lists a set of identifiers for association types that may exist between two resources represented in ebRIM. The identifiers in this table are used to extent the canonical ebRIM association type classification scheme.

These values shall be used as the value of the “associationType” property of the Association object within ebRIM to represent the type of association between registered resources.

Table 9 – OGC Association Type Identifiers for ebRIM

prefix¹: urn:ogc:def:associationType:OGC-CSW-ebRIM::	
Identifier	Description
renders	Associates two resources where one resource renders another resource (e.g. a WMS layer that renders a WFS feature type).
tiledBy	Associated two resource where one resource is a tiled representation of the other resource (e.g. a WMTS layers that is a tiles representation of a WMS layer).
parentOf	Associates two resources where one resource is the parent of the other resource. This is typically used to register a nested hierarchy of resources.
cascades	Associates two services where one OGC service is using the other OGC service as a data source. For examples where one WMS "cascades" a number of other WMS's.
createdBy	Associates two services where one is responsible for the other creation
symbolizes	Associates the symbology encoding document with a WFS Feature Type.
operatesOn	Associates two resource when one resource operates upon the other resource (e.g. a WFS service operates on feature types).
describedBy	Associates two resource where one resource is a description, using some metadata format, of another resource (e.g. an FGDC document might be used to describe a WFS feature type).
1. The complete identifier is formed by appending this prefix to the value in the <i>Identifier</i> column.	

The following table lists association identifiers that are useful in the context of OGC service integration and are already defined in the canonical ebRIM AssociationType classification scheme.

Table 10 – Additional Association Type Identifiers for ebRIM

Identifier	Description
urn:oasis:names:tc:ebxml-regrep:AssociationType:HasMember	Associates two resources where one resource is a collection and the other resource is a member of that collection (e.g. a collection of WMS layers that share

	a common theme).
urn:oasis:names:tc:ebxml-regrep:AssociationType:OffersService	Associates two resources where one resource is a web integration service and the other resource is another OGC web service offered by the WIS.

9.7 Identifiers for ebRIM slot names

The ebRIM model provides extensible metadata via a *slot* mechanism. Slots are a name and value list pair that provides additional metadata about a registered object. Among other things, slots are used in this standard to map values found in an OGC’s capabilities document into the ebRIM model.

The following table lists a set of identifiers that may be used as the value of the “name” parameter of a slot. These identifiers are used to define a canonical ebRIM SlotName classification scheme.

Table 11 – Slot Name Identifiers for ebRIM

prefix ¹ : urn:ogc:def:objectType:OGC-CSW-ebRIM::slotName:	
Identifier	Description
accessConstraints	Describes any access constraints associated with the resource.
baseTableName	The base table name within an RDBMS used to store a resource.
baseUrl	The base URL of the resource (e.g. the base URL of a service)
contactInstructions	Instruction for contacting a responsible party for the resource.
crs	A CRS associated with the resource.
fees	Any fees associated with obtaining the resource or a copy of the resource.
hasRepositoryItem	A Boolean flag indicating that the catalogue record representing a resource also has an associated repository item entry.
hoursOfService	Any hours of service associated with the resource.
keyword	A list of keywords associated with the resource.

layerLimit	The layer limit associated with a WMS service.
legendUrl	The legend URL for a WMS.
method	HTTP method name for a service binding.
maxHeight	The maximum map height that a WMS can serve.
maxWidth	The maximum map width that a WMS can serve.
onlineResource	May be used to provide a reference to the provider of the resource.
outputFormat	A list of formats indicating the representations available for the resource.
position	The position with an organization if the resource is a person.
queryable	A Boolean indicating whether a WMS map layer is queryable.
resourceType	A subtype for a resource represented in a CSW-ebRIM catalogue. This slot is typically used to differentiate one OGC web service type from another.
role	A role associated with a resource.
supportedVersions	The list of supported version of the resource; typically supported server versions.
scheme	An identifier from a classification scheme that is associated with the resource.
spatialPropertyName	The name of the spatial property of a resource (e.g. the spatial property name of a WFS feature type)
spatialPropertyType	The type of the spatial property of a resource (e.g. the spatial property of a WFS is of type POINT)
supportedOperations	A list of operations supported by the resource.
targetNamespace	A namespace associated with the resource.
title	A human-readable title associated with a resource.
url	A URL associated with a resource. Typically used to provide a link for accessing the resource directly.

where	A location or geometry associated with a resource
1. The complete identifier is formed by appending this prefix to the value in the <i>Identifier</i> column.	

9.8 Identifiers for data types for eBRIM

The following tables list identifiers for spatial and non-spatial data types. These values may be used to indicate the value type of a slot parameter.

The identifiers in Table 11 are defined in the eBRIM standard (see OASIS regrep-rim-3.0-os). The identifiers in Table 12 are defined as part of the Basic Package of the csw-eBRIM standard (see OGC 07-144r4).

Table 12 – Datatype Identifiers

Identifier	Description
urn:oasis:names:tc:ebxml-regrep:DataType:Boolean	Boolean
urn:oasis:names:tc:ebxml-regrep:DataType:Date	Date
urn:oasis:names:tc:ebxml-regrep:DataType:DateTime	DateTime
urn:oasis:names:tc:ebxml-regrep:DataType:Double	Double
urn:oasis:names:tc:ebxml-regrep:DataType:Float	Float
urn:oasis:names:tc:ebxml-regrep:DataType:Integer	Integer
urn:oasis:names:tc:ebxml-regrep:DataType:Number	Number
urn:oasis:names:tc:ebxml-regrep:DataType:Raw	Raw
urn:oasis:names:tc:ebxml-regrep:DataType:String	String
urn:oasis:names:tc:ebxml-regrep:DataType:Unknown	Unknown
urn:oasis:names:tc:ebxml-regrep:DataType:URI	URI

Table 13 – Spatial Datatype Identifiers

Identifier	Description
urn:ogc:def:dataType:ISO-19107:GM_Point	Point
urn:ogc:def:dataType:ISO-19107:GM_Curve	Line
urn:ogc:def:dataType:ISO-19107:GM_Surface	Polygon
urn:ogc:def:dataType:ISO-19107:GM_MultiPoint	Multit-point
urn:ogc:def:dataType:ISO-19107:GM_MultiCurve	Multi-line
urn:ogc:def:dataType:ISO-19107:GM_MultiSurface	Multi-polygon
urn:ogc:def:dataType:ISO-19107:GM_Aggregate	Geometry collection
urn:ogc:def:dataType:ISO-19107:GM_Object	Geometry object of any type

9.9 Classification schemes for eBRIM

Annex B defines an eBRIM packages for service integration that defines that following classification schemes: ServiceTypes, HarvestResourceTypes, SlotNames.

9.10 Mapping OGC capabilities documents into eBRIM

9.10.1 Introduction

The process of registering an OGC web service into the catalogue involves reading the service's capabilities document and then mapping the contents of that document into eBRIM thus making the information discoverable to catalogue clients.

OGC capabilities documents are composed of a number of sections some of which are common to all services and some of which are specific to a particular service. This clause describes the mapping of the common sections into eBRIM and further describes the mapping of the content sections for the WIS, WMS, WMTS, WFS and WCS services into eBRIM.

9.10.2 ServiceIdentification section

The following table maps the element of the ServiceIdentification section of an OGC capabilities document into eBRIM.

Table 14 – Mapping of ServiceIdentification Section into eBRIM

OGC Capabilities	eBRIM XPath
-------------------------	--------------------

XPath	
Title	Service/Slot[@name="Title"]/ValueList/Value[1]
Abstract	Service/Description/LocalizedString/@value
Keywords	Service/Slot[@name="keyword"]/ValueList/Value[1..*]
ServiceType	Service/Slot[@name="resourceType"]/ValueList/Value[1]
ServiceTypeVersion	Service/Slot[@name="supportedVersion"] /ValueList/Value[1..*]
Fees	Service/Slot[@name="fees"] /ValueList/Value[1]
AccessConstraints	Service/Slot[@name="accessConstraints"]/ValueList/Value[1]

9.10.3 ServiceProvider section

The following table maps the elements of the ServiceProvider section of an OGC capabilities document into ebRIM.

Table 15 – Mapping of ServiceProvider Section into ebRIM

OGC Capabilities XPath	ebRIM XPath
ProviderName	Organization/Name
ProviderSite	Organization/Slot[@name="onlineResource"]/ValueList/Value[1]
ServiceContact	See Table 16
NOTE: Organization/@parent = Service/@lid	

Table 16 -- Mapping of ServiceProvider/ServiceContact into ebRIM

OGC Capabilities XPath	ebRIM XPath
ServiceContact/IndividualName	Person/PersonName/@lastName
ServiceContact/PostitionName	Person/Slot[@name="position"]/ValueList/Value[1]

ServiceContact/Role	Person/Slot[@name="role"]/ValueList/Value[1]
ServiceContact/ContactInfo	See Table 17
NOTE: Organization/@primaryContact = Person/@lid	

Table 17 – Mapping of ServiceProvider/ServiceContact/ContactInfo into ebRIM

OGC Capabilities XPath	ebRIM XPath
OnlineResource	Organization/Slot[@name="onlineResource"] /ValueList/Value[1]
HoursOfService	Organization/Slot[@name="hoursOfService"] /ValueList/Value[1]
ContactInstructions	Organization/Slot[@name="contactInstructions"] /ValueList/Value[1]
Phone/Voice	Person/TelephoneNumber/[@phoneType="Voice"] /number
Phone/Facsimile	Person/TelephoneNumber/[@phoneType="ContactInfo"] /number
Address/DeliveryPoint	Organization/Address/@streetNumber
Address/City	Organization/Address/@city
Address/AdministrativeArea	Organization/Address/@stateOrProvince
Address/PostalCode	Organization/Address/@postalCode
Address/Country	Organization/Address/@country
Address/ElectronicMailAddress	Organization/EmailAddress/@address

9.10.4 OperationsMetadata section

The following table maps the elements of the OperationsMetadata section of an OGC capabilities document into ebRIM.

Table 18 – Mapping of OperationsMetadata Section into ebRIM

OGC Capabilities XPath	ebRIM XPath
Operation/@name	ServiceBinding/Name/LocalizedString/@value
Operation/DCP/HTTP/Get/@xlink	ServiceBinding/@accessURI ServiceBinding/Slot[@name="method"] /ValueList/Value[1]=GET
Operation/DCP/HTTP/Post/@xlink	ServiceBinding/@accessURI ServiceBinding/Slot[@name="method"] /ValueList/Value[1]=POST

9.10.5 Content section

9.10.5.1 Introduction

This clause defines the mapping of the content sections of the WIS, WMS, WFS and WCS into the ebRIM model.

9.10.5.2 WIS content

The content section of a WIS is simply a list of ServiceIdentification sections describing the set of services that the WIS offers. The content section of a WIS is not harvested directly. Rather each service listed in the WIS content section is harvested and an “OffersService” association (see Table 10) is registered between the WIS and the harvested child service.

9.10.5.3 WMS content

9.10.5.3.1 WMS theme

The following table maps the metadata describing a WMS layer that contains nested layers into ebRIM. Layers that in turn contain child layers are referred to as themes in this standard.

The relationship between a WMS offering a theme and the theme itself shall be encoded in ebRIM using the “operatesOn” association (see Table 9).

The relationship between a WMS layer or theme and its child WMS layers shall be encoded in ebRIM using the “HasMember” association (see Table 10).

Table 19 – Mapping of WMS Theme metadata into ebRIM

OGC Capabilities XPath	ebRIM XPath
-------------------------------	--------------------

Name	ExtrinsicObject[@objectType="wms:theme"]/Name /LocalizedString/@value
Description/Title	ExtrinsicObject[@objectType="wms:theme"]/Slot[@name="title"] /ValueList/Value[1]
Description/Abstract	ExtrinsicObject[@objectType="wms:theme"]/Description /LocalizedString/@value
Description/Keywords	ExtrinsicObject[@objectType="wms:theme"]/Slot[@name="keyword"] /ValueList/Value[1..*]
CRS	ExtrinsicObject[@objectType="wms:theme"]/Slot[@name=crs] /ValueList/Value[1]
EX_Geographic BoundingBox or BoudningBox	ExtrinsicObject[@objectType="wms:theme"]/Slot[@name="where" && @type="urn:ogc:def:dataType:ISO-19107:2003:GM_Envelope] /ValueList/Value[1..*]
LegendURL	ExtrinsicObject[@objectType="wms:theme"]/Slot[@name="legendURL"] /ValueList/Value[1]=LegendURL/onlineResource ExtrinsicObject[@objectType="wms:theme"]/Slot[@name="legendURL"] /ValueList/Value[2]=LegendURL/Format ExtrinsicObject[@objectType="wms:theme"]/Slot[@name="legendURL"] /ValueList/Value[3]=LegendURL/width ExtrinsicObject[@objectType="wms:theme"]/Slot[@name="legendURL"] /ValueList/Value[4]=LegendURL/height
Layer (child)	Each child layer is encoded into eBRIM as a sub-theme of WMS layer (see Table 20). The association between a layer and a child layer or theme is encoded into eBRIM using the "HasMember" association (see Table 10).

9.10.5.3.2 WMS layer

The following table maps the metadata describing a WMS layer into eBRIM.

The relationship between a WMS offering a layer and the layer itself shall be encoded in eBRIM using the "operatesOn" association (see Table 9).

The relationship between a WMS theme and a WMS layer it contains shall be encoded in eBRIM using the "HasMember" association (see Table 10).

Table 20 – Mapping of WMS Layer metadata into eBRIM

OGC Capabilities XPath	eBRIM XPath
Name	ExtrinsicObject[@objectType="wms:layer"]/Name /LocalizedString/@value
Description/Title	ExtrinsicObject[@objectType="wms:layer"]/Slot[@name="title"]

	/ValueList/Value[1]
Description/Abstract	ExtrinsicObject[@objectType="wms:layer"]/Description /LocalizedString/@value
Description/Keywords	ExtrinsicObject[@objectType="wms:layer"]/Slot[@name="keyword"] /ValueList/Value[1..*]
CRS	ExtrinsicObject[@objectType="wms:layer"]/Slot[@name="crs"] /ValueList/Value[1]
EX_GeographicBoundingBox or BoundingBox	ExtrinsicObject[@objectType="wms:layer"]/Slot[@name="where" && @type="urn:ogc:def:dataType:ISO-19107:2003:GM_Envelope"] /ValueList/Value[1..*]
LegendURL	ExtrinsicObject[@objectType="wms:layer"]/Slot[@name="legendURL"] /ValueList/Value[1]=LegendURL/onlineResource ExtrinsicObject[@objectType="wms:layer"]/Slot[@name="legendURL"] /ValueList/Value[2]=LegendURL/Format ExtrinsicObject[@objectType="wms:layer"]/Slot[@name="legendURL"] /ValueList/Value[3]=LegendURL/width ExtrinsicObject[@objectType="wms:layer"]/Slot[@name="legendURL"] /ValueList/Value[4]=LegendURL/height

9.10.5.4 WMTS content

9.10.5.4.1 WMTS themes

The following table maps the metadata describing a WMTS theme into eBRIM. In addition to these mappings, an “operatesOn” association (see Table 9) shall be created between the service offering the WMTS layer and the WMTS layer itself.

The relationship between a theme, its sub-themes and any WMTS layers shall be encoded in eBRIM using the “HasMember” association (see Table 10).

Table 21 – Mapping of WMTS Theme metadata into eBRIM

OGC Capabilities XPath	eBRIM XPath
Title	ExtrinsicObject[@objectType="wmts:theme"]/Slot[@name="title"] /ValueList/Value[1]
Abstract	ExtrinsicObject[@objectType="wmts:theme"]/Description /LocalizedString[@value="..."]
Keywords	ExtrinsicObject[@objectType="wmts:theme"]/Slot[@name="keyword"] /ValueList/Value[1..*]
Identifier	ExtrinsicObject[@objectType="wmts:theme"]/Name/LocalizedString/@v

	alue[1]
LayerRef	This is encoded in ebRIM as a “HasMember” association (see Table 10) between the theme and each child layer.

9.10.5.4.2 WMTS layers

The following table maps the metadata describing a WMTS layer into ebRIM. In addition to these mappings, an “operatesOn” association (see Table 9) shall be created between the service offering the WMTS layer and the WMTS layer itself.

Table 22 – Mapping of WMTS Layer metadata into ebRIM

OGC Capabilities XPath	ebRIM XPath
Title	ExtrinsicObject[@objectType=”wmts:layer”]/Slot[@name=”title”]/ValueList/Value[1]
Abstract	ExtrinsicObject[@objectType=”wmts:layer”]/Description/LocalizedString[@value=”...”]
Keywords	ExtrinsicObject[@objectType=”wmts:layer”]/Slot[@name=”keyword”]/ValueList/Value[1..*]
WGS84BoundingBox	ExtrinsicObject[@objectType=”wmts:layer”]/Slot[@name=”where” && @type=”urn:ogc:def:dataType:ISO-19107:2003:GM_Envelope”]/ValueList/Value[1..*]
Identifier	ExtrinsicObject[@objectType=”wmts:layer”]/Name/LocalizedString/@value
LegendURL	ExtrinsicObject[@objectType=”wmts:layer”]/Slot[@name=”legendURL”]/ValueList/Value[1]=href ExtrinsicObject[@objectType=”wmts:layer”]/Slot[@name=”legendURL”]/ValueList/Value[2]=format ExtrinsicObject[@objectType=”wmts:layer”]/Slot[@name=”legendURL”]/ValueList/Value[3]=minScaleDenominator ExtrinsicObject[@objectType=”wmts:layer”]/Slot[@name=”legendURL”]/ValueList/Value[4]=maxScaleDenominator ExtrinsicObject[@objectType=”wmts:layer”]/Slot[@name=”legendURL”]/ValueList/Value[5]=width ExtrinsicObject[@objectType=”wmts:layer”]/Slot[@name=”legendURL”]/ValueList/Value[6]=height
Format	ExtrinsicObject[@objectType=”wmts:layer”]/Slot[@name=”outputFormat”]/ValueList/Value[1..*]

9.10.5.5 WFS feature types

The following table maps the metadata describing a WFS feature type into ebRIM. In addition to these mappings, an “operatesOn” association (see Table 9) shall be created between the service offering the feature type and the feature type itself.

Table 23 – Mapping of WFS FeatureType metadata into ebRIM

OGC Capabilities XPath	ebRIM XPath
Name	ExtrinsicObject[@objectType="wfs:featureType"]/Name/LocalizedString/@value
Title	ExtrinsicObject[@objectType="wfs:featureType"]/Slot[@name="title"]/ValueList/Value[1]
Abstract	ExtrinsicObject[@objectType="wfs:featureType"]/Description/LocalizedString/@value
Keywords	ExtrinsicObject[@objectType="wfs:featureType"]/Slot[@name="keyword"]/ValueList/Value[1..*]
DefaultCRS or OtherCRS	ExtrinsicObject[@objectType="wfs:featureType"]/Slot[@name="crs"]/ValueList/Value[1] = DefaultCRS ExtrinsicObject[@objectType="wfs:featureType"]/Slot[@name="crs"]/ValueList/Value[2..*] = OtherCRS
OutputFormats	ExtrinsicObject[@objectType="wfs:featureType"]/Slot[@name="outputFormat"]/ValueList/Value[1..*]
WGS84BoundingBox	ExtrinsicObject[@objectType="wfs:featureType"]/Slot[@name="where" && @type="urn:ogc:def:dataType:ISO-19107:2003:GM_Envelope"]/ValueList/Value[1..*]
MetadataURL	ExtrinsicObject[@objectType="wfs:featureType"]/Slot[@name="metadataURL"]/ValueList/Value[1]

9.10.5.6 WCS Coverage

The following table maps the metadata describing a WCS coverage offering into ebRIM. In addition to these mappings, an “operatesOn” association (see Table 9) shall be created between the service offering the coverage and the coverage itself.

Table 24 – Mapping of WCS Coverage Offering into ebRIM

OGC Capabilities XPath	ebRIM XPath
Title	ExtrinsicObject[@objectType="wcs:coverage"] /Slot[@name="title"]/ValueList/Value[1]
Abstract	ExtrinsicObject[@objectType="wcs:coverage"]/Description /LocalizedString/@value
Keywords	ExtrinsicObject[@objectType="wcs:coverage"] /Slot[@name="keyword"]/ValueList/Value[1..*]
WGS84BoundingBox or BoundingBox	ExtrinsicObject[@objectType="wcs:coverage"]/Slot[@name="where" && @type="urn:ogc:def:dataType:ISO-19107:2003:GM_Envelope"] /ValueList/Value[1..*]
CoverageId	ExtrinsicObject[@objectType="wcs:coverage"]/Name /LocalizedString/@value
CoverageSubtype	ExtrinsicObject[@objectType="wcs:coverage"] /Slot[@name="resourceType"]/ValueList/Value[1]

9.11 GetAssociations stored query

CSW-ebRIM implementations shall implement a stored query names “GetAssociations” that allows clients to query associations in the catalogue. The prototype of the stored query shall be:

```
getAssociations( sourceId anyURI, associationType TokenOrAnyURI, targetId anyURI)
```

Any combination of sourceId, associationType and targetId can be specified as arguments and the query shall return the association records that satisfy the request. For example, specifying a sourceId and an associationType will return the Id of the resource that the

Annex A

XML Schema Documents (normative)

B.1 Introduction

This annex contains the normative schemas for the Web Integration Service (WIS) and the GetAssociations operation. The WIS is described in clause 7. The GetAssociations operation is described in clause 8.

B.2 wis.xsd

```
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema
  targetNamespace="http://www.opengis.net/wis/1.0"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:wis="http://www.opengis.net/wis/1.0"
  xmlns:ows="http://www.opengis.net/ows/2.0"
  xmlns:xlink="http://www.w3.org/1999/xlink"
  xmlns:xml="http://www.w3.org/XML/1998/namespace"
  elementFormDefault="qualified" version="1.0.0">
  <xsd:annotation>
    <xsd:documentation>This XML Schema Document includes and imports,
      directly or indirectly, all the XML Schemas defined by the
      Web Integration Service (WIS) Implementation Specification.

      WIS is an OGC Engineering Report.
      Copyright (c) 2014 Open Geospatial Consortium.
      To obtain additional rights of use,
      visit http://www.opengeospatial.org/legal/ .
    </xsd:documentation>
  </xsd:annotation>
  <!-- =====
    Includes and Imports
    ===== -->
  <xsd:import namespace="http://www.w3.org/XML/1998/namespace"
    schemaLocation="http://www.w3.org/2001/xml.xsd"/>
  <xsd:import namespace="http://www.w3.org/1999/xlink"
    schemaLocation="http://www.w3.org/1999/xlink.xsd"/>
  <xsd:import namespace="http://www.opengis.net/ows/2.0"
    schemaLocation="http://schemas.opengis.net/ows/2.0/owsAll.xsd"/>

  <!-- ===== -->
  <!-- =   GETCAPABILITIES Request and Response   = -->
  <!-- ===== -->
  <!-- REQUEST -->
  <xsd:element name="GetCapabilities" type="wis:GetCapabilitiesType"/>
  <xsd:complexType name="GetCapabilitiesType">
    <xsd:complexContent>
      <xsd:extension base="ows:GetCapabilitiesType">
        <xsd:attribute name="service" type="ows:ServiceType"
          use="required" fixed="WIS"/>
      </xsd:extension>
    </xsd:complexContent>
  </xsd:complexType>
</xsd:schema>
```

```

    </xsd:complexContent>
</xsd:complexType>
<!-- RESPONSE -->
<xsd:element name="Capabilities" type="wis:WIS_CapabilitiesType"/>
<xsd:complexType name="WIS_CapabilitiesType">
  <xsd:complexContent>
    <xsd:extension base="ows:CapabilitiesBaseType">
      <xsd:sequence>
        <xsd:element ref="wis:Contents"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:element name="Contents" type="wis:ContentsType"/>
<xsd:complexType name="ContentsType">
  <xsd:sequence>
    <xsd:element ref="wis:Service" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:element name="Service" type="wis:ServiceType"/>
<xsd:complexType name="ServiceType">
  <xsd:sequence>
    <xsd:element ref="ows:ServiceIdentification"/>
  </xsd:sequence>
  <xsd:attribute name="type" type="wis:TokenOrAnyURI" use="required"/>
  <xsd:attribute name="baseUrl" type="xsd:anyURI" use="required"/>
</xsd:complexType>
<xsd:simpleType name="TokenOrAnyURI">
  <xsd:union memberTypes="xsd:token xsd:anyURI"/>
</xsd:simpleType>
</xsd:schema>

```

B.2 owsGetAssociation.xsd

```

<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema
  targetNamespace="http://www.opengis.net/as/1.0"
  xmlns:as="http://www.opengis.net/as/1.0"
  xmlns:ows="http://www.opengis.net/ows/2.0"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:xml="http://www.w3.org/XML/1998/namespace"
  xmlns:xlink="http://www.w3.org/1999/xlink"
  elementFormDefault="qualified"
  version="1.0.0">
  <xsd:annotation>
    <xsd:documentation>
      This XML schema document provides a schema for the
      communication of associations between resources.

      Copyright (c) 2014 Open Geospatial Consortium.
      To obtain additional rights of use,
      visit http://www.opengeospatial.org/legal/ .
    </xsd:documentation>
  </xsd:annotation>

  <!-- =====
  Includes and Imports
  ===== -->
  <xsd:import namespace="http://www.w3.org/XML/1998/namespace"
    schemaLocation="http://www.w3.org/2001/xml.xsd"/>
  <xsd:import namespace="http://www.w3.org/1999/xlink"
    schemaLocation="http://www.w3.org/1999/xlink.xsd"/>

```

```

<xsd:import namespace="http://www.opengis.net/ows/2.0"
             schemaLocation="http://schemas.opengis.net/ows/2.0/owsAll.xsd"/>

<!-- =====
      GETASSOCIATIONS REQUEST
      ===== -->
<xsd:element name="GetAssociations" type="as:GetAssociationsType"/>
<xsd:complexType name="GetAssociationsType">
  <xsd:sequence>
    <xsd:element name="Content" type="as:StringOrQName"
                 minOccurs="0" maxOccurs="unbounded"/>
  </xsd:sequence>
  <xsd:attribute name="service"
                 type="ows:ServiceType" use="required"/>
  <xsd:attribute name="version" type="xsd:string"
                 use="required" fixed="1.0.0"/>
  <xsd:attribute name="outputFormat"
                 type="xsd:string" default="application/as+xml"/>
</xsd:complexType>
<xsd:simpleType name="StringOrQName">
  <xsd:union memberTypes="xsd:string xsd:QName"/>
</xsd:simpleType>

<!-- =====
      GETASSOCIATIONS RESPONSE
      ===== -->
<xsd:element name="Associations">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element ref="as:Association" minOccurs="0"
                   maxOccurs="unbounded"/>
    </xsd:sequence>
    <xsd:attribute name="version" type="xsd:string" use="required"
                   fixed="1.0.0"/>
  </xsd:complexType>
</xsd:element>

<!-- =====
      ASSOCIATION
      ===== -->
<xsd:element name="Association">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="Source" type="as:ResourceType"/>
      <xsd:element name="Target" type="as:ResourceType"/>
    </xsd:sequence>
    <xsd:attribute name="rel"
                   type="as:TokenOrAnyURI" use="required"/>
  </xsd:complexType>
</xsd:element>
<xsd:complexType name="ResourceType">
  <xsd:sequence>
    <xsd:element ref="as:Identifier" minOccurs="0"/>
  </xsd:sequence>
  <xsd:attribute name="type"
                 type="as:TokenOrAnyURI" use="required"/>
  <xsd:attribute ref="xlink:href" use="required"/>
</xsd:complexType>
<xsd:element name="Identifier">
  <xsd:complexType>
    <xsd:simpleContent>

```



```
        <xsd:extension base="xsd:string">
            <xsd:attribute name="namespace" type="xsd:anyURI"/>
        </xsd:extension>
    </xsd:simpleContent>
</xsd:complexType>
</xsd:element>
<xsd:simpleType name="TokenOrAnyURI">
    <xsd:union memberTypes="xsd:token xsd:anyURI"/>
</xsd:simpleType>
</xsd:schema>
```

Annex B

OGC Service Integration ebRIM Package (normative)

C.1 ebRIM Package

The following ebRIM package defines object identifiers, classification schemes and association that may be used by a CSW-ebRIM catalogue to harvest and register the resources described by the capabilities documents of OGC web services.

```
<?xml version="1.0" encoding="UTF-8"?>
<csw:Transaction
  xmlns="http://www.opengis.net/cat/csw/2.0.2"
  xmlns:csw="http://www.opengis.net/cat/csw/2.0.2"
  xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.opengis.net/cat/csw/2.0.2
    http://schemas.opengis.net/csw/2.0.2/CSW-discovery.xsd
    urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0
    http://docs.oasis-open.org/regrep/v3.0/schema/rim.xsd"
  service="CSW" version="2.0.2">
  <!-- ===== -->
  <!-- OGC Association types -->
  <!-- ===== -->
  <csw:Insert>
    <rim:ClassificationNode code="OGC-Association-Types"
      id="urn:ogc:def:associationType:OGC-CSW-ebRIM"
      parent="urn:oasis:names:tc:ebxml-
regrep:classificationScheme:AssociationType">
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="OGC-AssociationType"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
          value="A sub-tree defining association types defined by OGC"/>
      </rim:Description>
      <rim:ClassificationNode code="Renders"
        id="urn:ogc:def:associationType:OGC-CSW-ebRIM::renders">
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
          <rim:ValueList>
            <rim:Value>Renders</rim:Value>
          </rim:ValueList>
        </rim:Slot>
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:reverseAssociationTitle">
          <rim:ValueList>
            <rim:Value>Rendered by</rim:Value>
          </rim:ValueList>
        </rim:Slot>
        <rim:Name>
          <rim:LocalizedString charset="UTF-8" value="Renders"/>
        </rim:Name>

```

```

    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
        value="Associates one or more data sources (typically WFS
Feature Types) that are rendered by a WMS or WMTS layers."/>
    </rim:Description>
  </rim:ClassificationNode>
  <rim:ClassificationNode code="TiledBy"
    id="urn:ogc:def:associationType:OGC-CSW-ebRIM::tiledBy">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
      <rim:ValueList>
        <rim:Value>Tiled By</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:reverseAssociationTitle">
      <rim:ValueList>
        <rim:Value>Tiles</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Name>
      <rim:LocalizedString charset="UTF-8" value="Tiled By"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
        value="Associates one or more WMTS layers with the WMS layer
that they tile."/>
    </rim:Description>
  </rim:ClassificationNode>
  <rim:ClassificationNode code="ParentOf"
    id="urn:ogc:def:associationType:OGC-CSW-ebRIM::parentOf">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
      <rim:ValueList>
        <rim:Value>Parent Of</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:reverseAssociationTitle">
      <rim:ValueList>
        <rim:Value>Child Of</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Name>
      <rim:LocalizedString charset="UTF-8" value="Parent Of"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
        value="Associates a registry entry with a parent entry and is
typically used to register a nested hierarchy of objects."/>
    </rim:Description>
  </rim:ClassificationNode>
  <rim:ClassificationNode code="Cascades"
    id="urn:ogc:def:associationType:OGC-CSW-ebRIM::cascades">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
      <rim:ValueList>
        <rim:Value>Cascades</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:reverseAssociationTitle">

```

```

        <rim:ValueList>
          <rim:Value>Cascaded By</rim:Value>
        </rim:ValueList>
      </rim:Slot>
    <rim:Name>
      <rim:LocalizedString charset="UTF-8" value="Cascades"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
        value="Associates two services where one OGC web service is
using the other OGC web service as a data source. For examples where one WMS
cascades a number of other WMS's"/>
    </rim:Description>
  </rim:ClassificationNode>
  <rim:ClassificationNode code="CreatedBy"
    id="urn:ogc:def:associationType:OGC-CSW-ebRIM::createdBy">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
      <rim:ValueList>
        <rim:Value>Created By</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:reverseAssociationTitle">
      <rim:ValueList>
        <rim:Value>Creates</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Name>
      <rim:LocalizedString charset="UTF-8" value="Created By"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
        value="Associates two resources where one is responsible for
the other's creation."/>
    </rim:Description>
  </rim:ClassificationNode>
  <rim:ClassificationNode code="Symbolizes"
    id="urn:ogc:def:associationType:OGC-CSW-ebRIM::symbolizes">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
      <rim:ValueList>
        <rim:Value>Symbolizes</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:reverseAssociationTitle">
      <rim:ValueList>
        <rim:Value>Symbolized by</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Name>
      <rim:LocalizedString charset="UTF-8" value="Symbolizes"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
        value="Associates the symbology encoding document with a WFS
Feature Type."/>
    </rim:Description>
  </rim:ClassificationNode>
  <rim:ClassificationNode code="OperatesOn"

```

```

        id="urn:ogc:def:associationType:OGC-CSW-ebRIM::operatesOn">
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
            <rim:ValueList>
                <rim:Value>Operates On</rim:Value>
            </rim:ValueList>
        </rim:Slot>
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:reverseAssociationTitle">
            <rim:ValueList>
                <rim:Value>Operated On</rim:Value>
            </rim:ValueList>
        </rim:Slot>
        <rim:Name>
            <rim:LocalizedString charset="UTF-8" value="OperatesOn"/>
        </rim:Name>
        <rim:Description>
            <rim:LocalizedString charset="UTF-8"
value="Associates two resource when one resource operates
upon the other resource (e.g. a WFS service operates on feature types)."/>
        </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="DescribedBy"
id="urn:ogc:def:associationType:OGC-CSW-ebRIM::describedBy">
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
            <rim:ValueList>
                <rim:Value>Described By</rim:Value>
            </rim:ValueList>
        </rim:Slot>
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:reverseAssociationTitle">
            <rim:ValueList>
                <rim:Value>Describes</rim:Value>
            </rim:ValueList>
        </rim:Slot>
        <rim:Name>
            <rim:LocalizedString charset="UTF-8" value="DescribedBy"/>
        </rim:Name>
        <rim:Description>
            <rim:LocalizedString charset="UTF-8"
value="Associates two resource where one resource is a
description, using some metadata format, of another resource (e.g. an FGDC
document might be used to describe a WFS feature type)."/>
        </rim:Description>
    </rim:ClassificationNode>
</rim:ClassificationNode>
</csw:Insert>
<!-- ===== -->
<!-- OGC Service Types -->
<!-- ===== -->
<csw:Insert>
    <rim:ClassificationScheme
id="urn:ogc:names:tc:ebxml-regrep:classificationScheme:serviceTypes"
isInternal="true"
nodeType="urn:oasis:names:tc:ebxml-regrep:NodeType:UniqueCode">
        <rim:Name>
            <rim:LocalizedString charset="UTF-8" value="ServiceTypes"/>
        </rim:Name>
        <rim:Description>
            <rim:LocalizedString charset="UTF-8"

```

```

        value="This is the canonical classification scheme of OGC web
service types."/>
      </rim:Description>
      <rim:ClassificationNode code="wis"
        id="urn:ogc:def:serviceType:OGC-CSW-ebRIM:wis">
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
          <rim:ValueList>
            <rim:Value>Web Integration Service</rim:Value>
          </rim:ValueList>
        </rim:Slot>
        <rim:Name>
          <rim:LocalizedString charset="UTF-8" value="wis"/>
        </rim:Name>
        <rim:Description>
          <rim:LocalizedString charset="UTF-8"
value="An aggregation service that offers other OGC web
services."/>
        </rim:Description>
      </rim:ClassificationNode>
      <rim:ClassificationNode code="wfs"
        id="urn:ogc:def:serviceType:OGC-CSW-ebRIM:wfs">
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
          <rim:ValueList>
            <rim:Value>Web Feature Service</rim:Value>
          </rim:ValueList>
        </rim:Slot>
        <rim:Name>
          <rim:LocalizedString charset="UTF-8" value="wfs"/>
        </rim:Name>
        <rim:Description>
          <rim:LocalizedString charset="UTF-8"
value="A service offering features."/>
        </rim:Description>
      </rim:ClassificationNode>
      <rim:ClassificationNode code="wms"
        id="urn:ogc:def:serviceType:OGC-CSW-ebRIM:wms">
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
          <rim:ValueList>
            <rim:Value>Web Map Service</rim:Value>
          </rim:ValueList>
        </rim:Slot>
        <rim:Name>
          <rim:LocalizedString charset="UTF-8" value="wms"/>
        </rim:Name>
        <rim:Description>
          <rim:LocalizedString charset="UTF-8"
value="A service offering maps."/>
        </rim:Description>
      </rim:ClassificationNode>
      <rim:ClassificationNode code="wmts"
        id="urn:ogc:def:serviceType:OGC-CSW-ebRIM:wmts">
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
          <rim:ValueList>
            <rim:Value>Web Map Tiling Service</rim:Value>
          </rim:ValueList>
        </rim:Slot>
        <rim:Name>

```

```

        <rim:LocalizedString charset="UTF-8" value="wmts"/>
    </rim:Name>
    <rim:Description>
        <rim:LocalizedString charset="UTF-8"
            value="A service offering map tiles."/>
    </rim:Description>
</rim:ClassificationNode>
<rim:ClassificationNode code="wps"
    id="urn:ogc:def:serviceType:OGC-CSW-ebRIM:wps">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
            <rim:Value>Web Processing Service</rim:Value>
        </rim:ValueList>
    </rim:Slot>
    <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="wps"/>
    </rim:Name>
    <rim:Description>
        <rim:LocalizedString charset="UTF-8"
            value="A service making geo-processes accessible on the
web."/>
    </rim:Description>
</rim:ClassificationNode>
<rim:ClassificationNode code="wcs"
    id="urn:ogc:def:serviceType:OGC-CSW-ebRIM:wcs">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
            <rim:Value>Web Coverage Service</rim:Value>
        </rim:ValueList>
    </rim:Slot>
    <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="wcs"/>
    </rim:Name>
    <rim:Description>
        <rim:LocalizedString charset="UTF-8"
            value="A service offering coverages."/>
    </rim:Description>
</rim:ClassificationNode>
<rim:ClassificationNode code="csw"
    id="urn:ogc:def:serviceType:OGC-CSW-ebRIM:csw">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
            <rim:Value>Catalogue Service Web</rim:Value>
        </rim:ValueList>
    </rim:Slot>
    <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="csw"/>
    </rim:Name>
    <rim:Description>
        <rim:LocalizedString charset="UTF-8"
            value="An web accessible catalogue service."/>
    </rim:Description>
</rim:ClassificationNode>
<rim:ClassificationNode code="csw-ebRIM"
    id="urn:ogc:def:serviceType:OGC-CSW-ebRIM:csw-ebRIM">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>

```

```

        <rim:Value>CSW-ebRIM Registry Service - Part 1: ebRIM profile
of CSW</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Name>
      <rim:LocalizedString charset="UTF-8" value="csw-ebRIM"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
value="A catalogue profile using ebRIM."/>
    </rim:Description>
  </rim:ClassificationNode>
  <rim:ClassificationNode code="gss"
id="urn:ogc:def:serviceType:OGC-CSW-ebRIM::gss">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
      <rim:ValueList>
        <rim:Value>Web GeoCollaboration Service</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Name>
      <rim:LocalizedString charset="UTF-8" value="csw-ebRIM"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
value="A service supporting crowd sourced access to
transaction OGC web services."/>
    </rim:Description>
  </rim:ClassificationNode>
</rim:ClassificationScheme>
</csw:Insert>
<!-- ===== -->
<!-- OGC Service Content types. -->
<!-- ===== -->
<csw:Insert>
  <rim:ClassificationNode code="OGC-Service-Content-Types"
id="urn:ogc:def:objectType"
parent="urn:oasis:names:tc:ebxml-
regrep:classificationScheme:ObjectType">
    <rim:Name>
      <rim:LocalizedString charset="UTF-8" value="OGC-ObjectType"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
value="A sub-tree defining OGC object types."/>
    </rim:Description>
    <rim:ClassificationNode code="FeatureType"
id="urn:ogc:def:objectType:OGC-CSW-ebRIM::wfs:featureType">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>WFS Feature Type</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="WFS Feature Type"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
value="A feature type served by an OGC Web Feature
Service."/>

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    </rim:Description>
  </rim:ClassificationNode>
  <rim:ClassificationNode code="WMS Theme"
    id="urn:ogc:def:objectType:OGC-CSW-ebRIM::wms:theme">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
      <rim:ValueList>
        <rim:Value>WMS Theme</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Name>
      <rim:LocalizedString charset="UTF-8" value="WMS Theme"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
        value="A collection of WMS layers."/>
    </rim:Description>
    <rim:ClassificationNode code="WMS Layer"
      id="urn:ogc:def:objectType:OGC-CSW-ebRIM::wms:layer">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>WMS Layer</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="WMS Layer"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
          value="A map layer served by an OGC Web Map Service."/>
      </rim:Description>
    </rim:ClassificationNode>
  </rim:ClassificationNode>
  <rim:ClassificationNode code="WMTS Theme"
    id="urn:ogc:def:objectType:OGC-CSW-ebRIM::wmts:theme">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
      <rim:ValueList>
        <rim:Value>WMTS Theme</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Name>
      <rim:LocalizedString charset="UTF-8" value="WMTS Theme"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
        value="A collection of WMTS layers."/>
    </rim:Description>
    <rim:ClassificationNode code="WMTS Layer"
      id="urn:ogc:def:objectType:OGC-CSW-ebRIM::wmts:layer">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>WMTS Layer</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="WMTS Layer"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"

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        value="A WMTS map layer served by an OGC Web Map Service."/>
    </rim:Description>
</rim:ClassificationNode>
</rim:ClassificationNode>
<rim:ClassificationNode code="WCS Theme"
  id="urn:ogc:def:objectType:OGC-CSW-ebRIM::wcs:theme">
  <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
    <rim:ValueList>
      <rim:Value>WCS Theme</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Name>
    <rim:LocalizedString charset="UTF-8" value="WCS Theme"/>
  </rim:Name>
  <rim:Description>
    <rim:LocalizedString charset="UTF-8"
      value="A collection of WCS coverages."/>
  </rim:Description>
  <rim:ClassificationNode code="WCS Coverage"
    id="urn:ogc:def:objectType:OGC-CSW-ebRIM::wcs:coverage">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
      <rim:ValueList>
        <rim:Value>WCS Coverage</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Name>
      <rim:LocalizedString charset="UTF-8" value="WCS Coverage"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
        value="A coverage served by an OGC Web Coverage
Service."/>
    </rim:Description>
  </rim:ClassificationNode>
</rim:ClassificationNode>
<rim:ClassificationNode code="Process"
  id="urn:ogc:def:objectType:OGC-CSW-ebRIM::wps:process">
  <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
    <rim:ValueList>
      <rim:Value>WPS Process</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Name>
    <rim:LocalizedString charset="UTF-8" value="WPS Process"/>
  </rim:Name>
  <rim:Description>
    <rim:LocalizedString charset="UTF-8"
      value="A process served by an OGC Web Processing Service."/>
  </rim:Description>
</rim:ClassificationNode>
<rim:ClassificationNode code="Unknown"
  id="urn:ogc:def:objectType:OGC-CSW-ebRIM::unknown">
  <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
    <rim:ValueList>
      <rim:Value>Unknown</rim:Value>
    </rim:ValueList>
  </rim:Slot>

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    <rim:Name>
      <rim:LocalizedString charset="UTF-8" value="Unknown"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
        value="An artifact of unknown type."/>
    </rim:Description>
  </rim:ClassificationNode>
</rim:ClassificationNode>
</csw:Insert>
<!-- ===== -->
<!-- Harvestable resource types. -->
<!-- ===== -->
<csw:Insert>
  <rim:ClassificationScheme
    id="urn:ogc:names:tc:ebxml-
regrep:classificationScheme:HarvestResourceType"
    isInternal="true"
    nodeType="urn:oasis:names:tc:ebxml-regrep:NodeType:UniqueCode">
    <rim:Name>
      <rim:LocalizedString charset="UTF-8" value="HarvestResourceType"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
        value="This is the canonical classification scheme for harvest
resource types used by the CSW-ebRIM catalogue."/>
    </rim:Description>
    <!-- Service capabilities documents. -->
    <rim:ClassificationNode code="wis"
      id="urn:ogc:def:objectType:OGC-CSW-
ebRIM::document:capabilities:wis">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>Web Integration Service Capabilities
Document</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="wis"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
          value="The capabilities document of a WIS."/>
      </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="wfs"
      id="urn:ogc:def:objectType:OGC-CSW-
ebRIM::document:capabilities:wfs">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>Web Feature Service Capabilities
Document</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="wfs"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
          value="The capabilities document of a Web Feature Service"/>

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        </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="wms"
    id="urn:ogc:def:objectType:OGC-CSW-
ebRIM::document:capabilities:wms">
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
            <rim:ValueList>
                <rim:Value>Web Map Service Capabilities Document</rim:Value>
            </rim:ValueList>
        </rim:Slot>
        <rim:Name>
            <rim:LocalizedString charset="UTF-8" value="wms"/>
        </rim:Name>
        <rim:Description>
            <rim:LocalizedString charset="UTF-8"
            value="The capabilities document of a Web Map Service"/>
        </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="wmts"
    id="urn:ogc:def:objectType:OGC-CSW-
ebRIM::document:capabilities:wmts">
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
            <rim:ValueList>
                <rim:Value>Web Map Tiling Service Capabilities
Document</rim:Value>
            </rim:ValueList>
        </rim:Slot>
        <rim:Name>
            <rim:LocalizedString charset="UTF-8" value="wmts"/>
        </rim:Name>
        <rim:Description>
            <rim:LocalizedString charset="UTF-8"
            value="The capabilities document of a Web Map Tiling
Service"/>
        </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="wcs"
    id="urn:ogc:def:objectType:OGC-CSW-
ebRIM::document:capabilities:wcs">
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
            <rim:ValueList>
                <rim:Value>Web Coverage Service Capabilities
Document</rim:Value>
            </rim:ValueList>
        </rim:Slot>
        <rim:Name>
            <rim:LocalizedString charset="UTF-8" value="wcs"/>
        </rim:Name>
        <rim:Description>
            <rim:LocalizedString charset="UTF-8"
            value="The capabilities document of a Web Coverage Service"/>
        </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="wps"
    id="urn:ogc:def:objectType:OGC-CSW-
ebRIM::document:capabilities:wps">
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">

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        <rim:ValueList>
          <rim:Value>Web Processing Service Capabilities
Document</rim:Value>
        </rim:ValueList>
      </rim:Slot>
    <rim:Name>
      <rim:LocalizedString charset="UTF-8" value="wps"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
value="The capabilities document of a Web Processing
Service"/>
    </rim:Description>
  </rim:ClassificationNode>
  <rim:ClassificationNode code="csw"
id="urn:ogc:def:objectType:OGC-CSW-
ebRIM::document:capabilities:csw">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
      <rim:ValueList>
        <rim:Value>Catalogue Service Web Capabilities
Document</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Name>
      <rim:LocalizedString charset="UTF-8" value="csw"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
value="The capabilities document of a Catalogue Service
Web"/>
    </rim:Description>
  </rim:ClassificationNode>
  <rim:ClassificationNode code="csw-ebRIM"
id="urn:ogc:def:objectType:OGC-CSW-
ebRIM::document:capabilities:csw-ebRIM">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
      <rim:ValueList>
        <rim:Value>Web Registry Service Capabilities
Document</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Name>
      <rim:LocalizedString charset="UTF-8" value="csw-ebRIM"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
value="The capabilities document of a Web Registry Service"/>
    </rim:Description>
  </rim:ClassificationNode>
  <rim:ClassificationNode code="gss"
id="urn:ogc:def:objectType:OGC-CSW-
ebRIM::document:capabilities:gss">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
      <rim:ValueList>
        <rim:Value>Web GeoCollaboration Service (formerly
GeoSynchronization Service) Capabilities Document</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Name>

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        <rim:LocalizedString charset="UTF-8" value="gss"/>
    </rim:Name>
    <rim:Description>
        <rim:LocalizedString charset="UTF-8"
            value="The capabilities document of a Web GeoCollaboration
Service (formerly GeoSynchronization Service)."/>
    </rim:Description>
</rim:ClassificationNode>
<!-- Service capabilities documents referenced by base URL. -->
<rim:ClassificationNode code="wisBaseUrl"
    id="urn:ogc:def:objectType:OGC-CSW-ebRIM::baseUrl:wis">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
            <rim:Value>Web Integration Service Capabilities Document
(accessed via the server's base URL)</rim:Value>
        </rim:ValueList>
    </rim:Slot>
    <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="wisBaseUrl"/>
    </rim:Name>
    <rim:Description>
        <rim:LocalizedString charset="UTF-8"
            value="A capabilities document for a Web Integration Service
obtained using a URL created by appending GetCapabilities request parameters to
the server's base URL."/>
    </rim:Description>
</rim:ClassificationNode>
<rim:ClassificationNode code="wfsBaseUrl"
    id="urn:ogc:def:objectType:OGC-CSW-ebRIM::baseUrl:wfs">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
            <rim:Value>Web Feature Service Capabilities Document
(accessed via the server's base URL)</rim:Value>
        </rim:ValueList>
    </rim:Slot>
    <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="wfsBaseUrl"/>
    </rim:Name>
    <rim:Description>
        <rim:LocalizedString charset="UTF-8"
            value="A capabilities document for a Web Feature Service
obtained using a URL created by appending GetCapabilities request parameters to
the server's base URL."/>
    </rim:Description>
</rim:ClassificationNode>
<rim:ClassificationNode code="wmsBaseUrl"
    id="urn:ogc:def:objectType:OGC-CSW-ebRIM::baseUrl:wms">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
            <rim:Value>Web Map Service Capabilities Document (accessed
via the server's base URL)</rim:Value>
        </rim:ValueList>
    </rim:Slot>
    <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="wmsBaseUrl"/>
    </rim:Name>
    <rim:Description>
        <rim:LocalizedString charset="UTF-8"

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        value="A capabilities document for a Web Map Service obtained
using a URL created by appending GetCapabilities request parameters to the
server's base URL."/>
      </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="wmtsBaseUrl"
      id="urn:ogc:def:objectType:OGC-CSW-ebRIM::baseUrl:wmts">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>Web Map Tiling Service Capabilities Document
(accessed via the server's base URL)</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="wmtsBaseUrl"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
          value="A capabilities document for a Web Map Tiling Service
obtained using a URL created by appending GetCapabilities request parameters to
the server's base URL."/>
      </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="wcsBaseUrl"
      id="urn:ogc:def:objectType:OGC-CSW-ebRIM::baseUrl:wcs">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>Web Coverage Service Capabilities Document
(accessed via the server's base URL)</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="wcsBaseUrl"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
          value="A capabilities document for a Web Coverage Service
obtained using a URL created by appending GetCapabilities request parameters to
the server's base URL."/>
      </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="wpsBaseUrl"
      id="urn:ogc:def:objectType:OGC-CSW-ebRIM::baseUrl:wps">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>Web Processing Service Capabilities Document
(accessed via the server's base URL)</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="wpsBaseUrl"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
          value="A capabilities document for a Web Processing Service
obtained using a URL created by appending GetCapabilities request parameters to
the server's base URL."/>
      </rim:Description>
    </rim:ClassificationNode>

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    <rim:ClassificationNode code="cswBaseUrl"
      id="urn:ogc:def:objectType:OGC-CSW-ebRIM::baseUrl:csw">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>Catalogue Service Web Capabilities Document
(accessed via the server's base URL)</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="cswBaseUrl"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
          value="A capabilities document for a Catalogue Service Web
obtained using a URL created by appending GetCapabilities request parameters to
the server's base URL."/>
      </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="csw-ebRIMBaseUrl"
      id="urn:ogc:def:objectType:OGC-CSW-ebRIM::baseUrl:csw-ebRIM">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>Web Registry Service Capabilities Document
(accessed via the server's base URL)</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="csw-ebRIMBaseUrl"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
          value="A capabilities document for a Web Registry Service
obtained using a URL created by appending GetCapabilities request parameters to
the server's base URL."/>
      </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="gssBaseUrl"
      id="urn:ogc:def:objectType:OGC-CSW-ebRIM::baseUrl:gss">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>Web GeoCollaboration Service Capabilities Document
(accessed via the server's base URL)</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="gssBaseUrl"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
          value="A capabilities document for a Web GeoCollaboration
Service (formerly GeoSynchronization Service) obtained using a URL created by
appending GetCapabilities request parameters to the server's base URL."/>
      </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="fgdc"
      id="urn:ogc:def:objectType:OGC-CSW-ebRIM::document:fgdc">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">

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        <rim:ValueList>
          <rim:Value>Federal Geographic Data Committee's Content
Standard for Digital Geospatial Metadata</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="fgdc"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
          value="The Content Standard for Digital Geospatial Metadata
(CSDGM), Vers. 2 (FGDC-STD-001-1998) is the current US Federal Metadata
standard. The FGDC originally adopted the CSDGM in 1994 and revised it in 1998.
According to Executive Order 12096, all Federal agencies are ordered to use
this standard to document geospatial data created as of January 1995. The
standard is often referred to as the 'FGDC Metadata Standard' and has been
implemented beyond the federal level with State and local governments adopting
the metadata standard as well."/>
      </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="anzlic"
      id="urn:ogc:def:objectType:OGC-CSW-ebRIM::document:anzlic">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>ANZLIC Metadata Profile</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="anzlic"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
          value="This document provides a formal description of the
ANZLIC Metadata Profile which is based on AS/NZS ISO 19115:2005, Geographic
information -- Metadata. Changes introduced by ISO 19115:2003/Cor.1:2006,
Geographic information -- Metadata -- Technical Corrigendum 1 have also been
considered. Implementation of the Profile is based on ISO/TS 19139:2007,
Geographic information -- Metadata -- XML schema implementation."/>
      </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="iso19115"
      id="urn:ogc:def:objectType:OGC-CSW-ebRIM::document:iso19115">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>Geographic information -- Metadata -- XML schema
implementation</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="iso19115"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
          value="ISO/TS 19139:2007 defines Geographic MetaData XML
(gmd) encoding, an XML Schema implementation derived from ISO 19115."/>
      </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="iso19119"
      id="urn:ogc:def:objectType:OGC-CSW-ebRIM::document:iso19119">

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    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
      <rim:ValueList>
        <rim:Value>Geographic information â€” Services</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Name>
      <rim:LocalizedString charset="UTF-8" value="iso19119"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
value="This International Standard provides a framework for
platform neutral and platform specific specification of services that can
enable users to access, process and manage geographic data from a variety of
sources, potentially for various distributed computing platforms."/>
    </rim:Description>
  </rim:ClassificationNode>
  <rim:ClassificationNode code="iso19139"
id="urn:ogc:def:objectType:OGC-CSW-ebRIM::document:iso19139">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
      <rim:ValueList>
        <rim:Value>Geographic information -- Metadata -- XML schema
implementation</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Name>
      <rim:LocalizedString charset="UTF-8" value="iso19139"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
value="ISO/TS 19139:2007 defines Geographic MetaData XML
(gmd) encoding, an XML Schema implementation derived from ISO 19115."/>
    </rim:Description>
  </rim:ClassificationNode>
  <rim:ClassificationNode code="ebRIM-ClassificationScheme"
id="urn:ogc:def:objectType:OGC-CSW-
ebRIM::document:classificationScheme">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
      <rim:ValueList>
        <rim:Value>OASIS ebRIM Classification Scheme XML
Document</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Name>
      <rim:LocalizedString charset="UTF-8"
value="ebRIM-ClassificationScheme"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
value="ClassificationScheme XML documents instances describe
a structured way to classify or categorize registry objects. The structure of
the classification scheme may be defined internal or external to the registry,
resulting in a distinction between internal and external classification
schemes. A very common example of a classification scheme in science is the
&quot;Classification of living things&quot; where living things are categorized
in a tree like structure. Another example is the Dewey Decimal system used in
libraries to categorize books and other publications."/>
    </rim:Description>
  </rim:ClassificationNode>

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    <rim:ClassificationNode code="symbologyEncoding"
      id="urn:ogc:def:objectType:OGC-CSW-
ebRIM::document:symbologyEncoding">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>OGC Symbology Encoding Document</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="symbologyEncoding"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
          value="*** Place holder ***"/>
      </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="xmlSchema"
      id="urn:ogc:def:objectType:OGC-CSW-ebRIM::document:xmlSchema">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>W3C XML Schema Document</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="xmlSchema"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
          value="The XML Schema Definition Language, which offers
facilities for describing the structure and constraining the contents of XML
documents, including those which exploit the XML Namespace facility. The schema
language, which is itself represented in an XML vocabulary and uses namespaces,
substantially reconstructs and considerably extends the capabilities found in
XML document type definitions (DTDs)."/>
      </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="unknown"
      id="urn:ogc:def:objectType:OGC-CSW-ebRIM::document:unknown">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>Unknown (or other) Resource Type</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="unknown"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
          value="In general, a CSW-ebRIM catalogue can harvest any
resource that is described by a MIME type. Any harvested resource that is not
one of the well-known resource types described in the CSW specification or
listed in the CSW's capabilities document is considered to be of type
"unknown"."/>
      </rim:Description>
    </rim:ClassificationNode>
  </rim:ClassificationScheme>
</csw:Insert>
<!-- ===== -->
<!-- OGC Slot Names -->

```

```

<!-- ===== -->
<csw:Insert>
  <rim:ClassificationScheme
    id="urn:ogc:names:tc:ebxml-regrep:classificationScheme:SlotName"
    isInternal="true"
    nodeType="urn:oasis:names:tc:ebxml-regrep:NodeType:UniqueCode">
    <rim:Name>
      <rim:LocalizedString charset="UTF-8" value="SlotName"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
        value="This is the canonical ClassificationScheme for slot names
used by the OGC CSW-ebRIM catalogue."/>
    </rim:Description>
    <rim:ClassificationNode code="accessConstraints"
      id="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:accessConstraints">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>Access Constraints</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="accessConstraints"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
          value="The name of a slot used to describe any constraints
(e.g. temporal, volumetric) associated with accessing or using an object
represented as a catalogue entry."/>
      </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="baseTableName"
      id="urn:ogc:def:objectType:OGC-CSW-ebRIM::slotName:baseTableName">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>Base Table Name</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="baseTableName"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
          value="The name of a slot used to store the name of a
database table used to store an object represented as an entry in the
catalogue. For example, the spatial table name used to store data for a WMS
layer or WFS feature type."/>
      </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="baseUrl"
      id="urn:ogc:def:objectType:OGC-CSW-ebRIM::slotName:baseUrl">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>Base URL</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>

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        <rim:LocalizedString charset="UTF-8" value="baseUrl"/>
    </rim:Name>
    <rim:Description>
        <rim:LocalizedString charset="UTF-8"
            value="A slot used to store the base GetCapabilities URL of
an object represented as an entry in the catalogue. The base GetCapabilities
URL is the URL to which GetCapabilities parameters are appended to form a
GetCapabilities request."/>
    </rim:Description>
</rim:ClassificationNode>
    <rim:ClassificationNode code="crs" id="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:crs">
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
            <rim:ValueList>
                <rim:Value>Coordinate Reference System</rim:Value>
            </rim:ValueList>
        </rim:Slot>
        <rim:Name>
            <rim:LocalizedString charset="UTF-8" value="crs"/>
        </rim:Name>
        <rim:Description>
            <rim:LocalizedString charset="UTF-8"
                value="The name of a slot used to store the name or code of a
coordinate reference system associated with a catalogue entry."/>
        </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="fees" id="urn:ogc:def:objectType:OGC-
CSW-ebRIM::slotName:fees">
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
            <rim:ValueList>
                <rim:Value>Fees</rim:Value>
            </rim:ValueList>
        </rim:Slot>
        <rim:Name>
            <rim:LocalizedString charset="UTF-8" value="fees"/>
        </rim:Name>
        <rim:Description>
            <rim:LocalizedString charset="UTF-8"
                value="The name of a slot used to describe any fees
associated with accessing or using an object represented as a catalogue
entry."/>
        </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="hasRepositoryItem"
id="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:hasRepositoryItem">
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
            <rim:ValueList>
                <rim:Value>Has Repository Item</rim:Value>
            </rim:ValueList>
        </rim:Slot>
        <rim:Name>
            <rim:LocalizedString charset="UTF-8" value="hasRepositoryItem"/>
        </rim:Name>
        <rim:Description>
            <rim:LocalizedString charset="UTF-8"
                value="The name of a slot used to store a boolean that
indicates whether a catalogue entry has an associated item in the catalogue's
repository."/>

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        </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="keyword"
        id="urn:ogc:def:objectType:OGC-CSW-ebRIM::slotName:keyword">
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
            <rim:ValueList>
                <rim:Value>Keyword</rim:Value>
            </rim:ValueList>
        </rim:Slot>
        <rim:Name>
            <rim:LocalizedString charset="UTF-8" value="keyword"/>
        </rim:Name>
        <rim:Description>
            <rim:LocalizedString charset="UTF-8"
value="The name of a slot used to store a list of keywords
associated with a catalogue entry."/>
        </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="layerLimit"
        id="urn:ogc:def:objectType:OGC-CSW-ebRIM::slotName:layerLimit">
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
            <rim:ValueList>
                <rim:Value>Layer Limit</rim:Value>
            </rim:ValueList>
        </rim:Slot>
        <rim:Name>
            <rim:LocalizedString charset="UTF-8" value="layerLimit"/>
        </rim:Name>
        <rim:Description>
            <rim:LocalizedString charset="UTF-8"
value="The name of a slot used to store an integer that
represents the maximum number of layers that a client can specify in a WMS
request."/>
        </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="legendUrl"
        id="urn:ogc:def:objectType:OGC-CSW-ebRIM::slotName:legendUrl">
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
            <rim:ValueList>
                <rim:Value>Legend Graphic URL</rim:Value>
            </rim:ValueList>
        </rim:Slot>
        <rim:Name>
            <rim:LocalizedString charset="UTF-8" value="legendUrl"/>
        </rim:Name>
        <rim:Description>
            <rim:LocalizedString charset="UTF-8"
value="The name of a slot used to store the URL of legend
graphic associated with an entry in the catalogue that represents a WMS
layer."/>
        </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="maxHeight"
        id="urn:ogc:def:objectType:OGC-CSW-ebRIM::slotName:maxHeight">
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
            <rim:ValueList>
                <rim:Value>Maximum Map Height</rim:Value>

```

```

        </rim:ValueList>
    </rim:Slot>
    <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="maxHeight"/>
    </rim:Name>
    <rim:Description>
        <rim:LocalizedString charset="UTF-8"
            value="The name of a slot used to store, in pixels, the
maximum map height that a WMS service generates."/>
    </rim:Description>
</rim:ClassificationNode>
<rim:ClassificationNode code="maxWidth"
    id="urn:ogc:def:objectType:OGC-CSW-ebRIM::slotName:maxWidth">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
            <rim:Value>Maximum Map Width</rim:Value>
        </rim:ValueList>
    </rim:Slot>
    <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="maxWidth"/>
    </rim:Name>
    <rim:Description>
        <rim:LocalizedString charset="UTF-8"
            value="The name of a slot used to store, in pixels, the
maximum map width that a WMS service generates."/>
    </rim:Description>
</rim:ClassificationNode>
<rim:ClassificationNode code="onlineResource"
    id="urn:ogc:def:objectType:OGC-CSW-ebRIM::slotName:onlineResource">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
            <rim:Value>Online Resource</rim:Value>
        </rim:ValueList>
    </rim:Slot>
    <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="onlineResource"/>
    </rim:Name>
    <rim:Description>
        <rim:LocalizedString charset="UTF-8"
            value="The name of a slot used to store the URL that points
to additional information about the object represented by a catalogue entry."/>
    </rim:Description>
</rim:ClassificationNode>
<rim:ClassificationNode code="outputFormat"
    id="urn:ogc:def:objectType:OGC-CSW-ebRIM::slotName:outputFormat">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
            <rim:Value>Output Format</rim:Value>
        </rim:ValueList>
    </rim:Slot>
    <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="outputFormat"/>
    </rim:Name>
    <rim:Description>
        <rim:LocalizedString charset="UTF-8"
            value="The name of a slot used to store a list of formats
that may be used to represent the object represented by a catalogue entry."/>
    </rim:Description>
</rim:ClassificationNode>

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    <rim:ClassificationNode code="queryable"
      id="urn:ogc:def:objectType:OGC-CSW-ebRIM::slotName:queryable">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>Queryable</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="queryable"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
          value="The name of a slot used to store a boolean value
indicating whether the object represented by a catalogue entry is queryable or
not (usually used to indicate whether a WMS layer is queryable or not)."/>
        </rim:LocalizedString>
      </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="resourceType"
      id="urn:ogc:def:objectType:OGC-CSW-ebRIM::slotName:resourceType">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>Resource Type</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="resourceType"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
          value="The name of a slot used to store the name or code of a
standardized metadata type for the object represented by a catalogue entry."/>
        </rim:LocalizedString>
      </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="reverseAssociationTitle"
      id="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:reverseAssociationTitle">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>Reverse Association Title</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Name>
        <rim:LocalizedString charset="UTF-8"
          value="reverseAssociationTitle"/>
      </rim:Name>
      <rim:Description>
        <rim:LocalizedString charset="UTF-8"
          value="The name of a slot used to store the reverse title for
an association. For example, the reverse title of 'Serves' would be 'Served
By'."/>
        </rim:LocalizedString>
      </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="scheme"
      id="urn:ogc:def:objectType:OGC-CSW-ebRIM::slotName:scheme">
      <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
          <rim:Value>Scheme</rim:Value>

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        </rim:ValueList>
    </rim:Slot>
    <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="scheme"/>
    </rim:Name>
    <rim:Description>
        <rim:LocalizedString charset="UTF-8"
            value="The name of a slot used to store the name of a scheme
associated with a catalogue entry."/>
    </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="spatialPropertyName"
        id="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:spatialPropertyName">
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
            <rim:ValueList>
                <rim:Value>Spatial Property Name</rim:Value>
            </rim:ValueList>
        </rim:Slot>
        <rim:Name>
            <rim:LocalizedString charset="UTF-8"
value="spatialPropertyName"/>
        </rim:Name>
        <rim:Description>
            <rim:LocalizedString charset="UTF-8"
                value="The name of a slot used to store the name of the
spatial property of a catalogue entry (usually representing a feature type)."/>
        </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="supportedOperations"
        id="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:supportedOperations">
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
            <rim:ValueList>
                <rim:Value>Supported Operations</rim:Value>
            </rim:ValueList>
        </rim:Slot>
        <rim:Name>
            <rim:LocalizedString charset="UTF-8"
value="supportedOperations"/>
        </rim:Name>
        <rim:Description>
            <rim:LocalizedString charset="UTF-8"
                value="The name of a slot used to store a list of operations
supported by a catalogue entry (usually representing a service)."/>
        </rim:Description>
    </rim:ClassificationNode>
    <rim:ClassificationNode code="title"
        id="urn:ogc:def:objectType:OGC-CSW-ebRIM::slotName:title">
        <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
            <rim:ValueList>
                <rim:Value>Title</rim:Value>
            </rim:ValueList>
        </rim:Slot>
        <rim:Name>
            <rim:LocalizedString charset="UTF-8" value="title"/>
        </rim:Name>
        <rim:Description>
            <rim:LocalizedString charset="UTF-8"

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        value="The name of a slot used to store a human-readable
title associated with a catalogue entry."/>
    </rim:Description>
</rim:ClassificationNode>
<rim:ClassificationNode code="where"
id="urn:ogc:def:objectType:OGC-CSW-ebRIM::slotName:where">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
            <rim:Value>Where</rim:Value>
        </rim:ValueList>
    </rim:Slot>
    <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="where"/>
    </rim:Name>
    <rim:Description>
        <rim:LocalizedString charset="UTF-8"
value="The name of a slot used to store a location or
geometry associated with a catalogue entry"/>
    </rim:Description>
</rim:ClassificationNode>
<rim:ClassificationNode code="position"
id="urn:ogc:def:objectType:OGC-CSW-ebRIM::slotName:position">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
            <rim:Value>PositionName</rim:Value>
        </rim:ValueList>
    </rim:Slot>
    <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="position"/>
    </rim:Name>
    <rim:Description>
        <rim:LocalizedString charset="UTF-8"
value="The name of a slot used to store the role or position
of a responsible person."/>
    </rim:Description>
</rim:ClassificationNode>
<rim:ClassificationNode code="role" id="urn:ogc:def:objectType:OGC-
CSW-ebRIM::slotName:role">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>
            <rim:Value>Role</rim:Value>
        </rim:ValueList>
    </rim:Slot>
    <rim:Name>
        <rim:LocalizedString charset="UTF-8" value="role"/>
    </rim:Name>
    <rim:Description>
        <rim:LocalizedString charset="UTF-8"
value="The name of a slot used to store the function
performed by the responsible party. Possible values of this Role shall include
the values and the meanings listed in Subclause B.5.5 of ISO 19115:2003."/>
    </rim:Description>
</rim:ClassificationNode>
<rim:ClassificationNode code="url" id="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:url">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
        <rim:ValueList>

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        <rim:Value>URL</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Name>
      <rim:LocalizedString charset="UTF-8" value="url"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
        value="The name of a slot used to store a url associated with
the a catalogue entry."/>
    </rim:Description>
  </rim:ClassificationNode>
  <rim:ClassificationNode code="hoursOfService"
    id="urn:ogc:def:objectType:OGC-CSW-ebRIM::slotName:hoursOfService">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
      <rim:ValueList>
        <rim:Value>Hours of Service</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Name>
      <rim:LocalizedString charset="UTF-8" value="hoursOfService"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
        value="The name of a slot used to store the hours of service
associated with the a catalogue entry."/>
    </rim:Description>
  </rim:ClassificationNode>
  <rim:ClassificationNode code="contactInstructions"
    id="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:contactInstructions">
    <rim:Slot name="urn:ogc:def:objectType:OGC-CSW-
ebRIM::slotName:title">
      <rim:ValueList>
        <rim:Value>Contact Instructions</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Name>
      <rim:LocalizedString charset="UTF-8"
value="contactInstructions"/>
    </rim:Name>
    <rim:Description>
      <rim:LocalizedString charset="UTF-8"
        value="The name of a slot used to store any special contact
instructions associated with the a catalogue entry."/>
    </rim:Description>
  </rim:ClassificationNode>
</rim:ClassificationScheme>
</csw:Insert>
</csw:Transaction>

```