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## Cataloguing Earth Observation Products for ebXML Registry Information Model 3.0 based Catalogues

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## i. Preface

This document defines an ebRIM structure to represent Earth Observation Product metadata. This document also defines the mapping of Earth Observation Product metadata – defined in the Earth Observation Metadata profile of Observations & Measurements [OGC 10-157r2] (version 1.0) – to this model.

It defines the way Earth Observation product metadata resources are organized and implemented in the Catalogue for discovery, retrieval and management.

## ii. Document terms and definitions

This document uses the specification terms defined in Subclause 5.3 of [OGC 06-121], which is based on the ISO/IEC Directives, Part 2. Rules for the structure and drafting of International Standards. In particular, the word “shall” (not “must”) is the verb form used to indicate a requirement to be strictly followed to conform to this specification.

## iii. Submitting organizations

The following organizations submitted the original document to the OGC<sup>®</sup> Earth Observation Extension Package ebRIM profile of CSW SWG.

- ERDAS**
- Spacebel s.a.**
- European Space Agency**

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## v. Revision history

Please see the Annex I: for a complete Document Change History.

Date	Release	Editor	Sections modified	Description
28 Sept 2010	0.1	F. Skivee		Deep refactoring to adapt to Earth Observation Metadata profile for Observations and Measurements [OGC 10-157r1].
14 March 2011	1.0	F. Skivee, F. Houbie		Integrate ESA clarifications.

## vi. Changes to the OGC Abstract Specification

The OGC<sup>®</sup> Abstract Specification does not require changes to accommodate the technical contents of this document.

## vii. Foreword

This document has been created under the impulsion of the European Space Agency in the scope of the Heterogeneous Missions Accessibility projects. This document is built in conformance with the [OGC 10-157r1] Earth Observation Metadata profile of Observations and Measurements document proposed by the European Space Agency, the French Space Agency, ERDAS, STFC and GIM.

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## Introduction

This OGC Best Practice is part of a set that describes services for managing Earth Observation (EO) data products. The services include collection level and product level catalogues, online-ordering for existing and future products, online access, etc.

The services described in this document are intended to support the identification of (EO) data products from previously identified data collections. In other words, the search and presenting of metadata from catalogues of EO data products through standard compliant operations. The intent of this profile is to describe a cost-effective interface that can be supported by many data providers (satellite operators, data distributors, etc.), most of whom have existing (and relatively complex) facilities for the management of these data.

EO data product collections are usually structured to describe data products derived from a single sensor onboard a satellite or series of satellites. Products from different classes of sensors usually require specific product metadata. The following classes of products have been identified so far: radar, optical, atmospheric, radar altimetry, limb-looking, synthesis and systematic. The proposed approach is to identify a common set of elements grouped in a common (EOP) schema and extend this common schema to add sensor class-specific metadata.

## 1 Scope

This OGC<sup>®</sup> document specifies the Earth Observation Products Extension Package for ebXML Registry Information Model 3.0, based on the [OGC 10-157r1] Earth Observation Metadata profile of Observations and Measurements.

It enables CSW-ebRIM catalogues to handle a variety of metadata pertaining to earth observation products as defined in [OGC 10-157r1].

This proposed application profile document describes model and encodings required to discover, search and present metadata from catalogues of Earth Observation products. The profile presents a minimum specification for catalogue interoperability within the EO domain, with extensions for specific classes of metadata.

## 2 Compliance

### 2.1 Requirements classes of the base specifications

An implementation candidate to conformance to this specification shall conform to one of the two levels of conformance to the ebRIM profile of CS-W defined in OGC 07-110r4. As stated in clause 2 of OGC 07-110r4, this conformance statement concerns:

- The requirements stipulated for the corresponding conformance level of OGC 07-110r4;

- The applicable requirements in all normative base specifications.

## 2.2 Requirements classes of the EO EP

This specification defines seven classes of requirements.

### 2.2.1 Requirements class A.1: The core (EOP support)

This requirements class defines requirements covering support of the extrinsic objects, slots, associations and classifications supported by all Earth Observation products, i.e. those that are mapped to XML elements in the EOP namespace.

#### **Requirement A.1.1 /req/core/extension-package-availability**

The canonical extension package must be available through a GetRecordById with the @id="urn:ogc:def:registryPackage:OGC-CSW-ebRIM-EO:2.0:EOPProducts"

#### **Requirement A1.2 /req/core/collection-identifier-exposed**

The EO Product parent identifiers (i.e. collection names) are advertised in the Capabilities document

#### **Requirement A1.3 /req/core/eop-product-instantiation**

The EOProduct ExtrinsicObject contains the correct set of 'EOP' attributes.

#### **Requirement A1.4 /req/core/eop-product-mapping**

The Earth Observation parameters of an O&M document (in EOP namespace) describing an EO Product are correctly mapped to the EOProduct ExtrinsicObject and slots representing the EO Product.

#### **Requirement A1.5 /req/core/eop-product-classification**

The EOProduct ExtrinsicObject is classified in the EO\_Product\_Types taxonomy

#### **Requirement A1.6 /req/core/eo-product-classification-mapping**

The EOProduct ExtrinsicObject corresponding to an EarthObservation element in the O&M EO instance is correctly classified in the EO\_Product\_Types taxonomy.

#### **Requirement A1.7 /req/core/acquired-by-association**

The AcquiredBy association is correctly instantiated.

**Requirement A1.8 /req/core/ eo-product-acquisition-instantiation**

The EOProduct ExtrinsicObject is classified in the EO\_Product\_Types taxonomy

**Requirement A1.9 /req/core/eop-product-acquisition-mapping**

The acquisition platforms properties of a GML document (in EOP namespace) describing an EO Product are correctly mapped to the AcquiredBy association, the EOProductAcquisitionPlatform ExtrinsicObject and its slots.

**Requirement A1.10/req/core/registry-package-grouping**

All the RegistryObjects related to an EOProduct (i.e. all its metadata) are grouped into a RegistryPackage with the property Name set to 'EOProduct'.

**Requirement A1.11/req/core/repository-item**

A GetRepositoryItem<sup>1</sup> request with an id corresponding to an EOProduct returns the O&M document.

**2.2.2 Requirement class A.2: SAR Extension**

This requirement class extends the Core requirement class by defining requirements covering support for the slots relevant for the Synthetic Aperture Radar (SAR) Earth Observation products, i.e. those that are mapped to XML elements in the SAR namespace.

**Requirement A.2.1 /req/sar/eo-product-instantiation**

SAR-specific slots in the EOProduct ExtrinsicObject are correctly instantiated.

**Requirement A2.2 /req/sar/eo-product-mapping**

The SAR properties of a O&M document (in SAR namespace) describing an EO Product are correctly mapped to the relevant slots in the EOProduct ExtrinsicObject

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<sup>1</sup> The GetRepositoryItem operation should become GetRepositoryItemById in the next version of the CSW eBRIM Application profile to be aligned with the GetRecordById syntax.

<sup>2</sup> Due to historical reasons we will mainly use the term 'dataset collection' in this document, although the term 'dataset series' is used in the ISO/TC211 Terminology Maintenance Group.

<sup>3</sup> In practice, metadata describing EOProducts may be encoded in many different formats (DIMAP, HDF, GeoTIFF, netCDF, etc.) This extension package models the full set of metadata of the referred O&M schema, so

### 2.2.3 Requirements class A.3: OPT Extension

This requirements class extends the Core requirements class by defining requirements covering support for the slots relevant for Optical (OPT) Earth Observation products, i.e. those that are mapped to XML elements in the OPT namespace.

#### **Requirement A.3.1 /req/opt/eo-product-instantiation**

OPT-specific slots in the EOProduct ExtrinsicObject are correctly instantiated.

#### **Requirement A3.2 /req/opt/eo-product-mapping**

The OPT properties of a O&M document (in OPT namespace) describing an EO Product are correctly mapped to the relevant slots in the EOProduct ExtrinsicObject

### 2.2.4 Requirements class A.4: ATM Extension

This requirements class extends the Core requirement class by defining requirements covering support for the slots relevant for the Atmospheric (ATM) Earth Observation products, i.e. those that are mapped to XML elements in the ATM namespace of [OGC 10-157r1] Earth Observation Metadata profile of Observations and Measurements.

#### **Requirement A.4.1 /req/atm/eo-product-instantiation**

ATM-specific slots in the EOProduct ExtrinsicObject are correctly instantiated.

#### **Requirement A4.2 /req/atm/eo-product-mapping**

The ATM properties of a O&M document (in ATM namespace) describing an EO Product are correctly mapped to the relevant slots in the EOProduct ExtrinsicObject

### 2.2.5 Requirements class A.5: ALT Extension

This requirements class extends the Core requirements class by defining requirements covering support for the slots relevant for the Altimetry (ALT) Earth Observation products, i.e. those that are mapped to XML elements in the ALT namespace of [OGC 10-157r1] Earth Observation Metadata profile of Observations and Measurements.

There are no specific requirements for the Altimetry Extension



### 2.2.6 Requirements class A.6: LMB Extension

This requirements class extends the Core requirements class by defining requirements covering support for the slots relevant for the Limb Looking (LMB) Earth Observation products, i.e. those that are mapped to XML elements in the LMB namespace of [OGC 10-157r1] Earth Observation Metadata profile of Observations and Measurements.

**There are no specific requirements for the Limb Looking Extension**

### 2.2.7 Requirements class A.7: SSP Extension

This requirements class extends the Core requirements class by defining requirements covering support for the slots relevant for the Synthetic and Systematic (SSP) Earth Observation products, i.e. those that are mapped to XML elements in the SSP namespace of [OGC 10-157r1] Earth Observation Metadata profile of Observations and Measurements.

#### **Requirement A.7.1 /req/ssp/eo-product-instantiation**

SSP-specific slots in the EOProduct ExtrinsicObject are correctly instantiated.

#### **Requirement A7.2 /req/ssp/eo-product-mapping**

The SSP properties of a O&M document (in SSP namespace) describing an EO Product are correctly mapped to the relevant slots in the EOProduct ExtrinsicObject

## 2.3 Conformance requirements

An implementation candidate to conformance shall pass all applicable tests specified in the Abstract Test Suite of the ebRIM profile of CS-W documented in OGC 08-103. In complement to this, it shall pass the conformance tests specified in the EO EP Abstract Test Suite (See Annex A) applicable to both the targeted EO EP conformance class and to the conformance level to the ebRIM profile of CS-W, as described in the table below.

EO EP Requirement classes	Conformance levels of the ebRIM profile of CS-W
	Level 1
A.1 – The Core (EOP support)	A.1.1, A.1.2, A.1.3, A.1.4, A.1.5, A.1.6, A.1.7, A.1.8, A.1.9, A.1.10, A.1.11
A.2 – SAR Extension	A.2.1, A.2.2

A.3 – OPT Extension	A.3.1, A.3.2
A.4 – ATM Extension	A.4.1, A.4.2
A.5 – ALT Extension	
A.6 – LMB Extension	
A.7 – SSP Extension	A.7.1, A.7.2

### 3 Normative references

Parts of the following normative documents are referenced in this text. 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.

[ebRIM] *OASIS ebXML Registry Information Model Version 3.0*

[ISO 19115:2003] *Geographic information : Metadata*

[OGC 04-095] *OGC™ Filter Encoding Implementation Specification, version 1.1.0, 2005/05/03*

[OGC06-103r4] *OGC Simple Feature Access - Common Architecture*

[OGC 06-121r3] *OGC™ Web Services Common Specification version 1.1.0 with Corrigendum 1, version 1.1.0, 2007/02/09*

[OGC 07-006r1] *OGC™ Catalogue Services Specification, version 2.0.2, 2007/02/23*

[OGC 07-110r4] *OGC™ CSW-ebRIM Registry Service - Part 1: ebRIM profile of CSW, version 1.0.1, 2009/02/05.*

[OGC 07-144r4] *OGC™ CSW-ebRIM Registry Service – Part 2 : Basic extension package, version 1.0.1, 2009/02/05*

[OGC 08-103r2] *OGC™ CSW-ebRIM Registry Service – Part 3: Abstract Test Suite (1.0.1), version 1.0.1, 2009/02/05*

[OGC 10-157r1] *Earth Observation Metadata profile of Observations and Measurements, Version 1.0*

[OGC 10-004r1] *Observations and Measurements*, Version 2.0 (also published as ISO/DIS 19156:2010, Geographic information — Observations and Measurements)

[OGC 07-092] *OGC™ Definition identifier URNs in OGC namespace, version 1.3.0, 2006/01/15.*

In addition to this document, this specification includes several normative XML Schema Document files as specified in Annex B.

## 4 Terms and definitions

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

### **application profile**

see the term “profile” in this list.

### **client**

software component that can invoke an **operation** from a **server**

### **data level**

stratum within a set of layered levels in which data is recorded that conforms to definitions of types found at the application model level [ISO 19101]

### **dataset series (dataset collection<sup>2</sup>)**

collection of datasets sharing the same product specification [ISO 19113, ISO 19114, ISO 19115]. In the earth observation context, a collection typically corresponds to datasets (i.e. products) derived from data acquired by a single sensor onboard a satellite or series of satellites.

### **datastrip**

a satellite acquisition

### **geographic dataset**

dataset with a spatial aspect [ISO 19115]

### **geographic information**

information concerning phenomena implicitly or explicitly associated with a location relative to the Earth [ISO 19128 draft]

### **georesource**

geographic information of a specific type (e.g. geographic dataset, geographic application, geographic service)

---

<sup>2</sup> Due to historical reasons we will mainly use the term ‘dataset collection’ in this document, although the term ‘dataset series’ is used in the ISO/TC211 Terminology Maintenance Group.

**identifier**

linguistically independent sequence of characters capable of uniquely and permanently identifying that with which it is associated.

**interface**

named set of operations that characterize the behavior of an entity [ISO 19119]

**metadata entity**

set of metadata elements describing the same aspect of data

NOTE 1 May contain one or more metadata entities

NOTE 2 Equivalent to a class in UML terminology [ISO 19115]

**metadata schema**

conceptual schema describing metadata

NOTE ISO 19115 describes a standard for a metadata schema. [ISO 19101]

**metadata section**

subset of metadata that defines a collection of related metadata entities and elements [ISO 19115]

**operation**

specification of a transformation or query that an object may be called to execute [ISO 19119]

**parameter**

variable whose name and value are included in an operation **request** or **response** [ISO 19119]

**profile**

set of one or more base standards and – where applicable – the identification of chosen clauses, classes, subsets, options and parameters of those base standards that are necessary for accomplishing a particular function [ISO 19101, ISO 19106]

NOTE The terms “profile” and “application profile” are used interchangeably in this document

**qualified name**

name that is prefixed with its naming context

**request**

invocation of an **operation** by a **client**

**response**

result of an **operation**, returned from a **server** to a **client**

**schema**

formal description of a model [ISO 19101, ISO 19103, ISO 19109, ISO 19118]

**server****service instance**

a particular instance of a **service** [ISO 19128]

**service**

distinct part of the functionality that is provided by an entity through interfaces [ISO 19119]

**service interface**

shared boundary between an automated system or human being and another automated system or human being [ISO 19101]

**service metadata**

metadata describing the **operations** and **geographic information** available at a **server** [ISO 19128]

**state**

(of an object) persistent data object reflecting the internal values of all the member attributes or measurable descriptions of an object at a given time

NOTE State is usually associated to an object by its identity and to a time by a timestamp. [ISO 19132]

**transfer protocol**

common set of rules for defining interactions between distributed systems [ISO 19118]

**version**

version of an Implementation Specification (document) and XML Schemas to which the requested operation conforms

NOTE An OWS Implementation Specification version may specify XML Schemas against which an XML encoded operation request or response should be validated.

## 5 Conventions

### 5.1 Abbreviated terms

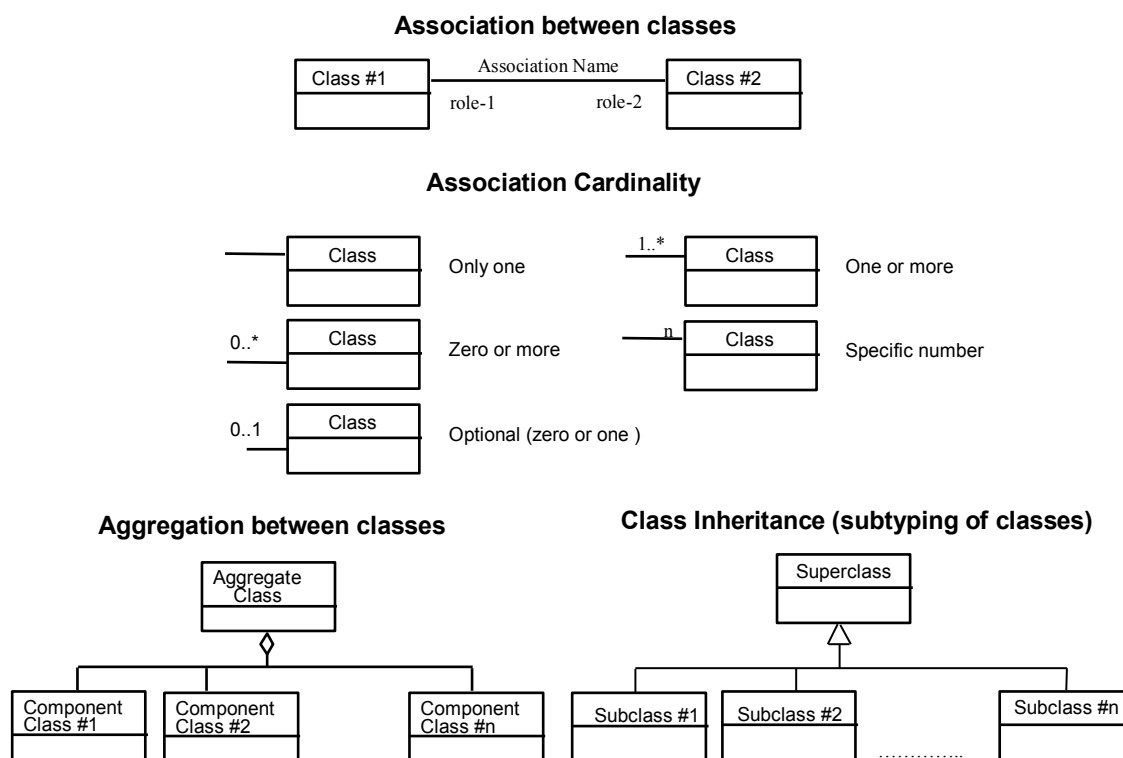
Some more frequently used abbreviated terms:

ALT	ALTimetry Product Type(Namespace)
ATM	Atmospheric Product Type (Namespace)
BPEL	Business Process Execution Language
COTS	Commercial Off The Shelf
CQL	Common Query Language
CRS	Coordinate Reference System
CSW	Catalogue Service for Web
DC	Dublin Core

DCMI	Dublin Core Metadata Initiative
DCP	Distributed Computing Platform
EBRIM	ebXML Registry Information Model
EO	Earth Observation
EOP	Basic Earth Observation Product Type (Namespace)
GML	Geography Markup Language
HMA	Heterogeneous Missions Accessibility
HTTP	HyperText Transfer Protocol
ISO	International Organization for Standardization
IUT	Implementation Under Test
LMB	LiMB Looking (Namespace)
OGC	Open Geospatial Consortium
OPT	Optical Type (Namespace)
PHR	Pleiades High Resolution Product Type (Namespace)
SAR	Synthetic Aperture Radar Product Type (Namespace)
RIM	Registry Information Model
SOAP	Simple Object Access Protocol
SQL	Structured Query Language
SSP	Synthesis and Systematic product Type(Namespace)
UML	Unified Modeling Language
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
URN	Uniform Resource Name
UTF-8	Unicode Transformation Format-8
WSDL	Web Service Definition Language
W3C	World Wide Web Consortium
XML	eXtensible Markup Language

## 5.2 UML notation

Some of the diagrams in this document are presented using the Unified Modeling Language (UML) static structure diagram. The UML notations used in this document are described in Figure 1, below.



**Figure 1: UML notations**

In these UML class diagrams, the class boxes with a light background are the primary classes being shown in this diagram, often the classes from one UML package. The class boxes with a gray background are other classes used by these primary classes, usually classes from other packages.

### 5.3 Used parts of other documents

This document uses significant parts of [OGC 10-157r1] Earth Observation Metadata profile of Observations and Measurements. To reduce the need to refer to that document, this document copies some of those parts.

### 5.4 Use of URN as identifiers

This document specifies a set of object types to be used in the ebRIM representation. The [ebRIM] *OASIS ebXML Registry Information Model Version 3.0* mandates the use of URN identifiers. For that reason, this standard does not follow the OGC Identifiers standard which promotes the usage of HTTP URI except for slot names where HTTP URI are used.

## 6 System context

This section focuses on the purpose, scope and policies of catalogue services that comply with the given profile. It documents special requirements and describes the context of use.

### 6.1 Application domain

The catalogue services proposed in this specification are intended to support the retrieval of EO products metadata possibly in two steps.

Step 1: identification of collections of interest through a catalogue of collections metadata.

Step 2: identification of EO products of interest within one or several collections through a catalogue of EO products metadata.

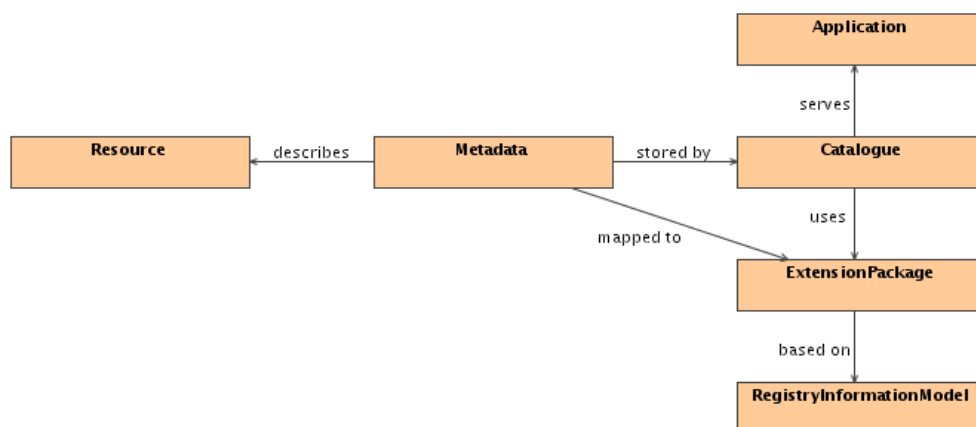
This specification covers step 2. For the retrieval of EO products metadata, the defined interface should allow to implement both generic clients not aware of sensor type specific metadata and more specialized clients aware of sensor type specific metadata.

### 6.2 Essential use cases

The use cases for this specification are the ebRIM profile of CSW use cases applied to Earth Observation. See [OGC 07-110r4].

## 7 Catalogue Infrastructure Overview

Catalogues are intended to store metadata describing resources published by providers and allow clients to find these resources. These resources metadata are organized in Catalogues according to specific data models, based on the registry information model.



**Figure 2: General Catalogue Infrastructure**

This schema clearly describes the following:



- *Resources* are described using *Metadata*,
- *Metadata* are stored in *Catalogues*, according to an *ExtensionPackage* defining accurately the mapping of such type of resources (*ExtensionPackage* is resource-specific),
- *ExtensionPackage* is based on a generic model, called the *RegistryInformationModel* (aka *RIM*). The *RegistryInformationModel* is common to all resources within a catalogue,
- *Applications* use *Catalogues* to discover resources through their metadata.

In the Earth Observation context:

- *Resources* are *Earth Observation Products* (aka *EOProducts*),
- *Metadata* (describing *EOProducts*) are typically encoded into O&M documents in conformance with [OGC 10-157r1]<sup>3</sup>,
- *Metadata* are stored in *Catalogues* according to the *EOProducts ExtensionPackage*,
- The *EOProducts ExtensionPackage* is based on the *ebRIM RegistryInformationModel*

Specifications define:

- The way to interact with *Catalogues* through operations on the service (in this case a *Web Service*) to publish and query data,
- The way to use a registry information model (in this case *ebRIM*) to allow mapping of resources in *Catalogues*,
- The way to map each type of metadata to the *RIM*. A specific kind of resource (e.g., an *Earth Observation Product*) shall be modeled using the same set of *ebRIM* objects in all *Catalogues*. Indeed, discovery queries are strongly dependent on the chosen mapping. Even if this strong dependence can be a drawback for client implementation, flexibility can be enhanced and complexity reduced from the client's point of view using mechanisms like stored queries (see section 16 of [OGC 07-110r4]). A single and common (standardized) mapping ensures interoperability between *Catalogue* implementations.

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<sup>3</sup> In practice, metadata describing *EOProducts* may be encoded in many different formats (*DIMAP*, *HDF*, *GeoTIFF*, *netCDF*, etc.) This extension package models the full set of metadata of the referred O&M schema, so the catalogue interface can be used independently of the existence of an O&M document – e.g for products with different encodings or as an interface to legacy catalogues. However, for the sake of simplicity, this document assumes the availability of metadata in O&M format.

## 8 Package overview

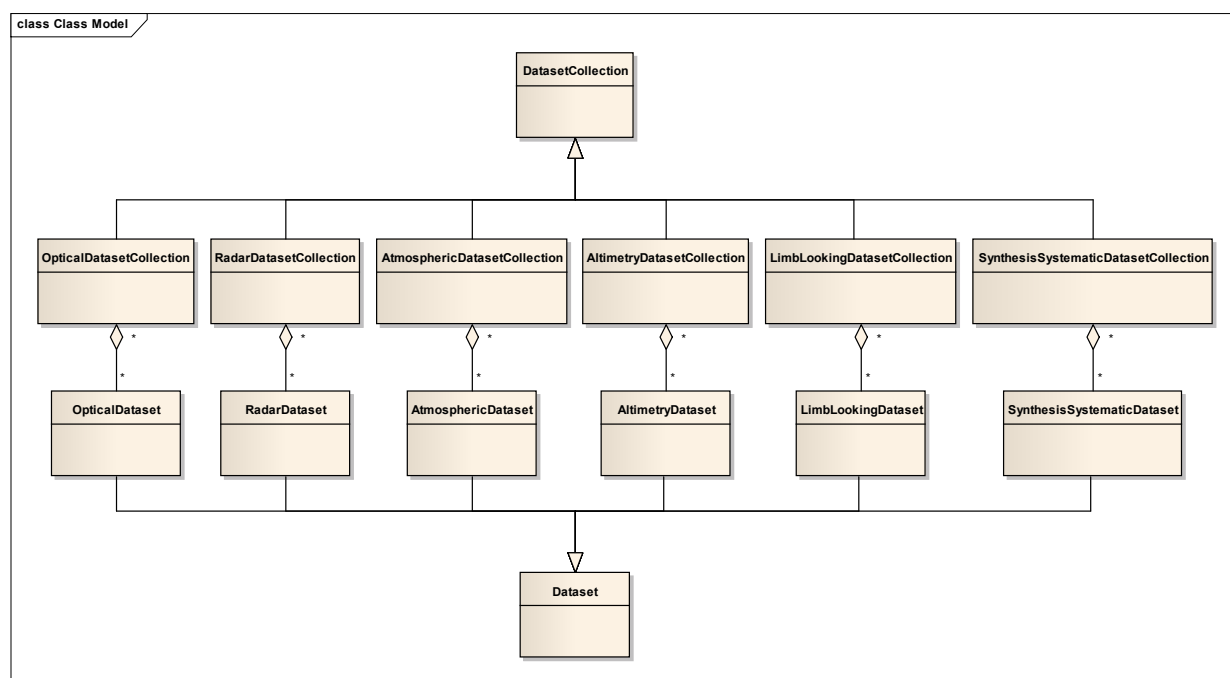
### 8.1 Purpose

The scope of the information managed within this profile is the core metadata that are required to distinguish and identify EO resources. As shown in Table 1, two levels of metadata describe the EO resources: the collection level (i.e., *dataset collection*) and the product level (i.e., *dataset*).

**Table 1 – EOProduct Metadata Levels**

EO resource	Description
EO Product Collection	Mapped to <i>dataset collection</i> in OGC Terminology. Set of metadata that describes an EO Product Collection.
EO Product	Mapped to <i>dataset</i> in OGC Terminology. Set of metadata that describes an EO Product.

These two levels are interrelated according to the following schema:



**Figure 3: Relationship between EO Dataset Collections and Datasets**

EO Collection level metadata are defined using the [ISO 19115:2003] ISO/TC211 Metadata Standards. As shown in the above diagram, nested EO Collections are not considered, as far as this document is concerned. Besides, the management of EO Collection metadata is out of the scope of this document.

Product level metadata are defined using [OGC 10-157r1]. This document defines how the EO Product level metadata can be registered smoothly into CS-W Catalogues implementing the eBRIM Application Profile. It also defines the set of fields that are available for efficient discovery.

### 8.2 EO Product model

This section defines the eBRIM model that represents the Earth Observation product metadata. The objective is not to store all the Earth Observation product metadata properties but only the attributes useful for discovering products.

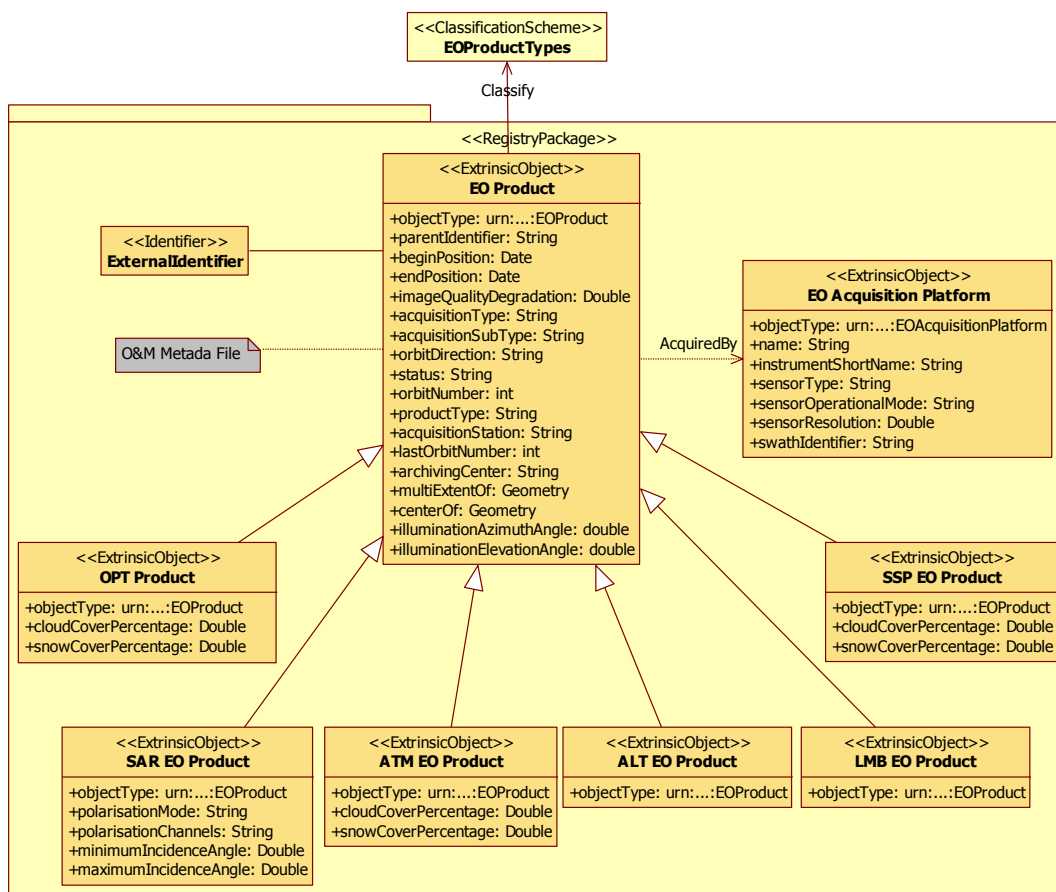


Figure 4 : EO Product eBRIM model

The model contains one main object “EOProduct” containing basic information about the EO product. The “EOAcquisitionPlatform” object contains information about the platform that was used to acquire the EO product.

### 8.2.1 EOProduct Extrinsic Object

In the ebRIM model, the EO Product is represented by an *ExtrinsicObject* with the *objectType* parameter equal to “*urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct*”.

This *ExtrinsicObject* is the main object of the Earth Observation Product model. It contains a set of attributes that characterize directly the product.

A set of thematic product types extend the standard EO Product type with specific information. There are 6 thematic product types:

- OPT : Optical products
- SAR : Synthetic Aperture Radar products
- ATM : Atmospheric products
- ALT: Altimetry products
- LMB: Limb Looking products
- SSP: Synthesis and Systematic products.

Each thematic product type defines some additional slots to the main EO Product *ExtrinsicObject*. This model can be extended with new thematic or mission specific profiles like for instance done for the Pleiades mission.

The original metadata file (the O&M file) is linked to the main *ExtrinsicObject* as *content* (this is the related *RepositoryItem*). This can be done either internally if the Catalogue is also a repository (the O&M file is stored in the Catalogue), or externally if the Catalogue is only a registry (the O&M file is linked, or generated from available up-to-date metadata). These implementation details are further discussed in Annex E:

The EO Product identifier is mapped to an *ExternalIdentifier* linked to this *ExtrinsicObject*, as shown in Figure 4

### 8.2.2 EOAcquisitionPlatform Extrinsic Object

The additional information about the Acquisition Platform is linked to the main EO Product *ExtrinsicObject*. This additional metadata is stored into a specific *ExtrinsicObject*, linked to the main one using an *Association*. Implementations claiming conformance to this specification shall implement the association and slots defined in this section.

The Acquisition Platform parameters (i.e., Platform, Instrument and Sensor) are stored in an *ExtrinsicObject* having the *objectType* attribute set to ‘*urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOAcquisitionPlatform*’. It is linked to the main *ExtrinsicObject* through an *Association* object, with the *associationType* attribute equals to ‘*urn:ogc:def:associationType:OGC-CSW-ebRIM-EO:2.0:AcquiredBy*’.

An Acquisition Platform metadata set may be common to multiple acquisitions, defining therefore a 1:n association from the EO Acquisition Platform *ExtrinsicObject* to the matching EO Product *ExtrinsicObject*. Such information ensures EO Products search by **acquisition platform**.

### 8.2.3 Grouping the objects into a Registry Package

To allow easier management of the registry representation of an EO Product, the objects defined earlier shall be grouped into a Registry Package. In the ebRIM specification [ebRIM], RegistryPackage instances allow for grouping of logically related RegistryObject. This RegistryPackage shall have the property Name set to 'EOProduct'. A query on the Registry Package element shall return all the objects that represent the discovery model of an EO Product.

### 8.2.4 EOProduct Types Classification Scheme

The different types of product are defined in the EOProductTypes classification scheme. Each EO Product shall be classified regarding this ClassificationScheme. The EO Product *ExtrinsicObject* shall be linked to its corresponding *ClassificationNode* through a *Classification* object. This allows EO Products discovery by **acquisition type**.

Figure 5 shows the different nodes of the EOProductTypes classification scheme.

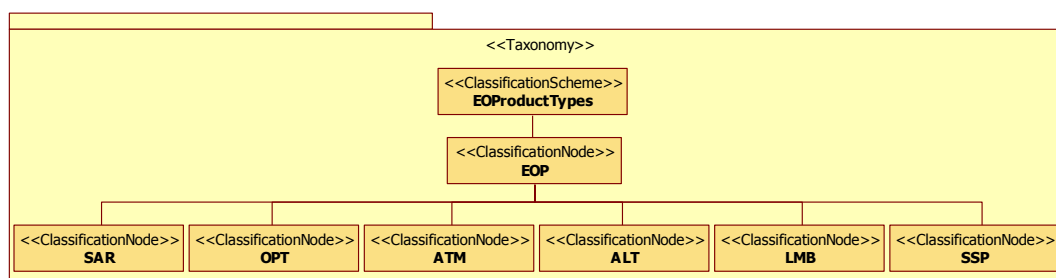


Figure 5 : EO Product Types Classification Scheme

## 8.3 Dependencies

This Extension Package depends on:

- [OASIS regrep-rim-3.0-cd-02] ebXML Registry Information Model Version 3.0. Committee Draft Specification 02, 15 March 2005.

The following canonical ebRIM 3.0 classification schemes are required by this package:

- [ObjectType Classification Scheme](#)
- [AssociationType Classification Scheme](#)
- [DataType Classification Scheme](#)

## 8.4 Implementation Guidance

### 8.4.1 Use of ParentIdentifier

Typically, the filter expression passed in the GetRecords request will contain a subexpression

```
<ogc:PropertyIsEqualTo>
  <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/ParentIdentifier']/rim:ValueList/rim:Value[1]</ogc:PropertyName>
  <ogc:Literal>collectionid</ogc:Literal>
</ogc:PropertyIsEqualTo>
```

This allows an implementation to search the catalogue for matching products with the same parentIdentifier, typically a collection of EO products.

The convention for the parentIdentifier is as defined in "Definition identifier URNs in OGC namespace" [OGC 07-092] i.e. *urn:ogc:def:objectType:authority:version:code*. where the registered namespace authority is ogc, the objectType is EOP (it cannot be thematic or mission specific acronyms like OPT, ATM, PHR, etc), the authority representing the Ground Segment i.e. ESA, SPOT, EUM etc. The version is optional.

The code is a unique identifier specified by the authority which corresponds here to the collection name. The ":" will delimit the start of the collection name. The collection name can be defined as required by the Ground Segment but to ensure unique names the following representation is proposed:

***programme.satellite\_instrument\_processing***

example of parentIdentifier: urn:ogc:def:EOP:ESA:EECF.ENVISAT\_ASA\_APx\_xS.

The GetCapabilities response shall advertise the supported parentIdentifier (collection name) values in a CSW service capabilities document, through the use of the ows:ExtendedCapabilities element and the parentIdentifier slot. The Annex C.3.1 described the GetCapabilities response.

## 9 Classification schemes

### 9.1 EO Product types

The EO Product Type classification scheme defines the types of the Earth Observation Products. Each EO Product shall be classified using one node in this scheme. The properties of the scheme are summarized in the table below.

**Table 2 – Classification scheme: EOProductTypes**

Property	Value
Identifier	urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-EO:2.0:EOProductTypes
Name	EOProductTypes
Description	This is the canonical ClassificationScheme for EO Product Types hierarchy
Node type	urn:oasis:names:tc:ebxml-regrep:NodeType:UniqueCode
Internal nodes	True

## 10 Classification nodes

### 10.1 Object types

Two object types are added to the ObjectType Classification Scheme.

#### 10.1.1 EOProduct

An EOProduct denotes an extrinsic object that describes an earth observation product. It contains the main attributes of the product acquisition. The properties of the classification node are summarized in the table below.

**Table 3 – Object type: EOProduct**

Property	Value
Identifier	urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct
Name	EOProduct
Description	Represents an Earth Observation Product
Parent	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject:ExtrinsicObject
Code	EOProduct

#### 10.1.2 EOAcquisitionPlatform

An EOAcquisitionPlatform denotes an extrinsic object that describes an earth observation acquisition platform. The properties of the classification node are summarized in the table below.

**Table 4 – Object type: EOAcquisitionPlatform**

Property	Value
Identifier	urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOAcquisitionPlatform
Name	EOAcquisitionPlatform
Description	Represents an Earth Observation Acquisition Platform
Parent	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject:ExtrinsicObject
Code	EOAcquisitionPlatform

### 10.2 Association types

One association type is added to the AssociationType Classification Scheme.



### 10.2.1 AcquiredBy

The “AcquiredBy” association relates a product with its acquisition platform. For an association of this type, the source and target objects shall be of the types indicated in **Error! Reference source not found.** .

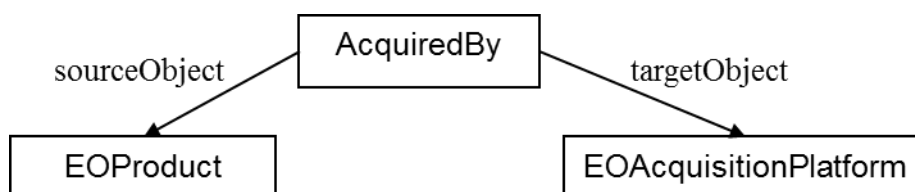


Figure 6: Object type constraints for the AcquiredBy association

The properties of the classification node are summarized in the table below.

Table 5 – Association type: AcquiredBy

Property	Value
Identifier	urn:ogc:def:associationType:OGC-CSW-ebRIM-EO:2.0:AcquiredBy
Name	AcquiredBy
Description	Associates a EOProduct with a EOAcquisitionPlatform.
Parent	urn:oasis:names:tc:ebxml-regrep:classificationScheme:AssociationType
Code	AcquiredBy

## 10.3 EO Product Types

Seven classification nodes are added to the EOProductTypes classification scheme defines in Section 9.1.

### 10.3.1 EOP product type

The properties of the classification node are summarized in the table below.

**Table 6 – EO Product Types: EOP**

Property	Value
Identifier	urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-EO:2.0:EOProductTypes:EOP
Name	EOP
Description	EOP General type
Parent	urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-EO:2.0:EOProductTypes
Code	EOP

### 10.3.2 OPT product type

The properties of the classification node are summarized in the table below.

**Table 7 – EO Product Types: OPT**

Property	Value
Identifier	urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-EO:2.0:EOProductTypes:OPT
Name	OPT
Description	Optical type
Parent	urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-EO:2.0:EOProductTypes:EOP
Code	OPT

### 10.3.3 SAR product type

The properties of the classification node are summarized in the table below.

**Table 8 – EO Product Types: SAR**

Property	Value
Identifier	urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-EO:2.0:EOProductTypes:SAR
Name	SAR
Description	Radar type
Parent	urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-EO:2.0:EOProductTypes:EOP
Code	SAR

### 10.3.4 ATM product type

The properties of the classification node are summarized in the table below.

**Table 9 – EO Product Types: ATM**

Property	Value
Identifier	urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-EO:2.0:EOProductTypes:ATM
Name	ATM
Description	Atmospheric type
Parent	urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-EO:2.0:EOProductTypes:EOP
Code	ATM

### 10.3.5 ALT product type

The properties of the classification node are summarized in the table below.

**Table 10 – EO Product Types: ALT**

Property	Value
Identifier	urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-EO:2.0:EOProductTypes:ALT
Name	ALT
Description	Altimetry type
Parent	urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-EO:2.0:EOProductTypes:EOP
Code	ALT

### 10.3.6 LMB product type

The properties of the classification node are summarized in the table below.

**Table 11 – EO Product Types: LMB**

<b>Property</b>	<b>Value</b>
Identifier	urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-EO:2.0:EOProductTypes:LMB
Name	LMB
Description	Limb looking type
Parent	urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-EO:2.0:EOProductTypes:EOP
Code	LMB

**10.3.7 SSP product type**

The properties of the classification node are summarized in the table below.

**Table 12 – EO Product Types: SSP**

<b>Property</b>	<b>Value</b>
Identifier	urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-EO:2.0:EOProductTypes:SSP
Name	SSP
Description	Synthesis and Systematic type
Parent	urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-EO:2.0:EOProductTypes:EOP
Code	SSP

## 11 Slots

The EO Product package includes the slots defined in the following tables. The value “–” appearing in the tables below indicates the absence of a more specific constraint.

**Table 13 – Slot: parentIdentifier**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/ParentIdentifier
<b>Definition</b>	Collection Identifier
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:String
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 14 – Slot: beginPosition**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/BeginPosition
<b>Definition</b>	Acquisition start date time
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:DateTime
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 15 – Slot: endPosition**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/EndPosition
<b>Definition</b>	Acquisition end date time
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:DateTime
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 16 – Slot: imageQualityDegradation**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/ImageQualityDegradation
<b>Definition</b>	Quality degradation percentage
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:Double
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 17 – Slot: acquisitionType**

<b>Name</b>	<a href="http://www.opengis.net/def/property/OGC-EO/0/AcquisitionType">http://www.opengis.net/def/property/OGC-EO/0/AcquisitionType</a>
<b>Definition</b>	Used to distinguish at a high level the appropriateness of the acquisition for "general" use, whether the product is a nominal acquisition, special calibration product or other. Values: - NOMINAL - CALIBRATION - OTHER
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:String
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 18 – Slot: acquisitionSubType**

<b>Name</b>	<a href="http://www.opengis.net/def/property/OGC-EO/0/AcquisitionSubType">http://www.opengis.net/def/property/OGC-EO/0/AcquisitionSubType</a>
<b>Definition</b>	The broad acquisitionType value is however too restrictive, so mission specific type definition should refer to mission/ground segment dedicated codeSpace.
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:String
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 19 – Slot: orbitDirection**

<b>Name</b>	<a href="http://www.opengis.net/def/property/OGC-EO/0/OrbitDirection">http://www.opengis.net/def/property/OGC-EO/0/OrbitDirection</a>
<b>Definition</b>	The orbit direction
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:String
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 20 – Slot: status**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/Status
<b>Definition</b>	Refers to product status. Values : - ARCHIVED - ACQUIRED - CANCELLED - FAILED - PLANNED - POTENTIAL - REJECTED - QUALITYDEGRADED
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:String
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 21 – Slot: orbitNumber**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/OrbitNumber
<b>Definition</b>	Orbit number. EOLI : orbit
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:Integer
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 22 – Slot: productType**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/ProductType
<b>Definition</b>	Describes product type in case that mixed types are available within a single collection, this is ground segment specific definition.
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:String
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 23 – Slot: acquisitionStation**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/AcquisitionStation
<b>Definition</b>	Acquisition / receiving station code. Possible values are mission specific and should be retrieved using codespace.
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:String
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 24 – Slot: lastOrbitNumber**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/LastOrbitNumber
<b>Definition</b>	The last orbit number
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:Integer
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 25 – Slot: archivingCenter**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/ArchivingCenter
<b>Definition</b>	Archiving centre code. Possible values are mission specific and should be retrieved using codespace.
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:String
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 26 – Slot: multiExtentOf**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/MultiExtentOf
<b>Definition</b>	Acquisition footprint coordinates, described by a closed polygon (last point=first point), using CRS:WGS84, Latitude,Longitude pairs (per-WGS84 definition of point ordering, not necessarily per all WFS implementations). Expected structure is gml:Polygon/gml:exterior/gml:LinearRing/gml:posList.
<b>Source</b>	–
<b>Slot type</b>	<i>urn:ogc:def:dataType:ISO-19107:2003:GM_Object</i>
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 27 – Slot: centerOf**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/CenterOf
<b>Definition</b>	Acquisition center coordinates. Expected structure is gml:Point/gml:pos.
<b>Source</b>	–
<b>Slot type</b>	<i>urn:ogc:def:dataType:ISO-19107:2003:GM_Object</i>
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject



**Table 28 – Slot: instrumentShortName**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/InstrumentShortName
<b>Definition</b>	Instrument short name
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:String
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 29 – Slot: platformSerialIdentifier**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/PlatformSerialIdentifier
<b>Definition</b>	Platform serial identifier (eg. for PHR : 1A).
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:String
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 30 – Slot: sensorType**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/SensorType
<b>Definition</b>	The sensorType of the acquisition platform
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:String
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 31 – Slot: sensorOperationalMode**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/SensorOperationalMode
<b>Definition</b>	Sensor mode. Possible values are mission specific and should be retrieved using codespace. (eg. PHR : PA, XS or PX).
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:String
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 32 – Slot: sensorResolution**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/SensorResolution
<b>Definition</b>	Image resolution.
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:Double
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 33 – Slot: swathIdentifier**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/SwathIdentifier
<b>Definition</b>	Swath identifier (e.g. Envisat ASAR has 7 distinct swaths (I1,I2,I3...I7) that correspond to precise incidence angles for the sensor). Value list can be retrieved with codeSpace.
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:String
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 34 – Slot: cloudCoverPercentage**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/CloudCoverPercentage
<b>Definition</b>	Cloud Cover Percentage. Must be expressed in percents.
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:Double
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 35 – Slot: snowCoverPercentage**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/SnowCoverPercentage
<b>Definition</b>	Snow Cover Percentage. Must be expressed in percents.
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:Double
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 36 – Slot: illuminationAzimuthAngle**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/IlluminationAzimuthAngle
<b>Definition</b>	Solar Azimuth angle given in degrees. EOLI : illAziAng
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:Double
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 37 – Slot: illuminationElevationAngle**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/IlluminationElevationAngle
<b>Definition</b>	Solar Elevation angle given in degrees. EOLI : illElevAng
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:Double
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 38 – Slot: polarisationMode**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/PolarisationMode
<b>Definition</b>	PolarisationMode. For instance: single S, dual D, twin T, quad Q, UNDEFINED
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:String
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 39 – Slot: polarisationChannels**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/PolarisationChannels
<b>Definition</b>	Polarisation channel transmit/receive configuration: horizontal, vertical
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:String
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 40 – Slot: minimumIncidenceAngle**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/MinimumIncidenceAngle
<b>Definition</b>	Minimum Incidence angle
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:Double
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 41 – Slot: maximumIncidenceAngle**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/MaximumIncidenceAngle
<b>Definition</b>	Maximum Incidence angle
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:Double
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

**Table 42 – Slot: creationDate**

<b>Name</b>	http://www.opengis.net/def/property/OGC-EO/0/CreationDate
<b>Definition</b>	Creation date of the catalog entry
<b>Source</b>	–
<b>Slot type</b>	urn:oasis:names:tc:ebxml-regrep:DataType:DateTime
<b>Parent object type</b>	urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject

## 12 Earth Observation Metadata profile of Observations and Measurements mapping

The OGC 10-157r1 standard defines an XML format to represent Earth Observation products.

The following tables define the use of predefined attributes and slots, in order to map information coming from the Earth Observation Metadata profile of Observations and Measurements file to the ebRIM model.

### 12.1 Earth Observation Product Types

The following picture describes the layered structure of the schemas used to define the different classes of product metadata. The layer structure means that the upper layer main element type is defined by extending a type from the lower level schema.

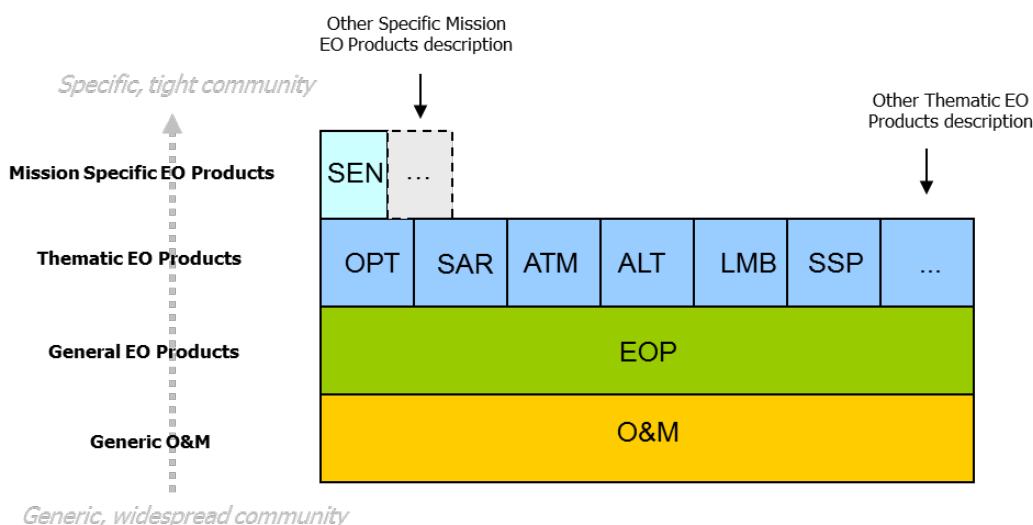


Figure 7 : A layered view of O&M EO Products metadata.

The layered approach explained above is extensible. The purpose of the Thematic layer in Figure 7 is to define the most commonly used EO metadata specific to the mission type. This layer can be extended for mission-specific needs as shown in the figure below, e.g. to add Pleiades specific metadata. In this particular example, the optical opt.xsd schema extensions are grouped in an additional schema phr.xsd which is a layer on top of opt.xsd.

The element that describes the EO metadata is the “EarthObservation” element which is defined in the SAR (Synthetic Aperture Radar), OPT (Optical), ATM

(Atmospheric), ALT (Altimetry), LMB (Limb Looking), SSP (Synthesis and Systematic) specific schemas as an extension of a common EarthObservation element defined in the EOP schema.

EO Products are described using one instance of the following types (or possibly of more specific subtypes):

- eop:EarthObservation;
- sar:EarthObservation, which derives from eop:EarthObservation;
- opt:EarthObservation, which derives from eop:EarthObservation;
- atm:EarthObservation, which derives from eop:EarthObservation.
- alt:EarthObservation, which derives from eop:EarthObservation.
- lmb:EarthObservation, which derives from eop:EarthObservation.
- ssp:EarthObservation, which derives from eop:EarthObservation.

The eop:EarthObservation element derives from om:OM\_Observation.

## 12.2 EOProduct Extrinsic Object mapping

The following table details the use of predefined attributes and slots, in order to map information coming from the O&M metadata file to the EOProduct *ExtrinsicObject*. Depending on the cardinality, instances of these slots may not be present in a specific EO Product instance. Mandatory slots shall be present.

**Table 43 – EOProduct ExtrinsicObject Correspondence**

GML Metadata XPath	EOProduct ExtrinsicObject Attribute	(Slot) Type <sup>4</sup>	Cardinality
"urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct" (fixed value)	/rim:ExtrinsicObject/@objectType <sup>5</sup>	/	
/eop:EarthObservation/eop:metaDataProperty/eop:EarthObservationMetaData/eop:identifier	/rim:ExternalIdentifier/@value (linked to the EOProduct ExtrinsicObject by the ExternalIdentifier's registryObject attribute)	/	1
/eop:EarthObservation/eop:metaDataProperty/eop:EarthObservationMetaData/eop:parentIdentifier	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/ParentIdentifier"]/rim:ValueList/rim:Value[1]	String	0..1
/eop:EarthObservation/eop:metaDataProperty/eop:EarthObservationMetaData/eop:productType	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-	String	0..1

<sup>4</sup> For the readability of the table, the slot type corresponds to the data type short name defined in Annex C.1. In the Table 49, the short name is mapped to the full data type URN. In the ebRIM model, the full URN must be used.

<sup>5</sup> In this document, the rim prefix is associated to the namespace "urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0". The wrs prefix is associated to the namespace "http://www.opengis.net/cat/wrs/1.0". The notations are not meant to be used literally: in particular, since the ebRIM AP specializes ExtrinsicObject, etc., in the wrs namespace, the above expressions may also be expressed in the wrs

GML Metadata XPath	EOPRODUCT ExtrinsicObject Attribute	(Slot) Type <sup>4</sup>	Cardinality
	EO/0/ProductType"/rim:ValueList/rim:Value[1]		
/eop:EarthObservation/eop:metaDataProperty/eop:EarthObservationMetaData/eop:status	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOPRODUCT"/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/Status"/rim:ValueList/rim:Value[1]	String	1
/eop:EarthObservation/om:featureOfInterest/eop:Footprint/eop:multiExtentOf	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOPRODUCT"/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/MultiExtentOf"/wrs:ValueList/wrs:AnyValue[1] <sup>6</sup>	GM_Object (MultiPolygon)	0..1
/eop:EarthObservation/om:featureOfInterest/eop:Footprint/eop:centerOf	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOPRODUCT"/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/CenterOf"/wrs:ValueList/wrs:AnyValue[1]	GM_Object (Point)	0..1
/eop:EarthObservation/eop:metaDataProperty/eop:EarthObservationMetaData/eop:acquisitionType	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOPRODUCT"/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/AcquisitionType"/rim:ValueList/rim:Value[1]	String	1

<sup>6</sup> See section 7.8 (Spatial References) of the doc [OGC 07-110] (ebRIM profile of CSW) to see how to include GML data into ebRIM Slots.



GML Metadata XPath	EOPProduct ExtrinsicObject Attribute	(Slot) Type <sup>4</sup>	Cardinality
/eop:EarthObservation/eop:metaDataProperty/eop:EarthObservationMetaData/eop:acquisitionSubType	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOPProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/AcquisitionSubType"]/rim:ValueList/rim:Value[1]	String	0..1
/eop:EarthObservation/om:phenomenonTime/gml:TimePeriod/gml:beginPosition	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOPProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/BeginPosition"]/rim:ValueList/rim:Value[1]	DateTime	1
/eop:EarthObservation/om:phenomenonTime/gml:TimePeriod/gml:endPosition	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOPProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/EndPosition"]/rim:ValueList/rim:Value[1]	DateTime	1
/eop:EarthObservation/eop:metaDataProperty/eop:EarthObservationMetaData/eop:downlinkedTo/eop:DownlinkInformation/eop:acquisitionStation	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOPProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/AcquisitionStation"]/rim:ValueList/rim:Value[1]	String	0..1
/eop:EarthObservation/om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/eop:Acquisition/eop:orbitNumber	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOPProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/OrbitNumber"]/rim:ValueList/rim:Value[1]	Integer	0..1
/eop:EarthObservation/om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/eop:Acquisition/eop:lastOrbitNumber	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOPProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/LastOrbitNumber"]/rim:ValueList/rim:Value[1]	Integer	0..1

GML Metadata XPath	EOPProduct ExtrinsicObject Attribute	(Slot) Type <sup>4</sup>	Cardinality
/eop:EarthObservation/om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/eop:Acquisition/eop:orbitDirection	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOPProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/OrbitDirection"]/rim:ValueList/rim:Value[1]	String	0..1
/eop:EarthObservation/eop:metaDataProperty/eop:EarthObservationMetaData/eop:imageQualityDegradation	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOPProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/ImageQualityDegradation"]/rim:ValueList/rim:Value[1]	Double	0..1
/eop:EarthObservation/eop:metaDataProperty/eop:EarthObservationMetaData/eop:archivedIn/eop:ArchivingInformation/eop:archivingCenter	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOPProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/ArchivingCenter"]/rim:ValueList/rim:Value[*]	String	0..1
/eop:EarthObservation/om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/eop:Acquisition/eop:illuminationAzimuthAngle	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOPProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/IlluminationAzimuthAngle"]/rim:ValueList/rim:Value[1]	Double	0..1
/eop:EarthObservation/om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/eop:Acquisition/eop:illuminationElevationAngle	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOPProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/IlluminationElevationAngle"]/rim:ValueList/rim:Value[1]	Double	0..1
/eop:EarthObservation/eop:metaDataProperty/eop:EarthObservationMetaData/eop:creationDate	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOPProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/CreationDate"]/rim:ValueList/rim:Value[1]	DateTime	0..1

### 12.3 EOAcquisitionPlatform Extrinsic Object mapping

The following tables define the use of predefined attributes and slots, in order to map information coming from the O&M metadata file to the EOAcquisitionPlatform ExtrinsicObjects.

**Table 44 – EOAcquisitionPlatform ExtrinsicObject Correspondence**

GML Metadata Xpath	EOAcquisitionPlatform ExtrinsicObject Attribute	(Slot) Type	Cardinality
“urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOAcquisitionPlatform” (fixed value)	/rim:ExtrinsicObject/@objectType	/	0..1 (the AcquiredBy association is optional)
/eop:EarthObservation/om:procedure/eop:EarthObservationEquipment/eop:platform/eop:Platform/eop:shortName	/rim:ExtrinsicObject[@objectType=“urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOAcquisitionPlatform”]/rim:Name/rim:LocalizedString/@value	String	1
/eop:EarthObservation/om:procedure/eop:EarthObservationEquipment/eop:platform/eop:Platform/eop:serialIdentifier	/rim:ExtrinsicObject[@objectType=“urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOAcquisitionPlatform”]/rim:Slot[@name=“http://www.opengis.net/def/property/OGC-EO/0/PlatformSerialIdentifier”]/rim:ValueList/rim:Value[1]	String	0..1
/eop:EarthObservation/om:procedure/eop:EarthObservationEquipment/eop:instrument/eop:Instrument/eop:shortName	/rim:ExtrinsicObject[@objectType=“urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOAcquisitionPlatform”]/rim:Slot[@name=“http://www.opengis.net/def/property/OGC-EO/0/InstrumentShortName”]/rim:ValueList/rim:Value[1]	String	1
/eop:EarthObservation/om:procedure/eop:EarthObservationEquipment/eop:sensor/eop:Sensor/eop:sensorType	/rim:ExtrinsicObject[@objectType=“urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOAcquisitionPlatform”]/rim:Slot[@name=“http://www.opengis.net/def/property/OGC-EO/0/SensorType”]/rim:ValueList/rim:Value[1]	String	0..1

<b>GML Metadata Xpath</b>	<b>EOAcquisitionPlatform ExtrinsicObject Attribute</b>	<b>(Slot) Type</b>	<b>Cardinality</b>
/eop:EarthObservation/om:procedure/eop:EarthObservationEquipment/eop:sensor/eop:Sensor/eop:operationalMode	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOAcquisitionPlatform"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/SensorOperationalMode"]/rim:ValueList/rim:Value[1]	String	0..1
/eop:EarthObservation/om:procedure/eop:EarthObservationEquipment/eop:sensor/eop:Sensor/eop:resolution	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOAcquisitionPlatform"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/SensorResolution"]/rim:ValueList/rim:Value[1]	Double	0..1
/eop:EarthObservation/om:procedure/eop:EarthObservationEquipment/eop:sensor/eop:Sensor/eop:swathIdentifier	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOAcquisitionPlatform"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/SwathIdentifier"]/rim:ValueList/rim:Value[1]	String	0..1

## 12.4 Thematic Metadata

The next sections describe the thematic-specific metadata and their mapping in the complete structure described earlier. Like for the basic EO Products, all the thematic products are represented by an *ExtrinsicObject* with the 'urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct' *objectType* attribute. There is no additional object type only additional slots.

### 12.4.1 Synthetic Aperture Radar EarthObservation Product Mapping

The following table defines the mapping for SAR specific metadata. Support of these slots is optional. It is mandatory only for those implementations that implement the SAR Extension conformance class (cf. section 2).

**Table 45 – SAR EOProduct ExtrinsicObject Correspondence**

GML Metadata Xpath	EOProduct ExtrinsicObject Attribute	(Slot) Type	Cardinality
/sar:EarthObservation/om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/sar:Acquisition/sar:polarisationMode	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/PolarisationMode"]/rim:ValueList/rim:Value[1]	String	0..1
/sar:EarthObservation/om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/sar:Acquisition/sar:polarisationChannels	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/PolarisationChannels"]/rim:ValueList/rim:Value[1]	String	0..1
/sar:EarthObservation/om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/sar:Acquisition/sar:minimumIncidenceAngle	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/MinimumIncidenceAngle"]/rim:ValueList/rim:Value[1]	Double	0..1
/sar:EarthObservation/om:procedure/eop:EarthObservationEquipment/eop:acquisitionParameters/sar:Acquisition/sar:maximumIncidenceAngle	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-	Double	0..1

GML Metadata Xpath	EOPProduct ExtrinsicObject Attribute	(Slot) Type	Cardinality
	EO/0/MaximumIncidenceAngle"/rim:ValueList/rim:Value[1]		

### 12.4.2 Optical EarthObservation Product Mapping

The following table defines mapping for OPT specific metadata. Support of these slots is optional. It is mandatory only for those implementations that implement the OPT Extension conformance class (cf. section 2).

**Table 46 – OPT EOPProduct ExtrinsicObject Correspondence**

GML Metadata Xpath	EOPProduct ExtrinsicObject Attribute	(Slot) Type	Cardinality
/opt:EarthObservation/om:result/opt:EarthObservationResult/opt:cloudCoverPercentage	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOPProduct"/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/CloudCoverPercentage"/rim:ValueList/rim:Value[1]	Double	0..1
/opt:EarthObservation/om:result/opt:EarthObservationResult/opt:snowCoverPercentage	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOPProduct"/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/SnowCoverPercentage"/rim:ValueList/rim:Value[1]	Double	0..1

### 12.4.3 Atmospheric EarthObservation Product Mapping

The following table defines mapping for ATM specific metadata. Support of these slots is optional. It is mandatory only for those implementations that implement the OPT Extension conformance class (cf. section 2).

**Table 47 – ATM EOProduct ExtrinsicObject Correspondence**

<b>GML Metadata Xpath</b>	<b>EOProduct ExtrinsicObject Attribute</b>	<b>(Slot) Type</b>	<b>Cardinality</b>
/atm:EarthObservation/om:resultopt:EarthObservationResult/atm:cloudCoverPercentage	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/CloudCoverPercentage"]/rim:ValueList/rim:Value[1]	Double	0..1
/atm:EarthObservation/om:result/opt:EarthObservationResult/atm:snowCoverPercentage	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/SnowCoverPercentage"]/rim:ValueList/rim:Value[1]	Double	0..1

#### 12.4.4 Altimetry EarthObservation Product Mapping

There is no additional information stored for ALT products.

#### 12.4.5 Limb Looking EarthObservation Product Mapping

There is no additional information stored for LMB products.

#### 12.4.6 Synthesis and Systematic EarthObservation Product Mapping

The following table defines mapping for SSP specific metadata. Support of these slots is optional. It is mandatory only for those implementations that implement the SSP Extension conformance class (cf. section 2).

**Table 48 – SSP EOProduct ExtrinsicObject Correspondence**

GML Metadata Xpath	EOProduct ExtrinsicObject Attribute	(Slot) Type	Cardinality
/ssp:EarthObservation/om:resultopt:EarthObservationResult/ssp:cloudCoverPercentage	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/CloudCoverPercentage"]/rim:ValueList/rim:Value[1]	Double	0..1
/ssp:EarthObservation/om:result/opt:EarthObservationResult/ssp:snowCoverPercentage	/rim:ExtrinsicObject[@objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct"]/rim:Slot[@name="http://www.opengis.net/def/property/OGC-EO/0/SnowCoverPercentage"]/rim:ValueList/rim:Value[1]	Double	0..1



## **Annex A: ABSTRACT TEST SUITE (NORMATIVE)**

### **A.1. Conformance Test Class: The Core (EOP support)**

#### **A.1.1 Package availability**

- a) Test purpose: The EO Products extension package is available as a supported extension package and is complete.
- b) Test method: Verify that a `rim:RegistryPackage` element with `@id = "urn:ogc:def:registryPackage:OGC-CSW-ebRIM-EO:2.0:EOProducts"` and Name property set to 'Earth Observation Products extension package for CSW-ebRIM' is a member of the 'root' package, which contains all packages supported by the service, and contains the additional extrinsic objects, association types, classification schemes and nodes, slots and stored queries defined by the specification. Pass if the assertion is satisfied; fail otherwise.
- c) References: OGC 07-110r4 Subclause 17.1, OGC 10-189r2 Subclause 8.2.3 (see also Annex G: )
- d) Test type: Capability

#### **A.1.2 Collection identifiers advertisement**

- a) Test purpose: The EO Product parent identifiers (i.e. collection names) are advertised in the Capabilities document.
- b) Test method: Verify that the Capabilities document contains an `ows:ExtendedCapabilities` element with a slot named `http://www.opengis.net/def/property/OGC-EO/0/parentIdentifier` whose values correspond to the EO Product collection names.
- c) References: OGC 10-189r2 Subclause 8.4.1
- d) Test type: Capability

#### **A.1.3 EOProduct parameters instantiation**

- e) Test purpose: The EOProduct ExtrinsicObject contains the correct set of 'EOP' attributes.
- f) Test method: Verify that the ExtrinsicObject is valid and contains the mandatory slots specified in Table 43 of the specification. Verify that slots with cardinality 0..1 are not instantiated multiple times.
- g) References: OGC 10-189r2 Subclause 8.2.1, Table 43
- h) Test type: Capability

#### **A.1.4 EOProduct parameters mapping**

- a) Test purpose: The acquisition parameters of a GML document (in EOP namespace) describing an EO Product are correctly mapped to the EOProduct ExtrinsicObject and slots representing the EO Product.

- b) Test method: Verify that the mappings between the GML document and the EOProduct ExtrinsicObject and its slots correspond to those specified in Table 41 of the specification. Pass if the mappings are correctly applied; fail otherwise.
- c) References: OGC 10-189r2 Subclause 8.2.2 and Table 44
- d) Test type: Capability

#### **A.1.5 EOProduct classification instantiation**

- a) Test purpose: The EOProduct ExtrinsicObject is classified in the EO\_Product\_Types taxonomy.
- b) Test method: Verify that the EOProduct ExtrinsicObject is linked through a Classification object to a ClassificationNode belonging to the EO\_Product\_Types:ClassificationScheme. Pass if the assertion is satisfied; fail otherwise.
- c) References: OGC 10-189r2 Subclause 8.2.4
- d) Test type: Capability

#### **A.1.6 EO\_Product\_Types classification mapping**

- e) Test purpose: The EOProduct ExtrinsicObject corresponding to an EarthObservation element in the O&M EO instance is correctly classified in the EO\_Product\_Types taxonomy.
- f) Test method: Verify that the classification node classifying the EOProduct ExtrinsicObject in the EO\_Product\_Types:ClassificationScheme corresponds to the namespace of the root EarthObservation element in the O&M EO instance. Pass if the mappings are correctly applied; fail otherwise.
- g) References: OGC 10-189r2 Subclause 8.2.4
- h) Test type: Capability

#### **A.1.7 AcquiredBy association instantiation**

- a) Test purpose: The AcquiredBy association is correctly instantiated.
- b) Test method: Verify that an EOProduct ExtrinsicObject instance is related to at least one instance of EOProductAcquisitionPlatform ExtrinsicObject through the AcquiredBy association. Pass if the assertion is satisfied; fail otherwise.
- c) References: OGC 10-189r2 Subclause 8.2.2
- d) Test type: Capability

#### **A.1.8 EOProductAcquisitionPlatform instantiation**

- a) Test purpose: The EOProductAcquisitionPlatform ExtrinsicObject and its slots are correctly instantiated.
- b) Test method: Verify that the EOProductAcquisitionPlatform ExtrinsicObject and its slots are instantiated with the correct cardinality, as defined in Table 15. Pass if the assertion is satisfied; fail otherwise.
- c) References: OGC 10-189r2 Subclause 8.2.2
- d) Test type: Capability

### **A.1.9 EOProductAcquisitionPlatform mapping**

- a) Test purpose: The acquisition platforms properties of a GML document (in EOP namespace) describing an EO Product are correctly mapped to the AcquiredBy association, the EOProductAcquisitionPlatform ExtrinsicObject and its slots.
- b) Test method: Verify that the mappings between the GML document and the AcquiredBy association, the EOProductAcquisitionPlatform ExtrinsicObject and its slots correspond to those specified in Table 4 of the specification. Pass if the mappings are correctly applied; fail otherwise.
- c) References: OGC 10-189r2 Subclause 12.3 Table 15
- d) Test type: Capability

### **A.1.10 EO Product metadata grouping**

- a) Test purpose: All the RegistryObjects related to an EOProduct (i.e. all its metadata) are grouped into a RegistryPackage with the property Name set to 'EOProduct'.
- b) Test method: Verify that a query on the RegistryPackage element will return all the objects that represent a full EO Product. Pass if the assertion is satisfied; fail otherwise.
- c) References: OGC 10-189r2 Subclause 8.2.3
- d) Test type: Capability

### **A.1.11 GetRepositoryItem id parameter**

- a) Test purpose: EO GML repository items are accessed through to extrinsic objects of type EOProduct only.
- b) Test method: Verify that a GetRepositoryItem request with an id matching a urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct ExtrinsicObject returns the EO GML attached to this object with status code 200 or an HTTP 404 error if no repository item is available. Verify that a GetRepositoryItem request with an id matching another objectType returns an HTTP 404 error.
- c) References: OGC 10-189r2 Subclause 8.2.1
- d) Test type: Capability

## **A.2. Conformance Test Class: SAR Extension**

The SAR Extension conformance class extends the Core conformance class (cf. A.1).

### **A.2.1 SAR-specific slots instantiation**

- a) Test purpose: SAR-specific slots in the EOProduct ExtrinsicObject are correctly instantiated.
- b) Test method: Verify that the SAR slots are instantiated with the correct cardinality, as defined in Table 16. Pass if the assertion is satisfied; fail otherwise.
- c) References: OGC 10-189r2 Subclause 12.4.1

- d) Test type: Capability

### **A.2.2 SAR-specific slots mapping**

- a) Test purpose: The SAR properties of a O&M document (in SAR namespace) describing an EO Product are correctly mapped to the relevant slots in the EOProduct ExtrinsicObject.
- b) Test method: Verify that the mappings between the O&M document and the SAR slots in the EOProduct ExtrinsicObject correspond to those specified in Table 16 of the specification. Pass if the mappings are correctly applied; fail otherwise.
- c) References: OGC 10-189r2 Subclause 12.4.1 Table 45
- d) Test type: Capability

### **A.3. Conformance Test Class: OPT Extension**

The OPT Extension conformance class extends the Core conformance class (cf. A.1).

#### **A.3.1 OPT-specific slots instantiation**

- a) Test purpose: OPT-specific slots in the EOProduct ExtrinsicObject are correctly instantiated.
- b) Test method: Verify that the OPT slots are instantiated with the correct cardinality, as defined in Table 17. Pass if the assertion is satisfied; fail otherwise.
- c) References: OGC 10-189r2 Subclause 12.4.2 Table 46
- d) Test type: Capability

#### **A.3.2 OPT-specific slots mapping**

- a) Test purpose: The OPT properties of a O&M document (in OPT namespace) describing an EO Product are correctly mapped to the relevant slots in the EOProduct ExtrinsicObject.
- b) Test method: Verify that the mappings between the O&M document and the OPT slots in the EOProduct ExtrinsicObject correspond to those specified in Table 17 of the specification. Pass if the mappings are correctly applied; fail otherwise.
- c) References: OGC 10-189r2 Subclause 12.4.2 Table 46
- d) Test type: Capability

### **A.4. Conformance Test Class: ATM Extension**

The ATM Extension conformance class extends the Core conformance class (cf. A.1).

#### **A.4.1 ATM-specific slots instantiation**

- e) Test purpose: ATM-specific slots in the EOProduct ExtrinsicObject are correctly instantiated.
- f) Test method: Verify that the ATM slots are instantiated with the correct cardinality, as defined in Table 17. Pass if the assertion is satisfied; fail otherwise.
- g) References: OGC 10-189r2 Subclause 12.4.3 Table 47
- h) Test type: Capability

#### **A.4.2 ATM-specific slots mapping**

- e) Test purpose: The ATM properties of a O&M document (in ATM namespace) describing an EO Product are correctly mapped to the relevant slots in the EOProduct ExtrinsicObject.
- f) Test method: Verify that the mappings between the O&M document and the ATM slots in the EOProduct ExtrinsicObject correspond to those specified in Table 18 of the specification. Pass if the mappings are correctly applied; fail otherwise.
- g) References: OGC 10-189r2 Subclause 12.4.3 Table 47
- h) Test type: Capability

#### **A.5. Conformance Test Class: ALT Extension**

The ALT Extension conformance class extends the Core conformance class (cf. A.1).

#### **A.6. Conformance Test Class: LMB Extension**

The LMB Extension conformance class extends the Core conformance class (cf. A.1).

#### **A.7. Conformance Test Class: SSP Extension**

The SSP Extension conformance class extends the Core conformance class (cf. A.1).

##### **A.7.1 SSP-specific slots instantiation**

- i) Test purpose: SSP-specific slots in the EOProduct ExtrinsicObject are correctly instantiated.
- j) Test method: Verify that the SSP slots are instantiated with the correct cardinality, as defined in Table 19. Pass if the assertion is satisfied; fail otherwise.
- k) References: OGC 10-189r2 Subclause 12.4.6 Table 48
- l) Test type: Capability

##### **A.7.2 SSP-specific slots mapping**

- i) Test purpose: The SSP properties of a O&M document (in SSP namespace) describing an EO Product are correctly mapped to the relevant slots in the EOProduct ExtrinsicObject.

- j) Test method: Verify that the mappings between the O&M document and the SSP slots in the EOProduct ExtrinsicObject correspond to those specified in Table 19 of the specification. Pass if the mappings are correctly applied; fail otherwise.
- k) References: OGC 10-189r2 Subclause 12.4.6 Table 48
- l) Test type: Capability

**Annex B: XML SCHEMA DOCUMENTS  
(NORMATIVE)**

See XML schema attached to this document.

## Annex C: EBRIM APPLICATION PROFILE USAGE (NORMATIVE)

This section describes the interactions with the EO ebRIM Catalogue, and the behavior of its CSW interface. It provides some examples of request and response message structures as part of the operation signatures, as specified in the [OGC 07-006] OGC Catalogue Service 2 and [OGC 07-110r4] CSW-ebRIM Registry Service - Part 1: ebRIM profile of CSW. It also documents supported query facilities and implementation guidances.

The following sections use significant parts of the [OGC 07-006] OGC Catalogue Service 2 specification and the [OGC 07-110r4] CSW-ebRIM Registry Service - Part 1: ebRIM profile of CSW documents. To reduce the need to refer to those documents, this document copies some of their parts.

### C.1 ebXML Slot Types Definition

In order to map the EO products to an ebRIM structure, we need to define the range of slot types that will be used in the model.

Slot types range should be defined in the CSW-ebRIM Registry Service - Part 1: ebRIM profile of CSW [OGC 07-110r4] , but since its not the case, the definition takes place in this document.

The following table defines the types allowed for the slotType attribute of ebXML slots. Several slot types are based on datatypes defined in the XML Schemas scope.

**Table 49 – Slot Types Defintion**

Slot Types	Definition and representation of the slot values
<i>URI</i>	URN: <i>urn:oasis:names:tc:ebxml-regrep:DataType:URI</i>  Represent a Uniform Resource Identifier (URI). An URI value can be absolute or relative, and may have an optional fragment identifier (i.e., it may be a URI Reference). This type should be used to specify the intention that the value fulfills the role of a URI as defined by the RFC 2396, as amended by the RFC 2732.
<i>Boolean</i>	URN: <i>urn:oasis:names:tc:ebxml-regrep:DataType:Boolean</i>  Defined as the mathematical concept of binary-valued logic. Accepted values are <i>true</i> and <i>false</i> .
<i>DateTime</i>	URN: <i>urn:oasis:names:tc:ebxml-regrep:DataType:DateTime</i>



Slot Types	Definition and representation of the slot values
	<p>Consist of objects with integer-valued year, month, day, hour and minute properties, a decimal-valued second property, and a boolean timezone property. Each such object also has one decimal-valued method or computed property, <code>timeOnTimeline</code>, whose value is always a decimal number; the values are dimensioned in seconds, the integer 0 is 0001-01-01T00:00:00 and the value of <code>timeOnTimeline</code> for other <code>dateTime</code> values is computed using the Gregorian algorithm as modified for leap-seconds. The <code>timeOnTimeline</code> values form two related “timelines”, one for timezoned values and one for non-timezoned values.</p> <p>Lexical representation is ISO 8601. For example, <code>2002-10-10T12:00:00-05:00</code> (noon on 10 October 2002, Central Daylight Savings Time as well as Eastern Standard Time in the U.S.) is <code>2002-10-10T17:00:00Z</code>, five hours later than <code>2002-10-10T12:00:00Z</code>.</p>
<i>Double</i>	<p>URN: <code>urn:oasis:names:tc:ebxml-regrep:DataType:Double</code></p> <p>Consist of the values <math>m \times 2^e</math> where <math>m</math> is an integer whose absolute value is less than <math>2^{53}</math> and <math>e</math> is an integer between <math>-1075</math> and <math>970</math>, inclusive. In addition, float also contains the following three special numbers : positive infinity (<i>INF</i>), negative infinity (<i>-INF</i>) and not-a-number (<i>NaN</i>). Positive infinity is greater than all other non-<i>NaN</i> values, negative infinity is smaller than all other non-<i>NaN</i> values. <i>NaN</i> equals itself but is incomparable with any other value.</p> <p>Allowed lexical representations includes <code>-1E4</code>, <code>1267.43233E12</code>, <code>17.78e-2</code>, <code>12</code>, <code>0</code>, <code>INF</code>, ...</p>
<i>Float</i>	<p>URN: <code>urn:oasis:names:tc:ebxml-regrep:DataType:Float</code></p> <p>Consist of the values <math>m \times 2^e</math> where <math>m</math> is an integer whose absolute value is less than <math>2^{24}</math> and <math>e</math> is an integer between <math>-149</math> and <math>104</math>, inclusive. In addition, float also contains the following three special numbers : positive infinity (<i>INF</i>), negative infinity (<i>-INF</i>) and not-a-number (<i>NaN</i>). Positive infinity is greater than all other non-<i>NaN</i> values, negative infinity is smaller than all other non-<i>NaN</i> values. <i>NaN</i> equals itself but is incomparable with any other value.</p> <p>Allowed lexical representations includes <code>-1E4</code>, <code>1267.43233E12</code>, <code>17.78e-2</code>, <code>12</code>, <code>0</code>, <code>INF</code>, ...</p>
<i>GM_Object</i>	<p>URN: <code>urn:ogc:def:dataType:ISO-19107:2003:GM_Object</code></p> <p>Represent a GML geometry, expressed in its XML format.</p>
<i>Integer</i>	<p>URN: <code>urn:oasis:names:tc:ebxml-regrep:DataType:Integer</code></p> <p>Defined as the mathematical concept of the integer numbers.</p> <p>Accepted values are integers from <code>-2147483648</code> (inclusive) to <code>+2147483647</code> (inclusive). Note that if the sign is omitted, “+” is assumed.</p>
<i>String</i>	<p>URN: <code>urn:oasis:names:tc:ebxml-regrep:DataType:String</code></p> <p>Represent alphanumeric character strings.</p>

## C.2 Supported Protocol Binding and Available Operations

The following table summarizes the required operations on ebRIM Catalogues supporting the EO Extension Package, in order to provide discovery abilities.

**Table 50 – Required Operations on ebRIM Catalogue Service 1.0**

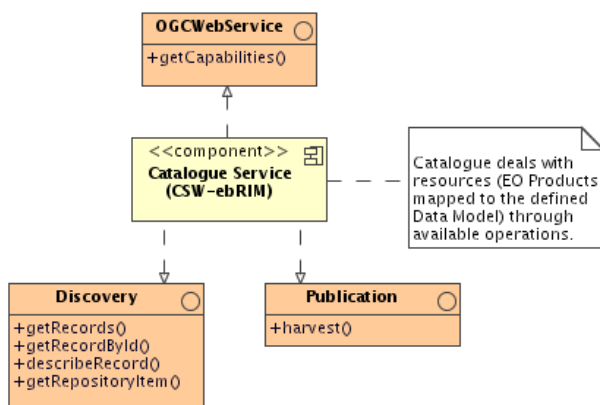
Operation	Description
GetCapabilities ( <i>Description</i> )	Allows a client to retrieve service metadata that describe the computational and non-computational characteristics of the service.
GetRecords ( <i>Discovery</i> )	The principal operation used to search Catalogue content and retrieve all or some members of the result set.
DescribeRecord ( <i>Discovery</i> )	Allows a client to discover the information model(s) supported by the Catalogue and to retrieve type definitions.
GetRecordById ( <i>Discovery</i> )	A simple means of retrieving one or more registry objects by their identifier.
GetRepositoryItem ( <i>Discovery</i> )	Requests the repository item for some <i>ExtrinsicObject</i> .

The following table summarizes optional operations on ebRIM Catalogues supporting the EO Extension Package, in order to provide publication abilities.

**Table 51 – Optional Operation on ebRIM Catalogue Service**

Operation	Description
Harvest ( <i>Publication</i> )	Enables a ‘pull’ style of publication whereby a resource is retrieved from some remote location (URL) and inserted into the Catalogue.

Following figure is an UML diagram summarizing the service interfaces. Optional operations are not shown in the schema.



**Figure 8: Service Interface (CSW-ebRIM)**

### C.3 Interface Specifications

This section highlights syntax and semantic details of the interface operations specified in both [OGC 06-007] OGC Catalogue Service 2 and [OGC 07-110r4] CSW-ebRIM Registry Service - Part 1: ebRIM profile of CSW.

#### C.3.1 GetCapabilities Operation

The *GetCapabilities* operation allows clients to retrieve service metadata from a server. The response to a *GetCapabilities* request should be an XML document containing service metadata about the server.

Here is a list of sections available in CSW ebRIM Capabilities Document:

**Table 52 – Permissible Section Names**

Section Names	Content
ServiceIdentification	General information about the service (type, version, etc.).
ServiceProvider	Information about the organization providing this service.
OperationsMetadata	Summarizes the operational characteristics of the service
Filter_Capabilities	Describes supported OGC filter operations
ServiceFeatures	Information about implemented features
ServiceProperties	Information about general service properties.

## GetCapabilities Request

All CSW servers shall implement the HTTP GET transfer using the keyword-value pair encoding of the GetCapabilities operation. Servers may optionally implement the HTTP POST transfer using XML encoding only. The value of the mandatory service parameter shall be 'CSW' or 'CSW-ebRIM'<sup>7</sup>. In the former case, the server should respond as defined in the baseline CSW specification. In the latter case, the server should respond as defined in the following section.

## GetCapabilities Response

If the request is processed successfully, the body of the response message shall include an XML document where the document element has the following infoset properties:

- A [local name] of '*Capabilities*',
- A [namespace name] of '<http://www.opengis.net/cat/wrs>' (usually represented by the 'wrs' prefix).

The response shall advertise the supported parentIdentifier (collection name) values in a CSW service capabilities document, through the use of the ows:ExtendedCapabilities element and the parentIdentifier slot, as demonstrated in the example below:

```
<ows:OperationsMetadata>
<!-- other content here -->
  <ows:ExtendedCapabilities xmlns:rim="urn:oasis:names:tc:ebxml-
  regrep:xsd:rim:3.0">
    <rim:Slot name=" http://www.opengis.net/def/property/OGC-
  EO/0/ParentIdentifier "
  slotType="urn:oasis:names:tc:ebxml-regrep:DataType:String">
      <rim:ValueList>
        <rim:Value>urn:ogc:def:EOP:ESA.EECF.ENVISAT_ASA_APx_xS</rim:Value>
        <rim:Value>urn:ogc:def:EOP:ESA.EECF.ENVISAT_RA2_MWx_2C</rim:Value>
      </rim:ValueList>
    </rim:Slot>
  </ows:ExtendedCapabilities>
</ows:OperationsMetadata>
```

The ows:ExtendedCapabilities element provides an open extensibility point. Any supplementary operational metadata may be added.

---

<sup>7</sup> In version 2.0.2 of CS-W, it is not possible to change the value of the SERVICE attribute due to a bug in the schemas. For operations that are specific to CS-W ebRIM Application Profile, the value '*CSW-ebRIM*' shall be used. The operations are : GetCapabilities and GetRepositoryItem

A WSDL description<sup>8</sup> may be used to complement the metadata provided in an OGC service capabilities document. The <wrs:WSDL-services> element is a simple link element that may be used to include a reference to a WSDL description containing service and binding elements. The value of the *xlink:href* attribute shall be a resolvable URI that produces the WSDL document when it is the target of a GET request, the *xlink:role* attribute shall indicate the relevant version of the WSDL specification (by namespace URI).

The document element shall be valid against the schema that can be found in the Annex B of the [OGC 07-110r4].

### Examples

An example of a capabilities document is provided in Annex F: of this document.

### Exceptions

If an error condition arises while performing a *GetCapabilities* request, the service shall return an exception report as specified in [OGC 07-110r4] CSW-ebRIM Registry Service - Part 1: ebRIM profile of CSW.

### C.3.2 GetRecords Operation

The mandatory *GetRecords* operation is the principal operation used to search the catalogue content. Some or all the registry objects in the result set that satisfy the search criteria may be piggy-backed in the response message. The messages are defined in a schema that can be found in the Annex B of [OGC 07-110r4].

The ‘search’ portion of the *GetRecords* operation is encoded using the *Query* element. The *Query* element includes the parameters *typeName* and *Constraint*. The *typeName* parameter is used to specify which entities, from the information model of the catalogue, shall be queried. This parameter should only contain the aliases that are referenced in the filter part. The *Constraint* parameter is used to specify which query constraints shall be applied to identify the request set.

The ‘present’ portion of the *GetRecords* operation is encoded using the *outputSchema* parameter and the *ElementName/ElementSetName* parameter(s). The *outputSchema* parameter indicates which schema shall be used to generate the response to the *GetRecords* operation. The *ElementName* or *ElementSetName* parameter is used to specify which properties of the *outputSchema* to include in each record in the *GetRecords* response.

The XML representation of the message body in a request submitted using the POST method shall be a valid *csw:GetRecords* element. The *csw:ResponseHandler* and *csw:DistributedSearch* elements, if present, shall be ignored and the request processed in the normal synchronous manner by the recipient.

---

<sup>8</sup> The Web Services Description Language (WSDL) is an XML language to describe the computational characteristics of web services in terms of interfaces, protocol bindings, and service endpoints. WSDL 2.0 is currently a W3C Recommendation that defines a component model in terms of an abstract XML infoset.

A `csw:GetRecords` element shall include a query statement. The following query elements shall be supported by a conforming implementation:

- a) A `csw:Query` element as specified in clause 10.8.4 of OGC 07-006r1. The OGC filter grammar (OGC 04-095) shall be supported by all conforming implementations.
- b) A `rim:AdhocQuery` element as specified in section 7.3 of ebRIM 3.0. Such an element may invoke a stored query or specify a query to execute; if the latter, the `queryLanguage` attribute shall identify a supported query language by referring to a node in the canonical query language scheme.

### GetRecords Request

If the *Content-Type* of the request entity body is an XML content type (*application/xml*), the document element shall be the '`csw:GetRecords`' element.

The following table specifies attributes of the *GetRecords* operation message.

**Table 53 – GetRecords Operation Parameters**

Parameter	Data type and value	Optionality <sup>9</sup>
Service	Character String. Fixed value of ' <i>CSW</i> '	One (Mandatory)
Version	Character String. Fixed value of ' <i>2.0.2</i> '	One (Mandatory)
RequestId	CharacterString.	Not Supported <sup>a</sup>
ResultType	CodeList. One of ' <i>hits</i> ' (default value) or ' <i>results</i> '.	Zero or one (Optional)
OutputFormat	CharacterString. The only supported value is ' <i>application/xml</i> ' (default value)	Zero or one (Optional)
OutputSchema	CodeList. One of ' <i>urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0</i> ' (default value) or ' <i>http://www.opengis.net/cat/csw/2.0.2</i> '.	Zero or one (Optional)
StartPosition	PositiveInteger. Default Value is <i>1</i>	Zero or one (Optional)
MaxRecords	PositiveInteger. Default Value is <i>10</i>	Zero or one (Optional)

<sup>9</sup>Optional means that a server may receive a request from a client in which this parameter/field may be present or may be absent, the server shall still implement this although the column says "optional".

Parameter	Data type and value	Optionality <sup>9</sup>
TypeNames (Query@typenames )	List of Character String, white space separated. Unordered List of object types implicated in the query.  In the conformance level 1 (see Annex about Conformance Levels), the only required object type is rim:RegistryPackage.	Optional
ElementSetName or ElementName	CodeList. Unordered List of ebRIM object types or aliases returned by the query.  One of 'brief', 'summary' (default value) or 'full'.	Optional
TypeNames (ElementSetName @typenames)	In the conformance level 1 (see Annex about Conformance Levels), the only required object type is rim:RegistryPackage. (See Annex on Conformance Level for full ebRIM requests).	Optional
ConstraintLanguage	CodeList. The only supported value is 'FILTER' (default value). Note that the support of the 1.1.0 version of OGC Filter Encoding [OGC 04-095] is mandatory.	Optional
Constraint	String. The predicate expression specified in the language indicated by the ConstraintLanguage parameter. Default action is to execute an unconstrained query.	Optional.
SortBy	List of Character String, comma separated Ordered list of names of metadata elements to use for sorting the response. Default action is to present the records in the order in which they are received. <sup>10</sup>	Optional
DistributedSearch	Boolean.	Not Supported <sup>a</sup>
HopCount	Integer.	Not Supported <sup>a</sup>
ResponseHandler	URL.	Not Supported <sup>a</sup>
<sup>a</sup> Not supported yet in the ebRIM Application Profile		

<sup>10</sup> The CSW specification (OGC07-006r1) defines the syntax of the SortBy parameter in the section 10.8.4.12. In this section, no default sort order is defined but the Table 11 from the Abstract model stipulates that the default sort order is "descending". If the the SortBy parameter is not specified, there is no constraint on the records order. Unsupported properties are ignored without throwing errors.

### Geometry Filter clarification

The Polygon geometry shall be encoded in the EPSG:4326 geographic coordinate reference system.

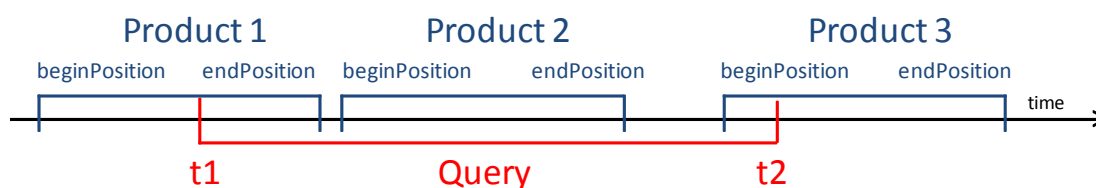
The coordinate pairs shall be ordered as lat, long following the official axis ordering convention for EPSG:4326.

The orientation of the exterior Linear Ring (outer boundary) of the polygon shall be counterclockwise as per the OGC Simple Feature Access -Common Architecture standard (OGC06-103r4). A service implementation can use this convention to select the actual area of interest that is inside the polygon as compared to the area that is outside the polygon. This convention helps to distinguish the internal area of the polygon and the "inverse area". Not following this "CCW for exterior" convention may lead to search results being returned that fall completely outside of the specified polygon but within the inverse area.

### Temporal Filter clarification

To perform a temporal filter on a temporal range, the `PropertyIsGreaterThanOrEqualTo` and `PropertyIsLessThanOrEqualTo` operator should be used.

The query pattern to get all the EO Products overlapping a temporal range  $[t1, t2]$  is “`beginPosition <= t2 and endPosition >= t1`”. This pattern allows to get the products inside the temporal range (see Product 2 Figure 9) and overlapping the temporal range (see Product 1 and Product 3 of Figure 9)



**Figure 9 Temporal Filter clarification**

Here is an example of OGC filter following this query pattern:

```
<!-- startDate & endDate -->
<ogc:PropertyIsLessThanOrEqualTo>
  <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/BeginPosition"]/rim:ValueList/rim:Value[1]</ogc:PropertyNam
e>
  <ogc:Literal>2008-05-15T23:59:59.000</ogc:Literal>
</ogc:PropertyIsLessThanOrEqualTo>

<ogc:PropertyIsGreaterThanOrEqualTo>
```



```
<ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/EndPosition"]/rim:ValueList/rim:Value[1]</ogc:PropertyName>
<ogc:Literal>2008-05-15T00:00:00.000</ogc:Literal>
</ogc:PropertyIsGreaterThanOrEqualTo>
```

**GetRecords Response**

If the request is processed successfully, the body of the response message shall include an XML document where the document element has the following infoset properties:

- A [local name] of ‘*GetRecordsResponse*’,
- A [namespace name] of ‘<http://www.opengis.net/cat/csw/2.0.2>’ (usually represented by the ‘*csw*’ prefix).

The search results may include a sequence of either *<csw:Record>* or *<rim:RegistryObject>* elements. In any case valid substitution elements may also be included, where these typically correspond to different views or instances of record subtypes.

The record representation shall conform to the requested output schema. The value of the *outputSchema* attribute in the request restricts which elements may appear in the response. If not specified, ebRIM representations are returned.

**Table 54 – Allowable Catalogue Record Representation**

OutputSchema	Record representations
<a href="http://www.opengis.net/cat/csw/2.0.2">http://www.opengis.net/cat/csw/2.0.2</a>	csw:Record csw:SummaryRecord csw:BriefRecord
urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0	rim:RegistryObject <i>Any subtype of rim:RegistryObject</i>

The OGC Catalogue Services specification (OGC 07-006) distinguishes three abstract property sets—or views—that provide differing levels of detail about a catalogue item: brief, summary, and full. These abstract views are mapped to the ebRIM schema as indicated in Table 17.

**Table 55 – Registry object views**

View name	ebRIM information items
Brief	rim:RegistryObject/@id rim:RegistryObject/@lid <sup>a</sup> rim:RegistryObject/@objectType rim:RegistryObject/@status

	rim:RegistryObject/rim:VersionInfo
Summary	As for Brief view, plus: rim:RegistryObject/rim:Slot rim:RegistryObject/rim:Name (in preferred languages) <sup>b</sup> rim:RegistryObject/rim:Description (in preferred languages) <sup>b</sup>
Full	Complete representation (all the ExtrinsicObject, Association, Classification elements).
<p>The brief and summary views map to reduced rim:RegistryObject representations for any object type. A full view yields the element information item corresponding to the actual object type.</p> <p>a The value of the @lid attribute implicitly identifies the "version history" resource for a registry object. Its value is set by the service to coincide with the @id value of the original registry object.</p> <p>b As specified by the value of the Accept-Language request header field (if present).</p>	

This mapping is rather ambiguous and lead to different interpretations, some interpretations giving a useless result of response structure. In the EO domain, the use of brief and summary are generally not useful, as they do not contain enough information (the brief view only contains ids and objecttypes; the summary view returns the same attributes than the full view of the products, but associations and classifications are missing).

A server compliant with this specification shall keep the real object type encoding for brief and summary representation. For example, should the request return RegistryPackage, the ebXML shall contain <rim:RegistryPackage> element instead of generalized <rim:RegistryObject> element.

#### Example 1 – Brief view of ebRIM Registry Package.

```
<rim:RegistryPackage id="urn:uuid:491265a5-3646-4a17-8595-782454ec4e00"
objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:RegistryPackage">
</rim:RegistryPackage>
```

#### Example 2 – Summary view of ebRIM registry object.

```
<rim:RegistryPackage id="urn:uuid:491265a5-3646-4a17-8595-782454ec4e00"
objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:RegistryPackage">
  <rim:Name>
    <rim:LocalizedString xml:lang="en-US" charset="UTF-8" value="EOProductContainer"/>
  </rim:Name>
</rim:RegistryPackage>
```

#### Example 3 – Full view of ebRIM Registry Package that contains a full EO Product representation

```
<rim:RegistryPackage id="urn:uuid:491265a5-3646-4a17-8595-782454ec4e00"
objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:RegistryPackage">
  <rim:Name>
    <rim:LocalizedString xml:lang="en-US" charset="UTF-8" value="EOProduct"/>
  </rim:Name>
  <rim:RegistryObjectList>
    <rim:ExtrinsicObject id="urn:x-
dali:sat:Shift0:a21:43733800701100016312I:dn:4377990:0"
objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct">
```

```

    <rim:Slot name=" http://www.opengis.net/def/property/OGC-
EO/0/ImageQualityDegradation" slotType="urn:oasis:names:tc:ebxml-
regrep:DataType:Double">
    <rim:ValueList>
    <rim:Value>75.0</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Slot name="http://www.opengis.net/def/property/OGC-EO/0/ProductType"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:String">
    <rim:ValueList>
    <rim:Value>Scene</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/BeginPosition"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:DateTime">
    <rim:ValueList>
    <rim:Value>2007-01-10T00:16:31Z</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/MultiExtentOf"
slotType="urn:ogc:def:dataType:ISO-19107:2003:GM_Object">
    <wrs:ValueList xmlns:wrs="http://www.opengis.net/cat/wrs/1.0">
    <wrs:AnyValue xmlns:gml="http://www.opengis.net/gml">
    <gml:Polygon srsName=" urn:ogc:def:crs:EPSG:6.3:4326">
    <gml:exterior>
    <gml:LinearRing srsName=" urn:ogc:def:crs:EPSG:6.3:4326">
    <gml:pos>147.49 -15.22700023651123</gml:pos>
    <gml:pos>148.1592 -15.340299606323242</gml:pos>
    <gml:pos>148.2935882414475 -14.803518295288086</gml:pos>
    <gml:pos>147.62540931867474 -14.691240310668945</gml:pos>
    <gml:pos>147.49 -15.22700023651123</gml:pos>
    </gml:LinearRing>
    </gml:exterior>
    </gml:Polygon>
    </wrs:AnyValue>
    </wrs:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/EndPosition"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:DateTime">
    <rim:ValueList>
    <rim:Value>2007-01-10T00:16:31Z</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/AcquisitionType"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:String">
    <rim:ValueList>
    <rim:Value>NOMINAL</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-
EO/0/CloudCoverPercentage" slotType="urn:oasis:names:tc:ebxml-regrep:DataType:Double">
    <rim:ValueList>
    <rim:Value>100.0</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-
EO/0/SnowCoverPercentage" slotType="urn:oasis:names:tc:ebxml-regrep:DataType:Double">
    <rim:ValueList>
    <rim:Value>100.0</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/OrbitNumber"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:Integer">
    <rim:ValueList>
    <rim:Value>235</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/Status"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:String">
    <rim:ValueList>
    <rim:Value>ACQUIRED</rim:Value>
    </rim:ValueList>
  </rim:Slot>

```

```

</rim:ExtrinsicObject>
<rim:Classification id="urn:x-dali:sat:Shift0:a21:43733800701100016312I:dn:4377990:50"
classifiedObject="urn:x-dali:sat:Shift0:a21:43733800701100016312I:dn:4377990:0"
classificationNode="urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-
EO:2.0:EOProductTypes:OPT" classificationScheme="urn:ogc:def:classificationScheme:OGC-
CSW-ebRIM-EO:2.0:EOProductTypes"></rim:Classification>
<rim:ExtrinsicObject id="urn:x-dali:sat:Shift0:a21:43733800701100016312I:dn:4377990:3"
objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOAcquisitionPlatform">
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/SensorType"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:String">
    <rim:ValueList>
      <rim:Value>OPTICAL</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/InstrumentShortName"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:String">
    <rim:ValueList>
      <rim:Value>HRVIR-Nb2</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-
EO/0/PlatformSerialIdentifier" slotType="urn:oasis:names:tc:ebxml-
regrep:DataType:String">
    <rim:ValueList>
      <rim:Value>I</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Name>
    <rim:LocalizedString xml:lang="en-US" charset="UTF-8" value="Spot4"/>
  </rim:Name>
</rim:ExtrinsicObject>
<rim:Association id="urn:x-dali:sat:Shift0:a21:43733800701100016312I:dn:4377990:21"
associationType="urn:ogc:def:associationType:OGC-CSW-ebRIM-EO:2.0:AcquiredBy"
sourceObject="urn:x-dali:sat:Shift0:a21:43733800701100016312I:dn:4377990:0"
targetObject="urn:x-
dali:sat:Shift0:a21:43733800701100016312I:dn:4377990:3"></rim:Association>
</rim:RegistryObjectList>
</rim:RegistryPackage>

```

## Examples

Annex F.2 contains GetRecords request and response examples.

## Exceptions

If the request is deemed invalid for any reason (e.g. missing a required element), the service shall return an *ows:ExceptionReport* containing a service exception with the code *wrs:InvalidRequest*.

### C.3.3 DescribeRecord Operation

The *DescribeRecord* operation allows a client to discover the information model(s) supported by the catalogue and to retrieve record type definitions.

The *DescribeRecord* operation is described in section 9 of [OGC 07-110r4]. The XML representation of the entity body, if present, shall conform to the *csw:DescribeRecord* element declaration. The *TypeName* elements, if present, identify the model elements for which type definitions are requested.

### DescribeRecord Request

The only schema language currently supported by the ebRIM Profile is W3C XML Schema. The corresponding value of the `schemaLanguage` attribute is given by the following URI: “<http://www.w3c.org/2001/XMLSchema>”

### DescribeRecord Response

If the request is processed successfully, the body of the response message shall include an XML document where the document element has the following infoset properties:

- A [local name] of ‘*DescribeRecordResponse*’,
- A [namespace name] of ‘<http://www.opengis.net/cat/csw/2.0.2>’ (usually represented by the ‘*csw*’ prefix).

If no *TypeName* elements were provided in the request, the whole schemas defining the information model shall be included within *csw:SchemaComponent* elements. If there are no matching schema components, the document element shall be empty.

The content of a *csw:SchemaComponent* element may be a complete schema or a fragment of one. If it is a fragment, the *parentSchema* attribute shall reference the source schema (by identifier).

### Exceptions

If the request is deemed invalid for any reason (e.g. missing a required element), the service shall return an *ows:ExceptionReport* containing a service exception with the code *wrs:InvalidRequest*.

### C.3.4 GetRecordById Operation

The *GetRecordById* operation provides a simple means of retrieving one or more records by identifier; the identifier may be that of some registry object (*rim:RegistryObject/@id*) or an external identifier (*rim:ExternalIdentifier/@value*) assigned to a registry object. The messages are defined in a schema that can be found in the Annex B of [OGC 07-110r4].

The *GetRecordById* operation is described in section 11 of [OGC 07-110r4].

### GetRecordById Request

The XML representation of the entity body, if present, shall conform to the *csw:GetRecordById* element declaration. If using the GET method, all reserved characters (e.g., general delimiters) appearing in identifier values shall be suitably percent-encoded in the KVP representation. The value of an *Id* (message parameter) item identifies a registry object either directly or by an external identifier that corresponds to a child *rim:ExternalIdentifier* element.

**Table 56 – GetRecordById Operation Parameters**

Parameter	Data type and value	Optionality
Service	Character String. Fixed value of 'CSW'	Mandatory
Version	Character String. Fixed value of '2.0.2'	Mandatory
OutputFormat	CharacterString. The only supported value is 'application/xml' (default value)	Optional
OutputSchema	CodeList. One of 'urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0' (default value) or 'http://www.opengis.net/cat/csw/2.0.2'.	Optional
Id	Comma separated list of anyURI	Mandatory

**GetRecordById Response**

If the request is processed successfully, the body of the response message shall include an XML document where the document element has the following infoset properties:

- A [local name] of '*GetRecordByIdResponse*',
- A [namespace name] of '<http://www.opengis.net/cat/csw/2.0.2>' (usually represented by the 'csw' prefix).

The child elements shall be registry object representations (i.e. *rim:RegistryObject* or some valid substitution element) corresponding to the requested identifier. If a match for an external identifier is found, the related registry object is included. If there are no matching records, an empty response is returned.

**Examples**

Annex F.3 contains GetRecordById request and response examples.

**Exceptions**

If the request is deemed invalid for any reason (e.g. missing a required element), the service shall return an *ows:ExceptionReport* containing a service exception with the code *wrs:InvalidRequest*.

**C.3.5 GetRepositoryItemById operation**

The *GetRepositoryItemById* operation is used to retrieve the repository item corresponding to some extrinsic object by identifier; the identifier may be that of

some registry object (*rim:RegistryObject/@id*) or an external identifier (*rim:ExternalIdentifier/@value*) assigned to a registry object.

In the context of EO Product Extension Package, a *GetRepositoryItemById* request with an id matching a *urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProductExtrinsicObject* shall return the EO O&M attached to this object, if it is available.

This operation corresponds to the *GetRepositoryItem* operation of the ebRIM profile 1.0 of CSW 2.0.2. At the time of writing, the *GetRepositoryItemById* operation is currently under the specification process of ebRIM profile 2.0 and not yet released (CR 10-175). For the purpose of this document, we defined this operation in the CATEOP namespace (<http://www.opengis.net/cateop/2.0>).

### GetRepositoryItemById Request

The XML representation of the entity body, if present, shall conform to the *cateop:GetRepositoryItems* element declaration. If using the GET method, all reserved characters (e.g., general delimiters) appearing in identifier values shall be suitably percent-encoded in the KVP representation. The value of an *Id* (message parameter) item identifies a registry object either directly or by an external identifier that corresponds to a child *rim:ExternalIdentifier* element.

**Table 57 – GetRepositoryItemById Operation Parameters**

Parameter	Data type and value	Optionality
Service	Character String. Fixed value of 'CSW-ebRIM'	Mandatory
Version	Character String. Fixed value of '2.0.0'	Mandatory
Id	CharacterString. Comma separated list of Absolute URI that specifies the identifiers of the extrinsic objects.	Mandatory

Here is the XSD definition of the *GetRepositoryItemById* request:

```
<xsd:element name="GetRepositoryItemById">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="Id" type="xsd:anyURI"/>
    </xsd:sequence>
    <xsd:attribute name="version" type="xsd:string"
use="required" fixed="2.0.2"/>
    <xsd:attribute name="service" type="xsd:string"
use="required" fixed="CSW-ebRIM"/>
  </xsd:complexType>
</xsd:element>
```

Here is an example of *GetRepositoryItemById* request:

```
<cateop:GetRepositoryItemById
  xmlns:cateop=" http://www.opengis.net/cateop/2.0"
  xmlns:csw="http://www.opengis.net/cat/csw/2.0.2"
  version="2.0.2" service="CSW-ebRIM">
  <cateop:Id>DS_PHR1A_20010822110247_TLS_PX_E123N45_0101_0123
  4_LMB</eop:Id>
</cateop:GetRepositoryItemById>
```

### GetRepositoryItem Response

If the request is processed successfully, the *GetRepositoryItemById* operation returns the metadata associated to a *RegistryObject*. If there are no matching records, an empty response is returned.

This metadata could be textual or binary data. As specified in OGC 06-121r8 “OGC Web Services Common Specification”, for binary data send via SOAP message, the Message Transportation Optimization Mechanism (MTOM) shall be used in conjunction with XML-binary Optimized Packaging (XOP).

When all the *RepositoryItems* are XML data, the *RepositoryItems* are directly encoded in the response inside the *repositoryItemXML* element. An XML data has an XML Mime Type like *text/xml*, *application/xml* or *application/vnd.google-earth.kml+xml*.

In this Earth Observation Product extension package, the *RepositoryItems* are O&M XML documents.

Here is the XSD definition of the *GetRepositoryItemByIdResponse*:

```
<xsd:element name="GetRepositoryItemsResponse">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element ref="wrs:ExtrinsicObject" minOccurs="0"
maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
```

Here is an example of *GetRepositoryItemByIdResponse*:

```
<cateop:GetRepositoryItemByIdResponse>
  <cateop:ExtrinsicObject id="eo-1"
mimeType="application/xml">
  <cateop:repositoryItemXML>
    <eop:EarthObservation
xmlns:eop="http://earth.esa.int/eop">
  ...
  </eop:EarthObservation>
```



```

    </cateop:repositoryItemXML>
  </cateop:ExtrinsicObject>
</cateop:GetRepositoryItemByIdResponse>

```

For binary data, the *GetRepositoryItemById* operation in SOAP uses the XOP-MTOM mechanism to return the metadata in a SOAP response.

**C.3.6 GetRepositoryItems Operation**

The *GetRepositoryItems* operation is used to retrieve a set of repository items corresponding to some search criteria. This request allows retrieving in one response a set of repositoryItems matching the search criteria. It corresponds to a *GetRecords* request followed by a *GetRepositoryItemById* (or *GetRepositoryItem* in CSW-ebRIM 1.0) request for each record.

At the time of writing, the *GetRepositoryItems* operation is currently under the specification process of ebRIM profile 2.0 and not yet released. For the purpose of this document, we defined this operation in the CATEOP namespace (<http://www.opengis.net/cateop/2.0>).

**GetRepositoryItems Request**

The XML representation of the entity body, if present, shall conform to the *cateop:GetRepositoryItems* element declaration.

The following table specifies attributes of the *cateop:GetRepositoryItems* operation message.

**Table 58 – GetRepositoryItems Operation Parameters**

Parameter	Data type and value	Optionality
Service	Character String. Fixed value of ‘ <i>CSW-ebRIM</i> ’	One (Mandatory)
Version	Character String. Fixed value of ‘ <i>2.0.0</i> ’	One (Mandatory)
ResultType	CodeList. One of ‘ <i>hits</i> ’ (default value) or ‘ <i>results</i> ’.	Zero or one (Optional)
StartPosition	PositiveInteger. Default Value is <i>1</i>	Zero or one (Optional)
MaxRecords	PositiveInteger. Default Value is <i>10</i>	Zero or one (Optional)

Parameter	Data type and value	Optionality
TypeNames (Query@typenames )	List of Character String, white space separated. Unordered List of object types implicated in the query. In the conformance level 1 (see Annex about Conformance Levels), the only required object type is rim:RegistryPackage.	Optional
ConstraintLanguage	CodeList. The only supported value is 'FILTER' (default value). Note that the support of the 1.1.0 version of OGC Filter Encoding [OGC 04-095] is mandatory.	Optional
Constraint	String. The predicate expression specified in the language indicated by the ConstraintLanguage parameter. Default action is to execute an unconstrained query.	Optional.
SortBy	List of Character String, comma separated Ordered list of names of metadata elements to use for sorting the response. Default action is to present the records in the order in which they are received. <sup>11</sup>	Optional

Here is the XSD definition of the *GetRepositoryItems* request:

```
<xsd:element name="GetRepositoryItems">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element ref="csw:AbstractQuery"/>
    </xsd:sequence>
    <xsd:attribute name="version" type="xsd:string"
use="required" fixed="2.0.2"/>
    <xsd:attribute name="service" type="xsd:string"
use="required" fixed="CSW-ebRIM"/>
    <xsd:attribute name="startPosition" type="xsd:int"
use="required"/>
    <xsd:attribute name="maxRecords" type="xsd:int"
use="required"/>
    <xsd:attribute name="resultType" type="wrs:ResultType"/>
  </xsd:complexType>
</xsd:element>
```

Here is an example of *GetRepositoryItems* request:

---

<sup>11</sup> The CSW specification (OGC07-006r1) defines the syntax of the SortBy parameter in the section 10.8.4.12. In this section, no default sort order is defined but the Table 11 from the Abstract model stipulates that the default sort order is "descending". If the the SortBy parameter is not specified, there is no constraint on the records order. Unsupported properties are ignored without throwing errors.

```

<cateop:GetRepositoryItems
xmlns:cateop="http://www.opengis.net/cateop/2.0"
xmlns:csw="http://www.opengis.net/cat/csw/2.0.2"
xmlns:ogc="http://www.opengis.net/ogc"
xmlns:gml="http://www.opengis.net/gml" resultType="results"
version="2.0.2" maxRecords="10"
outputSchema="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
startPosition="1">
  <csw:Query typeNames="ExtrinsicObject">
    <csw:ElementName>ExtrinsicObject</csw:ElementName>
    <csw:Constraint version="1.0.0">
      <ogc:Filter>
        <ogc:PropertyIsEqualTo>

          <ogc:PropertyName>/ExtrinsicObject/@objectType</ogc:Propert
yName>

          <ogc:Literal>urn:ogc:def:objectType:OGC-CSW-
ebRIM-EO:2.0:EOProduct</ogc:Literal>
        </ogc:PropertyIsEqualTo>
      </ogc:Filter>
    </csw:Constraint>
  </csw:Query>
</cateop:GetRepositoryItems>

```

### GetRepositoryItem Response

If the request is processed successfully, the *GetRepositoryItems* operation returns the set of metadata items matching the search criteria. If there are no matching records, an empty response is returned.

This metadata could be textual or binary data. As specified in OGC 06-121r8 “OGC Web Services Common Specification”, for binary data send via SOAP message, the Message Transportation Optimization Mechanism (MTOM) shall be used in conjunction with XML-binary Optimized Packaging (XOP).

When all the RepositoryItems are XML data, the RepositoryItems are directly encoded in the response inside the `repositoryItemXML` element. An XML data has an XML Mime Type like `text/xml`, `application/xml` or `application/vnd.google-earth.kml+xml`.

In this Earth Observation Product extension package, the RepositoryItems are O&M XML documents.

Here is the XSD definition of the `GetRepositoryItemsResponse`:

```

<xsd:element name="GetRepositoryItemsResponse">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element ref="wrs:ExtrinsicObject" minOccurs="0"
maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>

```

```
</xsd:element>
```

Here is an example of `GetRepositoryItemsResponse`:

```
<cateop:GetRepositoryItemsResponse>
  <cateop:ExtrinsicObject id="eo-1"
  mimeType="application/xml">
    <cateop:repositoryItemXML>
      <eop:EarthObservation xmlns:eop="
http://www.opengis.net/eop/2.0">
        ...
      </eop:EarthObservation>
    </wrs:repositoryItemXML>
  </wrs:ExtrinsicObject>
  <wrs:ExtrinsicObject id="eo-2" mimeType="application/xml">
    <wrs:repositoryItemXML>
      <eop:EarthObservation xmlns:eop="
http://www.opengis.net/eop/2.0">
        ...
      </eop:EarthObservation>
    </cateop:repositoryItemXML>
</cateop:GetRepositoryItemsResponse>
```

For binary data, the `GetRepositoryItems` operation in SOAP uses the XOP-MTOM mechanism to return the metadata in a SOAP response.

The encoding of the `RepositoryItems` must be the same and must be converted if necessary.

### C.3.7 Harvest Operation

The *Harvest* operation is described in section 14 of [OGC 07-110r4]. It allows a user to request the catalogue to harvest a resource from a specified network location, thereby realizing a ‘pull’ model for publishing registry content. If the catalogue successfully retrieves the resource and successfully processes it, then one or more corresponding registry objects are created or updated. Brief representations (see subclause 14.1 of [OGC 07-110r4]) of all modified records are returned to the client when processing is complete.

This publication operation is optional in Earth Observation ebRIM Catalogue. If not implemented, the catalogue is ‘read-only’ and only discovery operations are available.

#### Harvest Request

The `csw:Source` element specifies a URL from which the resource may be retrieved. The scheme component shall correspond to a protocol supported by the catalogue; support for the ‘*http*’ scheme is required by all conforming implementations, and

‘HTTP/1.1’ shall be listed in the capabilities document as a value for the ‘*harvest-protocols*’ system property.

If specified, the *csw:ResourceType* element shall indicate the object type of the corresponding extrinsic object. It may be possible for the catalogue to deduce this from the content of the resource (for example, an optical EO Product description that conforms to the opt schemas). The value should correspond to a type supported by the catalogue, as identified in the *objectType* classification scheme.

The *harvest* operation definition shall advertise the support for EO Metadata *resourceType* using the following literal<sup>12</sup> values:

- http://www.opengis.net/eop/2.0
- http://www.opengis.net/opt/2.0
- http://www.opengis.net/sar/2.0
- http://www.opengis.net/atm/2.0
- http://www.opengis.net/alt/2.0
- http://www.opengis.net/lmb/2.0
- http://www.opengis.net/ssp/2.0

Example 4 – Harvest Operation Definition in the Capabilities

```
<Operation name="Harvest">
  <DCP>
    <HTTP>
      <Get xlink:href="http://..." xlink:type="simple" xmlns:xlink="http://www.w3.org/1999/xlink"/>
      <Post xlink:href="http://..." xlink:type="simple" xmlns:xlink="http://www.w3.org/1999/xlink"/>
    </HTTP>
  </DCP>
  <Parameter name="resourceType">
    <Value>http://www.opengis.net/eop/2.0</Value>
    <Value>http://www.opengis.net/sar/2.0</Value>
    <Value>http://www.opengis.net/opt/2.0</Value>
    <Value>http://www.opengis.net/atm/2.0</Value>
    <Value>http://www.opengis.net/alt/2.0</Value>
    <Value>http://www.opengis.net/lmb/2.0</Value>
    <Value>http://www.opengis.net/ssp/2.0</Value>
  </Parameter>
  <Parameter name="source">
  </Parameter>
</Operation>
```

## Harvest Response

If the request is processed successfully, the body of the response message shall include an XML document where the document element has the following infoset properties:

<sup>12</sup> Note that the 3 letters acronyms (eop, sar, opt and atm) are not XML prefixes. ResourceType is not a QName.

- A [local name] of ‘*HarvestResponse*’,
- A [namespace name] of ‘<http://www.opengis.net/cat/csw/2.0.2>’ (usually represented by the ‘*csw*’ prefix).

The document element shall include a *csw:TransactionResponse* element that contains the *csw:InsertResults* child element; this element shall list all registry objects that were created as a result of the harvesting operation.

### Exceptions

If the resource cannot be retrieved from the source URL, an exception with the code *wrs:NotFound* shall be included in an *ogc:ExceptionReport*. If the resource format is not supported by the catalogue or the object type is not recognized, an exception with code *wrs:NotSupported* shall be returned. In the event that the transaction cannot be completed for any reason, an exception with the *wrs:TransactionFailed* code shall be returned.

## C.4 SOAP 1.1 Implementation

If SOAP 1.1 is used, only SOAP messaging (via HTTP/POST) with document/literal style shall be used, the expected SOAP Actions are:

<http://www.opengis.net/cat/csw/2.0.2/requests#GetCapabilities>  
<http://www.opengis.net/cat/csw/2.0.2/requests#DescribeRecord>  
<http://www.opengis.net/cat/csw/2.0.2/requests#GetRecords>  
<http://www.opengis.net/cat/csw/2.0.2/requests#GetRecordById>  
<http://www.opengis.net/cat/csw/2.0.2/requests#Harvest>  
<http://www.opengis.net/cat/wrs/1.0.0/requests#GetRepositoryItem>

These two values are to be used with this extension package

<http://www.opengis.net/cateop/2.0/requests#GetRepositoryItems>  
<http://www.opengis.net/cateop/2.0/requests#GetRepositoryItemByID>

You have below a request/response sample with the SOAP envelope information.

### C.4.1 Request

```
POST /daliproxy/wrs/DALIPROXYLAZY HTTP/1.0
Content-Type: text/xml; charset=utf-8
Accept: application/soap+xml, application/dime, multipart/related, text/*
User-Agent: Axis#axisVersion#
Host: dev.ionicsoft.com
Cache-Control: no-cache
Pragma: no-cache
SOAPAction: "http://www.opengis.net/cat/csw/2.0.2/requests#GetRecords"
Content-Length: 4121
Connection: close

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <soapenv:Body>
    .... // Any CSW Request
  </soapenv:Body>
</soapenv:Envelope>
```

## C.4.2 Response

```
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Body>
    .... // Any CSW Response
  </soap:Body>
</soap:Envelope>
```

## C.4.3 Error response

```
<?xml version="1.0" encoding="UTF-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://schemas.xmlsoap.org/soap/envelope/ ../schemas/soap/envelope.xsd">
  <soap:Body>
    <soap:Fault>
      <soap:faultcode>soap:Server</soap:faultcode>
      <soap:faultstring>A server exception was encountered.</soap:faultstring>
      <soap:detail>
        <ows:ExceptionReport version="1.2.0" xmlns:ows="http://www.opengis.net/ows"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.opengis.net/ows
../schemas/hma/catalogue/0.2.1/ows/1.0.0/owsExceptionReport.xsd">
          <ows:Exception exceptionCode="wrs:InvalidRequest" locator="The optional locator attribute may
be used to indicate where an exception was encountered in the request that generated the error">
            <ows:ExceptionText>Message describing the occurred error.</ows:ExceptionText>
          </ows:Exception>
        </ows:ExceptionReport>
      </soap:detail>
    </soap:Fault>
  </soap:Body>
</soap:Envelope>
```

## **Annex D: HMA IMPLEMENTATION GUIDELINES**

The HMA initiative adds some constraints to guarantee interoperability.

### **D.1 SOAP Protocol Binding**

In the HMA context, all operations shall support the embedding of requests and responses in SOAP 1.1 (with Attachment Feature for operations which need data transfer), with the exception of GetRepositoryItem, that is only bound to HTTP GET method, as described below.

If present, the value of the optional ‘action’ attribute on the ‘application/soap+xml’ media type shall be set to ‘urn:x-ogc:specification:csw-ebrim:EO’ for all requests. Note that the presence of this attribute can be used (e.g. by firewalls) to appropriately filter SOAP request messages.

<http://www.opengis.net/def/property/OGC-EO/0/>



## Annex E: IMPLEMENTATION ARCHITECTURES (INFORMATIVE)

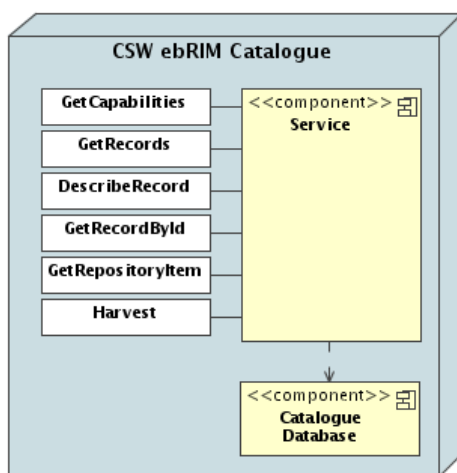
This specification describes interface and behavior of ebRIM Catalogues able to deal with Earth Observation Product Metadata. Such Catalogues can be deployed to manage EO Resources, in a ‘stand-alone’ mode (the catalogue acts as a registry and a repository where metadata are stored and indexed), or to provide an OGC compliant layer upon legacy catalogues, already deployed and serving existing data.

This annex focuses on these two possibilities, and provides some guidance on the way to implement both architectures.

### E.1 Stand-Alone Architecture

This is the simplest architecture. The Catalogue is used as a repository (for storing data) and as a registry (for indexing data). It is OGC compliant and provides all capabilities and operations defined in OGC ebRIM Application Profile for CSW document. It is able to map incoming data (in this case EO Products) to objects defined by the Data Model described in this specification.

Every resource (EarthObservation Product) is stored within the Catalogue and indexed to allow complex queries and fast retrieving. If needed, additional ebRIM associations and classifications (e.g., to additional business-related taxonomies) can extend the EO data model and provide additional metadata discovery facilities to implement new use-cases. EO Products might, for example, be linked to an object or structure describing their pricing model, in an eBusiness use-case.



**Figure 10: Stand-Alone Architecture**

## E.2 Proxy Architecture

If Earth Observation Products are already stored in legacy (non OGC-compliant) catalogues, the goal of this architecture is to provide an OGC compliant interface onto existing data.

From a very high-level point of view, two modes can be considered:

- The OGC layer is viewed as a **front-end** layer on the legacy catalogue: incoming requests are linked on the fly to the legacy catalogue, result sets are converted from the legacy format to the OGC CSW ebRIM format and responses are sent back to the user.
- The OGC layer is viewed as a **replication** of the legacy catalogue: metadata are harvested from the legacy catalogue, resulting in indexes (and eventually metadata themselves) available for discovery directly in the OGC layer. Queries are processed without querying on the legacy catalogue. Synchronization mechanisms exist between the two catalogues.

### E.2.1 Front-End Architecture

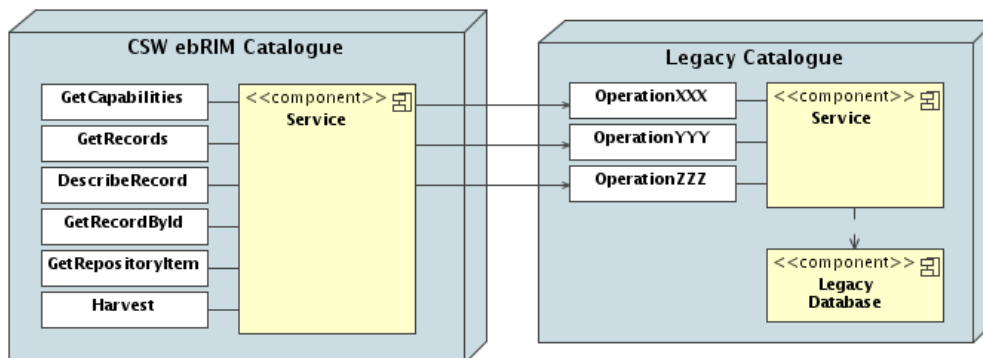
In this architecture, OGC queries must be translated to their native version (understandable by legacy catalogues) and executed on the proxied catalogue in real time. Native responses must then be translated to be sent to the final user in an OGC compliant way.

OGC CSW ebRIM Interface operations must either be directly mapped to operations available on the legacy catalogue, or processed (or emulated) by the CSW front-end. It can result in some limitations; the legacy catalogue might not provide all the functionalities needed to implement a compliant OGC CSW ebRIM interface.

Such architecture requires a permanent connection between the legacy catalogue and the front-end, and can considerably increase network traffic. Performance is strongly dependent of the legacy infrastructure. Each required CSW operation should be emulated using a combination of one or more legacy operations. The results will then be processed and formatted to be returned in an OGC compliant way.

A source of limitation and complexity appears if the legacy catalogue is not able to serve the metadata in the EO O&M format. Indeed, if requested, the EO O&M should be generated on-the-fly, and the information available in the legacy catalogue might not be sufficient to fill in the EO O&M structure. Moreover, the legacy metadata might be organized in very different way, needing multiple requests to gather needed information.

If metadata are rather static in the legacy database, a minimal caching mechanism can be used in the front-end layer to speed up queries, and avoid roundtrips to the legacy catalogue.



**Figure 11: Front-End Architecture**

This architecture avoids replication of data and synchronization mechanism to keep published data updated, indeed nothing is stored in the front-end layer.

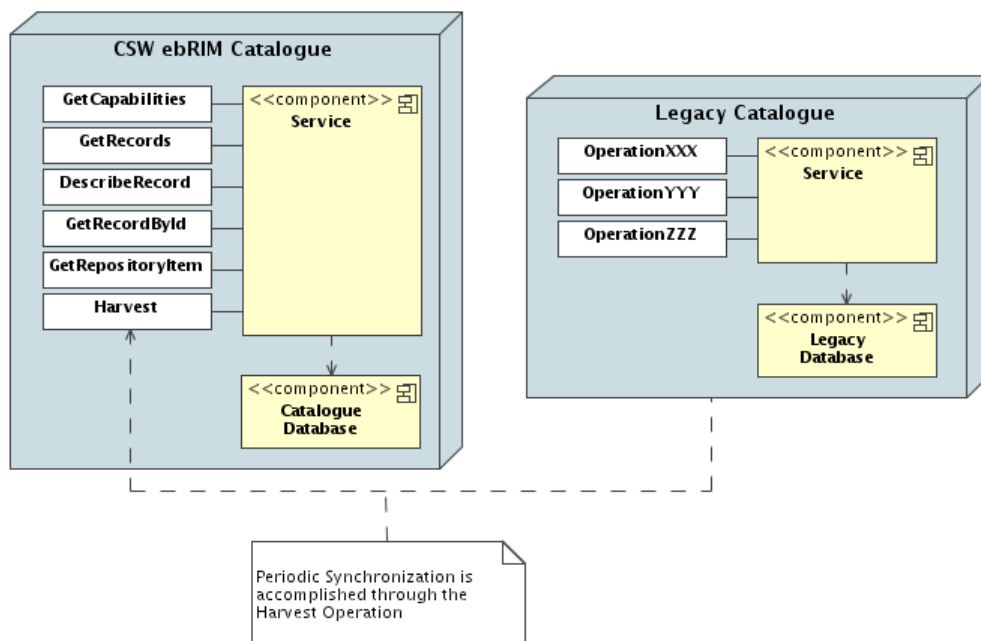
### E.2.2 Replication Architecture

The OGC layer is viewed as a **replication** of the legacy catalogue: indexes on metadata - and eventually metadata themselves - are available for discovery directly in the OGC layer. Queries are processed without querying in real-time the legacy catalogue. Synchronization (periodical or permanent) is needed between the two catalogues. This synchronization may be bidirectional if the replicated OGC Catalogue allows harvesting and/or transactional operations.

Harvest operation provides a publication ability to replicate every EO Products coming from the legacy catalogue to the OGC compliant one. Every resource is periodically submitted to the eBRIM Catalogue for storing and indexing, allowing complex queries and fast retrieving.

In this case, the only source of limitation and complexity comes from the quality and organization of the metadata coming from the legacy Catalogue. The legacy catalogue might not be able to serve the metadata in the EO O&M format. The EO O&M should be generated on-the-fly when requested, or generated during the Harvesting operation and stored in the replicated OGC Catalogue. Once again, the information available in the legacy catalogue might not be sufficient to fill in the EO O&M structure.

Note that, if needed, like for the stand-alone architecture, additional eBRIM associations and classifications (e.g., to additional business-related taxonomies) can extend the EO data model and provide additional metadata discovery facilities to implement new use-cases. EO Products might, for example, be linked to an object or structure describing their pricing model, in an eBusiness use-case.



**Figure 12: Replication Architecture**

**E.2.3 ‘Front-End’ vs ‘Replication’ Comparison**

Following table highlights benefits and disadvantages in both proxied architectures:

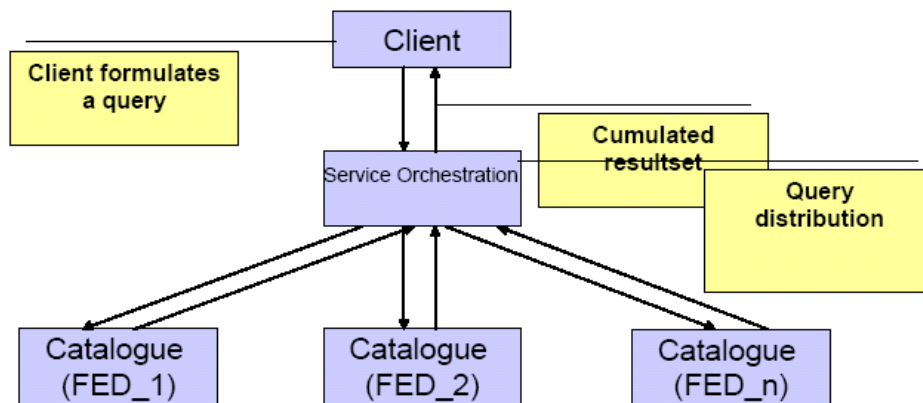
**Table 59 – ‘Front-End’ vs ‘Replication’ Comparison**

Front-End Architecture	Replication Architecture
(+) No database duplication, (+) Always ‘synchronized’ with the legacy catalogue,	(+) Full compliance on query requirements can be fulfilled, (+) Use of additional classifications or associations if needed, (+) No direct access to the legacy database, metadata are available in CSW database,

Front-End Architecture	Replication Architecture
(-) Inherits limitations from the legacy database and data access, (-) Permanent connection required to access legacy database, (-) Time and network-traffic consuming, (-) Full power of ebRIM cannot be exploited (additional classifications or associations),	(-) Database duplication, (-) Synchronization process needed,

**E.3 Distributed Search Implementation**

Although this extension package does not support DISTRIBUTEDSEARCH keyword in the GetRecords request, distributed searches can be implemented via a Web service orchestration engine, e.g. using OASIS BPEL as depicted below.



**Figure 13: Implementing distributed search**

**E.4 Proxy profile**

Considering the possible limitations related to the implementation of a Proxy architecture (see §E.2), this annex identifies the allowed deviations from the standard described in this document.

These deviations are primarily intended to accommodate legacy servers, where the implementation of the full specification would be unpractical or unfeasible, so as to clarify their expected behaviour and maintain the greatest possible extent of interoperability.

This profile allows a conforming server to deviate from the EO EP with respect to the following aspects:

- Queryable properties – since legacy catalogues may not be able to support all the queryable properties, these systems shall ignore unsupported queryables and process the query as far as possible; this behaviour deviates from what required in the correspondence tables in §8.2;
- Queries on multiple collections – since legacy catalogues may not be able to support complex Filter expression containing “or” or “and” conditions (used to search several EO collections with a single request, improving the efficiency of the catalogue), these systems shall only support queries on a single collection (i.e. parentIdentifier); this behaviour is similar to Conformance Level 1 in §H.1.1 and deviates from what is required in the baseline specifications.

## Annex F: EXAMPLES (INFORMATIVE)

### F.1 Service capabilities document

```

<?xml version='1.0' encoding='utf-8' ?>
<wrs:Capabilities version="1.0.0" xmlns:ionic="http://www.ionicsoft.com/versions/196611" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance" xsi:schemaLocation="http://www.opengis.net/cat/wrs/1.0
http://achemar:8280/erdaswrs/wrs/WRS/REQUEST/get/DATA/LPR/wrs/1.0.0/wrs-capabilities.xsd" xmlns:xlink="http://www.w3.org/1999/xlink"
xmlns:ows="http://www.opengis.net/ows" xmlns:wrs="http://www.opengis.net/cat/wrs/1.0">
<ows:ServiceIdentification xmlns:ows="http://www.opengis.net/ows" xmlns="http://www.opengis.net/ows">
  <Title>Ionic Web Registry Service</Title>
  <Abstract>A catalog service that conforms the HTTP protocol binding of the OpenGIS Catalog Service Specification Version 2.0.2.</Abstract>
  <Keywords>
    <Keyword>CSW</Keyword>
    <Keyword>ERDAS</Keyword>
    <Keyword>Geospatial</Keyword>
    <Keyword>Catalog</Keyword>
    <Keyword>RedSpider</Keyword>
  </Keywords>
  <ServiceType>CSW</ServiceType>
  <ServiceTypeVersion>2.0.2</ServiceTypeVersion>
  <Fees>NONE</Fees>
  <AccessConstraints>NONE</AccessConstraints>
</ows:ServiceIdentification>
<ows:ServiceProvider xmlns:ows="http://www.opengis.net/ows" xmlns="http://www.opengis.net/ows">
  <ProviderName>ERDAS S.A.</ProviderName>
  <ProviderSite xlink:href="http://www.ionicsoft.com" xlink:type="simple" xmlns:xlink="http://www.w3.org/1999/xlink"/>
  <ServiceContact>
    <IndividualName>Frédéric Houbie</IndividualName>
    <PositionName>Catalog Consultant</PositionName>
    <ContactInfo>
      <Phone>
        <Voice>+3243640364</Voice>
        <Facsimile>+3242534737</Facsimile>
      </Phone>
      <Address>
        <DeliveryPoint>Quai Timmermans, 14</DeliveryPoint>
        <City>Liege</City>
        <AdministrativeArea>Liege</AdministrativeArea>
        <PostalCode>4000</PostalCode>
        <Country>Belgium</Country>
        <ElectronicMailAddress>support@ionicsoft.com</ElectronicMailAddress>
      </Address>
      <OnlineResource xlink:href="mailto:support@ionicsoft.com" xlink:type="simple" xmlns:xlink="http://www.w3.org/1999/xlink"/>
      <HoursOfService>9-18</HoursOfService>
      <ContactInstructions>Call Me</ContactInstructions>
    </ContactInfo>
  </ServiceContact>
</ows:ServiceProvider>
<ows:OperationsMetadata xmlns:ows="http://www.opengis.net/ows" xmlns="http://www.opengis.net/ows">
  <Operation name="GetCapabilities">
    <DCP>
      <HTTP>
        <Get xlink:href="http://achemar:8280/erdaswrs/wrs/WRS?" xlink:type="simple" xmlns:xlink="http://www.w3.org/1999/xlink"/>
        <Post xlink:href="http://achemar:8280/erdaswrs/wrs/WRS" xlink:type="simple" xmlns:xlink="http://www.w3.org/1999/xlink"/>
      </HTTP>
    </DCP>
    <Parameter name="AcceptVersions">
      <Value>1.0.0</Value>
    </Parameter>
    <Parameter name="service">
      <Value>CSW</Value>
      <Value>CSW-ebRIM</Value>
    </Parameter>
    <Parameter name="version">
      <Value>2.0.2</Value>
      <Value>1.0.0</Value>
      <Value>2.0.0</Value>
    </Parameter>
    <Parameter name="AcceptFormats">
      <Value>text/xml</Value>
      <Value>application/xml</Value>
    </Parameter>
  </Operation>
  <Operation name="GetRecords">
    <DCP>
      <HTTP>
        <Get xlink:href="http://achemar:8280/erdaswrs/wrs/WRS?" xlink:type="simple" xmlns:xlink="http://www.w3.org/1999/xlink"/>
        <Post xlink:href="http://achemar:8280/erdaswrs/wrs/WRS" xlink:type="simple" xmlns:xlink="http://www.w3.org/1999/xlink"/>
      </HTTP>
    </DCP>
  </Operation>
</ows:OperationsMetadata>
</wrs:Capabilities>

```

```

</DCP>
<Parameter name="resultType">
  <Value>hits</Value>
  <Value>results</Value>
  <Value>validate</Value>
</Parameter>
<Parameter name="CONSTRAINTLANGUAGE">
  <Value>FILTER</Value>
</Parameter>
<Parameter name="DistributedSearch">
  <Value>FALSE</Value>
</Parameter>
<Parameter name="outputFormat">
  <Value>application/xml</Value>
  <Value>text/xml</Value>
  <Value>multipart/related</Value>
</Parameter>
<Parameter name="outputSchema">
  <Value>http://www.opengis.net/cat/csw/2.0.2</Value>
  <Value>urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0</Value>
</Parameter>
<Parameter name="typeName">
  <Value>csw:Record</Value>
  <Value>rim:RegistryObject</Value>
</Parameter>
</Operation>
<Operation name="GetRecordById">
  <DCP>
    <HTTP>
      <Get xlink:href="http://achernar:8280/erdaswrs/wrs/WRS?" xlink:type="simple" xmlns:xlink="http://www.w3.org/1999/xlink"/>
      <Post xlink:href="http://achernar:8280/erdaswrs/wrs/WRS" xlink:type="simple" xmlns:xlink="http://www.w3.org/1999/xlink"/>
    </HTTP>
  </DCP>
  <Parameter name="outputFormat">
    <Value>application/xml</Value>
    <Value>text/xml</Value>
    <Value>multipart/related</Value>
  </Parameter>
  <Parameter name="elementSetName">
    <Value>full</Value>
    <Value>brief</Value>
    <Value>summary</Value>
  </Parameter>
  <Parameter name="outputSchema">
    <Value>http://www.opengis.net/cat/csw/2.0.2</Value>
    <Value>urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0</Value>
  </Parameter>
  <Parameter name="typeName">
    <Value>csw:Record</Value>
    <Value>rim:RegistryObject</Value>
  </Parameter>
</Operation>
<Operation name="Harvest">
  <DCP>
    <HTTP>
      <Get xlink:href="http://achernar:8280/erdaswrs/wrs/WRS?" xlink:type="simple" xmlns:xlink="http://www.w3.org/1999/xlink"/>
      <Post xlink:href="http://achernar:8280/erdaswrs/wrs/WRS" xlink:type="simple" xmlns:xlink="http://www.w3.org/1999/xlink"/>
    </HTTP>
  </DCP>
  <Parameter name="resourceType">
    <Value>http://www.opengis.net/eop/2.0</Value>
    <Value>http://www.opengis.net/sar/2.0</Value>
    <Value>http://www.opengis.net/opt/2.0</Value>
    <Value>http://www.opengis.net/atm/2.0</Value>
    <Value>http://www.opengis.net/alt/2.0</Value>
    <Value>http://www.opengis.net/lmb/2.0</Value>
    <Value>http://www.opengis.net/ssp/2.0</Value>
  </Parameter>
</Operation>
<Operation name="DescribeRecord">
  <DCP>
    <HTTP>
      <Get xlink:href="http://achernar:8280/erdaswrs/wrs/WRS?" xlink:type="simple" xmlns:xlink="http://www.w3.org/1999/xlink"/>
      <Post xlink:href="http://achernar:8280/erdaswrs/wrs/WRS" xlink:type="simple" xmlns:xlink="http://www.w3.org/1999/xlink"/>
    </HTTP>
  </DCP>
  <Parameter name="outputFormat">
    <Value>application/xml</Value>
    <Value>text/xml</Value>
  </Parameter>
  <Parameter name="schemaLanguage">
    <Value>http://www.w3.org/TR/xmlschema-1</Value>
  </Parameter>
  <Parameter name="typeName">
    <Value>csw:Record</Value>
    <Value>rim:RegistryObject</Value>
  </Parameter>

```



```

</Operation>
<Operation name="GetRepositoryItem">
  <DCP>
    <HTTP>
      <Get xlink:href="http://achernar:8280/erdaswrs/wrs/WRS?" xlink:type="simple" xmlns:xlink="http://www.w3.org/1999/xlink"/>
      <Post xlink:href="http://achernar:8280/erdaswrs/wrs/WRS" xlink:type="simple" xmlns:xlink="http://www.w3.org/1999/xlink"/>
    </HTTP>
  </DCP>
</Operation>
<Operation name="DeleteResource">
  <DCP>
    <HTTP>
      <Get xlink:href="http://achernar:8280/erdaswrs/wrs/WRS?" xlink:type="simple" xmlns:xlink="http://www.w3.org/1999/xlink"/>
    </HTTP>
  </DCP>
</Operation>
<Operation name="Transaction">
  <DCP>
    <HTTP>
      <Post xlink:href="http://achernar:8280/erdaswrs/wrs/WRS" xlink:type="simple" xmlns:xlink="http://www.w3.org/1999/xlink"/>
    </HTTP>
  </DCP>
</Operation>
<Parameter name="service">
  <Value>http://www.opengis.net/cat/wrs/1.0</Value>
</Parameter>
<Parameter name="version">
  <Value>1.0.0</Value>
</Parameter>
<Constraint name="PostEncoding">
  <Value>XML</Value>
  <Value>SOAP</Value>
</Constraint>
<Constraint name="Content-Type">
  <Value>text/xml</Value>
  <Value>application/xml</Value>
  <Value>application/soap+xml</Value>
</Constraint>
<ExtendedCapabilities xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0">
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/ParentIdentifier"
  slotType="urn:oasis:names:tc:ebxml-regrep:DataType:String">
    <rim:ValueList>
      <rim:Value>urn:ogc:def:EOP:ESA:EECF.ENVISAT_ASA_APx_xS</rim:Value>
      <rim:Value>urn:ogc:def:EOP:ESA:EECF.ENVISAT_RA2_MWx_2C</rim:Value>
    </rim:ValueList>
  </rim:Slot>
</ExtendedCapabilities>
</ows:OperationsMetadata>
<Filter_Capabilities xmlns="http://www.opengis.net/ogc">
  <Spatial_Capabilities>
    <GeometryOperands xmlns:gml="http://www.opengis.net/gml">
      <GeometryOperand>gml:Point</GeometryOperand>
      <GeometryOperand>gml:LineString</GeometryOperand>
      <GeometryOperand>gml:Polygon</GeometryOperand>
      <GeometryOperand>gml:Envelope</GeometryOperand>
    </GeometryOperands>
    <SpatialOperators>
      <SpatialOperator name="BBOX"/>
      <SpatialOperator name="Equals"/>
      <SpatialOperator name="Disjoint"/>
      <SpatialOperator name="Intersects"/>
      <SpatialOperator name="Touches"/>
      <SpatialOperator name="Crosses"/>
      <SpatialOperator name="Within"/>
      <SpatialOperator name="Contains"/>
      <SpatialOperator name="Overlaps"/>
      <SpatialOperator name="Beyond"/>
      <SpatialOperator name="DWithin"/>
    </SpatialOperators>
  </Spatial_Capabilities>
  <Scalar_Capabilities>
    <LogicalOperators/>
    <ComparisonOperators>
      <ComparisonOperator>LessThan</ComparisonOperator>
      <ComparisonOperator>GreaterThan</ComparisonOperator>
      <ComparisonOperator>LessThanEqualTo</ComparisonOperator>
      <ComparisonOperator>GreaterThanEqualTo</ComparisonOperator>
      <ComparisonOperator>EqualTo</ComparisonOperator>
      <ComparisonOperator>NotEqualTo</ComparisonOperator>
      <ComparisonOperator>Like</ComparisonOperator>
      <ComparisonOperator>Between</ComparisonOperator>
      <ComparisonOperator>NullCheck</ComparisonOperator>
    </ComparisonOperators>
    <ArithmeticOperators>
      <SimpleArithmetic/>
    </ArithmeticOperators>
  </Scalar_Capabilities>

```

```

<Id_Capabilities>
  <EID/>
</Id_Capabilities>
</Filter_Capabilities>
</wrs:Capabilities>

```

## F.2 GetRecords operation

The `<csw:Query>` element is documented in Subclause 10.2.3 of [OGC 07-110r4]. It explains the use of binding variables – or aliases – to avoid ambiguity when specifying complex queries that navigate associations by traversing multiple links between related registry objects.

The value of the `Query/@typeName` attribute is a whitespace-separated list of object types that constitute the scope of the query. Each value in the list shall be a qualified type name. One or more variables may be bound to a type name.

A query like:

*“Give all EO Product having a begin position greater than 2007-01-01T00:00:00.000 and an acquisition platform sensor type equals to OPTICAL”*

Is expressed more formally as:

*“Give all EO Product Registry Package with an ExtrinsicObject of objectType equals to ‘urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct’, having a begin position greater than 2007-01-01T00:00:00.000, which are source of an Association of type ‘urn:ogc:def:associationType:OGC-CSW-ebRIM-EO:2.0:AcquiredBy’ pointing – as target – to an ExtrinsicObject having as objectType ‘urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOAcquisitionPlatform’ and having a sensorType equals to OPTICAL”*

Example 5 – GetRecords example.

```

<?xml version="1.0" encoding="UTF-8"?>
<csw:GetRecords xmlns:csw="http://www.opengis.net/cat/csw/2.0.2"
  xmlns:ogc="http://www.opengis.net/ogc" xmlns:gml="http://www.opengis.net/gml"
  xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0" outputSchema="urn:oasis:names:tc:ebxml-
  regrep:xsd:rim:3.0" version="2.0.2" service="CSW" resultType="results" startPosition="1"
  maxRecords="2">
  <csw:Query typeName="rim:RegistryPackage rim:ExtrinsicObject
  rim:ExtrinsicObject_ACQPLAT rim:Association">
    <csw:ElementSetName typeName="rim:RegistryPackage">full</csw:ElementSetName>
    <csw:Constraint version="1.1.0">
      <ogc:Filter>
        <ogc:And>
<!--This expression makes the link between the Registry Package and the elements it
contains -->
          <ogc:PropertyIsEqualTo>
<ogc:PropertyName>/rim:RegistryPackage/rim:RegistryObjectList[*]/rim:RegistryObject/@id</ogc:PropertyName>
            <ogc:PropertyName>/rim:ExtrinsicObject/@id</ogc:PropertyName>
          </ogc:PropertyIsEqualTo>

```

```

    <ogc:PropertyIsEqualTo>
      <ogc:PropertyName>/rim:ExtrinsicObject/@objectType</ogc:PropertyName>
      <ogc:Literal>urn:ogc:def:objectType:OGC-CSW-ebRIM-
EO:2.0:EOProduct</ogc:Literal>
      </ogc:PropertyIsEqualTo>
      <ogc:PropertyIsGreaterThanOrEqualTo>
      <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/BeginPosition"]/rim:ValueList/rim:Value[1]</ogc:PropertyName>
      <ogc:Literal>2007-01-10T00:00:00.000</ogc:Literal>
      </ogc:PropertyIsGreaterThanOrEqualTo>
      <ogc:PropertyIsEqualTo>
      <ogc:PropertyName>$SACQPLAT/@objectType</ogc:PropertyName>
      <ogc:Literal>urn:ogc:def:objectType:OGC-CSW-ebRIM-
EO:2.0:EOAcquisitionPlatform</ogc:Literal>
      </ogc:PropertyIsEqualTo>
      <ogc:PropertyIsEqualTo>
      <ogc:PropertyName>$SACQPLAT/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/SensorType"]/rim:ValueList/rim:Value[1]</ogc:PropertyName>
      <ogc:Literal>OPTICAL</ogc:Literal>
      </ogc:PropertyIsEqualTo>
      <ogc:PropertyIsEqualTo>
      <ogc:PropertyName>/rim:Association/@associationType</ogc:PropertyName>
      <ogc:Literal>urn:ogc:def:associationType:OGC-CSW-ebRIM-
EO:2.0:AcquiredBy</ogc:Literal>
      </ogc:PropertyIsEqualTo>
      <ogc:PropertyIsEqualTo>
      <ogc:PropertyName>/rim:Association/@sourceObject</ogc:PropertyName>
      <ogc:PropertyName>/rim:ExtrinsicObject/@id</ogc:PropertyName>
      </ogc:PropertyIsEqualTo>
      <ogc:PropertyIsEqualTo>
      <ogc:PropertyName>/rim:Association/@targetObject</ogc:PropertyName>
      <ogc:PropertyName>$SACQPLAT/@id</ogc:PropertyName>
      </ogc:PropertyIsEqualTo>
    </ogc:And>
  </ogc:Filter>
</csw:Constraint>
<csw:SortBy>
  <ogc:SortProperty>
    <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/BeginPosition"]/rim:ValueList/rim:Value[1]</ogc:PropertyName>
    <ogc:SortOrder>ASC</ogc:SortOrder>
  </ogc:SortProperty>
</csw:SortBy>
</csw:Query>
</csw:GetRecords>

```

In this request, four aliases are declared in the typenames attribute of the <csw:query>. One for the Registry Package, two aliases have the rim:ExtrinsicObject type and one has the rim:Association type. The first rim:extrinsicObject alias is named

‘ACQPLAT’ ; the other one has no name. If no name is used for the alias, it shall be referred to in the request using its type (rim:ExtrinsicObject or rim:Association). If the alias has a name, \$AliasName shall be used. A named alias is required as soon as several objects with the same type shall be filtered on. In the example, the acquisitionPlatform object and the EOProduct object have the same ‘ExtrinsicObject’ type so one of them shall be named.

In the example, the filter applied to the rim:ExtrinsicObject alias states that it is an EOProduct object with a beginDate greater than ‘2007-01-01T00:00:00.000’. The ACQPLAT alias is then filtered: it shall be an Acquisitionplatform type with a sensor type equals to ‘OPTICAL’. The two objects are then linked together. This is done by a filter on an Association object, which shall have AcquiredBy as its objectType, a sourceObject equals to the EOProduct id and a target Object equals to the AcquisitionPlatform id.

Specifying rim:RegistryPackage as the value of the ElementSetName parameter implies that the RegistryPackage structure will be returned. As the RegistryPackage contains all the objects that represent an EOProduct, the full representation of that EO Product will be sent back by the server.

This request returns the ‘full’ information (EOProduct, ExternalIdentifier, classification, AcquisitionPlatform and association objects) as shown below:

Example 6 – GetRecordsResponse example.

```
<?xml version="1.0" encoding="UTF-8"?>
<csw:GetRecordsResponse xmlns:csw="http://www.opengis.net/cat/csw/2.0.2"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://www.opengis.net/cat/csw/2.0.2"
xsi:schemaLocation="http://www.opengis.net/cat/csw/2.0.2
http://dev.ionicsoft.com:80/daliproxy/wrs/DALIPROXYLAZY/REQUEST/get/DATA/LPR/csw/2.0.2/CSW-
publication.xsd">
  <csw:SearchStatus/>
  <csw:SearchResults xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
numberOfRecordsMatched="3128834" numberOfRecordsReturned="2" nextRecord="21" xsi:schemaLocation="">
<rim:RegistryPackage id="urn:uuid:491265a5-3646-4a17-8595-782454ec4e00"
objectType="urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject:RegistryPackage">
  <rim:Name>
  <rim:LocalizedString xml:lang="en-US" charset="UTF-8" value="EOProduct"/>
  </rim:Name>
  <rim:RegistryObjectList>
    <rim:ExtrinsicObject id="urn:x-dali:sat:Shift0:a21:43733800701100016312I:dn:4377990:0"
objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct">
      <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/ImageQualityDegradation"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:Double">
        <rim:ValueList>
          <rim:Value>75.0</rim:Value>
        </rim:ValueList>
      </rim:Slot>
      <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/CenterOf"
slotType="urn:ogc:def:dataType:ISO-19107:2003:GM_Object">
        <wrs:ValueList xmlns:wrs="http://www.opengis.net/cat/wrs/1.0">
          <wrs:AnyValue xmlns:gml="http://www.opengis.net/gml">
```

```

        <gml:Point srsName=" urn:ogc:def:crs:EPSG:6.3:4326">
          <gml:pos>147.89204939003056 -15.015514612197876</gml:pos>
        </gml:Point>
      </wrs:AnyValue>
    </wrs:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/ProductType"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:String">
    <rim:ValueList>
      <rim:Value>Scene</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/BeginPosition"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:DateTime">
    <rim:ValueList>
      <rim:Value>2007-01-10T00:16:31Z</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/LastOrbitNumber"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:Integer">
    <rim:ValueList>
      <rim:Value>235</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/MultiExtentOf"
slotType="urn:ogc:def:dataType:ISO-19107:2003:GM_Object">
    <wrs:ValueList xmlns:wrs="http://www.opengis.net/cat/wrs/1.0">
      <wrs:AnyValue xmlns:gml="http://www.opengis.net/gml">
        <gml:Polygon srsName=" urn:ogc:def:crs:EPSG:6.3:4326">
          <gml:exterior>
            <gml:LinearRing srsName=" urn:ogc:def:crs:EPSG:6.3:4326">
              <gml:pos>147.49 -15.22700023651123</gml:pos>
              <gml:pos>148.1592 -15.340299606323242</gml:pos>
              <gml:pos>148.2935882414475 -14.803518295288086</gml:pos>
              <gml:pos>147.62540931867474 -14.691240310668945</gml:pos>
              <gml:pos>147.49 -15.22700023651123</gml:pos>
            </gml:LinearRing>
          </gml:exterior>
        </gml:Polygon>
      </wrs:AnyValue>
    </wrs:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/EndPosition"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:DateTime">
    <rim:ValueList>
      <rim:Value>2007-01-10T00:16:31Z</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/AcquisitionType"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:String">
    <rim:ValueList>
      <rim:Value>NOMINAL</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/CloudCoverPercentage"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:Double">
    <rim:ValueList>

```

```

        <rim:Value>100.0</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/SnowCoverPercentage"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:Double">
      <rim:ValueList>
        <rim:Value>100.0</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/OrbitNumber"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:Integer">
      <rim:ValueList>
        <rim:Value>235</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/Status"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:String">
      <rim:ValueList>
        <rim:Value>ACQUIRED</rim:Value>
      </rim:ValueList>
    </rim:Slot>
  </rim:ExtrinsicObject>
  <rim:Classification id="urn:x-dali:sat:Shift0:a21:43733800701100016312I:dn:4377990:50"
classifiedObject="urn:x-dali:sat:Shift0:a21:43733800701100016312I:dn:4377990:0"
classificationNode="urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-EO:2.0:EOProductTypes:OPT"
classificationScheme="urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-EO:2.0:EOProductTypes"/>

  <rim:ExtrinsicObject id="urn:x-dali:sat:Shift0:a21:43733800701100016312I:dn:4377990:3"
objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOAcquisitionPlatform">
    <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/SensorType"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:String">
      <rim:ValueList>
        <rim:Value>OPTICAL</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/InstrumentShortName"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:String">
      <rim:ValueList>
        <rim:Value>HRVIR-Nb2</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/PlatformSerialIdentifier"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:String">
      <rim:ValueList>
        <rim:Value>I</rim:Value>
      </rim:ValueList>
    </rim:Slot>
  </rim:ExtrinsicObject>
  <rim:Association id="urn:x-dali:sat:Shift0:a21:43733800701100016312I:dn:4377990:21"
associationType="urn:ogc:def:associationType:OGC-CSW-ebRIM-EO:2.0:AcquiredBy" sourceObject="urn:x-
dali:sat:Shift0:a21:43733800701100016312I:dn:4377990:0" targetObject="urn:x-
dali:sat:Shift0:a21:43733800701100016312I:dn:4377990:3"/>
</rim:RegistryObjectList>

```

```

</rim:RegistryPackage>
<rim:RegistryPackage id="urn:uuid:691265a5-3886-4a17-8565-782124ec4e00"
objectType="urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject:RegistryPackage">
  <rim:Name>
    <rim:LocalizedString xml:lang="en-US" charset="UTF-8" value="EOProduct"/>
  </rim:Name>
  <rim:RegistryObjectList>
    <rim:ExtrinsicObject id="urn:x-dali:sat:Shift0:a21:43733810701100016392I:dn:4377990:0"
objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct">
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/ImageQualityDegradation"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:Double">
    <rim:ValueList>
      <rim:Value>75.0</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/CenterOf"
slotType="urn:ogc:def:dataType:ISO-19107:2003:GM_Object">
    <wrs:ValueList xmlns:wrs="http://www.opengis.net/cat/wrs/1.0">
      <wrs:AnyValue xmlns:gml="http://www.opengis.net/gml">
        <gml:Point srsName=" urn:ogc:def:crs:EPSG:6.3:4326">
          <gml:pos>147.7709 -15.520999908447266</gml:pos>
        </gml:Point>
      </wrs:AnyValue>
    </wrs:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/ProductType"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:String">
    <rim:ValueList>
      <rim:Value>Scene</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/BeginPosition"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:DateTime">
    <rim:ValueList>
      <rim:Value>2007-01-10T00:16:39Z</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/LastOrbitNumber"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:Integer">
    <rim:ValueList>
      <rim:Value>235</rim:Value>
    </rim:ValueList>
  </rim:Slot>
  <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/MultiExtentOf"
slotType="urn:ogc:def:dataType:ISO-19107:2003:GM_Object">
    <wrs:ValueList xmlns:wrs="http://www.opengis.net/cat/wrs/1.0">
      <wrs:AnyValue xmlns:gml="http://www.opengis.net/gml">
        <gml:Polygon srsName=" urn:ogc:def:crs:EPSG:6.3:4326">
          <gml:exterior>
            <gml:LinearRing srsName=" urn:ogc:def:crs:EPSG:6.3:4326">
              <gml:pos>147.3624 -15.726499557495117</gml:pos>
              <gml:pos>148.0333 -15.840399742126465</gml:pos>
              <gml:pos>148.1661 -15.312800407409668</gml:pos>
              <gml:pos>147.497 -15.19950008392334</gml:pos>
              <gml:pos>147.3624 -15.726499557495117</gml:pos>
            </gml:LinearRing>
          </gml:exterior>
        </gml:Polygon>
      </wrs:AnyValue>
    </wrs:ValueList>
  </rim:Slot>

```



```

        </gml:LinearRing>
      </gml:exterior>
    </gml:Polygon>
  </wrs:AnyValue>
</wrs:ValueList>
</rim:Slot>
<rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/EndPosition"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:DateTime">
  <rim:ValueList>
    <rim:Value>2007-01-10T00:16:39Z</rim:Value>
  </rim:ValueList>
</rim:Slot>
<rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/AcquisitionType"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:String">
  <rim:ValueList>
    <rim:Value>NOMINAL</rim:Value>
  </rim:ValueList>
</rim:Slot>
<rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/CloudCoverPercentage"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:Double">
  <rim:ValueList>
    <rim:Value>21.0</rim:Value>
  </rim:ValueList>
</rim:Slot>
<rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/SnowCoverPercentage"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:Double">
  <rim:ValueList>
    <rim:Value>0.0</rim:Value>
  </rim:ValueList>
</rim:Slot>
<rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/OrbitNumber"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:Integer">
  <rim:ValueList>
    <rim:Value>235</rim:Value>
  </rim:ValueList>
</rim:Slot>
<rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/Status"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:String">
  <rim:ValueList>
    <rim:Value>ACQUIRED</rim:Value>
  </rim:ValueList>
</rim:Slot>
</rim:ExtrinsicObject>
<rim:Classification id="urn:x-dali:sat:Shift0:a21:43733810701100016392I:dn:4377990:50"
classifiedObject="urn:x-dali:sat:Shift0:a21:43733810701100016392I:dn:4377990:0"
classificationNode="urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-EO:2.0:EOProductTypes:OPT"
classificationScheme="urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-EO:2.0:EOProductTypes"/>
  <rim:ExtrinsicObject id="urn:x-dali:sat:Shift0:a21:43733810701100016392I:dn:4377990:3"
objectType="urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOAcquisitionPlatform">
    <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/sensorType"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:String">
      <rim:ValueList>
        <rim:Value>OPTICAL</rim:Value>
      </rim:ValueList>
    </rim:Slot>
    <rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/InstrumentShortName"

```



```

slotType="urn:oasis:names:tc:ebxml-regrep:DataType:String">
  <rim:ValueList>
    <rim:Value>HRVIR-Nb2</rim:Value>
  </rim:ValueList>
</rim:Slot>
<rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/PlatformSerialIdentifier"
slotType="urn:oasis:names:tc:ebxml-regrep:DataType:String">
  <rim:ValueList>
    <rim:Value>I</rim:Value>
  </rim:ValueList>
</rim:Slot>
<rim:Name>
  <rim:LocalizedString xml:lang="en-US" charset="UTF-8" value="Spot4"/>
</rim:Name>
</rim:ExtrinsicObject>
<rim:Association id="urn:x-dali:sat:Shift0:a21:43733810701100016392I:dn:4377990:21"
associationType="urn:ogc:def:associationType:OGC-CSW-ebRIM-EO:2.0:AcquiredBy" sourceObject="urn:x-
dali:sat:Shift0:a21:43733810701100016392I:dn:4377990:0" targetObject="urn:x-
dali:sat:Shift0:a21:43733810701100016392I:dn:4377990:3"/>
</rim:RegistryObjectList>
</rim:RegistryPackage>

</csw:SearchResults>
</csw:GetRecordsResponse>

```

Another example:

*“Give all EO Product having an orbitType that equals GEO in the area of France”*

More formally:

*“Give all EO Product Registry Package with an ExtrinsicObject of objectType equals to ‘urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct’, having an orbitType equals ‘GEO’, and multiExtentOf in the box having a lower left corner of 42.15;-5.2 and an upper right corner of 51.4;8.3”*

Example 7 – GetRecords example.

```

<?xml version="1.0" encoding="UTF-8"?>
<csw:GetRecords xmlns:csw="http://www.opengis.net/cat/csw/2.0.2"
xmlns:ogc="http://www.opengis.net/ogc" xmlns:gml="http://www.opengis.net/gml"
xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0" outputSchema="urn:oasis:names:tc:ebxml-
regrep:xsd:rim:3.0" version="2.0.2" service="CSW" resultType="results" startPosition="1"
maxRecords="20">
  <csw:Query typeNames="rim:RegistryPackage rim:ExtrinsicObject ">
    <csw:ElementSetName typeNames="rim:RegistryPackage">full</csw:ElementSetName>
    <csw:Constraint version="1.1.0">
      <ogc:Filter>
        <ogc:And>
<!--This expression makes the link between the Registry Package and the elements it
contains -->
          <ogc:PropertyIsEqualTo>
<ogc:PropertyName>/rim:RegistryPackage/rim:RegistryObjectList[*]/rim:RegistryObject/@i
d</ogc:PropertyName>

```

```

        <ogc:PropertyName>/rim:ExtrinsicObject/@id</ogc:PropertyName>
    </ogc:PropertyIsEqualTo>
</ogc:PropertyIsEqualTo>

    <ogc:PropertyName>/rim:ExtrinsicObject/@objectType</ogc:PropertyName>
    <ogc:Literal>urn:ogc:def:objectType:OGC-CSW-ebRIM-
EO:2.0:EOProduct</ogc:Literal>
    </ogc:PropertyIsEqualTo>
    <ogc:PropertyIsEqualTo>
        <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/OrbitType"]/rim:ValueList/rim:Value[1]</ogc:PropertyName>
        <ogc:Literal>GEO</ogc:Literal>
    </ogc:PropertyIsEqualTo>
    <ogc:BBOX>
        <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/MultiExtentOf"]/wrs:ValueList/wrs:AnyValue[1]</ogc:PropertyName>
        <Envelope xmlns="http://www.opengis.net/gml" srsName="
urn:ogc:def:crs:EPSG:6.3:4326">
            <lowerCorner>42.15 -5.2</lowerCorner>
            <upperCorner>51.4;8.3</upperCorner>
        </Envelope>
    </ogc:BBOX>
    </ogc:And>
</ogc:Filter>
</csw:Constraint>
</csw:Query>
</csw:GetRecords>

```

Another example:

- “Give me all altimetry EO Products”

More formally:

- “Give me all objects linked to the ALT ClassificationNode through a Classification”.

Example 8 – GetRecords query based on acquisition type.

```

<?xml version="1.0" encoding="UTF-8"?>
<csw:GetRecords
  xmlns:csw="http://www.opengis.net/cat/csw/2.0.2"
  xmlns:ogc="http://www.opengis.net/ogc"
  xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
  outputSchema="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
  version="2.0.2"
  resultType="results"
  startPosition="1"
  maxRecords="20"
  service="CSW">
  <csw:Query typeNames="rim:ExtrinsicObject rim:Classification rim:ClassificationNode">
    <csw:ElementSetName typeNames="rim:ExtrinsicObject">full</csw:ElementSetName>
    <csw:Constraint version="1.1.0">
      <ogc:Filter>
        <ogc:And>
          <!-- This clause means "Select the ALT ClassificationNode" -->
          <ogc:PropertyIsEqualTo>
            <ogc:PropertyName>/rim:ClassificationNode/@code</ogc:PropertyName>
            <ogc:Literal>ALT</ogc:Literal>
          </ogc:PropertyIsEqualTo>
          <!-- This clause means "Get Classification linked to the ALT ClassificationNode" -->

```

```

<ogc:PropertyIsEqualTo>
  <ogc:PropertyName>/rim:Classification/@classificationNode</ogc:PropertyName>
  <ogc:PropertyName>/rim:ClassificationNode/@id</ogc:PropertyName>
</ogc:PropertyIsEqualTo>
<!-- This clause means "Such Classifications must classify ExtrinsicObject" -->
<ogc:PropertyIsEqualTo>
  <ogc:PropertyName>/rim:Classification/@classifiedObject</ogc:PropertyName>
  <ogc:PropertyName>/rim:ExtrinsicObject/@id</ogc:PropertyName>
</ogc:PropertyIsEqualTo>
<!-- This clause means "Classified ExtrinsicObjects must be of type urn:....:EOProduct" -->
<ogc:PropertyIsEqualTo>
  <ogc:PropertyName>/rim:ExtrinsicObject/@objectType</ogc:PropertyName>
  <ogc:Literal>urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct</ogc:Literal>
</ogc:PropertyIsEqualTo>
</ogc:And>
</ogc:Filter>
</csw:Constraint>
</csw:Query>
</csw:GetRecords>

```

Another example:

- *"Give me all EO Product acquired by this kind of Sensor"*

More formally:

- *"Give me all ExtrinsicObjects with objectType equal to 'urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct', which are source of an Association of type 'urn:ogc:def:associationType:OGC-CSW-ebRIM-EO:2.0:AcquiredBy' pointing – as target – to an ExtrinsicObject having as objectType 'urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOAcquisitionPlatform' and having this as sensorType slot value".*

In ebRIM, the CS-W request is formulated as :

```

<?xml version='1.0' encoding='utf-8' ?>
<csw:GetRecords
  xmlns:csw="http://www.opengis.net/cat/csw/2.0.2"
  xmlns:ogc="http://www.opengis.net/ogc"
  xmlns:gml="http://www.opengis.net/gml"
  xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
  outputSchema="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
  service="CSW"
  version="2.0.2"
  resultType="results"
  startPosition="1"
  maxRecords="20">
  <csw:Query typeNames="rim:ExtrinsicObject rim:ExtrinsicObject_ACQPLAT rim:Association" >
    <csw:ElementSetName typeNames="rim:ExtrinsicObject">full</csw:ElementSetName>
    <csw:Constraint version="1.1.0" >
      <ogc:Filter>
        <ogc:And>
          <ogc:PropertyIsEqualTo >
            <ogc:PropertyName>/rim:ExtrinsicObject/@objectType</ogc:PropertyName>
            <ogc:Literal>urn:ogc:def:objectType:OGC-CSW-ebRIM-EO:2.0:EOProduct</ogc:Literal>
          </ogc:PropertyIsEqualTo>
          <ogc:PropertyIsEqualTo>
            <ogc:PropertyName>/$ACQPLAT/@objectType</ogc:PropertyName>

```

```

    <ogc:Literal>urn:ogc:def:objectType:OGC-CSW-ebRIM-
EO:2.0:EOAcquisitionPlatform</ogc:Literal>
  </ogc:PropertyIsEqualTo>
  <ogc:PropertyIsEqualTo>
    <ogc:PropertyName>$ACQPLAT/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/SensorType"]/rim:ValueList/rim:Value[1]</ogc:PropertyName>
    <ogc:Literal>OPTICAL</ogc:Literal>
  </ogc:PropertyIsEqualTo>
  <ogc:PropertyIsEqualTo>
    <ogc:PropertyName>/rim:Association/@associationType</ogc:PropertyName>
    <ogc:Literal>urn:ogc:def:associationType:OGC-CSW-ebRIM-
EO:2.0:AcquiredBy</ogc:Literal>
  </ogc:PropertyIsEqualTo>
  <ogc:PropertyIsEqualTo>
    <ogc:PropertyName>/rim:Association/@sourceObject</ogc:PropertyName>
    <ogc:PropertyName>/rim:ExtrinsicObject/@id</ogc:PropertyName>
  </ogc:PropertyIsEqualTo>
  <ogc:PropertyIsEqualTo>
    <ogc:PropertyName>/rim:Association/@targetObject</ogc:PropertyName>
    <ogc:PropertyName>$ACQPLAT/@id</ogc:PropertyName>
  </ogc:PropertyIsEqualTo>
  </ogc:And>
</ogc:Filter>
</csw:Constraint>
</csw:Query>
</csw:GetRecords>

```

### F.3 GetRecordById operation

The ID of the object corresponds to a Registry Package, so the response contains a RegistryPackage with all the EO objects inside.

#### GetRecordById request

```

<?xml version='1.0' encoding='utf-8' ?>
<GetRecordById xmlns="http://www.opengis.net/cat/csw/2.0.2"
xmlns:common="http://exslt.org/common"
xmlns:gmlns="http://www.opengis.net/gml"
xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
xmlns:sse="http://www.esa.int/mass"
xmlns:wrs="http://www.opengis.net/cat/wrs/1.0"
service="CSW"
version="2.0.2"
outputSchema="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0" >
  <Id>SPOT:SP1-19880924T112704493-PT9.024002075195312S.HVN:RP</Id>
</GetRecordById>

```

#### GetRecordById response

```

<?xml version='1.0' encoding='utf-8' ?>
<csw:GetRecordByIdResponse xmlns:csw="http://www.opengis.net/cat/csw/2.0.2" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0" xmlns:wrs="http://www.opengis.net/cat/wrs/1.0" xsi:schemaLocation="">
  <rim:RegistryPackage id="SPOT:SP1-19880924T112704493-PT9.024002075195312S.HVN:RP" objectType="urn:oasis:names:tc:ebxml-
regrep:Object:RegistryObject:RegistryPackage">
    <rim:Slot name="PublicationDate" slotType="urn:oasis:names:tc:ebxml-regrep:DataType:DateTime">

```

```

<rim:ValueList> <rim:Value>2009-01-22T09:11:37Z</rim:Value>
</rim:ValueList>
<rim:Slot>
<rim:Name>
<rim:LocalizedString xml:lang="en-US" charset="UTF-8" value="urn:ogc:def:registryPackage:OGC-CSW-ebRIM-EO:2.0:EOPProducts"/>
</rim:Name>
<rim:RegistryObjectList>
<wrs:ExtrinsicObject id="SPOT:SP1-19880924T112704493-PT9.024002075195312S.HVN" objectType="urn:ogc:def:objectType:OGC-CSW-
ebRIM-EO:2.0:EOPProduct" mimeType="text/xml">
<rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/beginPosition" slotType="urn:oasis:names:tc:ebxml-
regrep:DataType:DateTime">
<rim:ValueList> <rim:Value>1988-09-24T11:27:04Z</rim:Value>
</rim:ValueList>
</rim:Slot>
<rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/ProductType" slotType="urn:oasis:names:tc:ebxml-
regrep:DataType:String">
<rim:ValueList> <rim:Value>HRV2_X__1P</rim:Value>
</rim:ValueList>
</rim:Slot>
<rim:Slot name="PublicationDate" slotType="urn:oasis:names:tc:ebxml-regrep:DataType:DateTime">
<rim:ValueList> <rim:Value>2009-01-22T09:11:37Z</rim:Value>
</rim:ValueList>
</rim:Slot>
<rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/MultiExtentOf" slotType="urn:ogc:def:dataType:ISO-
19107:2003:GM_Object">
<wrs:ValueList xmlns:wrs="http://www.opengis.net/cat/wrs/1.0">
<wrs:AnyValue xmlns:gml="http://www.opengis.net/gml"> <gml:MultiPolygon srsName="EPSG:4326">
<gml:polygonMember>
<gml:Polygon srsName="EPSG:4326">
<gml:exterior>
<gml:LinearRing srsName="EPSG:4326">
<gml:pos>37.666 -6.419</gml:pos>
<gml:pos>37.551 -5.737</gml:pos>
<gml:pos>37.028 -5.916</gml:pos>
<gml:pos>37.142 -6.593</gml:pos>
<gml:pos>37.666 -6.419</gml:pos>
</gml:LinearRing>
</gml:exterior>
</gml:Polygon>
</gml:polygonMember>
</gml:MultiPolygon>
</wrs:AnyValue>
</wrs:ValueList>
</rim:Slot>
<rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/EndPosition" slotType="urn:oasis:names:tc:ebxml-
regrep:DataType:DateTime">
<rim:ValueList> <rim:Value>1988-09-24T11:27:13Z</rim:Value>
</rim:ValueList>
</rim:Slot>
<rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/ParentIdentifier" slotType="urn:oasis:names:tc:ebxml-
regrep:DataType:String">
<rim:ValueList> <rim:Value>SPOT</rim:Value>
</rim:ValueList>
</rim:Slot>
<rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/AcquisitionType" slotType="urn:oasis:names:tc:ebxml-
regrep:DataType:String">
<rim:ValueList> <rim:Value>NOMINAL</rim:Value>
</rim:ValueList>
</rim:Slot>
<rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/OrbitNumber" slotType="urn:oasis:names:tc:ebxml-
regrep:DataType:Integer">
<rim:ValueList> <rim:Value>185</rim:Value>
</rim:ValueList>
</rim:Slot>
<rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/Status" slotType="urn:oasis:names:tc:ebxml-regrep:DataType:String">
<rim:ValueList> <rim:Value>ACQUIRED</rim:Value>
</rim:ValueList>
</rim:Slot>
<rim:Slot name=" http://www.opengis.net/def/property/OGC-EO/0/AcquisitionStation" slotType="urn:oasis:names:tc:ebxml-
regrep:DataType:String">
<rim:ValueList> <rim:Value>TOU</rim:Value>
</rim:ValueList>
</rim:Slot>
<rim:Classification id="SPOT:SP1-19880924T112704493-PT9.024002075195312S.HVN_Classification"
objectType="urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject:Classification" classifiedObject="SPOT:SP1-19880924T112704493-
PT9.024002075195312S.HVN" classificationNode="urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-EO:2.0:EOPProductTypes:OPT"
classificationScheme="urn:ogc:def:classificationScheme:OGC-CSW-ebRIM-EO:2.0:EOPProductTypes">
<rim:Slot name="PublicationDate" slotType="urn:oasis:names:tc:ebxml-regrep:DataType:DateTime">
<rim:ValueList> <rim:Value>2009-01-22T09:11:37Z</rim:Value>
</rim:ValueList>
</rim:Slot>
<rim:Classification>
<wrs:repositoryItemRef href="http://achernar:8180/erdaswrs/wrs/HMAE?request=GetRepositoryItem&service=CSW-
ebRIM&version=2.0.2&id=SPOT%3ASP1-19880924T112704493-PT9.024002075195312S.HVN"/>
</wrs:ExtrinsicObject>
<rim:Association id="urn:uuid:7da3cae9-8d0e-444b-ad62-3e47fed58243" objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Association" associationType="urn:ogc:def:associationType:OGC-CSW-ebRIM-EO:2.0:AcquiredBy"
sourceObject="SPOT:SP1-19880924T112704493-PT9.024002075195312S.HVN" targetObject="SPOT-1">
<rim:Slot name="PublicationDate" slotType="urn:oasis:names:tc:ebxml-regrep:DataType:DateTime">

```

```
<rim:ValueList>      <rim:Value>2009-01-22T09:11:37Z</rim:Value>
</rim:ValueList>
</rim:Slot>
<rim:Name>
  <rim:LocalizedString xml:lang="en-US" charset="UTF-8" value="AcquiredBy"/>
</rim:Name>
</rim:Association>
</rim:RegistryObjectList>
</rim:RegistryPackage>
</csw:GetRecordByIdResponse>
```

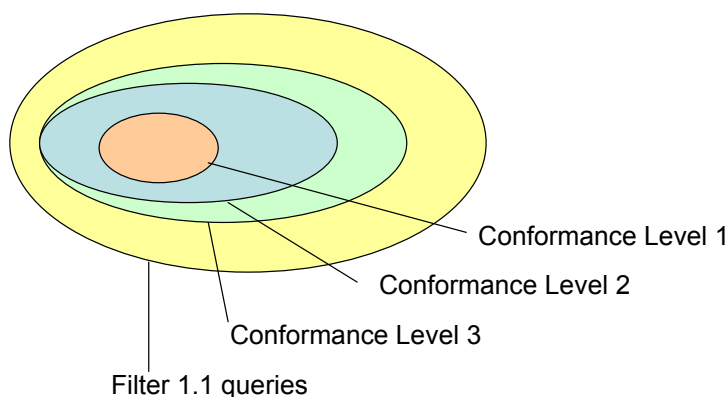
## **Annex G: XML REGISTRYPACKAGE DOCUMENTS (INFORMATIVE)**

The XML RegistryPackage document for EO Extension Package is not included anymore in the document but it is provided as a separate file.

## Annex H: PROPOSED FILTER SYNTAX COMPLIANCE LEVELS (INFORMATIVE)

This Annex provides information about the subset of the Filter Encoding used by the OGC 10-189 catalogue client <sup>13</sup> and proposes a set of conformance levels that could be supported by servers to limit the complexity of filter expressions that might be handled.

A catalogue server being able to handle the above type of requests could claim to have a “Conformance Level 1”, “Level 2” or “Level 3”. Conformance level 1 and 2 servers could consider that they will be addressed explicitly for the EO extension package, a conformance Level 3 server could consider that it could be addressed for other extension packages - as explained in the remainder of this annex.



**Figure 14: Proposed Conformance Levels versus query universe**

The following additional definitions are made to help describe the contents of a filter expression

Fixed	“Fixed” in this document means that this part of the request is always present when generated by the client, thus a server can assume it always being present.
Optional	“Optional” in this document means that this part of the request may or may not be present when generated by the client, thus a server cannot assume it always being present.

The example below illustrates the overall structure of the request sent by the catalogue client. The catalogue client sends “full” as `<csw:ElementSetName>` for all the

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<sup>13</sup> This annex is based on the implementation of the catalog client available in the SSE Portal (<http://services.eoportal.org>)



operations supported (GetRecords and GetRecordById). This filter is composed of different parts contained in an <ogc:And> structure.

```

<csw:GetRecords xmlns:csw="http://www.opengis.net/cat/csw/2.0.2"
xmlns:ogc="http://www.opengis.net/ogc"
xmlns:gml="http://www.opengis.net/gml"
xmlns:wrs="http://www.opengis.net/cat/wrs/1.0"
xmlns:rim="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0"
version="2.0.2" outputSchema="urn:oasis:names:tc:ebxml-
regrep:xsd:rim:3.0" resultType="results" service="CSW"
outputFormat="application/xml" maxRecords="10"
startPosition="1">
  <csw:Query typeNames="rim:RegistryPackage rim:ExtrinsicObject
rim:ExtrinsicObject_acquisitionPlatform
rim:Association_acquisitionPlatAsso rim:Classification
rim:ClassificationNode">
    <csw:ElementSetName typeNames="rim:
RegistryPackage">full</csw:ElementSetName>
    <csw:Constraint version="1.1.0">
      <ogc:Filter>
        <ogc:And>
          <ogc:PropertyIsEqualTo>
            <ogc:PropertyName>
/rim:RegistryPackage/rim:RegistryObjectList[*]/rim:RegistryObjec
t/@id
            </ogc:PropertyName>
            <ogc:PropertyName>/rim:ExtrinsicObject/@id
            </ogc:PropertyName>
          </ogc:PropertyIsEqualTo>
          <ogc:PropertyIsEqualTo>
            <ogc:PropertyName>/rim:ExtrinsicObject/@objectType</ogc:Property
Name>
            <ogc:Literal>urn:ogc:def:objectType:OGC-CSW-
ebRIM-EO:2.0:EOProduct</ogc:Literal>
            </ogc:PropertyIsEqualTo>

          <<PART 1>>
          <<PART 2>>
          <<PART 3>>
          <<PART 4>>

        </ogc:And>
      </ogc:Filter>
    </csw:Constraint>
  </csw:Query>
</csw:GetRecords>

```

## H.1 Request Handling

Before discussing the filter expression, a server can make a number of assumptions regarding the request

- A CONFORMANCE LEVEL 1 and 2 server can assume that the typeName identifiers in the above request are fixed (i.e. have the exact

values as shown in the example above in red/italic) and these elements could possibly be ignored.

- A CONFORMANCE LEVEL 3 server should be able to handle variable typeNames identifiers, thus has to interpret the red/italic section in the request above.

Within the filter, the different parts identified as <<Part 1>> ... <<Part 4>> above contain queryables. These queryables can have the following types, each type having its own comparators supported. The catalogue client uses the same comparator on a specific queryable for every request sent on this queryable.

type	Level 1 Comparators supported
String	PropertyIsEqualTo
Double, Integer	PropertyIsEqualTo, PropertyIsGreaterThanOrEqualTo, PropertyIsLessThanOrEqualTo
Date	PropertyIsEqualTo, PropertyIsGreaterThanOrEqualTo, PropertyIsLessThanOrEqualTo
Geometry	BBOX

- CONFORMANCE LEVEL 1 and 2: A server shall implement a “lazy” behaviour and ignore EO extension package attributes in a filter expression which are not supported by the requested selection. The Catalogue component shall ignore, whenever possible, search parameters that are not relevant.  
However, the Catalogue component shall not offend in its response the search parameters included in the query (i.e. a response shall not expose a slot whose value contradicts a search parameter targeting that slot).  
As a consequence (full view being the reference for the exposed slots):
  - a search parameter on a not relevant slot (i.e. not queryable and not exposed) shall be ignored
  - a search parameter on an exposed but not queryable slot shall raise an ExceptionReport
  - a search parameter with an unsupported operation on an exposed and queryable slot shall raise an ExceptionReport
- CONFORMANCE LEVEL 3: A server shall implement a “strict” behaviour and implement exception handling as in the specification OGC 10-189 when receiving EO extension package attributes in a filter expression which are not supported by the requested selection.

The sections below give details about this sequence of elements.

### H.1.1 Part 1: The Collections

<<Part 1>> is FIXED in the request.

The collections are identified with the `parentIdentifier` queryable.

For this part, we propose two levels of compliance:

- CONFORMANCE LEVEL 1: the server shall be able to handle single mission requests
- CONFORMANCE LEVEL 2: the server shall be able to handle as well multi-mission requests.
- CONFORMANCE LEVEL 1 & 2 Servers receiving unknown `parentIdentifiers` shall return an empty response for this unknown, collection (TBC) as if no products for this collection were found.

#### Single mission (Level 1)

For a single mission request (CONFORMANCE Level 1), <<Part 2>> is structured as below using an `<ogc:PropertyIsEqualTo>` tag.

```
<ogc:PropertyIsEqualTo>
  <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/ParentIdentifier"]/rim:ValueList/rim:Value[1]</ogc:Property
Name>
  <ogc:Literal>urn:ogc:def:EOP:ESA:EECF.ENVISAT_ASA_APx_xS</ogc:Li
teral>
</ogc:PropertyIsEqualTo>
```

#### Multi mission (Level 2)

For a multi-mission request (CONFORMANCE Level 2), <<Part 2>> contains all the `parentIdentifiers` in a single `<ogc:or>` expression as shown below.

```
<ogc:Or>
  <ogc:PropertyIsEqualTo>
    <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/ParentIdentifier"]/rim:ValueList/rim:Value[1]</ogc:Property
Name>
```

```

<ogc:Literal>urn:ogc:def:EOP:ESA:EECF.ENVISAT_ASA_APx_xS</ogc:Li
teral>
  </ogc:PropertyIsEqualTo>

  <ogc:PropertyIsEqualTo>
    <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/ParentIdentifier"]/rim:ValueList/rim:Value[1]</ogc:Property
Name>

  <ogc:Literal>urn:ogc:def:EOP:ESA:EECF.ENVISAT_RA2_MWx_2C</ogc:Li
teral>
  </ogc:PropertyIsEqualTo>
<ogc:Or>

```

### H.1.2 Part 2: Area of Interest

<<Part 2>> is OPTIONAL in a CONFORMANCE LEVEL 1 request.

#### Bounding Box (Level 1)

We use in the request the urn:ogc:def:crs:EPSG:6.3:4326 (i.e WGS 84) common coordinates reference system. The coordinates are expressed in Latitude Longitude.

The multiExtentOf is used as queryable. It shall be embedded in a <ogc:BBOX> tag. The following example shows the mandatory structure of <<Part 1>> for CONFORMANCE LEVEL 1:

```

<!--This example is not a complete request -->

<ogc:BBOX>

  <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/MultiExtentOf"]/wrs:ValueList/wrs:AnyValue[1]</ogc:Property
Name>

  <Envelope xmlns="http://www.opengis.net/gml" srsName="
urn:ogc:def:crs:EPSG:6.3:4326">

    <lowerCorner>35.1940 -22.5672</lowerCorner>

    <upperCorner>63.1343 25.2537</upperCorner>

  </Envelope>

</ogc:BBOX>

```

- CONFORMANCE LEVEL 1: Supports only BBOX with `urn:ogc:def:crs:EPSG:6.3:4326`, i.e; WGS 84.
- CONFORMANCE LEVEL 2: Supports also the following geometries: Circle, Polygon as shown below.

### Polygons (Level 2)

For the Polygon geometry<sup>14</sup>:

```
<ogc:Overlaps>
  <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/MultiExtentOf"]/wrs:ValueList/wrs:AnyValue[1]</ogc:Property
Name>
  <gml:Polygon srsName="urn:ogc:def:crs:EPSG:6.3:4326">
    <gml:exterior>
      <gml:LinearRing srsName="urn:ogc:def:crs:EPSG:6.3:4326">
        <gml:pos>76.28 116.84</gml:pos>
        <gml:pos>76.16 118.97</gml:pos>
        <gml:pos>73.27 116.40</gml:pos>
        <gml:pos>69.80 114.15</gml:pos>
        <gml:pos>66.31 112.42</gml:pos>
        <gml:pos>62.81 111.01</gml:pos>
        <gml:pos>59.30 109.80</gml:pos>
        <gml:pos>55.79 108.74</gml:pos>
        <gml:pos>52.27 107.77</gml:pos>
        <gml:pos>48.75 106.88</gml:pos>
        <gml:pos>48.41 106.80</gml:pos>
        <gml:pos>48.50 106.02</gml:pos>
        <gml:pos>48.83 106.10</gml:pos>
        <gml:pos>52.36 106.93</gml:pos>
        <gml:pos>55.87 107.82</gml:pos>
        <gml:pos>59.39 108.80</gml:pos>
        <gml:pos>62.89 109.89</gml:pos>
        <gml:pos>66.39 111.15</gml:pos>
        <gml:pos>69.89 112.67</gml:pos>
        <gml:pos>73.37 114.63</gml:pos>
      </gml:LinearRing>
    </gml:exterior>
  </gml:Polygon>
</ogc:Overlaps>
```

### Circle (Level 2)

For the CircleByCenterPoint geometry:

```
<ogc:Overlaps>
  <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
```

<sup>14</sup> The term spatially OVERLAPS is used if two geometries intersect and their intersection results in a geometry of the same dimension but not equal to either of the given geometries. Instead the INTERSECT operation would include results that have also have a precise overlap. However, since the examples in Annex G have been widely used and implemented (without the distinction of the precise overlap), both OVERLAP and INTERSECT could be implemented with the same semantic. In a future major revision, this difference could be re-addressed.

```
EO/0/MultiExtentOf"]/wrs:ValueList/wrs:AnyValue[1]</ogc:Property
Name>
<gml:Curve>
  <gml:segments>
    <gml:CircleByCenterPoint numArc="1">
      <gml:pos srsName=" urn:ogc:def:crs:EPSG:6.3:4326">42.5463 -
73.2512</gml:pos>
      <gml:radius uom="urn:EPSG:uom:9001">850.24</gml:radius>
    </gml:CircleByCenterPoint>
  </gml:segments>
</gml:Curve>
</ogc:Overlaps>
```

Circle radius uom should be expressed in meters using EPSG 9001 (as identified by the URN urn:ogc:def:uom:EPSG::9001).

### H.1.3 Part 3: the Earth Observation Products (EOP) queryables.

<<Part 3>> is OPTIONAL in the request.

A basic EOP request means that it only contains queryables of the EOP classification. This classification is the default one. The list of Ebrim queryables below constitutes a "Level 1" compliance of the 10-189 catalogue client regarding the queryables.

For the ExtrinsicObjects of type EOProduct:

Queryable	Type	Fixed/Optional	CONFORMANCE LEVEL
beginPosition	Date	Optional	1
endPosition	Date	Optional	1
imageQualityDegradation	Double	Optional	2
acquisitionType	String	Optional	2
acquisitionSubType	String	Optional	2
orbitDirection	String	Optional	1
Status	String	Optional	1
orbitNumber	Integer	Optional	1
productType	String	Optional	1
acquisitionStation	String	Optional	2
lastOrbitNumber	Integer	Optional	2

archivingCenter	String	Optional	2
-----------------	--------	----------	---

For the ExtrinsicObjects of type EOAcquisitionPlatform:

Queryable	Type	Fixed/Optional	CONFORMANCE LEVEL
instrumentShortName	String	Optional	1
platformSerialIdentifier	String	Optional	1
rim:Name (mapped with the eop:Platform/eop:shortName of the O&M Metadata)	String	Optional	1
sensorType	String	Optional	1
sensorOperationalMode	String	Optional	1
sensorResolution	Double	Optional	1
swathIdentifier	String	Optional	1

You have below the structure of <<Part 3>>. It shows how the EOP queryables appear in the request. Note that sections (e.g. Filter subexpressions) corresponding to “mandatory” queryables have to be present in <<Part 3>>. Sections corresponding to “optional” queryables (as indicated in the tables above) are not necessarily present in <<Part 3>>.

```

<!-- startDate & endDate -->
<ogc:PropertyIsLessThanOrEqualTo>
  <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/BeginPosition"]/rim:ValueList/rim:Value[1]</ogc:PropertyNam
e>
  <ogc:Literal>2008-05-15T23:59:59.000</ogc:Literal>
</ogc:PropertyIsLessThanOrEqualTo>

<ogc:PropertyIsGreaterThanOrEqualTo>
  <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/EndPosition"]/rim:ValueList/rim:Value[1]</ogc:PropertyName>
  <ogc:Literal>2008-05-15T00:00:00.000</ogc:Literal>
</ogc:PropertyIsGreaterThanOrEqualTo>

<!-- Image quality Degradation -->
<ogc:PropertyIsGreaterThanOrEqualTo>
  <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-

```

```

EO/0/ImageQualityDegradation"]/rim:ValueList/rim:Value[1]</ogc:Property
Name>
  <ogc:Literal>70</ogc:Literal>
</ogc:PropertyIsGreaterThanOrEqualTo>

<!-- Acquisition type -->
<ogc:PropertyIsEqualTo>
  <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/AcquisitionType"]/rim:ValueList/rim:Value[1]</ogc:PropertyN
ame>
  <ogc:Literal>CALIBRATION</ogc:Literal>
</ogc:PropertyIsEqualTo>

<!-- Acquisition subtype -->
<ogc:PropertyIsEqualTo>
  <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/AcquisitionSubType"]/rim:ValueList/rim:Value[1]</ogc:Proper
tyName>
  <ogc:Literal>OTHER</ogc:Literal>
</ogc:PropertyIsEqualTo>
<!-- Orbit direction -->
<ogc:PropertyIsEqualTo>
  <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/OrbitDirection"]/rim:ValueList/rim:Value[1]</ogc:PropertyNa
me>
  <ogc:Literal>ASCENDING</ogc:Literal>
</ogc:PropertyIsEqualTo>

<!-- Status -->
<ogc:PropertyIsEqualTo>
  <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/Status"]/rim:ValueList/rim:Value[1]</ogc:PropertyName>
  <ogc:Literal>ACQUIRED</ogc:Literal>
</ogc:PropertyIsEqualTo>

<ogc:PropertyIsEqualTo>

<ogc:PropertyName>$acquisitionPlatform/@objectType</ogc:Property
Name>
  <ogc:Literal>urn:ogc:def:objectType:OGC-CSW-ebRIM-
EO:2.0:EOAcquisitionPlatform</ogc:Literal>
</ogc:PropertyIsEqualTo>

<ogc:PropertyIsEqualTo>

<ogc:PropertyName>$acquisitionPlatAsso/@sourceObject</ogc:Proper
tyName>
  <ogc:PropertyName>/rim:ExtrinsicObject/@id</ogc:PropertyName>
</ogc:PropertyIsEqualTo>

<ogc:PropertyIsEqualTo>

```



```

<ogc:PropertyName>$acquisitionPlatAsso/@associationType</ogc:Pro
pertyName>
  <ogc:Literal>urn:ogc:def:associationType:OGC-CSW-ebRIM-
EO:2.0:AcquiredBy</ogc:Literal>
</ogc:PropertyIsEqualTo>

<ogc:PropertyIsEqualTo>

<ogc:PropertyName>$acquisitionPlatAsso/@targetObject</ogc:Proper
tyName>
  <ogc:PropertyName>$acquisitionPlatform/@id</ogc:PropertyName>
</ogc:PropertyIsEqualTo>

<!-- Instrument Short Name -->
<ogc:PropertyIsEqualTo>
  <ogc:PropertyName>$acquisitionPlatform/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/InstrumentShortName"]/rim:ValueList/rim:Value[1]</ogc:Prope
rtyName>
  <ogc:Literal>HRVIR</ogc:Literal>
</ogc:PropertyIsEqualTo>

<!-- Platform Serial Identifier -->
<ogc:PropertyIsEqualTo>
  <ogc:PropertyName>$acquisitionPlatform/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/PlatformSerialIdentifier"]/rim:ValueList/rim:Value[1]</ogc:
PropertyName>
  <ogc:Literal>I</ogc:Literal>
</ogc:PropertyIsEqualTo>

<!-- Platform Short Name -->
<ogc:PropertyIsEqualTo>

<ogc:PropertyName>$acquisitionPlatform/rim:Name/rim:LocalizedStr
ing/@value</ogc:PropertyName>
  <ogc:Literal>Spot4</ogc:Literal>
</ogc:PropertyIsEqualTo>

<!-- Sensor type -->
<ogc:PropertyIsEqualTo>
  <ogc:PropertyName>$acquisitionPlatform/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/SensorType"]/rim:ValueList/rim:Value[1]</ogc:PropertyName>
  <ogc:Literal>ALTIMETRIC</ogc:Literal>
</ogc:PropertyIsEqualTo>

<!-- Sensor Operational Mode -->
<ogc:PropertyIsEqualTo>
  <ogc:PropertyName>$acquisitionPlatform/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/SensorOperationalMode"]/rim:ValueList/rim:Value[1]</ogc:Pro
pertyName>
  <ogc:Literal>PA</ogc:Literal>
</ogc:PropertyIsEqualTo>

```

```

<!-- Image Quality Code -->
<ogc:PropertyIsGreaterThanOrEqualTo>
  <ogc:PropertyName>$acquisitionPlatform/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/SensorResolution"]/rim:ValueList/rim:Value[1]</ogc:Property
Name>
  <ogc:Literal>70.9</ogc:Literal>
</ogc:PropertyIsGreaterThanOrEqualTo>

```

- CONFORMANCE LEVEL 1, 2: the red/italic part of the request above can be ignored and does not have to be interpreted by the server. It is however present in the request for ebRIM AP compliance reasons.
- CONFORMANCE LEVEL 3: the red/italic part above is to be interpreted by the server.

The request can also contain expressions with multiple conditions for same queriable. The purpose of this definition is to allow queries like:

- give me all products acquired on swaths I1, I2, I4, ..
- give me all products acquired on orbits 1000, 1501, 2002, ...

In a more formal notation, the Part 3 is structured in this way:

```
<<Part 3>> := {<<queriable condition>>}0-N
```

```
<<queriable condition>> := <<single queriable condition>> |
<<multiple queriable condition>>
```

<<single queriable condition>> := it contains one condition on one property (e.g. orbitDirection, status, etc.) applying the corresponding comparison operator (e.g. PropertyIsEqualTo, PropertyIsGreaterThanOrEqualTo, etc.).

```
<<multiple queriable condition>> := ogc:Or { <<single equal queriable
condition>> }2-N
```

<<single equal queriable condition>> := it contains one condition on one property (e.g. orbitDirection, status, swath, etc.) applying the PropertyIsEqualTo comparison operator.

Note that all <<single equal queriable condition>> within a <<multiple queriable condition>> shall be related to the same property.

The following sample shows a multiple queryable condition for searching on *orbitNumber* queryable equals to 1001, 1501 or 2002.

```

<ogc:Or>
  <ogc:PropertyIsEqualTo>

```

```

<ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/OrbitNumber"]/rim:ValueList/rim:Value[1]</ogc:PropertyName>
  <ogc:Literal>1001</ogc:Literal>
</ogc:PropertyIsEqualTo>

<ogc:PropertyIsEqualTo>
<ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/OrbitNumber"]/rim:ValueList/rim:Value[1]</ogc:PropertyName>
  <ogc:Literal>1501</ogc:Literal>
</ogc:PropertyIsEqualTo>

<ogc:PropertyIsEqualTo>
<ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/OrbitNumber"]/rim:ValueList/rim:Value[1]</ogc:PropertyName>
  <ogc:Literal>2002</ogc:Literal>
</ogc:PropertyIsEqualTo>

<ogc:Or>

```

#### H.1.4 Part 4: the classification queryables.

<<Part 4>> is OPTIONAL in the request.

This document defines queryables for the following classifications: ATM, OPT, SAR, ALT, LMB, SSP. These queryables constitute a first level of compliance for the OGC 10-189 catalogue server.

#### Queryables for the Optical (OPT) classification

The OGC 10-189 catalogue client is able to send the following EBRIM OPT queryables:

Queryable	Type	Fixed/Optional	CONFORMANCE LEVEL
cloudCoverPercentage	Double	Optional	1
snowCoverPercentage	Double	Optional	1

You have below of the structure of <<Part 4>> for an OPT (Optical) request according to CONFORMANCE LEVEL 1. An OPT request means that it can contain queryables of the EOP classification plus the ones associated to the OPT classification.

Sections corresponding to “optional” queryables (as indicated in the table above) are not necessarily present in <<Part 4>>.

```

<!-- Select the OPT classification-->
<ogc:PropertyIsEqualTo>

```

```

<ogc:PropertyName>/rim:ClassificationNode/@code</ogc:PropertyName>
  <ogc:Literal>OPT</ogc:Literal>
</ogc:PropertyIsEqualTo>

<!-- get classification linked to the OPT classification -->
<ogc:PropertyIsEqualTo>

<ogc:PropertyName>/rim:Classification/@classificationNode</ogc:PropertyIsEqualTo>

<ogc:PropertyName>/rim:ClassificationNode/@id</ogc:PropertyName>
</ogc:PropertyIsEqualTo>
<!-- such classification must classify the ExtrinsicObject -->
<ogc:PropertyIsEqualTo>

<ogc:PropertyName>/rim:Classification/@classifiedObject</ogc:PropertyName>
  <ogc:PropertyName>/rim:ExtrinsicObject/@id</ogc:PropertyName>
</ogc:PropertyIsEqualTo>

<!-- Cloud Cover Percentage -->
<ogc:PropertyIsLessThanOrEqualTo>
  <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/CloudCoverPercentage"]/rim:ValueList/rim:Value[1]</ogc:PropertyName>
  <ogc:Literal>50</ogc:Literal>
</ogc:PropertyIsLessThanOrEqualTo>

<!-- Snow Cover Percentage -->
<ogc:PropertyIsLessThanOrEqualTo>
  <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/SnowCoverPercentage"]/rim:ValueList/rim:Value[1]</ogc:PropertyName>
  <ogc:Literal>30</ogc:Literal>
</ogc:PropertyIsLessThanOrEqualTo>

```

- 10-189 CONFORMANCE LEVEL 1, 2: the red/italic part of the request above can be ignored and does not have to be interpreted by the server. It is however present in the request for ebRIM AP compliance reasons.
- CONFORMANCE LEVEL 3: the red/italic part above is to be interpreted by the server.

### Queryable for the Radar (SAR) classification

The OGC 10-189 catalogue client is able to send the following EBRIM SAR queryables:

Queryable	Type	Fixed/Optional	CONFORMANCE LEVEL
polarisationMode	String	Optional	1
polarisationChannel	String	Optional	1
minimumIncidenceAngle	Double	Optional	1
maximumIncidenceAngle	Double	Optional	1

You have below the structure of <<Part 4>> for a SAR (Radar product) request according to CONFORMANCE LEVEL 1.. A SAR request means that it can contain queryables of the EOP classification plus the ones associated to the SAR classification.

Sections corresponding to “optional” queryables (as indicated in the table above) are not necessarily present in <<Part 4>>.

```

<!-- Select the SAR classification-->
<ogc:PropertyIsEqualTo>

<ogc:PropertyName>/rim:ClassificationNode/@code</ogc:PropertyName>
  <ogc:Literal>SAR</ogc:Literal>
</ogc:PropertyIsEqualTo>

<!-- get classification linked to the SAR classification -->
<ogc:PropertyIsEqualTo>

<ogc:PropertyName>/rim:Classification/@classificationNode</ogc:PropertyName>

<ogc:PropertyName>/rim:ClassificationNode/@id</ogc:PropertyName>
</ogc:PropertyIsEqualTo>
<!-- such classification must classify the ExtrinsicObject -->
<ogc:PropertyIsEqualTo>

<ogc:PropertyName>/rim:Classification/@classifiedObject</ogc:PropertyName>
  <ogc:PropertyName>/rim:ExtrinsicObject/@id</ogc:PropertyName>
  </ogc:PropertyIsEqualTo>

<ogc:PropertyIsEqualTo>
  <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/PolarisationMode"]/rim:ValueList/rim:Value[1]</ogc:PropertyName>
  <ogc:Literal>D</ogc:Literal>
</ogc:PropertyIsEqualTo>

```

```

<ogc:PropertyIsEqualTo>
  <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/PolarisationChannels"]/rim:ValueList/rim:Value[1]</ogc:Prop
ertyName>
  <ogc:Literal>HH</ogc:Literal>
</ogc:PropertyIsEqualTo>

<ogc:PropertyIsGreaterThanOrEqualTo>
  <ogc:PropertyName>/rim:ExtrinsicObject/Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/MinimumIncidenceAngle"]/rim:ValueList/rim:Value[1]</ogc:Pro
pertyName>
  <ogc:Literal>60</ogc:Literal>
</ogc:PropertyIsGreaterThanOrEqualTo>

<ogc:PropertyIsLessThanOrEqualTo>
  <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/MaximumIncidenceAngle"]/rim:ValueList/rim:Value[1]</ogc:Pro
pertyName>
  <ogc:Literal>70</ogc:Literal>
</ogc:PropertyIsLessThanOrEqualTo>
    
```

- ❑ CONFORMANCE LEVEL 1, 2: the red/italic part of the request above can be ignored and does not have to be interpreted by the server. It is however present in the request for eBRIM AP compliance reasons.
- ❑ CONFORMANCE LEVEL 3: the red/italic part above is to be interpreted by the server.

**Queryableables for the Atmospheric (ATM) classification**

The OGC 10-189 catalogue client is able to send the following EBRIM ATM queryables:

Queryable	Type	Fixed/Optional	CONFORMANCE LEVEL
cloudCoverPercentage	Double	Optional	1
snowCoverPercentage	Double	Optional	1

You have below of the structure of <<Part 4>> for an ATM (Athmospheric) request according to CONFORMANCE LEVEL 1. An ATM request means that it can contain queryables of the EOP classification plus the ones associated to the ATM classification.

Sections corresponding to “optional” queryables (as indicated in the table above) are not necessarily present in <<Part 4>>.

```

<!-- Select the ATM classification-->
<ogc:PropertyIsEqualTo>
    
```

```

<ogc:PropertyName>/rim:ClassificationNode/@code</ogc:PropertyName>
  <ogc:Literal>ATM</ogc:Literal>
</ogc:PropertyIsEqualTo>

<!-- get classification linked to the ATM classification -->
<ogc:PropertyIsEqualTo>

<ogc:PropertyName>/rim:Classification/@classificationNode</ogc:Property
Name>

<ogc:PropertyName>/rim:ClassificationNode/@id</ogc:PropertyName>
</ogc:PropertyIsEqualTo>
<!-- such classification must classify the ExtrinsicObject -->
<ogc:PropertyIsEqualTo>

<ogc:PropertyName>/rim:Classification/@classifiedObject</ogc:Property
Name>
  <ogc:PropertyName>/rim:ExtrinsicObject/@id</ogc:PropertyName>
</ogc:PropertyIsEqualTo>

<!-- Cloud Cover Percentage -->
<ogc:PropertyIsLessThanOrEqualTo>
  <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/CloudCoverPercentage"]/rim:ValueList/rim:Value[1]</ogc:Property
Name>
  <ogc:Literal>50</ogc:Literal>
</ogc:PropertyIsLessThanOrEqualTo>

<!-- Snow Cover Percentage -->
<ogc:PropertyIsLessThanOrEqualTo>
  <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/SnowCoverPercentage"]/rim:ValueList/rim:Value[1]</ogc:Property
Name>
  <ogc:Literal>30</ogc:Literal>
</ogc:PropertyIsLessThanOrEqualTo>

```

- CONFORMANCE LEVEL 1, 2: the red/italic part of the request above can be ignored and does not have to be interpreted by the server. It is however present in the request for eBRIM AP compliance reasons.
- CONFORMANCE LEVEL 3: the red/italic part above is to be interpreted by the server.

### Queryable for the Synthetic and Systematic (SSP) classification

The OGC 10-189 catalogue client is able to send the following EBRIM SSP queryables:

Queryable	Type	Fixed/Optional	CONFORMANCE LEVEL
cloudCoverPercentage	Double	Optional	1
snowCoverPercentage	Double	Optional	1

You have below of the structure of <<Part 4>> for an SSP (Synthetic and Systematic) request according to CONFORMANCE LEVEL 1. An SSP request means that it can contain queryables of the EOP classification plus the ones associated to the SSP classification.

Sections corresponding to “optional” queryables (as indicated in the table above) are not necessarily present in <<Part 4>>.

```

<!-- Select the SSP classification-->
<ogc:PropertyIsEqualTo>

<ogc:PropertyName>/rim:ClassificationNode/@code</ogc:PropertyName>
  <ogc:Literal>SSP</ogc:Literal>
</ogc:PropertyIsEqualTo>

<!-- get classification linked to the SSP classification -->
<ogc:PropertyIsEqualTo>

<ogc:PropertyName>/rim:Classification/@classificationNode</ogc:PropertyName>

<ogc:PropertyName>/rim:ClassificationNode/@id</ogc:PropertyName>
</ogc:PropertyIsEqualTo>
<!-- such classification must classify the ExtrinsicObject -->
<ogc:PropertyIsEqualTo>

<ogc:PropertyName>/rim:Classification/@classifiedObject</ogc:PropertyName>
  <ogc:PropertyName>/rim:ExtrinsicObject/@id</ogc:PropertyName>
</ogc:PropertyIsEqualTo>

<!-- Cloud Cover Percentage -->
<ogc:PropertyIsLessThanOrEqualTo>
  <ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/CloudCoverPercentage"]/rim:ValueList/rim:Value[1]</ogc:PropertyName>
  <ogc:Literal>50</ogc:Literal>
</ogc:PropertyIsLessThanOrEqualTo>

<!-- Snow Cover Percentage -->
<ogc:PropertyIsLessThanOrEqualTo>

```



```
<ogc:PropertyName>/rim:ExtrinsicObject/rim:Slot[@name="
http://www.opengis.net/def/property/OGC-
EO/0/SnowCoverPercentage"]/rim:ValueList/rim:Value[1]</ogc:Prope
rtyName>
  <ogc:Literal>30</ogc:Literal>
</ogc:PropertyIsLessThanOrEqualTo>
```

- CONFORMANCE LEVEL 1, 2: the red/italic part of the request above can be ignored and does not have to be interpreted by the server. It is however present in the request for ebRIM AP compliance reasons.
- CONFORMANCE LEVEL 3: the red/italic part above is to be interpreted by the server.

## H.2 Conclusions

This annex is a first attempt to reduce the complexity of the requests that an OGC 10-189 catalogue is expected to handle. At the moment, it is not possible for a catalogue to restrict the search space using the GetCapabilities document. Therefore, we propose to define CONFORMANCE LEVELS to allow for server implementations the complexity of which can be limited. This is of particular importance for implementers of OGC 10-189 gateways towards legacy catalogues.

**Annex I: DOCUMENT CHANGE HISTORY**  
**(INFORMATIVE)**