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OpenGIS® Catalogue Services Application Profile

Editor: Jolyon Martin

OpenGIS® Catalogue Services -
Best Practices for for Earth Observation Products

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i. Preface

This candidate implementation specification document describes a minimal profile to find and order data products from catalogues of Earth Observation (EO) products.

This work is not yet at the stage of a compliant profile of OGC Catalog 2.0, it describes a first set of SOAP/HTTP protocol binding that have been inspired from on the catalogue abstract model, that will be further refined in future work. The final goal being to agree to a coherent set of interfaces for catalogue and order of EO products to support access to data from heterogeneous systems dealing with derived data products from satellite based measurements of the earth’s surface and environment.

This document is based on the work of the European Space Agency (ESA), the Centre National d’Études Spatiales (CNES) and SPOT Image performed in the context of an interoperability experiment performed using the ESA service support environment [SSE] that resulted in an internal specification called EOLI-XML [EOLI-XML]. This EOLI-XML specification was extended to support an order interface subsequently adopted by ESA for online ordering from their catalogue.

Suggested additions, changes, and comments on this draft specification are welcome and encouraged. Such suggestions may be submitted by OGC portal message, email message, or by making suggested changes in an edited copy of this document.

The changes made in this document version, relative to the previous version, are tracked by Microsoft Word, and can be viewed if desired. If you choose to submit suggested changes by editing this document, please first accept all the current changes, and then make your suggested changes with change tracking on.

ii. Submitting organisations

The following organisations submitted the original document or its revisions to the Open Geospatial Consortium, Inc.

ESA – European Space Agency

The editors would like to acknowledge that this work is the result of collaboration and review of many organizations and would like to thank for the comments and contributions from CNES, ASI, DLR, EUCS, JRC, Intecs, Spacebel, Spot Image, Siemens, Kell, Seibersdorf, (also noting that this does not imply a complete endorsement from these organizations).

iii. Document contributor contact points

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

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<thead>
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<tr>
<td>Jolyon Martin</td>
<td>ESA</td>
</tr>
<tr>
<td>Pier Giorgio Marchetti</td>
<td>ESA</td>
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<td>16 June 2005</td>
<td>0.1.0</td>
<td>Jolyon Martin</td>
<td>N/A</td>
<td>Initial Document</td>
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<td>Carl Reed</td>
<td>N/A except added terms and definitions</td>
<td>Put in proper template.</td>
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<td>Jolyon Martin</td>
<td>Preface and Introduction</td>
<td>Improvement to the overview information, setting the context of discussion paper</td>
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<td>10 Jan 2005</td>
<td>0.3.0</td>
<td>Jolyon Martin</td>
<td>Title changed, annex added for mapping to CAT 2.0</td>
<td>Following review at OGC TC meeting Nov. 2005 it was agreed to rename the document, and to add an annex to describe the foreseen alignment towards CAT 2.0. The occasion was also take to make a few corrections to the specification based on operational experiences and provide additional information on the metadata fields.</td>
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v. Changes to the OpenGIS® Catalogue Services Specification

To be confirmed as a result of ongoing work. Any changes will be documented as official change request proposals and submitted to the OGC.

vi. Future work

In parallel to the OGC review process, this profile will be the subject of further revision in the context of the Heterogeneous Missions Accessibility study in the framework of the European Space Agency GMES preparatory activities. A number of national space agencies, which have missions contributing to GMES, will participate to this study, as well as an industrial consortium, which is being selected via an ESA open tender action.

The Agencies, which have already confirmed their participation, are:

ASI – Italian Space Agency
CNES – French Space Agency,
DLR – German Space Agency
EUSC – European Union Satellite Centre

The profile has been purposefully kept minimal to keep complexity for providers, enhancements may be considered, and will be discussed in context of the GMES preparatory work.

Areas of further work include discovery of product collections (e.g. capabilities description) should be aligned to the general discovery requirements of INSPIRE, better compliance with OGC 2.0 Catalogue Services (as outlined in Annex D), as well as order interface security considerations.

vii. Foreword

This document is a candidate profile of the OpenGIS Catalogue 2.0 Implementation Specification.

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

Annex A, B, the Abstract Conformance Test Suite, are normative to this specification and shall be implemented when a computing environment requires catalogue services. All other annexes are informative and provide background information.
Introduction

The services proposed in this profile are intended to support the identification and subsequent ordering of EO data products from previously identified data collections. The intent of this initial profile is to describe a minimum interface that can be supported by many data providers (satellite operators, data distributors …), most of whom have existing (and relatively complex) facilities for the management of these data.

The focus of this paper is the identification and ordering of EO data products from previously identified collections (catalogues). EO data product collections are usually structured to contain data items derived from a sensor onboard a satellite or series of sensors. The key characteristics differentiating these products are date of acquisition, location and in some cases, such as the optical imagery, the possible presence of cloud obscuring the image. These are the key characteristics; there are however other metadata that are required to identify products of interest. The data collections may be very extensive, in many cases products derived from satellites data have resulted in dataset series of over 10 years, depending on the product sizing conventions this easily equates to millions of items in a collection, it is an important aspect of this profile that in the case of an interactive query session, the client is able to efficiently refine a query to identify the products of interest. However, it is equally an important feature that the profile presented here may be used in the context of computer-to-computer interaction to allow routine / complex processing tasks to be automated, for example as part of an order entry work flow.

The target audience for this document includes catalogue users, client developers, service implementers, and system testers. The candidate specification encompasses three interrelated views that reflect different viewpoints on a catalogue service. Each viewpoint focuses on different areas of concern:

- **Enterprise** – describes the general capabilities of the service in light of functional and nonfunctional requirements (for catalogue users and system testers);
- **Information** – defines the kinds of information handled by the catalogue and the policies to be enforced (for catalogue users, developers, and testers);
- **Computational** – specifies the public interfaces, allowable interactions, and protocol bindings (for developers and testers).

This document presents work towards an application profile of an OGC Catalogue service. The document does not comply fully with the rules articulated in clause 11 of the *OpenGIS Catalogue Services Specification*, version 2.0 (OGC 04-021r2). This should be addressed as further work. However, the document presents the profile in the structure required for application profiles in order to facilitate the positioning of this work as a possible standard. Since the interfaces expressed are operationally used and maintained it was considered better to present the actual interfaces as they are. An informative annex D has been added in order to show the desireable evolution of the profile to better comply with OGC 04-021r2.

---

1 The Reference Model of Open Distributed Processing (RM-ODP, ISO/IEC 10746) is the architectural framework adopted by the OGC and ISO/TC 211 for specifying software-intensive systems. In IEEE 1471 terminology the RM-ODP framework provides a set of library viewpoints.
OpenGIS® Catalogue Services –
Best Practices for a Minimum Profile for EO Products using WSDL and SOAP

1 Scope

This application profile document describes best practices for the interfaces, bindings and encodings required to search, present and order data from catalogues of Earth Observation (EO) products. The profile is presented as a minimum requirement for catalogue interoperability within the EO domain. It is anticipated that implementation of this profile can be supported in a cost-effective manner by providers of EO products.

An OGC Best Practices document contains discussion of best practices related to either the use and/or implementation of an adopted OGC standard or an OpenGIS candidate specification that has not be submitted using the RFC process but is considered mature enough for implementation and for release to the public. Best Practices Documents are an official position of the OGC and thus represent an official endorsement of the content of the paper.

2 Conformance

Any software product claiming conformance with this application profile shall pass all requirements described in the following abstract test suites. The definition of an abstract test suite appears in ISO 19105.

This application profile defines two classes/levels of conformance: class A, and class B. Class A defines the minimum services for catalogue search and present, class B extends the conformance towards ordering. Any software product claiming conformance with one of these classes shall pass all the requirements described in the corresponding abstract test suites below.

2.1 Abstract test suite for conformance class/level A, catalogue services

See Annex A for the ATS for conformance class A

2.2 Abstract test suite for conformance class/level B, ordering services

See Annex B for the ATS for conformance class B.

3 Normative references

The following normative documents contain provisions that, through reference in this text, constitute provisions of this document. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. For undated references, the latest edition of the normative document referred to applies.

ISO 19105:2000, Geographic information — Conformance and Testing

OGC 05-008, OGC Web Services Common Specification

This OWS Common Specification contains a list of normative references that are also applicable to this Implementation Specification.
NOTE: Additional normative references to be confirmed. For a complete set of references see the Bibliography.
4 Terms and definitions

For the purposes of this document, the following terms and definitions apply:

For the purposes of this specification, the definitions specified in Clause 4 of the OWS Common Implementation Specification [OGC 05-008] shall apply. In addition, the following terms and definitions apply.

4.1 data clearinghouse
collection of institutions providing digital data, which can be searched through a single interface using a common metadata standard [ISO 19115]

4.2 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]

4.3 dataset series
collection of datasets sharing the same product specification [ISO 19113, ISO 19114, ISO 19115]

4.4 identifier
a character string that may be composed of numbers and characters that is exchanged between the client and the server with respect to a specific identity of a resource

4.5 metadata dataset
metadata describing a specific dataset [ISO 19101]

4.6 metadata entity
group of metadata elements and other metadata entities describing the same aspect of data

NOTE 1 A metadata entity may contain one or more metadata entities.

NOTE 2 A metadata entity is equivalent to a class in UML terminology [ISO 19115].

4.7 metadata schema
conceptual schema describing metadata

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

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

4.9 parameter
variable whose name and value are included in an operation request or response
4.10 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]

4.11 qualified name
name that is prefixed with its naming context

EXAMPLE The qualified name for the road no attribute in class Road defined in the Roadmap schema is RoadMap.Road.road_no. [ISO 19118].

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

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

4.14 state
condition that persists for a period

NOTE The value of a particular feature attribute describes a condition of the feature [ISO 19108].

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

5 Conventions

5.1 Abbreviated Terms
Some frequently used abbreviated terms:

API Application Program Interface
CSW Catalogue Service-Web
CEOS Committee on Earth Observation Satellites
DC Dublin Core
EO Earth Observation
HTTP HyperText Transport Protocol
I/F Interface
ICD Interface Control Document
ISO International Organisation for Standardisation
<table>
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<th>Acronym</th>
<th>Definition</th>
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<tr>
<td>N/A</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>OGC</td>
<td>Open Geospatial Consortium</td>
</tr>
<tr>
<td>SOAP</td>
<td>Simple Object Access Protocol</td>
</tr>
<tr>
<td>TCP/IP</td>
<td>Transmission Control Protocol/Internet Protocol</td>
</tr>
<tr>
<td>UML</td>
<td>Unified Modeling Language</td>
</tr>
<tr>
<td>URI</td>
<td>Uniform Resource Identifier</td>
</tr>
<tr>
<td>URL</td>
<td>Uniform Resource Locator</td>
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<tr>
<td>URN</td>
<td>Uniform Resource Name</td>
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<td>UTF-8</td>
<td>Unicode Transformation Format-8</td>
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<tr>
<td>WSDL</td>
<td>Web Service Definition Language</td>
</tr>
<tr>
<td>W3C</td>
<td>World Wide Web Consortium</td>
</tr>
<tr>
<td>XML</td>
<td>eXtensible Markup Language</td>
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<td>XSD</td>
<td>XML Schema Definition</td>
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6 Overview and 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 best practices profile are intended to support the identification and subsequent ordering of EO data products. The intent of the profile is to describe a minimum interface that can be supported by many data providers (e.g., satellite operators, data distributors, ancillary content providers), many of whom have existing facilities.

Points to be discussed: large historic archive of data, push for online ordering to reduce operations costs associated to order desk, context of GMES

It is an important feature that the profile presented here may be used in the context of computer-to-computer interaction to allow routine / complex processing tasks to be automated. The need to support online ordering is also a critical feature of the Catalogue Services. The services presented may form the basis for workflows within service chaining and are presented in the light of an overall service oriented architecture. These considerations have influenced the profile to use the following W3C and OASIS recommendations.

Message-based SOAP (Simple Object Access Protocol) [SOAP] over HTTP or HTTPS for secure communication is used as protocol between the client application and the catalogue service. SOAP is firewall-friendly, and platform independent. It is thus well suited to integrate services in a heterogeneous environment.

WSDL (Web Services Description Language) 1.1 [WSDL] is used to define the SOAP interface of a service in a formal way that can be processed by the workflow editor.

XML Schema (from W3C) [XML] is used within this profile to define the structure of the operations input and output XML messages.

6.2 Essential use cases

This profile identifies four basic operations:

- The “Search” operation is used to perform a query on a remote catalogue. It returns the metadata available in the catalogue for the EO products matching the search parameters such as area of interest and time interval. The client may present the search results in textual (list) format, and graphically on a map.

- The “Present” operation allows requesting detailed information about a search result (information on the metadata and possibly a graphical overview of the EO product).

- The “Order” operation allows a product to be requested. In many instances the EO product may not be available online, at one extreme it may have to be tasked by the satellite, or possibly it may have to be retrieved from an archive. The order may require some processing to be performed before delivery to the user, the order allows for the selection of reduced area (scene selection) and processing, delivery options that should be applied.

- The “OrderMonitor” operation allows the status of the order to be tracked.

The profile supports synchronous operations: that is the service will immediately return the result. The client application may thus display search results on the same page where the user entered the search criteria.
The various messages that are be supported to provide these services are summarised in the table below.

<table>
<thead>
<tr>
<th>Input Payload Message</th>
<th>Output Payload Message</th>
</tr>
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<tbody>
<tr>
<td>searchRequest</td>
<td>response</td>
</tr>
<tr>
<td>presentRequest</td>
<td>response</td>
</tr>
<tr>
<td>productOrderRequest</td>
<td>orderResponse</td>
</tr>
<tr>
<td>orderMonitorRequest</td>
<td>orderMonitorResponse</td>
</tr>
</tbody>
</table>

**Table 6-1: Payload Message Sequence.**

The system context overview presents the catalogue and order services as a whole. In practise, the catalogue services are relatively simple services, and may be offered by many organisations by implementing translations towards existing databases, these catalogue services are presented in the next section. The order services may not be supported by all data providers, and so are presented as extensions to the basic catalogue services.

## 7 Catalogue services

### 7.1 Information model for EO product catalogues

EO product catalogues provide metadata to describe the datasets derived from satellite based remote sensing which may eventually be ordered, or possibly accessed directly online. The metadata may describe physical products available in an archive, or basic acquisitions of data made by the satellite from which higher-level products may be requested, e.g. implying an additional processing of the data. The metadata may also describe acquisitions that have been planned, or potential acquisitions. The metadata framework is based on [ISO], [OpenGIS], [FGDC] standards. Extensions have been applied in order to cope these standards with this specific field of application.

The figure below illustrates the main schema for the metadata used to describe EO products within a catalogue.
Figure 7-1: Metadata Type Diagram.
Common to many catalogue access protocols a set of presentations formats are defined to reduce the message sizes during various steps of catalogue interaction. The “Presentation” column specifies the expected use of the element in the different type of descriptors: F (full), B (brief), b (browse) and s (summary); “-” means that the element is normally present in the response message for the specific format. Note that the schema does not prescribe tightly which elements need to be provided, it is also left to the discretion of the catalogue provider in case it is considered that certain elements are of key importance to the user for some specific collections, in this case the provider may choose to include it also in brief and summary presentations.

<table>
<thead>
<tr>
<th>Tag Name</th>
<th>Tag Description</th>
<th>Presentation</th>
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<tr>
<td>mdContact</td>
<td>Source: [ISO], contact.</td>
<td>F B b s</td>
</tr>
<tr>
<td>rpOrgName</td>
<td>Name of the responsible organisation. Source: [ISO], organisationName.</td>
<td>F B b s</td>
</tr>
<tr>
<td>role</td>
<td>Function performed by the responsible party. Type Values: Not Empty string Permitted Value: 002 (custodian), 006 (originator), 009 (processor) Source: [ISO], role.</td>
<td>F B b s</td>
</tr>
<tr>
<td>mdDateSt</td>
<td>Metadata Date Type: date or dateTime in ISO 8601 format Date Format: CCYY-MM-DD DateTime Format: CCYY-MM-DDThh:mm[:ss]Z Source: [ISO], dateStamp Note: field &quot;required&quot; by ISO19115, ideally the field would mean &quot;Date time of insertion within the catalog&quot;, but since in some catalogues metadata at are calculated on the fly based on last update of orbit information available it is also acceptable to fill with &quot;Date time of the response&quot;</td>
<td>F - - -</td>
</tr>
<tr>
<td>datalldInfo</td>
<td>Source: [ISO], identificationInfo.</td>
<td>F B b s</td>
</tr>
<tr>
<td>platInsId</td>
<td>Satellite element. Source: [FGDC], Platform_and_Instrument_identification</td>
<td>F B b s</td>
</tr>
<tr>
<td>platfSNm</td>
<td>Platform Name Type Value: string Permitted Values: see [Valids]. Source: [FGDC], Platform_Short_Name</td>
<td>F B b s</td>
</tr>
<tr>
<td>platfSer</td>
<td>Platform Identifier Type Value: string Permitted Values: see [Valids]. Source: [FGDC], Platform_Serial_Identifier</td>
<td>F B b s</td>
</tr>
<tr>
<td>instShNm</td>
<td>Sensor type. Type Value: string Permitted Values: see [Valids]. Source: [FGDC], Instrument_Short_Name</td>
<td>F B b s</td>
</tr>
<tr>
<td>instMode</td>
<td>Sensor Mode Type Value: string</td>
<td>F B b s</td>
</tr>
<tr>
<td>satDom</td>
<td>Satellite Domain element.</td>
<td>F B b s</td>
</tr>
<tr>
<td>orbit</td>
<td>Orbit Number. Type Value: integer Permitted Values: &gt; 0 Source: 0, orbitNumber</td>
<td>F B b s</td>
</tr>
<tr>
<td>lastOrbit</td>
<td>Type Value: integer Permitted Values: &gt; 0</td>
<td>F - - -</td>
</tr>
<tr>
<td>orbitDir</td>
<td>Orbit Direction Element. Type Value: Not Empty String Permitted Values: 0 (Ascending), 1 (Descending)</td>
<td>F B b s</td>
</tr>
<tr>
<td>wwRefSys</td>
<td>World Reference System element. Source: [FGDC], Worldwide_Reference_System</td>
<td>F B b s</td>
</tr>
<tr>
<td>Tag Name</td>
<td>Tag Description</td>
<td>Presentation</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>frame</td>
<td>Frame Number.                                                                                           Type Value: integer       Permitted Values: &gt; 0      Source: [ISO19130], frame</td>
<td>F B b s</td>
</tr>
<tr>
<td>track</td>
<td>Track Number.                                                                                           Type Value: integer       Permitted Values: &gt; 0      Source: [ISO19130], track</td>
<td>F B b s</td>
</tr>
<tr>
<td>swathId</td>
<td>Type Value: string                                                                                      Permitted Values: Not Empty String</td>
<td>F B b s</td>
</tr>
<tr>
<td>passCoverage</td>
<td>Pass Coverage element, describes the coverage of the product with respect to the orbit, specifying the start and stop time of the product relative to the ascending node crossing of the satellite. This information is typically used to subsequently calculate possible “frames” that may be selected from the product based on a standard framing size</td>
<td>F B b s</td>
</tr>
<tr>
<td>start</td>
<td>Start pass coverage                                                                                     Type Value: integer</td>
<td>F B b s</td>
</tr>
<tr>
<td>stop</td>
<td>Stop pass coverage                                                                                      Type Value: integer</td>
<td>F B b s</td>
</tr>
<tr>
<td>idCitation</td>
<td>Source: [ISO], Identification Information</td>
<td>F B b s</td>
</tr>
<tr>
<td>resTitle</td>
<td>Product identifier element.                                                                             Type Value: string       Source: [ISO], Citation and responsible party information</td>
<td>F B b s</td>
</tr>
<tr>
<td>idAbs</td>
<td>Abstract element.                                                                                       Type Value: string       Source: [ISO], Abstract. Example: ENVISAT ASAR/IM product.</td>
<td>F - - -</td>
</tr>
<tr>
<td>idStatus</td>
<td>Product Status element.                                                                                 Type Value: Not Empty String Permitted Values: 001 (completed), 005 (planned), 006 (required), 007 (underDevelopment), 008 (potential).</td>
<td>F - - -</td>
</tr>
<tr>
<td>dataExt</td>
<td>Extension both temporal and geographical of the product.                                                Source: [ISO], Identification information.</td>
<td>F B b s</td>
</tr>
<tr>
<td>tempEle</td>
<td>Temporal Coverage of the product.                                                                         Source: [ISO], temporalElement</td>
<td>F B b s</td>
</tr>
<tr>
<td>exTemp</td>
<td>Temporal extent information element.                                                                         Source: [ISO], extent.</td>
<td>F B b s</td>
</tr>
<tr>
<td>beginEnd</td>
<td>Information containing the Product temporal coverage.                                                       Source: [ISO]</td>
<td>F B b s</td>
</tr>
<tr>
<td>begin</td>
<td>Start Date                                                                                               Type: dateTime in ISO 8601 format (CCYY-MM-DDTh:mm[.ss[.cc]Z]) Source: [ISO]</td>
<td>F B b s</td>
</tr>
<tr>
<td>end</td>
<td>End Date                                                                                                Type: dateTime in ISO 8601 format (CCYY-MM-DDTh:mm[.ss[.cc]Z]) Source: [ISO]</td>
<td>F B b s</td>
</tr>
<tr>
<td>geoEle</td>
<td>Geographic extent of the product.                                                                          Source: [ISO], geographicElement</td>
<td>F B b s</td>
</tr>
<tr>
<td>polygon</td>
<td>Polygon element.                                                                                         Source: [ISO], polygon</td>
<td>F B b s</td>
</tr>
<tr>
<td>Tag Name</td>
<td>Tag Description</td>
<td>Presentation</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------</td>
</tr>
</tbody>
</table>
| coordinates  | Coordinates element. Type: string Syntax: points are separated by blank; point’s coordinates lat and long are separated by comma (,). The decimal point (.) is used to separate decimals. In order to correctly use the polygon to further allow scene selection within the acquisition the polygon shall have the following characteristics:  
  ° first point is the first image line right corner  
  ° second point is the first image line left corner  
  ° N intermediate points for the left border (direction FL to LL)  
  ° last left corner  
  ° last right corner  
  ° N intermediate points for the right border  
  Example: for a polygon having 4 points:  
  65.00,-10.00 65.00,-8.00 63.00,-8.00 63.00,-10.00 | F B b s       |
| scCenter     | Scene center element.                                                                                                                                                                                           | F B b s      |
| coordinates  | Coordinates element. Type: string Syntax: points are separated by blank; point’s coordinates lat and long are separated by comma (,). The decimal point (.) is used to separate decimals. Example: 64.00,-9.00 | F B b s      |
| contInfo     | Source: [ISO], contentInfo F - - -                                                                                                                                                                             |              |
| attDesc      | Source: [ISO], attributeDescription.                                                                                                                                                                           | F - - -      |
| typeName     | Source: [ISO19103]. Type: string Permitted Value: imageType                                                                                                                                                     | F - - -      |
| attTypes     | Source: [ISO19103].                                                                                                                                                                                             | F - - -      |
| attName      | Source: [ISO19103]. Type: string Permitted Value: imageQuality                                                                                                                                             | F - - -      |
| typeName     | Source: [ISO19103]. Type: string Permitted Value: imageQualityType                                                                                                                                              | F - - -      |
| contType     | Type: Not Empty String Permitted Values: 001(image) Source: [ISO], contentType                                                                                                                                 | F - - -      |
| illElevAng   | Illumination Elevation Angle element. Type: Float Permitted Values: [-90, +90] Source: [ISO], illuminationElevationAngle                                                                                      | F - - -      |
| illAziAng    | Illumination Azimuth Angle element. Type: Float Permitted Values: [0, +360] Source: [ISO], illuminationAzimuthAngle                                                                                         | F - - -      |
| cloudCovePerc| Cloud Cover Percentage element. Type Value: float Permitted Values: [0, 100] Source: [ISO], cloudCoverPercentage                                                                                         | F - - -      |
| dqInfo       | Source: [ISO], dataQualityInfo F - b s                                                                                                                                                                          |              |
| dqScope      | Source: [ISO], scope F - - -                                                                                                                                                                                    |              |
| scpLvl       | Level element. Type Value: string Permitted Value: DataSet Source: [ISO], level                                                                                                                                   | F - - -      |
| graphOver    | Graphic Overview element. Source: [ISO], graphicOverview                                                                                                                                                    | F - b s      |
### Table 7-1: Metadata Type.

<table>
<thead>
<tr>
<th>Tag Name</th>
<th>Tag Description</th>
<th>Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>bgFileName</td>
<td>HTTP URL for graphical overview, higher resolution browse should be specified in Full and Browse presentation records, lower resolution thumbnail within the Summary. Type Value: Not Empty String Source: [ISO], filename Examples: <img src="http://earth.esa.int:8090/XI/EN1/20000101T000000000-20000101000015100_A_B.jpg" alt="Browse HTTP URL" /> <img src="http://earth.esa.int:8090/XI/EN1/20000101T000000000-20000101000015100_D_T.jpg" alt="Thumbnail HTTP URL" /></td>
<td>F - b s</td>
</tr>
<tr>
<td>brwld</td>
<td>Identifier for browse in case more than one overview is available for example thermal bands and visible bands Type Value: string Source: [ISO], graphicOverview</td>
<td>F - b s</td>
</tr>
<tr>
<td>brwExt</td>
<td>Browse Extent element.</td>
<td>F - b s</td>
</tr>
<tr>
<td>tempEle</td>
<td>Temporal Coverage of the product. Source: [ISO], temporalElement</td>
<td>F - b s</td>
</tr>
<tr>
<td>exTemp</td>
<td>Temporal extent information element. Source: [ISO], extent.</td>
<td>F - b s</td>
</tr>
<tr>
<td>beginEnd</td>
<td>Information containing the Product temporal coverage. Source: [ISO]</td>
<td>F - b s</td>
</tr>
<tr>
<td>begin</td>
<td>Start Date Type: dateTime in ISO 8601 format (CCYY-MM-DDThh:mm:ss[.cc]Z) Source: [ISO]</td>
<td>F - b s</td>
</tr>
<tr>
<td>end</td>
<td>End Date Type: dateTime in ISO 8601 format (CCYY-MM-DDThh:mm:ss[.cc]Z) Source: [ISO]</td>
<td>F - b s</td>
</tr>
<tr>
<td>brwType</td>
<td>Browse Type element. Type Value: Not Empty String</td>
<td>F - b s</td>
</tr>
<tr>
<td>addInfo</td>
<td>Additional information element.</td>
<td>F - - -</td>
</tr>
<tr>
<td>locAtt</td>
<td>Local Attribute element.</td>
<td>F - - -</td>
</tr>
<tr>
<td>locName</td>
<td>Name of Local Attribute. Type Value: string</td>
<td>F - - -</td>
</tr>
<tr>
<td>locValue</td>
<td>Value of Local Attribute. Type Value: string</td>
<td>F - - -</td>
</tr>
</tbody>
</table>

7.2 External interfaces

7.2.1 Message sequencing

Three main XML elements have been identified for the Catalogue Search Interface:

- **searchRequest**: this message allows to identify products inside a single collection via a search condition and to request the number of hits or product metadata in different formats as Response.
- **presentRequest**: this message allows to retrieve (multiple) product metadata within a single collection by providing the product identification.
- **response**: this message contains the result in form of number of hits or returned product metadata
The messaging assumes a stateless interaction, it is expected that a series of search and present requests may be used to iterate over the results set from a search. It is therefore expected that the catalogue server returns results to a search in a predictable order.

The hand shaking between the SOAP/HTTP server and a SOAP/HTTP client will be the same for both Search and Present request messages. The SOAP/HTTP client sends a SOAP request message. When the response is ready, the SOAP/HTTP server builds the response message and sends the SOAP response to the client.

The message-based variant of SOAP will be used. This means that style="document" are used in the WSDL file as attribute of the <binding> element.

Table 7-2 shows the SOAP Body content messages exchanged between the EOLI-XML SOAP/HTTP server and a SOAP/HTTP client.

<table>
<thead>
<tr>
<th>Input Payload Message</th>
<th>Output Payload Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>searchRequest</td>
<td>response</td>
</tr>
<tr>
<td>presentRequest</td>
<td>response</td>
</tr>
</tbody>
</table>

Table 7-2: Payload Message Sequence.

7.2.2 Search request message

The body of this message is the “searchRequest XML element, derived from [OpenGIS].

Figure 7-2 gives a graphical representation:
<table>
<thead>
<tr>
<th>Tag Name</th>
<th>Tag Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>simpleQuery</td>
<td>SimpleQuery element. It contains the query conditions.</td>
</tr>
<tr>
<td>DataExt</td>
<td>Extension both temporal and geographical of the Metadata. This represents the spatial and temporal query condition. Source: [ISO], Identification information.</td>
</tr>
<tr>
<td>geoEle</td>
<td>Geographic extent of the product. Source: [ISO], geographicElement</td>
</tr>
<tr>
<td>Attribute Name</td>
<td>operator</td>
</tr>
<tr>
<td>Attribute Permitted values</td>
<td>OVERLAP</td>
</tr>
<tr>
<td>geoBndBox</td>
<td>Geographic Bounding Box element. Source: [ISO], EX. GeographicBoundingBox</td>
</tr>
<tr>
<td>westBL</td>
<td>Western-most coordinate. Type: Float Permitted Values: [-180, +180] Source: [ISO], westBoundLongitude</td>
</tr>
<tr>
<td>eastBL</td>
<td>Eastern-most coordinate. Type: Float Permitted Values: [-180, +180] Source: [ISO], eastBoundLongitude</td>
</tr>
<tr>
<td>southBL</td>
<td>Southern-most coordinate. Type: Float Permitted Values: [-90, +90] Source: [ISO], southBoundLongitude</td>
</tr>
</tbody>
</table>

Figure 7-2: SearchRequest Diagram.
<table>
<thead>
<tr>
<th>Tag Name</th>
<th>Tag Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>northBL</td>
<td>Northern-most coordinate. Type: Float Permitted Values: [-90, +90] Source: [ISO], northBoundLongitude</td>
</tr>
<tr>
<td>TempEle</td>
<td>Temporal Coverage of the product. Source: [ISO], temporalElement Attribute Name: operator Attribute Permitted values: OVERLAP</td>
</tr>
<tr>
<td>exTemp</td>
<td>Temporal extent information element. Source: [ISO] extent</td>
</tr>
<tr>
<td>beginEnd</td>
<td>Information containing the Product temporal coverage. Source: [ISO]</td>
</tr>
<tr>
<td>begin</td>
<td>Start Date Type: date in ISO 8601 format (CCYY-MM-DD) Source: [ISO]</td>
</tr>
<tr>
<td>end</td>
<td>End Date Type: date in ISO 8601 format (CCYY-MM-DD) Source: [ISO]</td>
</tr>
<tr>
<td>satelliteDomainConditions</td>
<td>SatelliteDomainConditions element.</td>
</tr>
<tr>
<td>plaInsIdCondition</td>
<td>Satellite and Instrument Identification. Attribute Name: operator Attribute Permitted values: EQUAL</td>
</tr>
<tr>
<td>plaInsId</td>
<td>Satellite element. Source: [FGDC], Platform_and_Instrument_identification</td>
</tr>
<tr>
<td>platfSNm</td>
<td>Platform Name Type Value: string Permitted Values: see [Valid]. Source: [FGDC], Platform_Short_Name</td>
</tr>
<tr>
<td>platfSer</td>
<td>Platform Identifier Type Value: string Permitted Values: see [Valid]. Source: [FGDC], Platform_Serial_Identifier Note: multiple values allowed in search request, in which case, a logical OR is expected to be applied</td>
</tr>
<tr>
<td>cloudCoverCondition</td>
<td>CloudCoverageCondition element. Attribute Name: operator Attribute Permitted values: LESS EQUAL.</td>
</tr>
<tr>
<td>cloudCovePerc</td>
<td>Cloud Cover Percentage element. Type Value: float Permitted Values: [0, 100] Source: [ISO], cloudCoverPercentage</td>
</tr>
<tr>
<td>genericCondition</td>
<td>genericCondition element. Attribute Name: operator Attribute Permitted values: EQUAL, LESS EQUAL, LESS, GREATER, GREATER EQUAL, WITHIN, INTERSECTS.</td>
</tr>
<tr>
<td>attributeId</td>
<td>Attribute identifier. Type Value: Not empty string</td>
</tr>
<tr>
<td>attributeValue</td>
<td>Attribute value. Type Value: Not empty string</td>
</tr>
<tr>
<td>ResultType</td>
<td>Type of data to be returned in a query response message and the behaviour of the message response. Type Value: string Permitted Values: hits, results. Source: [OpenGIS], CG_QueryRequest.</td>
</tr>
<tr>
<td>IteratorSize</td>
<td>Maximum number of the result set entries to be returned in the query response. Type Value: Integer Permitted Values: &gt; 0 Source: [OpenGIS], CG_QueryRequest and CG_QueryResponse.</td>
</tr>
</tbody>
</table>
### Table 7-3: Search Request Tags

#### 7.2.3 Present request message

The body of this message is the “presentRequest” XML element, derived from [OpenGIS].

Figure 7-3 gives a graphical representation:

![Figure 7-3: PresentRequest Diagram](image)

<table>
<thead>
<tr>
<th>Tag Name</th>
<th>Tag Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>idCitation</td>
<td>Source: [ISO], Identification Information</td>
</tr>
<tr>
<td>resTitle</td>
<td>Product identifier element. Type Value: string. Permitted Values: Not empty string. Source: [ISO], Citation and responsible party information. Syntax: The identifier format is not mandated by the specification, but is expected to be a persistent identifier.</td>
</tr>
<tr>
<td>presentation</td>
<td>Type of the descriptors returned in the response. Type: string. Permitted values: brief, summary, full, browse. Source: [OpenGIS], CG_QueryRequest</td>
</tr>
<tr>
<td>collectionId</td>
<td>Search space for the query request. Type Value: string. Permitted Values: Not empty string. Syntax: The identifier format is not mandated by the specification. Source: [OpenGIS], CG_QueryRequest</td>
</tr>
</tbody>
</table>
7.2.4 Response message

The body of this message is the “response” XML element, derived from [OpenGIS]. Figure 7-4 gives a graphical representation:

![Response Diagram](image)

Table 7-4: Present Request Tags

<table>
<thead>
<tr>
<th>Tag Name</th>
<th>Tag Description</th>
</tr>
</thead>
</table>
| retrievedData| Subset of the results of the query request. It is organised and formatted as specified in the resultType and/or presentation parameters. Source: [OpenGIS], CG_QueryResponse  
  Attribute Name: presentation  
  Attribute Permitted values: brief, summary, full, browse |
| Metadata     | Source: [ISO], Metadata                                                                                                                        |
| Cursor       | Last item in the result set that was returned in the retrieved data set. This element is not present in the present response messages. Type Value: Integer  
  Permitted Values: >0  
  Source: [OpenGIS], CG_QueryResponse |
| Hits         | Number of entries in the results set. Type Value: Integer  
  Permitted Values: >=0  
  Source: [OpenGIS], CG_QueryResponse |
| Status       | Status of the query request. Type Value: string  
  Permitted Values: success, failure, partial  
  Source: [OpenGIS], CG_QueryResponse  
  Note: partial value would be used to indicate that the server may have limited the number of results returned from a query, e.g. to protect from overload |
| errorMessage| Error Message element. Type: Not empty string.                                                                                       |
8 Ordering Services

8.1 Information model for EO product ordering

In order to specify an order, a product from the catalogue has to be identified, and the appropriate order options specified. The following elements present the order options.

Figure 8-1 gives a graphical representation of “ProductServiceOptions” Type:
Figure 8-1: ProductServiceOptions Type Diagram.
<table>
<thead>
<tr>
<th>Tag Name</th>
<th>Tag Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>productOrderOptions</td>
<td>ProductOrderOptions element. It contains the information about the different processing and/or order options available for the product order.</td>
</tr>
<tr>
<td>productOrderOptionsId</td>
<td>Identifier of the specific option.</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Not empty string</td>
</tr>
<tr>
<td></td>
<td><strong>Example:</strong> “on-line retrieval”</td>
</tr>
<tr>
<td>processingOption</td>
<td>Processing option available for an order option group</td>
</tr>
<tr>
<td>optionName</td>
<td>Name of a processing option.</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Not empty string</td>
</tr>
<tr>
<td>optionValueDefinition</td>
<td>Defines the allowed values that can be selected for a processing option.</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Not empty string</td>
</tr>
<tr>
<td>optionValueRange</td>
<td>Describes the allowed value range of a numeric values for a processing option.</td>
</tr>
<tr>
<td>numericOptionValueMin</td>
<td>Minimum numeric value allowed for a processing option.</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Float</td>
</tr>
<tr>
<td>numericOptionValueMax</td>
<td>Maximum numeric value allowed for a processing option.</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Float</td>
</tr>
<tr>
<td>numericOptionValueStep</td>
<td>Resolution allowed to modify the numeric value allowed for a processing option.</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Float</td>
</tr>
<tr>
<td>optionValueList</td>
<td>Lists the selectable values for a specific processing option.</td>
</tr>
<tr>
<td>stringOptionValue</td>
<td>String representation of a single allowed value out of a list of selectable values for a processing option.</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Not empty string</td>
</tr>
<tr>
<td>programmingOption</td>
<td>Programming option available for an order option group</td>
</tr>
<tr>
<td>optionName</td>
<td>Name of a programming option.</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Not empty string</td>
</tr>
<tr>
<td>optionValueDefinition</td>
<td>Defines the allowed values that can be selected for a programming option.</td>
</tr>
<tr>
<td>optionValueRange</td>
<td>Describes the allowed value range of a numeric values for a programming option.</td>
</tr>
<tr>
<td>numericOptionValueMin</td>
<td>Minimum numeric value allowed for a programming option.</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Float</td>
</tr>
<tr>
<td>numericOptionValueMax</td>
<td>Maximum numeric value allowed for a programming option.</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Float</td>
</tr>
<tr>
<td>numericOptionValueStep</td>
<td>Resolution allowed to modify the numeric value allowed for a programming option.</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Float</td>
</tr>
<tr>
<td>optionValueList</td>
<td>Lists the selectable values for a specific programming option.</td>
</tr>
<tr>
<td>stringOptionValue</td>
<td>String representation of a single allowed value out of a list of selectable values for a programming option.</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Not empty string</td>
</tr>
<tr>
<td>sceneSelectionOption</td>
<td>Identifies a scene selection option available for an order option group.</td>
</tr>
<tr>
<td>sceneType</td>
<td>Identifier for the scene type specific to the selected product. Detailed characteristics of the scene type are expected to be specified under link &quot;orderOptionsInfoURL&quot;</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Not empty string (max 20 chars)</td>
</tr>
<tr>
<td>productDeliveryOptions</td>
<td>Delivery Options for the order item.</td>
</tr>
<tr>
<td>deliveryMethod</td>
<td>Delivery methods valid for the delivery medium.</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> String</td>
</tr>
<tr>
<td></td>
<td><strong>Permitted Values:</strong> mail, ftp-pull, ftp-push</td>
</tr>
<tr>
<td>packageMedium</td>
<td>Identification of a delivery Medium and a Medium Formatting Option.</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Not empty string (max 40 chars)</td>
</tr>
<tr>
<td></td>
<td><strong>Examples:</strong> NTP, DAT, Exabyte, CD-ROM, DLT, D1, DVD, file.</td>
</tr>
<tr>
<td>qualityOfService</td>
<td>Quality of service available</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Not empty string (max 20 chars)</td>
</tr>
<tr>
<td></td>
<td><strong>Examples:</strong> Standard, Rush, NRT</td>
</tr>
<tr>
<td>orderOptionInfoURL</td>
<td>Pointer to external information about the current order option.</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Not empty string (max 255 chars)</td>
</tr>
<tr>
<td>Tag Name</td>
<td>Tag Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>priceInformationURL</td>
<td>Pointer to external information about the prices for the current order option.</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Not empty string (max 255 chars)</td>
</tr>
<tr>
<td>purchaseInformationURL</td>
<td>Pointer to external information about the purchase conditions for the current</td>
</tr>
<tr>
<td></td>
<td>order option.</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Not empty string (max 255 chars)</td>
</tr>
</tbody>
</table>

Table 8-1: ProductServiceOptions Type.

### 8.2 External interfaces

#### 8.2.1 Messaging sequence

The basic XML elements identified for Catalogue Search are extended and new elements are introduced for the Order Interface, the new elements introduced are:

- **productOrderRequest** this message allows to submit an order by providing one or more product identification and its collection.
- **orderMonitorRequest** this message allows to monitor the order status by providing the order identifier and to retrieve all orders for a user that have been updated since a given date.
- **orderResponse** this message contains the result in form of the order identifier.
- **orderMonitorResponse** this message contains the result in form of the order status returned.

#### 8.2.2 Search request message extension for ordering

The searchRequest is extended in order to retrieve the order option values needed to submit an order. Changes to the “SearchRequestType” comprise the addition of the value “orderOption” to the list of possible values for the “presentation” element and the insertion of a new optional element “userInformation” (see Figure 8-2). The “userInformation” element is provided in order to retrieve those “productServiceOptions” reserved to privileged users.
8.2.3 Present request message extension for ordering

<table>
<thead>
<tr>
<th>Tag Name</th>
<th>Tag Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>presentation</td>
<td>Type of the descriptors returned in the query response.</td>
</tr>
<tr>
<td></td>
<td><strong>Type</strong>: String</td>
</tr>
<tr>
<td></td>
<td><strong>Permitted Values</strong>: brief, summary, full, browse, orderOption</td>
</tr>
<tr>
<td>userInformation</td>
<td>It contains the personal user information as provided as input by the order issuer.</td>
</tr>
<tr>
<td>userId</td>
<td>User identifier.</td>
</tr>
<tr>
<td></td>
<td><strong>Type</strong>: Not empty string</td>
</tr>
<tr>
<td>password</td>
<td>Password to authenticate the user.</td>
</tr>
<tr>
<td></td>
<td><strong>Type</strong>: Not empty string</td>
</tr>
</tbody>
</table>

Table 8-2: Additional/Extended Search Request Tags

Changes to the “PresentRequestType” comprise the addition of the value “orderOption” to the list of possible values for the “presentation” element and the insertion of a new optional element “userInformation”. The “userInformation” element is provided in order to retrieve those “productServiceOptions” reserved to privileged users.
8.2.4 Response message extensions for ordering

The body of this message is the “response” XML element as described in 7.2.4. Only the Metadata Type has been extended in order to include the order option values needed to submit an order.

The XML response message to an XML search or present request with presentation values “orderOption” will include the Metadata Type element described in 7.1 in “brief” format and the productServiceOptions element. The type of the productServiceOptions element is described in the next paragraph.
8.2.5 Product order request message

The body of this message is the “productOrderRequest” XML element.

Figure 8-5 gives a graphical representation of productOrderRequest element:

<table>
<thead>
<tr>
<th>Tag Name</th>
<th>Tag Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProductOrderRequest</td>
<td>Order Submit Request element root. It contains the information to submit an order.</td>
</tr>
<tr>
<td>userInformation</td>
<td>See Table 7-3</td>
</tr>
<tr>
<td>userId</td>
<td>See Table 7-3</td>
</tr>
<tr>
<td>password</td>
<td>See Table 7-3</td>
</tr>
<tr>
<td>Tag Name</td>
<td>Tag Description</td>
</tr>
<tr>
<td>------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>orderAccount</td>
<td>Account under which the user is authorised to order from the specific provider. Type: Not empty string (max 20 chars)</td>
</tr>
<tr>
<td>orderReference</td>
<td>User defined name assigned to that order. Type: Not empty string (max 30 chars)</td>
</tr>
<tr>
<td>orderRemark</td>
<td>Textual remark on the order. Type: Not empty string (max 255 chars)</td>
</tr>
<tr>
<td>qualityOfService</td>
<td>See Table 7-1</td>
</tr>
<tr>
<td>deliveryInformation</td>
<td>Delivery Information element. Its type is described in paragraph 0</td>
</tr>
<tr>
<td>orderItem</td>
<td>Order Item element. Its type is described in paragraph 8.2.5.1.1</td>
</tr>
</tbody>
</table>

Table 8-4: ProductOrderRequest element.

8.2.5.1.1  ProductOrderItem Type

Figure 8-6 gives a graphical representation of the ProductOrderItem Type included into the ProductOrderRequest ("POR", see chapt. 8.2.5) Type.

![Figure 8-6: ProductOrderItem diagram.](image_url)
<table>
<thead>
<tr>
<th>Tag Name</th>
<th>Tag Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProductId</td>
<td>It identifies the target product on which the order item is based.</td>
</tr>
<tr>
<td>idCitation</td>
<td>Identification Information</td>
</tr>
<tr>
<td>resTitle</td>
<td>Product identifier element.</td>
</tr>
<tr>
<td></td>
<td>Type Value: string</td>
</tr>
<tr>
<td></td>
<td>Permitted Values: Not empty string</td>
</tr>
<tr>
<td></td>
<td>Source: [ISO], Citation and responsible party information</td>
</tr>
<tr>
<td></td>
<td>This Product Identifier will be follow the convention hereafter:</td>
</tr>
<tr>
<td></td>
<td>For available products:</td>
</tr>
<tr>
<td></td>
<td>- &lt;2 chars SatelliteId&gt;&lt;max 3 char SatelliteNumber&gt;&lt;StartYYMMDDhhmmsscc&gt;-</td>
</tr>
<tr>
<td></td>
<td>- &lt;DurationDDDDhhmmsscc without leading zeros&gt;&lt;max 3 chars ProductCodeId&gt;</td>
</tr>
<tr>
<td></td>
<td>For planned/possible future products:</td>
</tr>
<tr>
<td></td>
<td>- &lt;2 chars SatelliteId&gt;&lt;max 3 char SatelliteNumber&gt;&lt;6digitOrbit&gt;&lt;max8digitstartMillisecs&gt;-</td>
</tr>
<tr>
<td></td>
<td>- &lt;max8digitstopMillisecs&gt;&lt;swathId&gt;&lt;max 3 chars ProductCodeId&gt;</td>
</tr>
<tr>
<td></td>
<td>The start and stop milliseconds are relative to the time of the</td>
</tr>
<tr>
<td></td>
<td>last ascending node crossing of the satellite (which also defines the orbit number)</td>
</tr>
<tr>
<td></td>
<td>Examples:</td>
</tr>
<tr>
<td></td>
<td>pass based products: NO15-0305111200000-100000.A for a 10 minute NOAA pass or ER2-0305111200000-3500000000.G13 or for an &quot;ideal&quot; 35 day GOME level 13</td>
</tr>
<tr>
<td></td>
<td>For future Envisat products: EN1-012345-2152-25632.SEP</td>
</tr>
<tr>
<td></td>
<td>collectionId</td>
</tr>
<tr>
<td></td>
<td>Type: Not empty string</td>
</tr>
<tr>
<td></td>
<td>Syntax: Provider.Facility.Collection identifying a pre-defined TargetService (e.g. ESA.EECF.ERSE_SER for the ESA ERS SAR raw data catalogue).</td>
</tr>
<tr>
<td>Processing</td>
<td>It specifies the processing options to be applied on the product before delivery.</td>
</tr>
<tr>
<td>optionName</td>
<td>Name of a processing option specific to the selected product.</td>
</tr>
<tr>
<td></td>
<td>Type: Not empty string (max 40 chars)</td>
</tr>
<tr>
<td>optionSelectedValues</td>
<td>Values chosen for the processing option in question.</td>
</tr>
<tr>
<td></td>
<td>Type: Not empty string</td>
</tr>
<tr>
<td>programming</td>
<td>It specifies the programming options to be applied on the product before delivery.</td>
</tr>
<tr>
<td>optionName</td>
<td>Name of a programming option specific to the selected product.</td>
</tr>
<tr>
<td></td>
<td>Type: Not empty string (max 40 chars)</td>
</tr>
<tr>
<td>optionSelectedValues</td>
<td>Values chosen for the programming option in question.</td>
</tr>
<tr>
<td></td>
<td>Type: Not empty string</td>
</tr>
<tr>
<td>sceneSelection</td>
<td>It specifies the selection of the scene from the product that is to be</td>
</tr>
<tr>
<td></td>
<td>delivered. Its type is described in paragraph 0.</td>
</tr>
<tr>
<td>packageMedium</td>
<td>Identification of a delivery Medium and a Medium Formatting Option.</td>
</tr>
<tr>
<td></td>
<td>Type: Not empty string (max 40 chars)</td>
</tr>
<tr>
<td></td>
<td>Examples: NTP, DAT, Exabyte, CD-ROM, DLT, D1, DVD, file.</td>
</tr>
<tr>
<td>orderItemRemark</td>
<td>Textual remark on the order item put by the XML issuer.</td>
</tr>
<tr>
<td></td>
<td>Type: Not empty string</td>
</tr>
</tbody>
</table>

Table 8-5: ProductOrderItem Type.
8.2.5.1.2 DeliveryInformation Type

Figure 8-7 gives a graphical representation of DeliveryMethod Type:

![Figure 8-7: DeliveryMethod Type Diagram.](image)

<table>
<thead>
<tr>
<th>Tag Name</th>
<th>Tag Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ftp-push</td>
<td>FTP URL: address of a user-owned FTP server to which a product can be posted containing also directory, username, password information. Type: Not empty string (max 255 chars) Syntax: ftp://'ftpUserName':&quot;ftpPassword'@'ftpAddress'/'ftpDirectory' Example: ftp://muis_intecs:<a href="mailto:intecs@ftp.intecs.it">intecs@ftp.intecs.it</a>/MUIS</td>
</tr>
<tr>
<td>ftp-pull</td>
<td>FTP URL: address of a provider-owned FTP server from which user can fetch products containing also directory, username, password information. The value is set by the provider, therefore the element has to be set to &lt;blank&gt; in the OrderSubmitRequest Type: string (max 255 chars) Syntax: ftp://'ftpUserName':&quot;ftpPassword'@'ftpAddress'/'ftpDirectory' Example: ftp://userOder:<a href="mailto:userpwd@ftp.esa.int">userpwd@ftp.esa.int</a>/XI/EN1</td>
</tr>
<tr>
<td>mail</td>
<td>Mail element.</td>
</tr>
<tr>
<td>recipient</td>
<td>Identification of the receiving entity. Type: Not empty string (max 40 chars)</td>
</tr>
<tr>
<td>companyRef</td>
<td>Identification of the receiving person.</td>
</tr>
<tr>
<td>postalAddress</td>
<td>Postal Address of the user.</td>
</tr>
<tr>
<td>streetAddress</td>
<td>Street Address element. Type: String</td>
</tr>
<tr>
<td>city</td>
<td>City element. Type: String</td>
</tr>
<tr>
<td>state</td>
<td>State element. Type: String</td>
</tr>
<tr>
<td>Tag Name</td>
<td>Tag Description</td>
</tr>
<tr>
<td>---------------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>postalCode</td>
<td>Postal Code element.</td>
</tr>
<tr>
<td></td>
<td>Type: String</td>
</tr>
<tr>
<td>country</td>
<td>Country element.</td>
</tr>
<tr>
<td></td>
<td>Type: String</td>
</tr>
<tr>
<td>postalBox</td>
<td>Postal Box element.</td>
</tr>
<tr>
<td></td>
<td>Type: String</td>
</tr>
<tr>
<td>telNumber</td>
<td>Telephone number of the receiving person.</td>
</tr>
<tr>
<td></td>
<td>Type: Not empty string (max 18 chars)</td>
</tr>
</tbody>
</table>

Table 8-6: DeliveryMethod Type.

8.2.5.1.3 SceneSelection Type

Figure 8-8 gives a graphical representation of the SceneSelection Type:

![SceneSelectionType Diagram]

**Figure 8-8: SceneSelectionOptions Type diagram**

<table>
<thead>
<tr>
<th>Tag Name</th>
<th>Tag Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>sceneType</td>
<td>Identifier for the scene type specific to the selected product.</td>
</tr>
<tr>
<td></td>
<td>Type: Not empty string (max 20 chars)</td>
</tr>
<tr>
<td>sceneCenter</td>
<td>Scene center element.</td>
</tr>
<tr>
<td>coordinates</td>
<td>Coordinates element.</td>
</tr>
<tr>
<td></td>
<td>Type: String</td>
</tr>
<tr>
<td></td>
<td>Syntax: points are separated by blank; point’s coordinates lat and long are</td>
</tr>
<tr>
<td></td>
<td>separated by comma (,). The decimal point (.) is used to separate decimals.</td>
</tr>
<tr>
<td></td>
<td>Example: 64.00,-9.00</td>
</tr>
<tr>
<td>temporalSelection</td>
<td>Temporal selection element</td>
</tr>
<tr>
<td>startDateTime</td>
<td>Start time for the temporal selection in the following format:</td>
</tr>
<tr>
<td></td>
<td>CCYY-MM-DDThh:mm:ss.ccZ</td>
</tr>
<tr>
<td></td>
<td>Type: DateTime</td>
</tr>
<tr>
<td>Tag Name</td>
<td>Tag Description</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>endDateTime</td>
<td>Stop time for the temporal selection in the following format CCYY-MM-DDThh:mm:ss.ccZ</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> DateTime</td>
</tr>
<tr>
<td>scenePosition</td>
<td>Provider specific system to define the position of the scene.</td>
</tr>
<tr>
<td></td>
<td>Examples: “frame 1234”</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Not empty string</td>
</tr>
<tr>
<td>sceneSize</td>
<td>Provider specific system to define the size of the scene.</td>
</tr>
<tr>
<td></td>
<td>Examples: “frames: 3”, “40x50 km”, “26 seconds”</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Not empty string</td>
</tr>
</tbody>
</table>

Table 8-7: SceneSelectionOptions Type.

### 8.2.6 Order response message

The body of this message is the “orderResponse” XML element.

Figure 8-9 gives a graphical representation of OrderSubmitResponse Type:

![Figure 8-9: OrderResponse element diagram.](image)

<table>
<thead>
<tr>
<th>Tag Name</th>
<th>Tag Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>orderResponse</td>
<td>OrderResponse element.</td>
</tr>
<tr>
<td>orderId</td>
<td>Order identification number unique for this Provider.</td>
</tr>
<tr>
<td></td>
<td>Mandatory if status=&quot;success&quot;.</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Not empty string (max 16 chars)</td>
</tr>
<tr>
<td>orderReference</td>
<td>See Table 8-4</td>
</tr>
<tr>
<td>Status</td>
<td>Status of the order submit request.</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> String</td>
</tr>
<tr>
<td></td>
<td><strong>Permitted Values:</strong> success, failure, partial</td>
</tr>
<tr>
<td>errorMessage</td>
<td>Error Message element.</td>
</tr>
<tr>
<td></td>
<td><strong>Type:</strong> Not empty string</td>
</tr>
</tbody>
</table>

Table 8-8: OrderResponse Element.
8.2.7 Order monitor request message

The body of this message is the “orderMonitorRequest” XML element. Figure 8-10 gives a graphical representation of OrderMonitorRequest element:

![OrderMonitorRequest element diagram](image)

**Figure 8-10: OrderMonitorRequest element diagram.**

<table>
<thead>
<tr>
<th>Tag Name</th>
<th>Tag Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>orderMonitorRequest</td>
<td>OrderMonitorRequest element.</td>
</tr>
<tr>
<td>orderId</td>
<td>See Table 8-8</td>
</tr>
<tr>
<td>lastUpdate</td>
<td>Last update of the order.</td>
</tr>
<tr>
<td></td>
<td>Type: date in ISO 8601 format (CCYY-MM-DD)</td>
</tr>
<tr>
<td>userInformation</td>
<td>See Table 7-3</td>
</tr>
<tr>
<td>userId</td>
<td>See Table 7-3</td>
</tr>
<tr>
<td>password</td>
<td>See Table 7-3</td>
</tr>
</tbody>
</table>

**Table 8-9: OrderMonitorRequest element.**

8.2.8 Order monitor response message

The body of this message is the “orderMonitorResponse” XML element for submitted orders. Figure 8-11 gives a graphical representation of OrderMonitorResponse element:
Figure 8-11: OrderMonitorResponse element.

<table>
<thead>
<tr>
<th>Tag Name</th>
<th>Tag Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>orderMonitorResponse</td>
<td>OrderMonitorResponse element for submitted order.</td>
</tr>
<tr>
<td>orderSpecification</td>
<td>Order Specification element. Mandatory if status=success”</td>
</tr>
<tr>
<td>orderAccount</td>
<td>See Table 8-4</td>
</tr>
<tr>
<td>orderId</td>
<td>See Table 8-8</td>
</tr>
<tr>
<td>orderReference</td>
<td>See Table 8-4</td>
</tr>
<tr>
<td>orderRemark</td>
<td>See Table 8-4</td>
</tr>
<tr>
<td>qualityOfService</td>
<td>See Table 7-1</td>
</tr>
<tr>
<td>deliveryInformation</td>
<td>Delivery Information element. Its type is described in paragraph 0</td>
</tr>
<tr>
<td>orderItem</td>
<td>See Table 8-4</td>
</tr>
<tr>
<td>orderStatusInfo</td>
<td>Contains the Order status information.</td>
</tr>
<tr>
<td>orderState</td>
<td>See Table 8-5</td>
</tr>
<tr>
<td>additionalStatusInfo</td>
<td>See Table 8-5</td>
</tr>
<tr>
<td>status</td>
<td>Status of the order monitor response.</td>
</tr>
<tr>
<td></td>
<td>Type: String</td>
</tr>
<tr>
<td></td>
<td>Permitted Values: success, failure</td>
</tr>
<tr>
<td>errorMessage</td>
<td>See Table 8-8</td>
</tr>
</tbody>
</table>

Table 8-10: OrderMonitorResponse element.
8.2.8.1.1 OrderMonitorItemType

Figure 8-12 gives a graphical representation of the OrderMonitorItemType:

<table>
<thead>
<tr>
<th>Tag Name</th>
<th>Tag Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>productId</td>
<td>See Table 8-5</td>
</tr>
<tr>
<td>idCitation</td>
<td>See Table 8-5</td>
</tr>
<tr>
<td>resTitle</td>
<td>See Table 8-5</td>
</tr>
<tr>
<td>collectionId</td>
<td>See Table 8-5</td>
</tr>
<tr>
<td>sceneCenter</td>
<td>See Table 8-7</td>
</tr>
<tr>
<td>coordinates</td>
<td>See Table 8-7</td>
</tr>
<tr>
<td>programming</td>
<td>See Table 8-5</td>
</tr>
<tr>
<td>optionName</td>
<td>See Table 8-5</td>
</tr>
<tr>
<td>optionSelectedValues</td>
<td>See Table 8-5</td>
</tr>
<tr>
<td>Tag Name</td>
<td>Tag Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>processing</td>
<td>See Table 8-5</td>
</tr>
<tr>
<td>optionName</td>
<td>See Table 8-5</td>
</tr>
<tr>
<td>optionSelectedValues</td>
<td>See Table 8-5</td>
</tr>
<tr>
<td>programming</td>
<td>See Table 8-5</td>
</tr>
<tr>
<td>optionName</td>
<td>See Table 8-5</td>
</tr>
<tr>
<td>optionSelectedValues</td>
<td>See Table 8-5</td>
</tr>
<tr>
<td>sceneSelection</td>
<td>It specifies the selection of the scene from the product that is to be delivered. Its type is described in paragraph 0.</td>
</tr>
<tr>
<td>packageMedium</td>
<td>See Table 8-5</td>
</tr>
<tr>
<td>orderItemStatusInfo</td>
<td>See Table 8-5</td>
</tr>
<tr>
<td>orderState</td>
<td>See Table 8-5</td>
</tr>
<tr>
<td>additionalStatusInfo</td>
<td>See Table 8-5</td>
</tr>
<tr>
<td>orderItemRemark</td>
<td>See Table 8-5</td>
</tr>
</tbody>
</table>

Table 8-11: OrderMonitorItem Type.

9 Standards Extensions

The application profile at hand demands some extensions to the referenced ISO specifications. These extensions and recommendations are described in the following paragraphs.

9.1 Extensions to ISO19115:2003

A few extensions have been defined in the domain to provide metadata that are commonly referenced in EO products, e.g. orbit number, it may be necessary to align/propose these metadata to 19115 part 2.

9.2 Comparison to OGC CS 2.0 base specification

A preliminary analysis shows that the profile shares many common features to the OGC catalogue interface specification CSW 2.0. An alignment towards CSW 2.0 is presented in Annex E. and may provide a suitable framework to include the discovery of product collections. However, the requirements for ordering of data should be addressed at the same time.

9.2.1 Mappings to the common XML Record format

To be provided.

10 Implementation guidance

The following section gives developers help when setting up a catalogue service instance that complies with the defined application profile. Any information provided here is non-normative.

10.1.1 Technical issues

- 

10.1.2 Semantic issues

- 

10.1.3 Examples

The following sections show example of the requests / responses

10.1.3.1 SearchRequest message

<?xml version="1.0" encoding="UTF-8"?><SOAP:Envelope xmlns:SOAP="http://schemas.xmlsoap.org/soap/envelope/">
  <SOAP:Body>
    <searchRequest xmlns="http://earth.esa.int/XML/eoli">
      <simpleQuery>
        <dataExt>
          <geoEle operator="OVERLAP">
            <geoBndBox>
              <westBL>180.0</westBL>
              <eastBL>180.0</eastBL>
              <southBL>90.0</southBL>
              <northBL>90.0</northBL>
            </geoBndBox>
          </geoEle>
          <tempEle operator="OVERLAP">
            <exTemp>
              <beginEnd>
                <begin>2000-08-13</begin>
                <end>2000-08-13</end>
              </beginEnd>
            </exTemp>
          </tempEle>
        </dataExt>
        <satelliteDomainConditions>
          <plaInsIdCondition operator="EQUAL">
            <plaInsId>
              <platfSNm>ERS</platfSNm>
              <platfSer>2</platfSer>
            </plaInsId>
          </plaInsIdCondition>
          <genericCondition operator="EQUAL">
            <attributeId>track</attributeId>
            <attributeValue>1</attributeValue>
          </genericCondition>
          <genericCondition operator="EQUAL">
            <attributeId>frame</attributeId>
            <attributeValue>27</attributeValue>
          </genericCondition>
          <genericCondition operator="WITHIN">
            <attributeId>orbit</attributeId>
            <attributeValue>1000</attributeValue>
            <attributeValue>1300</attributeValue>
          </genericCondition>
        </satelliteDomainConditions>
      </simpleQuery>
      <resultType>results</resultType>
      <iteratorSize>1000</iteratorSize>
      <cursor>1</cursor>
      <presentation>brief</presentation>
      <collectionId>ESA.EECF.ERSE_SER</collectionId>
    </searchRequest>
  </SOAP:Body>
</SOAP:Envelope>

Listing 1 – searchRequest

10.1.3.2 PresentRequest message

<?xml version="1.0" encoding="UTF-8"?><SOAP:Envelope xmlns:SOAP="http://schemas.xmlsoap.org/soap/envelope/">
  <SOAP:Body>
  </SOAP:Body>
</SOAP:Envelope>
10.1.3.3 Response message (full format)

<?xml version="1.0" encoding="UTF-8"?>
<SOAP:Envelope xmlns:SOAP="http://schemas.xmlsoap.org/soap/envelope/"
<SOAP:Body>
<response xmlns="http://earth.esa.int/XML/eoli">
<retrievedData presentation="full">
<Metadata>
<mdContact>
<rpOrgName>ESA</rpOrgName>
<role>002</role>
</mdContact>
<mdDateSt>2000-01-01T10:00:00Z</mdDateSt>
<plaInsId>
<platfSNm>ENVISAT</platfSNm>
<instShNm>ASAR/IM</instShNm>
<instMode>high</instMode>
</plaInsId>
<satDom>
<orbit>1234</orbit>
<lastOrbit>1</lastOrbit>
<orbitDir>1</orbitDir>
<wwRefSys>
<frame>27</frame>
<track>1</track>
</wwRefSys>
<swathId>1</swathId>
<passCoverage>
<start>2152</start>
<stop>25632</stop>
</passCoverage>
</satDom>
<idCitation>
<resTitle>EN1-012345-2152-25632.XI</resTitle>
</idCitation>
</idAbs>
<idStatus>001</idStatus>
<dataExt>
<tempEle>
<exTemp>
<begin>2000-01-01T00:00:00Z</begin>
<end>2000-01-01T00:15.10Z</end>
</exTemp>
</tempEle>
<geoEle>
<polygon>
<coordinates>65.00,-10.00 65.00,-8.00 63.00,-8.00 63.00,-10.00</coordinates>
</polygon>
</geoEle>
</dataExt>
</response>
</SOAP:Body>
</SOAP:Envelope>
11 Security considerations

This document does not demand any specific security considerations regarding a compliant catalogue service.

However, for the order interfaces, it has to be acknowledged that use of user/password credentials passed over HTTP are not a secure solution, in practice ordering of EO data products within the context of ESA’s science community is regulated further by quota allocation and so this is not a major concern, a longer term solution is expected to be based on WS security standards.
Annex A
(normative)

Abstract test suite for catalogue services

A.1

A.1.1 Basic Client

A.1.1.3 searchRequest
a) Test purpose: Verify that a client satisfies all requirements for a searchRequest.
b) Test method: Generate an adequate sample of searchRequest from the client and verify that
each is a valid request.
c) Reference:
d) Test type: Basic

A.1.1.4 presentRequest
a) Test purpose: Verify that a client satisfies all requirements for a presentRequest.
b) Test method: Generate an adequate sample of presentRequest from the client and verify that
each is a valid request.
c) Reference:
d) Test type: Basic

A.1.2 Basic Server

A.1.2.1 Version negotiation <<NOT YET ADDRESSED IN THIS PROFILE>>
a) Test Purpose: Verify that the server interface satisfies the requirements for version negotiation.
b) Test Method: Submit requests containing version number both lower than and higher than the
version supported by the server. Verify that the server responses is in accord with the rules for
version negotiation.
c) Reference: CSW 2.0 base specification
d) Test Type: Basic

A.1.2.2 Request parameter rules <<NOT YET ADDRESSED IN THIS PROFILE>>
a) Test Purpose: Verify that the server interface satisfies the requirements for request parameter
rules.
b) Test Method: Generate a sample of requests from a client. Include both invalid requests and
valid request that vary within the limits allowed by the rules. Verify that the server provides an
appropriate response in each case.
c) Reference: CSW 2.0 base specification
d) Test Type: Basic

A.1.2.3 GetCapabilities response <<NOT YET ADDRESSED IN THIS PROFILE>>
a) Test Purpose: Verify that a basic CSW server interface satisfies all requirements of the
GetCapabilities operation.
b) Test Method: Make several GetCapabilities requests using a variety of input parameters.
Verify that an appropriate response is returned in each case.
c) Reference:
d) Test Type: Basic

A.1.2.3 searchRequest response
a) Test Purpose: Verify that the server satisfies all requirements of the searchRequest operation.
b) Test Method: Make several searchRequest requests using a variety of input parameters. Verify that an appropriate response is returned in each case.
c) Reference:
d) Test Type: Basic

A.1.2.3 presentRequest response
a) Test Purpose: Verify that the server satisfies all requirements of the presentRequest operation.
b) Test Method: Make several GetRecordsById requests using a variety of input parameters. Verify that an appropriate response is returned in each case.
c) Reference:
d) Test Type: Basic

Conformance to the catalogue search and present interfaces may be tested via the Service Support Environment in the ESA’s Eoportal [SSE]
Annex B
(normative)

Abstract test suite for ordering services (to be completed)

B.1
Annex B
(informative)

Design rationale (to be completed)
Annex C
(normative)

XSD & WSDL Specification

Catalogue XSD

```xml
<?xml version="1.0" encoding="UTF-8"?>
    targetNamespace="http://earth.esa.int/XML/eoli" elementFormDefault="qualified">
    <xsd:element name="searchRequest" type="SearchRequestType"/>
    <xsd:element name="beginEnd">
        <xsd:complexType>
            <xsd:sequence>
                <xsd:element name="begin" type="xsd:dateTime"/>
                <xsd:element name="end" type="xsd:dateTime"/>
            </xsd:sequence>
        </xsd:complexType>
    </xsd:element>
    <xsd:element name="collectionId" type="NonNullStringType"/>
    <xsd:element name="cursor" type="xsd:positiveInteger" nillable="false"/>
    <xsd:element name="presentation" type="PresentationType" nillable="false"/>
    <xsd:element name="status" type="StatusType" nillable="false"/>
    <xsd:element name="frame" type="xsd:positiveInteger" nillable="false"/>
    <xsd:element name="track" type="xsd:positiveInteger" nillable="false"/>
    <xsd:element name="orbit" type="xsd:positiveInteger" nillable="false"/>
    <xsd:element name="presentRequest" type="PresentRequestType"/>
    <xsd:element name="platfSNm" type="NonNullStringType"/>
    <xsd:element name="platfSer" type="CharacterString"/>
    <xsd:element name="instShNm" type="NonNullStringType"/>
    <xsd:element name="resTitle" type="NonNullStringType"/>
    <xsd:element name="response" type="ResponseType"/>
    <xsd:element name="coordinates" type="CoordinatesType" nillable="false"/>
    <xsd:element name="idStatus" type="IdStatusEnumType"/>
</xsd:schema>
```
<xsd:simpleType name="PresentationType">
  <xsd:restriction base="CharacterString">
    <xsd:enumeration value="brief"/>
    <xsd:enumeration value="summary"/>
    <xsd:enumeration value="full"/>
    <xsd:enumeration value="browse"/>
    <xsd:enumeration value="orderOption"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="StatusType">
  <xsd:restriction base="CharacterString">
    <xsd:enumeration value="success"/>
    <xsd:enumeration value="failure"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="RoleEnumType">
  <xsd:restriction base="NonNullStringType">
    <xsd:enumeration value="002"/>
    <xsd:enumeration value="006"/>
    <xsd:enumeration value="009"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="IdStatusEnumType">
  <xsd:restriction base="NonNullStringType">
    <xsd:enumeration value="001"/>
    <xsd:enumeration value="005"/>
    <xsd:enumeration value="006"/>
    <xsd:enumeration value="007"/>
    <xsd:enumeration value="008"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="DegreeType">
  <xsd:restriction base="xsd:float">
    <xsd:minInclusive value="0.0"/>
    <xsd:maxInclusive value="360.0"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="ContentTypeEnum">
  <xsd:restriction base="NonNullStringType">
    <xsd:enumeration value="001"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="OrbitDirectionEnumType">
  <xsd:restriction base="CharacterString">
    <xsd:enumeration value="0"/>
    <xsd:enumeration value="1"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="PolarisationEnumType">
  <xsd:restriction base="NonNullStringType">
    <xsd:enumeration value="HH"/>
    <xsd:enumeration value="VV"/>
    <xsd:enumeration value="HV"/>
    <xsd:enumeration value="VH"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="FullSceneEnumType">
  <xsd:restriction base="NonNullStringType">
    <xsd:enumeration value="F"/>
    <xsd:enumeration value="P"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="CoordinatesType">
  <xsd:restriction base="NonNullStringType"/>
</xsd:simpleType>

<!-- ================== Complex Type Section =================== -->
<!-- ============================================================== -->
<xsd:element name="satelliteDomainConditions" minOccurs="0">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="plaInsIdCondition" minOccurs="0">
        <xsd:complexType>
          <xsd:sequence>
            <xsd:element name="plaInsId">
              <xsd:complexType>
                <xsd:sequence>
                  <xsd:element ref="platfSNm"/>
                  <xsd:element ref="platfSer" minOccurs="0"/>
                </xsd:sequence>
              </xsd:complexType>
            </xsd:element>
          </xsd:sequence>
          <xsd:attribute name="operator">
            <xsd:simpleType>
              <xsd:restriction base="CharacterString">
                <xsd:enumeration value="EQUAL"/>
              </xsd:restriction>
            </xsd:simpleType>
          </xsd:attribute>
        </xsd:complexType>
      </xsd:element>
      <xsd:element name="cloudCoverCondition" minOccurs="0">
        <xsd:complexType>
          <xsd:sequence>
            <xsd:element name="cloudCovePerc" type="cloudCoveragePercType" nillable="false"/>
          </xsd:sequence>
          <xsd:attribute name="operator">
            <xsd:simpleType>
              <xsd:restriction base="CharacterString">
                <xsd:enumeration value="LESS EQUAL"/>
              </xsd:restriction>
            </xsd:simpleType>
          </xsd:attribute>
        </xsd:complexType>
      </xsd:element>
      <xsd:element name="genericCondition" minOccurs="0" maxOccurs="unbounded">
        <xsd:complexType>
          <xsd:sequence>
            <xsd:element name="attributeId" type="NonNullStringType" nillable="false" maxOccurs="unbounded"/>
          </xsd:sequence>
          <xsd:attribute name="operator">
            <xsd:simpleType>
              <xsd:restriction base="CharacterString">
                <xsd:enumeration value="EQUAL"/>
                <xsd:enumeration value="LESS EQUAL"/>
                <xsd:enumeration value="LESS"/>
                <xsd:enumeration value="GREATER"/>
                <xsd:enumeration value="GREATER EQUAL"/>
                <xsd:enumeration value="WITHIN"/>
                <xsd:enumeration value="INTERSECTS"/>
              </xsd:restriction>
            </xsd:simpleType>
          </xsd:attribute>
        </xsd:complexType>
      </xsd:element>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>
<xsd:element ref="resTitle" maxOccurs="unbounded"/>
</xsd:sequence>
</xsd:complexType>
<xsd:element>
<xsd:complexType>
<xsd:element ref="presentation"/>
</xsd:complexType>
<xsd:element ref="collectionId"/>
</xsd:complexType>
<xsd:complexType name="MetadataType">
<xsd:sequence>
<xsd:element name="mdContact">
<xsd:complexType>
<xsd:sequence>
<xsd:element name="rpOrgName" type="CharacterString"/>
</xsd:sequence>
</xsd:complexType>
<xsd:element>
<xsd:complexType>
<xsd:sequence>
<xsd:element name="role" type="RoleEnumType"/>
</xsd:sequence>
</xsd:complexType>
<xsd:element>
<xsd:complexType>
<xsd:sequence>
<xsd:element name="mdDateSt" type="DateTimeTypes" nillable="false" minOccurs="0"/>
</xsd:sequence>
</xsd:complexType>
<xsd:element name="dataIdInfo" type="DataIdInfoType"/>
</xsd:complexType>
<xsd:element name="contInfo" minOccurs="0">
<xsd:complexType>
<xsd:sequence>
<xsd:element name="attDesc">
<xsd:complexType>
<xsd:sequence>
<xsd:element name="typeName" fixed="imageType" nillable="false">
<xsd:simpleType>
<xsd:restriction base="CharacterString">
<xsd:enumeration value="imageType"/>
</xsd:restriction>
</xsd:simpleType>
</xsd:element>
<xsd:element name="attTypes">
<xsd:complexType>
<xsd:sequence>
<xsd:element name="attName" fixed="imageQuality" nillable="false">
<xsd:simpleType>
<xsd:restriction base="CharacterString">
<xsd:enumeration value="imageQuality"/>
</xsd:restriction>
</xsd:simpleType>
</xsd:element>
<xsd:element name="typeName" fixed="imageQualityType" nillable="false">
<xsd:simpleType>
<xsd:restriction base="CharacterString">
<xsd:enumeration value="imageQualityType"/>
</xsd:restriction>
</xsd:simpleType>
</xsd:element>
</xsd:sequence>
</xsd:complexType>
</xsd:sequence>
</xsd:complexType>
</xsd:element>
<xsd:element name="contType" type="ContentTypeEnum" minOccurs="0"/>
</xsd:sequence>
</xsd:complexType>
</xsd:element>
<xsd:element>
<xsd:complexType>
<xsd:sequence>
<xsd:element name="illElevAng" type="LatitudeType" nillable="false" minOccurs="0"/>
</xsd:sequence>
</xsd:complexType>
</xsd:element>
<xsd:element name="illAziAng" type="DegreeType" nillable="false" minOccurs="0"/>
</xsd:sequence>
</xsd:complexType>
</xsd:element>
<xsd:element name="cloudCovePerc" type="cloudCoveragePercType" nillable="false" minOccurs="0"/>
</xsd:sequence>
</xsd:complexType>
</xsd:element>
<xsd:element name="dqInfo" minOccurs="0"/>
</xsd:complexType>
</xsd:element>
<xsd:element name="dqScope" minOccurs="0"/>
</xsd:complexType>
</xsd:element>
<xsd:element name="scpLvl" fixed="DataSet"/>
</xsd:complexType>
<xsd:restriction base="NonNullStringType">
  <xsd:enumeration value="DataSet"/>
  <xsd:restriction>
    <xsd:simpleType>
      <xsd:element name="graphOver" minOccurs="0" maxOccurs="unbounded">
        <xsd:complexType>
          <xsd:sequence>
            <xsd:element name="bgFileName" type="NonNullStringType"/>
          </xsd:complexType>
        </xsd:element>
      </xsd:complexType>
    </xsd:complexType>
    <xsd:element name="addInfo" minOccurs="0">
      <xsd:complexType>
        <xsd:sequence>
          <xsd:element name="locAtt" minOccurs="0" maxOccurs="unbounded">
            <xsd:complexType>
              <xsd:sequence>
                <xsd:element name="locName" type="NonNullStringType"/>
                <xsd:element name="locValue" type="NonNullStringType" minOccurs="0"/>
              </xsd:sequence>
            </xsd:complexType>
          </xsd:element>
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>
    <xsd:element name="satDom" minOccurs="0">
      <xsd:complexType>
        <xsd:sequence>
          <xsd:element name="swathId" type="NonNullStringType" minOccurs="0"/>
          <xsd:element name="passCoverage" minOccurs="0"/>
          <xsd:element ref="orbit" minOccurs="0"/>
          <xsd:element name="lastOrbit" type="xsd:positiveInteger" nillable="false" minOccurs="0"/>
          <xsd:element name="orbitDir" type=" OrbitDirectionEnumType" nillable="false" minOccurs="0"/>
          <xsd:element name="wwRefSys" minOccurs="0"/>
          <xsd:element ref="frame" minOccurs="0"/>
          <xsd:sequence>
            <xsd:element ref="track" minOccurs="0"/>
          </xsd:sequence>
        </xsd:sequence>
      </xsd:complexType>
    </xsd:element>
  </xsd:complexType>
</xsd:restriction>
<xsd:complexType>
  <xsd:sequence>
    <xsd:element name="start" type="xsd:integer"/>
    <xsd:element name="stop" type="xsd:integer"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:element name="idCitation">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="resTitle" type="NonNullStringType"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>

<xsd:element name="idAbs" type="CharacterString" minOccurs="0"/>

<xsd:element ref="idStatus" minOccurs="0"/>

<xsd:element name="dataExt">
  <xsd:complexType>
    <xsd:complexContent>
      <xsd:restriction base="DataExtType">
        <xsd:sequence>
          <xsd:element name="tempEle" type="EX_TemporalExtendType" minOccurs="0"/>
          <xsd:element name="geoEle" minOccurs="0"/>
        </xsd:sequence>
      </xsd:restriction>
    </xsd:complexContent>
  </xsd:complexType>
</xsd:element>

<xsd:complexType name="ResponseType">
  <xsd:sequence>
    <xsd:element name="retrievedData" minOccurs="0">
      <xsd:complexType>
        <xsd:sequence>
          <xsd:element name="Metadata" type="MetadataType" minOccurs="0" maxOccurs="unbounded"/>
        </xsd:sequence>
        <xsd:attribute name="presentation" type="PresentationType"/>
      </xsd:complexType>
    </xsd:element>
    <xsd:element ref="cursor" minOccurs="0"/>
    <xsd:element name="hits" type="xsd:nonNegativeInteger" nillable="false" minOccurs="0"/>
    <xsd:element ref="status"/>
    <xsd:element name="errorMessage" type="NonNullStringType" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
</xsd:element>
</xsd:complexType>
</xsd:schema>
Catalogue WSDL

<?xml version="1.0" encoding="UTF-8"?>
xmlns:tns="http://earth.esa.int/XML/dsm" xmlns:eoli="http://earth.esa.int/XML/eoli"
targetNamespace="http://earth.esa.int/XML/dsm">
  <import namespace="http://earth.esa.int/XML/eoli" location="eoli.xsd"/>
  <message name="searchRequestInput">
    <part name="searchRequestParameter" element="eoli:searchRequest"/>
  </message>
  <message name="presentRequestInput">
    <part name="searchRequestParameter" element="eoli:presentRequest"/>
  </message>
  <message name="responseOutput">
    <part name="responseParameter" element="eoli:response"/>
  </message>
<operation name="processSearchRequest">
  <input message="tns:searchRequestInput"/>
  <output message="tns:responseOutput"/>
</operation>
<operation name="processPresentRequest">
  <input message="tns:presentRequestInput"/>
  <output message="tns:responseOutput"/>
</operation>
</portType>
</service>
</definitions>

Order XSD

<?xml version="1.0" encoding="UTF-8"?>
<!-- edited with XML Spy v4.4 U (http://www.xmlspy.com) by Simone Gianfranceschi (ESA - European Space Agency) -->
<!-- Order.xsd
Type :C Schema
 : October 2005
 :Patrizia :.3 -->
targetNamespace="http://earth.esa.int/XML/eoli" elementFormDefault="qualified" attributeFormDefault="unqualified">
  <xsd:redefine schemaLocation="/eoli.xsd"/>
  <xsd:complexType name="MetadataType">
    <xsd:complexContent>
      <xsd:extension base="MetadataType">
```xml
<xsd:sequence minOccurs="0">
  <xsd:element name="productServiceOptions" type="ProductServiceOptionsType" minOccurs="0"/>
</xsd:sequence>
</xsd:extension>
</xsd:complexContent>
</xsd:complexType>
</xsd:complexType>
<xsd:complexType name="ResponseType">
  <xsd:complexContent>
    <xsd:restriction base="ResponseType">
      <xsd:sequence>
        <xsd:element name="retrievedData" minOccurs="0">
          <xsd:complexType>
            <xsd:sequence>
              <xsd:element name="Metadata" type="MetadataType" minOccurs="0" maxOccurs="unbounded"/>
            </xsd:sequence>
            <xsd:attribute name="presentation" type="PresentationType"/>
          </xsd:complexType>
        </xsd:element>
        <xsd:element ref="cursor" minOccurs="0"/>
        <xsd:element name="hits" type="xsd:nonNegativeInteger" nillable="false" minOccurs="0"/>
        <xsd:element ref="status"/>
        <xsd:element name="errorMessage" type="NonNullStringType" minOccurs="0"/>
      </xsd:sequence>
    </xsd:restriction>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="SearchRequestType">
  <xsd:complexContent>
    <xsd:extension base="SearchRequestType">
      <xsd:sequence>
        <xsd:element ref="userInformation" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="PresentRequestType">
  <xsd:complexContent>
    <xsd:extension base="PresentRequestType">
      <xsd:sequence>
        <xsd:element ref="userInformation" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="OrderMonitorRequest">
  <xsd:complexContent>
    <xsd:extension base="SearchRequestType">
      <xsd:sequence>
        <xsd:element ref="orderId"/>
        <xsd:element name="lastUpdate" type="DateTimeTypes"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="OrderMonitorResponse">
  <xsd:complexContent>
    <xsd:extension base="PresentRequestType">
      <xsd:sequence>
        <xsd:element ref="userInformation" minOccurs="0"/>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
```

<xsd:element name="sceneCenter">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element ref="coordinates"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>

<xsd:element name="programming">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="optionName">
        <xsd:simpleType>
          <xsd:restriction base="NonNullStringType">
            <xsd:maxLength value="40"/>
          </xsd:restriction>
        </xsd:simpleType>
      </xsd:element>
      <xsd:element name="optionSelectedValues" type="NonNullStringType" maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>

<xsd:element name="userInformation">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="userId" type="NonNullStringType"/>
      <xsd:element name="password" type="NonNullStringType"/>
    </xsd:sequence>
  </xsd:complexType>
</xsd:element>

<xsd:element name="orderAccount" nillable="false">
  <xsd:simpleType>
    <xsd:restriction base="NonNullStringType">
      <xsd:maxLength value="20"/>
    </xsd:restriction>
  </xsd:simpleType>
</xsd:element>

<xsd:element name="alongGridUnitType">
  <xsd:simpleType>
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="A"/>
      <xsd:enumeration value="S"/>
    </xsd:restriction>
  </xsd:simpleType>
</xsd:element>

<xsd:element name="alongGrid" type="xsd:integer"/>

<xsd:element name="acrossGrid" type="xsd:integer"/>

<xsd:element name="orderId">
  <xsd:simpleType>
    <xsd:restriction base="NonNullStringType">
      <xsd:maxLength value="16"/>
    </xsd:restriction>
  </xsd:simpleType>
</xsd:element>

<xsd:element name="deliveryMedium" type="xsd:string">  <xsd:restriction base="NonNullStringType">
    <xsd:maxLength value="40"/>
  </xsd:restriction>
</xsd:element>

<xsd:element name="packageMedium">
  <xsd:simpleType>
    <xsd:restriction base="NonNullStringType">
      <xsd:maxLength value="40"/>
    </xsd:restriction>
  </xsd:simpleType>
</xsd:element>

<xsd:element name="deliveryInformation" type="DeliveryInformationType"/>

<xsd:element name="price" type="PriceType"/>

<xsd:element name="listPrice" type="PriceType"/>

<xsd:element name="expectedPrice" type="PriceType"/>

<xsd:element name="productId" type="string"/>
<xsd:complexType name="ProductOrderSpecification">
  <xsd:sequence>
    <xsd:element ref="orderAccount" minOccurs="0" maxOccurs="0"/>
    <xsd:element name="orderReference">
      <xsd:simpleType>
        <xsd:restriction base="NonNullStringType">
          <xsd:maxLength value="30"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:element>
    <xsd:element name="deliveryInformation" minOccurs="0"/>
    <xsd:element name="orderItem" type="ProductOrderItemType" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="OrderDataAccessSpecification">
  <xsd:sequence>
    <xsd:element name="orderReference">
      <xsd:simpleType>
        <xsd:restriction base="NonNullStringType">
          <xsd:maxLength value="30"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:element>
    <xsd:element name="orderItem" type="ProductOrderItemType" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="OrderMonitorSpecification">
    <xsd:sequence>
        <xsd:element ref="orderAccount" minOccurs="0"/>
        <xsd:element ref="orderId"/>
        <xsd:element name="orderReference"/>
        <xsd:element ref="orderRemark" minOccurs="0"/>
        <xsd:element ref="deliveryInformation" minOccurs="0"/>
        <xsd:element name="orderItem" type="OrderMonitorItemType" maxOccurs="unbounded"/>
        <xsd:element name="orderStatusInfo" type="OrderStatusType"/>
    </xsd:sequence>
</xsd:complexType>

<!--=========================  Order Item Definition ============================ -->
<!--======================================================================= -->
<xsd:complexType name="ProductOrderItemType">
    <xsd:sequence>
        <xsd:element name="productId">
            <xsd:complexType>
                <xsd:sequence>
                    <xsd:element name="idCitation">
                        <xsd:complexType>
                            <xsd:sequence>
                                <xsd:element ref="resTitle"/>
                            </xsd:sequence>
                        </xsd:complexType>
                    </xsd:element>
                    <xsd:element ref="collectionId" minOccurs="0"/>
                </xsd:sequence>
            </xsd:complexType>
        </xsd:element>
        <xsd:element ref="processing" minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element ref="programming" minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element ref="sceneSelection" minOccurs="0"/>
        <xsd:element ref="packageMedium" minOccurs="0"/>
        <xsd:element name="qualityOfService" minOccurs="0"/>
        <xsd:element name="orderItemStatusInfo" type="OrderItemStatusType" minOccurs="0"/>
        <xsd:element name="orderItemRemark" type="xsd:string" minOccurs="0"/>
    </xsd:sequence>
</xsd:complexType>

<!--===================== ComplexType  Definition Section ======================= -->
<!--======================================================================= -->
<xsd:complexType name="ProductOrderRequestType">
    <xsd:sequence>
        <xsd:element ref="userInformation"/>
        <xsd:element name="orderSpecification" type="ProductOrderSpecification"/>  
    </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="ProductServiceOptionsType">
    <xsd:sequence>
        <xsd:element name="productOrderOptions" maxOccurs="unbounded">  
            <xsd:complexType>
                <xsd:sequence>
                    <xsd:element name="productOrderOptionsId" type="CharacterString"/>
                    <xsd:element name="processingOption" minOccurs="0" maxOccurs="unbounded">  
                        <xsd:complexType>
                            <xsd:extension base="ProductProcessingOptionType">
                                <xsd:sequence>
                                    <xsd:element name="optionName" type="NonNullStringType"/>
                                    <xsd:element name="optionValueDefinition"/>
                                </xsd:sequence>
                            </xsd:extension>
                        </xsd:complexType>
                    </xsd:element>
                    <xsd:element name="numericOptionValueMin" type="xsd:float"/>
                    <xsd:element name="numericOptionValueMax" type="xsd:float"/>
                    <xsd:element name="numericOptionValueStep" type="xsd:float"/>
                </xsd:sequence>
            </xsd:complexType>
        </xsd:element>
    </xsd:sequence>
</xsd:complexType>

<xsd:complexType>
    <xsd:element name="optionValueList" type="NonNullStringType" maxOccurs="unbounded"/>
</xsd:complexType>

<xsd:element name="optionName" type="NonNullStringType"/>

<xsd:element name="optionValueDefinition">
    <xsd:complexType>
        <xsd:choice>
            <xsd:element name="optionValueRange">
                <xsd:complexType>
                    <xsd:sequence>
                        <xsd:element name="numericOptionValueMin" type="xsd:float"/>
                        <xsd:element name="numericOptionValueMax" type="xsd:float"/>
                        <xsd:element name="numericOptionValueStep" type="xsd:float"/>
                    </xsd:sequence>
                </xsd:complexType>
            </xsd:element>
            <xsd:element name="optionValueList">
                <xsd:complexType>
                    <xsd:sequence>
                        <xsd:element name="stringOptionValue" type="NonNullStringType" maxOccurs="unbounded"/>
                    </xsd:sequence>
                </xsd:complexType>
            </xsd:element>
        </xsd:choice>
    </xsd:complexType>
</xsd:element>

<xsd:element name="sceneSelectionOption" minOccurs="0" maxOccurs="unbounded">
    <xsd:complexType>
        <xsd:sequence>
            <xsd:element name="sceneType" type="xsd:string"/>
        </xsd:sequence>
    </xsd:complexType>
</xsd:element>

<xsd:element name="productDeliveryOptions" maxOccurs="unbounded">
    <xsd:complexType>
        <xsd:sequence>
            <xsd:element name="deliveryMethod" type="xsd:string"/>
        </xsd:sequence>
    </xsd:complexType>
</xsd:element>

<xsd:element ref="packageMedium" maxOccurs="unbounded"/>
<xsd:element name="horizontalSceneSelectionDefinitionType">
  <xsd:complexType>
    <xsd:choice>
      <xsd:element name="rectangleSceneSelectionOption">
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          <xsd:complexContent>
            <xsd:restriction base="xsd:complexType">
              <xsd:sequence>
                <xsd:element ref="acrossGrid"/>
                <xsd:element ref="alongGridUnitType"/>
                <xsd:element ref="alongGrid"/>
              </xsd:sequence>
            </xsd:restriction>
          </xsd:complexContent>
        </xsd:element>
      </xsd:element>
      <xsd:element name="acrossSizeLimitation">
        <xsd:complexType>
          <xsd:complexContent>
            <xsd:restriction base="xsd:complexType">
              <xsd:sequence>
                <xsd:element name="acrossSizeMin" type="xsd:integer"/>
                <xsd:element name="acrossSizeMax" type="xsd:integer"/>
                <xsd:element name="acrossSizeStep" type="xsd:integer"/>
              </xsd:sequence>
            </xsd:restriction>
          </xsd:complexContent>
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      </xsd:element>
      <xsd:element name="acrossPositionLimitation">
        <xsd:complexType>
          <xsd:complexContent>
            <xsd:restriction base="xsd:complexType">
              <xsd:sequence>
                <xsd:element name="acrossStart" type="xsd:integer"/>
                <xsd:element name="acrossStop" type="xsd:integer"/>
                <xsd:element name="acrossStep" type="xsd:integer"/>
              </xsd:sequence>
            </xsd:restriction>
          </xsd:complexContent>
        </xsd:element>
      </xsd:element>
      <xsd:element name="alongSizeLimitation">
        <xsd:complexType>
          <xsd:complexContent>
            <xsd:restriction base="xsd:complexType">
              <xsd:sequence>
                <xsd:element name="alongSizeMin" type="xsd:integer"/>
                <xsd:element name="alongSizeMax" type="xsd:integer"/>
                <xsd:element name="alongSizeStep" type="xsd:integer"/>
              </xsd:sequence>
            </xsd:restriction>
          </xsd:complexContent>
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      </xsd:element>
      <xsd:element name="alongPositionLimitation">
        <xsd:complexType>
          <xsd:complexContent>
            <xsd:restriction base="xsd:complexType">
              <xsd:sequence>
                <xsd:element name="alongStart" type="xsd:integer"/>
                <xsd:element name="alongStop" type="xsd:integer"/>
                <xsd:element name="alongStep" type="xsd:integer"/>
              </xsd:sequence>
            </xsd:restriction>
          </xsd:complexContent>
        </xsd:element>
      </xsd:element>
    </xsd:choice>
  </xsd:complexType>
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<xsd:enumeration value="Cancelled"/>
<xsd:enumeration value="BeingCancelled"/>
<xsd:enumeration value="Deleted"/>
<xsd:enumeration value="BeingDeleted"/>
<xsd:enumeration value="Completed"/>
<xsd:enumeration value="BeingOnHold"/>
<xsd:enumeration value="Terminated"/>
</xsd:restriction>
</xsd:simpleType>
</xsd:element>
<xsd:element name="additionalStatusInfo" type="NonNullStringType" minOccurs="0"/>
</xsd:sequence>
</xsd:complexType>
<xsd:complexType name="OrderItemStatusType">
<xsd:sequence>
<xsd:element name="orderState" type="xsd:string"/>
<xsd:element name="additionalStatusInfo" type="NonNullStringType" minOccurs="0"/>
</xsd:sequence>
</xsd:complexType>
<xsd:complexType name="PackagePriceType">
<xsd:sequence>
<xsd:element ref="price" minOccurs="0"/>
<xsd:element ref="listPrice" minOccurs="0"/>
<xsd:element ref="expectedPrice" minOccurs="0"/>
</xsd:sequence>
</xsd:complexType>
<xsd:complexType name="PriceType">
<xsd:sequence>
<xsd:element name="refCurrency">
<xsd:simpleType>
<xsd:restriction base="NonNullStringType">
<xsd:maxLength value="3"/>
</xsd:restriction>
</xsd:simpleType>
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<xsd:element name="refAmount">
<xsd:simpleType>
<xsd:restriction base="xsd:unsignedLong">
<xsd:maxInclusive value="4294967296"/>
</xsd:restriction>
</xsd:simpleType>
</xsd:element>
<xsd:element name="userCurrency" minOccurs="0">
<xsd:simpleType>
<xsd:restriction base="NonNullStringType">
<xsd:maxLength value="3"/>
</xsd:restriction>
</xsd:simpleType>
</xsd:element>
<xsd:element name="userAmount" minOccurs="0">
<xsd:simpleType>
<xsd:restriction base="xsd:unsignedLong">
<xsd:maxInclusive value="4294967296"/>
</xsd:restriction>
</xsd:simpleType>
</xsd:element>
</xsd:sequence>
</xsd:complexType>
<xsd:complexType name="ProductDeliveryOptionsType">
<xsd:sequence>
<xsd:element name="productByteSize" type="xsd:integer" minOccurs="0"/>
<xsd:element name="productFormat" type="NonNullStringType" minOccurs="0"/>
<xsd:element name="productCompression" type="NonNullStringType" minOccurs="0"/>
</xsd:sequence>
</xsd:complexType>
<xsd:complexType name="SceneSelectionType">
<xsd:sequence>
<xsd:element name="sceneType">
<xsd:simpleType>
<xsd:complexType name="OrderItemStatusType">
  <xsd:sequence>
    <xsd:choice>
      <xsd:sequence>
        <xsd:element ref="sceneCenter" minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element ref="programming" minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element ref="processing" minOccurs="0" maxOccurs="unbounded"/>
        <xsd:element ref="sceneSelection" minOccurs="0"/>
        <xsd:element ref="packageMedium" minOccurs="0"/>
        <xsd:element name="qualityOfService" minOccurs="0"/>
      </xsd:sequence>
      <xsd:element name="orderItemStatusInfo" type="OrderItemStatusType" minOccurs="0"/>
      <xsd:element name="orderItemRemark" type="xsd:string" minOccurs="0"/>
    </xsd:choice>
  </xsd:sequence>
</xsd:complexType>

<!-- Simple Types -->
<xsd:simpleType name="ExtendedStatusType">
  <xsd:restriction base="CharacterString">
    <xsd:enumeration value="success"/>
    <xsd:enumeration value="failure"/>
    <xsd:enumeration value="incomplete"/>
  </xsd:restriction>
</xsd:simpleType>

Order WSDL

xmlns:tns="http://earth.esa.int/XML/dsm" xmlns:eoli="http://earth.esa.int/XML/eoli"
targetNamespace="http://earth.esa.int/XML/dsm">
  <types>
    <schema attributeFormDefault="qualified" elementFormDefault="qualified" targetNamespace="http://schemas.xmlsoap.org/wsdl/" xmlns="http://www.w3.org/2001/XMLSchema">
      <import namespace="http://earth.esa.int/XML/eoli" schemaLocation="Eoli_Order.xsd"/>
    </schema>
    <types>
      <message name="searchRequestInput">
        <part name="searchRequestParameter" element="eoli:searchRequest"/>
      </message>
      <message name="presentRequestInput">
        <part name="searchRequestParameter" element="eoli:presentRequest"/>
      </message>
      <message name="productOrderRequestInput">
        <part name="productOrderRequestParameter" element="eoli:productOrderRequest"/>
      </message>
      <message name="orderMonitorRequestInput">
        <part name="orderMonitorRequestParameter" element="eoli:orderMonitorRequest"/>
      </message>
      <message name="responseOutput">
        <part name="responseParameter" element="eoli:response"/>
      </message>
      <message name="orderResponseOutput">
        <part name="orderResponseParameter" element="eoli:orderResponse"/>
      </message>
      <message name="orderMonitorResponseOutput">
        <part name="orderMonitorResponseParameter" element="eoli:orderMonitorResponse"/>
      </message>
      <portType name="dsmPortType">
        <operation name="processSearchRequest">
          <input message="tns:searchRequestInput"/>
          <output message="tns:responseOutput"/>
        </operation>
        <operation name="processPresentRequest"/>
<input message="tns:presentRequestInput"/>
<output message="tns:responseOutput"/>
</operation>

<operation name="processProductOrderRequest">
  <input message="tns:productOrderRequestInput"/>
  <output message="tns:orderResponseOutput"/>
</operation>

<operation name="processOrderMonitorRequest">
  <input message="tns:orderMonitorRequestInput"/>
  <output message="tns:orderMonitorResponseOutput"/>
</operation>

</portType>

<binding name="dsmBinding" type="tns:dsmPortType">
  <soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
  <operation name="processSearchRequest">
    <input>
      <soap:body use="literal"/>
    </input>
    <output>
      <soap:body use="literal"/>
    </output>
  </operation>
  <operation name="processPresentRequest">
    <input>
      <soap:body use="literal"/>
    </input>
    <output>
      <soap:body use="literal"/>
    </output>
  </operation>
  <operation name="processProductOrderRequest">
    <input>
      <soap:body use="literal"/>
    </input>
    <output>
      <soap:body use="literal"/>
    </output>
  </operation>
  <operation name="processOrderMonitorRequest">
    <input>
      <soap:body use="literal"/>
    </input>
    <output>
      <soap:body use="literal"/>
    </output>
  </operation>
</binding>

<service name="dsmService">
  <port name="dsmSoap" binding="tns:dsmBinding">
    <soap:address location="http://earth.esa.int/"/>
  </port>
</service>
</definitions>
Annex D
(informative)

Proposed evolution towards OGC CAT 2.0 and CSW Compliance

This annex describes the desirable and anticipated evolution of the profile to better comply with OGC 04-021r2 and specifically an alignment with CSW.

It should be kept in mind that a key driver for this profile is to allow it to be implemented as a standard interface to existing catalogues of EO products in a cost effective manner, and thus we wish to require quite a minimal set of interfaces. These interfaces may subsequently be extended to ensure compatibility with other systems (for example when required INSPIRE directives), it should be anticipated that translators/adaptors may be developed to provide further interoperability by offering alternative bindings, however, the profile is kept to a minimum so that the overhead needn’t be implemented by all catalogue providers.

Catalogue Schema and Searchable Properties
The EO profile is targeted towards the identification of EO products from large collections of data that are typically contain data of a certain product type generated from a same sensor on board a satellite or series of satellites. The key attributes that distinguish the products within a collection are those identified within this profile.

It is proposed to align further the geographical metadata within this profile with GML 3.1.1

The core catalogue schema of CAT 2.0 is not really appropriate for the individual product metadata, but more towards collection level metadata (e.g. textual information that is common to all data within the collection), this is also the case for the core searchable properties. Inclusion of additional metadata and queriables may be included in the profile in the future, but would be expected to be aligned towards the requirements from INSPIRE.

Interfaces
The basic search operations of the EO Profile have a good mapping to CSW. The anticipated evolution is summarised below:

<table>
<thead>
<tr>
<th>EOProfile</th>
<th>CSW</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>EOProfile:SearchRequest</td>
<td>CSW:GetRecords</td>
<td>The operations shall be renamed to be inline with the CSW implementation</td>
</tr>
<tr>
<td>EOProfile:PresentRequest</td>
<td>CSW:GetRecordById</td>
<td>The operations shall be renamed to be inline with the CSW implementation</td>
</tr>
</tbody>
</table>
OGC_Service:GetCapabilities

Service metadata discovery should be aligned with INSPIRE in a future iteration of the EO profile.

CSW:DescribeRecord

Since we currently intend to only to specify SOAP bindings, and so schema described are published and referenced via the WSDL there seems little added value to provide this interface within the EO profile.

Request Encoding

The current required binding to be mandated by this profile is SOAP, it is not anticipated to require a KVP encoding.

Query Format

The query format within the EO profile currently defined by the simpleRequest. The advantages of this format is that it provides a well defined set of parameters that need to be supported by each catalogue provider, and search performances can be optimised towards these parameters. The simpleRequest can also be described using OGC Filter Syntax, and so it would be anticipated to migrate towards this syntax. However, it appears not to be possible to define using OGC Filter Syntax restrictions on what has to be supported by a catalogue provider, or to limit the possibilities to avoid “unreasonable” queries that would not be feasible to respond. These issues have been also previously reported to OGC WFS working group in change request 05-022.

GetRecords Request

Considering the mandatory or request parameters and those already present in the EO profile the following table shows the anticipated evolution

<table>
<thead>
<tr>
<th>EOProfile</th>
<th>CSW</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>simpleQuery</td>
<td>constraint,</td>
<td>Use of OGC Filter Syntax is anticipated</td>
</tr>
<tr>
<td></td>
<td>constraintLanguageVersion</td>
<td></td>
</tr>
<tr>
<td>resultType</td>
<td>resultType</td>
<td>Within EO profile we do not foresee much use in the validate value available in CSW</td>
</tr>
<tr>
<td>iteratorSize</td>
<td>maxRecords</td>
<td>These parameters shall be renamed to align to CSW</td>
</tr>
<tr>
<td>cursor</td>
<td>startPosition</td>
<td>These parameters shall be renamed to align to CSW, the EO profile adds a browse</td>
</tr>
<tr>
<td>presentation</td>
<td>elementSetName</td>
<td>These parameters shall be renamed to align to CSW</td>
</tr>
<tr>
<td>collectionId</td>
<td>typeNames</td>
<td>value</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------</td>
<td>-------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CSW foresees search against service, dataset, dataset collection and application. The EO profile is targeted towards searches within already identified collections, at this level no further alignment is foreseen</td>
</tr>
</tbody>
</table>

**GetRecords Response**

<table>
<thead>
<tr>
<th>EOProfile</th>
<th>CSW</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>retrievedData</td>
<td>abstractRecords</td>
<td>No further alignment foreseen at this time</td>
</tr>
</tbody>
</table>
| cursor hits | nextRecord
numberOfRecordsMatched
numberOfRecordsReturned | These parameters shall be renamed to align to CSW |
| status | status | |

**GetRecordById Request**

<table>
<thead>
<tr>
<th>EOProfile</th>
<th>CSW</th>
<th>Comment</th>
</tr>
</thead>
</table>
| idCitation
collectionId | id | It may be possible to combine collectionId and idCitation within the EO profile to result in a URI of the type prescribed by CSW although we would seem to loose alignment with ISO (TBC) |
| presentation | elementSetName | These parameters shall be renamed to align to CSW, the EO profile adds a *browse* value |

**GetRecords Response**

<table>
<thead>
<tr>
<th>EOProfile</th>
<th>CSW</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>retrievedData</td>
<td>abstractRecords</td>
<td>No further alignment foreseen at this time</td>
</tr>
<tr>
<td>hits</td>
<td>To be renamed <code>numberOfRecordsReturned</code>, which does not seem to be specified by CSW as part of response, but is considered useful in the EO profile</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>status, errorMessage</td>
<td>status does not seem to be specified by CSW as part of response, but is considered useful in the EO profile</td>
<td></td>
</tr>
</tbody>
</table>
Bibliography

[SSE] ESA Service Support Environment
http://services.eoportal.org


http://wgiss.ceos.org/ics/documentation.html


[Valids] Catalogue Interoperable Catalogue System Valids, CEOS/WGISS/PTT/Valids


