
# INSPIRE Discovery Service

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# 1. Contents IR document for Discovery service

The Implementing Rules for Discovery services document consists of 4 chapters:

1. Background & directive requirements
2. Abstract model with functions, their elements and parameters & search criteria
3. Performance requirements
   - Performance
   - Availability
   - Capacity
4. Instructions for implementation: Technical Guidance

# Discovery Service – Directive requirements

- Directive requirements for the Discovery service:
  - Art. 11 (1a) Discovery service
  - Art. 11 (2) Search criteria
  - Art. 12 Linking datasets and services to the network
  - Art. 13 (1) Protection
  - Art. 14 (1) E-commerce
- Other articles:
  - Art. 15 (2) EU portal access & member state level access
  - Art. 16-a Performances / reporting
  - Art. 20 Standards (interoperability)

# Discovery Service – Directive requirements

**Article 11 (1)**
**Member States shall establish and operate a network of the following services for the spatial data sets and services for which metadata have been created in accordance with this Directive:**
**(a) Discovery services making it possible to search for spatial data sets and services on the basis of the content of the corresponding metadata and to display the content of the metadata.**
**...**

**Those services shall take into account relevant user requirements and shall be easy to use, available to the public and accessible via the Internet or any other appropriate means of telecommunication.**

# Discovery Service – Abstract model operations (1)

| Function | Description | M/O |
|---|---|---|
| Get Discovery Service Metadata | Provides all necessary information about the service to a user (service provider, content, query language, access constraints …) and describes service capabilities to enable a client application to use the service (list of supported operations). | M |
| Discover Metadata | The Discover Metadata operation allows to request for all or a predefined set of metadata (record) elements of spatial resources based on a query statement to be retrieved from the target Discovery Service datastore. | M |
| Get Metadata | The Get Metadata operation allows to retrieve metadata for specific resources from a result set based on the resource unique Identification (ID). This operation is additional to the Discover Metadata operation. The Discover Metadata operation is to discover a set of resources based on a specific query, repetitively the Get Metadata operation is intended to retrieve additional metadata of (some) of the resources in the result set. | M |

# Discovery Service – Directive requirements

**Article 12:**

**Member States shall ensure that public authorities are given the technical possibility to link their spatial data sets and services to the network referred to in Article 11. This service shall also be made available upon request to third parties whose spatial data sets and services comply with implementing rules laying down obligations with regard, in particular, to metadata, network services and interoperability.**

# Discovery Service – Abstract model operations (2)

According to Article 12, the Discovery service shall provide the following functions to link spatial data sets and services to the network to the INSPIRE network. The INSPIRE Discovery service shall offer either the Publish Metadata function **or** the Collect Metadata function (**one of both**).

| Function | Description | M/O |
|---|---|---|
| Publish Metadata | The Publish Metadata operation allows to create, delete or update (set) metadata (record) elements of spatial resources in the Discovery Service datastore (push metadata mechanisme). | M,O |
| Collect Metadata | The Collect Metadata operation allows to pull metadata (record) elements of spatial resources from a source Discovery Service datastore and allows to create, delete or update (set) the metadata (record) elements of these spatial resources in the target Discovery Service datastore (pull metadata mechanisme). | M,O |

M,O = either Mandatory or Optional (one of both)

# Discovery Service – Directive requirements

**Article 11 (2):**
**For the purposes of the services referred to in point (a) of paragraph 1, as a minimum the following combination of search criteria shall be implemented:**
**(a) keywords;**
**(b) classification of spatial data and services;**
**(c) the quality and validity of spatial data sets;**
**(d) degree of conformity with the implementing rules provided for in Article 7(1);**
**(e) geographical location;**
**(f) conditions applying to the access to and use of spatial data sets and services;**
**(g) the public authorities responsible for the establishment, management, maintenance and distribution of spatial data sets and services.**

# Search criteria (article 11 (2)) and INSPIRE metadata

| INSPIRE Directive search criteria Article 11 (2) | INSPIRE metadata elements | Search criteria for the INSPIRE Discovery Service |
|---|---|---|
| (a) keywords | Keyword value | Yes |
| (b) classification of spatial data and services; | Topic category | Yes, if resources of type ‘dataset’ or ‘series’ are supported by the discovery service instance |
| (b) classification of spatial data and services | Spatial data services type | Yes, if resources of type ‘service’ are supported by the discovery service instance. |
| (c) the quality and validity of spatial data sets | Spatial resolution | Yes, if resources of type 'dataset' or 'series' are supported by the discovery service instance |
| (c) the quality and validity of spatial data sets | Spatial resolution | Yes, if resources of type 'dataset' or 'series' are supported by the discovery service instance |
| (c) the quality and validity of spatial data sets | Lineage | Yes |
| (d) degree of conformity with the implementing rules provided for in Article 7(1) | Degree | Yes |
| (d) degree of conformity with the implementing rules provided for in Article 7(1) | Specification | Yes |
| (e) geographical location | Geographic bounding box | Yes, if resources of type ‘dataset’ or ‘series’ are supported by the discovery service instance |
| (f) conditions applying to the access to and use of spatial data sets and services | LimitationsOnPublicAccess | Yes |
| (f) conditions applying to the access to and use of spatial data sets and services | ConditionApplyingToAccessAndUse | Yes |
| (g) the public authorities responsible for the establishment, management, maintenance and distribution of spatial data sets and services | Responsible party | Yes |

# Discovery Service – Directive requirements

**Article 16:**
**Rules for implementation designed to amend non-essential elements of this Chapter by supplementing it, shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Article 22(3), and shall in particular lay down the following:**
**(a) technical specifications for the services referred to in Articles 11 and 12 and minimum performance criteria for those services, taking account of existing reporting requirements and recommendations adopted within the framework of Community environmental legislation, existing e-commerce services and technological progress;**

# Minimum performance requirements

- Performance :
  - The time for sending initial response to service request  in normal situation shall be 3 seconds. This time includes sending Discovery service errors or exceptions. For the Discovery Service, this time shall allow to send 1 metadata record.
  - Normal situation represents periods out of peak load. It is considered to be 90% of the time.
- Availability :
  - 99% of the time (3.7 days per year), no more than 15 minutes downtime per day during working hours
- Capacity:
  - The minimum number of simultaneous service requests served according to the performance requirement shall be 30 requests per second without performance lost.

# 2. Discovery Service Technical Guidance

- Considerations for the CSW ISO metadata AP 2.0.2
- Mapping IR functions to CSW ISO AP operations
- INSPIRE profile of CSW ISO AP
  - Addition of advertising AdditionalQuerables
  - Addition of Language parameter
  - Harvest ResourceType & ResourceFormat parameters
- Performance requirements

# CSW ISO metadata AP - Considerations

- Metadata Drafting Team
  - Metadata IR & Draft Guidelines – INSPIRE metadata implementing rules based on ISO 19115 and ISO 19119 and ISO/TS 19139 encoding

- Available catalogue standards and their support for discovery of spatial resources

- Adoption of these catalogue standards in Europe, especially
  - SDIC / LMO reference material for metadata and network services
  - INSPIRE metadata survey by Nowak and Craglia (2006)

# Mapping IR functions to the CSW ISO AP operations

| Function | Description | M/O | CSW ISO AP |
|---|---|---|---|
| Get Discovery Service Metadata | Provides all necessary information about the service to a user (service provider, content, query language, access constraints …) and describes service capabilities to enable a client application to use the service (list of supported operations). | M | getCapabilities |
| Discover Metadata | The Discover Metadata operation allows to request for all or a predefined set of metadata (record) elements of spatial resources based on a query statement to be retrieved from the target Discovery Service datastore. | M | getRecords |
| Get Metadata | The Get Metadata operation allows to retrieve metadata for specific resources from a result set based on the resource unique Identification (ID). This operation is additional to the Discover Metadata operation. The Discover Metadata operation is to discover a set of resources based on a specific query, repetitively the Get Metadata operation is intended to retrieve additional metadata of (some) of the resources in the result set. | M | getRecordsByID |
| Publish Metadata | The Publish Metadata operation allows to create, delete or update (set) metadata (record) elements of spatial resources in the Discovery Service datastore (push metadata mechanisme). | M,O | transaction |
| Collect Metadata | The Collect Metadata operation allows to pull metadata (record) elements of spatial resources from a source Discovery Service datastore and allows to create, delete or update (set) the metadata (record) elements of these spatial resources in the target Discovery Service datastore (pull metadata mechanisme). | M,O | harvest |

# INSPIRE profile of CSW ISO AP

1. Addition of  advertising  AdditionalQuerables
2. Addition of Language parameter
3. Harvest ResourceType & ResourceFormat parameter

# Discovery Service – Additional Querables advertised

CSW ISO AP defines a mechanism to advertise additional queryables through the capabilities document of the Discovery service instance (see chapter 7.5, table 23 in CSW ISO AP). An appropriate OperationMetadata section of a capabilities document is shown in the next figure (excerpt from full capabilities).

All supported ISO queryables shall be advertised in the section “SupportedISOQQueryables”; in addition, all INSPIRE queryables shall be listed in the section “AdditionalQueryables”.

# Discovery Service - Querables advertised

```
<ows:OperationsMetadata>
<ows:Operation name="GetRecords">
      […] (List of DCPs, parameters here)
     <ows:Constraint name="SupportedISOQueryables">
          <ows:Value>RevisionDate</ows:Value>
          <ows:Value>CreationDate</ows:Value>
          <ows:Value>PublicationDate</ows:Value>
          <ows:Value>OrganisationName</ows:Value>
          <ows:Value>ResourceIdentifier</ows:Value>
          <ows:Value>TopicCategory</ows:Value>
          <ows:Value>ResourceLanguage</ows:Value>
          <ows:Value>DistanceValue</ows:Value>
          <ows:Value>DistanceUOM</ows:Value>
          <ows:Value>TempExtent_begin</ows:Value>
          <ows:Value>TempExtent_end</ows:Value>
          <ows:Value>ServiceType</ows:Value>
          <ows:Value>OperatesOn</ows:Value>
          <ows:Value>Denominator</ows:Value>
     </ows:Constraint>
     <ows:Constraint name="AdditionalQueryables">
          <ows:Value>Degree</ows:Value>
          <ows:Value>AccessConstraints</ows:Value>
          <ows:Value>OtherConstraints</ows:Value>
          <ows:Value>Classification</ows:Value>
          <ows:Value>ConditionApplyingToAccessAndUse</ows:Value>
          <ows:Value>MetadataPointOfContact</ows:Value>
          <ows:Value>Lineage</ows:Value>
          <ows:Value>SpecificationTitle</ows:Value>
          <ows:Value>SpecificationDate</ows:Value>
          <ows:Value>SpecificationDateType</ows:Value>
     </ows:Constraint>
</ows:Operation>
```

# Discovery Service – Language parameter

An INSPIRE Discovery Service must indicate the languages that are supported to formulation values within a query. This requires that a client application must be able to determine the supported languages of the values of the queryables.

To indicate the supported languages the following has to be supported by a capabilities document that is returned by an INSPIRE Discovery Service:

- The capabilities document shall be returned in the default language
- A list of supported languages for queryable values defined by a 3-letter code as described in ISO 639-2
- The translations to other supported languages shall be referenced in the "ExtendedCapabilities" element, as a link to an online resource.

Service exceptions shall be returned within a "ServiceException" element, one element by supported language.

See "Annex D Capabilities extensions and examples" that defines the required extension types for INSPIRE Discovery Service.

# Discovery Service – Harvest operation parameters

Within the context of INSPIRE an INSPIRE Discovery Service is at least able to harvest single metadata documents that are provided through some online location.

CSW ISO AP specifies a harvest operation that is based on the related operation of the underlying base specification OGC CSW. For an INSPIRE Discovery Service, the following settings have to be met if a resource is requested to be harvested by a catalogue service instance:

- RESOURCETYPE: The resource type of the resource being harvested has to be http://www.isotc211.org/schemas/2005/gmd/
- RESOURCEFORMAT: The resource format of the resource being harvested has to be “application/xml”

The following XML code fragment shows a valid Harvest request:

```
<?xml version="1.0" encoding="UTF-8"?>
<csw:Harvest service="CSW" version="2.0.2" xmlns:csw="http://www.opengis.net/cat/csw/2.0.2">
        <csw:Source>http://www.myhost.com/metadata_dataset.xml</csw:Source>
        <csw:ResourceType>http://www.isotc211.org/schemas/2005/gmd/</csw:ResourceType>
        <csw:ResourceFormat>application/xml</csw:ResourceFormat>
        <csw:HarvestInterval>P1Y2M3DT10H30M0S</csw:HarvestInterval>
</csw:Harvest>
```

# Discovery Service – Performance requirements

- Reliability: reference tests and datasets recommended
- Security: certification recommended
- Regulatory: reference tests recommended


Thank you for your attention

Questions ?

# Discovery Service – Directive requirements (3)

**Article 13 (1):**
**By way of derogation from Article 11(1), Member States may limit public access to spatial data sets and services through the services referred to in point (a) of Article 11(1) where such access would adversely affect international relations, public security or national defense.**

**Article 14 (1):**
**Member States shall ensure that the services referred to in points (a) and (b) of Article 11(1) are available to the public free of charge.**

**Article 15 (2):**
**Member States shall provide access to the services referred to in Article 11(1) through the Inspire geo-portal referred to in paragraph 1. Member States may also provide access to those services through their own access points.**

# Discovery Service – Directive requirements (3)

**Article 16:**
**Rules for implementation designed to amend non-essential elements of this Chapter by supplementing it, shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Article 22(3), and shall in particular lay down the following:**
**(a)technical specifications for the services referred to in Articles 11 and 12 and minimum performance criteria for those services, taking account of existing reporting requirements and recommendations adopted within the framework of Community environmental legislation, existing e-commerce services and technological progress;**

**Article 20:**
**The implementing rules referred to in this Directive shall take due account of standards adopted by European standardisation bodies in accordance with the procedure laid down in Directive 98/34/EC, as well as international standards.**