



INSPIRE

Infrastructure for Spatial Information in Europe

D3.9 Draft Implementing Rules for Download Services

Drafting Team “Network Services”

Title	Draft Implementing Rules for Download Services
Creator	Network Services Drafting Team
Date	2009-02-14
Subject	Implementing Rules for Download Services
Status	Draft
Publisher	Network Services Drafting Team
Type	Text
Description	This document identifies the implementing rules for Download Services to fulfil the INSPIRE directive.
Format	MS Word (doc)
Source	Network Services Drafting Team
Rights	INSPIRE DT members.
Identifier	D3.9 Draft IR Download Services v2.0.doc
Language	EN
Relation	Not applicable
Coverage	Project duration

Table of contents

- 1 Introduction..... 3**
 - 1.1 Background 3
 - 1.2 The Directive’s Requirements for Download services 4
- 2 The Download Service Implementing Rules..... 5**
 - 2.1 Introduction 5
 - 2.2 Spatial data sets..... 6
 - 2.2.1 Spatial objects 6
 - 2.3 Query – abstract model..... 6
 - 2.3.1 Query in the case of download services..... 6
 - 2.4 Download Service description..... 7
 - 2.4.1 INSPIRE Download Service description..... 7
 - 2.4.2 Pre-defined data set 8
 - 2.4.3 Direct access download service 8
 - 2.4.4 Criteria for “where practicable” 8
 - 2.4.5 Other aspects 8
 - 2.5 Download service functions 8
 - 2.6 Download Service elements..... 9
 - 2.6.1 Nature of the Metadata 10
 - 2.6.2 Coordinate Reference Systems..... 10
 - 2.6.3 Temporal data dimension 10
 - 2.7 Download service functions – further description 10
 - 2.7.1 Get Download Service Metadata 10
 - 2.7.2 Get Spatial Objects..... 11
 - 2.7.3 Describe Spatial Object Types 11
 - 2.7.4 Define Query..... 11
 - 2.7.5 Link Download Service 12
 - 2.8 Download Output Format..... 12
 - 2.9 Multilingualism..... 12
 - 2.10 Geo Rights Management..... 12
- 3 Quality of Download service requirements 12**
 - 3.1 Performance..... 13
 - 3.2 Capacity 13
 - 3.3 Availability 14
 - 3.4 Reliability 14
 - 3.5 Security 14
 - 3.6 Compliance 14
- 4 Instructions for implementation 14**
- Annex A: Terms and definitions 15**

Infrastructure for Spatial Information in Europe	Reference: D3.9 Draft IR Download Services v2.0.doc
	2009-02-14
	Page 3 of 17

1 Introduction

This document contains the draft proposal for Implementing Rules (IRs) on Download services as required by the INSPIRE Directive (2007/2/EC). This document is published on the INSPIRE web site¹ on [2009-XX-XX](#) and will be submitted to the Regulatory Committee as required by the Directive.

The document is organised as follows: Section 1 is introductory to help readers understand the background and requirements without need to reference other documents. It is expected that in the final Implementing Rules this section will be removed or be strongly summarized. Section 2 is the core of the proposal. Annex A defines key terms used in the text. A separate document² explains how different standards and specifications should be used to implement the INSPIRE Download services defined in Chapter 2 of this document.

1.1 Background

INSPIRE is a Directive (2007/2/EC) of the European Parliament and of the Council establishing an Infrastructure for Spatial Information in the European Community³. The purpose of such an infrastructure is to assist policy-making in relation to policies and activities that may have a direct or indirect impact on the environment. The Directive came into force on the 15th May 2007.

INSPIRE should be based on the infrastructures for spatial information that are created by the Member States. Such infrastructures should be designed to ensure that spatial data are stored, made available and maintained at the most appropriate level; that it is possible to combine spatial data from different sources across the Community in a consistent way and share them between several users and applications; that it is possible for spatial data collected at one level of public authority to be shared between other public authorities; that spatial data are made available under conditions which do not unduly restrict their extensive use; that it is easy to discover available spatial data, to evaluate their suitability for the purpose and to know the conditions applicable to their use.

To achieve these aims, the Directive focuses in particular on five key areas: metadata, the interoperability and harmonisation of spatial data and services for selected themes (as described in Annexes I, II, III of the Directive); network services and technologies; measures on sharing spatial data and services; and coordination and monitoring measures.

Member States are required to bring into force national legislation, regulations, and administrative procedures necessary to comply with the Directive by the 15th May 2009.

To ensure that the spatial data infrastructures of the Member States are compatible and usable in a Community and trans-boundary context, the Directive requires that common Implementing Rules (IRs) are adopted in a number of specific areas. These IRs will be adopted as Commission Regulations or Decisions, and will be binding in their entirety. The Commission is assisted in the process of adopting such rules by a Regulatory Committee composed by representatives of the Member States and chaired by a representative of the Commission (this is known as the Comitology procedure⁴). The Committee was established in June 2007.

The requirements of the Directive in relation to Download services are detailed below.

¹ INSPIRE Website: <http://www.ec-gis.org/inspire/>

² Technical guidance to implement INSPIRE download services

³ The text of the Directive in multiple languages is available at <http://eur-lex.europa.eu/JOHtml.do?uri=OJ:L:2007:108:SOM:EN:HTML>

⁴ An explanation of the process for the development and adoption of the Implementing Rules is contained in Section 3 of the Work Programme 2007-09 see http://inspire.jrc.it/reports/transposition/INSPIRE_IR_WP2007_2009_en.pdf

Infrastructure for Spatial Information in Europe	Reference: D3.9 Draft IR Download Services v2.0.doc
	2009-02-14
	Page 4 of 17

1.2 The Directive's Requirements for Download services

In the context of INSPIRE Download Services, the following articles from the Directive (PE-CONS 3685/2006) are of major relevance and are quoted here for convenience reasons:

Article 7:

1. Implementing rules laying down technical arrangements for the interoperability and, where practicable, harmonisation of spatial data sets and services, designed to amend non-essential elements of this Directive by supplementing it, shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Article 22(3). Relevant user requirements, existing initiatives and international standards for the harmonisation of spatial data sets, as well as feasibility and cost-benefit considerations shall be taken into account in the development of the implementing rules. Where organisations established under international law have adopted relevant standards to ensure interoperability or harmonization of spatial data sets and services, these standards shall be integrated, and the existing technical means shall be referred to, if appropriate, in the implementing rules mentioned in this paragraph.

Article 11:

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:

...

(c) download services, enabling copies of spatial data sets, or parts of such sets, to be downloaded and, where practicable, accessed directly;

...

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(1). 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.

Article 14:

Member States may allow a public authority supplying a service referred to in point (b) of Article 11(1) to apply charges where such charges secure the maintenance of spatial data sets and corresponding data services, especially in cases involving very large volumes of frequently updated data. Data made available through the Download services referred to in point (b) of Article 11(1) may be in a form preventing their reuse for commercial purposes.

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.

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.

Performance criteria for INSPIRE Network Services are required in Article 16 of the INSPIRE Directive :

(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 :

Infrastructure for Spatial Information in Europe	Reference: D3.9 Draft IR Download Services v2.0.doc
	2009-02-14
	Page 5 of 17

- (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 ;*

And in Recital 17:

Network services are necessary for sharing spatial data between the various levels of public authority in the Community. Those network services should make it possible to discover, transform, view and download spatial data and to invoke spatial data and e-commerce services. The services of the network should work in accordance with commonly agreed specifications and minimum performance criteria in order to ensure the interoperability of the infrastructures established by the Member States. The network of services should also include the technical possibility to enable public authorities to make their spatial data sets and services available.

The arrangements for the exchange of spatial data and the INSPIRE geo-portal are not formally part of the Network Services Implementing Rules development, but will nevertheless play an important role. Following the INSPIRE proposal, the arrangements for the exchange of spatial data depends on the harmonized data specifications implementation rules for its technical content. In addition, the INSPIRE geo-portal will not be part of the Network Services Implementing Rules as it is for Commission internal development.

The INSPIRE Directive refers to e-commerce services,:

(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 points (b) to (e) of Article 11(1), or to the e-commerce services referred to in Article 14(3), where such access would adversely affect any of the following: ; points (a) to (h) follows

(Article 14-4) Member States shall ensure that e-commerce services are available. Such services may be covered by disclaimers, click-licences or, where necessary, licences;

(Article 16-a) technical specifications for the services 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.

E-commerce services specifications and Implementing Rules may refer to existing European/National legal frameworks and relevant technical documents whenever applicable. For example, the Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 defines legal aspects of information society services, in particular electronic commerce, in the Internal Market ('Directive on electronic commerce'). Particular attention will be required on Digital Rights Management and its relationship to e-commerce services.

The Directive does not mandate the use of any particular natural language for the metadata content. The Directive recognizes the importance of multi-lingual aspects and mandates the use of multi-lingual thesauri in the context of interoperability of spatial data sets and services (Art. 8-2 (c)).

2 The Download Service Implementing Rules

2.1 Introduction

The ability to access and use and reuse geographic information across Europe and across INSPIRE Annex I-III themes is probably the most important concrete achievement of the INSPIRE programme. Download services are the mechanisms by which users can have access to the full information content captured and transformed by MS into their geographic data sets according to the INSPIRE defined themes. The download services provide the capability to access the information in order to fulfil a

Infrastructure for Spatial Information in Europe	Reference: D3.9 Draft IR Download Services v2.0.doc
	2009-02-14
	Page 6 of 17

series of possible tasks including visualizing information in a variety of ways, integration with other information, and to allow deep analysis as a basis for knowledge and decision making.

European SDIs already offer several ways to access and utilize geographic information for the users and their objectives. The download services defined in these implementing rules aims at capturing an extensive range of these existing functionalities.

Download services are coupled to the data sets to which they give access. MS shall implement download services providing access to every spatial data set within the scope of Article 4 of the INSPIRE directive. This implementing rule will describe download services at a generic level, that is, independent of the concrete underlying INSPIRE theme.

2.2 Spatial data sets

Spatial phenomena fall into two broad categories — discrete and continuous. Discrete phenomena, like a building or a transportation network, are normally modelled as spatial objects with a distinct geometry (point, curve, surface, or solid) and a set of attributes. Continuous phenomena, like a temperature distribution, are normally modelled as a function that associates a value (or a tuple of values) to each point in space.

A spatial data set contains a collection of representations of spatial phenomena.

2.2.1 Spatial objects

The spatial characteristics of a discrete real-world phenomenon are represented by a set of one or more geometric primitives (points, curves, surfaces or solids). Other characteristics of the phenomenon are recorded as spatial object attributes. Usually, a single spatial object is associated with a single set of attribute values. The discrete phenomena can be seen as a spatial object collection containing one or more spatial objects instances.

Each spatial object has an associated type name which is unique in the spatial object collection. This name may also be unique across spatial object collections.

The value of a attribute of a spatial object might be another spatial object, a literal value or a complex object value which may in turn be represented by a sequence of attribute nodes and value nodes.

A spatial object that acts as a function to return values from its range for any direct position within its spatial, temporal or spatiotemporal domain is called a coverage.

The spatial object types and associated attributes shall be compliant with the INSPIRE Generic Conceptual Model.

2.3 Query – abstract model

2.3.1 Query in the case of download services

A query in the abstract sense, is a set of *predicates* expressed in a syntax collectively called a query and defined by a query expression.

A predicate is an expression that can be validated to be *true* or *false*.

A *query* is used to identify a subset of resources from a collection of resources whose property values satisfy a set of logically connected predicates. If the property values of a resource satisfy all the predicates in a query, then that resource is considered to be part of the resulting subset.

Infrastructure for Spatial Information in Europe	Reference: D3.9 Draft IR Download Services v2.0.doc	
	2009-02-14	Page 7 of 17

In the case of spatial information the collection of resources is a spatial data set. The predicates of a query will specify conditions based on the spatial object types and their attributes and associations. The result of applying the filter to a spatial data set, will thus result in a subset of the spatial data set.

In the context of INSPIRE, the spatial data set is a data set as defined by the Annexes I-III. The result of applying a query will be a part of the data set, as required by the directive.

This implementing rule requires that the query mechanism shall support all aspects defined by the data model of the data sets under this directive, including selection based upon spatial object types, any identifiers, attributes spatial (i.e. geometry or topology), temporal, thematic attributes, or any other attribute.

Predicates in a query expression shall be applied to appropriate attributes or properties of the spatial object types. E.g. a temporal predicate shall only be applied to a property of a temporal type, a spatial predicate shall only be applied to a spatial datatype. General predicates can be applied to other datatypes or between predicates of any kind. A query expression shall support the following functionality: general predicates, including logical and comparison predicates, spatial predicates, and temporal predicates.

In the case where a spatial data set description describes spatial object identifiers, and/or attributes that designate versions or updating information, it shall be possible to query on the basis of this information. E.g. in the case that a spatial object type has defined a unique identifier, the download service shall support a query that allows access to exactly the spatial object corresponding to a specific value of that identifier.

2.4 Download Service description

In the following Download Service is defined only on an abstract level. Instructions to implement such a service according to the current technology and existing standards are given in a separate document named "Technical guidance".

2.4.1 INSPIRE Download Service description

An INSPIRE Download Service is a web service that provides access to the full extent of geographic and thematic information in data sets belonging to the themes covered by the INSPIRE Directive Annexes. A Download Service shall give access to the data set or a part of the data set. The Download Service shall provide access to spatial objects whether representing discrete or continuous phenomena as described above.

Every spatial object accessed through an INSPIRE Download Service shall conform to a spatial object type specified by an INSPIRE Implementing Rule on the interoperability of spatial data sets and services. The Download service shall provide access to the extent of a data set as provided by a MS that are within scope of INSPIRE per Article 4, or to a part of such data set based upon a selection mechanism called a query above.

Every spatial object accessed through an INSPIRE Download Service shall conform to a spatial object type specified by an INSPIRE Implementing Rule on the interoperability of spatial data sets and services. The service shall also provide description of the spatial object type as specified by such INSPIRE Implementing Rule.

According to article 12, an INSPIRE Download service shall be linked to, and integrated in the INSPIRE Network architecture⁵.

⁵ D3.5 INSPIRE Network services Architecture document.

Infrastructure for Spatial Information in Europe	Reference: D3.9 Draft IR Download Services v2.0.doc
	2009-02-14
	Page 8 of 17

2.4.2 Pre-defined data set

A pre-defined data set will represent a full or partial MS extent of one of the INSPIRE themes. It will exist in a data store using one of the Coordinate Reference Systems in Annex I, point 1 of the INSPIRE Directive and be expressed in an INSPIRE encoding specified by the corresponding INSPIRE Implementing Rule on the interoperability of spatial data sets, or else a recommended encoding.

A pre-defined part of a spatial data set will typically be a part representing a subset of the geographic extent, e.g. an administrative subdivision of the MS, and/or a subset of the spatial object types in the MS spatial data set.

In the case of pre-defined data sets, metadata shall exist that describes the data set and in the case of parts of the data set, metadata shall exist that describe these parts.. It is recommended that the metadata include the description of the spatial data set in conformance with the corresponding INSPIRE Implementing Rule on the interoperability of spatial data sets.

2.4.3 Direct access download service

The directive states that MS shall operate download services enabling “*copies of spatial data sets, or parts of such sets, to be downloaded and, where practicable, accessed directly*”.

A download service can either download a pre-defined data set or pre-defined part of a data set, or give direct access to the spatial objects contained in the data set, and download selections of spatial objects based upon a query.

The service metadata elements will define if the service is a direct access download service or not. If the download service offers a query capability, it is a direct access download service. If the service does not offer a query capability, then only a complete pre-defined spatial data set or a pre-defined part of a spatial data set can be downloaded.

2.4.4 Criteria for “where practicable”

The differentiation between direct access and non-direct access has technical implications, but the technical aspects depends more on the capability of the MS. This implementing rule does not define any criteria for when direct access is practicable. This can be defined by the Implementing rule for the different themes, or by the MS themselves.

Data set download services and direct access download service may serve different purposes. MSs should be encouraged to implement both types for a given theme.

2.4.5 Other aspects

This Download service implementing rules do not cover any client application using a Download Service. Client application definition is out of scope.

2.5 Download service functions

An INSPIRE download service shall be defined by five functions, Get Download Service Metadata, Get Spatial Objects, Describe Spatial Object Types, Define Query, and Link Download Service.

Download services shall be described by service metadata and be discovered using a Discovery service.

The INSPIRE Download service shall provide the following functions:

Function	Description	M/O/C
Get Download Service Metadata	Provides all necessary information about the service to a user (service provider, spatial objects available, access constraints ...) and describes service capabilities to enable a client application to use the service (list of supported operations).	M
Get Spatial Objects	The Get Spatial Objects operation allows spatial object instances to be retrieved. In the case of direct access, the retrieval can be based on an optional query defined by the Define Query operation. In the case of non-direct access, the operation will retrieve a pre-defined data set or a pre-defined part of a data set. The operation shall support user requested CRS belonging to the INSPIRE defined CRSs.	M
Describe Spatial Object Types	The Describe Spatial object Type operation generates a description that defines zero or more of the spatial object types that the service offers. In the case of download service of a pre-defined data set or pre-defined part of data set, the function shall return the description of the complete set of spatial object types contained in the data set or part of data set. In the case of a direct access download service, the function can have as parameter a set named spatial object types for which the description is requested.	C, M in case of direct access
Define Query	Defines a query to be used in the Get Spatial Objects operation. The query predicates, encoded using a query expression, can include spatial, temporal and non-spatial constraints. The predicates shall express characteristics based upon the model of the data set as defined by an INSPIRE Implementing Rule on the interoperability of spatial data sets. The general characteristics are defined by the generic conceptual model. This function is applicable only in the case of direct access download service. The capability to define a query is mandatory, but a query can be omitted in a concrete Get Spatial Objects request.	C, M in case of direct access
Link Download Service	Allows the declaration of a Download Service for downloading of its resources through the Member State Download Service while maintaining the downloading capability at the Public Authority or the Third party location.	M

M/O/C: Mandatory / Optional/Conditional

2.6 Download Service elements

Additionally to the functions, an INSPIRE Download Service must follow rules for the elements described in this section.

Infrastructure for Spatial Information in Europe	Reference: D3.9 Draft IR Download Services v2.0.doc
	2009-02-14
	Page 10 of 17

2.6.1 Nature of the Metadata

According to Article 11, for the Download service two kinds of metadata must be available:

- metadata for the INSPIRE Download Services
- metadata for each data sets represented in the Download Service

These metadata must be defined according to the INSPIRE Metadata Implementing Rules.

Where a direct access download service retrieves a part of a data set, there is no requirement that separate metadata corresponding to this part shall exist.

2.6.2 Coordinate Reference Systems

The Download Service shall support the mandatory CRSs as defined in the Annex I implementing rule for coordinate reference systems.

2.6.3 Temporal data dimension

Following Article 8.2.d of the directive, the Download Service shall address the temporal aspect of the data. Therefore for data themes with a temporal component the Download Service shall allow filtering based upon the temporal dimension when relevant.

Temporal aspects depend upon the data set specification, and may include versioning and/or timestamps.

2.7 Download service functions – further description

2.7.1 Get Download Service Metadata

The Get Download Service Metadata operation allows clients to request a service metadata document describing a service.

The service metadata response document contains the following sections:

- 1) Service Identification section. The service identification section provides information about the download service itself.
- 2) Service Provider section. The service provider section provides metadata about the organization offering the download service.
- 3) Operation Metadata section. The operations metadata section provides metadata about the operations implemented by the download service. All mandatory and optional operations that a download service implements shall be listed in the operation metadata section. This metadata includes constraints for the service and for each operation.
- 4) Spatial object type list section (where applicable). This section defines the list of spatial object types and/or predefined data sets that are offered by the download service.

Coverages that are offered by the download service (where applicable).

- 5) Query capabilities section (where applicable). This section is used to advertise the types of predicates that may be used to form a query expression.

2.7.2 Get Spatial Objects

The Get Spatial Objects operation returns a set of spatial objects. An INSPIRE Download service processes a Get Spatial Objects request and returns a response to the client that contains zero or more spatial object instances.

In the case of a direct access download service, the response shall consist of all the spatial object instances that satisfy the query specified in the request. If no query is specified, the response shall consist of the complete data set. In this case the Get Spatial object operation may specify the CRS of the returned coordinates. This CRS must be in the set of CRSs supported by INSPIRE, see 2.6.2.

In the case of a non-direct access download service no query expression is allowed and the response to the Get Spatial Objects request shall be the complete spatial data set or the complete part of such a data set as offered by the MS. In this case the Get Spatial Objects cannot request a specific CRS, but will download coordinates in the CRS used by the pre-defined data set or pre-defined part of data set.

Note: In this case, a transformation to a different CRS can be achieved by invoking a coordinate transformation service (for a CRS supported by that coordinate transformation service).

Each individual query to be applied in a Get Spatial Objects request shall be encoded using a query expression and stated in a Define Query request. The query elements defines which spatial object type(s) to query, what properties to retrieve and what constraints (spatial and non-spatial) to apply to the spatial object properties in order to select the valid spatial object set.

The Get Spatial Objects operation shall be implemented by all INSPIRE Download services.

2.7.3 Describe Spatial Object Types

The Describe Spatial Object Types operation returns a description of spatial object types offered by a download service instance. The operation has a set of named spatial object types as input parameter, and returns the description of these spatial object types. These descriptions can e.g. be used as a basis for query predicates in the Define Query operation. If no spatial object types are named as input parameter, the operation shall respond with a description of all spatial object types covered by the download service instance.

The Describe Spatial Object Types operation shall be implemented by all direct access INSPIRE Download services.

2.7.4 Define Query

The Define Query operation defines a query expression to be used in the Get Spatial Objects operation in direct access download. The query shall be built as a set of logically connected predicates of the following types:

Function	Description	M/O
General predicates	Shall consist of: - logical predicates: and, or and not - comparison predicates: equal to, not equal to, less than, less than or equal to, greater than, greater than or equal to, like, is null and between	M
Identifier predicate	Shall consist of predicate to check whether a resource identifier matches a specified value	M
Spatial predicate – Bounding box	Shall only include bounding box	M
Complex spatial predicates	Shall consist of spatial predicates: equal, disjoint, touches, within, overlaps, crosses, intersects, contains, within a	O

	specified distance, beyond a specified distance and bounding box	
Temporal predicates	Shall consist of temporal predicates: after, before, begins, begun by, contains, during, equals, overlaps, meets, overlapped by, met by and ended by	M

The bounding box defines a 'rectangle' in the coordinate space of the associated CRS. The bounding box query applied to a spatial data set shall return all spatial objects of the data set that interact with the bounding box.

2.7.5 Link Download Service

The Link Download Service request parameter shall provide all information about the Public Authority's or Third Party's Download service compliant with INSPIRE, enabling the Member State Download Service to get resources from the Public Authority's or Third Party's Download Service and to collate it with other resources.

2.8 Download Output Format

The Download Services shall support any encodings defined by the corresponding specification of the INSPIRE themes.

2.9 Multilingualism

According to article 8c of the Directive, some elements of the Download service responses may be multilingual. The multilingualism applies only for exceptions raised by the INSPIRE service and for the abstract Get Download Service Metadata function.

The default language used for these elements is left to each MS.

2.10 Geo Rights Management

Member States may allow restricted access to spatial data sets and services, and/or licence, and/or require payment from, the public authorities or institutions and bodies of the Community that use these spatial data sets and services.

Security, protection and rights management aspects shall be as transparent as possible for service users.

Any functionality of this kind shall be compatible with digital right managements and restriction of access and use as envisioned in the INSPIRE directive.

When access to a download service is restricted, then the following elements shall be given as part of the Get Download Service Metadata response:

access constraints	type of constraints for accessing the download service
fees	information about pricing/licensing

3 Quality of Download service requirements

Following article 16 of the Directive, the minimum performance requirements for Download services must be laid down.

Here's the list of the quality of service requirements for the INSPIRE Network Services:

1. performance criteria :
 1. performance ;
 2. capacity ;
2. service maintenance criteria :
 1. availability ;
 2. reliability ;
3. others :
 1. security ;
 2. compliance ;

More details and discussions on the subject can be found in ⁵.

The performance, capacity and availability shall be monitored and reported as part of the INSPIRE directive. For monitoring reasons 90% of the availability is taken into account to leave out peak loads.

The following values, required by the Directive, are estimated from present-day implementation experiences and technology.

3.1 Performance

Definition :

The performance of an INSPIRE service represents the service response time, which must be kept for the given capacity. A service request is understood as a single call to a single operation of an INSPIRE service. Response time is the time measured on the server, in which the service operation returned the first byte of the result.

This criterion is theme/layer/function independent.

Value :

The Download services shall provide the following performance:

Function	Description
Get Download Service Metadata	3 seconds in normal situations *)
Get Spatial Objects	30 second initial response, then the service shall maintain a sustained response > 0,5 MB/s, alternatively 500 spatial objects/s in normal situations *)
Describe Spatial Object Types	10 seconds initial response, then the service shall maintain a sustained response > 0,5 MB/s, alternatively the attribute values of 500 spatial object types per s in normal situations *)
Define Query	Performance criteria are not applicable.

*) Normal situation represents periods out of peak load. It is set at 90% of the time.

3.2 Capacity

Definition :

The capacity of an INSPIRE service is given by a number of service request which are sent in a given time frame. Then the performance indicator has to be met for every individual service response.

Value : 10 connections per second.

Infrastructure for Spatial Information in Europe	Reference: D3.9 Draft IR Download Services v2.0.doc
	2009-02-14
	Page 14 of 17

3.3 Availability

Definition :

The availability of an INSPIRE service is the probability that the system is up and running.

Value : 99%

3.4 Reliability

Definition :

The reliability of an INSPIRE service represents the ability of a web service to perform its required functions under stated conditions for a specified time interval.

In order to allow comparison between responses, it is also recommended to provide reference data sets.

Value : no value or conformance criteria is defined for this aspect.

3.5 Security

Definition :

The security of an INSPIRE service is the quality aspect of the web service of providing confidentiality and non-repudiation by authenticating the parties involved, encrypting messages and providing access control.

Value : no value or conformance criteria is defined for this aspect.

3.6 Compliance

Definition :

The compliance of an INSPIRE service is the quality aspect of the Web service in conformance with the rules, the law, compliance with standards, and the established service level agreement.

Value : no value or conformance criteria is defined for this aspect.

4 Instructions for implementation

The European Commission shall establish, in collaboration with stakeholders and relevant standardisation organisations, instructions for implementation to ensure interoperability of services. These will contained in a Technical Guidance document on how to implement INSPIRE Download services.

Annex A: Terms and definitions

availability

Probability that the INSPIRE service is up.

capacity

Limit of the number of simultaneous service requests which should be provided with guaranteed performance.

coverage

feature that acts as a function to return values from its range for any direct position within its spatial, temporal or spatiotemporal domain (ISO 19123).

EXAMPLE Examples include a raster image, polygon overlay or digital elevation matrix.

NOTE In other words, a coverage is a feature that has multiple values for each attribute type, where each direct position within the geometric representation of the feature has a single value for each attribute type.

data

Reinterpretable representation of information in a formalised manner suitable for communication, interpretation or processing (ISO/IEC23821).

Note: Data can be any form of information. Data may refer to any electronic file, no matter what the format: e.g. a database or binary data, text, images. Everything read and written by a computer can be considered data except for instructions in a program that are executed (software).

data sets

Identifiable collection of data (ISO19101).

Note: A data set may have a hierarchical structure. Theoretically, a data set may be as small as a single feature or feature attribute contained within a larger data set. A hardcopy map or chart may be considered a data set.

discovery

The inquiry of the nature and content of a spatial resource.

discovery service

Distinct part of the functionality that is provided by an entity through interfaces for the inquiry of the nature and content of a spatial resource.

download service

A web service that provide access to the full extent of geographic and thematic information in a data set. By access to the full extent is meant access to features described with feature attributes and real world coordinates. A download service may includes elements of a feature type service, a coordinate conversion/transformation service and schema transformation service.

feature

Abstraction of real-world phenomena. A feature may occur as a type or an instance (ISO 19101).

Note: See also spatial object. This implementing rule uses the term spatial object.

query expression

An encoding for identifying a subset of resources from a collection of resources whose property values satisfy a set of logically connected predicates.

interoperability

Infrastructure for Spatial Information in Europe	Reference: D3.9 Draft IR Download Services v2.0.doc
	2009-02-14
	Page 16 of 17

The possibility for spatial data sets to be combined, and for services to interact, without repetitive manual intervention, in such a way that the result is coherent and the added value of the data sets and services is enhanced (INSPIRE Directive).

performance

Performance is the minimal level by which an objective is considered to be attained. The performance of a web service represents how fast a service request can be completed.

quality

Totality of characteristics of a product that bear on its ability to satisfy stated and implied needs (ISO 19101).

regulatory

Quality aspect of the Web service in conformance with the rules, the law, compliance with standards, and the established service level agreement.

reliability

Represents the ability of a web service to perform its required functions under stated conditions for a specified time interval.

resource

Asset or means that fulfils a requirement. Example: data set, service, document, person or organisation.

security

Quality aspect of the Web service of providing confidentiality and non-repudiation by authenticating the parties involved, encrypting messages, and providing access control.

service

Distinct part of the functionality that is provided by an entity through interfaces (ISO19119). In computing terms, a service is an application that provides information and/or functionality to other applications. Services are typically non-human-interactive applications that run on servers and interact with applications via an interface.

Note: This distinct part of the functionality is a computation performed on one side of an interface in response to a request made on the other side of the interface.

Note: Some services may be not available via the network, where data may be on offline media.

service request

Operation specified by a service.

Example : Get Download Service Metadata, Get Spatial Objects.

spatial data

Any data with a direct or indirect reference to a specific location or geographic area. (INSPIRE Directive)

spatial data set

An identifiable collection of spatial data. (INSPIRE Directive)

spatial object

An abstract representation of a realworld phenomenon related to a specific location or geographical area. (INSPIRE Directive)

spatial resource

Asset or means that fulfils a requirement and has a direct or indirect reference to a specific location or geographic area. Example: data set, data set series, service.

Infrastructure for Spatial Information in Europe	Reference: D3.9 Draft IR Download Services v2.0.doc
	2009-02-14
	Page 17 of 17

Abbreviations

MB megabyte, 1024 x 1024 bytes, computer term for storage unit

MS Member state

SDI Spatial data infrastructure