INSPIRE
Infrastructure for Spatial Information in Europe

INSPIRE Coverage Types

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Foreword

INSPIRE is a Directive proposed by the European Commission in July 2004 setting the legal framework for the establishment of the Infrastructure for Spatial Information in the European Community, for the purposes of Community environmental policies and policies or activities which may have an impact on the environment.

INSPIRE should be based on the infrastructures for spatial information that are created and maintained by the Member States. The components of those infrastructures include: metadata, spatial data themes (as described in Annexes I, II, III of the Directive), spatial data services; network services and technologies; agreements on data and service sharing, access and use; coordination and monitoring mechanisms, processes and procedures.

The guiding principles of INSPIRE are that the infrastructures for spatial information in the Member States will 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 and services 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 all the different levels of public authorities; that spatial data and services are made available under conditions that do not restrict their extensive use; that it is easy to discover available spatial data, to evaluate their fitness for purpose and to know the conditions applicable to their use.

The text of the INSPIRE Directive is available from the INSPIRE web site (http://inspire.ec.europa.eu/). The Directive identifies what needs to be achieved, and Member States had two years from the date of adoption to bring into force national legislation, regulations, and administrative procedures that define how the agreed objectives will be met taking into account the specific situation of each Member State. To ensure that the spatial data infrastructures of the Member States are compatible and usable in a Community and transboundary context, the Directive requires that common Implementing Rules (IR) are adopted in a number of specific areas. Implementing Rules are adopted as Commission Regulations and are 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 European Parliament[1]. The Committee is chaired by a representative of the Commission (this is known as the Comitology procedure). The committee was established on 15 August 2007.

The IR will be shaped in their legal structure and form by the Commission legal services on the basis of technical documents prepared by especially convened Drafting Teams, for each of the main components of INSPIRE: metadata, data specifications, network services, data and service sharing, and monitoring procedures. For data specifications, the technical documents for each spatial data theme will be prepared by especially convened Thematic Working Groups.

This document represents a contribution of the Data Specification Drafting Team.

It is important to note that this document is not a draft Implementing Rule, but a document that is a basis for the development and maintenance of the thematic data specifications that will serve as technical basis for the legal text of the INSPIRE Implementing Rules. It is foreseen that relevant requirements will continue to be included in the Implementing Rules.

The document will be publicly available as a 'non-paper', as it does not represent an official position of the Commission, and as such can not be invoked in the context of legal procedures.

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[1] The implementing rules for interoperability of spatial data are formally adopted through regulatory procedure with scrutiny according to Council Decision of 17 July 2006 (2006/512/EC). Under this regulation, the Parliament and the Council are on equal footing for all regulatory procedures related to co-decision acts. As a consequence, all measures must be ratified by all three institutions to come into force.

1 Scope

This document specifies application schemas for coverage types for use by thematic application schemas in INSPIRE.

The document identifier is: D2.10.2.

2 Normative references

D2.5 v3.4, Generic Conceptual Model, April 2012

3 Terms and abbreviations

The terms and definitions, abbreviations and other conventions specified in clause 3 of the Generic Conceptual Model apply.

4 Coverages

4.1 Overview

See Generic Conceptual Model, sub-clauses 10.4 and 10.5.

Note that in the GML encoding, these types are mapped to the XML elements and types of the GML Coverage application schema specified by OGC (OGC document 09-146r1).

4.2 Coverages (Base)

Table 3 - Feature catalogue metadata

Feature catalogue name	INSPIRE feature catalogue Coverages (Base)
Scope	Coverages (Base)
Version number	1.0
Version date	2011-06-01
Definition source	INSPIRE data specification Coverages (Base)

Table 4 - Types defined in the feature catalogue

Type	Package	Stereotypes	Section
Coverage	Coverages (Base)	«featureType»	6.3.1.1.1

4.2.1 Spatial object types

4.2.1.1 Coverage

Coverage (abstract)	
Definition:	feature that acts as a function to return values from its range for any direct position within its spatial, temporal or spatiotemporal domain
Description:	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.
Status:	Proposed
Stereotypes:	«featureType»
URI:	null
Attribute: metadata	

Coverage (abstract)

Value type:	Any	
Definition:	application specific metadata of the coverage	
Description:	NOTE The values of this property will typically be constrained in subtypes or in profiles specified by information communities.	
Multiplicity:	0..*	

Attribute: rangeType

Value type:	RecordType	
Definition:	description of the structure of the range values	
Multiplicity:	1	

4.2.2 Imported types (informative)

This section lists definitions for feature types, data types and enumerations and code lists that are defined in other application schemas. The section is purely informative and should help the reader understand the feature catalogue presented in the previous sections. For the normative documentation of these types, see the given references.

4.2.2.1 Any

Any

Package:	INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19103 Conceptual Schema Language::ISO 19103:2005 Schema Language::Basic Types::Implementation::Records and Class Metadata

4.2.2.2 RecordType

RecordType

Package:	INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19103 Conceptual Schema Language::ISO 19103:2005 Schema Language::Basic Types::Implementation::Records and Class Metadata

4.3 Coverage (Domain and Range)

Table 5 - Feature catalogue metadata

Feature catalogue name	INSPIRE feature catalogue Coverages (Domain and Range)
Scope	Coverages (Domain and Range)
Version number	1.1
Version date	2012-02-13
Definition source	INSPIRE data specification Coverages (Domain and Range)

Table 6 - Types defined in the feature catalogue

| Type	Package	Stereotypes	Section
CoverageByDomainAndRange	Coverages (Domain and Range)	«featureType»	6.3.2.1.1
CoverageFunction	Coverages (Domain and Range)	«union»	6.3.2.2.1
GridFunction	Coverages (Domain and Range)	«dataType»	6.3.2.2.2
RectifiedGridCoverage	Coverages (Domain and Range)	«featureType»	6.3.2.1.2
ReferenceableGridCoverage	Coverages (Domain and Range)	«featureType»	6.3.2.1.3
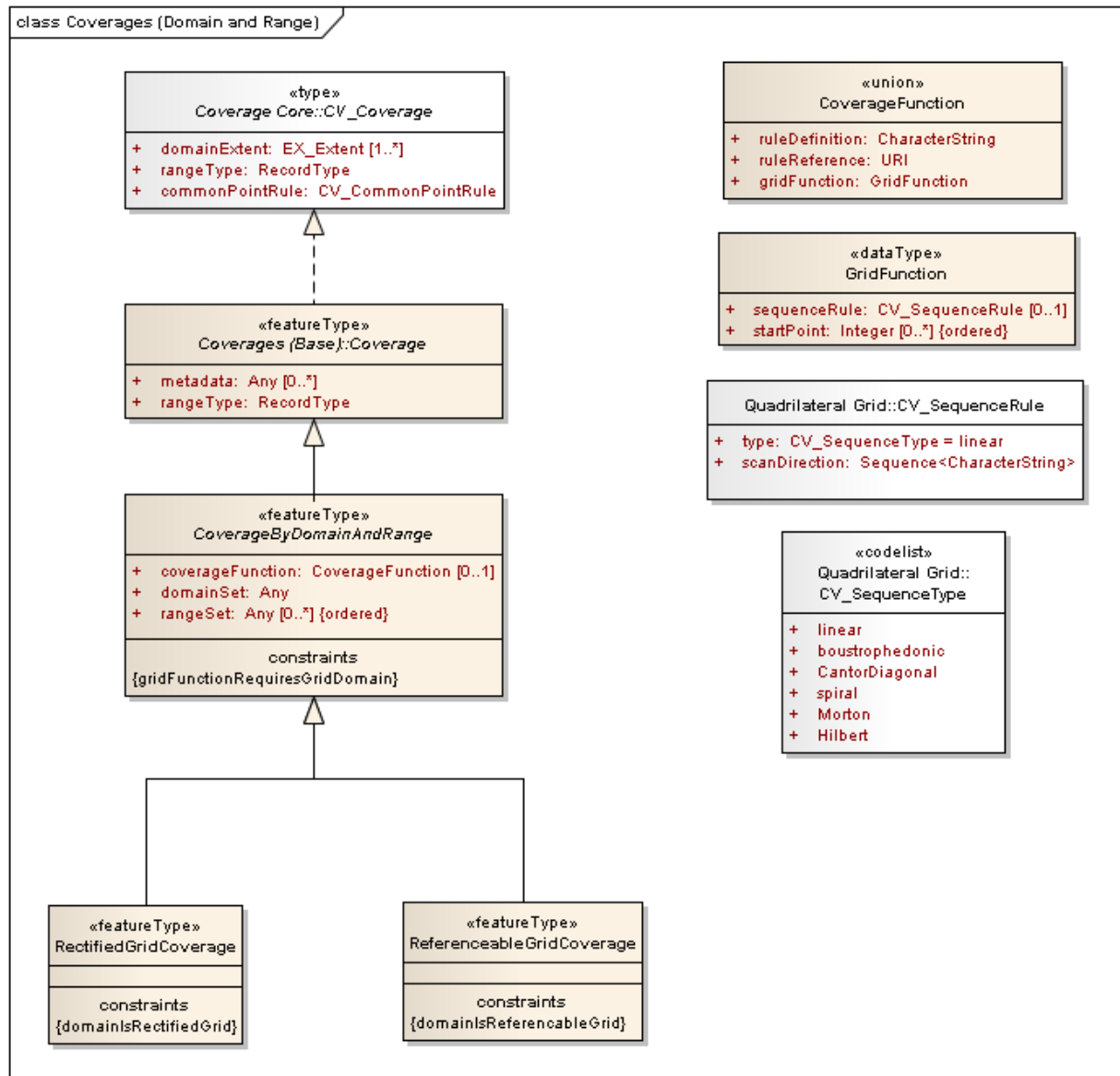
Figure 1 – Coverage representation using a domain/range pair

4.3.1 Spatial object types

4.3.1.1 CoverageByDomainAndRange

CoverageByDomainAndRange (abstract)	
Subtype of:	Coverage
Definition:	coverage which provide the domain and range as separate properties
Status:	Proposed
Stereotypes:	«featureType»
URI:	null
Attribute: coverageFunction	
Value type:	CoverageFunction
Definition:	description how range values at locations in the coverage domain can be obtained
Multiplicity:	0..1

CoverageByDomainAndRange (abstract)

Attribute: domainSet

Value type:	Any
Definition:	configuration of the domain of the coverage described in terms of coordinates
Description:	NOTE The values of this property will typically be constrained in subtypes to specific spatial and/or temporal geometries.
Multiplicity:	1

Attribute: rangeSet

Value type:	Any
Definition:	set of feature attribute values associated by a function with the elements of the domain of the coverage
Multiplicity:	0..*
Collection Constraints:	ordered

Constraint: gridFunctionRequiresGridDomain

Natural language:	grid function only valid for domains that are grids
OCL:	inv: coverageFunction.gridFunction.notEmpty() implies domainSet.oclIsKindOf(CV_Grid)

4.3.1.2 RectifiedGridCoverage

RectifiedGridCoverage

Subtype of:	CoverageByDomainAndRange
Definition:	coverage whose domain consists of a rectified grid
Description:	A rectified grid is a grid for which there is an affine transformation between the grid coordinates and the coordinates of a coordinate reference system.
	NOTE This type can be used for both discrete and continuous coverages.
Status:	Proposed
Stereotypes:	«featureType»
URI:	null

Constraint: domainIsRectifiedGrid

Natural language:	domain is a rectified grid
OCL:	inv: domainSet.oclIsKindOf(CV_RectifiedGrid)

4.3.1.3 ReferenceableGridCoverage

ReferenceableGridCoverage

Subtype of:	CoverageByDomainAndRange
Definition:	coverage whose domain consists of a referencable grid
Description:	A referencable grid is a grid associated with a transformation that can be used to convert grid coordinate values to values of coordinates referenced to a coordinate reference system.
	NOTE This type can be used for both discrete and continuous coverages.
Status:	Proposed
Stereotypes:	«featureType»
URI:	null

Constraint: domainIsReferencableGrid

ReferenceableGridCoverage

Natural language:	domain is a referencable grid	
OCL:	inv: domainSet.oclIsKindOf(CV_ReferenceableGrid)	

4.3.2 Data types

4.3.2.1 CoverageFunction

CoverageFunction

Definition:	description how range values at locations in the coverage domain can be obtained
Description:	NOTE The following variants are currently supported: a mapping rule either by inline text or by reference and a grid function that specifies the sequence of the grid points.
Status:	Proposed
Stereotypes:	«union»
URI:	null

Attribute: gridFunction

Value type:	GridFunction
Definition:	mapping rule for grid geometries
Multiplicity:	1

Attribute: ruleDefinition

Value type:	CharacterString
Definition:	provides a formal or informal description of the coverage function as text
Multiplicity:	1

Attribute: ruleReference

Value type:	URI
Definition:	provides a formal or informal description of the coverage function as reference
Multiplicity:	1

4.3.2.2 GridFunction

GridFunction

Definition:	provides an explicit mapping rule for grid geometries
Status:	Proposed
Stereotypes:	«dataType»
URI:	null

Attribute: sequenceRule

Value type:	CV_SequenceRule
Definition:	description how the grid points are ordered for association to the elements of the values in the range set of the coverage
Multiplicity:	0..1

Attribute: startPoint

Value type:	Integer
Definition:	identifies the grid point to be associated with the first record in the range set of the coverage
Description:	If startPoint is omitted it is assumed to be equal to the lowest values in the envelope of the grid geometry.
Multiplicity:	0..*

GridFunction

Collection Constraints:	ordered

4.3.3 Imported types (informative)

This section lists definitions for feature types, data types and enumerations and code lists that are defined in other application schemas. The section is purely informative and should help the reader understand the feature catalogue presented in the previous sections. For the normative documentation of these types, see the given references.

4.3.3.1 Any

Any

Package:	INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19103 Conceptual Schema Language::ISO 19103:2005 Schema Language::Basic Types::Implementation::Records and Class Metadata

4.3.3.2 CV_SequenceRule

CV_SequenceRule

Package:	INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19123 Coverage geometry and functions::ISO 19123:2005 Coverages::Coverages::Quadrilateral Grid

4.3.3.3 CharacterString

CharacterString

Package:	INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19103 Conceptual Schema Language::ISO 19103:2005 Schema Language::Basic Types::Primitive::Text

4.3.3.4 Coverage

Coverage (abstract)

Package:	INSPIRE Consolidated UML Model::INSPIRE schemas::Generic Conceptual Model::Base Models::Coverages (Base)
Definition:	feature that acts as a function to return values from its range for any direct position within its spatial, temporal or spatiotemporal domain
Description:	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. |

4.3.3.5 Integer

Integer

Package:	INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::ISO 19103 Conceptual Schema Language::ISO 19103:2005 Schema Language::Basic Types::Primitive::Numerics

4.3.3.6 URI

URI

Package:	INSPIRE Consolidated UML Model::Foundation Schemas::ISO TC211::Drafts::ISO 19115-1 Metadata - Fundamentals::Citation and responsible party information