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GML 3.1.1 CRS support profile

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i. Preface

This document defines a profile of the Geography Markup Language (GML) version 3.1.1 for supporting other profiles for encoding definitions of Coordinate Reference Systems (CRSs) and Coordinate Operations. This profile can be used without a GML Application Schema, and such use is assumed in this document.

Suggested additions, changes, and comments on this document are welcome and encouraged. Such suggestions may be submitted using the formal Change Request Proposal process as documented in the OGC Policies and Procedures.

ii. Document terms and definitions

This document uses the specification terms defined in Subclause 5.3 of [OGC 05-008]. In particular, the word “shall” (not “must”) is the verb form used to indicate a requirement to be strictly followed to conform to this specification

iii. Document contributor contact points

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

Name	Organization
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iv. Revision history

Date	Release	Editor	Primary clauses modified	Description
2005-10-11	0.0.0	Arliss Whiteside	All	Initial release
2005-11-17	0.1.0	Arliss Whiteside	All	Minor editing

v. Changes to OGC Specifications

No previously approved OGC™ Specifications need to be changed to accommodate the technical contents of this document.

vi. Future work

Improvements in this document may be desirable. There will be a 30-day public comment period to solicit input and comments from the broader geospatial community.

Foreword

This document specifies a subset profile of the existing OGC Implementation Specification for the Geometry Markup Language (GML) version 3.1.1 [OGC 03-105r1 and 04-093r4], and does not modify it. This is a GML profile as specified in Subclause 22 of [OGC 03-105r1]. This document does not replace any existing OGC document.

This document includes one normative annex: Annex A.

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

Introduction

This document specifies a GML profile for supporting multiple profiles for XML encoding definitions of Coordinate Reference Systems (CRSs) and Coordinate Operations. This XML schema is a profile of the OGC Geography Markup Language (GML) version 3.1.1. This profile supports almost all the XML elements, attributes, and types used by CRS-related GML object elements.

GML 3.1.1 CRS support profile

1 Scope

This GML 3.1.1 profile is defined for supporting multiple other possible profiles for XML encoding definitions of Coordinate Reference Systems (CRSs) and Coordinate Operations. This profile supports the following XML elements, attributes, and types:

- a) Definition element
- b) Envelope element
- c) PolygonType complexType
- d) LengthType, AngleType, GridLengthType, ScaleType, TimeType, and SpeedType complexTypes
- e) unitOfMeasure element
- f) simpleLink attributeGroup
- g) _CRS abstract element
- h) IdentifierType complexType
- i) Dictionary element

This profile does not support encoding of most other concrete elements defined in GML 3.1.1.

2 Compliance

All CRS and CRS-related definitions encoded using this profile shall produce XML documents that are fully compliant with the normative XML Schema Documents associated with this specification, named:

- a) gmlCrsSupportProfile.xsd
- b) basicTypes.xsd
- c) dictionary.xsd
- d) geometryBasic0d1d.xsd
- e) geometryBasic2d.xsd
- f) gmlBase.xsd
- g) measures.xsd
- h) units.xsd
- i) referenceSystems.xsd

j) xlink.ssd

Except for gmlCrsSupportProfile.xsd, all these XML Schema Documents contain the subset of the corresponding GML 3.1.1 document that is needed by this GML 3.1.1 CRS Support profile. This was done to facilitate checking that this profile is a strict subset of GML 3.1.1. This also facilitates comparing each document with the original, to determine which elements, attributes, and types were retained, and which were removed.

XML documents compliant with this profile shall (indirectly) import the gmlCrsSupportProfile.xsd XML Schema Document, which will be available following approval of this document at <http://schemas.opengis.net/gml/3.1.1/Profiles/CrsSupport/1.0.0/>.

More specifically, compliance with this specification shall be checked using all the relevant tests specified in Annex A (normative).

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.

IETF RFC 2396 (August 1998), *Uniform Resource Identifiers (URI): Generic Syntax*, Berners-Lee, T., Fielding, N., and Masinter, L., eds.,
<<http://www.ietf.org/rfc/rfc2396.txt>>

ISO 19105:2000, *Geographic information — Conformance and Testing*

OGC 03-105r1, *OpenGIS Geography Markup Language (GML) Implementation Specification*, Version 3.1.0,

OGC 04-092r4, *GML 3.1.1 schemas*

OGC 05-008, *OGC Web Services Common Specification*, Version 1.0.0

OGC 05-095r1, *GML 3.1.1 common CRSs profile* (proposal)

W3C, *Extensible Markup Language (XML) 1.0* (Second Edition), W3C Recommendation, 6 October 2000, <http://www.w3.org/TR/REC-xml>

W3C, *XML Schema Part 1: Structures*, <http://www.w3.org/TR/xmlschema-1>

W3C, *XML Schema Part 2: Datatypes*, <http://www.w3.org/TR/xmlschema-2>

W3C, *Namespaces in XML*, <http://www.w3.org/TR/1999/REC-xml-names-19990114>

In addition to this document, this specification includes ten normative XML Schema Document files. Following approval of Version 1.0.0 of this specification, all but one of

these documents will be posted online at the URL:
<http://schemas.opengis.net/gml/3.1.1/Profiles/CrsSupport/1.0.0/>. The `xlinks.xsd` document will be posted at the URL: <http://schemas.opengis.net/xlink/1.0.1/xlinks.xsd>. These XML Schema Document files are also bundled with the present document. In the event of a discrepancy between the bundled and online versions of the XML Schema files, the online files shall be considered authoritative.

4 Terms and definitions

For the purposes of this specification, the definitions specified in Clause 4 of the GML 3.1.1 Common CRSs profile [OGC 05-095] shall apply.

5 Conventions

The abbreviated terms used in this document include:

CRS	Coordinate Reference System
GML	Geography Markup Language
IETF	Internet Engineering Task Force
ISO	International Organization for Standardization
OGC	Open Geospatial Consortium
URL	Uniform Resource Locator
XML	Extensible Markup Language

6 CRS support profile

6.1 Background

GML 3.1.1 includes six XML Schema Documents for encoding definitions of Coordinate Reference Systems (CRSs) and Coordinate Operations, namely: (listed alphabetically)

- a) `coordinateOperations.xsd`
- b) `coordinateReferenceSystems.xsd`
- c) `coordinateSystems.xsd`
- d) `dataQuality.xsd`
- e) `datums.xsd`
- f) `referenceSystems.xsd`

However, this set of XML Schema Documents supports many abilities that are rarely used. Therefore, multiple CRS-related profiles of this part of GML 3.1.1 are expected to be useful and specified, where each profile is significantly simpler and thus easier to understand and use.

This set of CRS-related XML Schema Documents does not use all the other 23 GML 3.1.1 XML Schema Documents, and does not use all the abilities specified in the documents it does use. Furthermore, even fewer abilities will be used by the expected profiles of that set of six XML Schema Documents which remove rarely-used abilities. Therefore, a profile of the other 23 GML 3.1.1 XML Schema Documents will be useful to support profiles of the XML Schema Documents for XML encoding of Coordinate Reference Systems (CRSs) and Coordinate Operations.

This profile was produced by retaining only those parts of the other 23 GML 3.1.1 XML Schema Documents which are used (directly and indirectly) by the six XML Schema Documents for XML encoding of Coordinate Reference Systems (CRSs) and Coordinate Operations. Other parts used by CRS-related parts which are rarely used were also removed. In addition, the referenceSystems.xsd XML Schema Document was modified by removing rarely used parts, and was included in this CRS Support profile because it is expected to be needed by all other CRS-related profiles.

6.2 Overview

This GML 3.1.1 profile is defined for supporting multiple other profiles for encoding definitions of Coordinate Reference Systems (CRSs) and Coordinate Operations. This GML 3.1.1 CRS Support profile retains the following XML elements, attributes, and types used by CRS-related elements:

- a) Definition in dictionary.xsd, which is the head of a substitution group containing all CRS-related XML object elements
- b) Envelope in geometryBasic0d1d.xsd, which is used in the validArea element for several CRS-related XML objects
- c) PolygonType in geometryBasic2d.xsd, which is used in the validArea element for several CRS-related XML objects
- d) LengthType, AngleType, GridLengthType, ScaleType, TimeType, and SpeedType in measures.xsd, which are expected to be used in parameterValue elements (in coordinateOperations.xsd). The LengthType and AngleType are now used in GeodeticDatum elements (in datums.xsd).
- e) unitOfMeasure in units.xsd, which is used in covarianceMatrix elements (in dataQuality.xsd)
- f) simpleLink in xlink.xsd, which is frequently used CRS-related XML property elements
- g) _CRS in referenceSystems.xsd, which is used by concrete CRS object elements
- h) IdentifierType in referenceSystems.xsd, which is used by concrete CRS object elements

- i) Dictionary in dictionary.xsd, which is used in XML encoded dictionaries of CRS-related XML objects

In addition to the above listed XML elements, attributes, and types, the types, elements, and attributes needed to support those were also retained. Essentially all other parts were removed, including all deprecated parts.

This GML 3.1.1 CRS Support profile removes optional and alternative contents elements and attributes from the above-listed XML elements and types, when these options and alternatives are rarely used for defining Coordinate Reference Systems (CRSs) and Coordinate Operations. In addition to removing all deprecated parts, the removed contents elements and attributes include:

- a) metaDataProperty, from StandardObjectProperties in gmlBase.xsd
- b) remoteSchema, from AssociationAttributeGroup in gmlBase.xsd
- c) AssociationAttributeGroup alternative, from “description” in gmlBase.xsd
- d) srsDimension and SRSInformationGroup, from SRSReferenceGroup in geometryBasic0d1d.xsd
- e) “count”, from DirectPositionListType in geometryBasic0d1d.xsd
- f) “interior”, from PolygonType in geometryBasic2d.xsd
- g) all alternatives to LinearRing in _Ring substitutionGroup in geometryBasic2d.xsd
- h) temporalExtent, from ExtentType in referenceSystems.xsd
- i) indirectEntry, from Dictionary in dictionary.xsd
- j) AssociationAttributeGroup, from DictionaryEntryType in dictionary.xsd

7 XML schema documents

This GML 3.1.1 CRS Support profile is specified in the 10 normative XML Schema Documents included in the zip file with this text document, which are named:

- a) gmlCrsSupportProfile.xsd
- b) basicTypes.xsd
- c) dictionary.xsd
- d) geometryBasic0d1d.xsd
- e) geometryBasic2d.xsd
- f) gmlBase.xsd
- g) measures.xsd

- h) units.xsd
- i) referenceSystems.xsd
- j) xlink.xsd (version 1.0.1)

NOTE Although referenceSystems.xsd is a CRS-related schema document, parts of it are required in all other CRS-related GML profiles, so it is included in this CRS Support profile.

All these XML Schema Documents contain documentation of the meaning of each element and attribute, and this documentation shall be considered normative as specified in Subclause 11.6.3 of [OGC 05-008].

After OGC acceptance of Version 1.0.0 of this specification, all but one of these XML Schema Documents will also be posted online at the URL <http://schemas.opengis.net/gml/3.1.1/Profiles/GCrsSupport/1.0.0>. The xlink.xsd document will be posted at the URL: <http://schemas.opengis.net/xlink/1.0.1/xlink.xsd>. In the event of a discrepancy between the bundled and online versions of the XML Schema Documents, the online files shall be considered authoritative.

Annex A (normative)

Abstract test suite

An abstract test suite is not provided in this version of this Profile Implementation Specification.