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BSI Standards Publication

Geographic information – Metadata

Part 3: XML schema implementation for fundamental concepts

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National foreword

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 211, *Geographic information/Geomatics*.

A list of all parts in the ISO 19115 series can be found on the ISO website.

Introduction

ISO 19115-1 explains the importance of metadata, specifies a model for describing geographic information resources by defining metadata entities, elements and terminology, and establishing an extension procedure for additional metadata content. ISO 19115-1:2014, Annex G describes the revisions from ISO 19115:2003. The revised content model also incorporates metadata elements defined in ISO 19119:2005 and ISO 19119:2005/Amd 1:2008 for metadata describing web services. More detailed metadata for geographic data types and data quality are defined in other ISO geographic information standards (e.g. ISO 19110 and ISO 19157). Where necessary, interpretations of some other ISO geographic information standards are incorporated for this implementation.

ISO 19115-2 extends ISO 19115-1 by adding models for acquisition information and extending the models for metadata (MD_Metadata), data quality (DQ_DataQuality, now in ISO 19157), spatial representation (MD_SpatialRepresentation), and content information (MD_ContentInformation).

ISO 19115-1 and ISO 19115-2 define conceptual models for metadata content that are independent of any particular encoding scheme. ISO/TS 19139 and ISO/TS 19139-2 define eXtensible Markup Language (XML) schemas for encoding that content. This document defines XML encodings for ISO 19115-1 and ISO 19115-2 metadata content. This integrated schema makes it possible to use concepts from ISO 19115-1 and ISO 19115-2 together in metadata instance documents, effectively replacing ISO/TS 19139 and ISO/TS 19139-2 and enables automated validation and interchange of ISO 19115-1 and ISO 19115-2, metadata content using standard software tools.

The integrated schema were derived from ISO 19115-1 and ISO 19115-2 conceptual models using the rules defined in ISO 19118:2011, Annex A, ISO/TS 19139 applied to an adopted implementation-ready UML version of the conceptual models as described in Clause 8. The implementation approach enables modularization and eases reuse of elements of the conceptual models. Abstract classes were added to the ISO geographic information harmonized model, without altering the semantics, to create an implementation model that was used for this XML implementation (see Clause 8 for details).

The primary use case envisioned for this XML implementation is the exchange of geographic metadata in a client-server environment as typified by the World Wide Web, in which the internal management and structure of metadata content is independent of the encoding used for exchange of metadata information. Adoption of this geographic metadata XML schema within an information-sharing community will garner the benefits of standardization for resource discovery, access, use, and understanding.

Geographic information — Metadata —

Part 3:
XML schema implementation for fundamental concepts

1 Scope

This document defines an integrated XML implementation of ISO 19115-1, ISO 19115-2, and concepts from ISO/TS 19139 by defining the following artefacts:

a) a set of XML schema required to validate metadata instance documents conforming to conceptual model elements defined in ISO 19115-1, ISO 19115-2, and ISO/TS 19139;

b) a set of ISO/IEC 19757-3 (Schematron) rules that implement validation constraints in the ISO 19115-1 and ISO 19115-2 UML models that are not validated by the XML schema;

c) an Extensible Stylesheet Language Transformation (XSLT) for transforming ISO 19115-1 metadata encoded using the ISO/TS 19139 XML schema and ISO 19115-2 metadata encoded using the ISO/TS 19139-2 XML schema into an equivalent document that is valid against the XML schema defined in this document.

This document describes the procedure used to generate XML schema from ISO geographic information conceptual models related to metadata. The procedure includes creation of an UML model for XML implementation derived from the conceptual UML model.

This implementation model does not alter the semantics of the target conceptual model, but adds abstract classes that remove dependencies between model packages, tagged values and stereotypes required by the UML to XML transformation software, and refactors the packaging of a few elements into XML namespaces. The XML schema has been generated systematically from the UML model for XML implementation according to the rules defined in ISO/TS 19139 or ISO 19118.

2 Conformance

2.1 General

In order to claim conformance to a conformance class defined in this document, an XML instance shall validate against the test procedures specified in Annex A. These tests include validation using a specific XML schema document, as well as Schematron rule documents that test conformance with constraints specified by the base conceptual model that are not tested by XML schema validation. Each namespace module and interchange document schema defined by the implementation carries with it an implicit conformance class for xml instance documents. This conformance class tests the requirement that xml element and attribute instances from the namespace shall be well formed and valid. The test is validation with a specific XML schema and Schematron rule set if necessary. The framework, concepts, and methodology for testing, and the criteria to be achieved to claim conformance are specified in ISO 19105.

Implementers may choose to define other "information exchange" document schemas that import normative XML schemas not specified here to identify and validate interchange documents. The design of these schemas will be contingent on the requirements of the user community for the particular information exchange. These information exchange schema should be documented in a technical note.

