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Geographic information — Metadata —

Part 4: JSON schema implementation of metadata fundamentals

Information géographique — Métadonnées —

Partie 4: Mise en œuvre des principes fondamentaux des métadonnées par des schémas JSON

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Foreword

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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).

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

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

ISO 19115-1 [1] explains the importance of metadata, specifies a model for describing geographic information resources by defining metadata entities, elements and terminology, and establishes an extension procedure for additional metadata content. This document investigates the JSON implementation of this same conceptual model including relevant parts of ISO 19157-1 [2]. A resulting JSON encoding is developed for a subset of the named conceptual models showing the principles used. In this regard the defined JSON encoding is not intended to be a formal JSON encoding but serves as a proof of concept.

The primary use case envisioned for the JSON implementation illustrated in this document is the exchange and publication of geographic metadata through APIs. The intention in publishing this document is that the community can begin using this approach and can feed back improvements so that a formal specification can be developed.

JSON has become one of the major encodings used by current web applications, for example in many implementations of OGC API Records. A JSON encoding to standardize a JSON implementation of metadata types is needed. This document describes a JSON encoding of ISO 19115-1 [1] including the data quality concepts in ISO 19157-1 [2]. In this document only a subset of both standards is implemented. A subset, considered to be the core part of both standards, currently satisfies the need for an initial evaluation and proof of concept for the JSON encoding. This document and the resulting JSON encoding are regarded as mature within the context of an ISO technical report, encompassing a broad range of content. In the future, the scope will potentially be expanded to include the complete content of the ISO 19115 series conceptual models.

The integrated JSON schema was derived from the ISO 19115-1 [1] and ISO 19157-1 [2] conceptual models in UML. Since standardized UML-to-JSON encoding rules do not yet exist, the OGC document Best Practice for OGC - UML to JSON Encoding Rules[3] was used as a reference.

This implementation model described in this document does not alter the semantics of the source conceptual models, but profiles content required for efficient JSON implementation and adds tagged values to the UML to facilitate UML to JSON transformation software. The JSON schemas were created automatically from the UML model, based on UML to JSON encoding rules as well as on a manually generated JSON reference instance document. Automated generation is according to the encoding rules described in OGC best practice report: [3]Best Practice for OGC - UML to JSON Encoding Rules. The JSON reference instance document was created based on a manually created ISO 19115-3 [4] XML document. The name and contact information of the maintenance agency for this document can be found at www.iso.org/maintenance_agencies.

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Geographic information — Metadata —

Part 4:
JSON schema implementation of metadata fundamentals

1 Scope

This document describes a ECMA 404:2017 [5] JSON implementation of ISO 19115-1 [1] and ISO 19157-1 [2] as a proof of concept. The resulting JSON encoding is not a formal json specification but is intended to proof the feasibilty of the approach taken and the implicated encoding principles.

The document provides a set of JSON schema[6] files which define a JSON encoding of the concepts defined by conceptual schemas in ISO 19115-1 [1] and ISO 19157-1 [2]. The JSON representation is scoped to exchange via HTTP. In this document, only a subset of the content of both ISO 19115-1 [1] and ISO 19157-1 [2] is included, in order to simplify the process of defining the resulting JSON schema. For the same reason, ISO 19115-2:2019 [7] is currently not included. The subset is chosen to be a core operational set of both ISO 19115-1 [1] and ISO 19157-1 [2].

This document describes the procedure used to generate JSON schema from ISO geographic information conceptual models related to metadata. The procedure includes creation of an UML implementation model for JSON implementation derived from the ISO 19115-1 [1] and ISO 19157-1 [2]conceptual schemas.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Basic approach and design decisions

4.1 Overview

This clause describes the approach that was taken to generate the metadata JSON schema. The approach consists of a workflow identifying several steps. The workflow and the separate steps are described and include formulated design decisions and requirements set for the JSON schema to be produced.

4.2 General approach and workflow

A general approach and workflow has been followed to guide the process for the realization of the JSON schemas and the related document. This workflow was based on a combination of requirements and decisions that are explained in the following subclauses. Figure 1 explains the approach and workflow and shows six steps and several products.

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