SLOVENSKI STANDARD
oSIST prEN ISO 19105:2020

01-september-2020

Geografske informacije - Ustreznost in preskušanje (ISO/DIS 19105:2020)

Geographic information - Conformance and testing (ISO/DIS 19105:2020)

Geoinformation - Konformität und Prüfung (ISO/DIS 19105:2020)

Information géographique - Conformité et essais (ISO/DIS 19105:2020)

Ta slovenski standard je istoveten z: **prEN ISO 19105**

ICS:

07.040	Astronomija. Geodezija. Geografija	Astronomy. Geodesy. Geography
35.240.70	Uporabniške rešitve IT v znanosti	IT applications in science

oSIST prEN ISO 19105:2020 **en,fr,de**

DRAFT INTERNATIONAL STANDARD

ISO/DIS 19105

ISO/TC **211**

Secretariat: **SIS**

Voting begins on:
2020-07-15

Voting terminates on:
2020-10-07

Geographic information — Conformance and testing

Information géographique — Conformité et essais

ICS: 35.240.70

This document is circulated as received from the committee secretariat.

ISO/CEN PARALLEL PROCESSING

Reference number
ISO/DIS 19105:2020(E)

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Published in Switzerland

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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. A 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).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 211, Geographic information/Geomatics.

This second edition cancels and replaces the first edition (ISO 19105:2000), which has been technically revised.

The main changes compared to the previous edition are as follows:

— reformat the document in a modular structure;

— add conformance testing requirements for modular specification;

— introduce dependency relationships among conformance classes;

— support three-valued logic on the overall result evaluation;

— omit the statements on process, leave the freedom to implementers.

A list of all parts in the ISO 19105 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.

Introduction

The scope of ISO/TC 211 is standardization in the field of digital geographic information. This work aims at establishing a structured set of International Standards for information concerning objects or phenomena that are directly or indirectly associated with a location relative to the Earth. These International Standards may specify, for geographic information, methods, tools and services for data management (including definition and description), acquiring, processing, analysing, accessing, presenting and transferring such data in digital/electronic form between different users, systems and locations. The work will be linked to appropriate International Standards for information technology and data, where possible, and provide a framework for the development of sector-specific applications using geographic data.

This International Standard is based on concepts defined in ISO standards which describe conformance and testing. Furthermore, some components of the OGC modular specification[1], including requirements, requirements classes, abstract test cases, and conformance classes are used in this International Standard. While the framework of conformance testing described in these International Standards is used in this International Standard, some concepts have been modified for use in this particular domain.

Conformance testing does not include robustness testing, acceptance testing and performance testing, because the geographic information family of standards does not establish requirements for these areas.

Conformance testing tests a candidate product according to normative requirements which must be satisfied by passing the tests of the abstract test suite. These abstract test cases are organized into conformance classes in a modular structure, each of which represents a mechanism for partial satisfaction of the standard by regarding to the corresponding requirements class.

In the practical sense it is very important to be able to ensure a good quality of the test and compliance with the requirement, this can achieved via traceability and perhaps even an traceability matrix where the requirement and the test result are correlated.

All applicable standards documents regarding geographic information and relevant application domains are recommended to follow the formatting for requirements used in this International Standard.

Geographic information — Conformance and testing

1 Scope

This document specifies the framework, concepts and methodology for conformance testing and criteria to be achieved to claim conformance to the family of applicable standards documents regarding geographic information and relevant application domains. This document provides a framework for specifying abstract test suites (ATS) composed of abstract test cases grouped in conformance classes and for defining the procedures to be followed during conformance testing.

Conformance may be claimed for data or software products or services or by specifications including any profile or functional standard. The structure of, and relationships between, conformance classes as defined in this document underlies a systematic approach to configuration management involving managing dependencies within and between modules.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

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

3.1
abstract
<as a modifier> implementation-independent

3.2
abstract test case
conformance test case
ATC
test for a particular requirement or a set of related requirements

Note 1 to entry: An abstract or conformance test case is a formal basis for deriving executable test cases. It should be complete in the sense that it is sufficient to enable a test verdict to be assigned unambiguously to each potentially observable test outcome.

Note 2 to entry: ISO Directives Part 2, 3.3.3 defines requirement as an expression, in the content of a document, that conveys objectively verifiable criteria to be fulfilled and from which no deviation is permitted if conformance with the document is to be claimed.

Note 3 to entry: ISO/IEC/IEEE 24765:2017, 3.4210 concludes the definitions for test case or test.

3.3
abstract test suite
ATS
set of conformance classes that define tests for all requirements of a specification

3.4
conformance
conformity
fulfilment of a requirement

Note 1 to entry: When no ambiguity, the modifier "conformance" may be omitted. i.e. test report is the same as conformance test report.

[SOURCE: ISO/IEC Directives, Part 1, Consolidated ISO Supplement, modified — conformance is the preferred term and conformity the admitted term]

3.5
conformance assessment
assessment of the conformance of an implementation to a specification

3.6
conformance clause
conformity clause
clause containing all the requirements that must be fulfilled

3.7
conformance class
conformance test class
set of abstract test cases that when applied receive a single certificate of conformance

3.8
conformance testing
testing of a product to determine the extent to which the product is a conforming implementation

3.9
conformance test report
test report
document that presents verdicts of each conformance class and abstract test case in an organized format

3.10
conformance test result
test result
all information recorded during executing an executable test case (ETS) against an implementation under test (IUT)

3.11
conformance test verdict
result of an executable test case execution

Note 1 to entry: ISO/IEC 9646-1:1993, 3.3.124 defines a similar concept under the name (test) verdict which is a statement of "pass," "fail," or "inconclusive", as specified in an abstract test case, concerning conformance of an IUT with respect to that test case when it is executed.

3.12
conforming implementation
implementation which satisfies the requirements

3.13
executable test case
ETC
specific test of an implementation to meet the specific requirements as stated in the specification containing the requirements

Note 1 to entry: Instantiation of an abstract test case with executable expressions.

3.14
executable test module
set of related executable test cases to test a single certificate of conformance.

3.15
executable test suite
ETS
set of executable test modules

3.16
fail verdict
test verdict of non-conformance

Note 1 to entry: Non-conformance may be with respect to either the test purpose or at least one of the conformance requirements of the relevant specification(s).

3.17
identifier
linguistically independent sequence of characters capable of uniquely and permanently identifying that with which it is associated

[SOURCE: ISO 19135-1:2015, 4.1.5]

3.18
implementation
realization of a specification

Note 1 to entry: In the context of the applicable standards documents, this includes relevant specifications of geographic information services and datasets.

3.19
implementation conformance statement
ICS
statement of conformance classes that have been implemented

3.20
implementation under test
IUT
implementation that is being evaluated for conformance

[SOURCE: ISO/IEC 18477-4:2017, 3.1.40]

3.21
inconclusive verdict
test verdict when neither a pass verdict nor a fail verdict apply

3.22
modular
consisting of separate parts that, when combined, form a complete whole

[SOURCE: Cambridge Dictionary]

3.23
modular specification
specification which organizes its requirements and conformance classes in a modular structure

3.24
modular standard
standard which organizes its requirements and conformance classes in a modular structure

3.25
non-conformance
failure to fulfil one or more specified requirements

3.26
pass verdict
test verdict of conformance

3.27
performance testing
measurement of the performance characteristics of an implementation under test (IUT)

EXAMPLE throughput and responsiveness are examples of performance characteristic measurements.

Note 1 to entry: This is not a part of conformance testing.

3.28
requirements class
aggregate of all requirements that have the same specification target to satisfy a conformance test class

Note 1 to entry: OGC 08-131r3 defines a similar concept under the name requirement class which is aggregate of all requirement modules that must all be satisfied to satisfy a conformance test class.

3.29
requirements suite
set of requirements classes of a specification

3.30
specification
document containing requirements and abstract test cases for those requirements

Note 1 to entry: A specification may also contain recommendations and permissions.

Note 2 to entry: ISO Directives Part 2, 3.3 provides definitions of recommendation and permission.

3.31
specification target
entity to which some requirements of a specification apply

Note 1 to entry: OGC 08-131r3 defines a similar concept under the name standardization target which is an entity that may receive a proof of conformance for a requirements class.

3.32
specification target type
type of entity or set of entities to which the requirements of a specification apply

Note 1 to entry: OGC 08-131r3 defines a similar concept under the name standardization target type.

3.33
standard
document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context

Note 1 to entry: Standards should be based on the consolidated results of science, technology and experience, and aimed at the promotion of optimum community benefits.

[SOURCE: ISO/IEC Guide 2:2004, 3.2]

3.34
test tool
application that executes an Executable Test Suite

