Irish Standard
I.S. EN ISO 19143:2012

Geographic information - Filter encoding (ISO 19143:2010)

I.S. EN ISO 19143:2012

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NSAI
1 Swift Square,
Northwood, Santry
Dublin 9

T +353 1 807 3800
F +353 1 807 3838
E standards@nsai.ie

W NSAI.ie

Sales:
T +353 1 857 6730
F +353 1 857 6729
W standards.ie

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English Version

Geographic information - Filter encoding (ISO 19143:2010)

Information géographique - Codage de filtres (ISO 19143:2010)

Geoinformation - Filter Encoding (ISO 19143:2010)

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Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

The text of ISO 19143:2010 has been prepared by Technical Committee ISO/TC 211 “Geographic information/Geomatics” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 19143:2012 by Technical Committee CEN/TC 287 “Geographic Information” the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2012, and conflicting national standards shall be withdrawn at the latest by October 2012.

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I.S. EN ISO 19143:2012

INTERNATIONAL STANDARD

ISO 19143

First edition
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Geographic information — Filter encoding

Information géographique — Codage de filtres

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Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 19143 was prepared by Technical Committee ISO/TC 211, *Geographic information/Geomatics*, in collaboration with the Open Geospatial Consortium Inc. (OGC).

Introduction

Filter encoding was originated within the OGC.

A fundamental operation performed on a set of data or resources is that of querying in order to obtain a subset of the data which contains certain desired information that satisfies some query criteria and which is also, perhaps, sorted in some specified manner.

The term “projection clause” is used to describe an encoding for specifying which subset of resource properties are presented in the response to a query.

The term “filter or selection clause” is used to describe an encoding of predicates which are typically used in query operations to specify how data instances in a source dataset should be filtered to produce a result set. Each data instance in the source set is evaluated using the filter expression. The overall filter expression always evaluates to true or false. If the expression evaluates to true, the data instance satisfies the expression and is marked as being in the result set. If the overall filter expression evaluates to false, the data instance is not in the result set. Thus, the net effect of evaluating a filter expression is a set of data or resource identifiers which satisfy the predicates in the expression.

The term “sorting clause” is used to describe an encoding for specifying how the data in a response is ordered prior to being presented.

Such encodings are considered system neutral because using the numerous XML tools available today, XML encoded projection, selection and sorting clauses can be easily validated, parsed and then transformed into whatever target query language is required to retrieve or modify resources stored in some persistent object store. For example an XML encoded query composed of a projection, selection and sorting clauses can be transformed into a SQL “SELECT … FROM … WHERE … ORDER BY …” statement to fetch data stored in a SQL-based relational database. Similarly, the same XML encoded query expression can just as easily be transformed into an XQuery expression in order to retrieve data from XML document.

The XML and KVP encodings of projection, selection and sorting clauses described in this International Standard are common components which can be used together or as individually by a number of web services. Any service that requires the ability to query objects from a web-accessible repository can make use of the XML and KVP encodings of a query expression described in this International Standard. For example the GetFeature operation, defined in ISO 19142, uses the elements derived from definitions in this International Standard to encode query expressions.

Geographic information — Filter encoding

1 Scope

This International Standard describes an XML and KVP encoding of a system neutral syntax for expressing projections, selection and sorting clauses collectively called a query expression.

These components are modular and intended to be used together or individually by other standards which reference this International Standard.

EXAMPLE 1 ISO 19142 makes use of some or all of these components.

This International Standard defines an abstract component, named AbstractQueryExpression, from which other specifications can subclass concrete query elements to implement query operations.

This International Standard also defines an additional abstract query component, named AbstractAdhocQueryExpresison, which is derived from AbstractQueryExpression and from which other specifications can subclass concrete query elements which follow the following query pattern:

> An abstract query element from which service specifications can subclass a concrete query element that implements a query operation that allows a client to specify a list of resource types, an optional projection clause, an optional selection clause, and an optional sorting clause to query a subset of resources that satisfy the selection clause.

This pattern is referred to as an ad hoc query pattern since the server is not aware of the query until it is submitted for processing. This is in contrast to a stored query expression, which is stored and can be invoked by name or identifier.

This International Standard also describes an XML and KVP encoding of a system-neutral representation of a select clause. The XML representation is easily validated, parsed and transformed into a server-specific language required to retrieve or modify object instances stored in some persistent object store.

EXAMPLE 2 An XML encoded filter can be transformed into a WHERE clause for a SQL SELECT statement to fetch data stored in a SQL-based relational database. Similarly, and XML encoded filter expression can be transformed into an XPath or XPointer expression for fetching data from XML documents.

This International Standard defines the XML encoding for the following predicates.

a) A standard set of logical predicates: and, or and not.

b) A standard set of comparison predicates: equal to, not equal to, less than, less than or equal to, greater than, greater than or equal to, like, is null and between.

c) A standard set of spatial predicates: equal, disjoint, touches, within, overlaps, crosses, intersects, contains, within a specified distance, beyond a specified distance and BBOX.

d) A standard set of temporal predicates: after, before, begins, begun by, contains, during, ends, equals, meets, met by, overlaps and overlapped by.

e) A predicate to test whether the identifier of an object matches the specified value.

This International Standard defines the XML encoding of metadata that allows a service to declare which conformance classes, predicates, operators, operands and functions it supports. This metadata is referred to as Filter Capabilities.

2 Conformance

Few usage scenarios require the full implementation of this International Standard to work. Therefore, service providers may want to specify requirements for only the subset needed to fulfil their service. Or system developers may want to document which subset of this International Standard it is that that they have implemented and conform to. These named conformance classes help in specifying such subsets.

This International Standard defines conformance classes based on the operations and behaviour that a filter encoding service claims to implement. Table 1 indicates which behaviour shall be implemented for each of the conformance classes. The described behaviour shall be implemented for the corresponding conformance class, and the name of the paragraph of the actual detailed abstract test suite in Annex A.

Table 1 — FE conformance classes

Conformance class name	Operation or behaviour	Subclause of the abstract test suite
Query	Service that references this International Standard materializes a concrete query element that is substitutable for fes:AbstractQueryElement.	A.1
Ad hoc Query	Service that references this International Standard materializes a concrete query element that is substitutable for fes:AbstractAdhocQueryElement and materializes a concrete selection clause element that is substitutable for fes:AbstractSelectionClause and materializes a concrete projection clause element that is substitutable for fes:AbstractProjectionClause and materializes a concrete sorting clause element that is substitutable for fes:AbstractSortingClause.	A.2
Functions	Implements functions that are in addition to the operators defined in this International Standard.	A.3
Resource Identification	Implements the ResourceId operator with the rid parameter to allow predicates to be written that allow a specific resource to be queried.	A.4
Minimum Standard Filter	Implements the comparison operators: PropertyIsEqualTo, PropertyIsNotEqualTo, PropertyIsLessThan, PropertyIsGreaterThan, PropertyIsLessThanOrEqualTo, PropertyIsGreaterThanOrEqualTo. Implements the logical operators. Does not implement any additional functions.	A.5
Standard Filter	Implements all the comparison and logical operators and may implement one or more additional functions.	A.6
Minimum Spatial Filter	Implements only the BBOX spatial operator.	A.7
Spatial Filter	Implements the BBOX spatial operator and one or more of the other spatial operators.	A.8
Minimum Temporal Filter	Implements only the During temporal operator.	A.9
Temporal Filter	Implements the During temporal operator and one or more of the other temporal operators.	A.10
Version navigation	Implements ResourceId operator with the parameters that allow versions of resources to be queried (version, startTime, endTime).	A.11
Sorting	Implements sorting of the resources in a response.	A.12
Extended Operators	Implements additional operators not defined in this International Standard.	A.13
Minimum XPath	Implements the minimum required set of XPath capabilities.	A.14
Schema Element Function	Implements the schema-element() XPath function.	A.15

Other standards that include this International Standard shall declare what constitutes a “minimum” filter by declaring the minimum set of conformance classes from Table 1 that shall be implemented.