
**Geographic information — Web Feature
Service**

*Information géographique — Service d'accès aux entités
géographiques par le web*

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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 19142 was prepared by Technical Committee ISO/TC 211, *Geographic Information/Geomatics*, in collaboration with the Open Geospatial Consortium, Inc. (OGC). The Web Feature Service (WFS) was originated within OGC.

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Introduction

The Web Feature Service (WFS) represents a change in the way geographic information is created, modified and exchanged on the Internet. Rather than sharing geographic information at the file level using File Transfer Protocol (FTP), for example, the WFS offers direct fine-grained access to geographic information at the feature and feature property level. Web feature services allow clients to only retrieve or modify the data they are seeking, rather than retrieving a file that contains the data they are seeking and possibly much more. That data can then be used for a wide variety of purposes, including purposes other than their producers' intended ones.

In the taxonomy of services defined in ISO 19119, the WFS is primarily a feature access service but also includes elements of a feature type service, a coordinate conversion/transformation service and a geographic format conversion service.

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Geographic information — Web Feature Service

1 Scope

This International Standard specifies the behaviour of a web feature service that provides transactions on and access to geographic features in a manner independent of the underlying data store. It specifies discovery operations, query operations, locking operations, transaction operations and operations to manage stored parameterized query expressions.

Discovery operations allow the service to be interrogated to determine its capabilities and to retrieve the application schema that defines the feature types that the service offers.

Query operations allow features or values of feature properties to be retrieved from the underlying data store based upon constraints, defined by the client, on feature properties.

Locking operations allow exclusive access to features for the purpose of modifying or deleting features.

Transaction operations allow features to be created, changed, replaced and deleted from the underlying data store.

Stored query operations allow clients to create, drop, list and describe parameterized query expressions that are stored by the server and can be repeatedly invoked using different parameter values.

NOTE This International Standard does not address the access control issues.

This International Standard defines 11 operations:

- GetCapabilities (discovery operation);
- DescribeFeatureType (discovery operation);
- GetPropertyValue (query operation);
- GetFeature (query operation);
- LockFeature (locking operation);
- GetFeatureWithLock (query and locking operation);
- Transaction (transaction operation);
- CreateStoredQuery (stored query operation);
- DropStoredQuery (stored query operation);
- ListStoredQueries (stored query operation);
- DescribeStoredQueries (stored query operation).

2 Conformance

Table 1 specifies the conformance classes defined by this International Standard and the tests specified in Annex A that shall be satisfied in order to comply with each class.

Table 1 also lists the following.

- a) Which, if any, filter encoding (see ISO 19143:2010, Clause 2) conformance tests need to be satisfied with each WFS conformance class.
- b) Which, if any, GML (see ISO 19136:2007) conformance tests need to be satisfied with each WFS conformance class.

Table 1 — Conformance classes

Conformance class name	Operation or behaviour	WFS conformance test	FES conformance test(s)	GML conformance test(s)
Simple WFS	<p>The server shall implement the following operations: GetCapabilities, DescribeFeatureType, ListStoredQueries, DescribeStoredQueries, GetFeature operation with at least the StoredQuery action.</p> <p>One stored query, that fetches a feature using its id, shall be available, but the server may also offer additional stored queries.</p> <p>Additionally, the server shall conform to at least one of the HTTP GET, HTTP POST or SOAP conformance classes.</p>	A.1.1	ISO 19143:2010, A.1	ISO 19136:2007, A.1.1, A.1.4, A.1.5, A.1.7, B.3, B.5, B.2.3
Basic WFS	<p>The server shall implement the Simple WFS conformance class and shall additionally implement the GetFeature operation with the Query action and the GetPropertyValue operation.</p>	A.1.2	ISO 19143:2010, A.2, A.7, A.8, A.10, A.11, A.12, A.14	ISO 19136:2007, B.4
Transactional WFS	<p>The server shall implement the Basic WFS conformance class and shall also implement the Transaction operation.</p>	A.1.3		
Locking WFS	<p>The server shall implement the Transactional WFS conformance class and shall implement at least one of the GetFeatureWithLock or LockFeature operations.</p>	A.1.4		
HTTP GET	<p>The server shall implement the Key-value pair encoding for the operations that the server offers.</p>	A.1.5		
HTTP POST	<p>The server shall implement the XML encoding for the operations that the server implements.</p>	A.1.6		
SOAP	<p>The server shall implement XML-encoded requests and results within SOAP Envelopes.</p>	A.1.7		
Inheritance	<p>The server shall implement the schema-element() function for XPath expressions.</p>	A.1.8	ISO 19143:2010, A.15	

Table 1 (continued)

Conformance class name	Operation or behaviour	WFS conformance test	FES conformance test(s)	GML conformance test(s)
Remote resolve	The server shall implement the ability to resolve remote resource references.	A.1.9		ISO 19136:2007, B.2.1
Response paging	The server shall implement the ability to page through the set of response features or values.	A.1.10		ISO 19136:2007, B.3
Standard joins	The server shall implement join predicates using all Filter operators except the spatial and temporal operators.	A.1.11	ISO 19143:2010, A.8, A.10	
Spatial joins	The server shall implement join predicates using spatial operators.	A.1.12	ISO 19143:2010, A.11, A.12	
Temporal joins	The server shall implement join predicates using temporal operators.	A.1.13	ISO 19143:2010, A.9, A.10	
Feature versions	The server shall implement the ability to navigate feature versions.	A.1.14	ISO 19143:2010, A.11	
Manage stored queries	The server shall implement the CreateStoredQuery and the DropStoredQuery operations.	A.1.15	ISO 19143:2010, A.1	

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3 Normative references

The following normative documents contain provisions, which, 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.

ISO/TS 19103:2005, *Geographic information — Conceptual schema language*

ISO 19136:2007, *Geographic information — Geography Markup Language (GML)*

ISO 19143:2010, *Geographic information — Filter encoding*

IETF RFC 2616, *Hypertext Transfer Protocol — HTTP/1.1* (June 1999)

IETF RFC 4646, *Tags for Identifying Languages* (September 2006)

OGC 06-121r3, *OGC Web Services Common Specification*, OGC® Implementation Specification (9 February 2009)

OGC 07-092r3, *Definition identifier URNs in OGC namespace*, OGC® Best Practices (15 January 2009)

W3C SOAP, *Simple Object Access Protocol (SOAP) 1.2*, W3C Note (27 April 2007)

W3C WSDL, *Web Services Description Language (WSDL) 1.1*, W3C Note (15 March 2001)

W3C XML Namespaces, *Namespaces in XML*, W3C Recommendation (14 January 1999)

W3C XML Path Language, *XML Path Language (XPath) 2.0*, W3C Recommendation (23 January 2007)

W3C XML Schema Part 1, *XML Schema Part 1: Structures*, W3C Recommendation (2 May 2001)