

AS/NZS ISO 19128:2006  
ISO 19128:2005  
Reconfirmed 2016

AS/NZS ISO 19128:2006

Australian/New Zealand Standard™

**Geographic information—Web map  
server interface**



## **AS/NZS ISO 19128:2006**

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee IT-004, Geographical Information/Geomatics. It was approved on behalf of the Council of Standards Australia on 29 September 2006 and on behalf of the Council of Standards New Zealand on 20 October 2006.  
This Standard was published on 30 October 2006.

---

The following are represented on Committee IT-004:

ACT Planning and Land Authority  
ANZLIC – the Spatial Information Council  
Association of Aerial Surveyors Australia  
Association of Crown Research Institutes, New Zealand  
Australasian Fire Authorities Council  
Australian Antarctic Division  
Australian Bureau of Statistics  
Australian Hydrographic Office  
Australian Map Circle  
Australian Spatial Information Business Association  
CSIRO Exploration and Mining  
Department of Administrative and Information Services, SA  
Department of Conservation, NZ  
Department of Defence  
Department of Natural Resources, Mines and Water, Qld  
Department of Planning and Infrastructure, NT  
Department of Primary Industries, Water and Environment, Tas.  
Geoscience Australia  
Land Information, NZ  
Land Victoria  
Spatial Sciences Institute  
Telecom New Zealand  
Western Australian Land Information System

---

### **Keeping Standards up-to-date**

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about joint Australian/New Zealand Standards can be found by visiting the Standards Web Shop at [www.standards.com.au](http://www.standards.com.au) or Standards New Zealand web site at [www.standards.co.nz](http://www.standards.co.nz) and looking up the relevant Standard in the on-line catalogue.

Alternatively, both organizations publish an annual printed Catalogue with full details of all current Standards. For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia or Standards New Zealand at the address shown on the back cover.

---

*This Standard was issued in draft form for comment as DR 06310.*

---

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

---

**RECONFIRMATION**  
**OF**  
**AS/NZS ISO 19128:2006**  
**Geographic information—Web map server interface**

---

**RECONFIRMATION NOTICE**

Technical Committee IT-004 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

Certain documents referenced in the publication may have been amended since the original date of publication. Users are advised to ensure that they are using the latest versions of such documents as appropriate, unless advised otherwise in this Reconfirmation Notice.

Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 10 May 2016.

Approved for reconfirmation in New Zealand on behalf of the Standards Council of New Zealand on 18 May 2016.

The following are represented on Technical Committee IT-004:

ANZLIC - the Spatial Information Council  
Australian Antarctic Division  
Australian Bureau of Meteorology  
Australian Bureau of Statistics  
Australian Hydrographic Office  
CSIRO  
Department of Communications (Australian Government)  
Department of Defence (Australian Government)  
Geoscience Australia  
Master Builders Australia  
New Zealand Geospatial Office  
Science New Zealand  
Spatial Industries Business Association

## NOTES

Australian/New Zealand Standard™

**Geographic information—Web map  
server interface**

First published as AS/NZS ISO 19128:2006.

**COPYRIGHT**

© Standards Australia/Standards New Zealand

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher.

Jointly published by Standards Australia, GPO Box 476, Sydney, NSW 2001 and Standards New Zealand, Private Bag 2439, Wellington 6020

ISBN 0 7337 7824 0

## PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee IT-004, Geographical Information/Geomatics.

The objective of this Standard is to provide systems users and designers with the specifics of the behaviour of a service that produces spatially referenced maps dynamically from geographic information. It specifies operations to retrieve a description of the maps offered by a server, to retrieve a map, and to query a server about features displayed on a map.

This Standard is identical with, and has been reproduced from ISO 19128:2005, *Geographic information—Web map server interface*.

As this Standard is reproduced from an international standard, the following applies:

- (a) Its number appears on the cover and title page while the international standard number appears only on the cover
- (b) In the source text ‘this International Standard’ should read ‘this Australian/New Zealand Standard’.
- (c) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

<i>Reference to International Standard</i>	<i>Australian/New Zealand Standard</i>
ISO	AS/NZS ISO
19111 Geographic information—Spatial referencing by coordinates	19111 Geographic information—Spatial referencing by coordinates
19115 Geographic information—Metadata	19115 Geographic information—Metadata

Only International references that have been adopted as Australian or Australian/New Zealand Standards have been listed.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the annex to which they apply. A ‘normative’ annex is an integral part of a Standard, whereas an ‘informative’ annex is only for information and guidance.

## CONTENTS

	<i>Page</i>
<b>1</b>	<b>Scope .....</b> 1
<b>2</b>	<b>Conformance .....</b> 1
<b>2.1</b>	<b>Conformance classes and requirements .....</b> 1
<b>2.2</b>	<b>Basic WMS.....</b> 1
<b>2.3</b>	<b>Queryable WMS.....</b> 1
<b>3</b>	<b>Normative references .....</b> 1
<b>4</b>	<b>Terms and definitions.....</b> 2
<b>5</b>	<b>Abbreviated terms .....</b> 3
<b>6</b>	<b>Basic service elements .....</b> 4
<b>6.1</b>	<b>Introduction .....</b> 4
<b>6.2</b>	<b>Version numbering and negotiation .....</b> 4
<b>6.3</b>	<b>General HTTP request rules .....</b> 5
<b>6.4</b>	<b>General HTTP response rules .....</b> 7
<b>6.5</b>	<b>Numeric and Boolean values.....</b> 7
<b>6.6</b>	<b>Output formats.....</b> 8
<b>6.7</b>	<b>Coordinate systems.....</b> 8
<b>6.8</b>	<b>Request parameter rules.....</b> 12
<b>6.9</b>	<b>Common request parameters.....</b> 13
<b>6.10</b>	<b>Service result .....</b> 14
<b>6.11</b>	<b>Service exceptions .....</b> 14
<b>7</b>	<b>Web Map Service operations.....</b> 14
<b>7.1</b>	<b>Introduction .....</b> 14
<b>7.2</b>	<b>GetCapabilities (mandatory).....</b> 14
<b>7.3</b>	<b>GetMap (mandatory).....</b> 25
<b>7.4</b>	<b>GetFeatureInfo (optional).....</b> 31
<b>Annex A</b> (normative)	<b>Conformance tests .....</b> 34
<b>Annex B</b> (normative)	<b>CRS Definitions.....</b> 37
<b>Annex C</b> (normative)	<b>Handling multi-dimensional data .....</b> 44
<b>Annex D</b> (normative)	<b>Web Map Service profile of ISO 8601.....</b> 50
<b>Annex E</b> (normative)	<b>XML Schemas.....</b> 52
<b>Annex F</b> (normative)	<b>UML model .....</b> 63
<b>Annex G</b> (informative)	<b>Web Mapping Examples.....</b> 68
<b>Annex H</b> (informative)	<b>XML examples .....</b> 71
<b>Bibliography</b>	<b>.....</b> 76

## INTRODUCTION

A Web Map Service (WMS) produces maps of spatially referenced data dynamically from geographic information. This International Standard defines a “map” to be a portrayal of geographic information as a digital image file suitable for display on a computer screen. A map is not the data itself. WMS-produced maps are generally rendered in a pictorial format such as PNG, GIF or JPEG, or occasionally as vector-based graphical elements in Scalable Vector Graphics (SVG) or Web Computer Graphics Metafile (WebCGM) formats.

This International Standard defines three operations: one returns service-level metadata; another returns a map whose geographic and dimensional parameters are well-defined; and an optional third operation returns information about particular features shown on a map. Web Map Service operations can be invoked using a standard web browser by submitting requests in the form of Uniform Resource Locators (URLs). The content of such URLs depends on which operation is requested. In particular, when requesting a map the URL indicates what information is to be shown on the map, what portion of the Earth is to be mapped, the desired coordinate reference system, and the output image width and height. When two or more maps are produced with the same geographic parameters and output size, the results can be accurately overlaid to produce a composite map. The use of image formats that support transparent backgrounds (e.g. GIF or PNG) allows underlying maps to be visible. Furthermore, individual maps can be requested from different servers. The Web Map Service thus enables the creation of a network of distributed map servers from which clients can build customized maps. Illustrative examples of map request URLs and their resulting maps are shown in Annex G.

This International Standard applies to a Web Map Service instance that publishes its ability to produce maps rather than its ability to access specific data holdings. A basic WMS classifies its geographic information holdings into “Layers” and offers a finite number of predefined “Styles” in which to display those layers. This International Standard supports only named Layers and Styles, and does not include a mechanism for user-defined symbolization of feature data.

**NOTE** The Open Geospatial Consortium (OGC) Styled Layer Descriptor (SLD) specification [6] defines a mechanism for user-defined symbolization of feature data instead of named Layers and Styles. In brief, an SLD-enabled WMS retrieves feature data from a Web Feature Service [7] and applies explicit styling information provided by the user in order to render a map.

## AUSTRALIAN/NEW ZEALAND STANDARD

# Geographic information — Web map server interface

## 1 Scope

This International Standard specifies the behaviour of a service that produces spatially referenced maps dynamically from geographic information. It specifies operations to retrieve a description of the maps offered by a server to retrieve a map, and to query a server about features displayed on a map. This International Standard is applicable to pictorial renderings of maps in a graphical format; it is not applicable to retrieval of actual feature data or coverage data values.

## 2 Conformance

### 2.1 Conformance classes and requirements

This International Standard defines two conformance classes, one for a basic WMS, and the other for a queryable WMS. Each has two subclasses, one for clients and the other for servers.

### 2.2 Basic WMS

A basic WMS shall support the basic service elements (see Clause 6), the GetCapabilities operation (see 7.2), and the GetMap operation (see 7.3). To conform to this International Standard, a basic WMS shall satisfy the requirements of A.1 of the Abstract Test Suite in Annex A.

### 2.3 Queryable WMS

A queryable WMS shall satisfy all the requirements for a basic WMS, and shall also support the GetFeatureInfo operation (see 7.4). To conform to this International Standard, a queryable WMS shall satisfy all requirements of the Abstract Test Suite in Annex A.

## 3 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 8601:2004, *Data elements and interchange formats — Information interchange — Representation of dates and times*

ISO 19111, *Geographic information — Spatial referencing by coordinates*

ISO 19115:2003, *Geographic information — Metadata*

EPSG (February 2003), *European Petroleum Survey Group Geodesy Parameters*, Lott, R., Ravanas, B., Cain, J., Simonson, G, and Nicolai, R., eds., available at <<http://www.epsg.org/>>

IETF RFC 2045 (November 1996), *Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies*, Freed, N. and Borenstein, N., eds., available at <<http://www.ietf.org/rfc/rfc2045.txt>>