CR-Form-v3

CHANGE REQUEST

WMS 1.3.0 CR 06-149 rev **2** Current version: 1.3.0

Proposed change affects: AS ☐ Imp Spec ☒ Best Practices Paper ☐ Other ☐

Title:	OGC Web Map Service Interface change request - Add multilingual support
Source:	Keith Pomakis (CubeWerx Inc.) and OWS-4 GeoDSS
Work item code:	***Date:*** 2007-03-26
Category:	**B**

Use one of the following categories:
- ***F*** *(Critical correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(Addition of feature),*
- ***C*** *(Functional modification of feature)*
- ***D*** *(Editorial modification)*

Detailed explanations of the above categories can be found in the TC Policies and Procedures.

Reason for change:	The OWS-4 GeoDSS project has expressed a desire to add multilingual support to the WMS. This change would allow a WMS client to communicate the user's language preferences to a WMS server so that a WMS can respond in the most appropriate language(s).
Summary of change:	Define an optional LANGUAGE parameter for all WMS requests, allowing a WMS client to communicate the user's language preferences to a WMS server. Modify the XML schemas of the responses appropriately so that the language of the various titles, abstracts and keywords can be explicitly stated, and so that titles, abstracts and keywords can be returned in more than one language Modify the XML schema of the GetCapabilities response so that a WMS server can declare a set of fully-supported languages. Obsolete the ServiceExceptionReport schema in favor of the OWS Common 1.1 ServiceException schema so that the language of the exception text can be explicitly stated.

Consequences if not approved:	Future Web Map Servers will have no interoperable multilingual support, and the OWS-4 GeoDSS project will not achieve its goals.

Clauses affected:	6.9.3, 6.9.5, table 3, table 4, 7.2.3.5 (new), 7.2.4.2, 7.2.4.3, table 5, 7.2.4.6.2, 7.2.4.6.3, 7.2.4.6.4, 7.2.4.6.5 (new), 7.2.4.7.2, table 7, 7.3.3.4, 7.2.4.6.3, 7.2.4.7.2, table 8, 7.3.3.3 (new), 7.3.3.4, 7.3.3.5, 7.3.3.7, 7.3.3.11, 7.4.1, table 9, 7.4.3.3 (new), 7.4.3.3, 7.4.3.4, 7.4.3.5, 7.4.3.7, C.3.4, C.3.5, C.4.1, C.4.2, C.4.3, E.1, E.2, H.1, H.2 (removed), WMS_Capabilities.xsd, WMS_CapabilitiesExample.xml, ServiceExceptionReport.xsd (removed), ServiceExceptionReportExample.xml (removed)
Other specs Affected:	☐ Other core specifications ☐ Abstract specifications ☐ Recommendation Papers
Supporting Doc.	
Other comments:	The OWS Common Change Request 06-127r1, written as part of the OWS-4 GeoDSS project for the purpose of defining a mechanism (at the OWS Common level, so that the mechanism can be inherited by all OWS server types) for communicating descriptions in more than one language, has been accepted as part of the new OWS Common 1.1.0 specification (06-121r2). A primary aspect of this WMS change request, therefore, is to make use of the OWS Common 1.1.0 ows:DescriptionType XML schema type and its associated semantics. This WMS change request also defines a mechanism for negotiating the set of preferred languages, something which the OWS Common 1.1.0 specification does not address. If this mechanism proves itself as a reliable and sufficient mechanism for language negotiation, it should be considered for inclusion in the next version of the OWS Common specification.
Status Disposition	

Add the following normative references to section 3 (Normative references):

IETF RFC 4646 (September 2006), *Tags for Identifying Languages*, Phillips, A. and Davis, M., eds., <http://www.ietf.org/rfc/rfc4646.txt>

OGC 06-121r3 (February 2007), *OGC Web Services Common Specification*, Whiteside, A., ed.

(NOTE: The version number and date of the OGC Web Services Common Specification document may change, since it is still undergoing minor revisions as of the writing of this change request. Also, the official URL of the document should be provided once one is established.)

Make the following changes regarding exception codes:

section 6.9.3 (FORMAT):
with code "InvalidFormat" ---> exceptionCode="InvalidFormat"

table 4 (Use of UpdateSequence Parameter):
code=CurrentUpdateSequence ---> exceptionCode="CurrentUpdateSequence"
code=InvalidUpdateSequence ---> exceptionCode="InvalidUpdateSequence"

section 7.2.4.6.3 (Name):
code="LayerNotDefined" ---> exceptionCode="LayerNotDefined", locator="*layerName*"

section 7.2.4.7.2 (Queryable layers):
code="LayerNotQueryable" ---> exceptionCode="LayerNotQueryable", locator="*layerName*"

section 7.3.3.4 (STYLES):
code = StyleNotDefined ---> exceptionCode="StyleNotDefined", locator="*styleName*"

section 7.3.3.5 (CRS):
code = "InvalidCRS" ---> exceptionCode="InvalidCRS"

section 7.3.3.7 (FORMAT):
code = InvalidFormat ---> exceptionCode="InvalidFormat"

section 7.4.1 (General):
code = OperationNotSupported ---> exceptionCode="OperationNotSupported", locator="GetFeatureInfo"

section 7.4.3.4 (QUERY_LAYERS):
code = LayerNotDefined ---> exceptionCode="LayerNotDefined", locator="*layerName*"

section 7.4.3.5 (INFO_FORMAT):
code = InvalidFormat ---> exceptionCode="InvalidFormat"

section 7.4.3.7 (I, J):
code = InvalidPoint ---> exceptionCode="InvalidPoint"

section C.3.4 (Single- and multiple-valued requests):
code = InvalidDimensionValue ---> exceptionCode="InvalidDimensionValue", locator="*dimensionName*"

section C.3.5 (Applicability to multiple layers):
code = InvalidDimensionValue ---> exceptionCode="InvalidDimensionValue", locator="TIME"

section C.4.1 (Incorrect values):
code = InvalidDimensionValue ---> exceptionCode="InvalidDimensionValue"

code = MissingDimensionValue ---> exceptionCode="MissingDimensionValue"

section C.4.2 (Default values):

code = MissingDimensionValue ---> exceptionCode="MissingDimensionValue",
locator="*dimensionName*"

section C.4.3 (Nearest values):

code="InvalidDimensionValue" ---> exceptionCode="InvalidDimensionValue",
locator="*dimensionName*"

Add the following section (after 6.9.4 EXCEPTIONS):

6.9.5 LANGUAGE

The LANGUAGE parameter, an optional parameter for all WMS requests (unless otherwise specified as required), specifies what the client's preferred set of languages is. Its value is a comma-separated list of RFC 4646 language tags in order of client preference. For each human-language text string in the server's response (including strings plotted into graphic images such as in a GetMap response), the server shall return that string in the most preferred language it has available for that string. If the server cannot return a text string in any of the client-preferred languages, it shall return that string in a default language of the server's choice. (Therefore, servers that ignore the LANGUAGE parameter entirely are trivially compliant.) The special value "MUL" may be accepted for GetCapabilities requests, indicating that descriptions should be returned in all available languages. If a LANGUAGE parameter is not present in a request, it is recommended that the server attempt to honor the Accept-Language MIME header in the HTTP request (usually passed to the process by the web server by means of the HTTP_ACCEPT_LANGUAGES environment variable) instead

This mechanism, in conjunction with the list of fully-supported languages that may appear in the capabilities document of a server (see section 7.2.4.3), allows the client to effectively perform language negotiation with either *all-or-nothing* semantics or *best-effort* semantics.

If a client wishes to perform language negotiation with *all-or-nothing* semantics, it shall choose a language from the list of languages reported in the capabilities document, or end communication with the server if a required language is not listed. Once a language is chosen, the client shall specify this language using the LANGUAGE parameter in all future requests to this server. There is no need to send a list in preferred order. The client is guaranteed to receive everything back in the requested language because it is requesting a language that is in the list of languages reported in the capabilities document.

If a client wishes to perform language negotiation with *best-effort* semantics, it can ignore the list of languages reported in the capabilities document, and use the LANGUAGE parameter to request the language(s) that the user would prefer to receive responses in, in order of preference. There is no guarantee that the response will uniformly contain one language. Each text string will be returned in the best available language relative to the user's preferences.

Change table 3 (The parameters of a GetCapabilities request URL) to:

Request Parameter	Mandatory/Optional	Description
VERSION=version	O	Request version
SERVICE=WMS	M	Service type
REQUEST=GetCapabilities	M	Request name
FORMAT=MIME_type	O	Output format of service metadata
LANGUAGE=list	O	List of human languages preferred by client
UPDATESEQUENCE=string	O	Sequence number or string for cache control

Add the following section (after 7.2.3.4 REQUEST):

7.2.3.5 LANGUAGE

The nature of the optional LANGUAGE parameter is defined in 6.9.5.

Change the text of section 7.2.4.2 (Names and titles) to:

A number of elements have both a <Name> and a <Description><Title>. The Name is a text string used for machine-to-machine communication while the Title is for the benefit of humans. For example, a dataset might have the descriptive Title "Maximum Atmospheric Temperature" and be requested using the abbreviated Name "ATMAX".

Change the first paragraph of section 7.2.4.3 (General service metadata) to:

The first part of the service metadata is a <Service> element providing general metadata for the service as a whole. It shall include a Name, Title, and Online Resource URL. Optional service metadata includes Abstract, Keywords list, Language list, Contact Information, Fees, Access Constraints, and limits on the number of layers in a request or the output size of maps. The Title, Abstract and Keywords list are embedded in a Description object, which is of a subtype of ows:DescriptionType that declares the Title to be mandatory.

Add the following as the 7th paragraph of section 7.2.4.3 (General service metadata):

The optional <Languages> element in the service metadata lists the languages (as RFC 4646 language tags) that this server is able to fully support. That is, if one of the listed languages is requested using the LANGUAGE parameter (see section 6.9.5) in future requests to the server, all text strings contained in the response are guaranteed to be in that language. This list does not necessarily constitute a complete list of all languages that may be (at least partially) supported by the server. It only states the languages that are fully supported. If a server cannot guarantee full support of any particular language, it shall omit the <Languages> element from the capabilities document.

Change table 5 (Relationship between ISO 19128 and ISO 19115 metadata fields) to:

???

Change the text of section 7.2.4.6.2 (Title) to:

A <Description><Title> is mandatory for all layers; it is a human-readable string for presentation in a menu. The Title is not inherited by child layers. The language of the title should be specified with the xml:lang attribute if possible. In accordance with the multilingual text encoding mechanism specified in Subclause 10.7 of the OWS Common 1.1.0 specification [OGC 06-121r2], a title may be expressed in multiple languages by repeating the <Title> element once for each language.

Change section 7.2.4.6.4 (Abstract and KeywordList) to:

7.2.4.6.4 Abstract and Keywords

The <Abstract> and <Keywords> elements in the <Description> element are optional, but a server should provide them. An abstract is a narrative description of the map layer, while keywords aid in catalogue searches. The Abstract and Keywords elements are not inherited by child Layers. The language of the abstract and of each keyword should be specified with the xml:lang attribute if possible. An abstract or keyword list may be expressed in multiple languages in accordance with the multilingual text encoding mechanism specified in Subclause 10.7 of the OWS Common 1.1.0 specification [OGC 06-121r2].

Change table 7 (Inheritance of Layer Properties) to:

Element	Number	Inheritance
Layer	0+	no
Name	0/1[a]	no
Description/Title	1+[b]	no
Description/Abstract	0+[b]	no
Description/Keywords	0/1	no
Style	0+	add
CRS	1+[c]	add
EX_GeographicBoundingBox	1[c]	replace
BoundingBox	1+[c]	replace
…rest of table unmodified …		
a See 7.2.4.6.3 regarding distinction between named and unnamed layers. b At most 1 may exist per unique value of the xml:lang attribute. c May be 0 only if a value is inherited from an enclosing Layer element; see 7.2.4.6.6 through 7.2.4.6.8.		

Add the following row to table 8 (The Parameters of a GetMap Request):

Request Parameter	Mandatory/Optional	Description
LANGUAGE=list	O	List of human languages preferred by client

Add the following section (after 7.3.3.2 REQUEST):

7.3.3.3 LANGUAGE

The nature of the optional LANGUAGE parameter is defined in 6.9.5.

Change the first paragraph of the "XML (mandatory)" part of section 7.3.3.12 (EXCEPTIONS) (was section 7.3.3.11) to:

Errors are reported using XML exception reports as specified in Clause 8 of the OWS Common 1.1.0 specification [OGC 06-121r2]. This is the default exception format if none is specified in the request. In an HTTP environment, the MIME type of the returned XML exception reports shall be "text/xml".

Add the following row to table 9 (The Parameters of a GetFeatureInfo Request):

Request Parameter	Mandatory/Optional	Description
LANGUAGE=list	O	List of human languages preferred by client

Add the following section (after 7.4.3.2 REQUEST):

7.4.3.3 LANGUAGE

The nature of the optional LANGUAGE parameter is defined in 6.9.5.

Change the text of section 7.4.3.4 (Map request part) (was section 7.4.3.3) to:

The mandatory "map request part" entry in Table 9 represents a sequence of parameters from the GetMap request that generated the original map. Three of the GetMap parameters are omitted because GetFeatureInfo provides its own values: VERSION, REQUEST and LANGUAGE.

(NOTE: I have removed the sentence "The remainder of the GetMap request shall be embedded contiguously in the GetFeatureInfo request" because it is inconsistent with section 6.8.1, which states that "parameters in a request may be specified in any order".)

Add the following import statement to section E.1 (WMS Capabilities XML schema) and to WMS_Capabilities.xsd:

```
<import namespace="http://www.w3.org/1999/xlink"
        schemaLocation="../../xlink/1.0.0/xlinks.xsd"/>
```

Replace the definition of Title, Abstract, KeywordList and Keyword in section E.1 (WMS Capabilities XML schema) and in WMS_Capabilities.xsd with:

```
<complexType name="DescriptionWithTitleType">
   <annotation>
       <documentation>
       A subtype of DescriptionType that requires at least
       one Title.
       </documentation>
   </annotation>
   <complexContent>
      <restriction base="ows:DescriptionType">
         <sequence>
            <element ref="ows:Title"
                     minOccurs="1" maxOccurs="unbounded"/>
            <element ref="ows:Abstract"
                     minOccurs="0" maxOccurs="unbounded"/>
            <element ref="ows:Keywords"
                     minOccurs="0" maxOccurs="unbounded"/>
         </sequence>
      </restriction>
   </complexContent>
</complexType>
```

Add the following definitions just before the "General Service Metadata" section in section E.1 (WMS Capabilities XML schema) and in WMS_Capabilities.xsd:

```
<element name="Languages">
   <annotation>
      <documentation>
      A list of human languages that this server has full
      support for.
      </documentation>
   </annotation>
   <complexType>
      <sequence>
         <element ref="wms:Language"
                  minOccurs="0" maxOccurs="unbounded"/>
      </sequence>
   </complexType>
</element>

<element name="Language" type="language">
   <annotation>
      <documentation>
      A human language (in the syntax specified by RFC 4646)
      that this server has full support for.
      </documentation>
   </annotation>
</element>
```

Replace the Title, Abstract and KeywordList elements in the definition of the Service element in section E.1 (WMS Capabilities XML schema) and in WMS_Capabilities.xsd with:

```
<element name="Description" type="wms:DescriptionWithTitleType"/>
```

```
<element ref="wms:Languages" minOccurs="0"/>
```

Replace the Title, Abstract and KeywordList elements in the definition of the Layer element in section E.1 (WMS Capabilities XML schema) and in WMS_Capabilities.xsd with:

```
<element name="Description" type="wms:DescriptionWithTitleType"/>
```

Change the Title element in the definition of the Attribution element in section E.1 (WMS Capabilities XML schema) and in WMS_Capabilities.xsd with:

```
<element ref="ows:Title" minOccurs="0" maxOccurs="unbounded"/>
```

Replace the Title and Abstract elements in the definition of the Style element in section E.1 (WMS Capabilities XML schema) and in WMS_Capabilities.xsd with:

```
<element name="Description" type="wms:DescriptionWithTitleType"/>
```

Replace section E.2 (Service Exception schema) with:

E.2 Service Exception codes

This International Standard defines several exception codes in Table E.1. These exception codes are in addition to the codes that are specified in Table 25 of the OWS Common 1.1.0 specification [OGC 06-121r2]. Servers shall not use these codes for meanings other than those specified. Clients may use these codes to automate responses to service exceptions.

Table E.1 - Service exception codes

exceptionCode value	Meaning of code	"locator" value
InvalidFormat	Request contains a Format not offered by the server.	None
InvalidCRS	Request contains a CRS not offered by the server for one or more of the Layers in the request.	None
LayerNotDefined	GetMap request is for a Layer not offered by the server, or GetFeatureInfo request is for a Layer not shown on the map.	The offending layer name
StyleNotDefined	Request is for a Layer in a Style not offered by the server.	The offending style name
LayerNotQueryable	GetFeatureInfo request is applied to a Layer which is not declared queryable.	The offending layer name
InvalidPoint	GetFeatureInfo request contains invalid I or J value.	None
CurrentUpdateSequence	Value of (optional) UpdateSequence parameter in GetCapabilities request is equal to current value of service metadata update sequence number.	None

exceptionCode value	Meaning of code	"locator" value
MissingDimensionValue	Request does not include a sample dimension value, and the server did not declare a default value for that dimension.	Name of the dimension whose value is missing
InvalidDimensionValue	Request contains an invalid sample dimension value.	Name of the dimension whose value is invalid

(NOTE: We may wish to consider obsoleting some of the WMS-specific exception codes such as InvalidFormat and InvalidCRS in favor of the OWS Common 1.1 InvalidParameterValue exception code with the appropriate "locator" value.)

Change section H.1 (Sample WMS service metadata) and WMS_CapabilitiesExample.xml appropriately (by making use of the <Description> object and providing an example of multilingual text).

Remove section H.2.

Remove the files ServiceExceptionReport.xsd and ServiceExceptionReportExample.xml.