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Web Map Context Documents

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Contents

1	Scope.....	8
2	Conformance.....	8
3	Normative references	8
4	Terms and definitions	9
5	Conventions.....	10
5.1	Normative verbs	10
5.2	Abbreviated Terms	10
6	Elements of a Context Document.....	11
6.1	MIME Type	12
6.2	View_Context.....	13
6.2.1	Version Number	13
6.2.2	fid	13
6.3	General section	13
6.3.1	Bounding Box and Spatial Reference System.....	13
6.3.2	Window Size.....	14
6.3.3	gml:name.....	14
6.3.4	gml:description.....	14
6.3.5	Keywords.....	14
6.3.6	Contact Information	14
6.3.7	LogoURL.....	14
6.3.8	DataURL	14
6.4	LayerList.....	15
6.4.1	Layer.....	15
6.4.1.1	Server.....	15
6.4.1.2	Name.....	15
6.4.1.3	Title.....	15
6.4.1.4	Abstract.....	16
6.4.1.5	Spatial Reference System.....	16
6.4.1.6	DataURL	16
6.4.1.7	FormatList	16
6.4.1.8	Format	16
6.4.1.9	StyleList.....	16
6.4.1.10	Style	16
6.4.1.10.1	Named Style description :.....	16
6.4.1.10.2	Name.....	17
6.4.1.10.3	Title.....	17
6.4.1.10.4	LegendURL.....	17
6.4.1.10.5	Abstract.....	17

6.4.1.10.6	SLD	17
7	Description of a Context Collection	18
7.1	View_Context_Collection	18
7.1.1	Version Number	18
Annex A		19
A.1	Web Map Context Document XMLSchema (Normative)	19
A.2	Web Map Context XML Example (Informative).....	22

i. Preface

This document is the result of work begun during the first and second Open GIS Consortium (OGC) Web Mapping Testbeds in 1999 and 2000 by IONIC Software and the US National Aeronautics and Space Administration (NASA) and demonstrated by IONIC in september 1999. At the OGC Technical Committee meeting in June 2002 work by Canada Center for Remote Sensing and NASA was demonstrated. This demonstration showed a map comprising layers from several distinct servers being built up in one Viewer Client, the creation of a platform-independent description of that map, the retrieval of that description by an entirely different Client, and the display of the map in the second Client. The ability to read and write Context documents have been already tested in many OGC Interoperability Program testbeds such as OWS and GISD initiatives.

ii. Submitting Organizations

The following organizations submitted this Implementation Specification to the Open GIS Consortium Inc. as a Request For Comment (RFC):

- a) Ionic Software (Belgium)
- b) GeoConnections / Natural Resources Canada
- c) US National Aeronautics and Space Administration
- d) DM Solutions
- e) Social Change Online
- f) Syncline

iii. Submission Contact Points

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iv. Revision History

Date	Release	Editor	Description
2000-05-05	0.1.0	Jeff de La Beaujardière Dimitri Monie	First draft proposed to WMT mailing list.
2000-06-27	0.1.2	Jeff de La Beaujardiere	Intermediate
2002-06-11	0.1.2	Jeff de La Beaujardière	Demonstration at OGC TC.
2002-06-25	0.1.3	Jean-Philippe Humblet	Intermediate
2002-08-19	0.1.4	Jean-Philippe Humblet	Discussion Paper
2002-12-12	0.1.5	Rob Atkinson	General review. Incorporated extensibility and standard GML elements.
2002-12-20	0.1.6	Tom Kralidis	Updates from previous draft and inclusion of context collection definitions
2003-01-13	0.1.6	Jérôme Sonnet	Preparation for RFC submission

v. Changes to the OpenGIS Abstract Specification

The OpenGIS[®] Abstract Specification requires the following change to accommodate this OpenGIS[®] standard:

- The abstract concept of a persistent, reusable "context" for geospatial services should be added.

vi. Future work

This document directly supports only persistence of portrayed maps created by one or more Web Map Server bindings, but provides an extensibility mechanism for Web Feature Server and other types of service and persisted interface object states. It is expected that these will be developed and added to the formal schema in a backward compatible fashion.

A specified filename extension such as .cml and .ccml has been proposed for Contexts and Context Collections. This may be added to the section dealing with Mime Type.

Foreword

Attention is drawn to the possibility that some of the elements of this part of OGC 02-066 may be the subject of patent rights. Open GIS Consortium Inc. shall not be held responsible for identifying any or all such patent rights.

Introduction

This document is a companion specification to the OpenGIS Web Map Service Interface Implementation Specification version 1.1.1 [4], hereinafter "WMS 1.1.1."

WMS 1.1.1 specifies how individual map servers describe and provide their map content. The present Context specification states how a specific grouping of one or more maps from one or more map servers can be described in a portable, platform-independent format for storage in a repository or for transmission between clients. This description is known as a "Web Map Context Document," or simply a "Context."

A Context document includes information about the server(s) providing layer(s) in the overall map, the bounding box and map projection shared by all the maps, sufficient operational metadata for Client software to reproduce the map, and ancillary metadata used to annotate or describe the maps and their provenance for the benefit of human viewers.

A Context document is structured using eXtensible Markup Language (XML). Annex A of this specification contains the XMLSchema against which Context XML can be validated.

There are several possible uses for Context documents:

- The Context document can provide default startup views for particular classes of user. Such a document would have a long lifetime and public accessibility.
- The Context document can save the state of a viewer client as the user navigates and modifies map layers.
- The Context document can store not only the current settings but also additional information about each layer (e.g., available styles, formats, SRS, etc.) to avoid having to query the map server again once the user has selected a layer.
- The Context document could be saved from one client session and transferred to a different client application to start up with the same context.

Contexts could be cataloged and discovered, thus providing a level of granularity broader than individual layers.

Web Map Context Documents

1 Scope

This specification applies to the creation and use of documents which unambiguously describe the state, or "Context," of a WMS Client application in a manner that is independent of a particular client and that might be utilized by different clients to recreate the application state. This specification defines an encoding for the Context using eXtensible Markup Language [XML 1.0].

This specification is relevant to Clients of the OGC Web Map Service [WMS 1.0, WMS 1.1.0, WMS 1.1.1]. Reference is made to normative material from [WMS 1.1.1]. In some cases, reference is made to normative material from the Styled Layer Descriptor specification [SLD]

This specification does not address the archival, cataloging, discovery or retrieval of Context XML documents.

2 Conformance

Conformance with this specification shall be checked using all the relevant tests specified in Annex D (normative).

3 Normative references

The following normative documents contain provisions that, through reference in this text, constitute provisions of this specification. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this specification are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies.

EPSG, *European Petroleum Survey Group Geodesy Parameters*, Lott, R., Ravanias, B., Cain, J., Girbig, J.-P., and Nicolai, R., eds., <<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., <<http://www.ietf.org/rfc/rfc2045.txt>>

IETF RFC 2119 (March 1997), *Key words for use in RFCs to Indicate Requirement Levels*, Bradner, S., ed., <<ftp://ftp.isi.edu/in-notes/rfc2119.txt>>.

SLD 0.7.3 (April 2002), *Styled Layer Description (SLD) 0.7.3*, Open GIS Consortium Proposed Implementation Specification, Peter Vretanos, <<http://www.opengis.org/techno/RFC14.pdf>>

XML 1.0 (October 2000), *eXtensible Markup Language (XML) 1.0 (2nd edition)*, World Wide Web Consortium Recommendation, Bray, T., Paoli, J., Sperberg-McQueen, C.M., and Maler, E., eds., <<http://www.w3.org/TR/2000/REC-xml>>

4 Terms and definitions

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

4.1

operation

specification of a transformation or query that an object may be called to execute [OGC AS 12]

4.2

interface

named set of **operations** that characterize the behavior of an entity [OGC AS 12]

4.3

service

distinct part of the functionality that is provided by an entity through **interfaces** [OGC AS 12]

4.4

service instance

server

actual implementation of a **service**

4.5

client

software component that can invoke an **operation** from a **server**

4.6

request

invocation of an **operation** by a **client**

4.7

response

result of an **operation** returned from a **server** to a **client**

4.8

map

pictorial representation of geographic data.

NOTE: Need better term than "map" for stack of map layers forming a combined map described by a Context XML document.

4.9

spatial reference system

a projected or geographic coordinate reference system

4.1

Capabilities

service-level metadata describing the **operations** and content available at a **service instance**.

5 Conventions

5.1 Normative verbs

In the sections labeled as normative, the key words "**required**", "**shall**", "**shall not**", "**should**", "**should not**", "**recommended**", "**may**", and "**optional**" in this document are to be interpreted as described in [IETF RFC 2119].

The verb "**deprecate**" provides notice that the referenced portion of the specification is being retained for backwards compatibility with earlier versions but may be removed from a future version of the specification without further notice.

5.2 Abbreviated Terms

CGI	Common Gateway Interface
DCP	Distributed Computing Platform
DTD	Document Type Definition
EPSG	European Petroleum Survey Group
GIF	Graphics Interchange Format
GIS	Geographic Information System
GML	Geography Markup Language
HTTP	Hypertext Transfer Protocol
IETF	Internet Engineering Task Force
JPEG	Joint Photographic Experts Group
MIME	Multipurpose Internet Mail Extensions
OGC	Open GIS Consortium
OWS	OGC Web Service
PNG	Portable Network Graphics
RFC	Request for Comments
SLD	Styled Layer Descriptor
SVG	Scalable Vector Graphics
URL	Uniform Resource Locator
WebCGM	Web Computer Graphics Metafile
WCS	Web Coverage Service
WFS	Web Feature Service
WMS	Web Map Service

XML Extensible Markup Language

6 Elements of a Context Document

The parent element of the WMS_Viewer_Context document includes as children a "General" element for layer-independent context and a **sequential** "LayerList" with specific details about each layer in use. The 'version' attribute specifies the Viewer Context specification revision to which this XMLSchema applies.

The General element provides layer-independent context information. It states the bounding box in units of a particular Spatial Reference System, as well as a Name and Title and an optional abstract.

The LayerList element encapsulates all the layers in the current context. One or more of those layers may be retained in the context but hidden from the display. LayerList contains a series of one or more Layer elements.

Each Layer element is nearly identical to that in WMS Capabilities. A few things are added, however, including information about the server providing that layer and the styles available.

The 'queryable' attribute is taken directly from the WMS Capabilities. The binary 'hidden' attribute, if present and nonzero, means to retain the layer in the file but not to display it for the user. The Viewer Client **should** provide a means for the user to detect that a hidden layer(s) exists and to show it if desired.

The Server element indicates the WMS from which this layer is retrieved. The 'version' attribute is taken from the WMT_MS_Capabilities/@version attribute of WMS Capabilities. The 'onlineResource' attribute is taken from the WMT_MS_Capabilities/Capability/Request/Map/DCPType/HTTP/Get/@onlineResource attribute.

The 'title' attribute is taken from the /WMT_MS_Capabilities/Service/Title/text() value.

The Name element of Layer gives the machine-readable name of this layer (as used in a GetMap request). The Title element is a human-readable title to briefly identify this layer in menus. The Abstract element provides a descriptive narrative for more information about this layer. The Keywords element contains short words to help catalog searching. Both Abstract and Keywords are retained to allow the UI to show the information to the user.

The SRS element is a listing of available Spatial Reference Systems (SRS) for this layer. For all the layers that are not hidden, one of these **must** be the particular SRS in use for this context, as stated in the General/BoundingBox/@SRS attribute.

LatLonBounding box is the minimum enclosing bounding box in geographic coordinates for this layer.

A StyleList element lists the Styles available for the enclosing Layer. Styles might be Named Styles from the WMT_MS_Capabilities/Capability/Layer/Style/@Name or remote SLD documents. In case of a named style, the Style element must contain a name and a title, the name by which a style is requested and a machine-readable title for menu lists, optionally (and ideally) provides a human-readable description, and optionally gives a legend URL. In case of an SLD style, Context document provides a link to the online resource where the SLD document can be found.

The 'current' attribute indicates whether this is the style currently selected by the user.

A Context document **may** use zero or more LegendURL elements to provide an image of a legend relevant to each available Style of a Layer. An attribute indicates the media type of the legend; optional width and height are encouraged for image types to assist client applications in laying out space to display the legend.

The FormatList element lists available formats for this layer. Format values are taken from /WMT_MS_Capabilities/Capability/Request/Map/Format in WMS Capabilities. The attribute 'current' added in Context documents is nonzero for the format that is currently selected to display this layer.

6.1 MIME Type

When used with a MIME type, the context XML format should be identified by "application/vnd.ogc.context+xml".

6.2 View_Context

The eXtensible Markup Language (XML) [XML 1.0] encoding of a Context document **shall** be valid according to the XMLSchema in annex A.1 of this document. This XMLSchema specifies the required and optional content of the Context document and how this document is formatted.

A Context document **may** reference an exact copy of the XMLSchema in annex A.1 of this document. The XMLSchema **shall** be located at a fully-qualified and accessible URL to permit XML validating process to retrieve it.

The root element of the context. This element must contain the version number of the Context Specification which the current Context document complies with.

The View_Context is composed of two sets of elements, one for general information like the default bounding box, the default image size, the context title, ... and the other define a list of layers that may be rendered as a map.

This top level element is declared as a GML Feature, allowing Context documents to be conveniently stored, located and retrieved using a Web Feature Server. This will also assist future extension to support Web Feature Server and emerging OGC interfaces, since there will be a guarantee that the View spatial properties can be directly mapped onto service filter semantics.

6.2.1 Version Number

The published specification version number contains three positive integers, separated by decimal points, in the form “x.y.z”. Each context specification is numbered independently.

6.2.2 fid

The computer identification of the current Context document. This element is mandatory. Since a Context is defined as a GML Feature, the identification is carried by the feature id.

6.3 General section

This section contains layer-independent information about the current Context document such as the bounding box and the spatial reference system and also some information describing the Context document itself such as title, abstract, etc.

6.3.1 Bounding Box and Spatial Reference System

The bounding box formatted as defined in the WMS 1.1 Specification. This element is mandatory.

6.3.2 Window Size

The size in pixel of the map the Context document describes. Negotiation between Context defined aspect ratio and typical client aspect ratio (according to client's vendor) is left to the client. This element is optional.

6.3.3 gml:name

Human readable name of the Context (i.e. Title...). This element is mandatory. For the same reason as above, the GML name element has been used conforming to GML recommendations.

6.3.4 gml:description

A description for the Context document describing its content (i.e. an abstract). This element is optional.

6.3.5 Keywords

A list of comma separated keywords allow search across context collections. This element is optional.

6.3.6 Contact Information

Contact information for the creator of the Context document. Contact is described as defined in WMS 1.1 Specification. This element is optional.

6.3.7 LogoURL

A reference to an image that might be attached to the Context document. It can be, for instance, the logo of the project for which the context has been setup, an overview of the map the context describes, ...

This element contains a link to the image as well as the dimension of the image (in pixel) and its format.

This element is optional.

6.3.8 DataURL

A URL reference to a webpage which contains relevant information to the view.

This element is optional

6.4 LayerList

A Context document contains one maps defined within a LayerList. This element describes the list of all layers to build a required view (map). The Layers are presented in a bottom to top approach.

Each layer is defined in a <Layer> element in the Context document XML. If desired, Layers may be repeated with different attributes (i.e. different styles).

6.4.1 Layer

Layers attributes are

- **hidden** : contains true if the layer should be hidden in the client result map
- **queryable** : contains true if the layer is set queryable for client side GetInfo action

The <Layer> element **must** enclose child elements providing information about the Layer. The meaning of these elements is defined hereunder.

6.4.1.1 Server

The element defining the service from which the named Layer may be requested

Attributes are :

- **Service** : the type of the server (according to OGC interfaces : WMS, WFS, ...)
- **Version** : Version number of the OGC interface Specification the query might be build according to.
- **Title** : the title of the service (extracted from the Capabilities by the Context document creator)
- **Online Resource** element: the link to the online resource

This element is mandatory

6.4.1.2 Name

The name of the selected layer (extracted from Capabilities by the Context document creator). This element is mandatory

6.4.1.3 Title

The title of the selected layer (extracted from Capabilities by the Context document creator). This element is mandatory.

6.4.1.4 Abstract

The abstract of the selected layer (extracted from Capabilities by the Context document creator). This element is optional.

6.4.1.5 Spatial Reference System

A list of available SRS for the enclosing layer. One of the listed SRS's must be the SRS mentioned in the WMT_Viewer_Context/General@SRS element.

6.4.1.6 DataURL

This element contains a link to the online resource where data describing the layer can be found. This element is optional.

6.4.1.7 FormatList

The parent element containing the list of available image format for this layer. Image format should be expressed with MIME types as described in WMS1.1 Specification.

Each image format is defined in a <Format>. A <FormatList> **shall** include at least one <Format> element.

6.4.1.8 Format

Describe one output image format for the Layer.
Attribute : "current" : contains 1 if the current image format is selected.

6.4.1.9 StyleList

The parent element containing the list of available styles for this layer.

Each style is defined in a <Style> element. A <StyleList> **shall** include at least one <Style> element.

6.4.1.10 Style

Attribute : current : contains 1 if the current style is selected.

A <Style> element may be composed in two different ways: named style or SLD.

6.4.1.10.1 Named Style description :

Each <Style> element **shall** have a <Name> and <Title> elements. The style name is used in the map request STYLE parameter. The title is a human-readable string.

Style element may also contain an <Abstract> element, that provide narrative description, and a <LegendURL> element that contains the location of an image of a map legend appropriate to the enclosing Style.

6.4.1.10.2 Name

The name of the style (extracted from Capabilities by the Context document creator). This element is mandatory.

6.4.1.10.3 Title

The human-readable title of the style (extracted from Capabilities by the Context document creator). This element is optional.

6.4.1.10.4 LegendURL

The location of an image of a map legend describing the current style (extracted from Capabilities by the Context document creator). This element is optional.

6.4.1.10.5 Abstract

A narrative description of the current style (extracted from Capabilities by the Context document creator). This element is optional.

6.4.1.10.6 SLD

Each <Style> element **may** have a <SLD> element.

The <SLD> element contains an <OnlineResource> element describing a link to the specified SLD document.

```
<OnlineResource xmlns:xlink="http://www.w3.org/1999/xlink" xlink:type="simple"
xlink:href="xxxxxxxxxxxxxxxxxxxx">
```

7 Description of a Context Collection

Context Collections represent a list of context documents. Context collections could be used in several ways:

- A particular Viewer Client could use a Collection to construct a menu of default start-up views.
- A Collection of related contexts could server as a script for a demonstration.
- A user could create a Collection to "bookmark" public or user-specific contexts. The creation of such a Collection might be managed by the Viewer Client itself.

7.1 View_Context_Collection

This element is the root element of the context collection, it extends the concept of GML Feature Collection. This element must also contain the version number of the Context Collection which the current document complies with.

7.1.1 Version Number

The published specification version number contains three positive integers, separated by decimal point, in the form “x.y.z”. Each context collection specification is numbered independently.

Annex A

A.1 Web Map Context Document XMLSchema (Normative)

This annex contains the normative XMLSchema definition for a Context document corresponding to this version of the specification. The XML schema document will be published by the OpenGIS Consortium within a public schema repository.

Comments are informative; in case of conflict with the main body of this specification the main body takes precedence.

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema targetNamespace="http://www.opengis.net/ows" xmlns="http://www.opengis.net/ows"
  xmlns:gml="http://www.opengis.net/gml" xmlns:xlink="http://www.w3.org/1999/xlink"
  xmlns:xs="http://www.w3.org/2001/XMLSchema" elementFormDefault="qualified">
  <xs:import namespace="http://www.opengis.net/gml"
    schemaLocation="http://www.opengis.net/namespaces/gml/core/feature.xsd"/>
  <xs:element name="View_Context" type="View_ContextType" substitutionGroup="gml:_Feature">
    <xs:annotation>
      <xs:documentation>The View_Context element contains metadata to persist service binding information so
        that multi-source spatial views can be described, transferred, stored and retrieved by clients. This version provides support
        for WMS and extension elements for private descriptions of other service bindings. The document consists of metadata to
        support search and retrieval and recreation of the view initial parameters, and binding information to one or more map
        objects.
      </xs:documentation>
    </xs:annotation>
  </xs:element>
  <!-- global abstract elements and defined concrete instances. -->
  <xs:element name="Window" type="WindowType"/>
  <xs:element name="Keyword" type="xs:string"/>
  <xs:element name="ContactInformation" type="ContactInformationType"/>
  <xs:element name="LogoURL" type="LogoURLType"/>
  <xs:element name="LayerList" type="LayerListType"/>
  <!-- locally renamed standard GML Feature properties - simply to
    maximise backward compatibility with WMS and original discussion paper
  -->
  <!-- Title should belong to a codeSpace that indicates its a human
    readable identifier. This requires formal sepcification of such a
    codeSpace so is deferred for now -->
  <!-- specific types -->
  <xs:complexType name="View_ContextType">
    <xs:complexContent>
      <xs:extension base="gml:AbstractFeatureType">
        <xs:sequence>
          <xs:element ref="Window"/>
          <xs:element ref="Keyword"/>
          <xs:element ref="ContactInformation"/>
          <xs:element ref="LogoURL"/>
          <xs:element ref="LayerList"/>
        </xs:sequence>
        <xs:attribute name="version" type="xs:string" use="required"/>
      </xs:extension>
    </xs:complexContent>
  </xs:complexType>
  <xs:complexType name="WindowType">
```

```

<xs:attribute name="width" type="xs:integer" use="required"/>
<xs:attribute name="height" type="xs:integer" use="required"/>
</xs:complexType>
<xs:complexType name="BoundingBoxType">
  <xs:attribute name="SRS" type="xs:string" use="required"/>
  <xs:attribute name="minx" type="xs:short" use="required"/>
  <xs:attribute name="miny" type="xs:byte" use="required"/>
  <xs:attribute name="maxx" type="xs:short" use="required"/>
  <xs:attribute name="maxy" type="xs:byte" use="required"/>
</xs:complexType>
<xs:complexType name="ContactInformationType">
  <xs:sequence>
    <xs:element name="ContactPersonPrimary" type="ContactPersonPrimaryType"/>
    <xs:element name="ContactPosition" type="xs:string"/>
    <xs:element name="ContactAddress" type="AddressType"/>
    <xs:element name="ContactVoiceTelephone" type="xs:string"/>
    <xs:element name="ContactFacsimileTelephone" type="xs:string"/>
    <xs:element name="ContactElectronicMailAddress" type="xs:string"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="LogoURLType">
  <xs:sequence>
    <xs:element name="OnlineResource" type="OnlineResourceType"/>
  </xs:sequence>
  <xs:attribute name="width" type="xs:integer" use="required"/>
  <xs:attribute name="height" type="xs:integer" use="required"/>
  <xs:attribute name="format" type="xs:string" use="required"/>
</xs:complexType>
<xs:complexType name="ContactPersonPrimaryType">
  <xs:sequence>
    <xs:element name="ContactPerson" type="xs:string"/>
    <xs:element name="ContactOrganization" type="xs:string"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="AddressType">
  <xs:sequence>
    <xs:element name="AddressType" type="xs:string"/>
    <xs:element name="Address" type="xs:string"/>
    <xs:element name="City" type="xs:string"/>
    <xs:element name="StateOrProvince" type="xs:string"/>
    <xs:element name="PostCode" type="xs:string"/>
    <xs:element name="Country" type="xs:string"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="LayerListType">
  <xs:sequence>
    <xs:element name="Layer" type="LayerType" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="LayerType">
  <xs:sequence>
    <xs:element name="Server" type="ServerType"/>
    <xs:element name="Name" type="xs:string"/>
    <xs:element name="Title" type="xs:string"/>
    <xs:element name="Abstract" type="xs:string" minOccurs="0"/>
    <xs:element name="DataURL" type="DataURLType" minOccurs="0"/>
    <xs:element name="SRS" type="xs:string" minOccurs="0"/>
    <xs:element name="FormatList" type="FormatListType" minOccurs="0"/>
    <xs:element name="StyleList" type="StyleListType" minOccurs="0"/>
  </xs:sequence>
  <xs:attribute name="queryable" type="xs:boolean" use="required"/>
  <xs:attribute name="hidden" type="xs:boolean" use="required"/>
</xs:complexType>

```

```

<xs:complexType name="ServerType">
  <xs:sequence>
    <xs:element name="OnlineResource" type="OnlineResourceType"/>
  </xs:sequence>
  <xs:attribute name="service" type="xs:string"/>
  <xs:attribute name="version" type="xs:string" use="required"/>
  <xs:attribute name="title" type="xs:string" use="required"/>
</xs:complexType>
<xs:complexType name="DataURLType">
  <xs:sequence>
    <xs:element name="OnlineResource" type="OnlineResourceType"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="FormatListType">
  <xs:sequence>
    <xs:element name="Format" type="FormatType" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="FormatType">
  <xs:simpleContent>
    <xs:extension base="xs:string">
      <xs:attribute name="current" type="xs:boolean"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
<xs:complexType name="StyleListType">
  <xs:sequence>
    <xs:element name="Style" type="StyleType" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="StyleType">
  <xs:choice>
    <xs:sequence>
      <xs:element name="Name" type="xs:string" minOccurs="0"/>
      <xs:element name="Title" type="xs:string" minOccurs="0"/>
      <xs:element name="LegendURL" type="LegendURLType" minOccurs="0"/>
    </xs:sequence>
    <xs:element name="SLD" type="SLDType" minOccurs="0"/>
  </xs:choice>
  <xs:attribute name="current" type="xs:boolean"/>
</xs:complexType>
<xs:complexType name="LegendURLType">
  <xs:sequence>
    <xs:element name="OnlineResource" type="OnlineResourceType"/>
  </xs:sequence>
  <xs:attribute name="width" type="xs:integer" use="required"/>
  <xs:attribute name="height" type="xs:integer" use="required"/>
  <xs:attribute name="format" type="xs:string" use="required"/>
</xs:complexType>
<xs:complexType name="SLDType">
  <xs:sequence>
    <xs:element name="OnlineResource" type="OnlineResourceType"/>
    <xs:element name="Title" type="xs:string" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>
<!--
  Define the context collection
-->
<xs:element name="View_Context_Collection" type="View_Context_CollectionType"
substitutionGroup="gml:_FeatureCollection"/>
<xs:element name="View_Context_Member" type="View_Context_MemberType"
substitutionGroup="gml:featureMember"/>
<xs:complexType name="View_Context_CollectionType">

```

```

<xs:complexContent>
  <xs:restriction base="gml:AbstractFeatureCollectionType">
    <xs:sequence>
      <xs:element ref="View_Context_Member" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="version" type="xs:string" use="required"/>
  </xs:restriction>
</xs:complexContent>
</xs:complexType>
<xs:complexType name="View_Context_MemberType">
  <xs:complexContent>
    <xs:restriction base="gml:FeatureAssociationType">
      <xs:sequence>
        <xs:element ref="View_Context" minOccurs="0" maxOccurs="unbounded"/>
      </xs:sequence>
      <xs:attributeGroup ref="gml:AssociationAttributeGroup"/>
    </xs:restriction>
  </xs:complexContent>
</xs:complexType>
<xs:complexType name="OnlineResourceType">
  <xs:attributeGroup ref="xlink:simpleLink"/>
</xs:complexType>
</xs:schema>

```

A.2 Web Map Context XML Example (Informative)

This annex contains a *sample* Context XML document.

```

<?xml version="1.0" encoding="UTF-8"?>
<View_Context_Collection version="0.1.6" xmlns="http://www.opengis.net/ows" xmlns:gml="http://www.opengis.net/gml"
xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <View_Context_Member>
    <View_Context version="0.1.6">
      <Window width="200" height="100"/>
      <Keyword>Context</Keyword>
      <Keyword>Specification</Keyword>
      <Keyword>Example</Keyword>
      <ContactInformation>
        <ContactPersonPrimary>
          <ContactPerson>Jerome Sonnet</ContactPerson>
          <ContactOrganization>Ionic Software s.a.</ContactOrganization>
        </ContactPersonPrimary>
        <ContactPosition>Software engineer</ContactPosition>
        <ContactAddress>
          <AddressType>Postal</AddressType>
          <Address>Rue de Wallonie, 18</Address>
          <City>Grace-Hollogne</City>
          <StateOrProvince>Liege</StateOrProvince>
          <PostCode>4480</PostCode>
          <Country>Belgium</Country>
        </ContactAddress>
        <ContactVoiceTelephone>+3243640364</ContactVoiceTelephone>
        <ContactElectronicMailAddress>jerome.sonnet@ionicsoft.com</ContactElectronicMailAddress>
      </ContactInformation>
      <LogoURL width="127" height="65" format="image/gif">
        <OnlineResource xlink:href="http://www.ionicsoft.com/_images/pressroom/mediakit/ionic.gif"/>
      </LogoURL>
      <LayerList>
        <Layer hidden="false" queryable="false">
          <Server version="1.1.0" title="SpotImage data on Niger River in Mali">
            <OnlineResource xlink:href="http://webservices.ionicsoft.com/gisd/map/SPOT_MALI"/>
          </Server>
        </Layer>
      </LayerList>
    </View_Context>
  </View_Context_Member>
</View_Context_Collection>

```

```

        </Server>
        <Name>20M_COLOR_tif</Name>
        <Title>20M_COLOR_tif</Title>
    </Layer>
    <Layer hidden="false" queryable="false">
        <Server version="1.1.0" title="The GLOBE Program Visualization Server">
            <OnlineResource xlink:href="http://wmt.digitalearth.gov/cgi-bin/wmt.cgi"/>
        </Server>
        <Name>COASTLINES</Name>
        <Title>Coastlines</Title>
    </Layer>
</LayerList>
</View_Context>
</View_Context_Member>
<View_Context_Member>
    <View_Context version="0.1.6">
        <Window width="400" height="200"/>
        <Keyword>Context</Keyword>
        <Keyword>Specification</Keyword>
        <Keyword>Example</Keyword>
        <ContactInformation>
            <ContactPersonPrimary>
                <ContactPerson>Jerome Sonnet</ContactPerson>
                <ContactOrganization>Ionic Software s.a.</ContactOrganization>
            </ContactPersonPrimary>
            <ContactPosition>Software engineer</ContactPosition>
            <ContactAddress>
                <AddressType>Postal</AddressType>
                <Address>Rue de Wallonie, 18</Address>
                <City>Grace-Hollogne</City>
                <StateOrProvince>Liege</StateOrProvince>
                <PostCode>4480</PostCode>
                <Country>Belgium</Country>
            </ContactAddress>
            <ContactVoiceTelephone>+3243640364</ContactVoiceTelephone>
            <ContactElectronicMailAddress>jerome.sonnet@ionicsoft.com</ContactElectronicMailAddress>
        </ContactInformation>
        <LogoURL width="127" height="65" format="image/gif">
            <OnlineResource xlink:href="http://www.ionicsoft.com/_images/pressroom/mediakit/ionic.gif"/>
        </LogoURL>
    </View_Context_Member>
    <LayerList>
        <Layer hidden="false" queryable="false">
            <Server version="1.1.0" title="SpotImage data on Niger River in Mali">
                <OnlineResource xlink:href="http://webservices.ionicsoft.com/gisd/map/SPOT_MALI"/>
            </Server>
            <Name>20M_COLOR_tif</Name>
            <Title>20M_COLOR_tif</Title>
        </Layer>
        <Layer hidden="false" queryable="false">
            <Server version="1.1.0" title="The GLOBE Program Visualization Server">
                <OnlineResource xlink:href="http://wmt.digitalearth.gov/cgi-bin/wmt.cgi"/>
            </Server>
            <Name>COASTLINES</Name>
            <Title>Coastlines</Title>
        </Layer>
    </LayerList>
</View_Context>
</View_Context_Member>
</View_Context_Collection>

```