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Specification best practices

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i. Preface

This document describes a variety of Best Practices and Specification development guidance that the Members have discussed and approved over the years. These Best Practices have not been captured in other formal OGC documents other than meeting notes.

The Open Geospatial Consortium (OGC) is an international industry consortium of more than 320+ companies, government agencies, and universities participating in a consensus process to develop publicly available geo-processing specifications.

ii. Document terms and definitions

This document uses the specification terms (SHALL, MUST, etc) defined in Subclause 5.3 of [OGC 05-008], which is based on the ISO/IEC Directives, Part 2: Rules for the structure and drafting of International Standards. In particular, the word "shall" (not "must") is the verb form used to indicate a requirement to be strictly followed to comply with this specification.

iii. Revision History

Date	Internal version	Editor	Sections modified	Description
15 July 2006	0.1.0 Draft	Carl Reed	N/A	Initialised Draft Document.
19 Sept 2006	0.1.1 Draft	Arliss Whiteside	N/A	Many edits and comments

Specification best practices

1   Scope

This document captures numerous motions and recommendations from the OGC Technical Committee and Planning Committee regarding specification development best practices, guidance, and rules. As new Best Practices are identified and agreed to, this document will be updated.

2   Proper Specification templates

There are two similar OGC Document Templates: The standard OGC Specification Document Template and the OGC Specification Template for use in preparing and editing OpenGIS® Implementation Specifications that normatively reference the OWS Common Implementation Specification. Every OpenGIS implementation and abstract specifications shall use these official OGC Specification Document Templates.

The current version of the Template for normatively referencing OWS Common is available from the members' portal at http://portal.opengeospatial.org/files/?artifact_id=11092.

The current version of the Template for GML Profile Implementation Specifications is available from the members' portal at http://portal.opengeospatial.org/files/?artifact_id=12640.

The current version of the Template for all other OpenGIS Abstract and Implementation Specifications is located at TBD

3   Correct OGC document copyright

(Agreed to in January 2005) All OGC documents that are in the categories of Best Practices, candidate or adopted Implementation Specifications, Implementation Specification Profiles, Implementation Specification Application Profiles, and Implementation Specification Application Schemas shall use the following copyright:

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This copyright must be displayed on all title pages of all OGC documents except as noted below. Further, the following statement must be displayed in the footer of any OGC document: Copyright © 2006 OGC – All rights reserved.

All OGC Discussion Papers that have been approved for Public Release will also use this official OGC Copyright unless there are circumstances in which a shared copyright is

required. In these cases, the document Author/Editor must discuss the copyright requirements for that specific document with the Technical Committee Chair (TCC).

4   Use of specification terms such as SHALL, MUST etc.

(Agreed to in 2005) All OGC Specification related documents shall use the following terminology as defined in Subclause 5.3 of [OGC 05-008 and OGC 06-121], which is based on the ISO/IEC Directives, Part 2: Rules for the structure and drafting of International Standards

1. shall – verb form used to indicate a requirement to be strictly followed to conform to this specification, from which no deviation is permitted

2. should – verb form used to indicate desirable ability or use, without mentioning or excluding other possibilities

3. may – verb form used to indicate an action permissible within the limits of this specification

4. can – verb form used for statements of possibility

5. informative – a part of a document that is provided for explanation, but is not required

6. normative – a part of a standards document that is required

5   Guidance on naming new OpenGIS Specifications:

Whenever possible and as appropriate, when naming an OGC Specification try to work the name so that a three (3) or letter (4) letter acronym can be used to be a short-hand designation for that new specification. Examples are WMS for Web Map Service Implementation Specification and GML for Geography Markup Language. By way of guidance, all OGC web service interface specifications should begin with the letter "W" for Web and end in "S" for Service.

6   Appinfo for specifying profile version

At the March 2006 meetings, the TC first agreed that a GML application schema document conforming to one or more GML Profiles shall provide an appInfo annotation element <gml:gmlProfileSchema> for every profile in the root schema document <schema> element where the value is a schema location of the profile schema. Note that an application schema may conform to multiple profiles. Example:

```
<schema ...>
 <annotation>
  <appInfo>
   <gml:gmlProfileSchema>http://schemas
.opengis.net/gml/3.1.1/profiles/gmlSimpleFeatureProfile/1.0.0/gmlsf.xsd</gml:gmlProfileSc
hema>
```

```
    <gml:gmlProfileSchema>http://schemas
.opengis.net/gml/3.1.1/profiles/gmlPointProfile/1.0.0/gmlPointProfile.xsd</gml:gmlProfile
Schema>
  </appInfo>
 </annotation>
 ...
</schema>
```

- Define the <gml:gmlProfileSchema> element in the GML Schema as

```
<element name="gmlProfileSchema"
         type="anyURI"/>
```

The discussion then broadened to OGC profiles in general. The agreement is that any OGC application schema document conforming to one or more Profiles shall provide an appInfo annotation element for every profile in the root schema document <schema> element where the value is a schema location of the profile schema.

As a result, the TC also decided that OGC Application Schema documents shall directly (or primarily) reference the location of the complete GML Schema, not the profile XML Schema. Furthermore, an OGC Application Schema document shall also be valid when it is modified to directly reference the profile XML Schema(s) that it uses.

Important NOTE:

GML simple features profile [OGC 06-049r1] specifies using <gmlsf:GMLProfileSchema>, not <gml:gmlProfileSchema> as specified above. Since GML 3.2 has not been adopted and since GMLSF references GML 3.1.1 which does not contain such an element, GMLSF (in its GML 3.1.1 based version) has to use its own element for now.

GML 3.2 has accepted the change proposal referenced in the Huntsville motion (Bonn was the general motion, Huntsville was the GML profile motion), so gml:gmlProfileSchema it will be.

7   Axis order

During the closing TC Plenary for June 2005 meeting, the members in attendance agreed that:
   1. Going forward, for new specifications, coordinate values shall be listed in the axis order as specified by the referenced coordinate reference system (CRS).
   2. Going forward, when a RWG is working on edits to an existing adopted specification related to CRS and axis order, coordinate values shall be listed in the axis order specified by the referenced coordinate reference system (CRS).
   3. Going forward, for updated and new OGC specifications, CRSs should be referenced using URNs in the "ogc" URN namespace, as now specified in Clause 7 of OGC 05-023r1/OWS Common, unless a URL is used to reference a CRS.
   4. Existing adopted specifications will remain as is unless change requests are submitted and accepted, that seek consistency in CRS usage - such as for WMS.

8   Naming of Profiles, Application Schemas, and Application Profiles

It is possible for approved OGC Implementation Specifications to also have associated Profiles, Application Schemas, and Application Profiles. These associated Profiles, Application Schemas, and Application Profiles can be submitted to the OGC for consideration as candidates for approval as formal OGC implementation specifications. For example, there have been a number of Profiles and Application Schemas developed for GML. Some of these, such as the GML Simple Features Profile, have gone through the formal approval and adoption process. Below are the definitions for Profiles, Application Schemas, and Application Profiles (from the TC Policies and Procedures, section 7.6.1).

The following are definitions for Profile and Application Schema. They are derived from ISO 19109.

- A profile is a strict subset of a Specification applicable to multiple Application Schemas. An example of a profile is the GML Simple Feature Profile.
- An application schema is a subset of an Implementation Specification and adds application specific entities, e.g., feature types. An example of an application schema is LandGML or CityGML.
- An Application Profile is a profile of an OpenGIS interface specification, such as for Catalogue.

<We still need well defined rules for how to name examples of naming profiles and application schemas.>

9   Tightly coupled architectures

At the January 2005 meetings, the Planning Committee unanimously agreed that in addition to web services interfaces, work on API/interfaces for tightly coupled architectures is germane and valuable in terms of the work of the consortium and fully endorses and supports such work.

Component Coupling refers to the independence of software components. In a narrow sense, coupling refers to the way data is exchanged between components. Loose coupling is generally better than tight coupling. The loosest, and therefore preferred, type of coupling is data coupling, where data is transferred as parameters via well-defined interfaces. The tightest coupling involves components directly referencing shared variables. Tight coupling often indicates that components are not insulated from each other, and are not designed to be separate and independent. Tightly coupled components are usually complex, difficult to maintain, and monolithic. As a result there is very little flexibility regarding physical distribution of components. Two applications that communicate with each other via database management system (DBMS) updates, but which are otherwise independent of each other, would be considered loosely coupled. (**Software Architecture, Chapter 2 – Technical Architecture Overview, 1997**

10 SOAP/WSDL recommendation

Approved at the June 2006 Meetings. Going forward, all future revisions of existing and all new OWS (including OLS) interface specifications:

1. Should include an optional SOAP (messaging) binding and
2. Should express that binding in WSDL.

Exceptions may only be granted through appeal to the OAB. The process will be to write a short argument as to why a SOAP binding is not requried for a given implementation specification. The argument might document specific market requirements or technology constraints. For example, a given implementation environment might not support SOAP or there are bandwidth restrictions.

In order to insure that all OGC WS specifications use a consistent approach, the recommendation also included the requirement for OWS Common to describe a consistent pattern for SOAP/WSDL bindings on OGC interface specifications

For the foreseeable future, OGC will maintain existing GET and POST bindings. Further, there is considerable work being done in the OWS Common RWG on defining a consistent pattern for SOAP binding. Further, please note that SOAP can be thought of as another POST binding. The membership should consider joining into that activity so that we can define a common and consistent patter for implementing SOAP bindings for relevant OGC W*S interface specifications.

The PC recommends not using that the 2.0 version of WSDL as there are numerous unresolved issues with 2.0.

11 XML namespace identification URIs

(Approved in November 2005) Going forward, all first and second level revision number changes for all OGC XML Schemas (except for GML Profiles) require a new namespace identifier URI. A new namespace identifier URI is not required for third level revision number changes. This applies to revision number changes of GML Application Schemas and of Application Profiles that use extensions of the XML Schema of the base Implementation Specification.

The pattern in use for these XML namespace identifier URIs (normally URLs) is to follow the specification abbreviation with a slash, the first level revision number, a period, and then the second level revision number.

EXAMPLE 1   WCS 1.1.0 is using "…wcs/1.1"

More completely, the pattern in use for these XML namespace identifiers is to use a URL starting with "http://www.opengis.net/".

EXAMPLE 2   WCS 1.1.0 is using "http://www.opengis.net/wcs/1.1"