# Open Geospatial Consortium

# OGC® Web Coverage Service 2.0 Interface Standard - XML/POST Protocol Binding Extension

**Warning**

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## i. Preface

This document specifies an extension to the OGC Web Coverage Service (WCS) 2.0 core to allow for client/server communication using HTTP POST with XML encoding.

## ii. Terms and definitions

This document uses the specification terms defined in Subclause 5.3 of [OGC 06-121r9], 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 conform to this standard.

## iii. Submitting organizations

The following organizations have submitted this Implementation Specification to the Open Geospatial Consortium, Inc.:

- Jacobs University Bremen
- National Center for Atmospheric Research (NCAR)
- Oracle USA
- PCI Geomatics Inc.
- ERDAS, Inc.

- EOX IT Services GmbH
- Spot Image
- BAE Systems - C3I Systems
- Natural Environment Research Council (NERC)
- George Mason University

## iv. Document Contributor Contact Points

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## v. Revision history

| Date | Release | Author | Paragraph modified | Description |
|------|---------|--------|-------------------|-------------|
| 2009-11-02 | 0.0.1 | PB | All | Created |

## vi. Changes to the OpenGIS® Abstract Specification

The OpenGIS® Abstract Specification does not require any changes to accommodate the technical contents of this (part of this) document.

## vii. Future Work

Nothing foreseen currently.

# Foreword

Some of the elements of this document may be the subject of patent rights. Open Geospatial Consortium Inc. shall not be held responsible for identifying any such patent rights.

*Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The Open Geospatial Consortium Inc. shall not be held responsible for identifying any or all such patent rights.*

*Recipients of this document are requested to submit, with their comments, notification of any relevant patent claims or other intellectual property rights of which they may be aware that might be infringed by any implementation of the standard set forth in this document, and to provide supporting documentation.*

## Introduction

The OGC Web Coverage Service (WCS) supports electronic retrieval of geospatial data as "coverages" – that is, digital geospatial information representing space/time-varying phenomena.

This document specifies an extension to the OGC Web Coverage Service (WCS) 2.0 core to allow for client/server communication using HTTP POST with XML encoding.

# OGC® Web Coverage Service 2.0 Interface Standard - XML/POST Protocol Binding Extension

## 1    Scope

This document specifies how Web Coverage Service (WCS) clients and servers can communicate over the Internet using HTTP POST with XML encoding.

## 2    Conformance

Standardization target are WCS 2.0 implementations (currently: servers).

This document establishes a single requirements class, *post-xml*, of URI http://www.opengis.net/spec/WCS_protocol-binding_post-xml/1.0/req/post-xml with a single pertaining conformance class, *post-xml*, of URI http://www.opengis.net/spec/WCS_protocol-binding_post-xml/1.0/conf /post-xml. Requirements and conformance test URIs defined in this document are relative to http://www.opengis.net/spec/ WCS_protocol-binding_post-xml/1.0/.

Annex A lists the conformance tests which shall be exercised on any software artefact claiming to implement an OGC WCS using this extension.

## 3    Normative references

This *OGC WCS 2.0 XML POST Protocol Binding Extension* specification consists of the present document and an XML Schema. The complete specification is identified by OGC URI http://www.opengis.net/spec/WCS_protocol-binding_post-xml/1.0, the document has OGC URI http://www.opengis.net/doc/ISx/WCS_protocol-binding_post-xml/1.0.

The complete specification is available for download from http://www.opengeospatial.org/standards/wcs; additionally, the XML Schema is posted online at http://schemas.opengis.net/wcs/ 2.0 as part of the OGC schema repository. In the event of a discrepancy between bundled and schema repository versions of the XML Schema files, the schema repository shall be considered authoritative.

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. For undated references, the latest edition of the normative document referred to applies.

OGC 06-121r9, *OGC Web Service Common Specification*, version 2.0
 Conformance classes used:

- HTTP POST

OGC 09-110r3, OGC® *Web Coverage Service 2.0 Interface Standard - Core*, version 2.0
 Conformance classes used:

- Core

## 4    Terms and definitions

For the purposes of this document, the terms and definitions given in the above references apply.

## 5    Conventions

### 5.1    UML notation

All the diagrams that appear in this specification are presented using the Unified Modeling Language (UML) static structure diagram, as described in Subclause 5.2 of OGC Web Service Common [OGC 06-121r9].

### 5.2    Data dictionary tables

The UML model data dictionary is specified herein in a series of tables. The contents of the columns in these tables are described in Subclause 5.5 of [OGC 06-121r9]. The contents of these data dictionary tables are normative, including any table footnotes.

## 6    HTTP/POST with XML

### 6.1    General

**Requirement 1  /req/post-xml/extension-identifier:**
A WCS service implementing this extension shall include the following URI in the `Profile` element of the `ServiceIdentification` in a *GetCapabilities* response:
```
http://www.opengis.net/spec/
  WCS_protocol-binding_post-xml/1.0
```

**Requirement 2   /req/post-xml/wcsServiceMetadata:**
For those `WCSServiceMetadata` elements inherited from `OWSServiceMetadata`, the following rules **shall** apply:
-        WCS servers **shall** specify the HTTP POST request encodings accepted by including an `ows:Constraint` element, with "PostEncoding" as the value of the `name` attribute and a value "XML" to indicate that XML encoding is allowed, but without SOAP message encapsulation.
-        If the HTTP POST connect point URL is different for different encodings of the operation requests, this `ows:Constraint` element **shall** be included in each POST element. When the connect point URL is the same for all encodings of all operation requests, this `ows:Constraint` element **shall** be included in the `OperationsMetadata` element.

NOTE      In addition, [OGC 06-121r9] applies.

To allow WCS extensions to add further parameters the XML Schema `wcs:Request-BaseType` contains an optional element `<extension>` with unbounded cardinality. This way, extensions can add their individual request parameters without (syntactic) interference.

## 6.2   GetCapabilities

**Requirement 3   /req/post-xml/getCapabilities-request-structure:**
A *GetCapabilities* request using POST/XML **shall** consist of an XML document of type
`wcs:GetCapabilities`.

Example    The following is a minimum *GetCapabilities* request encoded in XML:

```
<?xml version="1.0" encoding="UTF-8"?>
<GetCapabilities
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:ows="http://www.opengis.net/ows/1.1"
  xmlns:wcs="http://www.opengis.net/wcs/2.0"
  xsi:schemaLocation=
    "http://schemas.opengis.net/wcs/2.0 ../wcsAll.xsd"
  service="WCS">
  <ows:AcceptVersions>
    <ows:Version>2.0.0</ows:Version>
  </ows:AcceptVersions>
</GetCapabilities>
```

## 6.3   DescribeCoverage

**Requirement 4   /req/post-xml/describeCoverage-request-structure:**
A *DescribeCoverage* request using POST/XML **shall** consist of an XML document of type
`wcs:DescribeCoverage`.

Example    The following XML document requests information about the coverages with identifiers
`cov1`, `cov2`, and `cov3`, resp.:

```
<?xml version="1.0" encoding="UTF-8"?>
<DescribeCoverage
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:wcs="http://www.opengis.net/wcs/2.0"
  xmlns:gml="http://www.opengis.net/gml/3.2"
  xsi:schemaLocation=
    "http://schemas.opengis.net/wcs/2.0 ../wcsAll.xsd"
  service="WCS" version="2.0.0">
  <wcs:CoverageId>C0001</wcs:CoverageId >
  <wcs:CoverageId>C0002</wcs:CoverageId >
  <wcs:CoverageId>C0003</wcs:CoverageId>
</DescribeCoverage>
```

## 6.4   GetCoverage

**Requirement 5   /req/post-xml/getCoverage-request-structure:**
A *GetCoverage* request using POST/XML **shall** consist of an XML document of type
`wcs:GetCoverage`.

Example    The following XML document requests a subset of coverage "rgb", applying trim operations in
x and y dimension.

```
<?xml version="1.0" encoding="UTF-8"?>
<wcs:GetCoverage
```

```
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xmlns:wcs="http://www.opengis.net/wcs/2.0"
    xmlns:gml="http://www.opengis.net/gml/3.2"
    xsi:schemaLocation=
      "http://schemas.opengis.net/wcs/2.0 ../wcsAll.xsd"
    service="WCS" version="2.0.0">
    <wcs:CoverageId>C0002</wcs:CoverageId>
    <wcs:trimDimension>
      <wcs:dimension>Long</wcs:dimension>
      <wcs:trimLow>20</wcs:trimLow>
      <wcs:trimHigh>29</wcs:trimHigh>
    </wcs:trimDimension>
    <wcs:trimDimension>
      <wcs:dimension>Lat</wcs:dimension>
      <wcs:trimLow>20</wcs:trimLow>
      <wcs:trimHigh>30</wcs:trimHigh>
    </wcs:trimDimension>
  </wcs:GetCoverage>
```

## 7   Exceptions

**Requirement 6   /req/post-xml/exceptions:**
When a WCS server encounters an error described in column "meaning of exception code" inTable 1 then it **shall** return the corresponding exception report message with the contents of the locator parameter value as specified in the right column of  Table 1.

**Table 1     — Exception codes for XML/POST operations**

| exceptionCode value | HTTP code | Meaning of code | locator value |
|---|---|---|---|
| InvalidEncodingSyntax | 400 | Document received does not conform with protocol syntax. | Name of violating element |

# Bibliography

[1]  IETF RFC 2387, *The MIME Multipart/Related Content-type*. IETF, 1998

[2]  IETF RFC 2396, *Uniform Resource Identifiers (URI): Generic Syntax*. IETF, 1998

[3]  W3C Note 11, *SOAP Messages with Attachments*. W3C Note 11, 2000

**Annex A**
**(normative)**

**Abstract test suite**

A WCS implementing this extension shall pass all of the following tests, plus those of the WCS core [OGC 09-110r3], to be conformant with this specification.

## A.1    Conformance Test Class: post-xml

The OGC URI identifier of this conformance class is:
http://www.opengis.net/spec/WCS_protocol-binding_post-xml/1.0/conf-class/post-xml.

Test identifiers below are relative to http://www.opengis.net/spec/WCS_protocol-binding_post-xml/1.0/.

### A.1.1    Extension identification

**Test id:**    **/conf/post-xml/extension-identifier**

**Test Purpose:**    **Requirement /req/post-xml/extension-identifier:**
A WCS service implementing this extension shall include the following URI in the `Profile` element of the `ServiceIdentification` in a *GetCapabilities* response:
```
http://www.opengis.net/spec/
    WCS_protocol-binding_post-xml
```

**Test method:**    Send a *GetCapabilities* request to server under test, verify that the response contains a `Profile` element with said URI.

### A.1.2    Correct service metadata

**Test id:**    **/conf/post-xml/wcsServiceMetadata**

**Test Purpose:**    **Requirement  /req/post-xml/wcsServiceMetadata:**
For those `WCSServiceMetadata` elements inherited from `OWSServiceMetadata`, the following rules **shall** apply:

- WCS servers **shall** specify the HTTP POST request encodings accepted by including an `ows:Constraint` element, with "PostEncoding" as the value of the `name` attribute and a value "XML" to indicate that XML encoding is allowed, but without SOAP message encapsulation.

- If the HTTP POST connect point URL is different for different encodings of the operation requests, this `ows:Constraint` element **shall** be included in each POST element. When the connect point URL is the same for all encodings of all operation requests, this `ows:Constraint` element **shall** be included in the

OperationsMetadata element.

**Test method:** Send a *GetCapabilities* request to server under test, verify that the response satisfies the constraints.

### A.1.3 Correct *GetCapabilities* request structure

**Test id:** /conf/post-xml/getCapabilities-request-structure

**Test Purpose:** **Requirement /req/post-xml/getCapabilities-request-structure:**
A *GetCapabilities* request using POST/XML **shall** consist of an XML document of type wcs:GetCapabilities.

**Test method:** Send syntactically legal and illegal *GetCapabilities* requests to server under test, verify that the server responds appropriately.

### A.1.4 Correct *DescribeCoverage* request structure

**Test id:** /conf/post-xml/describeCoverage-request-structure

**Test Purpose:** **Requirement /req/post-xml/describeCoverage-request-structure:**
A *DescribeCoverage* request using POST/XML **shall** consist of an XML document of type wcs:DescribeCoverage.

**Test method:** Send syntactically legal and illegal *DescribeCoverage* request to server under test, verify that the server responds appropriately.

### A.1.5 Correct *GetCoverage* request structure

**Test id:** /conf/post-xml/getCoverage-request-structure

**Test Purpose:** **Requirement /req/post-xml/getCoverage-request-structure:**
A *GetCoverage* request using POST/XML **shall** consist of an XML document of type wcs:GetCoverage.

**Test method:** Send syntactically legal and illegal *GetCoverage* request to server under test, verify that the server responds appropriately.

### A.1.6 Exceptions

**Test id:** /conf/post-xml/exceptions

**Test Purpose:** **Requirement /req/post-xml/exceptions:**
When a WCS server encounters an error described in column "meaning of exception code" inTable 1 then it **shall** return the corresponding exception report message with the contents of the locator parameter value as speci-

fied in the right column of  Table 1.

**Test method:**    Send requests of all types supported to the server under test. Each request shall include all (mandatory and) optional parameters and shall be valid except for one parameter which shall contain an encoding error described in the exception specification. Test passes if exception is reported according to requirement.

-- end of ATS --