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DGIWG – xxx + Defence Profile of OGC’s Web Processing Service 2.0

|  |  |
| --- | --- |
| Document type: | Standard |
| Document subtype: | Implementation profile |
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| Editor : | Dimitri Sarafinof |
| Audience: | DGIWG participants and associates |
| Abstract: | This document defines specific DGIWG requirements, recommendations and guidelines for implementations of the OGC Web Processing Service standards. |
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**Executive Summary**

*(The inclusion of an Executive Summary is the discretion of the author(s)).*

**Acknowledgement**

*(The acknowledgement clause is optional. Acknowledgements are listed after the Executive Summary, if present, and precede the table of contents)*

*(Clauses i-iv are optional, and not mandated for approval of issue, however assist in the management of the document)*

**i.Contributing participants**

| **Nation** | **Parent organization** |
| --- | --- |
| France | Institut National de l’Information Géographique et Forestière (IGN) |
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| United States | National Geospatial-Intelligence Agency (NGA) |
| United Kingdom | JtUser-C4ISR-Standards-Dev3 |

**ii.Document points of contact**

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For Document approved for public release use: All questions regarding this document shall be directed to the [secretariat@dgiwg.org](mailto:secretariat@dgiwg.org) NOTE: All personal information will be removed when an internal document is made public. This includes names and personal e-mail accounts.

**iii.Revision history**

| **Date** | **Edition number** | **Primary clauses modified** | **Description** |
| --- | --- | --- | --- |
| 2018.08.03 | 0.1 | All | first draft from DGIWG adoc template |
| 2019.04.15 | 0.1.1 | All | draft prior to Vienna |
| 2019.10.10 | 0.2 | All | draft after Tallinn |

**iv. Future work**

1. Introduction

*(Mandatory. The introduction is located on a separated page preceding the ‘Scope’ statement. The introduction is not numbered.)*

The OpenGIS® Web Processing Service (WPS) Interface Standard provides rules for standardizing how inputs and outputs (requests and responses) for geospatial processing services, such as polygon overlay. The standard also defines how a client can request the execution of a process, and how the output from the process is handled. It defines an interface that facilitates the publishing of geospatial processes and clients’ discovery of and binding to those processes. The data required by the WPS can be delivered across a network or they can be available at the server.

2. Scope

*(Mandatory)*

This document defines specific Defence requirements, recommendations and guidelines for implementations of the OGC Web Processing Service (WPS) standard (document number 14-065), version 2.0.

3. Conformance

*(Mandatory for standards)*

3.1. Conformance classes

This document establishes 1 conformance class:

* DGIWG basic WPS.

DGIWG WPS Profile conformance classes define requirements for WPS 2.0 servers allowing distribution of geographic data in a military environment. Annex A lists the conformance abstract tests which shall be exercised on any software artefact claiming to implement the DGIWG WPS profile.

| **Table 1. Conformance classes** | | | |
| --- | --- | --- | --- |
| **Conformance class name** | **Operation or behavior** | **OGC WPS Conformance Test** | **DGIWG WPS Conformance Test** |
| DGIWG basic WPS <http://www.dgiwg.org/std/wps/1.0/conf/basic> | DGIWG requirements x to y | - | Annex A.1 |

|  |  |
| --- | --- |
| **NOTE** | "http://www.dgiwg.org/std/wps/1.0/conf/basic" is an HTTP-URI which works as an identifier for the DGIWG basic conformance class. It is not an URL, redirecting to a web page. 1.0 identifies the version of the DGIWG standard (not the version of WPS it profiles). |

3.2. Backward compatibility

4. References

*(As applicable)*

4.1. Normative references

| **ID** | **Title** | **Reference** | **Version** |
| --- | --- | --- | --- |
| [1] | OGC® WPS 2.0.2 Interface Standard | OGC 14-065 | 2.0.2 |
| [2] | OGC® OWS-Common 2.0 Implementation Specification | 06-121r9 | 2.0.0 |

4.2. Informative references

| **Title** | **Reference** | **Version** |
| --- | --- | --- |
| OGC® Testbed-13: Workflows ER | OGC 17-029 | r1 |
| OGC® Testbed-13: Cloud ER | OGC 17-035 | - |
| *OGC® Testbed-14 ERs to be added here* | OGC 18-XXX | - |

5. Terms, definitions, and abbreviations

*(As applicable)*

5.1. Definitions

For the purposes of this document, terms and definitions found in WPS 2.0 ([[Ref-1]](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\profile_std\std.html#Ref-1)) apply.

5.2. Abrevations

|  |  |
| --- | --- |
| **BBox** | Bounding Box |
| **CRS** | Coordinate Reference System |
| **HTTP** | Hypertext Transfer Protocol |
| **WPS** | Web Processing Service |
| **XML** | Extensible Markup Language |

6. WPS 2.0 presentation (informative)

6.1. Introduction

Version 2.0 of OGC WPS ([[OGC-WPS-2.0]](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\profile_std\std.html#OGC-WPS-2.0)) defines :

* a Core conceptual model that may be used to specify a WPS in different architectures such as REST or SOAP,
* a process model to support the description and discovery of processes on the web,
* a basic data model that supports arbitrary (standard or non-standard) data formats for inputs and outputs,
* a WPS service model and encoding based on OGC baseline standards, and
* a Dismiss extension to allow clients to terminate asynchronous processing jobs.

The WPS service model defines five operations, the Dismiss operation (allowing a user to cancel a job) being defined as an extension to it:

* *GetCapabilities* (mandatory): returns service metadata,
* *DescribeProcess* (mandatory): returns the description of a specific process,
* *Execute* (mandatory): creates a job to run a specific process,
* *GetStatus*: returns status information about a processing job,
* *GetResult*: returns the result of a processing job,

Two bindings are defined for these operations : HTTP/POST+XML and HTTP/GET+KVP (excepted for the *Execute* operation).

Conformity to the standard is organized with five conformance classes:

* Basic WPS service profile
* Synchronous WPS
* Asynchronous WPS
* WPS process model encoding
* Dismiss extension

The "*basic WPS service profile*" defines a minimal WPS implementation that comprises the synchronous and asynchronous execution protocol, the WPS process model, and implements HTTP/POST+XML and HTTP/GET+KVP encodings.

7. DGIWG WPS basic (Normative)

7.1. Introduction

This chapter defines normative requirements to implement DGIWG WPS basic conformance class.

7.2. Normative requirements

The Normative requirements requested by this conformance class are summarized in [Table 2](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\profile_std\std.html#dgiwg_basic_wps_req).

| **Table 2. DGIWG Basic WPS Normative Server Requirements** | | |
| --- | --- | --- |
| **No.** | **Requirement** | **Compliance** |
| 1 | a DGIWG Basic WPS server shall implement the "Basic WPS service profile" conformance class (<http://www.opengis.net/spec/WPS/2.0/conf/service/profile/basic-wps>) from [[OGC-WPS-2.0]](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\profile_std\std.html#OGC-WPS-2.0). | M |
| 2 | a DGIWG Basic WPS server shall provide elements in the GetCapabilities response document as described in tables [Table 4](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\profile_std\std.html#get_cap_serviceID), [Table 5](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\profile_std\std.html#get_cap_serviceProvider), [Table 6](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\profile_std\std.html#get_cap_OperationsMetadata), [Table 7](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\profile_std\std.html#get_cap_Language) and [Table 8](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\profile_std\std.html#process_sum). | M |
| 3 | a DGIWG Basic WPS server shall provide lang element for all content of type LanguageString. | M |
| 4 | a DGIWG Basic WPS server shall provide metadata content in a response to a "GetCapabilities" request in English language. For each element of type LanguageString, it does require for element lang to be "en-GB". | M |

7.3. Non-Normative Recommendations for Implementation

The non-normative recommandations defined by this profile are summarized in [Table 3](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\profile_std\std.html#dgiwg_basic_wps_rec).

| **Table 3. DGIWG WPS Profile Non-normative Recommendations for DGIWG Basic WPS Server Implementation** | | |
| --- | --- | --- |
| **No.** | **Recommendation** | **Compliance** |
| 1 | A DGIWG Basic WPS server should …​ | O |
| 2 | A DGIWG Basic WPS server should …​ | O |
| 3 | …​ | …​ |

7.4. General

|  |  |
| --- | --- |
| **WARNING** | structure of requirement (DGIWG current style vs new OGC style), to be discussed in MANAGEMENT Team |

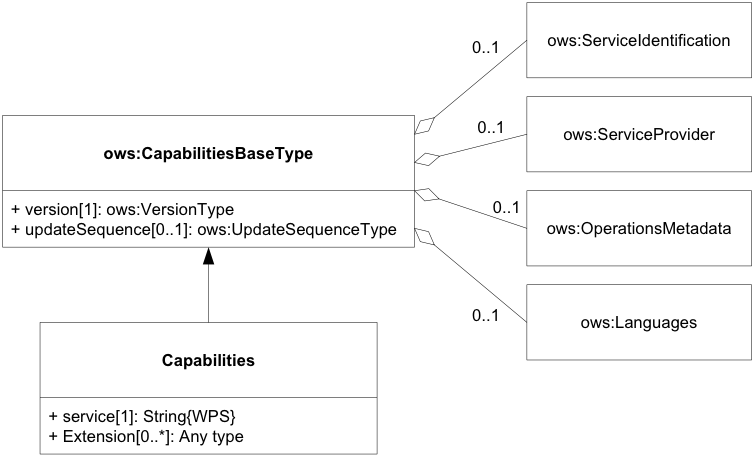
***Requirement 1: a DGIWG Basic WPS server shall implement the "Basic WPS service profile" conformance class (***[***http://www.opengis.net/spec/WPS/2.0/conf/service/profile/basic-wps***](http://www.opengis.net/spec/WPS/2.0/conf/service/profile/basic-wps)***) from***[***[OGC-WPS-2.0]***](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\profile_std\std.html#OGC-WPS-2.0)***.***

"*Basic WPS service profile conformance class comprises the synchronous and asynchronous execution protocol, the WPS process model, and implements HTTP/POST+XML and HTTP/GET+KVP encodings.*" (source [[OGC-WPS-2.0]](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\profile_std\std.html#OGC-WPS-2.0))

|  |  |
| --- | --- |
| **NOTE** | To clarify previous sentence, it requires to support synchronous or/and asynchronous conformance class(es). Synchronous requires support of GetCapabilities, DescribeProcess and Execute operations. Asynchronous requires suport of GetCapabilities, DescribeProcess, Execute, GetStatus and GetResult operations. For each of these operation, at least one binding has to be supported (HTTP/GET+KVP or HTTP/POST+XML). |

7.4.1. GetCapabilities operation

Following figure illustrates different parts of the GetCapabilities response document.



**Figure 1. GetCapabilities response document UML class diagram (source**[**[OGC-WPS-2.0]**](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\profile_std\std.html#OGC-WPS-2.0)**)**

***Requirement 2: a DGIWG Basic WPS server shall provide elements in the GetCapabilities response document as described in tables***[***Table 4***](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\profile_std\std.html#get_cap_serviceID)***,***[***Table 5***](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\profile_std\std.html#get_cap_serviceProvider)***,***[***Table 6***](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\profile_std\std.html#get_cap_OperationsMetadata)***,***[***Table 7***](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\profile_std\std.html#get_cap_Language)***and***[***Table 8***](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\profile_std\std.html#process_sum)***.***

***Requirement 3: a DGIWG Basic WPS server shall provide lang element for all content of type LanguageString.***

***Requirement 4: a DGIWG Basic WPS server shall provide metadata content in a response to a "GetCapabilities" request in English language. For each element of type LanguageString, it does require for element lang to be "en-GB".***

***Requirement 5: If content provided by a WFS server is classified, a DGIWG Basic WPS server shall identify the highest classification level of the content accessible through the WFS service by populating the accessConstraints element.***

|  |  |
| --- | --- |
| **NOTE** | for example *title*, *abstract* and *keywords* elements are of type LanguageString which comprise a value (CharacterString) and an optional lang element (from RFC 4646). They have to be provided at least in english (with lang being en-GB) and optionalty in other languages (with lang fr-CA for french (Canada)). |

Following tables describes adittional requirements for filling in GetCapabilities response document.

| **Table 4. GetCapabilities response elements - ServiceIdentification** | | | | |
| --- | --- | --- | --- | --- |
| **Names** | **Definition** | **Data type and values** | **Multiplicity and use** | **DGIWG** |
| serviceType | A service type URN from a registry of services, normally used for machine-to-machine communication. | URN | One (mandatory) ***Fixed to "WPS"*** | no change |
| serviceTypeVersion | Versions of this service type implemented by this server. | Character string type, not empty | One or more (mandatory) ***Shall contain at least value 2.0.2*** | no change |
| profile | Identifier of OGC Web Service (OWS) Application Profile. | Character string type, not empty | Zero or one (optional) | One (mandatory) ***Shall contain at least one element with value***[***http://www.dgiwg.org/std/wps/1.0/conf/basic***](http://www.dgiwg.org/std/wps/1.0/conf/basic) |
| title | Title of this server, normally used for display to a human. | LanguageString data structure, see Figure 15 | One or more (mandatory) | no change |
| abstract | Brief narrative description of this server, normally available for display to a human. | LanguageString data structure, see Figure 15 | Zero or more (optional) | Zero or more (optional) ***A DGIWG basic WPS server shall include the following information in the abstract element of the service metadata: "This service implements the DGIWG WPS 2.0 profile version 1.0, DGIWG Basic WPS conformance class (***[***http://www.dgiwg.org/std/wps/1.0/conf/basic)."***](http://www.dgiwg.org/std/wps/1.0/conf/basic).) |
| keywords | Unordered list of one or more commonly used or formalised word(s) or phrase(s) used to describe this serve. | See MD\_Keywords class in ISO 19115 | Zero or more (optional) | keywords are recommanded. |
| fees | Fees and terms for using this server, including the monetary units as specified in ISO 4217. | Character string type, not empty Reserved value NONE (case insensitive) shall be used to mean no fees or terms | Zero or one (optional) | ? |
| accessConstraints | Access constraints that should be observed to assure the protection of privacy or intellectual property, and any other restrictions on retrieving or using data from or otherwise using this server. | Character string type, not empty Reserved value NONE (case insensitive) shall be used to mean no constraints are imposed | Zero or more (optional) | ? |

| **Table 5. GetCapabilities response elements - ServiceProvider** | | | | |
| --- | --- | --- | --- | --- |
| **Names** | **Definition** | **Data type and values** | **Multiplicity and use** | **DGIWG** |
| providerName | Unique identifier for service provider organization | Character string type, not empty | One (mandatory) | ? |
| providerSite | Reference to the most relevant web site of the service provider. | See CI\_OnlineResource class in ISO 19115 | Zero or one (optional) | ? |
| serviceContact | Information for contacting service provider. | See CI\_ResponsibleParty and subsidiary classes in ISO 19115\* | Zero or one (optional | ? |

|  |  |  |  |
| --- | --- | --- | --- |
| **NOTE** | The contents of the CI\_ResponsibleParty class are modified to omit the optional organizationName attribute in CI\_ContactInfo, since the ProviderName contains this information. The mandatory ―role― attribute in the CI\_ResponsibleParty class is made optional, since no clear use of this information is known in the ServiceProvider section. Since all contents of the ServiceContact are now optional, the ServiceContact is now made optional. | | |
| **Table 6. GetCapabilities response elements - OperationsMetadata** | | | |
| **Names** | **Definition** | **Multiplicity and use** | **DGIWG** |
| operation | Metadata for one operation that this server interface implements | One or more (mandatory). One for each implemented operation. | Meaning at least GetCapabilities, DescribeProcess and Execute for synchronous WPS. Additionally GetStatus and GetResult have to be described. |
| parameter | Parameter valid domain that applies to one or more operations which this server implements. | Zero or more (optional) One for each such parameter with limited domain | ? |
| constraint | Constraint on valid domain of a nonparameter quantity that applies to this server. | Zero or more (optional) One for each such quantity with limited domain | ? |
| extendedCapabilities | Metadata about server and software additional abilities | Zero or one (optional) Included when server provides additional capabilities | ? |

| **Table 7. GetCapabilities response elements - Language** | | | |
| --- | --- | --- | --- |
| **Names** | **Definition** | **Multiplicity and use** | **DGIWG** |
| Languages | List of languages supported by the server. | Zero or One (optional) | ***One containing at least english.*** |

***Parts of Operation data structure ?*** nothing to be added here ?

The contents section delivers information about the process offerings of the server.

| **Table 8. ProcessSummary response elements** | | | | |
| --- | --- | --- | --- | --- |
| **Names** | **Definition** | **Data type and values** | **Multiplicity and use** | **DGIWG** |
| Title | Title of a process, normally available for display to a human. | ows:Title | One (mandatory) | ***One (mandatory). it shall be English.*** |
| Abstract | Brief narrative description of a process, normally available for display to a human. | ows:Abstract | Zero or more (optional) | ***One containing at least english.*** |
| Keywords | Keywords that characterize a process. | ows:Keyword | Zero or more (optional | ***One or more. Minimal set of keywords is required.*** |
| Identifier | Unambiguous identifier or name of a process. | ows:Identifier | One (mandatory) | ***Using URI is recommended.*** |
| Metadata | Reference to more metadata about this item. | ows:Metadata | Zero or more (optional) Include when available and useful | ***Providing metadata, for example in an human readable form (HTML web page) is recommended.*** |
| processModel | Inherited from Table 29. | - | - | ? |
| jobControlOptions | Inherited from Table 29. | - | - | ? |
| outputTransmission | Inherited from Table 29. | - | - | ? |

7.4.2. DescribeProcess operation

anything to be added ?

7.4.3. Execute operation

anything to be added ?

7.4.4. GetStatus operation

anything to be added ?

GetStatus operation returns back a StatusInfo document, providing identification and status information about jobs on a WPS server.

| **Table 9. StatusInfo document** | | | | |
| --- | --- | --- | --- | --- |
| **Names** | **Definition** | **Data type and values** | **Multiplicity and use** | **DGIWG** |
| JobID | Unambiguously identifier of a job within a WPS instance. | Character String | One (mandatory) |  |
| Status | Well-known identifier describing the status of the job. | Character String | One (mandatory) |  |
| ExpirationDate | Date and time by which the job and its results will be no longer accessible. | ISO-8601 date/time string in the form YYYY-MM-DDTHH:MM:SS.SSSZ with T separator character and Z suffix for coordinated universal time (UTC) | Zero or one (optional) Include if required. |  |
| EstimatedCompletion | Date and time by which the processing job will be finished. | ISO-8601 date/time string in the form YYYY-MM-DDTHH:MM:SS.SSSZ with T separator character and Z suffix for coordinated universal time (UTC) | Zero or one (optional) Include if available. |  |
| NextPoll | Date and time for the next suggested status polling. | ISO-8601 date/time string in the form YYYY-MM-DDTHH:MM:SS.SSSZ with T separator character and Z suffix for coordinated universal time (UTC) | Zero or one (optional) Include if required. |  |
| PercentCompleted | Percentage of process that has been completed. | Integer{0..100} | Zero or one (optional) Include if available. | recommendation ? |

7.4.5. GetResult operation

anything to be added ?

Appendix A: Abstract Test Suite

An Abstract Test Suite may be relevant to an Engineering Report.

An Abstract Test Suite is specified in Clause 9 and Annex A of ISO 19105. That Clause and Annex specify the ISO/TC 211 requirements for Abstract Test Suites. Examples of Abstract Test Suites are available in an annex of most ISO 191XX documents, one of the more useful is in ISO 19136. Note that this guidance may be more abstract than needed in an OGC® Implementation Standard.

|  |  |
| --- | --- |
| **Table 10. A.1.1 Conformance level 1** | |
| Test identifier | /test/case/id |
| Test purpose: | Confirm that the IUT satisfies all applicable requirements for conformance level 1. |
| Test method: | Functional testing performed in an automated and/or manual manner. Verify the behaviour of the IUT for the following operations:   * GetCapabilities (mandatory) * DescribeRecord (mandatory) * GetRecords (mandatory) * GetRecordById (mandatory) * GetRepositoryItem (mandatory) * GetDomain (optional) |
| Requirement: | DGIWG-XXX : clause 2.2 |
| Test type: | Capability |

|  |  |
| --- | --- |
| **Table 11. A.1.2 Test case for validity of XML response entity** | |
| Test identifier | <http://www.dgiwg.org/xxx/xxx> |
| Test purpose: | The XML response entity is valid. |
| Test method: | Validate content of response entity against corresponding element declaration. |
| Requirement: | DGIWG-XXX : clause. 10.2.5.1, p. 118 |
| Test type: | Capability |

|  |  |
| --- | --- |
| **Table 12. A.2.1 Conformance level 2** | |
| Test identifier | /test/case/id |
| Test purpose: | Confirm that the IUT satisfies all applicable requirements for conformance level 1. |
| Test method: | Functional testing performed in an automated and/or manual manner. Verify the behaviour of the IUT for the following operations:   * GetCapabilities (mandatory) * DescribeRecord (mandatory) * GetRecords (mandatory) * GetRecordById (mandatory) * GetRepositoryItem (mandatory) * GetDomain (optional) |
| Requirement: | DGIWG XXX: cl. 2.2 |
| Test type: | Capability |

|  |  |
| --- | --- |
| **Table 13. A.2.2 Test case for validity of XML response entity** | |
| Test identifier | <http://www.dgiwg.org/xxx/xxx> |
| Test purpose: | The XML response entity is valid. |
| Test method: | Validate content of response entity against corresponding element declaration. |
| Requirement: | OGC DGIWG XXX: clause. 10.2.5.1, p. 118 |
| Test type: | Capability |

Appendix B: XML Schema Documents

XML Schema Documents relevant for DGIWG STD.

The term “XML schema“ means all the XML schema parts having the same XML namespace, usually separated into multiple XML Schema Document files (with the file type “.xsd“. The XML schema parts in one XML namespace are usually separated into multiple XML Schema Documents to ease human understanding.

In addition to this document, this report includes several XML Schema Documents. These XML Schema Documents are bundled in a zip file with the present document.

The TBD abilities now specified in this document use TBD specified XML Schema Documents included in the zip file with this document. These XML Schema Documents combine the XML schema fragments listed in various subclauses of this document, eliminating duplications.

These XML Schema Documents roughly match the TBD UML packages described in Annex B, and are named:

TBD.xsd

TBD.xsd

These XML Schema Documents use and build on the OWS common XML Schema Documents specified [OGC 06-121r3], named:

ows19115subset.xsd

owsCommon.xsd

owsDataIdentification.xsd

owsExceptionReport.xsd

owsGetCapabilities.xsd

owsOperationsMetadata.xsd

owsServiceIdentification.xsd

owsServiceProvider.xsd

All these XML Schema Documents contain documentation of the meaning of each element and attribute, and this documentation shall be considered normative as specified in Subclause 11.6.3 of [OGC 06-121r9].

**GetCapabilities.xsd**

<ows:Operation name="GetCapabilities">

  <ows:DCP>

    <ows:HTTP>

      <ows:Post xlink:href="http://www.opengis.net/?">

        <ows:Constraint name="PostEncoding">

          <allowedValues>

            <ows:Value>SOAP</ows:Value>

          </ows:AllowedValues>

        </ows:Constraint>

      </ows:Post>

    </ows:HTTP>

  </ows:DCP>

</ows:Operation>

<ows:Operation name="GetTile">

  <ows:DCP>

    <ows:HTTP>

      <ows:Post xlink:href="http://www.opengis.net/?">

        <ows:Constraint name="PostEncoding">

          <ows:AllowedValues>

            <ows:Value>SOAP</ows:Value>

          </ows:AllowedValues>

        </ows:Constraint>

      </ows:Post>

    </ows:HTTP>

  </ows:DCP>

</ows:Operation>

Appendix C: Bibliography

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