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DEFENCE GEOSPATIAL INFORMATION WORKING GROUP
DGIWG
SPECULUM ORBIS TERRARUM

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

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Abstract:	This document defines specific DGIWG requirements, recommendations and guidelines for implementations of the OGC Web Processing Service standards.
Copyright:	

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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)

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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

Chapter 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.

Chapter 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.

Chapter 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.

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

Table 1. Conformance classes

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

Chapter 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	-

Chapter 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]) apply.

5.2. Abrevations

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

Chapter 6. WPS 2.0 presentation (informative)

6.1. Introduction

Version 2.0 of OGC WPS ([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.

Chapter 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.

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].	M
2	a DGIWG Basic WPS server shall provide elements in the GetCapabilities response document as described in tables Table 4, Table 5, Table 6, Table 7 and Table 8.	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

Table 2. DGIWG Basic WPS Normative Server Requirements

7.3. Non-Normative Recommendations for Implementation

The non-normative recommandations defined by this profile are summarized in Table 3.

No.	Recommendation	Compliance
1	A DGIWG Basic WPS server should …	O
2	A DGIWG Basic WPS server should …	O
3	…	…

Table 3. DGIWG WPS Profile Non-normative Recommendations for DGIWG Basic WPS Server Implementation

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) from [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])

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.

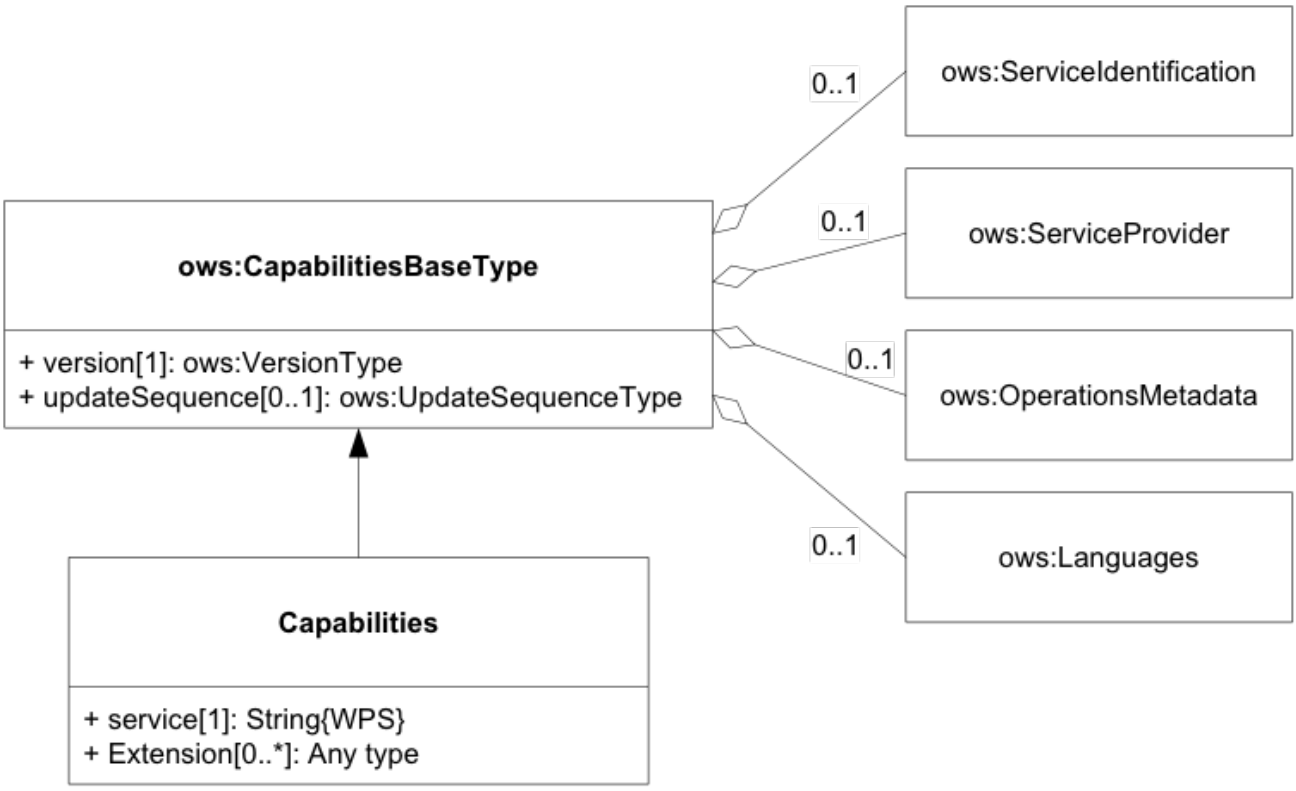

Figure 1. GetCapabilities response document UML class diagram (source [OGC-WPS-2.0])

Requirement 2: a DGIWG Basic WPS server shall provide elements in the GetCapabilities response document as described in tables Table 4, Table 5, Table 6, Table 7 and Table 8.

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.

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***

Names	Definition	Data type and values	Multiplicity and use	DGIWG
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)."
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.

Names	Definition	Data type and values	Multiplicity and use	DGIWG
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 4. GetCapabilities response elements - ServiceIdentification

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	?

Table 5. GetCapabilities response elements - ServiceProvider

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.

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 6. GetCapabilities response elements - OperationsMetadata

Names	Definition	Multiplicity and use	DGIWG
Languages	List of languages supported by the server.	Zero or One (optional)	***One containing at least english.***

Table 7. GetCapabilities response elements - Language

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

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

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.	-	-	?

Table 8. ProcessSummary response elements

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.

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.	

Names	Definition	Data type and values	Multiplicity and use	DGIWG
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 ?

Table 9. StatusInfo document

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.

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 10. A.1.1 Conformance level 1

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 11. A.1.2 Test case for validity of XML response entity

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 12. A.2.1 Conformance level 2

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

Table 13. A.2.2 Test case for validity of XML response entity

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