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DGIWG – xxx - Defence Geoprocessing generic profiles

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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** |
| --- | --- | --- | --- |
| 2019.08.10 | 0.1 | Dimitri Sarafinof | first draft from DGIWG adoc template |
| 2019.10.11 | 0.2 | Dimitri Sarafinof | second draft with generic processes description |
| 2020.01.28 | 0.3 | Dimitri Sarafinof | third draft with generic processes description (with feedback from Tallinn meeting) |

**iv. Future work** Development of new process profiles based on submitted requirements

1. Introduction

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

Geoprocessing is a GIS operation used to manipulate spatial data. A typical geoprocessing operation takes an input dataset, performs an operation on that dataset, and returns the result of the operation as an output dataset. Common geoprocessing operations include geographic feature overlay, feature selection and analysis, topology processing, raster processing, and data conversion. Geoprocessing allows for definition, management, and analysis of information used to form decisions.[Wade, T. and Sommer, S. eds. A to Z GIS]. Geoprocessing may be done locally or remotely on a server (typically trhough the web or a network).

This document defines geoprocesses at the generic level which may be implemented by any version of OGC WPS standard or eventually another geoprocessing API.

2. Scope

*(Mandatory)*

This document defines geoprocesses at the generic level which may be implemented by any version of OGC WPS standard or eventually another geoprocessing API. Following geoprocesses are defined:

* elevation analysis,
* distance measurement,
* range rings,
* viewshed analysis,
* slope analysis,
* helicopter landing zone,
* routing,
* geopackage creation.

3. Conformance

*(Mandatory for standards)*

3.1. Conformance classes

This document establishes 9 conformance classe(s):

* DGIWG process,
* DGIWG process profile for elevation analysis,
* DGIWG process profile for distance measurement,
* DGIWG process profile for range rings,
* DGIWG process profile for viewshed analysis,
* DGIWG process profile for slope analysis,
* DGIWG process profile for helicopter landing zone,
* DGIWG process profile for routing,
* DGIWG process profile for geopackage creation.

***"DGIWG process"*** class define requirements for defining generic process description

***"DGIWG process profile for X"*** classes define generic process profiles according to "DGIWG process" conformance class. Process profiles are blueprints for process implementations and are meant to harmonize process implementations to a certain degree. They serve as a reference for process implementations by providing a description of what the process actually does. These are defined at a generic level, meaning, these processes profiles may be implemented by OGC WPS standards (versions 1 or 2) or possibly other geoprocessing APIs. [Abstract Test Suite](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#AbstractTestSuite) lists the conformance abstract tests which shall be exercised on process profiles claiming to implement these conformance classes.

| **Table 1. Conformance classes** | | | |
| --- | --- | --- | --- |
| **Conformance class name** | **Operation or behavior** | **OGC WPS Conformance Test** | **DGIWG WPS Conformance Test** |
| DGIWG process <http://www.dgiwg.org/std/geoprocessing/1.0/conf/process> | DGIWG requirements 1 to 4 | - | [*DGIWG process* (Conformance Class)](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#cc_dgiwg_process) |
| DGIWG process profile for elevation analysis <http://www.dgiwg.org/std/geoprocessing/1.0/conf/process-elevationAnalysis> | DGIWG requirement 5 | - | [*DGIWG process profile for elevation analysis* (Conformance Class)](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#cc_dgiwg_process_elevation_analysis) |
| DGIWG process profile for distance measurement <http://www.dgiwg.org/std/geoprocessing/1.0/conf/process-distanceMeasurement> | DGIWG requirement 6 | - | Annex A.2.2 |
| DGIWG process profile for range rings <http://www.dgiwg.org/std/geoprocessing/1.0/conf/process-rangeRings> | DGIWG requirement 7 | - | Annex A.2.3 |
| DGIWG process profile for viewshed analysis <http://www.dgiwg.org/std/geoprocessing/1.0/conf/process-viewshedAnalysis> | DGIWG requirement 8 | - | Annex A.2.4 |
| DGIWG process profile for slope analysis <http://www.dgiwg.org/std/geoprocessing/1.0/conf/process-slopeAnalysis> | DGIWG requirement 9 | - | Annex A.2.5 |
| DGIWG process profile for helicopter landing zone <http://www.dgiwg.org/std/geoprocessing/1.0/conf/process-hlz> | DGIWG requirement 10 | - | Annex A.2.6 |
| DGIWG process profile for routing <http://www.dgiwg.org/std/geoprocessing/1.0/conf/process-routing> | DGIWG requirement 11 | - | Annex A.2.7 |
| DGIWG process profile for geopackage creation <http://www.dgiwg.org/std/geoprocessing/1.0/conf/process-geopackageCreation> | DGIWG requirement 12 | - | Annex A.2.8 |

|  |  |
| --- | --- |
|  | table to be updated accordingly to processes description |

3.2. Backward compatibility

This is the first version of the DGIWG processes description.

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: Application Package Engineering Report | OGC 18-049 | r1 |
| OGC® Testbed-14: WPS-T Engineering Report | OGC 18-036 | r1 |
| OGC® Testbed-14: ADES & EMS Results and Best Practices Engineering Report | OGC 18-050 | r1 |
| OGC® Testbed-15: Catalogue and Discovery Engineering Report | OGC 19-020 | r1 |
| OGC® Testbed-15: Delta Updates Engineering Report | OGC 19-012 | r1 |
| OGC® Testbed-15: Federated Clouds Analytics Engineering Report | OGC 19-026 | - |
| OGC® Testbed-15: Machine Learning Engineering Report | OGC 19-027 | r2 |

5. Terms, definitions, and abbreviations

*(As applicable)*

5.1. Definitions

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

5.2. Abrevations

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

6. DGIWG Process (Normative)

6.1. Introduction

This chapter defines normative requirements to implement "DGIWG process" class.

6.2. 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\processes_std\std.html#dgiwg_process_req).

| **Table 2. DGIWG process Normative Requirements** | | |
| --- | --- | --- |
| **No.** | **Requirement** | **Compliance** |
| 1 | a DGIWG generic process profile shall satisfy requirements from <http://www.opengis.net/spec/WPS/2.0/req/native-process/model/profile/generic> ([[OGC-WPS-2.0]](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#OGC-WPS-2.0)) requirement class. | M |
| 2 | a DGIWG generic process profile shall additionally provide elements according to [Table 5](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#dgiwg_process_req2) for the description of a DGIWG generic process. | M |
| 3 | a DGIWG generic process profile shall additionally provide elements according to [Table 6](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#dgiwg_process_req3) for the description of input/output parameters. | M |
| 4 | a DGIWG generic process profile shall be documented using template provided in [DGIWG process template](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#DGIWGProcessTemplate). | M |

6.3. Non-Normative Recommendations for Implementation

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

| **Table 3. DGIWG process Non-normative Recommendations for DGIWG processes.** | | |
| --- | --- | --- |
| **No.** | **Recommendation** | **Compliance** |
| 1 | a DGIWG generic process profile should also be documented in XML as a valid wps:GenericProcess from <http://schemas.opengis.net/wps/2.0>. | O |

6.4. General

While this document definitions and requirements may be used by any geoprocessing implementation, OGC WPS 2.0 specification ([[OGC-WPS-2.0]](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#OGC-WPS-2.0)) provides a mechanism to define common processing functionality. Aiming at harmonization, the definitions of process profiles may be used to foster a common understanding of widely used processing functions. However, they may also be used to harmonize the technical details of process interfaces and thus document particular interoperability arrangements between process providers and consumers.

A process profile is a description of a process on an interface level. Process profiles may have different levels of abstraction and cover several aspects. On a generic level, a process profile may only refer to the provided functionality of a process, i.e. by giving a verbal or formal definition how the outputs are derived from the inputs. On a concrete level a process profile may completely define inputs and outputs including data type definitions and formats. This document specifies requirement to develop process profiles at a generic level.

Figure below provides an UML description of the generic process model. .Generic process model (source [[OGC-WPS-2.0]](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#OGC-WPS-2.0)) image::./images/GenericProcess.png[WPS\_GenericProcess,align=center]

***Requirement 1: a DGIWG generic process profile shall satisfy requirements from***[***http://www.opengis.net/spec/WPS/2.0/req/native-process/model/profile/generic***](http://www.opengis.net/spec/WPS/2.0/req/native-process/model/profile/generic)***(***[***[OGC-WPS-2.0]***](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#OGC-WPS-2.0)***) requirement class.***

For convenience, detailed requirement from [[OGC-WPS-2.0]](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#OGC-WPS-2.0) are repeated below:

|  |  |
| --- | --- |
| **Table 4. WPS 2.0 requirements for generic profile requirement class (**[**http://www.opengis.net/spec/WPS/2.0/req/native-process/model/profile/generic**](http://www.opengis.net/spec/WPS/2.0/req/native-process/model/profile/generic)**)** | |
| Requirement | <http://www.opengis.net/spec/WPS/2.0/req/native-process/model/profile/generic/structure> A process description shall comply with the structure defined in Figure 13 and Table 18. |
| Requirement | <http://www.opengis.net/spec/WPS/2.0/req/native-process/model/profile/generic/description-language> The language of the human-readable elements within the process description shall be identified by a language identifier as specified in IETF RFC 4646. |
| Requirement | <http://www.opengis.net/spec/WPS/2.0/req/native-process/model/profile/generic/io-description-type> The description of process inputs and outputs shall comply with the structure defined in Figure 13, Table 19, and Table 20. |

***Requirement 2: a DGIWG generic process profile shall additionally provide elements according to***[***Table 5***](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#dgiwg_process_req2)***for the description of a DGIWG generic process.***

| **Table 5. DGIWG generic process structure (edited from Table 18**[**[OGC-WPS-2.0]**](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#OGC-WPS-2.0)**)** | | | | |
| --- | --- | --- | --- | --- |
| **Name** | **Definition** | **Data type and Values** | **Multiplicity and use** | **DGIWG** |
| Title | Title of the process, input, and output. Normally available for display to a human. | ows:Title | One (mandatory) | No channge |
| Abstract | Brief narrative description of a process, input, and output. Normally available for display to a human. | ows:Abstract | Zero or one (optional) Include when available and useful. | One (mandatory) |
| Keywords | Keywords that characterize a process, its inputs, and outputs. | ows:Keywords | Zero or more (optional) Include when available and useful. | Mandatory (at least one) |
| Identifier | Unambiguous identifier of a process, input, and output. | ows:Identifier Value is a URI or HTTP-URI a | One (mandatory) | HTTP-URI shall be defined with following template [http://www.dgiwg.org/service/processing/process/{process-name}](http://www.dgiwg.org/service/processing/process/%7bprocess-name%7d). |
| Metadata | Reference to additional metadata about this item. | ows:Metadata Allowed values are specified in Table 5. | Zero or more (optional) | It is recommended to provide metadata on the process profile. |
| Language | Language identifier for the human readable process description elements. | Character String. This language identifier shall be as specified in IETF RFC 4646. | One (mandatory) | English is mandatory in a coalition implementation (en-GB) |
| Input | Input items (arguments) of a process. | GenericInput structure, see Table 167. | Zero or more (optional) | no change |
| Output | Output items (results) of a process | GenericOutput structure, see Table 178. | One or more (mandatory) | no change |

***Requirement 3: a DGIWG generic process profile shall additionaly provide elements according to***[***Table 6***](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#dgiwg_process_req3)***for the description of input/output parameters.***

| **Table 6. Parts of the GenericInput structure (edited from Table 19 and Table 20**[**[OGC-WPS-2.0]**](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#OGC-WPS-2.0)**)** | | | | |
| --- | --- | --- | --- | --- |
| **Name** | **Definition** | **Data type and Values** | **Multiplicity and use** | **DGIWG** |
| Title | Title of the process, input, and output. Normally available for display to a human. | ows:Title | One (mandatory) | No change |
| Abstract | Brief narrative description of a process, input, and output. Normally available for display to a human. | ows:Abstract | Zero or one (optional) Include when available and useful. | One (mandatory) |
| Keywords | Keywords that characterize a process, its inputs, and outputs. | ows:Keywords | Zero or more (optional) Include when available and useful. | Mandatory (at least one) |
| Identifier | Unambiguous identifier of a process, input, and output. | ows:Identifier Value is a URI or HTTP-URI a | One (mandatory) | HTTP-URI shall be defined with following template [http://www.dgiwg.org/service/processing/parameter/{parameter-name}](http://www.dgiwg.org/service/processing/parameter/%7bparameter-name%7d) or just parameter name ?. |
| Metadata | Reference to additional metadata about this item. | ows:Metadata Allowed values are specified in Table 5. | Zero or more (optional) | It is recommended to provide metatatda on the process profile. |
| minOccurs | Minimum number of times that values for this parameter are required. | Non-negative integer; defaults to “1”, ‘0’ means the input is optional. | Zero or one (optional) | no change |
| maxOccurs | Maximum number of times that this parameter may be present. | Non-negative integer, defaults to “1”. | Zero or more (optional) | no change |
| Input | Nested Input. | GenericInput structure, Table 19 (this table). | Zero or more (optional) | no change |

***Requirement 4: a DGIWG generic process profile shall be documented using template provided in***[***DGIWG process template***](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#DGIWGProcessTemplate)***.***

***Recommendation 1: a DGIWG generic process profile should also be documented in XML as a valid wps:GenericProcess from***[***http://schemas.opengis.net/wps/2.0***](http://schemas.opengis.net/wps/2.0)***.***

|  |  |
| --- | --- |
|  | TBD what king of ows:metadata ? recomandation for registering profile on DGIWG website/registry discussion |

7. DGIWG Processes Description (Normative)

7.1. Introduction

This chapter defines DGIWG processes at a generic level. These definitions are conformant to ***"DGIWG process"*** conformance class; they may be implemented through WPS or other APIs. Following DGIWG processes are described below:

* elevation analysis
* distance measurement
* range rings
* viewshed analysis
* slope analysis
* helicopter landing zone
* geocoding
* routing
* geopackage creation

7.2. Normative requirements

The Normative requirements requested by this conformance class are summarized in [Table 7](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#dgiwg_process_profiles_req).

| **Table 7. DGIWG process profiles Normative Requirements** | | |
| --- | --- | --- |
| **No.** | **Requirement** | **Compliance** |
| 5 | a DGIWG process for elevation analysis shall implement a process description accordingly to parameters defined in [Elevation analysis](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#_elevation_analysis). | M |
| 6 | a DGIWG process for distance measurement shall implement a process description accordingly to parameters defined in [Distance measurement](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#_distance_measurement). | M |
| 7 | a DGIWG process for range rings shall implement a process description accordingly to parameters defined in [Range rings](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#_range_rings). | M |
| 8 | a DGIWG process for viewshed analysis shall implement a process description accordingly to parameters defined in [Viewshed analysis](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#_viewshed_analysis). | M |
| 9 | a DGIWG process for slope analysis shall implement a process description accordingly to parameters defined in [Slope analysis](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#_slope_analysis). | M |
| 10 | a DGIWG process for helicopter landing zone shall implement a process description accordingly to parameters defined in [Helicopter Landing Zone](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#_helicopter_landing_zone). | M |
| 11 | a DGIWG process for routing shall implement a process description accordingly to parameters defined in [Routing](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#_routing). | M |
| 12 | a DGIWG process for routing shall implement a process description accordingly to parameters defined in [Geopackage creation](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#_geopackage_creation). | M |

7.3. Elevation analysis

***Requirement 5: a DGIWG process for elevation analysis shall implement a process description accordingly to parameters defined in***[***Elevation analysis***](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#_elevation_analysis)***.***

7.3.1. Generic process: Elevation analysis

  Identifier http://www.dgiwg.org/service/processing/process/elevationanalysis

  Title Elevation analysis

  Keywords elevation, analysis, highest point, lowest point

  Abstract It provides lowest and highest point(s) on a given area.

  Metadata

Input: Area of interest

  Identifier aoi

  Title Area of interest

  Keywords

  Abstract Area of interest where a process will be executed. This could be a BBOX, a polygon, or any surface geometry.. (GM\_Surface)

  Metadata

  Multiplicity 1

Input: Elevation data

  Identifier elavation\_data

  Title Elevation data

  Keywords elevation, height, Digital Surface Model, Digital Elevation Model

  Abstract Digital representation of the earth's surface. Elevation data on which the process will be executed. It may be internal data (with a choice for the users) or data provided by the user itself (URI, external service, …).

  Metadata

  Multiplicity 0..1

Input: Choice of highest or lowest points

  Identifier analysis\_type

  Title Choice of highest or lowest points

  Keywords

  Abstract Information providing if highest or lowest.

  Metadata

  Multiplicity 1

Output: Highest or lowest points

  Identifier result\_points

  Title Highest or lowest points

  Keywords

  Abstract Highest or lowest points returned by the process on the provided area of interest. This may also contain metadata describing the data sources used, the vertical CRS of the result.

  Metadata

7.3.2. Process implementation : elevation analysis

Find below a WPS 2.0 example of the elevation analysis generic process profile.

**elevationAnalysis.xml**

<?xml version="1.0" encoding="UTF-8"?>

<wps:GenericProcess

xmlns:ows="http://www.opengis.net/ows/2.0"

xmlns:wps="http://www.opengis.net/wps/2.0"

xmlns:xlink="http://www.w3.org/1999/xlink"

xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

xsi:schemaLocation="http://www.opengis.net/wps/2.0 http://schemas.opengis.net/wps/2.0/wps.xsd">

<ows:Title>Elevation analysis</ows:Title>

<ows:Abstract>It provides lowest and highest point(s) on a given area.</ows:Abstract>

<ows:Keywords>

<ows:Keyword>elevation</ows:Keyword>

<ows:Keyword>analysis</ows:Keyword>

<ows:Keyword>highest point</ows:Keyword>

<ows:Keyword>lowest point</ows:Keyword>

</ows:Keywords>

<ows:Identifier>http://www.dgiwg.org/service/processing/process/elevationanalysis</ows:Identifier>

*<!--*

*HTML page providing human readable description of the generic profile with examples.*

*-->*

<ows:Metadata xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation" xlink:href="http://www.dgiwg.org/service/processing/process/elevationanalysis.html"/>

<ows:Metadata xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation" xlink:href="generic\_processes/elevationAnalysis.html"/>

<wps:Input>

<ows:Title>Area of interest</ows:Title>

<ows:Abstract>Area of interest where a process will be executed. This could be a BBOX, a polygon, or any surface geometry (GM\_Surface).</ows:Abstract>

<ows:Identifier>aoi</ows:Identifier>

<ows:Metadata xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation" xlink:href="http://www.dgiwg.org/service/processing/process/elevationanalysis.html#aoi"/>

</wps:Input>

<wps:Input>

<ows:Title>Elevation data</ows:Title>

<ows:Abstract>Digital representation of the earth's surface. Elevation data on which the process will be executed. It may be internal data (with a choice for the users) or data provided by the user itself (URI, external service, …).</ows:Abstract>

<ows:Keywords>

<ows:Keyword>elevation</ows:Keyword>

<ows:Keyword>height</ows:Keyword>

<ows:Keyword>Digital Surface Model</ows:Keyword>

<ows:Keyword>Digital Elevation Model</ows:Keyword>

</ows:Keywords>

<ows:Identifier>elevationData</ows:Identifier>

<ows:Metadata xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation" xlink:href="http://www.dgiwg.org/service/processing/process/elevationanalysis.html#elevationData"/>

</wps:Input>

<wps:Input>

<ows:Title>Choice of highest or lowest points</ows:Title>

<ows:Abstract>Parameter indicating wether lowest points or highest points are requested.</ows:Abstract>

<ows:Identifier>analysis\_type</ows:Identifier>

<ows:Metadata xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation" xlink:href="http://www.dgiwg.org/service/processing/process/elevationanalysis.html#analysis\_type"/>

</wps:Input>

<wps:Output>

<ows:Title>Highest or lowest points</ows:Title>

<ows:Abstract>Highest or lowest points returned by the process on the provided area of interest. This may also contain metadata describing the data sources used, the vertical CRS of the result.</ows:Abstract>

<ows:Identifier>result\_points</ows:Identifier>

<ows:Metadata xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation" xlink:href="http://www.dgiwg.org/service/processing/process/elevationanalysis.html#result\_points"/>

</wps:Output>

</wps:GenericProcess>

7.4. Distance measurement

***Requirement 6: a DGIWG process for distance measurement shall implement a process description accordingly to parameters defined in***[***Distance measurement***](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#_distance_measurement)***.***

7.4.1. Generic process: Distance measurement

  Identifier http://www.dgiwg.org/service/processing/process/distancemeasurement

  Title Distance measurement

  Keywords distance

  Abstract It provides the distance between two or more points.

  Metadata

Input: List of points

  Identifier points\_list

  Title List of points

  Keywords

  Abstract List of two or more points in a given CRS. CRS may be 2D or 3D (with Z or height information).

  Metadata

  Multiplicity 1

Input: Method of measurement

  Identifier measurement\_method

  Title Method of measurement

  Keywords

  Abstract Method of measurement to be used for the calculation (for example euclidean, geodesic, …). This could include Z coordinate (or height above elispoid).

  Metadata

  Multiplicity 0..1

Input: Unit of measure

  Identifier uom

  Title Unit of measure

  Keywords

  Abstract Unit of measure for the measured distance(s) to be returned.

  Metadata

  Multiplicity 1

Output: Distance results

  Identifier distance\_results

  Title Distance results

  Keywords

  Abstract Result set containing individual distance between each point pair and/or the sum. This should include uom.

  Metadata

Process implementation : distance measurement

Find below a WPS 2.0 example of the distance measurement generic process profile.

**distanceMeasurement.xml**

<?xml version="1.0" encoding="UTF-8"?>

<wps:GenericProcess xmlns:ows="http://www.opengis.net/ows/2.0" xmlns:wps="http://www.opengis.net/wps/2.0" xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.opengis.net/wps/2.0 http://schemas.opengis.net/wps/2.0/wps.xsd">

<ows:Title xml:lang="en-GB">Distance measurement</ows:Title>

<ows:Abstract>It provides the distance between two or more points.</ows:Abstract>

<ows:Keywords>

<ows:Keyword xml:lang="en-GB">distance</ows:Keyword>

</ows:Keywords>

<ows:Identifier>http://www.dgiwg.org/service/processing/process/distancemeasurement</ows:Identifier>

*<!--*

*HTML page providing human readable description of the generic profile with examples.*

*-->*

<ows:Metadata xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation" xlink:href="http://www.dgiwg.org/service/processing/process/distancemeasurement.html"/>

<ows:Metadata xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation" xlink:href="generic\_processes/distanceMeasurement.html"/>

<wps:Input>

<ows:Title xml:lang="en-GB">List of points</ows:Title>

<ows:Abstract xml:lang="en-GB">List of two or more points in a given CRS. CRS may be 2D or 3D (with Z or height information).</ows:Abstract>

<ows:Identifier>points\_list</ows:Identifier>

<ows:Metadata xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation" xlink:href="http://www.dgiwg.org/service/processing/process/elevationanalysis.html#points\_list"/>

</wps:Input>

<wps:Input>

<ows:Title xml:lang="en-GB">Method of measurement</ows:Title>

<ows:Abstract xml:lang="en-GB">Method of measurement to be used for the calculation (for example euclidean, geodesic, …). This could include Z coordinate (or height above elispoid).</ows:Abstract>

<ows:Identifier>measurement\_method</ows:Identifier>

<ows:Metadata xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation" xlink:href="http://www.dgiwg.org/service/processing/process/elevationanalysis.html#measurement\_method"/>

</wps:Input>

<wps:Input>

<ows:Title xml:lang="en-GB">Unit of measure</ows:Title>

<ows:Abstract xml:lang="en-GB">Unit of measure for the measured distance(s) to be returned.</ows:Abstract>

<ows:Identifier>uom</ows:Identifier>

<ows:Metadata xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation" xlink:href="http://www.dgiwg.org/service/processing/process/elevationanalysis.html#uom"/>

</wps:Input>

<wps:Output>

<ows:Title xml:lang="en-GB">Distance results</ows:Title>

<ows:Abstract xml:lang="en-GB">Result set containing indivual distance between each point pair and/or the sum. This should include uom..</ows:Abstract>

<ows:Identifier>distance\_results</ows:Identifier>

<ows:Metadata xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation" xlink:href="http://www.dgiwg.org/service/processing/process/elevationanalysis.html#distance\_results"/>

</wps:Output>

</wps:GenericProcess>

7.5. Range rings

***Requirement 7: a DGIWG process for range rings shall implement a process description accordingly to parameters defined in***[***Range rings***](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#_range_rings)***.***

7.5.1. Generic process : Range rings

  Identifier http://www.dgiwg.org/service/processing/process/rangerings

  Title Range rings analysis

  Keywords radius, range

  Abstract It creates ranges rings. Two methods are proposed, either by providing a list of radius values (radius\_value), or by providing a number of rings (rings\_nb) and an equal spacing (rings\_spacing). Radials may be added (radials\_nb) to divide range rings into sectors.

  Metadata

Input: A center point

  Identifier center\_point

  Title A center point

  Keywords

  Abstract A center point from which the rings will be defined in a given CRS.

  Metadata

  Multiplicity 1

Input: Radius value(s)

  Identifier radius\_value

  Title Radius value(s)

  Keywords radius

  Abstract One or more radius value(s) with UOM defining the range(s) around the center point.

  Metadata

  Multiplicity 0..n

Input: Number of rings

  Identifier rings\_nb

  Title Number of rings

  Keywords

  Abstract The number of ring(s) around the center points, with an equal space (rings\_spacing).

  Metadata

  Multiplicity 0..1

Input: Spacing between rings

  Identifier rings\_spacing

  Title Spacing between rings

  Keywords

  Abstract The spacing with UOM that is used to create ring\_nb ring(s).

  Metadata

  Multiplicity 0..1

Input: Number of radials

  Identifier radials\_nb

  Title Number of radials

  Keywords

  Abstract The number of the radials dividing the range rings into sectors.

  Metadata

  Multiplicity 0..1

Output: Range rings

  Identifier range\_rings

  Title Range rings

  Keywords

  Abstract A geometry representing the created range rings and optional radials.

  Metadata

7.5.2. Process implementation : range rings

Find below a WPS 2.0 example of the range rings generic process profile.

**rangeRings.xml**

<?xml version="1.0" encoding="UTF-8"?>

<wps:GenericProcess

xmlns:ows="http://www.opengis.net/ows/2.0"

xmlns:wps="http://www.opengis.net/wps/2.0"

xmlns:xlink="http://www.w3.org/1999/xlink"

xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

xsi:schemaLocation="http://www.opengis.net/wps/2.0 http://schemas.opengis.net/wps/2.0/wps.xsd">

<ows:Title>Range rings analysis</ows:Title>

<ows:Abstract>It creates ranges rings. Two methods are proposed, either by providing a list of radius values (radius\_value), or by providing a number of rings (rings\_nb) and an equal spacing (rings\_spacing). Radials may be added (radials\_nb) to divide range rings into sectors.</ows:Abstract>

<ows:Keywords>

<ows:Keyword>radius</ows:Keyword>

<ows:Keyword>range</ows:Keyword>

</ows:Keywords>

<ows:Identifier>http://www.dgiwg.org/service/processing/process/rangerings</ows:Identifier>

*<!--*

*HTML page providing human readable description of the generic profile with examples.*

*-->*

<ows:Metadata xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation" xlink:href="http://www.dgiwg.org/service/processing/process/rangerings.html"/>

<ows:Metadata xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation" xlink:href="generic\_processes/rangeRings.html"/>

<wps:Input>

<ows:Title>A center point</ows:Title>

<ows:Abstract>A center point from which the rings will be defined in a given CRS.</ows:Abstract>

<ows:Identifier>center\_point</ows:Identifier>

<ows:Metadata xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation" xlink:href="http://www.dgiwg.org/service/processing/process/rangerings.html#center\_point"/>

</wps:Input>

<wps:Input>

<ows:Title>Radius value(s)</ows:Title>

<ows:Abstract>One or more radius value(s) with UOM defining the range(s) around the center point.</ows:Abstract>

<ows:Keywords>

<ows:Keyword>radius</ows:Keyword>

</ows:Keywords>

<ows:Identifier>radius\_value</ows:Identifier>

<ows:Metadata xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation" xlink:href="http://www.dgiwg.org/service/processing/process/rangerings.html#radius\_value"/>

</wps:Input>

<wps:Input>

<ows:Title>Number of rings</ows:Title>

<ows:Abstract>The number of ring(s) around the center points, with an equal space (rings\_spacing).</ows:Abstract>

<ows:Identifier>rings\_nb</ows:Identifier>

<ows:Metadata xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation" xlink:href="http://www.dgiwg.org/service/processing/process/rangerings.html#rings\_nb"/>

</wps:Input>

<wps:Input>

<ows:Title>Spacing between rings</ows:Title>

<ows:Abstract>The spacing with UOM that is used to create ring\_nb ring(s).</ows:Abstract>

<ows:Identifier>rings\_spacing</ows:Identifier>

<ows:Metadata xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation" xlink:href="http://www.dgiwg.org/service/processing/process/rangerings.html#rings\_spacing"/>

</wps:Input>

<wps:Input>

<ows:Title>Number of radials</ows:Title>

<ows:Abstract>The number of the radials dividing the range rings into sectors.</ows:Abstract>

<ows:Identifier>radials\_nb</ows:Identifier>

<ows:Metadata xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation" xlink:href="http://www.dgiwg.org/service/processing/process/rangerings.html#radials\_nb"/>

</wps:Input>

<wps:Output>

<ows:Title>Range rings</ows:Title>

<ows:Abstract> A geometry representing the created range rings and optional radials.</ows:Abstract>

<ows:Identifier>range\_rings</ows:Identifier>

<ows:Metadata xlink:role="http://www.opengis.net/spec/wps/2.0/def/process/description/documentation" xlink:href="http://www.dgiwg.org/service/processing/process/elevationanalysis.html#result\_points"/>

</wps:Output>

</wps:GenericProcess>

7.6. Viewshed analysis

***Requirement 8: a DGIWG process for viewshed analysis shall implement a process description accordingly to parameters defined in***[***Viewshed analysis***](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#_viewshed_analysis)***.***

7.6.1. Generic process : Viewshed analysis

  Identifier http://www.dgiwg.org/service/processing/process/viewshed

  Title Viewshed analysis

  Keywords visibility, sight

  Abstract Visibility of one observer around him (at 360°)

  Metadata

Input: Elevation data

  Identifier elavation\_data

  Title Elevation data

  Keywords elevation, height, Digital Surface Model, Digital Elevation Model

  Abstract Digital representation of the earth's surface. Elevation data on which the process will be executed. It may be internal data (with a choice for the users) or data provided by the user itself (URI, external service, …).

  Metadata

  Multiplicity 0..1

  Data format raster, tif

Input: Marker/point(s) denoting observer(s)

  Identifier observer\_position

  Title Marker/point(s) denoting observer(s)

  Keywords observer

  Abstract Marker/point(s) in a given CRS.

  Metadata

  Multiplicity 1

Input: Height of observer

  Identifier observer\_height

  Title Height of observer

  Keywords observer, height

  Abstract Eye-level height of observer(s).

  Metadata

  Multiplicity 1

Input: Line of sight target

  Identifier target\_height

  Title Line of sight target

  Keywords observer, height, target

  Abstract Height of observable objects

  Metadata

  Multiplicity 1

Input: Line of sight distance

  Identifier viewshed\_distance

  Title Line of sight distance

  Keywords observer, distance, target

  Abstract Limit of viewshed analysis

  Metadata

  Multiplicity 1

Input: Earth curvature

  Identifier earth\_curvature

  Title Earth curvature

  Keywords curvature

  Abstract Whether earth curvature shall be taken into account or not.

  Metadata

  Multiplicity 0..1

Input: Atmosphere refraction

  Identifier Athm\_refraction

  Title Atmosphere refraction

  Keywords refraction

  Abstract Whether Athmosphere refraction shall be taken into account or not.

  Metadata

  Multiplicity 0..1

Output: Viewshed results

  Identifier viewshed\_results

  Title Viewshed results

  Keywords

  Abstract The unimpeded view or access from one point to another point across a terrain or surface. Compound line of sight results in areas visible by multiple observers.

  Metadata

7.7. Slope analysis

***Requirement 9: a DGIWG process for slope analysis shall implement a process description accordingly to parameters defined in***[***Slope analysis***](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#_slope_analysis)***.***

7.7.1. Generic process : Slope analysis

  Identifier http://www.dgiwg.org/service/processing/process/slope

  Title Slope analysis

  Keywords slope

  Abstract Calculates the slope on a given area of interest. Slope may be percentage or angle in degrees. Result is a raster coverage.

  Metadata

Input: Area of interest

  Identifier aoi

  Title Area of interest

  Keywords

  Abstract Area of interest where a process will be executed. This could be a BBOX, a polygon, or any surface geometry.. (GM\_Surface)

  Metadata

  Multiplicity 1

Input: Elevation data

  Identifier elavation\_data

  Title Elevation data

  Keywords elevation, height, Digital Surface Model, Digital Elevation Model

  Abstract Digital representation of the earth's surface. Elevation data on which the process will be executed. It may be internal data (with a choice for the users) or data provided by the user itself (URI, external service, …).

  Metadata

  Multiplicity 0..1

Input: Slope units

  Identifier slope\_units

  Title Slope units

  Keywords slope, units, degrees, percentage

  Abstract Units to be used for the slope measurement.

  Metadata

  Multiplicity 1

Output: Slope analysis results

  Identifier slope\_results

  Title Slope analysis results

  Keywords slope, analysis

  Abstract Slope (in degrees or percentage) calculated by the analysis representing the steepness of each cell. This may also contain metadata describing the data sources and the units used.

  Metadata

7.8. Helicopter Landing Zone

***Requirement 10: a DGIWG process for helicopter landing zone shall implement a process description accordingly to parameters defined in***[***Helicopter Landing Zone***](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#_helicopter_landing_zone)***.***

7.8.1. Generic process : Helicopter landing zone

  Identifier http://www.dgiwg.org/service/processing/process/hlz

  Title Helicopter landing zone

  Keywords helicopter, landing zone, slope, obstacle

  Abstract Helicopter landing zones contain one or more helicopter landing sites.

  Metadata

Input: Elevation data

  Identifier elevation\_data

  Title Elevation data

  Keywords elevation, height, Digital Surface Model, Digital Elevation Model

  Abstract Digital representation of the earth's surface. Elevation data on which the process will be executed. It may be internal data (with a choice for the users) or data provided by the user itself (URI, external service, …).

  Metadata

  Multiplicity 0..1

Input: Land cover

  Identifier land\_cover

  Title Land cover

  Keywords land, cover, vegetation, water, brush;

  Abstract General land cover and vegetation types over areas of land, including water.

  Metadata

  Multiplicity 0..1

Input: Maximum slope tolerance

  Identifier max\_slope\_tolerance

  Title Maximum slope tolerance

  Keywords slope, units

  Abstract The maximum slope tolerance with units (degrees or percentage).

  Metadata

  Multiplicity 1

Input: Minimum radius

  Identifier min\_radius

  Title Minimum radius

  Keywords radius

  Abstract The minimum necessary radius of landing zone, based on aircraft used. See aircraft specs or operational guidance.

  Metadata

  Multiplicity 1

Input: Surface obstructions height tolerance

  Identifier height\_tolerance

  Title Surface obstructions height tolerance

  Keywords z value, obstacle

  Abstract Maximum size object suitable in HLZ with UOM ; ground clearance of aircraft.

  Metadata

  Multiplicity 1

Output: HLZ analysis results

  Identifier hlz\_results

  Title HLZ analysis results

  Keywords

  Abstract A coverage depicting zones large enough for a helicopter to land and take off.

  Metadata

7.9. Routing

***Requirement 11: a DGIWG process for routing shall implement a process description accordingly to parameters defined in***[***Routing***](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#_routing)***.***

7.9.1. Generic process : Routing

|  |  |
| --- | --- |
|  | consistent with OGC routing API pilot <https://app.swaggerhub.com/apis/cportele/wps-routing-api/1.0.0#/Option%20WPS/getProcessDescription> |

  Identifier http://www.dgiwg.org/service/processing/process/routing

  Title Routing

  Keywords route

  Abstract It provides route according specified parameters.

  Metadata

Input: Way points

  Identifier way\_points

  Title Way points

  Keywords

  Abstract A list of points along the route. At least two points have to be provided (start and end point).

  Metadata

  Multiplicity 2..n

Input: Routing preference

  Identifier preference

  Title Routing preference

  Keywords shortest, fastest

  Abstract The routing preference (shortest, fastest or other specific by the service or API). Fastest is the default value.

  Metadata

  Multiplicity 0..1

Input: Maximum height of the vehicle

  Identifier max\_height

  Title Maximum height of the vehicle

  Keywords

  Abstract A height restriction for vehicles in meters to consider when computing the route. Support for this parameter is not required and the parameter may be removed from the API definition.

  Metadata

  Multiplicity 0..1

Input: Maximum weight of the vehicle

  Identifier max\_weight

  Title Maximum weight of the vehicle

  Keywords

  Abstract A weight restriction for vehicles in tons to consider when computing the route. Support for this parameter is not required and the parameter may be removed from the API definition.

  Metadata

  Multiplicity 0..1

Input: Input dataset

  Identifier dataset

  Title Input dataset

  Keywords

  Abstract The source dataset to use for calculating the route.

  Metadata

  Multiplicity 1

Input: Routing engine

  Identifier engine

  Title Routing engine

  Keywords

  Abstract The routing engine to use for calculating the route.

  Metadata

  Multiplicity 0..1

Input: Graph solving algorithm

  Identifier algorithm

  Title Graph solving algorithm

  Keywords

  Abstract The routing / graph solving algorithm to use for calculating the route.

  Metadata

  Multiplicity 0..1

Input: Time of departure or arrival

  Identifier when

  Title Time of departure or arrival

  Keywords

  Abstract The time of departure or arrival. Default is "now".

  Metadata

  Multiplicity 0..1

Input: Departure

  Identifier departure

  Title Departure

  Keywords

  Abstract Specifies whether the value of `when` refers to the time of departure or arrival. Default is departure.

  Metadata

  Multiplicity 0..1

Output: Calculated route

  Identifier route

  Title Calculated route

  Keywords

  Abstract Calculated route according specified parameters.

  Metadata

7.10. Geopackage creation

***Requirement 12: a DGIWG process for geopackage creation shall implement a process description accordingly to parameters defined in***[***Geopackage creation***](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#_geopackage_creation)***.***

7.10.1. Generic process : Geopackage creation

  Identifier http://www.dgiwg.org/service/processing/process/geopackage

  Title Geopackage creation

  Keywords Geopackage, vector, raster, imagery, coverage

  Abstract It provides geopackage file from input data.

  Metadata

Input: Area of interest

  Identifier aoi

  Title Area of interest

  Keywords

  Abstract Area of interest where a process will be executed. This could be a BBOX, a polygon, or any surface geometry.. (GM\_Surface)

  Metadata

  Multiplicity 1

Input: Geopackage name

  Identifier name

  Title Geopackage name

  Keywords

  Abstract Name of the generated geopackage

  Metadata

  Multiplicity 1

Input: Geopackage description

  Identifier description

  Title Geopackage description

  Keywords

  Abstract Description of the generated geopackage

  Metadata

  Multiplicity 0..1

Input: Data sources

  Identifier data\_sources

  Title Data sources

  Keywords tiles, chart maps, imagery, vector, elevation

  Abstract Selection of input data to compute the geopackage file. A same source can contain different layers; desired layers to be package shall be specified in the request.

  Metadata

  Multiplicity 1..n

Output: Geopackage file

  Identifier geopackage

  Title Geopackage file

  Keywords gpkg

  Abstract Generated geopackage file according to input data and provided parameters.

  Metadata

Appendix A: Abstract Test Suite

A.1. *DGIWG process* (Conformance Class)

<http://www.dgiwg.org/std/geoprocessing/1.0/conf/process>

A.1.1. Tests from OGC

|  |  |
| --- | --- |
| Test identifier | <http://www.dgiwg.org/xxx/xxx> |
| Test purpose: | Verify that a DGIWG process is conformant to the [[OGC-WPS-2.0]](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#OGC-WPS-2.0) generic requirement class (<http://www.opengis.net/spec/WPS/2.0/req/native-process/model/profile/generic>) |
| Test method: | Validate DGIWG generic process against OGC tests for <http://www.opengis.net/spec/WPS/2.0/req/native-process/model/profile/generic>. |
| Requirement: | [[Requirement\_1]](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#Requirement_1) |
| Test type: | Capability |

A.1.2. Specific tests

|  |  |
| --- | --- |
| Test identifier | <http://www.dgiwg.org/xxx/xxx> |
| Test purpose: | Verify the mandatory elements to describe a DGIWG process. |
| Test method: | Validate elements against [Table 5](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#dgiwg_process_req2). |
| Requirement: | [[Requirement\_2]](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#Requirement_2) |
| Test type: | Capability |

|  |  |
| --- | --- |
| Test identifier | <http://www.dgiwg.org/xxx/xxx> |
| Test purpose: | Verify the mandatory elements to describe inputs and output of a DGIWG process. |
| Test method: | Validate elements against [Table 6](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#dgiwg_process_req3). |
| Requirement: | [[Requirement\_3]](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#Requirement_3) |
| Test type: | Capability |

|  |  |
| --- | --- |
| Test identifier | <http://www.dgiwg.org/xxx/xxx> |
| Test purpose: | Verify the mandatory elements to describe inputs and output of a DGIWG process. |
| Test method: | Validate elements against table [[dgiwg\_process\_req4]](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#dgiwg_process_req4). |
| Requirement: | [[Requirement\_4]](file:///C:\Users\dsarafinof\Documents\GitHub\DGIWG\P5.05-WPS\processes_std\std.html#Requirement_4) |
| Test type: | Capability |

A.2. *DGIWG process profile for elevation analysis* (Conformance Class)

<http://www.dgiwg.org/std/geoprocessing/1.0/conf/process-elevationAnalysis>

A.3. *DGIWG process profile for distance measurement* (Conformance Class)

<http://www.dgiwg.org/std/geoprocessing/1.0/conf/process-distanceMeasurement>

Appendix B: DGIWG process template

**Generic process: *"process name"***

  Identifier "http-uri of the process"

  Title "process tile"

  Keywords "process keywords"

  Abstract "process abstract"

  Metadata

**Input: "input name" (to be repeated as many a required)**

  Identifier "input name"

  Title "input title"

  Keywords "input keywords"

  Abstract "input abstract"

  Metadata

  Multiplicity N

…​

**Output: *"output name"***

  Identifier "output name"

  Title "output title"

  Keywords "output keywords"

  Abstract "output abstract"

  Metadata

Appendix C: Bibliography

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