European Commission

WCS as Candidate INSPIRE Download Service for Coverage Data

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Context

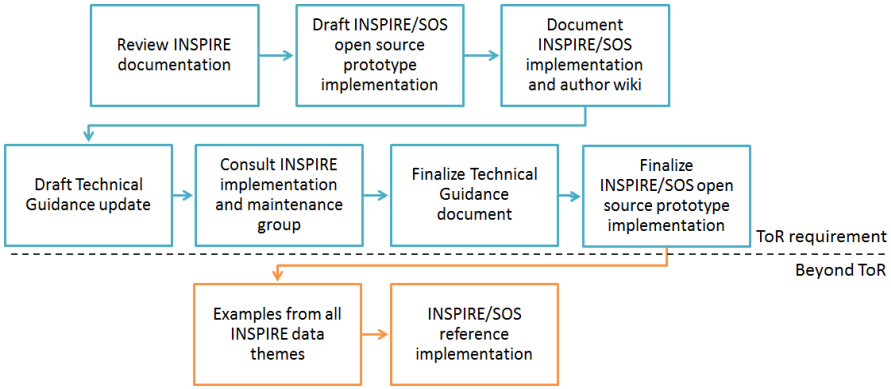
- NS Regulation defines two types of download services
  - Predefined dataset download services (mandatory)
  - Direct access download services (where practicable)
- TG (non-legally binding)
  - How MS 'may' implement INSPIRE download services

Service implementation	Predefined dataset download service	Direct access download service
WFS	X	X
Atom	X	

  - Latest version of the TG (3.1)
    - Candidate extensions: SOS, WCS, TJS
    - What is new?
      - Hybrid implementations

Context

- Are3na project study on SOS
  - TG update and Open Source INSPIRE/SOS Implementation (Are3na)
  - Bundle of:
    - Open Source Software
    - Proposal for an update of the Technical Guidance document for INSPIRE Download services



Service implementation	Predefined dataset download service	Direct access download service
WFS	X	X
Atom	X	
SOS	X	X

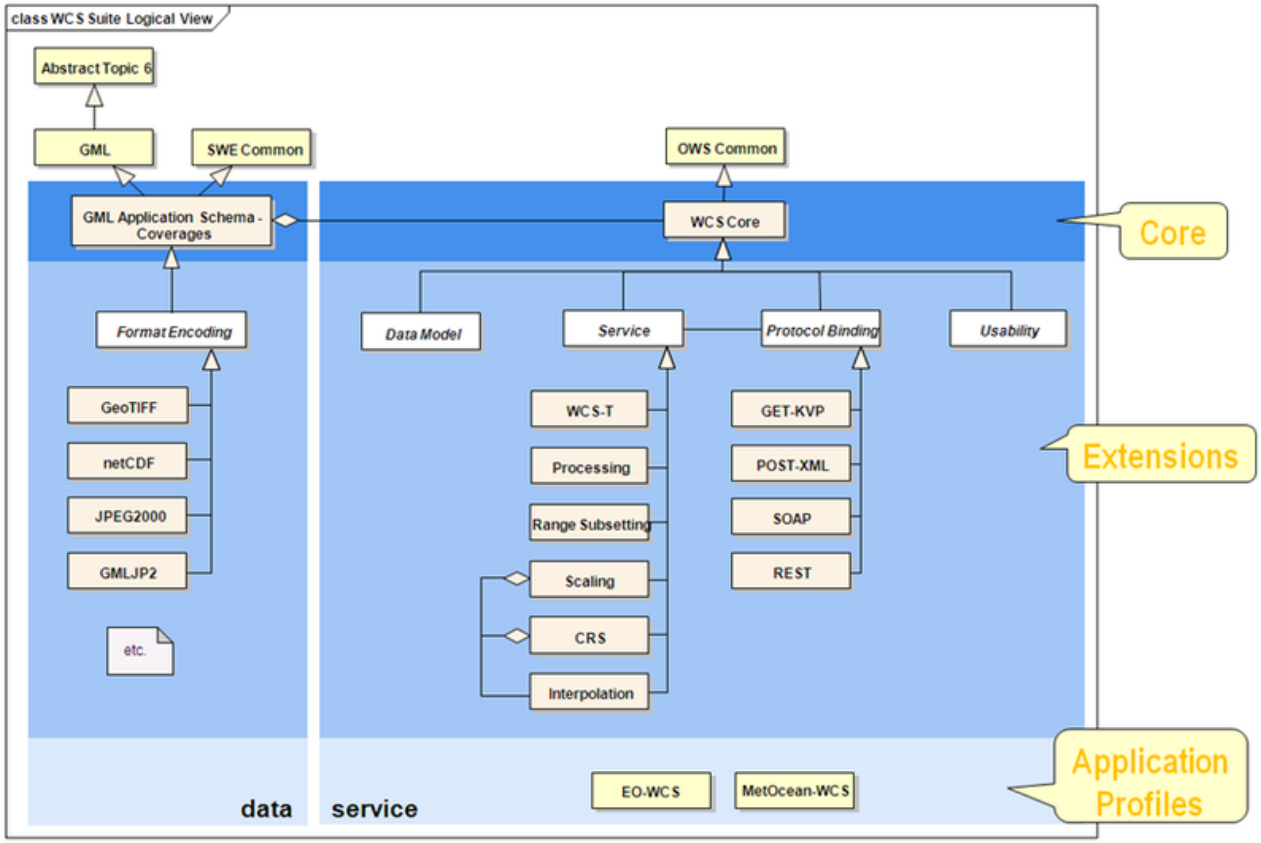
http://inspireaq.jrc.ec.europa.eu/52n-inspire-sos

Study on WCS (July, August 2014)

1. **Study on WCS**, identifying:
   - Maturity of the standard
   - Availability of:
     - clients
     - service implementations
2. **INSPIRE/WCS mapping**

- Following same process as what is done for SOS
  - Bröring et al, 2013
  - Are3na SOS study (with 52North)

Web Coverage Service



Source: OGC

Service implementations

WCS implementation	Description
Rasdaman	Rasdaman is the most mature implementation of the WCS interface standard, with version 2.0.1 of the standard being reflected within the software (both in terms of core and WCS extensions).
Deegree	Deegree is a portal solution providing means for establishment of OGC web services with the perspective of an SDI in mind. The products can be used to establish WCS 1.0.0 services.
EOxServer	EOxServer is a server side open source application which implements WCS 2.0 with the earth observation profile enabled.
MapServer	MapServer is a server side open source application which provides full support of WCS 1.1.1 and earlier, and partial support to WCS 2.0.
ESRI ArcGIS Server	The proprietary ESRI ArcGIS server (9.3 and above) supports WCS versions 1.1.1. and below.
GeoServer	GeoServer is a portal solution which can be used to establish WCS services with supported versions 2.0 and above

WCS clients

WCS client	Description
GDAL	The Geospatial Data Abstraction Library (GDAL) is a widely used open source library which provides support for a huge number of raster formats, used within the geospatial domain. GDAL supports WCS version 1.0.0 only. GDAL acts as a client to WCS through creating a local xml file which contains the coverage server url, together with the name of the requested coverage.
GRASS	The GRASS Desktop GIS inherits from the GDAL library support WCS 1.0.0. Connection to a WCS instance is achieved through GDAL, and the location of the service and the required coverage should be provided within a text file for being called by the r.external command of GRASS.
ESRI ArcGIS Desktop	ESRI ArcGIS Desktop can be used as a client for WCS, supporting version 1.1.2 and below of the standard.
QuantumGIS	The open source desktop QuantumGIS has a native support for WCS 1.0.0 and 1.1.0.

Mapping of WCS to INSPIRE NS Regulation

- **Pre-defined dataset download service operations**

INSPIRE requirement	WCS operations
1. Get Download Service Metadata	*GetCapabilities*
2. Get Spatial Data Set	*GetCoverage*
3. Describe Spatial Data Set	*DescribeCoverage*
4. Link Download Service	xlink

  - The central element of the WCS is the *coverage*, the most suitable approach to complying with Get Spatial Data Set would be to equalize a dataset to a coverage.
  - CRS extension of WCS should be enabled to ensure that coverages are provided in any of the offered coordinate reference systems
  - http://www.inspirewcsserver.eu/wcs?SERVICE=WCS&REQUEST=GetCoverage&COVERAGEID=&Coverage001&**CRS=3035**

Mapping of WCS to INSPIRE NS Regulation

- **Direct access download service operations**

INSPIRE requirement	WCS operations
5. Get Spatial Object	GetCoverage (incl. optional query parameters for subsetting the coverage)
6. Describe Spatial Object Type	GetCapabilities

- The *Get Spatial Object* operation allows the retrieval of spatial objects based upon a query
- The *GetCoverage* operation can be used together with the parameters for subsetting (trim, slice) the offered coverages.

Conclusions

- Lessons learned from work on SOS would make it easier to extend TG
- WCS standard is mature & Implementations are diverse and well supported.
- TG update
  - Extension of WCS GetCapabilities with INSPIRE-specific section
  - TG should be extended to include WCS section
    - Level of complexity of the TG
    - Implications from hybrid solutions (Atom+WCS, SOS+WCS, etc.)

Discussion

- Definition of a spatial object in a coverage dataset?
- How to avoid WCS, SOS, etc. silos?
- Support of WCS version 2.0 and above in client solutions (ex. inherited from GDAL …)?
- Implications of an WCS download service for other types of INSPIRE services (View, Discovery)?
- WCS & WCPS?

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Thank you!

Joint Research Centre