



Implementation and publication of Inspire Download Services, WFS 2.0, and Inspire View Service, WMTS 1.0.0, in CNIG

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Presentation overview

WMS 1.1.0
WFS
WMTS

Tools
Experience

WMS 1.3.0
WFS 2.0

19.10.2009

Commission Regulation (EC) No 976/2009 of 19 October 2009 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards the Network Services



Access to the Network Services

*Not later than **9 November 2011**, Member States shall provide the **Discovery and View Services** in conformity with this Regulation.*

08.12.2010

Commission Regulation amending Regulation (EC) No 976/2009 as regards download services and transformation service



Access to the Network Services

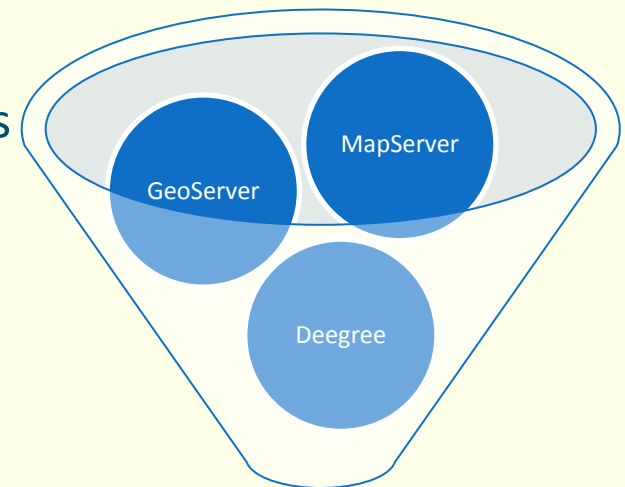
*Not later than **28 December 2012**, Member States shall provide the **Download Services** in conformity with this Regulation*

2009

WMS	➔	View Service
WFS	➔	Download Service
CSW	➔	Location Service

● Tool requirements

- Free and open data
- Connection to a Postgis Database
- with a large community consisting of users and developers.
- The tool should be to according to Inspire



Depending on the service you are creating to select one tool or another

- In our comparative study:
 - View service (WMS 1.3.0):
 - Vector database used **Geoserver**
 - Raster database used **Mapserver** (orthoimagery and DEM)
 - Web Map Tile Service (WMTS 1.0.0)
 - Vector database used **Geoserver + Geowebcache**
 - Raster database used **Mapserver + Geowebcache**
 - Download service (WFS 2.0):
 - **Deegree**
 - Location Service (CSW)
 - **GeoNetwork**
- Comply with Inspire
 - We tried to take into account all user's needs

■ View Services according to Technical Guidance

Tools

Vector database used Geoserver
Raster database used Mapserver

Difficult

Low

One service

One or more data set
base map with GN, HY, TN, AD layers

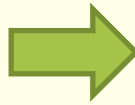
Weakest points

WMS is a service too slow to deal in internet

Data specifications

Basic Knowledge

- **View Services according to Technical Guidance**
 - **There are a number of hard issues**
 - **To link the database with inspire layers**



TN.RailTransportNetwork.RailwayLink

AU.AdministrativeBoundary

GN.GeographicalNames

EL.Elevation

PS.ProtectedSite

- **The layer can be no Inspire: other countries or historical orthoimagery**

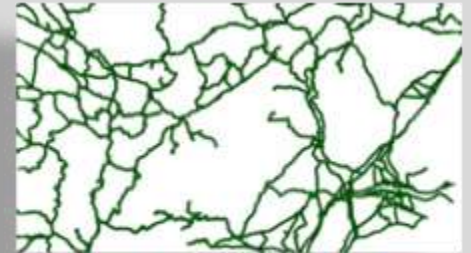


- **Two style: default portrayal style and National Style**
 - Inspire portrayal will be addressed from the perspective of a single theme only.
 - This means that generally it is not expected that cross-theme issues are addressed in the data specifications.

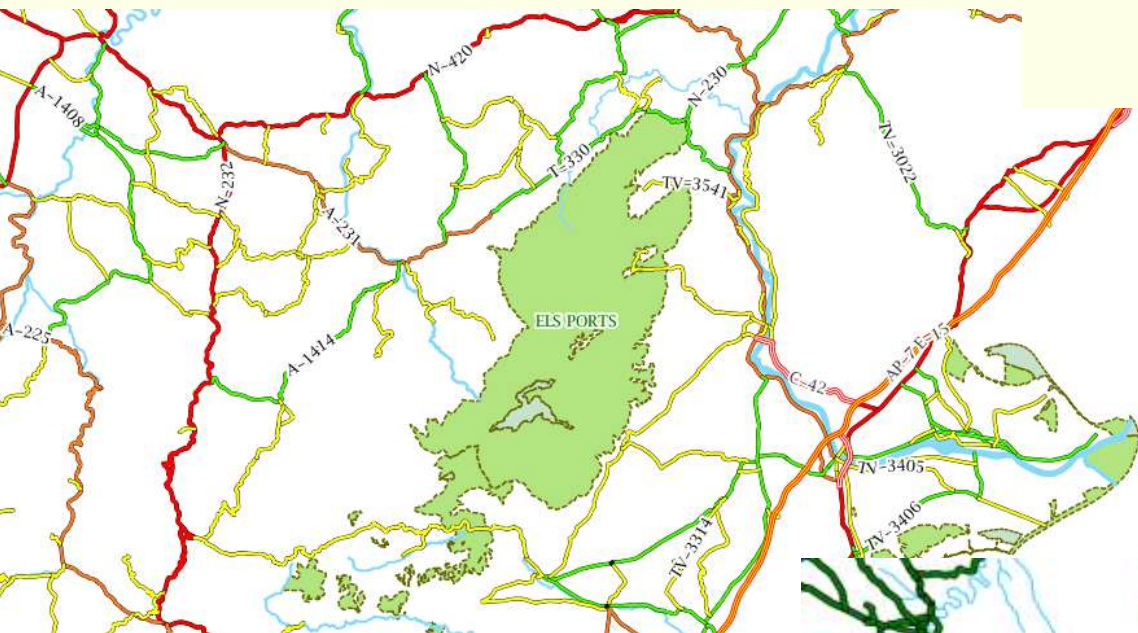
National Style



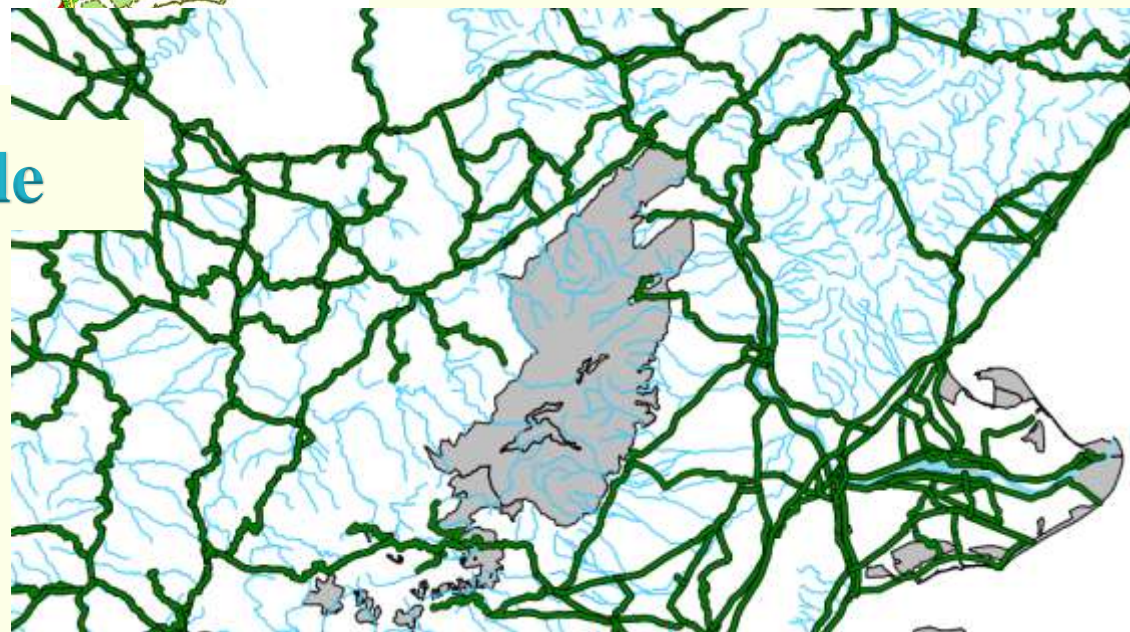
INSPIRE Default Style



National Style





INSPIRE Default Style



- **WMTS is a service for distributing tile sets of geospatial data.**
- **This is a faster and more efficient way of distributing data than WMS because with WMTS the tile sets are pre-generated**
- **The client only requests the transmission of the tiles, not their production.**



■ WMTS Services according to Technical Guidance

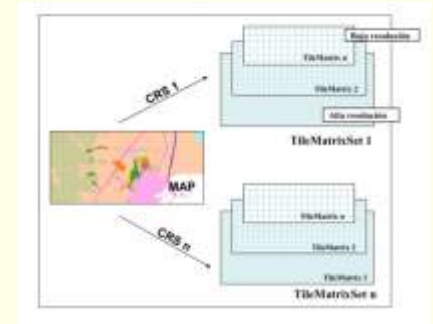
Tools	Vector database used Geoserver + GeoWebCache Raster database used Mapserver + GeoWebCache
Difficult	Low but it uses of many resources
Knowledge squema applicaton	No
One service	One layerr: Orthomagery or elevation More data set in the same layer: All vector geographic information in a same layer, as so on Raster map
Validation Inspire depends on the geographic information to publish	Layer Orthoimagery  OI.OrthoimageCoverage When a layers can not be Inspire Later about Cartography.....There isn't Inspire layer name 
Weakest points	Information updates involves generating of new tiles

■ WMTS

- WMTS same requirements: origin of tile, size tile, the levels, ...
- Problems: Don't interoperability between them, because the WMTS can used different TilematrixSet

■ OGC defined 4 tilematrixset (Well-known scale sets)

- GlobalCRS84Scale
 - CRS84. Vector data and Zoom level name: 21
- GlobalCRS84Pixel
 - CRS84. Raster data and Zoom level name: 18
- GoogleCRS84Quad
 - CRS84. To allow quadtree pyramids in CRS84
 - Level 0 allows representing the whole world in a single 256x256 pixels. The next level represents the whole world in 2x2 tiles of 256x256 pixels and so on in powers of 2 and Zoom level name: 19
- GoogleMapsCompatible
 - Compatible with Google Maps and Microsoft Live Map projections and zoom levels
 - Zoom level name: 19



- **Technical Guidance for the implementation of INSPIRE View Services**

Implementation Recommendation 21 Every layer offered by a INSPIRE WMTS should use the InspireCRS84Quad MatrixSet

■ InspireCRS84Quad

Table 16: InspireCRS84Quad – Pixel size for each level

Level	Pixel Size (degrees)
0	0,703125000000000000
1	0,351562500000000000
2	0,175781250000000000
3	0,087890625000000000
4	0,043945312500000000
5	0,021972656250000000
6	0,010986328125000000
7	0,005493164062500000
8	0,002746582031250000
9	0,001373291015625000
10	0,000686645507812500
11	0,000343322753906250
12	0,000171661376953125
13	0,000085830688476563
14	0,000042915344238281
15	0,000021457672119141
16	0,000010728836059570
17	0,000005364418029785

CRS: <http://www.opengis.net/def/crs/OGC/1.3/CRS84>

TILING ORIGIN: (-180, 90)

EXTENT: (-180,180); (-90,90)

PIXEL SIZE FORMULA: $\frac{180}{2^{(8+i)}}$

TILE HEIGHT: 256 pixels

TILE WIDTH: 256 pixels

Difference between GoogleCRS84Quad and InspireCRS84Quad

Level 0 of InspireCRS84Quad is similar to level 1 of GoogleCRS84Quad with a change in the origin of the tiles. Level 1 of GoogleCRS84Quad represents whole world in a four 256x256 pixels tiles level 0 of InspireCRS84Quad is composed of two tiles representing exactly the whole world.

GetCapabilities WMTS

WMTS shall be based on common criteria

<TileMatrixSetLink>

<TileMatrixSet>**InspireCRS84Quad**</TileMatrixSet>

<TileMatrixSet>**EPSG:4326**</TileMatrixSet>

<TileMatrixSet>**EPSG:4258**</TileMatrixSet>

<TileMatrixSet>**EPSG:25830**</TileMatrixSet>

<TileMatrixSet>**EPSG:25828**</TileMatrixSet>

<TileMatrixSet>**GoogleMapsCompatible**</TileMatrixSet>

</TileMatrixSetLink>

-Resolution of tile

-Origin of tile

-Size of tile

-Identifier of tilematrix

<TileMatrixSet>

<ows:Identifier>**InspireCRS84Quad**</ows:Identifier>

<ows:SupportedCRS><http://www.opengis.net/def/crs/OGC/1.3/CRS84></ows:SupportedCRS>

<TileMatrix>

<ows:Identifier>**0**</ows:Identifier><

ScaleDenominator>2.79541132014358E8</ScaleDenominator>

<TopLeftCorner>-180.0 90.0</TopLeftCorner>

<TileWidth>256</TileWidth>

<TileHeight>256</TileHeight>

<MatrixWidth>2</MatrixWidth>

<MatrixHeight>1</MatrixHeight>

</TileMatrix>

Same format

Jpeg: less storage space is needed

Png: recommendation of Inspire, transparent, Teselas cacheadas por el usuario

■ Update the tile: level / time

InspireCRSQuad84	Approximate time required to publish a tiling service	Scale
Level 0 to 9	...	

Orthoimagery WMTS

<TileMatrixSet>**InspireCRS84Quad**</TileMatrixSet> 21 days

<TileMatrixSet>**EPSG:4326**</TileMatrixSet> User tiling the image

<TileMatrixSet>**EPSG:4258**</TileMatrixSet>

<TileMatrixSet>**EPSG:25830**</TileMatrixSet> 21 days

<TileMatrixSet>**EPSG:25828**</TileMatrixSet>

<TileMatrixSet>**GoogleMapsCompatible**</TileMatrixSet> 21 days

Level 18

512 hours = 21 days

1:1000 (pixel size =0,30 m)

■ Download Services according to Technical Guidance

- download services enabling copies of complete spatial data sets, or of parts of such sets, to be downloaded.

Tools	Deegree: automatically generates the structure of tables Extract-Transform-Load. ETL
Difficult	High
Knowledge schema applicaton	Yes. Necessary condition
One service	One Data Set WFS Transport Network WFS Geographic Names WFS Hydrographic ---
Weakest points	Don't use massive like WMS

- **Join and split tables, select specific columns in a table, encode or decode values, join or separate columns of a table, create new fields, etc.**
 - **Deegree automatically generates the structure of tables in the database from a specific application schema.**
 - **Advantage of file mapping between the database and application schema is generated automatically**
 - **Disadvantage: a large number of tables are created in the database, especially if the scheme is complex.**
 - **ETL (Extract Transform Load). *FME o GeoKettle.***

WFS generated

WFS Geographical name
 WFS Administrative Units
 WFS Address
 WFS Transport Network
 WFS Hydrography Application schema
 Hydro - Physical Waters

To-do list

WFS Land Use and Land Cover
 WFS Elevation
 WFS Hydrography (Application schema
 Hydro – Network)

23-nov-2012	Annex I: all newly collected and extensively restructured spatial data sets and the corresponding spatial data services are available in conformity with the implementing rules 1089/2010 [Inspire Directive art.7.3 art.9(a)]
Oct 2015	Annex II and III: all newly collected and extensively restructured spatial data sets and the corresponding spatial data services are available in conformity with the implementing rules 1089/2010 [Inspire Directive art.7.3 art.9(a)]
23-Nov-2017	Annex I: Other spatial data sets in use are available in conformity with the implementing rules 1089/2010 [Inspire Directive art.7.3 art.9(b)]
Oct 2020	Annex II and III: Other spatial data sets in use are available in conformity with the implementing rules 1089/2010 [Inspire Directive art.7.3 art.9(b)]

- **Today National Geographic Institute has**
 - **17 WMS in IGN**
 - 13 services according to Technical Guidance for the implementation of INSPIRE View Services
 - 4 services not according to Directive because is not Inspire geographic information or is a specific service
 - **13 WFS**
 - 5 services according to Technical Guidance for the implementation of INSPIRE Download Services
 - 8 services not according to technical guidance. Many of these need to be transformed, others eliminated
 - **6 WMTS**
 - According to implementing rules except the names of layers and the information displayed

All spatial data services are free and available in a

<http://www.idee.es/web/guest/directorio-de-servicios> or IDEE Catalogue

<http://www.idee.es/csw-inspire-idee/srv/spa/main.home>



Thank you for your attention

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