



The INSPIRE Network Services Drafting Team

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13th EC-GIS meeting
Porto, 4-6 July 2007

Content



Network services Drafting team

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1 - Objective



To draft Implementing rules for INSPIRE network services:

- **Discovery** services: to search for spatial data sets and services using metadata
- **View** services: to display spatial data sets, legend information and metadata
- **Download** services: to download copies of spatial data sets, or parts of such sets
- **Transformation** services: to transform spatial data sets for achieving interoperability
- “**Invoke** services”: to invoke spatial data services (chaining services)

- The possibility to link spatial data sets and services to the network (art.12)

Notes

- The drafting team is not expected to develop new specifications
- Implementing rules should be based on standards (when exist)



2 – Organisation



DT Members:

Active members	
Olaf Østensen	NO
Markus Müller	DE
Didier Richard	FR
Tapani Sarjakoski	FI
Jean-Jacques Serrano (Chair)	FR
Graham Vowles (Co-Chair)	UK
Dominique Flandroit	BE
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Lars Bernard	DE

Facilitators :

- Michel Millot – JRC
- Ioannis Kanellopoulos - JRC

Additional members	
Yves Coene	BE
Wernher Hoffmann	AT
Corrado Iannucci	IT
Pedro J. Álvarez Pérez-Aradros	ES
Tomasz Berezowski	PL
Martin Tuchyna	SK

One sub-group for each service

3 - Progress



- General issues to address:
 - Architecture
 - Technical protocol
 - Right Management
 - Service metadata
 - Multilingualism
- Discovery and View services
- Download services
- Transformation services
- Invoke spatial data services services

3 – Progress - Architecture



- NS DT maintains a living technical document:
 - to define in which context services have to run,
 - to address technical issues,
 - for internal use.
- NS DT participates with MD, DS DT and CT to the creation of an Overview document about INSPIRE Architecture
 - To provide an overview of the current understanding of the technical architecture of INSPIRE,
 - To identify gaps and needs for additional collaboration,
 - To help SDICs/LMOs better understand context of different deliverables.

3 – Progress - Technical protocols



- INSPIRE services shall be Web Services (W3C)
 - for interoperability (applications ⇔ services, services ⇔ services),
 - Using the SOAP protocol to exchange messages,
 - and WSDL language to describe these messages,
 - plus a possible entry in a UDDI directory.
- Why SOAP binding instead of classical OGC type with URL encoding?
 - Standard information technology,
 - Smooth and complete integration in development environments,
 - Full integration with Web Services environments (WSDL, UDDI, ...),
 - To support requirements from “horizontal services” (e-commerce, geoRM, ...).

⇒ For each service type a specific SOAP binding and WSDL has to be defined:

- Documents (not normative) and software exist for OGC services (WMS, WFS, WCS, CS-W),
- A pilot study to be launched by EC will help to clarify this task.



3 – Progress - Multilingualism



- What is concerned?
 - Documents (metadata, capabilities, feature info, error messages, ...),
 - Maps.
- From the NS point of view:
 - Requirement with a limited impact on services,
 - For an application: to be able to ask for results in a specific language (when available),
 - For a service provider: to inform users on supported languages.

⇒ An optional parameter LANGUAGE has to be introduced for each service

3 – Progress – Service metadata



- Service metadata: to describe the operations and geographic information available at a server (ISO 19128)
- Various possibilities to describe a service:
 - ISO 19119: available in a catalogue (defined by Metadata DT),
 - OGC Capabilities: available directly from the service,
 - + W3C WSDL (to describe precisely service operations)

- ⇒ Need to harmonize the content of some common metadata fields:
- Contact information,
 - Access constraints,
 - Fees (when necessary).

3 – Progress – Discovery & View Services



- A draft document on IR for Discovery & View services was sent for reviewing to CT and DTs
- This internal review has provided > 400 comments:
 - General comments related to the Directive
 - Technical comments:
 - Service metadata: capabilities / metadata IR
 - Link data sets / layers of a view service, useful scale
 - CRS, overlay capability, legend, temporal component of view service
 - Multilinguality
 - Protection, SOAP / WSDL
 - Needs for clarification
- We are now processing these comments:
 - Classification, checking
 - DT meeting 2-3/07 to discuss the main comments

3 – Progress – Discovery Services



- Discovery services to search for **spatial data sets** and **services** on the basis of the content of the corresponding metadata and to display the content of the metadata.
- As a minimum the following combination of search criteria shall be implemented:
 - keywords;
 - classification of spatial data and services;
 - quality and validity of spatial data sets;
 - degree of conformity with the IR for interoperability;
 - geographical location;
 - conditions applying to the access to and use of spatial data sets; and services;
 - the public authorities responsible for spatial data sets and services.
- Metadata DT has defined search and response metadata elements

3 – Progress – Discovery Services



- Search and response metadata (Metadata DT)

Metadata element	Search	Response
Resource title	X	X
Temporal reference	X	X
Geographic extent of the resource	X	X
Resource language	X	X
Resource topic category	X	X
Keyword	X	X
Service type	X	X
Resource responsible party		X
Abstract		X
Resource locator		X
Constraints		X
Lineage		X
Service type version		X
Operation name		X
Resource Identifier		X
Spatial resolution		X



Metadata elements for discovery level 1

Metadata elements for discovery level 2



3 – Progress – Discovery Services



- The proposal for INSPIRE Discovery services:
 - OGC CSW : OGC Catalogue Service for the Web
 - According to requirements from Metadata IR, the proposal is to use the ISO 19115/19119 Information Model for the catalogue:
 - => standard : OGC CSW 2.0.2 AP ISO 1.0
 - Query language: OGC Filter Encoding
- Function to publish metadata
Need for a “technical possibility to link spatial datasets and services to the network” (art.12)

3 – Progress – Discovery Services



Mandatory Operations of the Discovery Service	
GetCapabilities	To retrieve service metadata from a server
DescribeRecord	To allow a client to discover elements of the information model supported by the catalogue
GetDomain	To obtain runtime information about the range of values of a metadata record element
GetRecords	To search and present records
GetRecordById	To retrieve a record using its Id
HarvestRecords	To retrieve resource metadata from a specified location («pull» mechanism)
Transaction	To create, modify and delete catalogue records («push» mechanism)

To search data sets and services

To link data sets and services to the network



3 – Progress – View Services



- View services to display, navigate, zoom in/out, pan, overlay viewable spatial data sets, to display legend and any relevant content of metadata.
- Notes:
 - Overlay data sets: data sets defined in various CRS but displayed in a common geographic or projected CRS
 - Overlay data sets: if a raster output format is used, it must be transparent
 - Legend: mandatory
 - Metadata: those defined by Metadata DT
 - Limited access or applying charges => role of “Horizontal services”
 - The view service does not cover client application

3 – Progress – View Services



- The proposal for INSPIRE View services:
 - ISO 19128 : WMS (Web Map Service) 1.3

Operations of the View Service	
GetCapabilities	To retrieve service metadata from a server
GetMap	To return a map
GetFeatureInfo (optional)	To provide clients of a WMS with more information about features in the picture of maps



3 – Progress – View Services



- **Contact Information:** address, email, phone (email preferred)
- **Layer name & title:** mandatory
- **Coordinate Reference Systems:**
 - EPSG:4258 – ETRS89 (ellipsoidal coordinates)
 - EPSG:3035 – ETRS89 / ETRS-LAEA; EPSG:3034 – ETRS89 / ETRS-LCC
 - EPSG:3038 to EPSG:3051 – ETRS89/ETRS-TM26 to ETRS89/ETRS-TM39
 - CRS:84 – WGS84 (lat-lon coordinates)
 - At least one of above CRS's is mandatory
(for continental location: use EPSG, for outside continental Europe: use CRS:84)
- **Legend:** legend URL mandatory, format PNG or HTML
- **Styling:** default style shall be defined, possibility to use various styles
- **Metadata:** metadata URL, format text/xml (ISO19139)
- **Useful scale range:** min and max scale denominators mandatory (related to themes and also to CRS)

3 – Progress – Download Services



- Download services: enabling copies of spatial data sets, or parts of such sets, to be downloaded, and where practicable, access directly.
- Data set:
 - **one or more physical files** serialized in an encoding format
 - **database** realized in a concrete database system
 - **part of one of the above** specified by some *filter* (query, ...)
- Generic use case:
 - Discover using a discovery service on metadata,
 - Select desired data sets,
 - Apply filter to identify part of selected data sets (if appropriate),
 - Download using one or more download services defined in the IR.

3 – Progress – Download Services



3 possibilities:

- Full data set download based on discovery:
 - Normally implemented through a discovery client,
 - Find => Select => Download using http.
- Partial data set download based on discovery and filter:
 - As the previous but with addition of a filter condition using FE (Filter Encoding),
 - Reliant on FE and harmonized application schema.
- Partial (or full) data set download based on WFS / WCS including FE:
 - FE specification input based on harmonized application schema,
 - GML output according to harmonized application schema.

3 – Progress – Download Services



Tools:

- Discovery service NS DT (OGC CSW)
- Web Feature Service OGC WFS / ISO 19142
- Filter Encoding OGC Filter Encoding / ISO 19143
- Web Coverage Service OGC WCS
- GML ISO 19136
- Harmonized app. schema DS DT
- HTTP protocol IETF
- Web Services W3C (SOAP/WSDL/UDDI)

- After Discovery and View services, Download services are the next step,
- Common issues with DS DT

3 – Progress – Transformation Services



- Transformation services: enabling spatial data sets to be transformed with a view to achieving interoperability
- The transformation services shall be combined with the other services in such a way as to enable all those services to be operated in conformity with the implementing rules
- Two architectural approaches for transformation services:
 - seen as a front-end for an underlying service,
 - seen as a node in a service chain, can be used by a workflow management service.

3 – Progress – Transformation Services



- First service: **Coordinate Transformation service**
 - OGC WCTS: Web Coordinate Transformation Service (discussion paper, not a specification, but relatively mature)
 - Will need a European SRS Register
 - Could be defined and implemented as a Web Processing Service
- Second service: **Schema transformation service**
 - To transform geospatial content between two schemas (MS => EU)
 - No OGC or ISO activity on this topic
 - A pilot study to be launched by EC for help

3 – Progress – “Invoke spatial data service” Services



- Invoke services: Services allowing spatial data services to be invoked
- Interpretation:
 - Chaining services
 - Web Processing Services
- Few progress by DT, some remarks:
 - Geoservices chaining is in a early stage,
 - There is a strong need for SOAP WSDL UDDI for service chaining,
 - There is a need for both CS-W and UDDI,
 - Service orchestration should be described using BPEL.

4 – Next steps



- No date for Network Services in the Directive
- But need to be in line with other DTs (=> dates in the work programme):
 - Metadata IR available => need for Discovery services IR,
 - When a resource has been discovered => need for View services IR,
 - Need for Download services IR (+ Transformation Services),
 - A support to Data Sharing DT for GeoRM services.

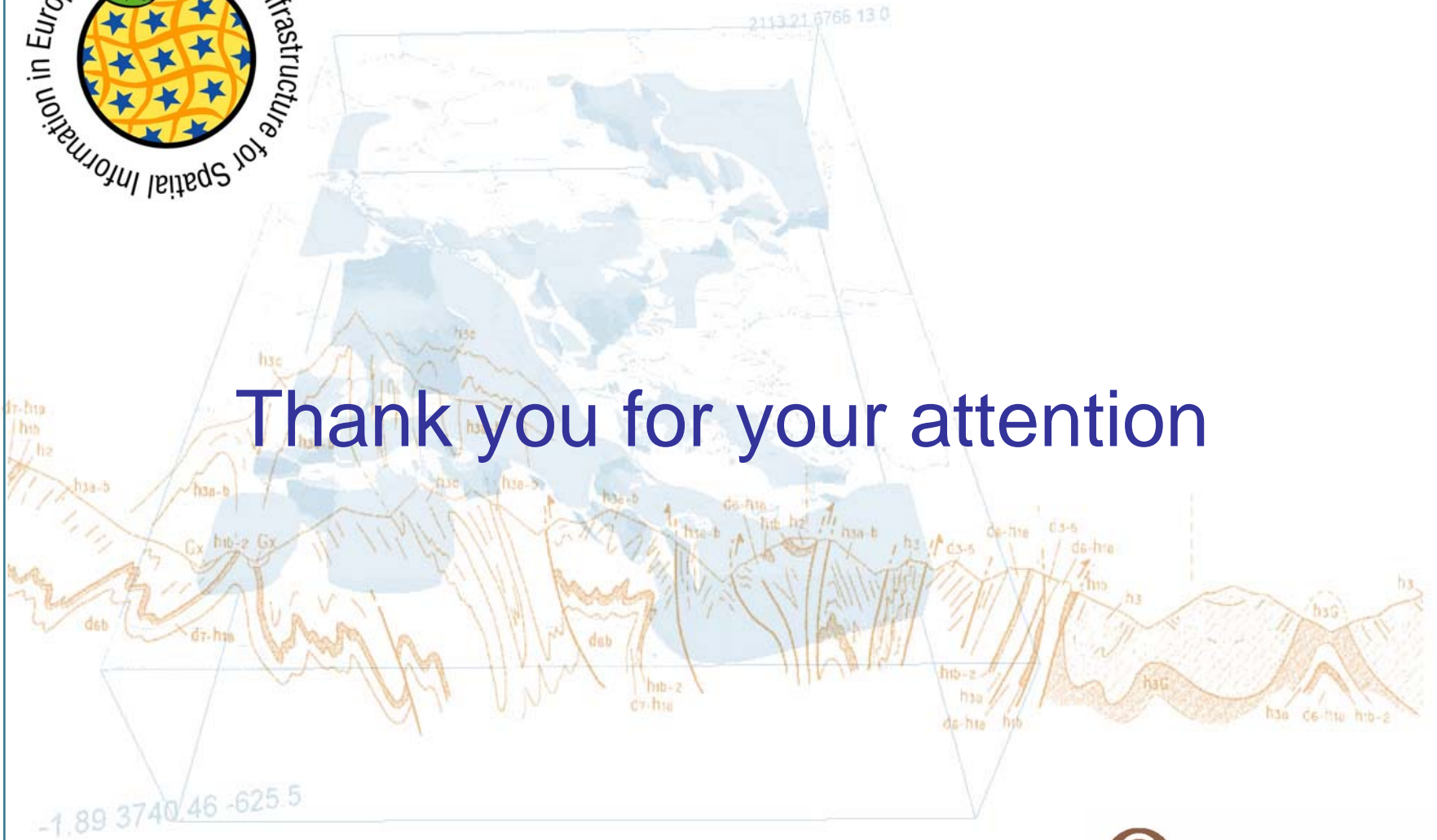
=> Priorities defined for Network services, with different deliverables:

- Discovery and View services,
- Download services,
- Transformation services:
 - Coordinate Transformation services,
 - Schema Transformation services.

4 – Next steps in the Work Programme



Deliverables	Description	Milestone	Who
NS - D 3.7	Discovery and View services		
	SDIC/LMO Consultation	2007 – 09	DT
	Final Draft IR	2008 – 01	CT
	Adoption of IR	2008 – 05	Comitology
NS - D 3.9	Download services		
	SDIC/LMO Consultation	2007 – 12	DT
	Final Draft IR	2008 – 06	CT
	Adoption of IR	2008 – 11	Comitology
NS - D 3.10	Coordinates Transformation Services		
	SDIC/LMO Consultation	2007 – 12	DT
	Final Draft IR	2008 – 07	CT
	Adoption of IR	2008 – 11	Comitology



Thank you for your attention