Technical Components for an INSPIRE compliant Spatial Data Infrastructure within the European Commission

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Content

- **General introduction**
  - Project outline
  - Project goals
  - Time plan

- **INSPIRE related requirements and their implementation**
INSPIRE@EC in a nutshell – a few facts

**Overall objective**

Provision of fast and easy to operate infrastructure services that support users within the European Commission to share and use spatial data and services compliant to the provisions of INSPIRE

**Contracting party is EUROSTAT**

**Project duration from 01/2009 – 07/2011**

**Overall budget: 300.000 EUR**
INSPIRE@EC – Project goals

- Provide a recognised reference point for geo-information in the Commission
- Give strong support to EC users describing and sharing their data and services
- Take the step from prototyping to production
  
  Stable, scalable, easy to use
- Comply to INSPIRE Implementing Rules soon after adoption

As the initiator and facilitator of INSPIRE, the Commission committed itself to comply with the INSPIRE framework for all spatial data and services held and managed by the Commission itself.
Project team

- EUROSTAT (Contracting Party)
- con terra, Germany (Main Contractor)
- HNIT-BALTIC, Lithuania
- Spatial Applications Division Leuven, Belgium (University of Leuven)
- ESRI Inc. Professional Services Team, USA
Project Timeline

2009
- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December

2010
- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December

2011
- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December

Kickoff
- Analysis Requirements
- System Design
- Implementation
  - Quality Control
  - Bug fixing

Installation 1.0
- acceptance test
- Performance testing & tuning
- check for new requirements
- Service and maintenance

Touchdown

Metadata
- Project Management
- Quality Management

...connecting worlds
Analysis Phase (February - June 2009)

Input:

24 interviews with staff from different DGs (ESTAT, JRC, DG REGIO, DG TREN, DG AGRI, DG ENVI, DG ENTR, DG MARE)

Web Survey

Discussions with DG DIGIT staff for technical requirements

Analysis of INSPIRE Implementing Rules (IR) and Technical Guidance Documents (TG)

Output:

State of Affairs Report

Inventory of spatial datasets and spatial services available at the Commission

User Requirements Specification
Requirements Specification

76 functional requirements (67 were implemented), assigned to the following categories / components

- Geoportal
- Metadata management
- Metadata catalogue
- Spatial data / services
- Map Viewer
- Security and Monitoring

29 non-functional requirements (all were implemented)

- System design
- Compliance with the Commission’s IT environment
- Performance
- Usability
Functional Requirements related to the INSPIRE Directive
INSPIRE Metadata Management

Baseline

INSPIRE Metadata Implementing Rules
Technical Guidelines based on EN ISO19115 and EN ISO19119 (v.1.1)

Ability to create INSPIRE compliant metadata using an online Metadata Editor

Ability to easily upload/import INSPIRE metadata (according the xml encoding defined in Annex A)

Ability to create and store multilingual metadata

Not implemented as metadata within the EC is usually maintained in the English language (however: ‘metadata language’ metadata element is filled when using the online metadata editor)

Ability to search for metadata language dependent. Advanced search criteria should include the INSPIRE ‘metadata language’ metadata element
Implementation: INSPIRE Metadata Management (1)

INSPIRE@EC Components for metadata creation

- Online Metadata Editor
- Upload and validation tool for INSPIRE metadata

Software stack

- ArcGIS Server Geoportal Extension provides the portal front end
- terraCatalog provides the Metadata Catalogue Service
- sdi.suite
Implementation: INSPIRE Metadata Management (2)

INSPIRE@EC Components for metadata access

Client that allows users to query and access INSPIRE Metadata
Advanced search functions that support INSPIRE queryables

Software stack

ArcGIS Server Geoportal Extension provides the portal front end
terraCatalog provides the Metadata Catalogue Service

sdi.suite
Requirements related to the INSPIRE Directive
INSPIRE data themes at the Commission

- Provide GISCO data compliant to INSPIRE data specifications
  Geographic Information System of the European Commission
- Many GISCO data themes correspond to Annex themes
- Still to be decided when "INSPIRE compliance" is to be achieved for GISCO data
- Also dependent on timeline of Data Specifications

Excerpt from overview table from "Inventory of spatial information resources available at the Commission"

<table>
<thead>
<tr>
<th>INSPIRE Theme</th>
<th>Name of dataset</th>
<th>Organisation responsible (owner or custodian)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.2 Geographical grid systems</td>
<td>GISCO (30 Deg GRID)</td>
<td>GISCO</td>
</tr>
<tr>
<td>I.3 Geographical names</td>
<td>Settlements</td>
<td>EuroGeographics-GISCO</td>
</tr>
<tr>
<td></td>
<td>General Bathymetric Chart of the Oceans (GEBCO) site</td>
<td>DG MARE / GEBCO</td>
</tr>
<tr>
<td></td>
<td>World Gazetteer</td>
<td>EEA/ Bartholomew Collins</td>
</tr>
<tr>
<td>I.4 Administrative units</td>
<td>Countries, Communes.</td>
<td>ESTAT, EuroGeographics, FAO</td>
</tr>
<tr>
<td></td>
<td>REGIO (objective of convergence)</td>
<td>REGIO</td>
</tr>
</tbody>
</table>
Functional Requirements related to the INSPIRE Directive
INSPIRE Network Services

 Metadata provision
Baseline: Technical Guidance: Discovery Services (v.2)
Ability to serve an INSPIRE discovery service
Ability to consume INSPIRE Discovery Services and to use INSPIRE queryables for searching metadata

 View spatial data
Baseline: Technical Guidance: View Services (v.2)
Ability to serve an INSPIRE View Services
Ability to consume INSPIRE View Services

 Download spatial data
Baseline: Technical Guidance: Download Services (v.2)
Ability to serve an INSPIRE Download Services
Implementation: INSPIRE Discovery Service

🎉 INSPIRE@EC Components

Catalogue that follows the Catalogue Services Web Specification 2.0.2 - ISO Metadata Application Profile

- Supports the INSPIRE Metadata Elements from Technical Guidance Discovery Services
- Supports federated search via INSPIRE Discovery Service or plain CSW

Catalogue client that connects to the INSPIRE@EC CSW for internal searches

鞯 Software stack

terraCatalog provides the Metadata Catalogue Service

ArcGIS Server Geoportal Extension provides the portal front end
Implementation: INSPIRE View Service (1)

**INSPIRE@EC Components for serving View Services**

View Service that follows the base specifications WMS1.3.0, SLD 1.1

Supports INSPIRE requirements according to technical guidelines

Pre-configured in order to provide GISCO data

**Software stack**

ArcGIS Server

Extension to add support for INSPIRE requirements

e.g. language, harmonized name of the layers for machine-to-machine communication
Implementation: INSPIRE View Service (2)

**INSPIRE@EC Components for binding View Services**

Mapviewer application that supports the base specifications EN ISO 19128:2005(E), WMS1.3.0

The base spec. does not define a SOAP binding

**Software Stack**

ESRI Map Viewer based on Web ADF

Java Server Faces (JSF)

Support for WMS 1.3.0

SOAP binding can be added in the future
Implementation: Download Services (1)

- **INSPIRE@EC Components for serving Download Services**
  
  Download Service following the base specifications
  ISO/DIS 19142 Web Feature Service and ISO/DIS 19143 Filter Encoding
  
  Provided geodata is not yet compliant to the Data Specifications

- **Software stack**
  
  ArcGIS Server

- **No requirement for binding INSPIRE download services**
  
  Technical Guidance is still version 1 and it did not seem stable enough to warrant a requirement
Implementation: Download Services (2)

**INSPIRE@EC Components for consuming Download Services**

Map Viewer functionality to download data provided by WFS

Preview via a Web Map Service (WMS)

Connection of a WFS for download and WMS for viewing by configuration

**Software stack**

ArcGIS Server

Geoprocessing service for download

Customized viewer based on ArcGIS Web ADF
Future Implementation: View- and Download Services

- Technical Guidance need to be stable
- Data Models of the Geodata need to be compliant to the data specifications
  
  Planned for GISCO data
  Will be done by EUROSTAT

- INSPIRE Fusion Center is available
  
  For provision of geodata according to INSPIRE data models
  To add support for INSPIRE View and Download services
  FME can be used for automated ETL
Non-Functional Requirements related to INSPIRE

- **System Design**
- **Compliance with the Commission’s IT environment**

**Performance**

Baseline: Implementing Rules for Network Services

INSPIRE Quality of Service criteria relating to performance, capacity and availability shall be ensured

QoS criteria are tested in a special work package for performance testing and tuning

**Usability**

*Currently starting a phase of performance testing*
Technical Solution for INSPIRE@EC

Security Administrator

Geoportal Extension

Map Viewer

Map Clients

Catalogs

securityManager

Security layer added to include authentication

authentication against central user store

terraCatalog CSW / INSPIRE

AGS Services

WMS

WFS

WCS

serviceMonitor

INSPiRE Services

Fusion Center

ArcGIS Server

INSPIRE GDB

Oracle RDBMS

GISCO GDB

Oracle RDBMS

External applications to access secured services via gateway

EC LDAP

authentication against central user store

...connecting worlds
Thank you for your attention!

Questions?

Please visit us at the exhibition