Implementation of INSPIRE Rules in EUMETSAT’s EOPortal

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EUMETSAT

**EU**ropean Organisation for the Exploitation of **MET**eorological **SAT**ellites

EUMETSAT's primary objective

**establish, maintain** and **exploit** European systems of operational meteorological satellites

EUMETSAT is responsible for the **launch** and **operation** of the satellites and for **delivering** satellite data to end-users as well as contributing to the operational **monitoring of climate** and the detection of global climate changes
26 Member States & 5 Cooperating States

Member States:
- Austria
- Belgium
- Croatia
- Denmark
- Finland
- France
- Greece
- Ireland
- Italy
- United Kingdom
- Turkey
- Hungary
- Poland

Cooperating States:
- Bulgaria
- Iceland
- Estonia
- Lithuania
- Serbia

Countries:
- Austria
- Belgium
- Croatia
- Denmark
- Finland
- France
- Greece
- Ireland
- Italy
- United Kingdom
- Turkey
- Hungary
- Poland
- Bulgaria
- Iceland
- Estonia
- Lithuania
- Serbia
EUMETSAT Data Centre AND EO Portal

- EUMETSAT delivers weather and climate-related satellite data, images and products
- Operates meteorological satellites such as Meteosat, EPS and their ground systems
- Satellite data and products are stored in the Data Centre
• Past:
  Several applications for discovery, search, order and subscription
  – applications with self contained user management
  – Users had to register with every application

• EO Portal:
  offers a single online access point for discovery, search, visualization and order/subscription to satellite data
  – supports different INSPIRE Implementing Rules
  – Trade off analysis and various implementation supported by contracts with industry (con terra)
Product Navigator - INSPIRE conformant Metadata

- **Product Navigator (PN)**
  - Discovery, search and management of EO Collection metadata
  - EO Collections - describe sets of related EO Products

- **Metadata model**
  - is conformant to INSPIRE:
    - follows Metadata Implementing Rules
    - INSPIRE Technical Guidelines are based on EN ISO 19115 and EN ISO 19119
  - Future:
    - When **INSPIRE-Data Specifications** will be extended
      - Annex III themes
      - Additionally required metadata elements will be considered
- for Metadata Management
  - Web-based Metadata Editor
  - Batch-import of metadata files (XML)
  - Periodical automatic harvesting of metadata files from known locations
  - Export of metadata
  - Metadata-Editor
    - Checks INSPIRE conformity
    - Supports INSPIRE specific elements
      - i.e. GEMET Thesaurus
for search and discovery different interfaces:
  - simple and extended search
  - to search across metadata attributes
  - including spatial extent, defined on interactive map
  - live Search Support browse by theme through collection hierarchy
Product Navigator - Search and Discovery Clients

- Search Results
  - ranked by access frequency
  - present important attributes like abstract, title, thumbnail...
  - bookmarking
- Metadata detail view
  - URLs lead to various services such as:
    - offline product search/order (Data Centre Client)
    - online registration
  - full XML metadata
  - browse images
  - spatial extent in world map
for programmatic access to search and discovery of EO Collections, the EO Portal - Clearinghouse provides:

- INSPIRE Discovery Services
- OGC CSW AP ISO 1.0
- Additional INSPIRE queryables (i.e. access contraints, linage)
- Queryables provided in Capabilities
- Search Responses fulfilling INSPIRE requirements
• for programmatic access to search and discovery, the EO Portal’s Clearinghouse further provides interfaces to GMES and GEOSS:

  – For collection discovery:
    » **CSW AP ebRIM CIM** (INSPIRE Conformance Class) which is based on ISO19115
      » Interface defined in ESA’s Heterogeneous Missions Accessibility (HMA) project which was brought into the OGC
    » **WMO/WIS z39.50/SRU**

• For discovery of EO products:
  » **CSW AP ebRIM EOP interface**
    » Interface defined in ESA’s Heterogeneous Missions Accessibility (HMA) project which was brought into the OGC
    » metadata model based on „OGC GML Application Schema for EO Products“
Data Centre Client
- allows registered users to search EO Products (not Collections)
  » can use map-browser
  » gets user friendly result display:
    » product information, thumbnail, location on map
- allows product ordering:
  » products into shopping trolley
  » subsetting selected products
  » order them and follow process flow of order

programmatic access to order-/subscription:
- OGC/HMA Order Interface provided
- no INSPIRE equivalent Order-Service Standard available
Image Client provides direct access to recent satellite imagery:
- allows browsing by product type and temporal selection
- displays images on interactive and navigable map
- users can download the products in a variety of formats
  - e.g. KML to display in Google Earth
- possible to integrate into arbitrary WMSs
  - satellite images can be overlaid with other thematic layers
• Image Server provides EO Products as web services:
  – Web Map Services 1.3 (supporting temporal dimension and different formats (gif, jpeg, tiff, KML)
  – Web Coverage Services 1.1 (supporting different formats (gif, jpeg, tiff, KML)

• As Annex III Themes are not fully defined, therefore changes are expected for the WMS/ WCS services in the future
• When this comes into play the current EUMETSAT implementation will be extended to be inline with INSPIRE requirements
CONTROLLING ACCESS TO PRODUCTS AND SERVICES

- Access to ordering-/subscription- and user-management is **secured**
- Security concept includes:
  - Federated Identity-/UserManagement
  - AccessManagement: controlling access to resources

- For integration of EOPortal into ESA/GMES HMA infrastructure:
  - security concept was aligned with HMA UserManagement Specification

- As INSPIRE does not yet consider protecting services there is no need for an alignment with an existing INSPIRE security concept
Clearinghouse: Integration into INSPIRE and other Infrastructures
• EOPortal provides discovery, search, ordering, visualization and access to EO products by:
  – Web-Clients + Web-Services
• Results of first development phase (after architectural design):
  – Collection metadata management and discovery (Product Navigator 2.0)
  – Establishment of an integrated security concept
  – Clearinghouse: integrating legacy systems and providing GMES-, INSPIRE- and GEOSS-interfaces
  – Image Client/ Server for easy access to recent satellite imagery

• Coming next...
  – Security concept enhancements: upgrade to OpenAM, latest HMA UserManagement specification
  – Data Centre Client: development of light-weight webApp using Google Web Toolkit
  – Further improvements of workflows:
    • collection-/product-search, product preview, ordering/subscription and “on-the-fly” data delivery as GMES/HMA-, OGC- and INSPIRE conformant Web-services
  – Clearinghouse to search, order/subscribe and access EO data from partner agencies
  – Integration into INSPIRE Clients