Third Workshop on the use of GIS/OGC Standards in Meteorology

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Implementation and Use of OGC/HMA/WMO/ISO & Inspire Standards in EUMETSAT EO Portal

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Agenda

EO-Portal
Project History / Project Status
Information Models
System Overview
Product Navigator
UserManagement/IdP-Concept
Clearinghouse
WMS-Service / -Client (another presentation from Michael Schick)
Next steps

EO Portal

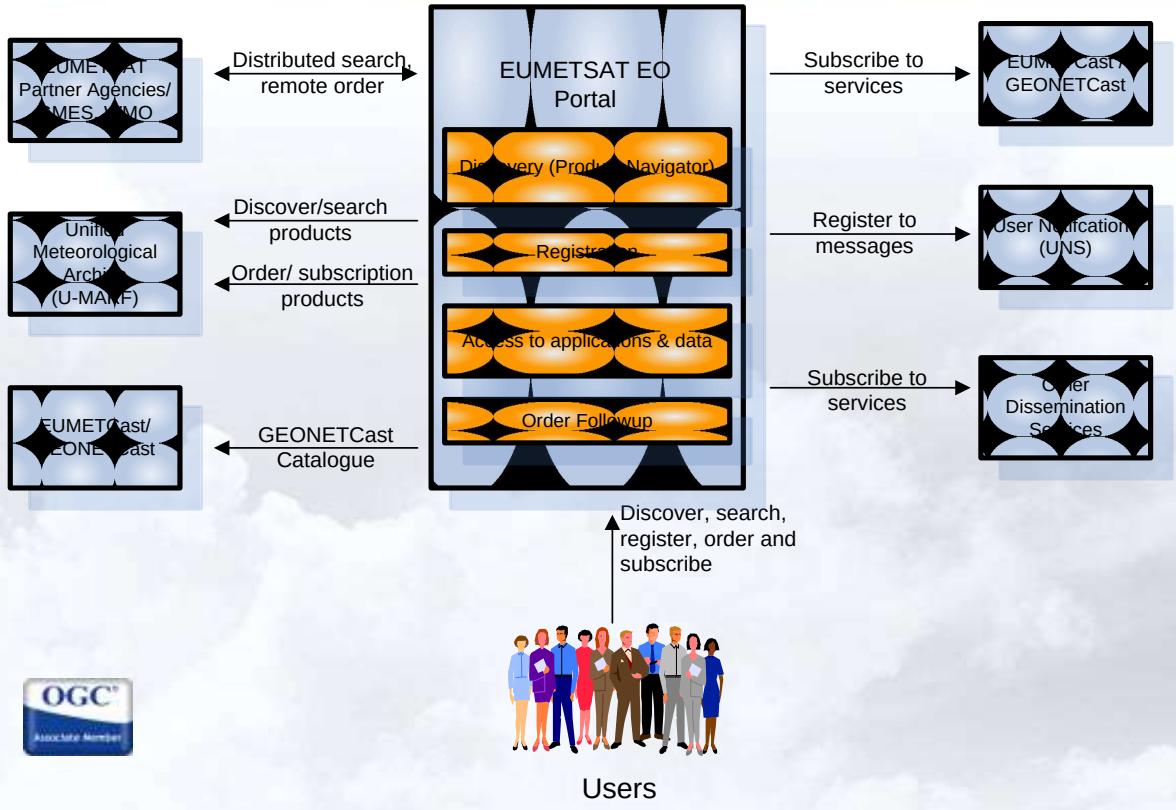
EO Portal provides single access point to EUMETSAT data and dissemination services

- Past: several applications with self contained user management
- Users had to register with every application and to memorise different user ids and passwords

EO Portal encapsulates the legacy applications and offers a harmonised user interface to discover, search, order / subscribe to data and services

Clearinghouse:

- will allow users to access data and services of partner agencies (e.g. CNES, NOAA, WMO, ESA)
- vice versa: allows partner agencies to discover, search, order and subscribe to EUMETSAT data and services via a set of programmatic, interoperable services
  - Services based on OGC/HMA/ISO, WMO and INSPIRE EU specifications



Project History / Project Status

2008:

- Started with architectural design phase accomplished by con terra
- Implementation of Collection Catalogue (Product Navigator) with con terra´s terraCatalog
- Sophisticated security concept including IdentityProvider (IdP)- and UserManagement Prototype based on SUNs OpenSSO

2009:

- first release of Clearinghouse launched:
  - integrating legacy systems for orchestrated user administration
  - Successful Experiment to check interoperability with ESA/HMA UserManagement
  - HMA Product Search (EOP) realized and integrated into Clearinghouse
  - Started with HMA Order Service Implementation

2010:

- Realization of the Order Service providing HMA Order Service Interface
- Z39.50/SRU Adaptor implementing WMO/WIS z39.50/SRU interface
- WMS Server and WMS Client
- Study on federated collection search
- Started development of Product Navigator 2.0

Information Models

Different types of information are involved

Metadata for EO Collections and EO Products (as reflected within ESA's HMA and WMO/WIS):

EO Product

- set of EO data, identifiable e.g. by spatial / temporal extent, specific band. Located within larger dataset
- based on

EO Collection: EO Products sharing same product specification

- based on ISO19115-2 and ISO19139(-2)
- specific EUMETSAT requirements (e.g. distribution channels) in ISO conformant extension to ISO191(15|39)-2
  - XSD dedined, brought into ISO process

Ordering / Subscription Information

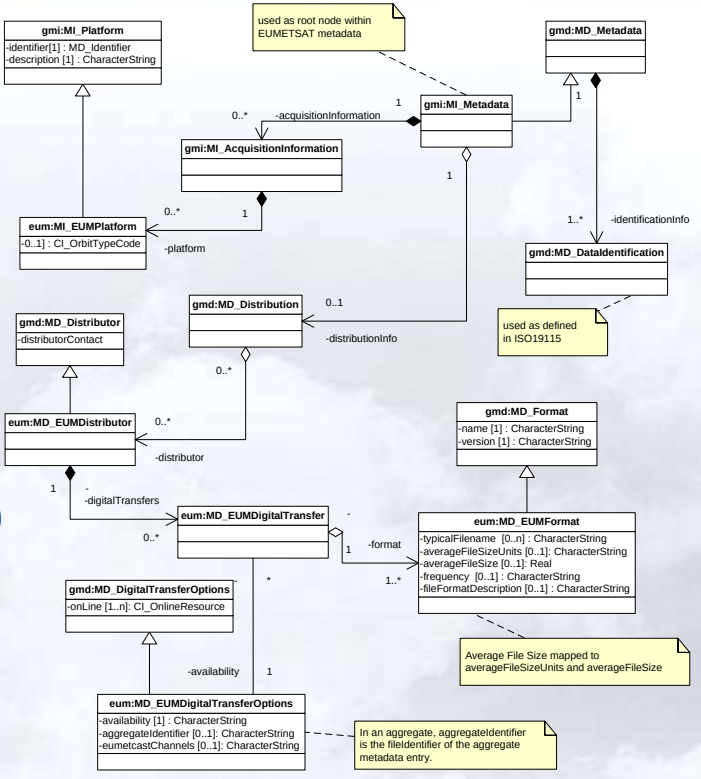
based on information model of OGC/HMA Order Services

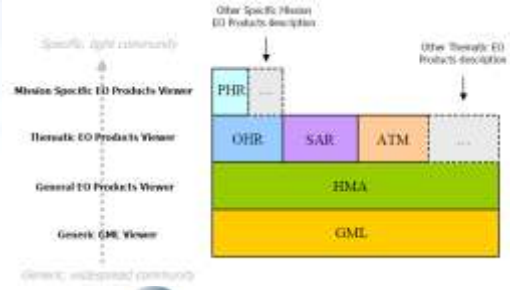
User and Role Data

Data Model for WMS:

Layer, LayerGroups, Thematic Hierarchies

Important: mappings between ISO-/OGC-/HMA-models and legacy models had to be done





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System Overview

EO WebPortal: main web interface

Product Navigator UI: web-interface

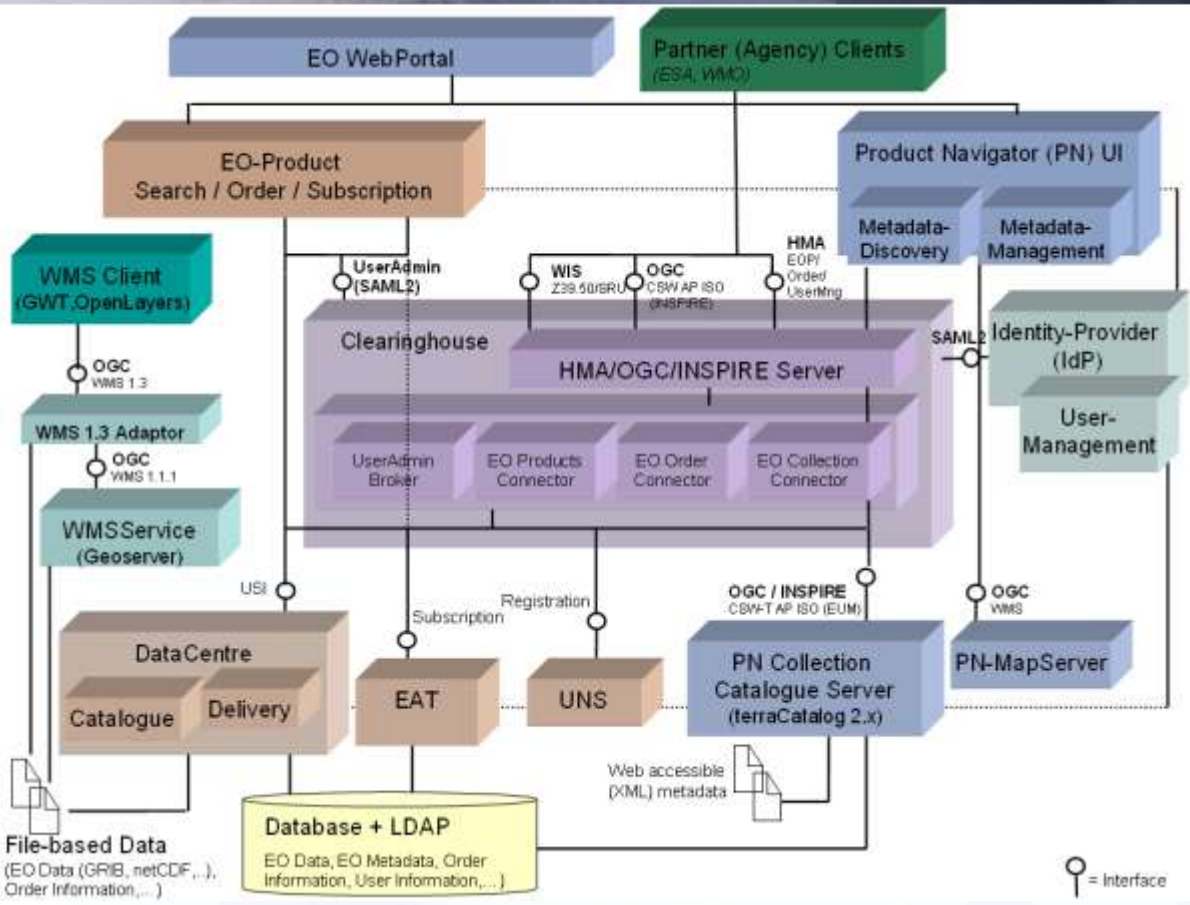
EO Product Search/Order/Subscription: web-interface for discovery, order-ing/subscription, Order-Follow-Up

UserManagement/IdP

Clearinghouse: provides OGC/HMA-, WMO-,INSPIRE- and EUMETSAT-inter-faces. Communicates with legacy systems and external partner agencies

WMSService / WMSClient: visualization of satellite products via WMS with date/time support

PN-MapServer: WMS for definition of spatial filters and visualization of spatial extends of items found



Data Centre/EAT/UNS: EUM legacy systems for Product Discovery, Order/Subscription

EO Portal Datastore: Database Components (RDBMS, LDAP, files)

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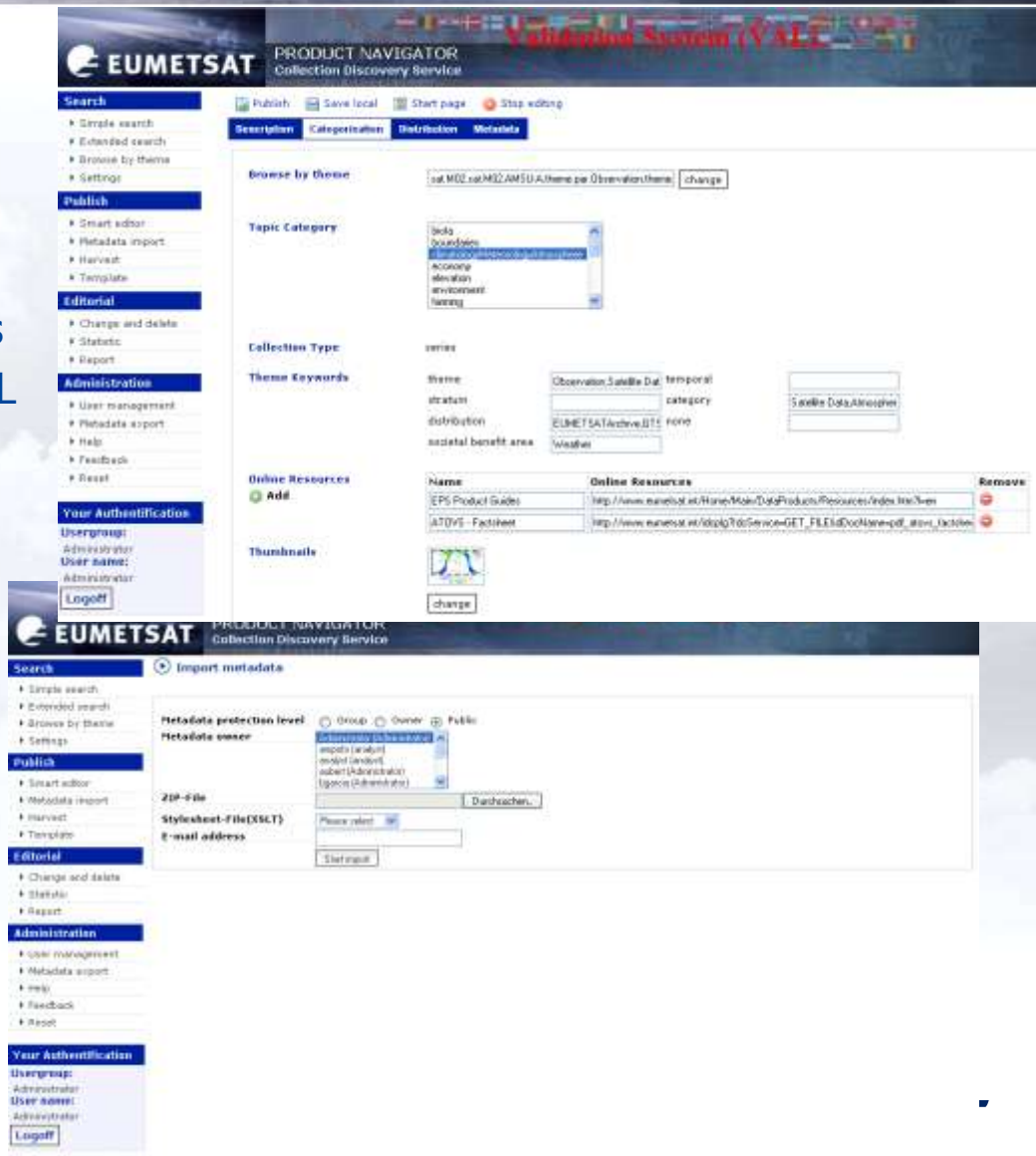
Product Navigator (navigator.eumetsat.int)

- Management and Discovery of Metadata for EO Collections (called Products)
- Metadata Management
  - Web based Metadata Editor
  - Batch-import of XML encoded metadata files
  - Periodical automatic harvesting of single XML metadata files from known locations
  - possible to automatically harvest metadata from other Catalogues
  - Export of metadata
- Web-UI for browse/search/discovery
- Collection Catalogue Server
  - server-side processing (query-generator,db-
  - discovery / management via programmatic



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Product Navigator (navigator.eumetsat.int)

Web Search UI

Simple-search

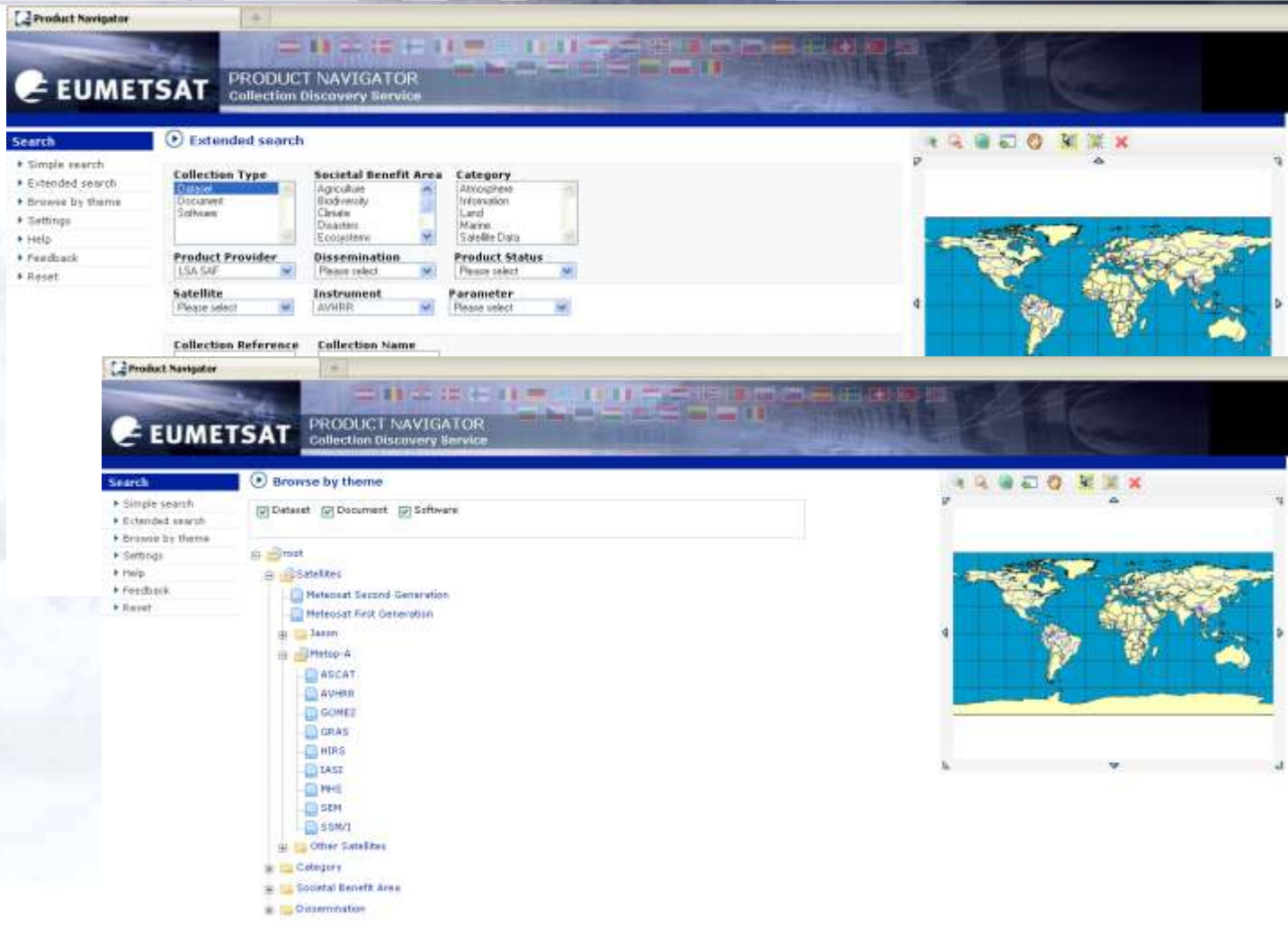
Advanced search: by number combinations of metadata attributes:

- collection type, sba, product provider, time
- spatial extent defined on OGC WMS based map

Live Search

metadata entries shown to user where he has access rights

Instead searching: discovery of collections by browsing through collection tree



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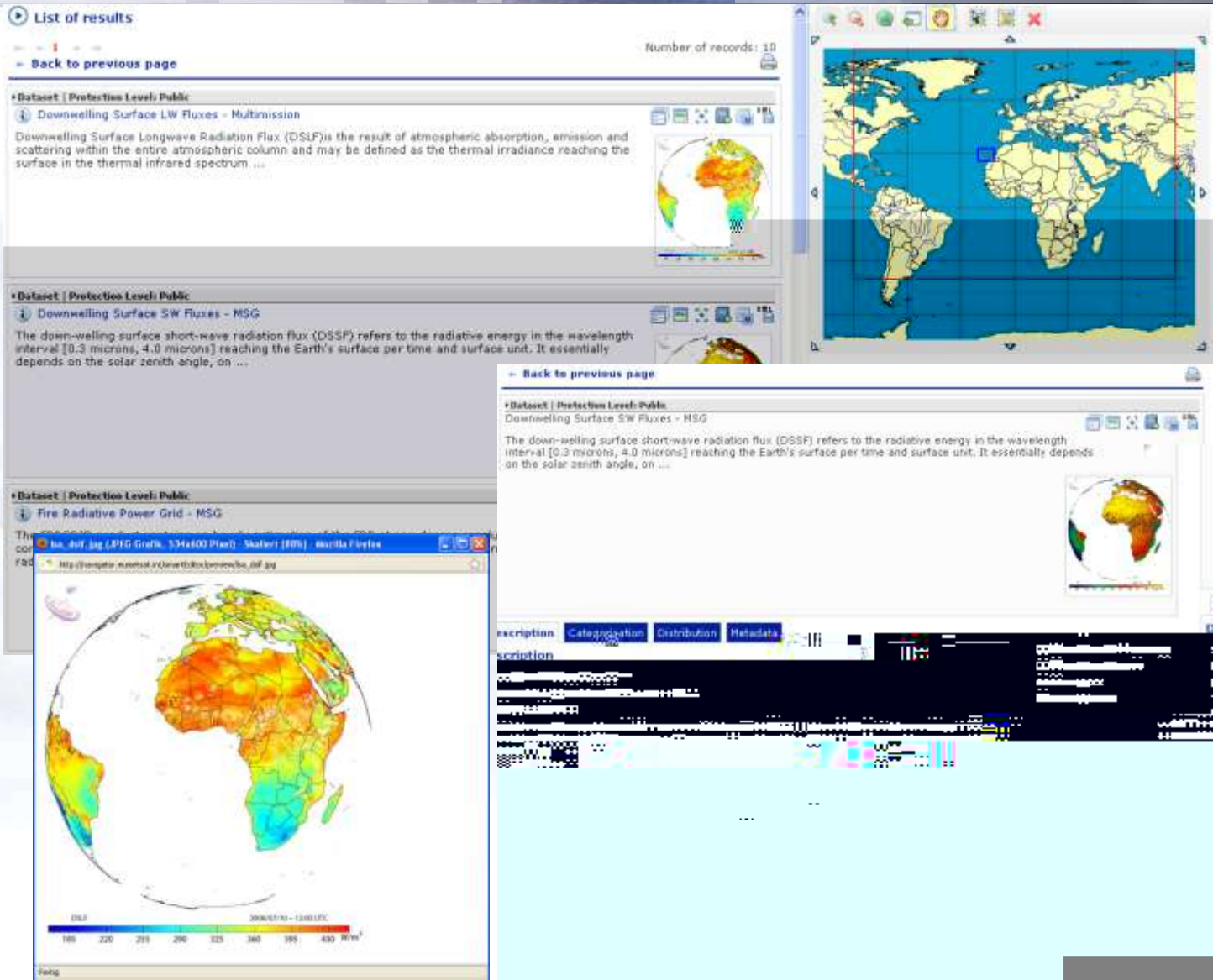
Product Navigator (navigator.eumetsat.int)

Search Results

- ranked by access frequency
- presents important attributes abstract,
- Bookmark record

Metadata details view

- URLs lead user to various services as offline product search/order or online registration
- full XML metadata
- browse image
- spatial extent shown in a geographical representation of the world



UserManagement/IdP-Concept

For details see Presentation by Marko Reiprecht (con terra) 2009 in Toulouse

Background:

some Services require user details passed using security concepts

harmonization of various EUMETSAT user management functions

- offering a single registration and subscription mechanism for all services

centralized authentication, while user has different credentials at different providers

- advantage: business entities maintain own user accounts, no global unique ID required

con terra developed together with EUMETSAT a sophisticated security concept

including (federated) IdentityProvider (IdP) - and UserManagement

build up on OASIS SAML 2 and implemented with SUNs (Oracle) OpenSSO

concept differentiates between SSO at web applications and the way how web services are secured

For SSO between web service consumer (WSC) and web service no global security token required

WSC can request new token for business entity at STS

via SAML2 AuthnRequest and private/public key mechanism

Trust in requesting entity at web service requires:

valid and trusted signature of request

valid and trusted security token from an IdP

Integration of ESA/HMA User Management

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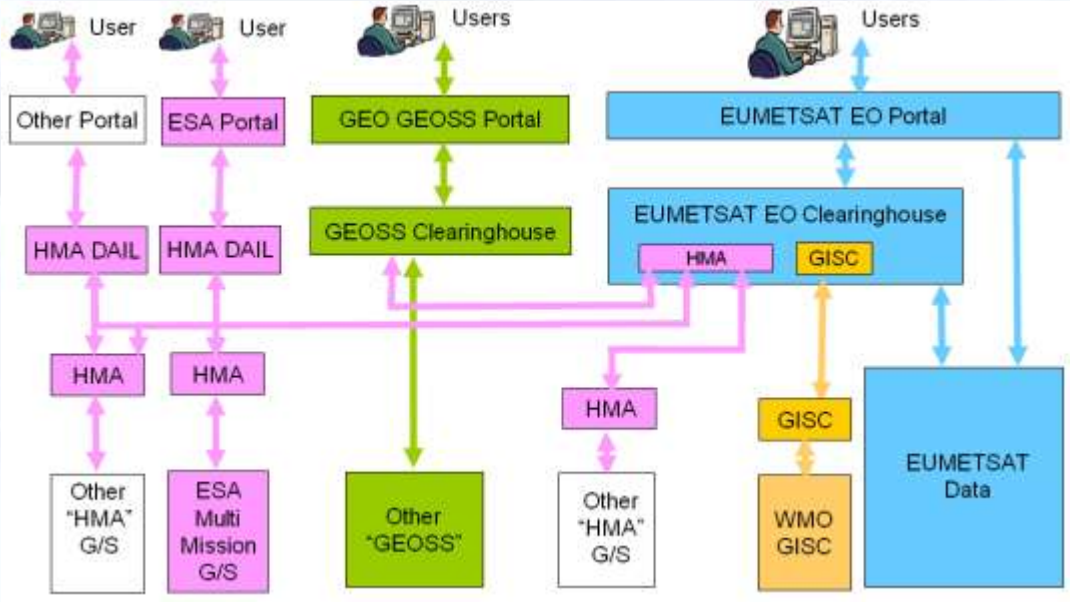
Clearinghouse

Main goals :

- Integration of legacy-systems
- Provision of (standardized) programmatic interfaces to allow to discovery, search and ordering of EO Data
- Integration of partner agencies
  - Interfaces based on OGC/ESA/HMA-, WMO- and INSPIRE-web-service
- Integration with new User-Management / IdP-Concepts
  - services secured by WS-Security and expect SAML2 tokens
  - for interaction with protected services in other domains Clearinghouse requests SAML token from EO-Portal Security Token Service (STS)
- Concept and implementation by con terra and EUMETSAT



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Programmatic Interfaces — Adaptors

translate request sent to interface, route it via Connectors

Connector

external system

response send back via interface to requestor

If more than one system of same type integrated a broker comes into play

Handles requests to and responses from backend systems

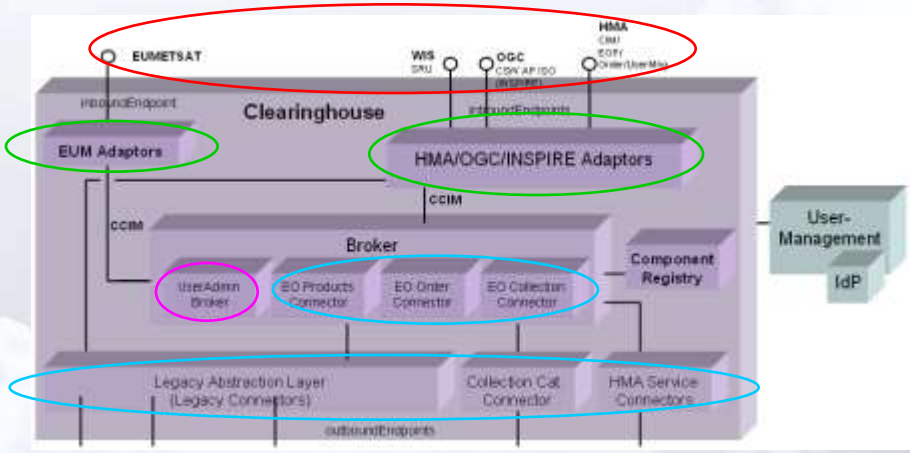
broker concept tested with UserAdminBroker

retrieval and management of user-information within legacy systems

Implementation based on Java, XSLT, ApacheCXF, Mule 2

Mule 2: lightweight Java-based messaging framework that allows to connect applications and enables them to exchange data

Mule is based on ideas from Enterprise Service Bus (ESB) architectures.



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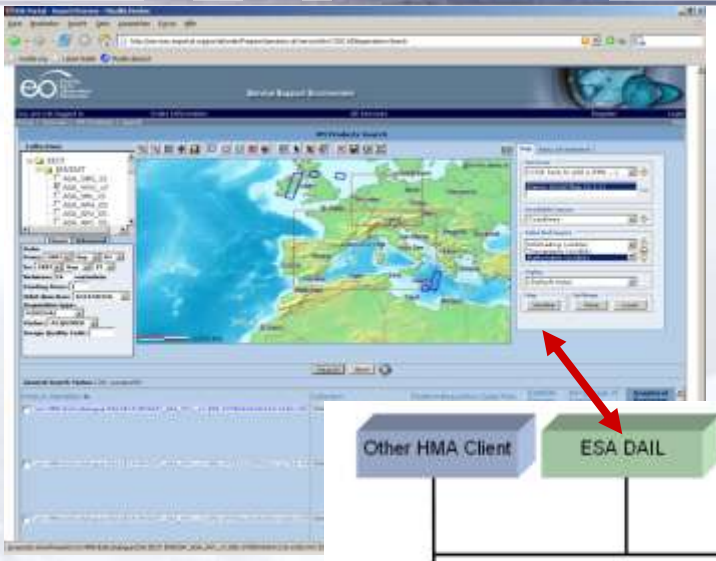
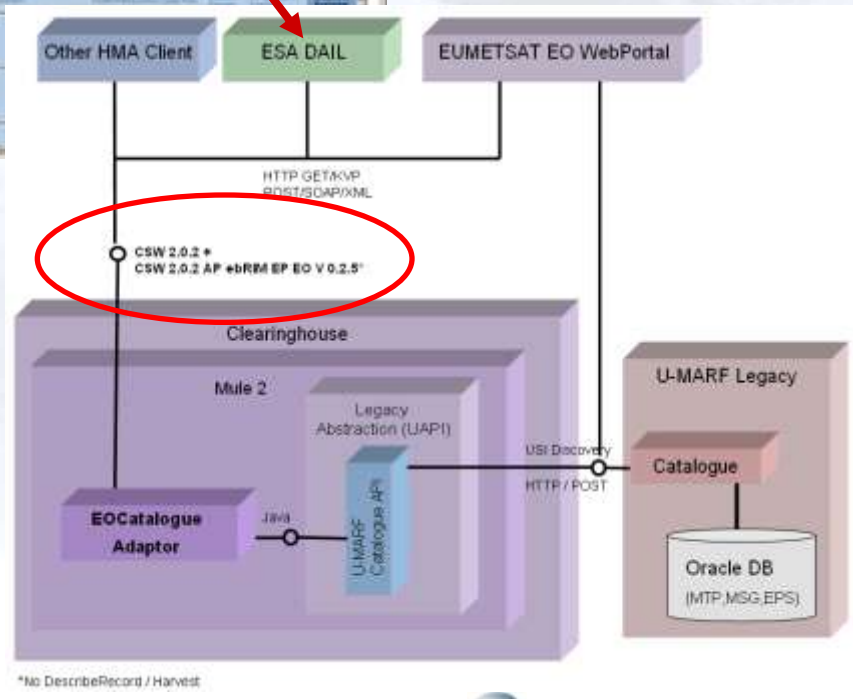
Programmatic interfaces

OGC/HMA EO Catalogue

- Implements:
  - OGC 06-080, GML Application Schema for EO Products
  - OGC 06-131, EO Products Extension Package for ebRIM Profile of CSW 2.0
- based on Data Centre UAPI
- mapping between EO GML and Data Centre EO Product information model done
- Integrated in ESA SSE and OGC FedEO Clients
- Problems:
  - complex interface
  - individual tailorings to different conformance levels and queryables/returnables





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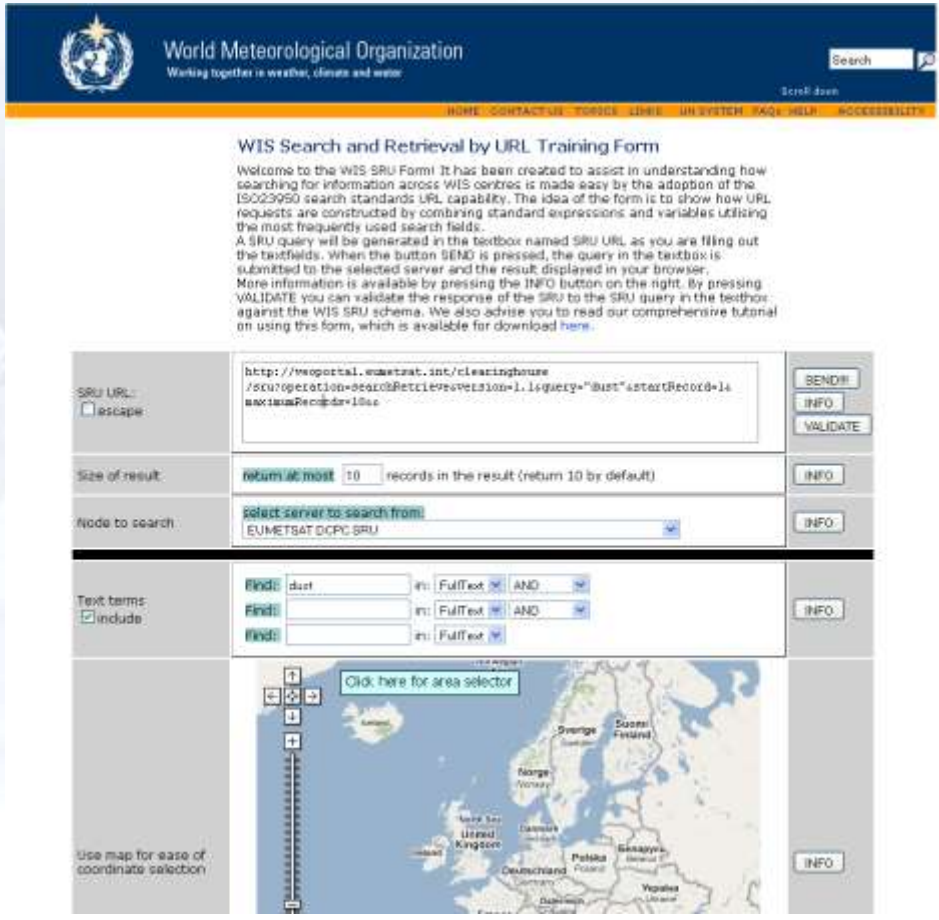
OGC/HMA Order

- Ordering/subscription/access to EOProducts
- Implements OGC 06-141 Ordering Services for EO Products
- based on Data Centre UAPI
- mappings between Order Services and

WMO/WIS Catalogue

- implements WMO/WIS z39.50/SRU interface
- implemented in Mule 2 as proxy on top of PN CSW interface.
- Integrated in WMO/WIS Training Form

- OGC/HMA UserManagement
  - Implements OGC 07-118 User Management



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Overview of supported OGC/ESA/HMA, WMO, INSPIRE Standards:

- OGC 07-006r1, OpenGIS Catalogue Service 2.0.2 (Dublin Core information model)
- OGC 07-045 , OpenGIS Catalogue Service 2.0.2 ISO Metadata Application Profile 1.0
- OGC 06-131 , EO Products Extension Package for ebRIM Profile of CSW 2.0
- OGC 06-080 , GML Application Schema for EO Products
- OGC 06-141 , Ordering Services for Earth Observation Products
  - Diverging product options and scene selections will make clients complicated
- OGC 03-109r1, OGC Web Map Service 1.3.0
- OGC 07-063r1, OpenGIS WMS EO Application Profile (partial)
- OGC 07-118 , OGC/HMA User Management
- INSPIRE Metadata Implementing Rules: Technical Guidelines based on EN ISO 19115 and EN ISO 19119 1.2 (full implementation with PN 2.0)
- INSPIRE DS: Technical Guidance to implement INSPIRE Discovery Services (full implementation with PN 2.0)
- WMO/WIS z39.50/SRU ISO19115
  - Only working draft -> should be standardized in a standardization organization like OGC
- EO Portal SOAP WS-S
- SAML 2.0 ECP Profile with SOAP Binding
- SAML 2.0 Web Browser SSO Profile with HTTP Redirect/Post Binding
- 2011: OGC 07-038r3, -W

Next steps

Next development steps include:

Enhancement of OGC W*S Operational Services to provide data access via WCS

ProductNavigator (PN)

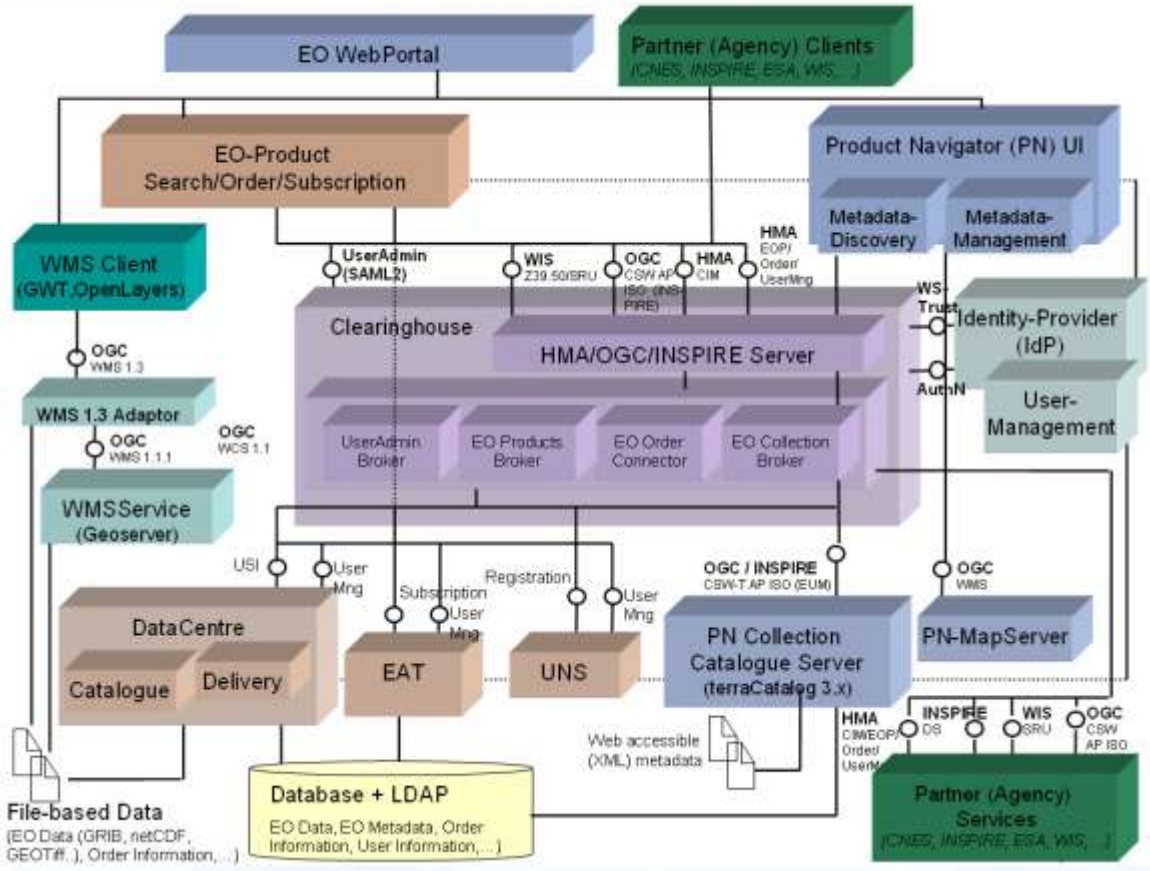
- adaptation of PN to terraCatalog 3.0, resulting in PN 2.0

Clearinghouse Enhancements

- Collection Search via HMA CIM
  - Connector sitting on top of INSPIRE interface of PN
- Ordering
  - implement latest spec
  - support of HMA UserManagement

Advanced Identity-/UserManagement

- Adaptation to HMA UserManagement 0.0.6 (e.g. current STS be replaced with a WS-TRUST STS)



Data Centre Ordering Application

- to support discovery, search and ordering products from partner organisations
- start integrating partners based on OGC, WIS/WMO and INSPIRE_DS interfaces

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