

The EUMETSAT EO Portal and Clearinghouse Project

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- **Introduction**
- **Project History / Project Status**
- **Information Models**
- **System Overview**
- **Product Navigator**
- **Clearinghouse**
- **IdentityProvider (IdP)- and UserManagement-Concept**
- **Conclusion**



- EO Portal provides a **single point of online access** 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:**
 - allows users to **access data and services of partner agencies** (e.g. CNES Altimetry products, 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 are based on **OGC/HMA and INSPIRE EU specifications**



- Some Services used programmatically (e.g. ordering) require **user details passed using security concepts**
- In order to implement this between different organizations:
 - >> A harmonized and **standards based security concept** is required
 - >> This involves the operation of a **federated Identity Management System**, including IdentityProvider (IdP)



 2008:

- Started with **architectural design phase** accomplished by con terra
 - accompanied by comparison and selection of **COTS/ Open Source SW**
 - documented in a **trade-off analysis**
- Next step: Implementation of Collection Catalogue (called “**Product Navigator**”)
 - based on **con terra´s terraCatalog SW**
- Development of sophisticated **security concept** including **IdentityProvider (IdP)-** and **UserManagement**
 - based on **SUNs OpenSSO**

 2009:

- first release of the **Clearinghouse** was launched:
 - integrating legacy systems for **orchestrated user administration** service calls
- Successful Experiment: to check interoperability with **ESA/HMA UserManagement**
- **OGC/HMA** based **EO Product Search** realized and integrated into Clearinghouse
- Presently:
 - Realization of the Order Service providing **OGC/HMA Order Service** Interface
 - **WMS/WCS Prototype** underway

- Different types of information are involved:
 - especially (meta-)data for EO Product discovery and ordering
- EO Metadata is provided and managed at Collection and Product level
- Collection Metadata
 - based on ISO19115-2 (conceptual model) and ISO19139 (encoding model)
 - specific EUMETSAT requirements (e.g. channels of distribution) are described in ISO conformant extensions to ISO19115-2 and ISO19139-2
- Product Metadata
 - based on HMA´s “OGC GML Application Schema for EO Products”
- Ordering / Subscription Information
 - based on information model of OGC/HMA Order Services
 - As the legacy systems use different information models for ordering / subscription, mappings between OGC/HMA Order and legacy models was important



EO WebPortal: main web-interface

Product Navigator UI: web-interface for Metadata Discovery / Management

EO Product Search/Order/Subscription: web-interface for discovery and ordering/subscription and Order-Follow-Up

UserManagement/IdP

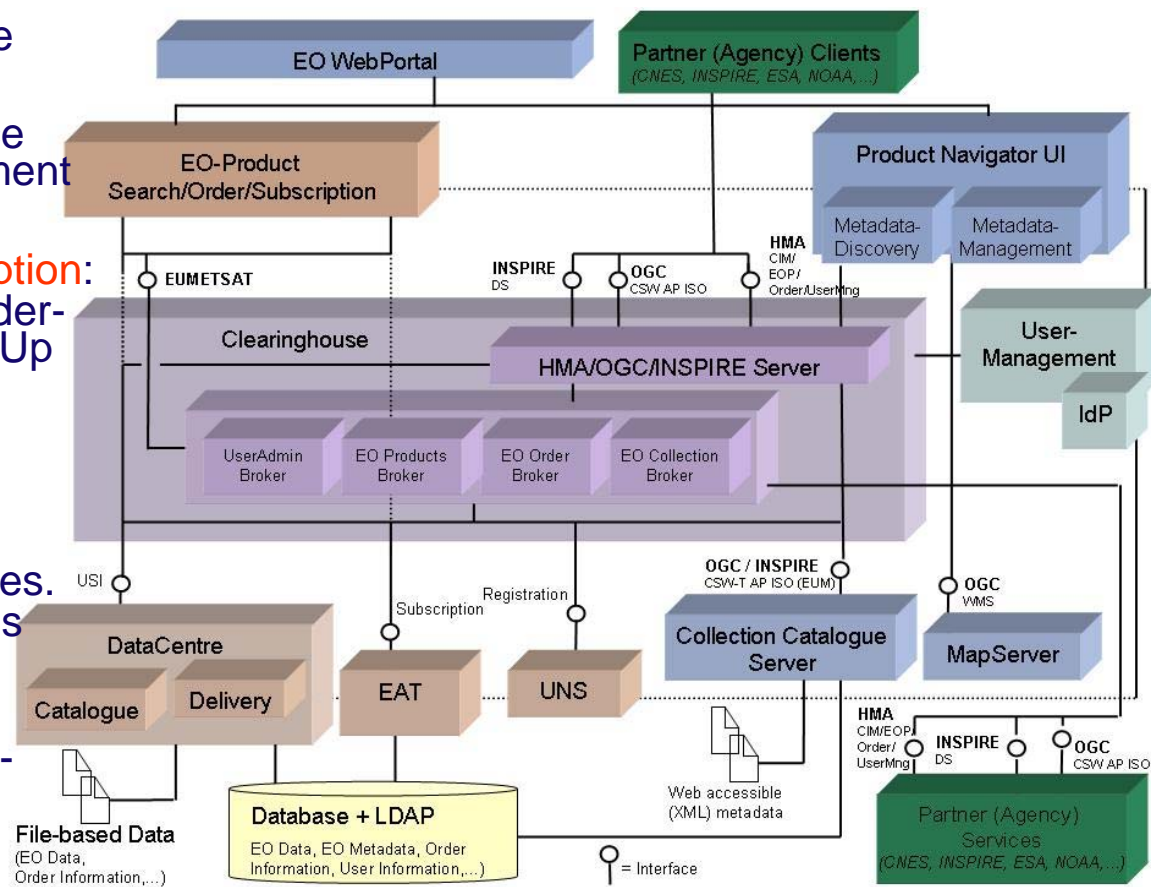
Clearinghouse: provides OGC, INSPIRE and EUMETSAT-interfaces. Communicates with legacy systems and external partner agencies

MapServer: provides WMS for definition of spatial filters and visualization of spatial extents of items

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

Partner Agency Services: provide their functionality via OGC/HMA web services

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



responsible for **Management and Discovery of Collection Metadata**. Consists of:

- Web-UI for **browse/search/discovery** of Collection Metadata
- Components for **Metadata Management**
- Service component (**Collection Catalogue Server**): provides discovery and management of Collections via service interfaces

The screenshot shows the EUMETSAT Product Navigator interface. The main content area displays metadata for a dataset titled "Active Fire Monitoring - MSG (GRIB)". The interface includes a search sidebar, a "Metadata details" section with a "Back to previous page" link, and a "Description" tab. The description text states: "The active fire monitoring product is a fire detection product indicating the presence of fire within a pixel. The underlying concept of the algorithm takes advantage of the fact that SEVIRI channel IR3.9 is very sensitive to hot spots which are caused...". Below the description is a table of metadata fields including Collection Reference, Name, Acronym, Status, Time Range, Geographic Bounding Box, and Point of Contact. To the right, there is a map of Europe with a blue box highlighting a region in the Balkans, and a smaller inset map showing a zoomed-in view of that region with red and yellow spots indicating fire detections.

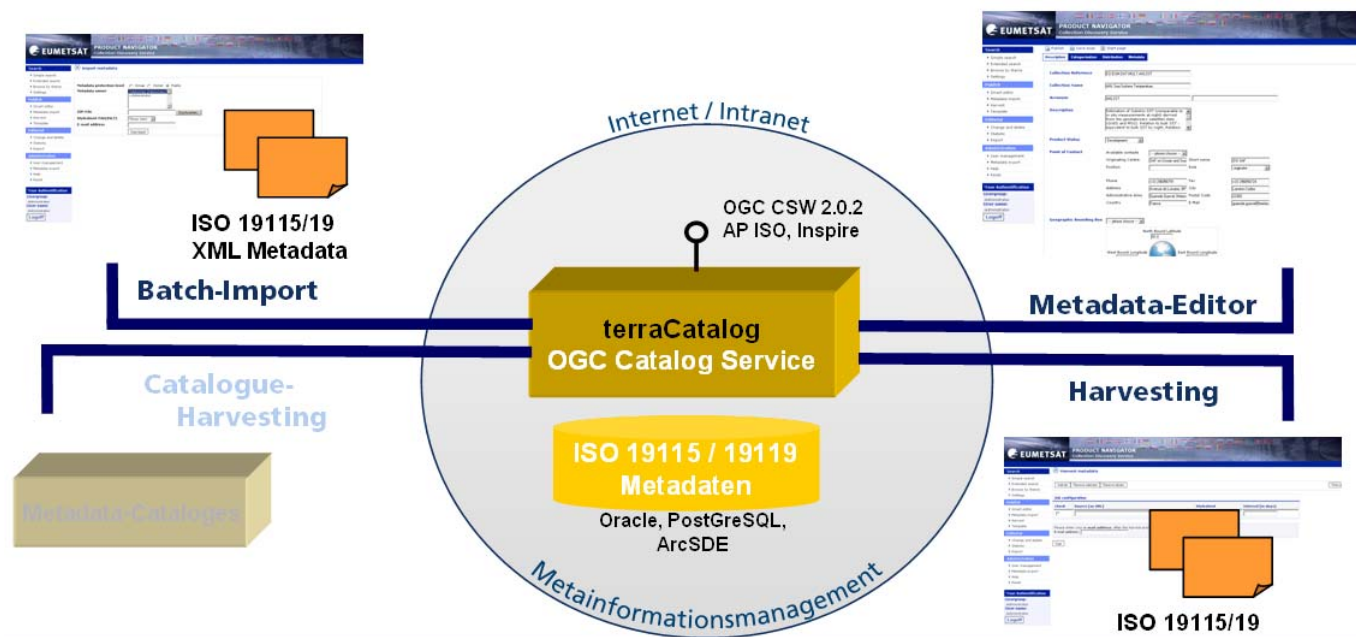
Collection Reference:	EO:EUM:DAT:MSG:FIR
Collection Name:	Active Fire Monitoring - MSG (GRIB)
Acronym:	FIR, MSGFIRG
Description:	The active fire monitoring product is a fire detection product indicating the presence of fire within a pixel. The underlying concept of the algorithm takes advantage of the fact that SEVIRI channel IR3.9 is very sensitive to hot spots which are caused... The algorithm distinguishes between potential fire and active users: Fire detection and monitoring.
Product Status:	Operational
Time Range:	Begin: 2006-12-14 End: -
Geographic Bounding Box:	West Bound Longitude: -79.00 East Bound Longitude: 79.00 North Bound Latitude: 81.00 South Bound Latitude: -81.00
Point of Contact:	Role: originator Originating Centre: European Organisation for the Exploit Satellites Short name: EUMETSAT URL: http://www.eumetsat.int Telephone: +49(0)6151-807 366/377 Fax: +49(0)6151-807 379

Web Search UI

- Search by combinations of spatial extent, content type, data format, keyword etc.
- Spatial extent is defined using selections within an **OGC WMS based-interactive map**
- **Metadata details:** URL can lead user to various applications or servers such as the EO Product Order for offline product search/order or online registration

For the **metadata management** different **components** are available:

- Web User-Interface (**Metadata Editor**) for insertion/editing of metadata entries
- **Batch-import** of XML encoded metadata files
- **Periodical automatic harvesting** of single XML encoded metadata files from known locations (also possible to automatic harvest metadata from other Catalogues)
- **Export** of metadata



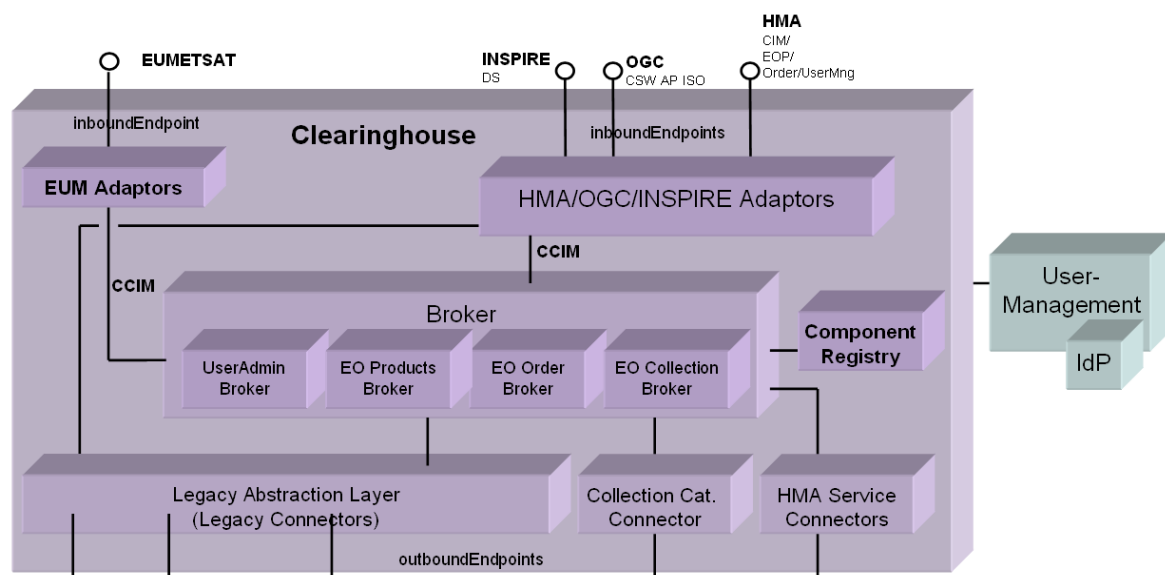
provides different **OGC CSW-** and **INSPIRE-**service interfaces

Implementation based on con terra's sdi.Suite terraCatalog version 2.3.



Main goals

- **Integration** of legacy-systems and partner agencies via **web-service interfaces**
- Provision of **programmatic interfaces** to discover, search and order EO Data from EUMETSAT and partner external agencies
- **Interfaces** based on **OGC/ESA/HMA-** and **INSPIRE-** specifications:
 - **OGC/HMA EO Product Discovery Interface** (finished)
 - **EO Product Ordering** (work in progress)
 - **User-Management** (finished)
- Interfaces implemented as so called **“Adaptors”**:
 - ...translate requests sent to interface, route it through Legacy Abstraction Layer to legacy system and their response back via the interface to requestor



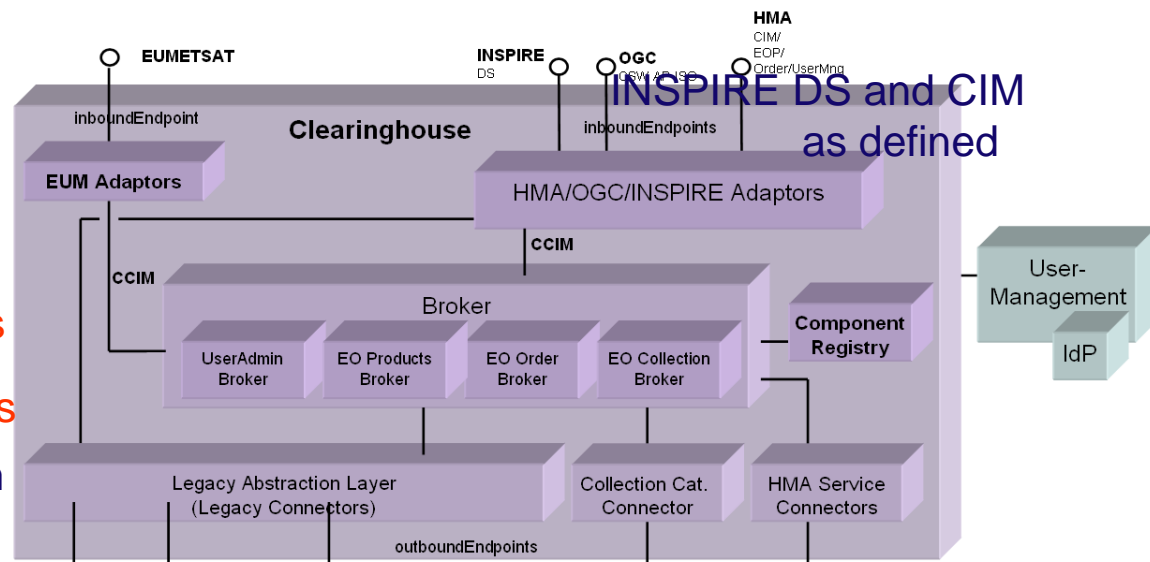
2010 the **OGC/HMA** interface for **EO Collection discovery** (CIM EP) will be provided

- Connector will be integrated sitting on top of INSPIRE interface of Product Navigator
- Provides **mapping** between

EP
in HMA-T

Start 2010 **integrating partners** based on the **OGC/HMA** interfaces

- processing is done by **brokers**
- broker handles requests from Adaptor by delegating sub-requests to **Connectors**
- Connector** interacts with service (in specific format and interaction model)
- Connector results** are **integrated by broker** and returned by the Adaptor in expected format of Clearinghouse interface



broker concept is already tested in the implementation of the **UserAdminBroker**

- This allows for retrieval and management of user-information within legacy systems
- Some Legacy systems already enhanced to support **UserManagement** concepts

Brokers in final version:

- **EO Collection Broker:** proceeds searches Collection-metadata in ProductNavigator and in partner agency collection catalogues
- **EO Products Broker:** proceeds searches for EO Product metadata on Data Centre and on external EO product catalogues
- **EO Order Broker:** supports ordering (subscription) of EO products from EUMETSAT or from partner agency order services

Clearinghouse is fully **integrated with UserManagement** concept

- protected **services are secured by WS-Security** and expect SAML2 tokens
- for interaction with protected services in other domains (e.g. partner companies), Clearinghouse must **request SAML token from EO-Portal Security Token Service**

Implementation is done with **Java 6, XML/XSLT, Apache CXF and Mule 2**

- **Mule 2:**
 - lightweight Java-based messaging framework
 - based on ideas from Enterprise Service Bus (ESB) architectures.
- For the integration with the **UserManagement libraries** had been developed.

- builds up on OASIS SAML 2

- centralized authentication, while user has different credentials at different providers

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

- Concept differentiates between

- SSO at web applications
- the way how web services are secured

- For SSO between web service consumer (WSC) and secured web service no global security token is required:

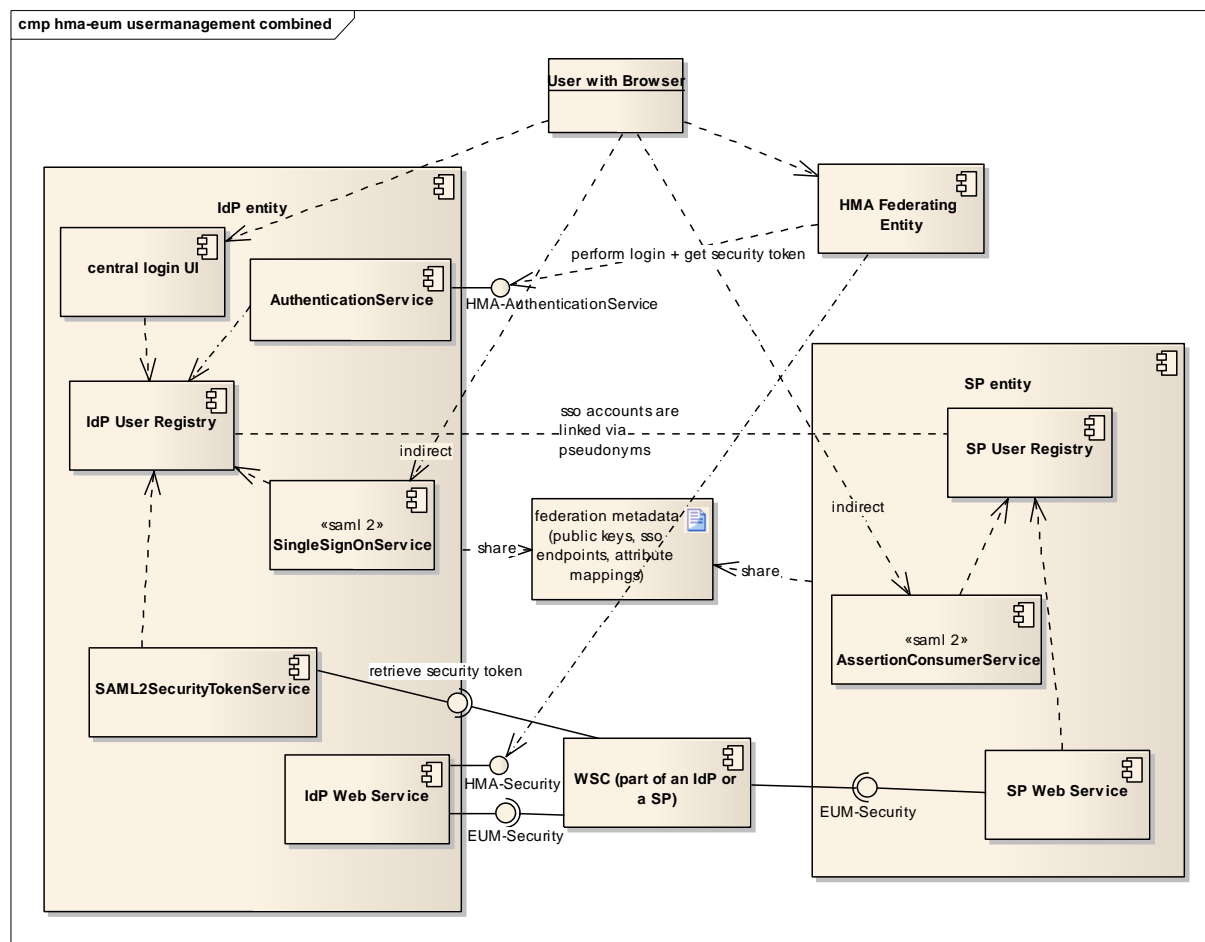
- because WSC is able to request new token for business entity at STS
- to be done via SAML2 AuthnRequest protocol and private/public key mechanisms

- Trust in requesting entity at web service requires two things:

- First: valid and trusted signature of the whole request
- Second: valid and trusted security token from an IdP

IdentityProvider (IdP) components:

- **central login:** user authenticated via username/ password
- user can only consume services within circle of trust, if authenticated at IdP
- **SingleSignOnService:** SSO between web applications. Interface specified in SAML2
- **User Registry** user profiles, mapping of local user ids to pseudonyms to provide user privacy during communications with services
- **IdP WebService** is secured by the WS-Security.
 - For calling: WSC needs to put security token in soap header

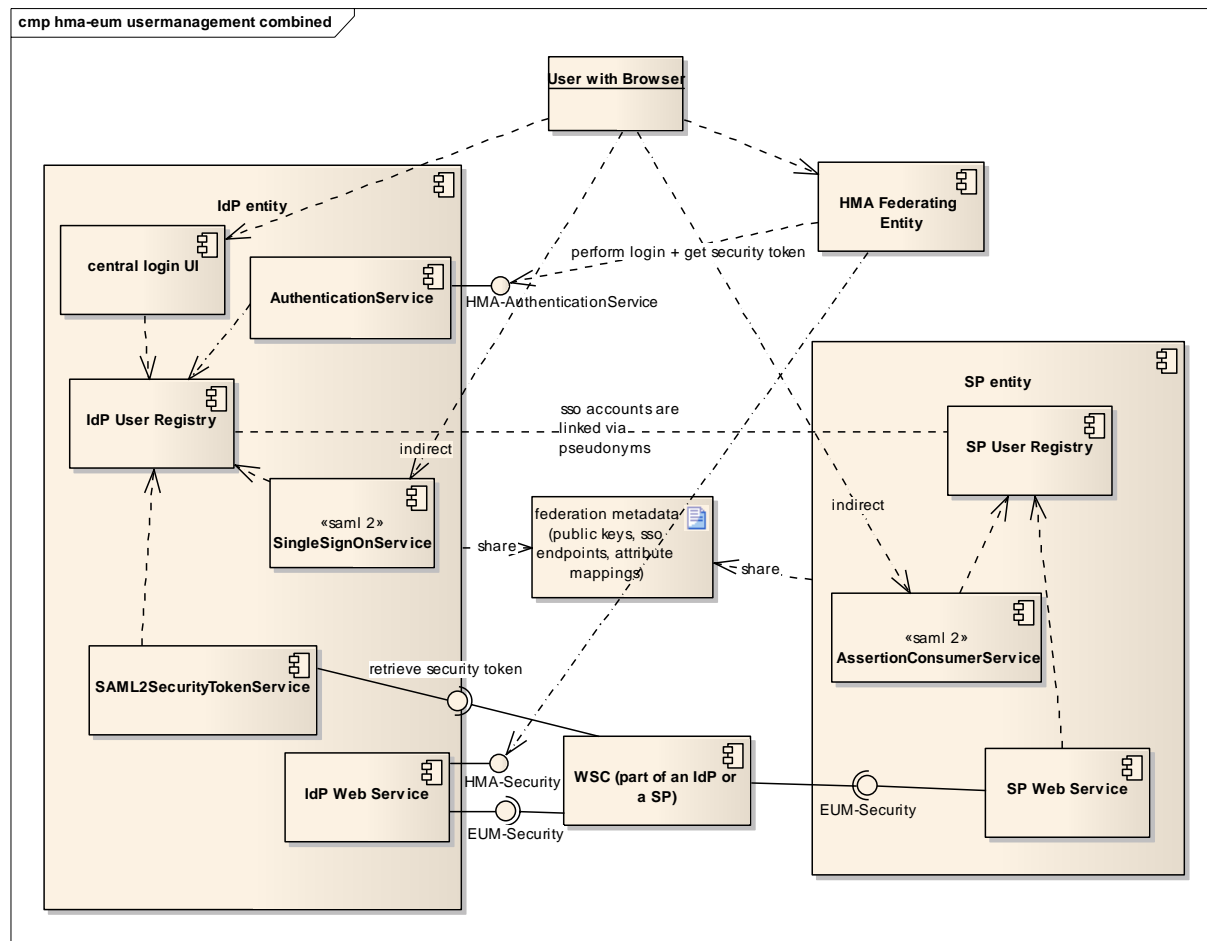


Service-Provider (SP):

- **business web service;** secured equally to IdP WebService
- **SP User Registry** manages local user profiles
- **AssertionConsumerService** endpoint of SSO between web applications at SP: interface specified in SAML2

Supports HMA UserManagement

- IdPs **AuthenticationService** validates user credentials and creates HMA security token (SAML1) on authenticate request
- token can be used by HMA federating entity to consume web services provided by EO-Portal.



- Provision of **interoperable access to data of GS is important**
- **Effort** for becoming familiar with those standards and migrating legacy systems towards those goals is **quite high**
- **Introduction of components** towards an interoperable infrastructure is advisable to be taken with **little steps**
 - Prototyping of components and concepts are essential prior introducing those into operations
- With the complexity of standards **expertise from external consultants is required**, if it is not possible to have staff completely allocated to such domains
- The **approach taken by EUMETSAT** towards a harmonized/ interoperable infrastructure will be **continued in 2010**
- For this it is:
 - important that **standards remain stable**
 - **partner organizations invest into an interoperable infrastructure** so that an exchange of data is possible and beneficial to the end users