# Big Data Earth Observation Standardization elements

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# Earth Observation standardization intro

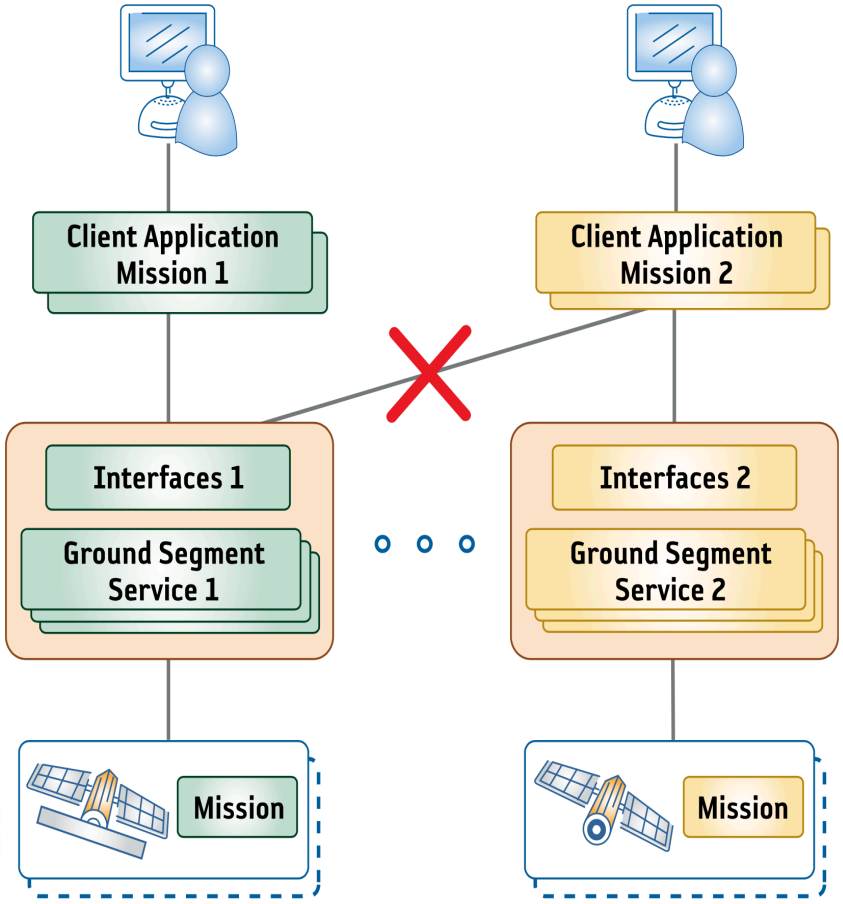
**2 directions:**

1. standardization of the Ground Segment Services: Heterogeneous Missions Accessibility

2. Development of a central interface between users and a set of computational Earth Observation data centers that agree on supporting this interface.

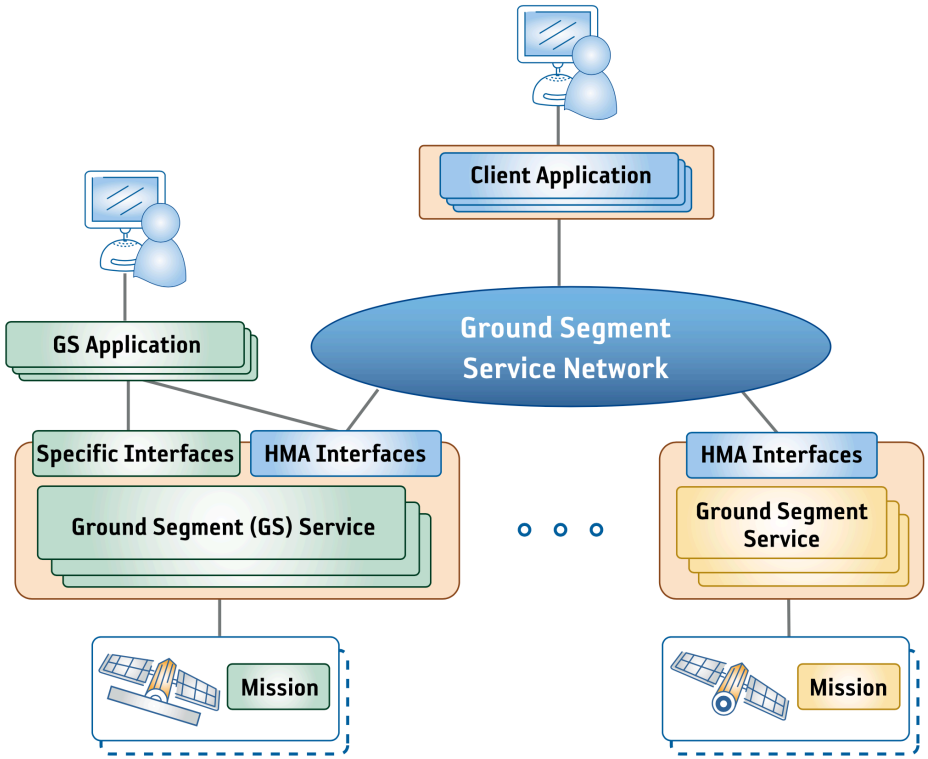
# 1. Heterogeneous Mission Accessibility

Each EO missions offers its own method and technology to search for access to and exploit the mission results in terms of software products, i.e. EO datasets or series of datasets, or images derived from these products. -> Ground Segment Services (called through interfaces by client applications, e.g. web portal applications or any other software components.



# 1. Heterogeneous Mission Accessibility

European Space Agency




- HMA initial step - to define the discovery, catalogue, ordering, EO instrument programming and data access and data delivery standards.
- HMA final objective - service-oriented architectural

# 1. Heterogeneous Mission Accessibility

European Space Agency

Federated Earth Observation Pilot:

- Catalog Service for the Web (CSW) for EO Collection and Service Discovery
- Standard template user guide for an CSW ebRIM extension package
- Web Map Services - Application Profile for EO Products
- Sensor Planning Service for EO Sensors
- GML 3.1.1 Application schema for Earth Observation products
- Improvements to Ordering Services for Earth Observation Products

| Organization | Standard | Purpose |
|---|---|---|
| ISO/TC211 | ISO 19115-2 – Metadata – Part 2: Extensions for imagery and gridded data | extends the existing geographic metadata standard by defining the schema required for describing imagery and gridded data. It provides information about the properties of the measuring equipment used to acquire the data, the geometry of the measuring process employed by the equipment, and the production process used to digitize the raw data. |
| ISO/TC211 | ISO 19129 – Imagery, gridded and coverage data framework | defines the framework for imagery, gridded and coverage data. This framework defines a content model for the content type imagery and for other specific content types that can be represented as coverage data. |
| ISO/TC211 | ISO 19130 – Imagery sensor models for geopositioning | identifies the information required to determine the relationship between the position of a remotely sensed pixel in image coordinates and its geoposition. It supports exploitation of remotely sensed images. It defines the metadata to be distributed with the image to enable user determination of geographic position from the observations. |
| OGC | Catalog Service for the Web (CSW) for EO Collection and Service Discovery | This describes the interfaces, bindings and encodings required to discover, search and present metadata from catalogues of Earth Observation products. The profile presents a minimum specification for catalogue interoperability within the EO domain, with extensions for specific classes of data. |
| OGC | Sensor Planning Service for EO Sensors | This standard describes a consistent Sensor Planning Service configuration that can be supported by many satellite data providers, most of whom have existing facilities for the management of these programming requests. The resulting extended web service interface can be used for determining the feasibility of an intended sensor planning request, for submitting such a request, for inquiring about the status of such a request, for updating or canceling such a request, and for requesting information on means of obtaining the data collected by the requested task. |
| OGC | GML 3.1.1 Application schema for Earth Observation products | This application schema document describes the encodings required to describe Earth Observation (EO) products from general to mission specific characteristics. |

| Organization | Other documents ( e.g. best practices) | Purpose |
|---|---|---|
| OGC | Web Map Services - Application Profile for EO Products | The objective of this work is to define how data providers can apply OGC Web Service standards in a “standard” way to ensure that the inventory level visualisation of EO data is carried out in a truly interoperable way. |

# 2. central interface between users and a set of computational Earth Observation data centers

## GDAL for Earth Observation Analytics – OpenEO

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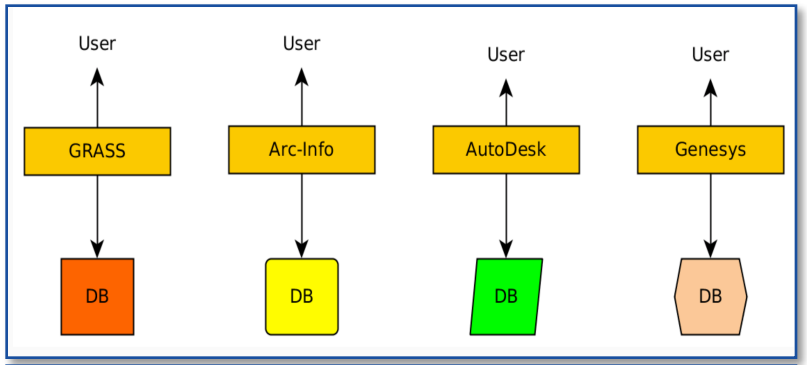


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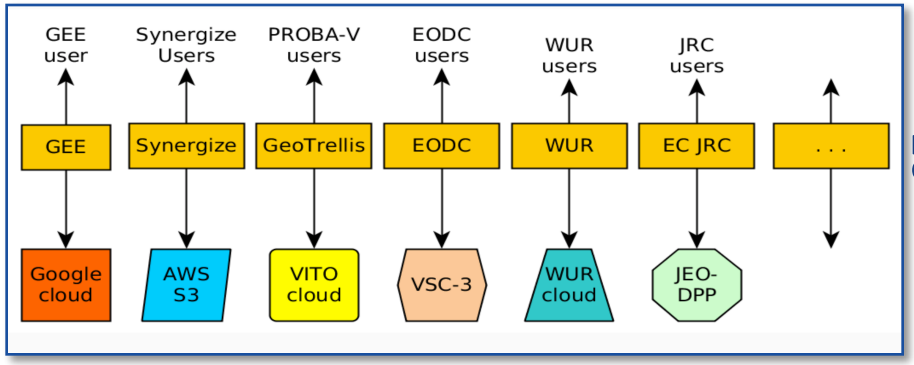


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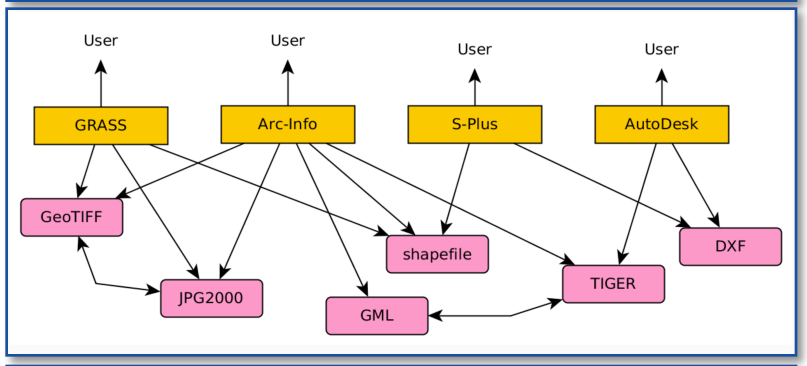


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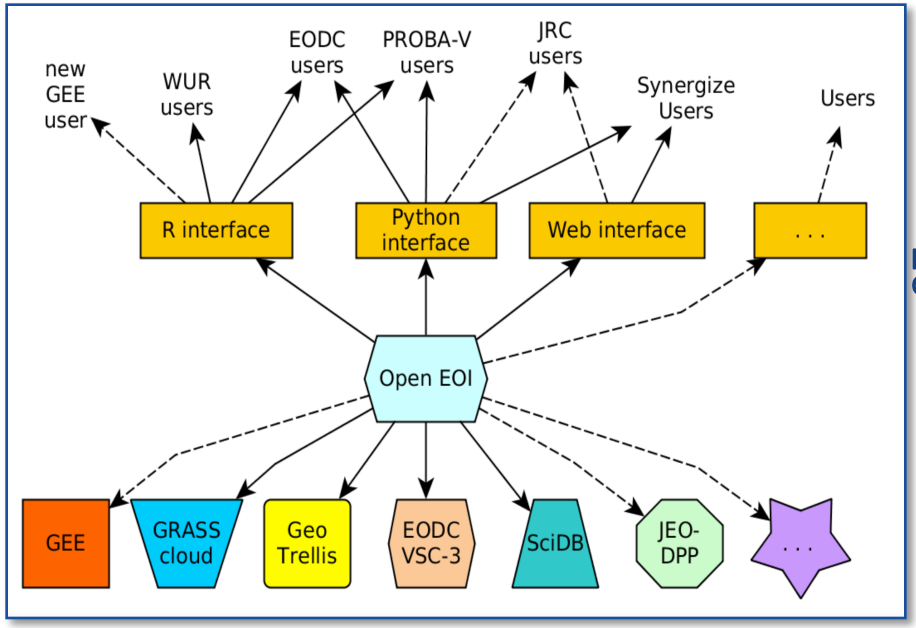


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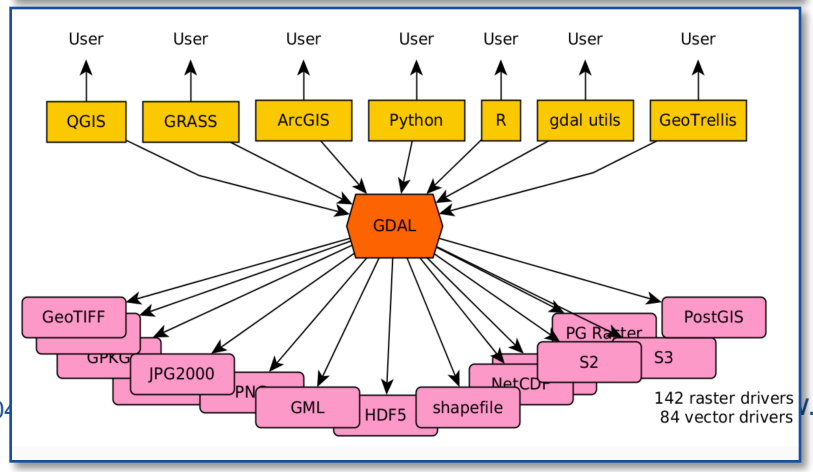

# Thank you!

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