

Big Data Analytics for agricultural monitoring using Copernicus Sentinels and EU open data sets pilot (EAP)

Short description	The key aspect in the early adopter demonstrator is to show how federated EOSC resources can facilitate a range of Sentinel data applications across agricultural user domains and demonstrate the use of advanced Big Data Analytics (BDA) approaches applied to multi-annual high resolution Copernicus Sentinel time series and EU open access reference data sets.
Type of community	Others (EAP)
Community contact	Guido Lemoine (JRC) Guido.LEMOINE@ec.europa.eu
Interviewer	Enol Fernandez del Castillo
Date of interview	
Meetings	
Supporters	Shepherd: Enol Fernandez del Castillo

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User stories



Instruction

Requirements are based on a user story, which is an informal, natural language description of one or more features of a software system. User stories are often written from the perspective of an end user or user of a system. Depending on the community, user stories may be written by various stakeholders including clients, users, managers or development team members. They facilitate sensemaking and communication, that is, they help software teams organize their understanding of the system and its context. Please do not confuse user story with system requirements. A user story is an informal description of a feature; a requirement is a formal description of need (See section later).

User stories may follow one of several formats or templates. The most common would be:

"As a <role>, I want <capability> so that <receive benefit>"

"In order to <receive benefit> as a <role>, I want <goal/desire>"

"As <persona>, I want <what?> so that <why?>" where a persona is a fictional stakeholder (e.g. user). A persona may include a name, picture; characteristics, behaviours, attitudes, and a goal which the product should help them achieve.

Example:

"As provider of the Climate gateway I want to empower researchers from academia to interact with datasets stored in the Climate Catalogue, and bring their own applications to analyse this data on remote cloud servers offered via EGI."

No.	User stories
US1	As a farmer, I want direct access to Copernicus Sentinel imagery that covers my parcels, so that I can check how they compare in crop development within and across sets.
US2	In order to make a precise analysis as a user, I want the extracted imagery to be correctly georeferenced and available for the full history of acquisitions
US3	As an inspector in the Paying Agency, I want to generate consistent statistical time series for the whole region of interest, which may contain up to 1 million parcels, in a reasonable time frame (several days)

US4	As a scientist I want to be able to analyse time series from Sentinel-1 and Sentinel-2 for 3 types of summer crops in this area to understand how the signals relate to crop phenology trends
US5	As a service company, I want to develop a method to inventorize all wheat parcels in a production area, to help in the planning of the deployment of combines for the harvesting operations
US6	As a developer, I need to integrate imagery as GeoTIFFs and time series profiles as JSON formatted responses in my farm advisory service app.

Use cases



Instruction

A use case is a list of actions or event steps typically defining the interactions between a role (known in the Unified Modeling Language as an actor) and a system to achieve a goal.

Include in this section any diagrams that could facilitate the understanding of the use cases and their relationships.

Step	Description of action	Dependency on 3rd party services (EOSC-hub or other)
UC1	Access to full Copernicus Sentinel archive	One or more DIAS instances need to be federated
UC2	Marshall scalable compute resources to facilitate parallel analysis tasks	
UC3	Provide transparent accounting across federated resource instances	
UC4	Single sign on and allow transparent resource marshalling across federated resources	
UC5	Provide (temporary) storage for caching essential data sets relevant for data analytics	Open data access platforms (e. g. national OGC compliant data servers)
UC6	Support interactive data analysis with advanced geospatial data visualization and libraries of advanced method (including ML)	
UC7	Provide service end points (e.g. RESTful) for client-side access to both raw data selections and analysis results	

Requirements

Technical Requirements



Instruction

- Requirement number: Use numbers RQ1, RQ2, RQ3, ...
- Requirement title: Use a short but descriptive title. Use the same title in the Jira ticket 'Summary' field
- Link to requirement JIRA ticket: Open a ticket in <this JIRA queue <https://jira.eosc-hub.eu/projects/EOSCWP10/issues/EOSCWP10-4?filter=allopenissues>> (click on 'CREATE' button in the middle-top of JIRA)
- Source use case: Refer back to the use cases above (UC1, 2, ...)

Requirement number	Requirement title	Link to Requirement JIRA ticket	Source Use Case
RQ1	EOSC-hub to provide access to the full Copernicus archive		UC1
RQ2	EOSC-hub to provide single sign on to marshall compute resources		UC2, UC4
RQ3	EOSC.hub to provide accounting services, across federated resources		UC3
RQ4	EOSC-hub to provide scalable data transfer, storage for temporary data assets		UC5
RQ5	EOSC-hub to provide multi-user data analytics platform (e.g. JupyterHub) and relevant data processing libraries (e.g. GDAL, python modules)		UC6
RQ6	EOSC-hub to develop fast data access mechanism to block storage (e.g. smart caching, optimized storage formats)		UC2, UC5, UC7

Capacity Requirements

EOSC-hub services	Amount of requested resources	Time period