C-SCALE

Copernicus - eoSC AnaLytics Engine

Implementing a European Big Copernicus Data Analytics platform: The C-SCALE service offer in a nutshell

Charis Chatzikyriakou (EODC) and the C-SCALE Team

Charis.Chatzikyriakou@eodc.eu

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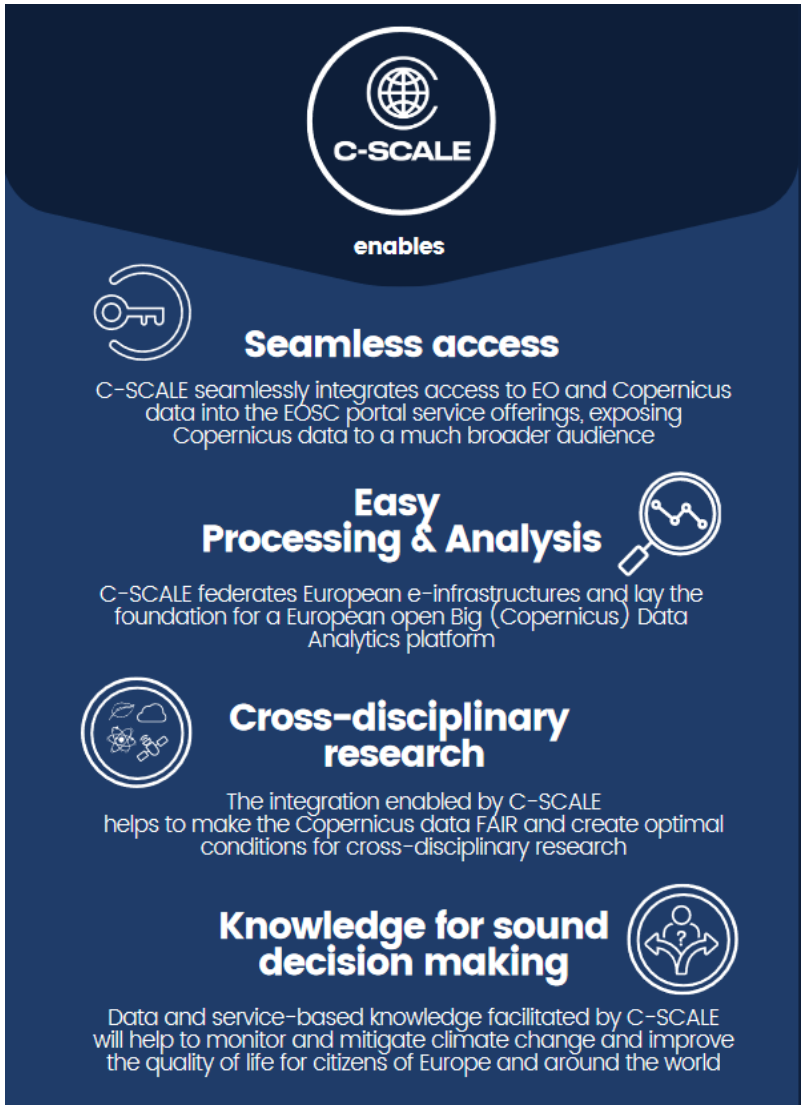
The C-SCALE Project

Europe lacks an integrated compute and storage infrastructure for the exploitation of **Copernicus** datasets in scientific and applied applications.

C-SCALE responds to that challenge by enhancing the **EOSC Portal** with pan-European federated data and computing infrastructure services for Copernicus.

C-SCALE: Copernicus - eoSC AnaLytics Engine

- Project duration: Jan 2021 – June 2023
- Budget: ~ 2 million Euros
- Consortium of 11 partners with pan-European coverage



Project Objectives and KERs

Objectives

- O1: Scale-up the EOSC Portal integrating pan-European computing and data resources for Copernicus
- O2: Federate Copernicus resources with EOSC computing and storage providers
- O3: Piloting the provision of a distributed online Sentinel long-term archive in EOSC
- O4: Co-design of the federation with relevant scientific communities across Europe

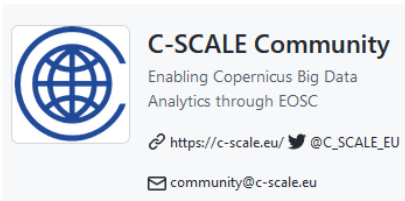
Key Exploitable Results:

FedEarthData

openEO Platform

Earth Observation Metadata Query Service

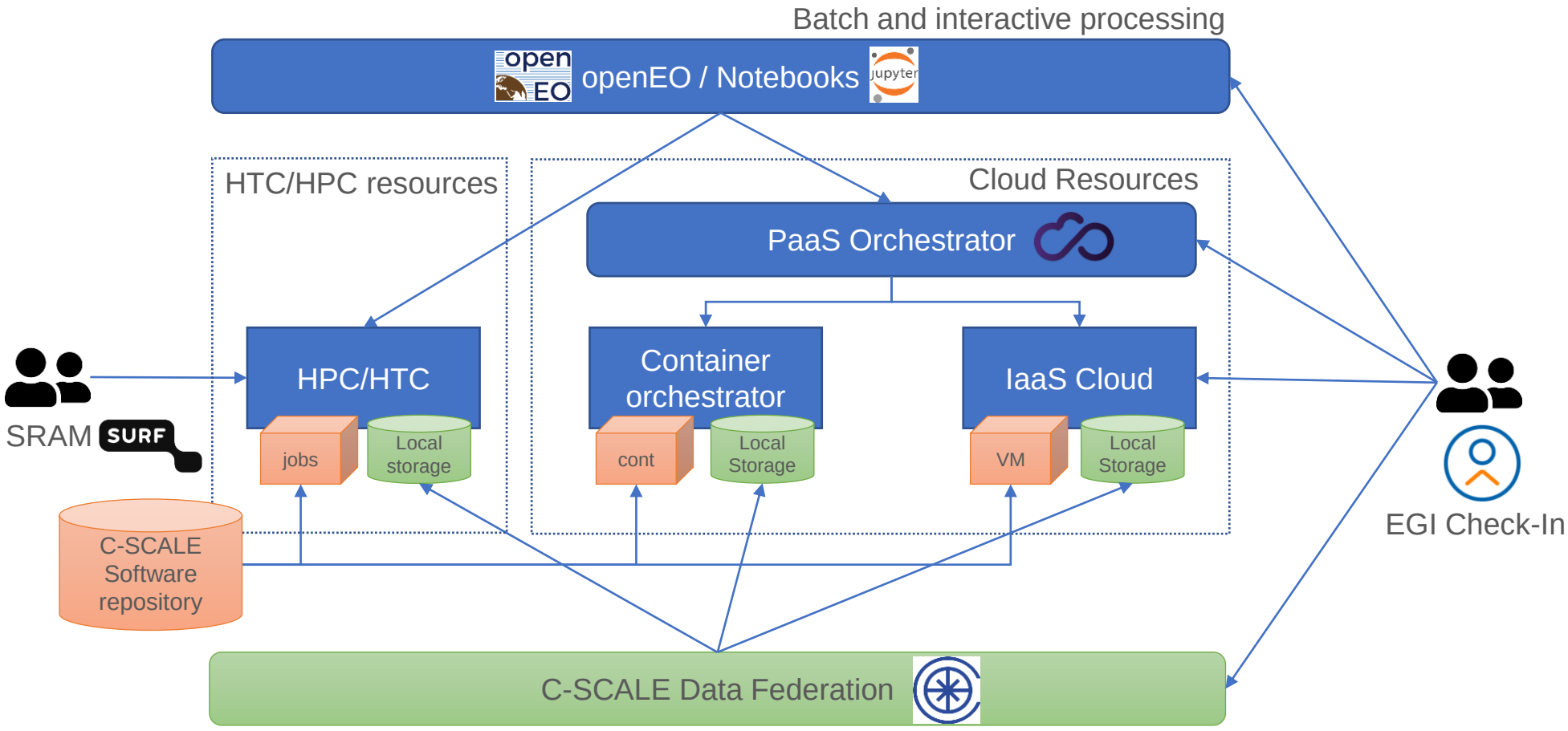
Workflow solutions



C-SCALE Community

FedEarthData

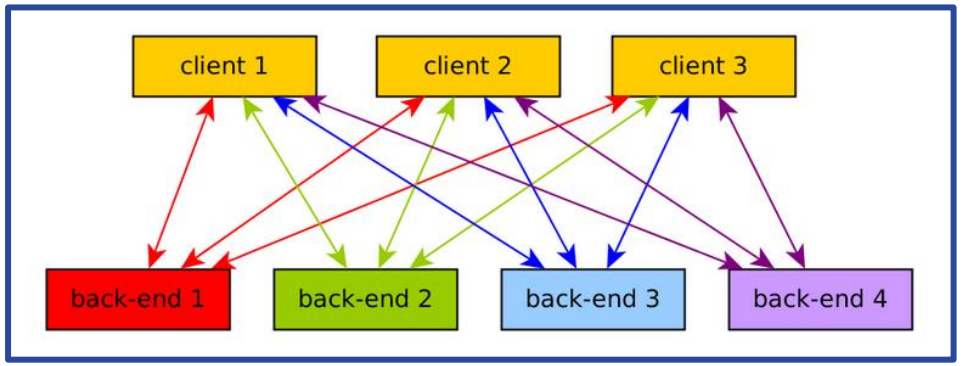
FedEarthData: federation of Earth observation data archives and computing resource providers, enabling execution of Earth observation processing workflows with seamless access to data



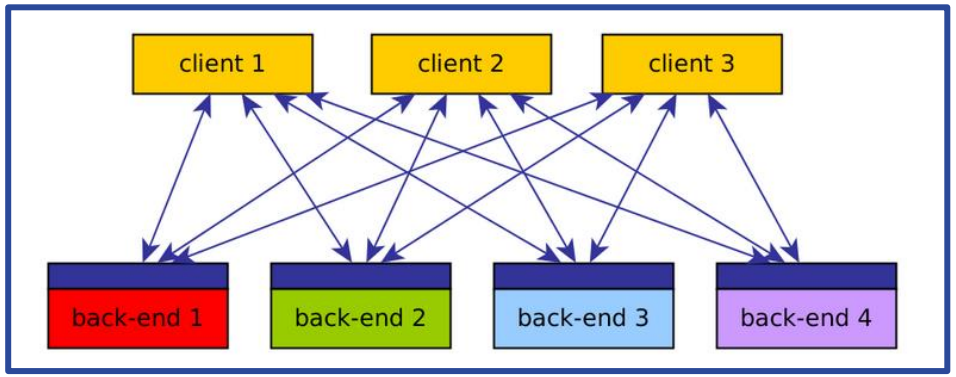
- Authentication and authorisation services
- Identity management infrastructure services
- Monitoring
- Accounting
- Virtual Machine or container image management and redistribution

openEO Platform

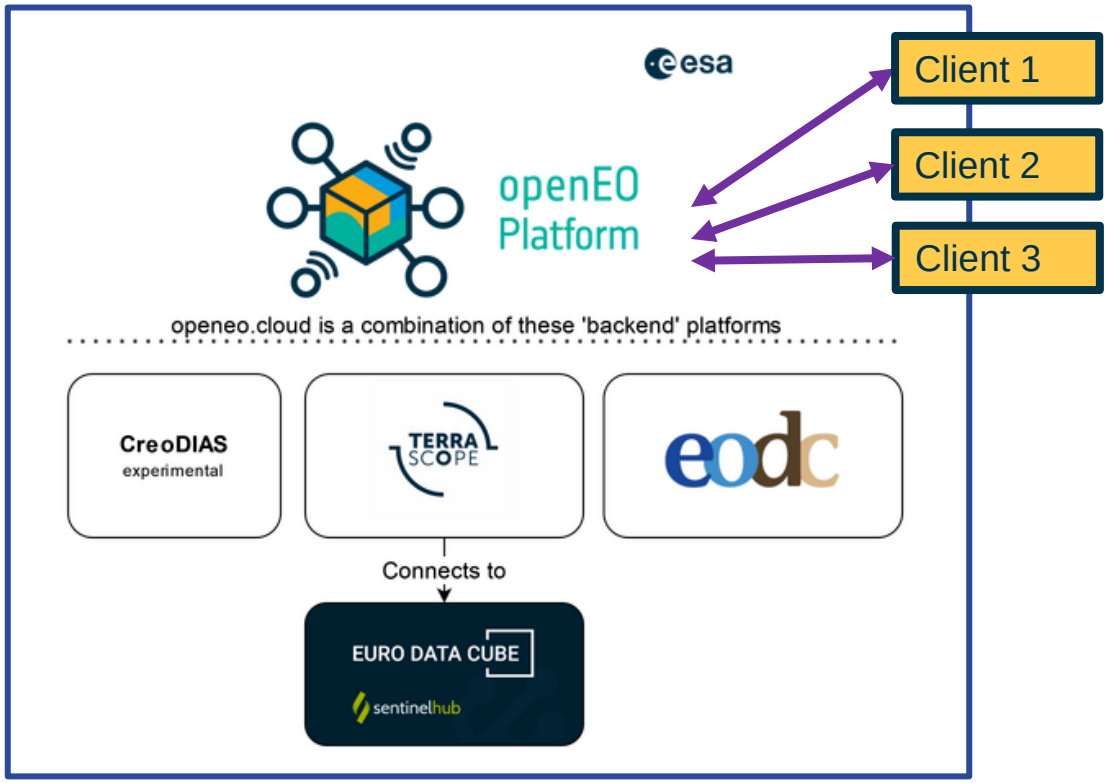
Situation before openEO:



openEO API:



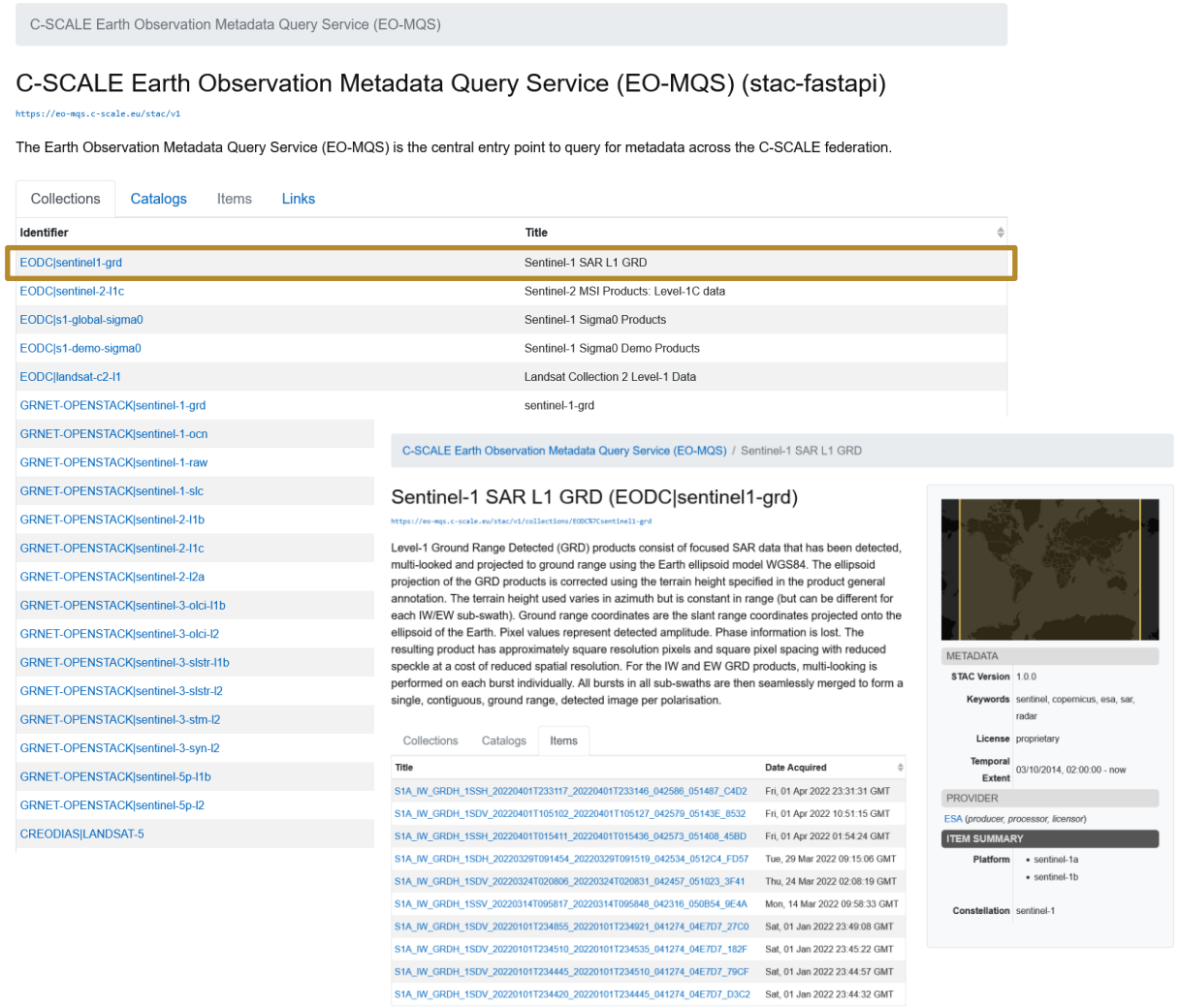
openEO Platform:



- Clients: Python, R, Javascript
- Web Editor
- JupyterLab

Earth Observation Metadata Query Service

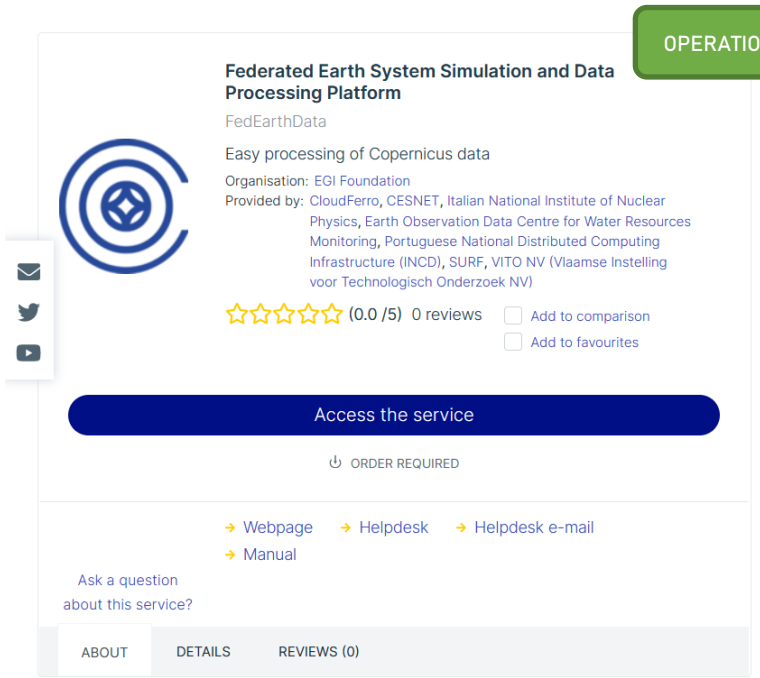
- Earth Observation data discovery service arching over FedEarthData member providers
- Data providers already know where their data are
  - Bring their discovery interfaces under a common one
    - single point
    - shared protocol
- Spatio-Temporal Asset Catalogue (STAC) interface to enable queries across the federation
- EO-MQS is a query broker and aggregator, it is **not yet another metadata database**.
- Focus and data retention policies at member sites - avoiding polling resources irrelevant to the given query



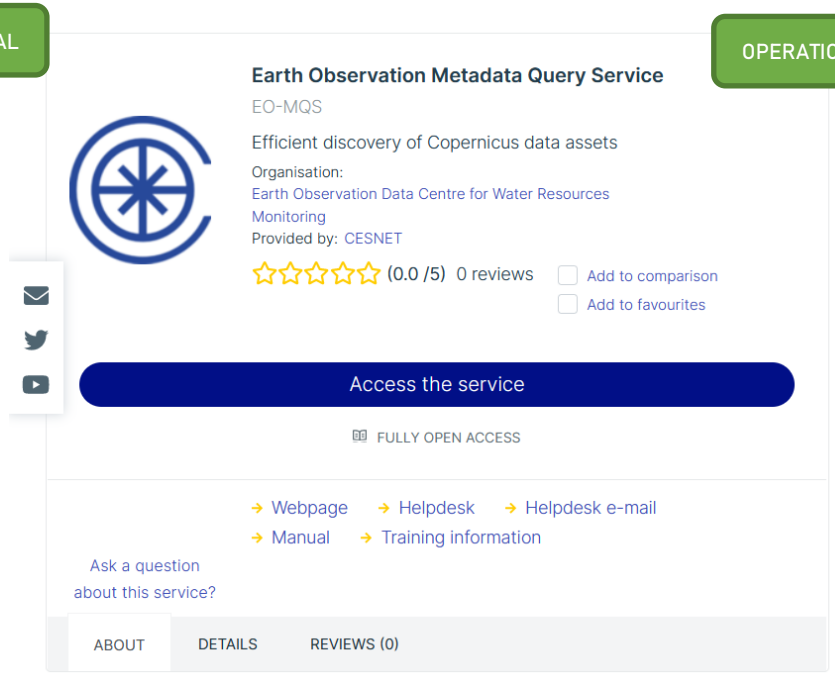
How to access the C-SCALE services

Main exploitation paths:

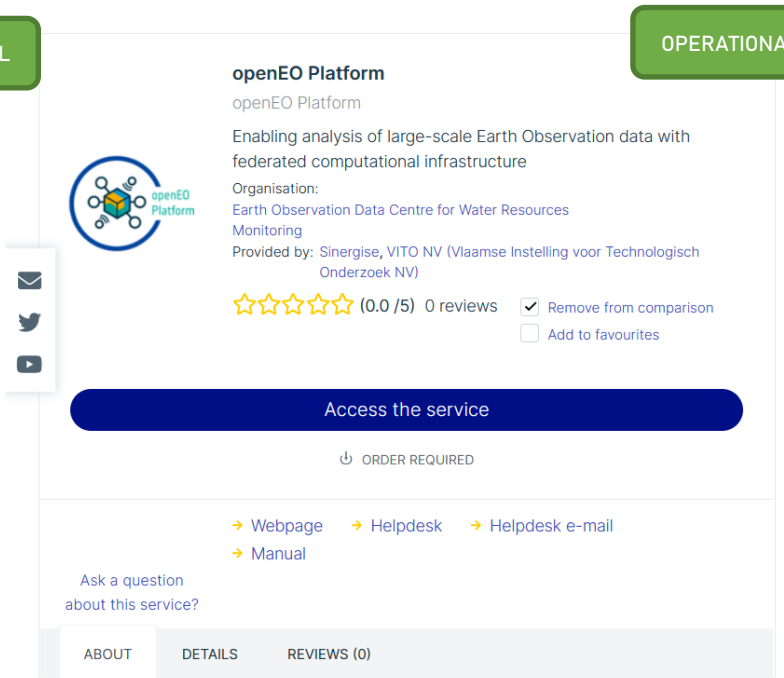
- EOSC Marketplace
- C-SCALE website
- openEO Platform website



https://marketplace.eosc-portal.eu/services/eosc.egi-fed.fedearthdata



https://marketplace.eosc-portal.eu/services/eosc.eodc.eo-mqs

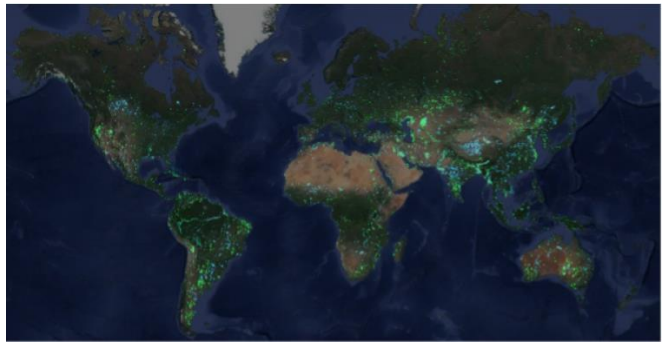


https://marketplace.eosc-portal.eu/services/openeo-platform/

C-SCALE workflow solutions

Workflows for Copernicus data processing: easy deployment of workflows supporting monitoring, modelling and forecasting of the Earth system

- Provided by C-SCALE Use Cases
- Templates and reusable components for users to build their own applications on FedEarthData

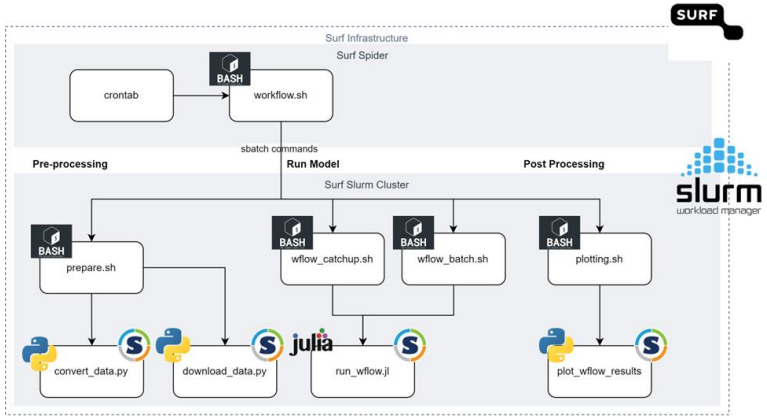


Aquamonitor using OpenEO on C-SCALE

RoHub Link zenodo Link

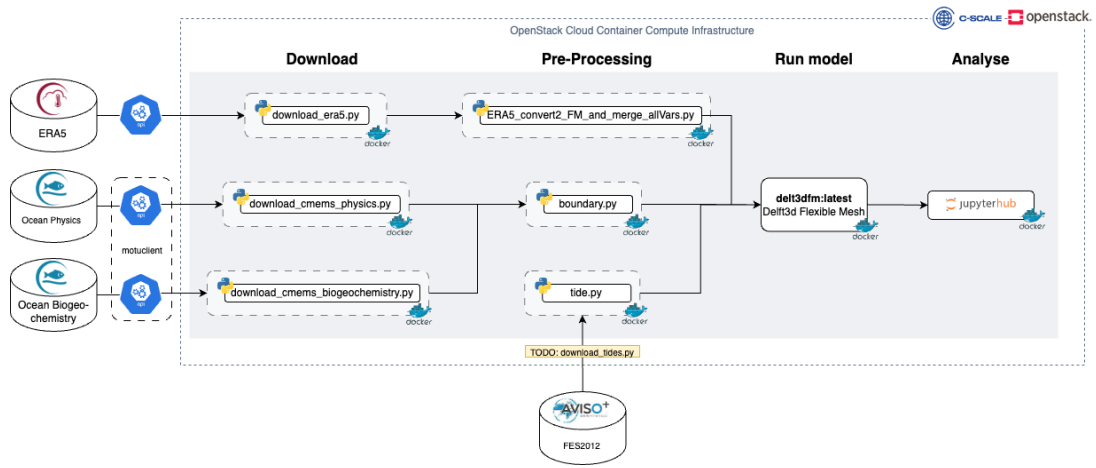
Global Water Watch using OpenEO on C-SCALE

RoHub Link



Automated monthly river forecasts using Wflow

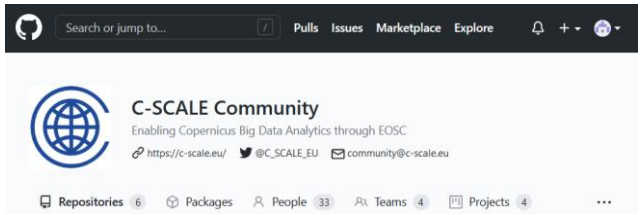
RoHub Link zenodo Link



Coastal hydrodynamic and water quality modelling using Delft3D FM

RoHub Link zenodo Link

User engagement

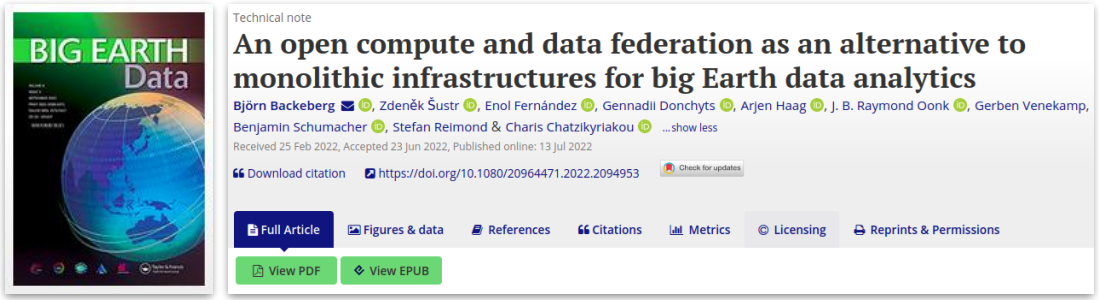


User forum and functional co-design

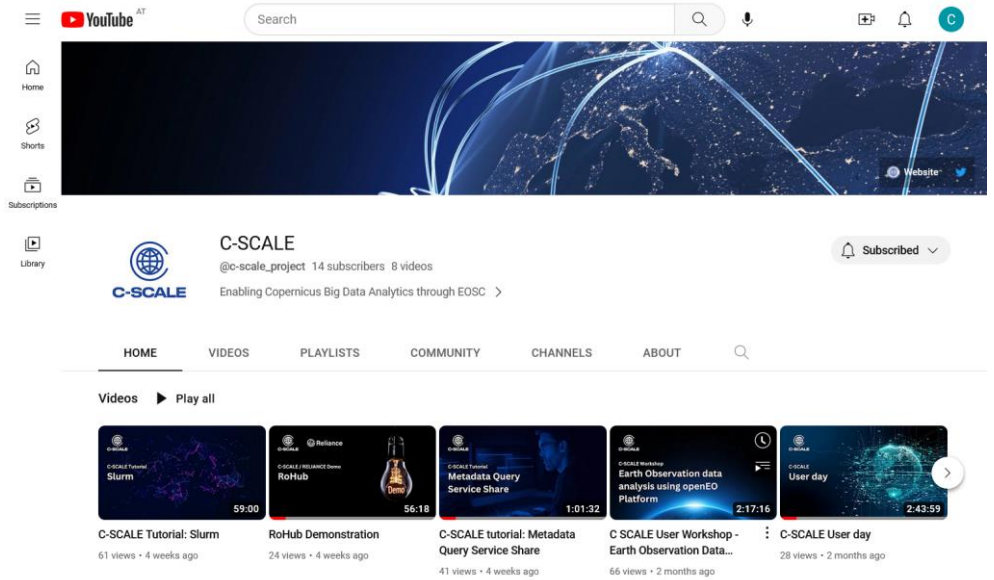
- C-SCALE community: https://github.com/c-scale-community/discussions
- encourages advanced users to become active participants in the development of the future C-SCALE services
- mechanism to engage with the national and international organisations invested in Copernicus services

C-SCALE documentation, training and support

- https://wiki.c-scale.eu/C-SCALE
- https://www.youtube.com/@c-scale_project



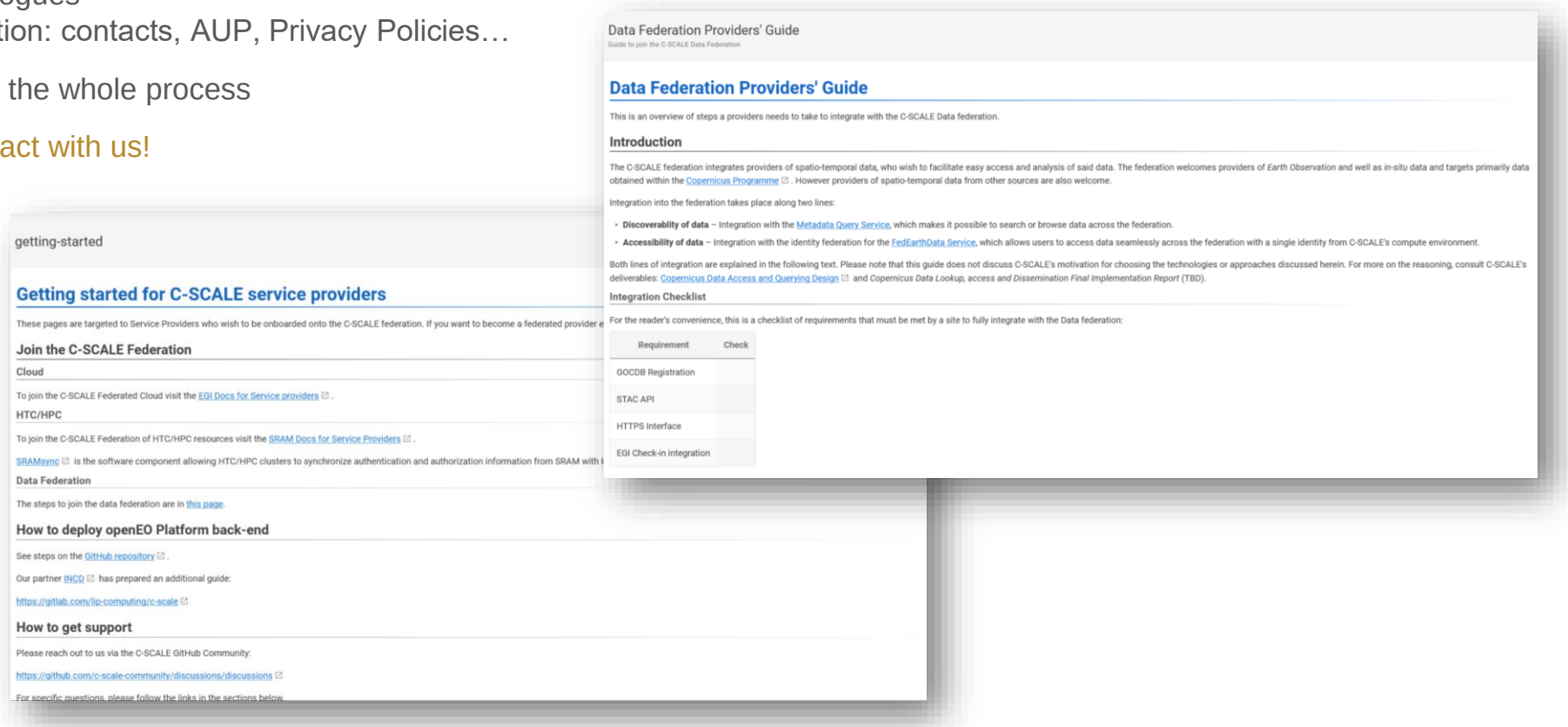
https://doi.org/10.1080/20964471.2022.2094953



Provider onboarding

C-SCALE aims to expand its Compute and Data federation with new service providers!

- Well-defined guidelines to join the federation
  - Technical integration
    - configure your system to allow federated identity
    - register in catalogues
  - Non-technical integration: contacts, AUP, Privacy Policies…
- Support is provided through the whole process
- If you interested, get in contact with us!



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Thank you for your attention.

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Charis.Chatzikyriakou@eodc.eu

contact@c-scale.eu

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