

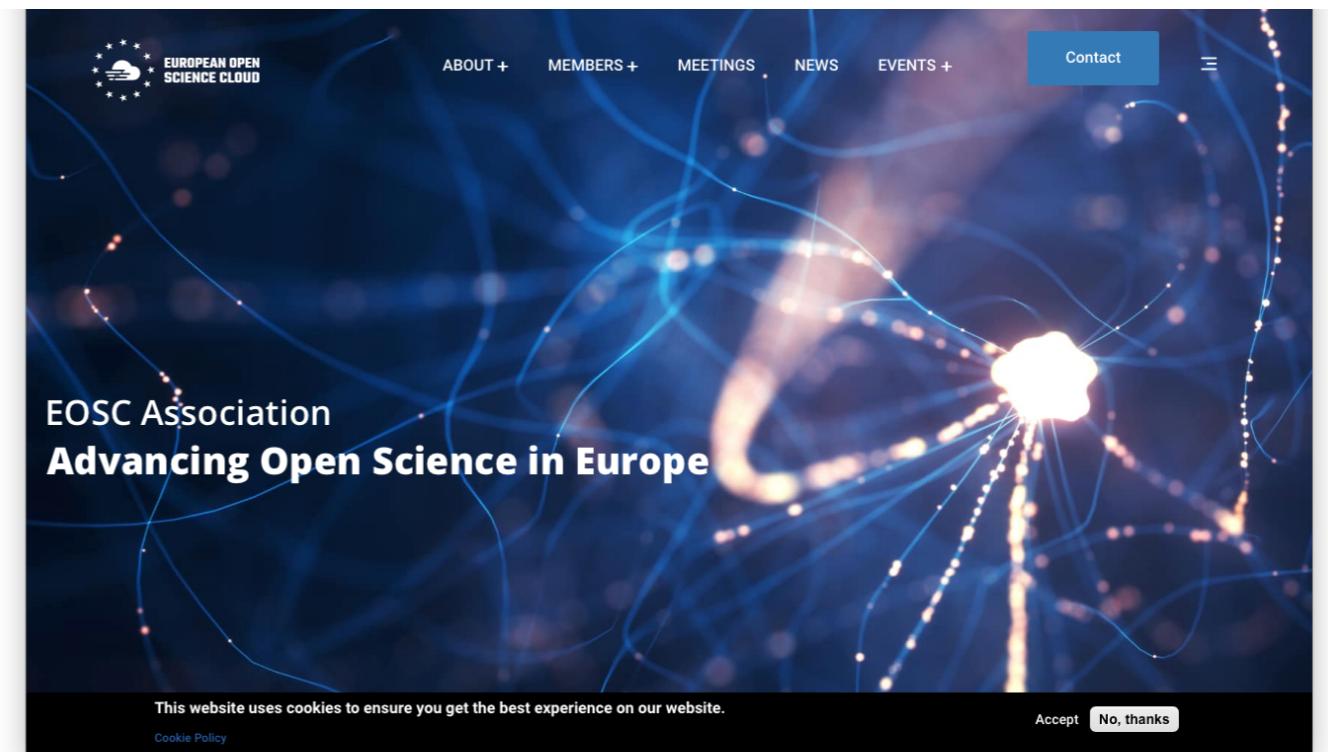


EUROPEAN OPEN
SCIENCE CLOUD

EOSC & Sciences de l'Univers

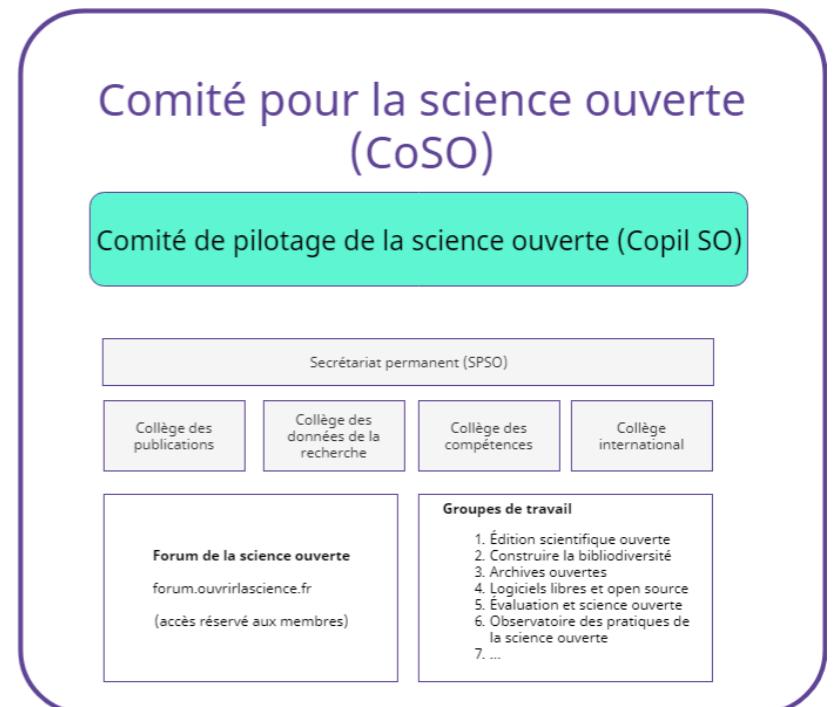
B. Cecconi, ObsParis-PSL

- EOSC:
European Open
Science Cloud
<https://eosc.eu>



Science Ouverte à tous les étages

- Politique Science Ouverte nationale
 - CoSO (Comité pour la Science Ouverte)
 - <https://www.ouvrirlascience.fr>
- Politique Science Ouverte européenne:
 - EOSC (<https://eosc.eu>)
- + initiatives locales (établissements, universités, CER...), communautaires (astro, science de la Terre...), internationales (RDA, IVOA, IHDEA, OGC...)
- Tous les appels d'offre demandent DMP, FAIR, etc



- Initiative lancée en 2015 par la commission européenne.
- Objectif: développer une infrastructure ouverte de services “cloud” pour les pratiques de science ouverte.
- Fin 2020: création de l'Association EOSC (assoc. non-lucrative belge).
=> Ecriture du *Strategic Research and Innovation Agenda of the EOSC (Feb 2021)*
https://www.eosc.eu/sites/default/files/EOSC-SRIA-V1.0_15Feb2021.pdf
- Mise en place des “Advisory Groups” & “Task Forces”
- Collège EOSC-France
membres FR Association-EOSC

<https://www.eosc.eu/advisory-groups>

- **Implementation of EOSC**
 - [PID policy and implementation](#)
 - [Researcher engagement and adoption](#)
 - [Rules of Participation \(RoP\) compliance monitoring](#)
- **Metadata and data quality**
 - [FAIR metrics and data quality](#)
 - [Semantic interoperability](#)
- **Research careers and curricula**
 - [Data stewardship curricula and career paths](#)
 - [Research careers, recognition and credit](#)
 - [Upskilling countries to engage in EOSC](#)
- **Technical challenges on EOSC**
 - [AAI Architecture](#)
 - [Infrastructures for quality research software](#)
 - [Technical interoperability of data and services](#)
- **Sustaining EOSC**
 - [Financial Sustainability](#)
 - [Long-term data preservation](#)

Liste de membres Français de l'association EOSC



European Open Science Cloud Objectives Tree

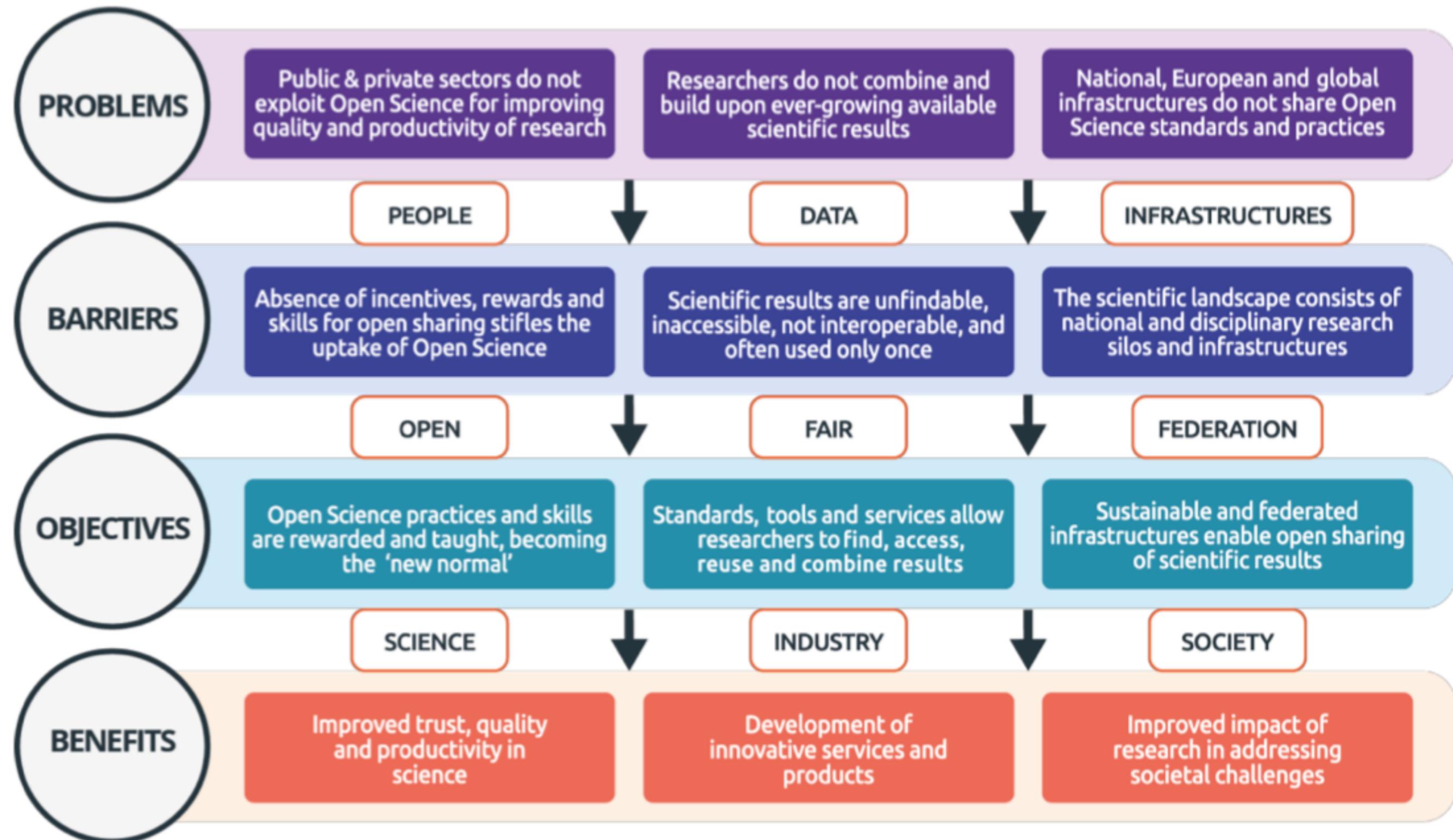


Figure 0.1: European Open Science Cloud Objectives Tree

EOSC crash-course

- **EOSC Marketplace:** <https://marketplace.eosc-portal.eu> => accéder/ commander un service
- services générique:
 - calcul (EGI - cloud compute, Jupyter Notebook...)
 - stockage (EUDAT - B2drop/B2Share)
 - préservation/publication/DOI (B2Share, Zenodo...)
- Les services peuvent être configurables,
Certains services nécessitent configuration/discussion avec fournisseur.
- Authentification et Accès:
enregistrement dans l'AAI du fournisseur (e.g., EUDAT-B2Access, EGI-Checkin, GÉANT-eduTEAMS...)

EOSC Marketplace

Scientific Domains	Categories
 Medical & Health Sciences	 Engineering & Technology
 Generic	 Humanities
 Social Sciences	 Support Activities
 Natural Sciences	 Agricultural Sciences
	 Other
Scientific Domains	Categories
 Access physical & eInfrastructures	 Aggregators & Integrators
 Security & Operations	 Sharing & Discovery
	 Processing & Analysis
	 Training & Support

[Browse all resources](#)

Home > Resources

All Resources

CATEGORIES

Access physical &
eInfrastructures 0

Aggregators & Integrators 0

Processing & Analysis 2

Security & Operations 0

Sharing & Discovery 0

Training & Support 0

Other 0

FILTERS

Scientific Domains



Find or choose from the list below

- Natural Sciences 2
- Earth & Related Environmental Sciences 2

2 Looking for: eiscat

Displaying 2 results

Sort by: Best match

EISCAT data access portal

EISCAT user portal

Organisation: EISCAT Scientific Association

Scientific domain: Earth & Related Environmental Sciences

Add to comparison Add to Favourites

 ORDER REQUIRED

EISCAT data access portal

EISCAT user portal

Organisation: EISCAT Scientific Association

Scientific domain: Earth & Related Environmental Sciences

 ORDER REQUIRED



Resources

All Resources

6 Looking for: jupyter

CATEGORIES

Access physical & eInfrastructures	2
Aggregators & Integrators	0
Processing & Analysis	2
Security & Operations	0
Sharing & Discovery	1
Training & Support	0
Other	0

FILTERS

Scientific Domains

Find or choose from the list below

<input type="checkbox"/> Generic	3
<input type="checkbox"/> Generic	3
<input type="checkbox"/> Natural Sciences	3
<input type="checkbox"/> Chemical Sciences	1
<input type="checkbox"/> Earth & Related	1
Environmental Sciences	1
<input type="checkbox"/> Physical Sciences	1
<input type="checkbox"/> Biological Sciences	0
<input type="checkbox"/> Computer & Information Sciences	0
<input type="checkbox"/> Information Sciences	0
<input type="checkbox"/> Mathematics	0
<input type="checkbox"/> Other Natural Sciences	0
<input type="checkbox"/> Agricultural Sciences	0
<input type="checkbox"/> Agricultural Biotechnology	0
<input type="checkbox"/> Agriculture, Forestry & Fisheries	0
<input type="checkbox"/> Animal & Dairy Sciences	0
<input type="checkbox"/> Other Agricultural Sciences	0
<input type="checkbox"/> Veterinary Sciences	0
<input type="checkbox"/> Engineering & Technology	0
<input type="checkbox"/> Aerospace Engineering	0
<input type="checkbox"/> Chemical Engineering	0
<input type="checkbox"/> Civil Engineering	0
<input type="checkbox"/> Electrical, Electronic & Information Engineering	0
<input type="checkbox"/> Industrial Biotechnology	0

jupyter X All res... 🔍

My EOSC Marketplace



Resources

All Resources

10 Looking for: docker

CATEGORIES

Access physical & eInfrastructures	7
Aggregators & Integrators	0
Processing & Analysis	3
Security & Operations	0
Sharing & Discovery	1
Training & Support	0
Other	1

FILTERS

Scientific Domains

Find or choose from the list below

<input type="checkbox"/> Generic	7
<input type="checkbox"/> Generic	7
<input type="checkbox"/> Natural Sciences	2
<input type="checkbox"/> Biological Sciences	1
<input type="checkbox"/> Earth & Related	1
Environmental Sciences	1
<input type="checkbox"/> Chemical Sciences	0
<input type="checkbox"/> Computer & Information Sciences	0
<input type="checkbox"/> Information Sciences	0
<input type="checkbox"/> Mathematics	0
<input type="checkbox"/> Other Natural Sciences	0
<input type="checkbox"/> Physical Sciences	0
<input type="checkbox"/> Engineering & Technology	1
<input type="checkbox"/> Electrical, Electronic & Information Engineering	1
<input type="checkbox"/> Aerospace Engineering	0
<input type="checkbox"/> Chemical Engineering	0
<input type="checkbox"/> Civil Engineering	0
<input type="checkbox"/> Environmental Biotechnology	0
<input type="checkbox"/> Environmental Engineering	0
<input type="checkbox"/> Industrial Biotechnology	0

docker X All res... 🔍

My EOSC Marketplace

My EOSC Marketplace

EOSC et les Sciences de l'Univers

- Avant EOSC: beaucoup d'initiatives Science-Ouverte (IVOA, SPASE/IHDEA, RDA, OGC/Dataterra).
Culture Science Ouverte & FAIR assez bien implantée
- Avec EOSC:
 - Science de la Terre: EPOS
 - Collaboration EUDAT/B2FIND + IVOA
 - Astrophysique & Phys. des Particules: **ESCAPE**
- Projets utilisant EOSC sans être directement financé par EOSC: Europlanet/VESPA, VAMDC...





Europaⁿ-VESPA

Exploring EOSC Opportunities

B. Cecconi

(and the VESPA, EOSC-Hub, EUDAT and GÉANT teams)

The Europlanet-2024 Research Infrastructure project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 871149.
This work used the EGI Infrastructure with the dedicated support of IN2P3-IRES and CESNET-MCC. This work used the eduTEAMS service provided by GÉANT.

VESPA: A distributed Virtual Observatory for Solar System Sciences

VESPA Query Portal



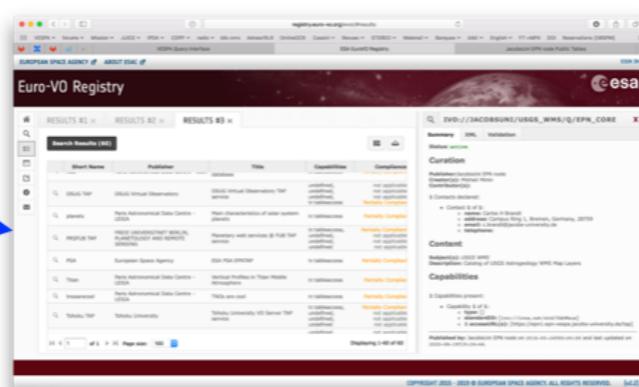
EPN-TAP Services



EPN-TAP

EPN-TAP
Service Lookup

Services
Registration



IVOA Registry

VESPA Ecosystem

EPN-TAP = TAP (Table Access Protocol) + EPNcore (core metadata dictionary for solar system)

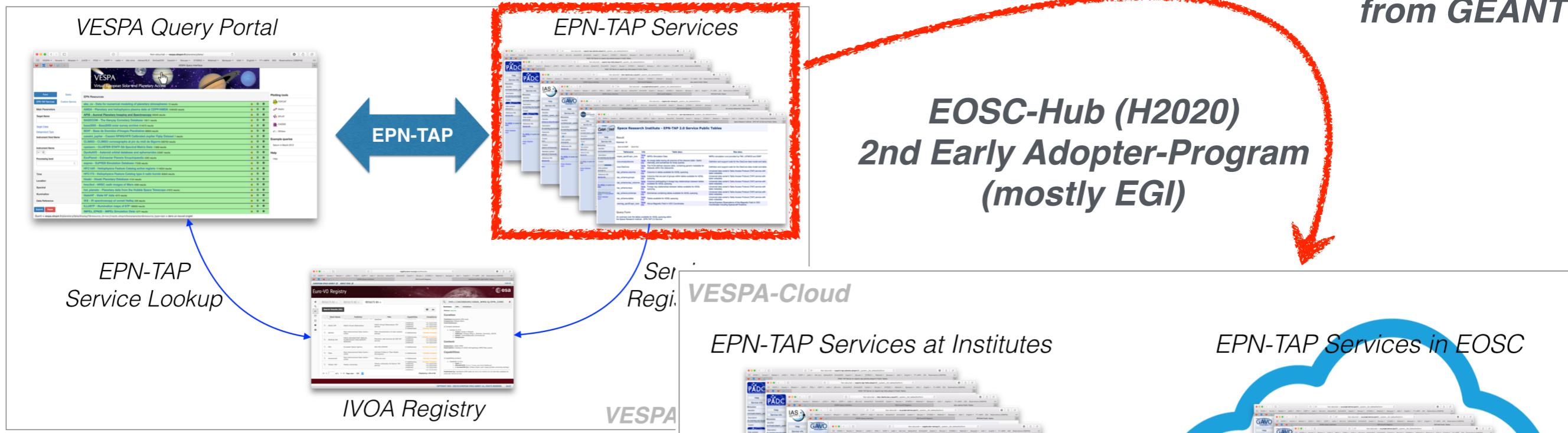
Main use case = data product discovery with science oriented metadata (coverage, origin, target)

VESPA-Cloud

Virtual European Solar and Planetary Access

VESPA-Cloud: enabling sustainability

AAI = *in-kind support from GÉANT*



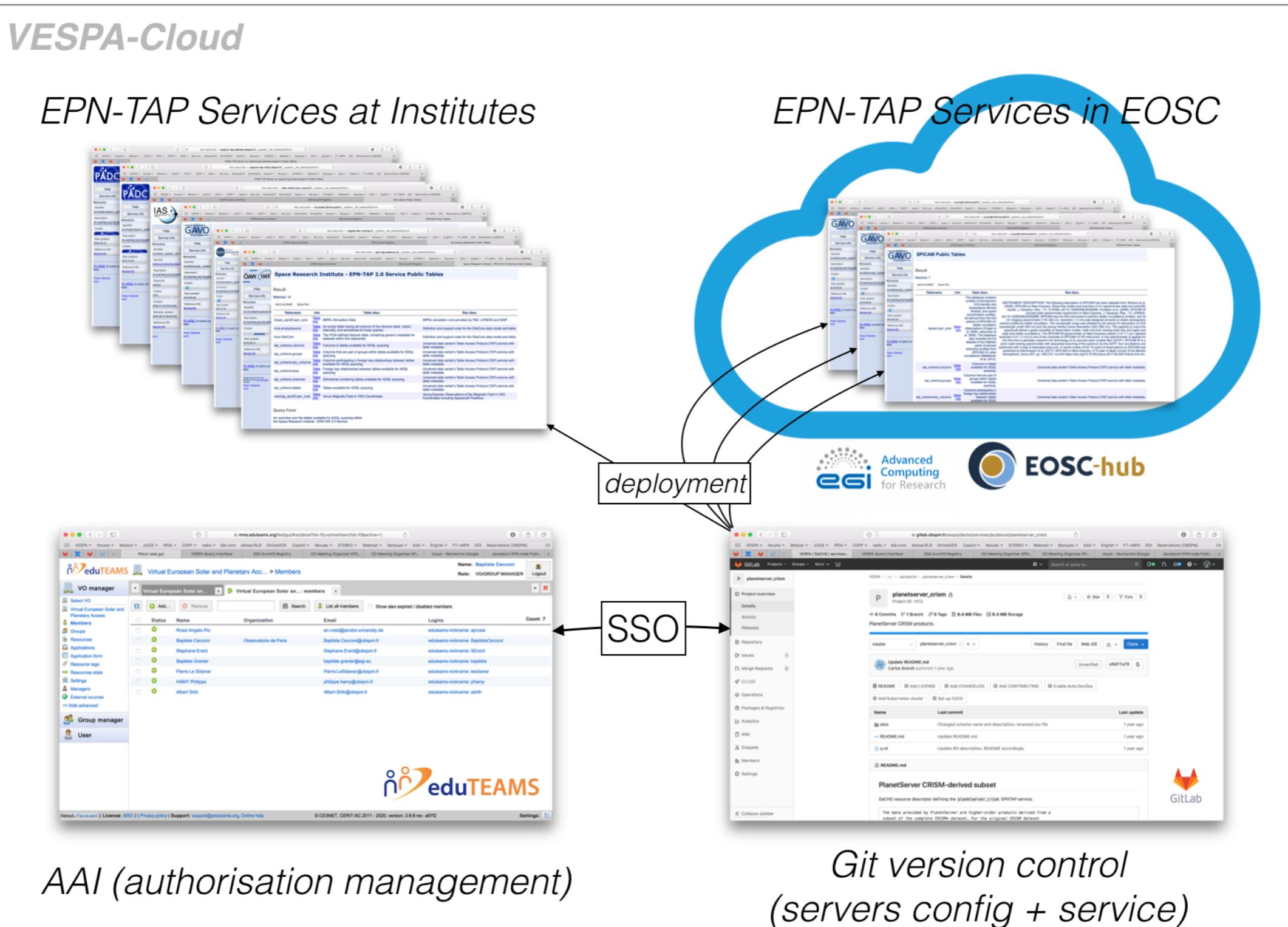
In short:

- cloud-compute resources with VO framework
- docker-based deployment
- gitlab repository for configuration

Prototype:

<http://voparis-vespa-eosc.obspm.fr>

VESPA: Improved architecture

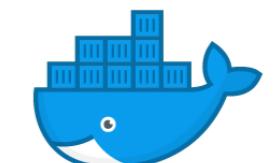




VESPA: Improved maintenance and deployment

On VESPA Hub git repositories (hosted by ObsParis/PADC):

- server configuration (for docker instance config)
- service configuration (data provider resource descriptor)
- template docker configuration for server deployment



docker



openstack®



EOSC-hub



Ongoing work: Server deployment workflow.

- configure template:
 - retrieve server configuration from git
 - add services to deploy as git submodules
- deploy (docker run) and import (entry-point script)
- retrieve server instance IP and configure redirection

Future work: data and metadata staging

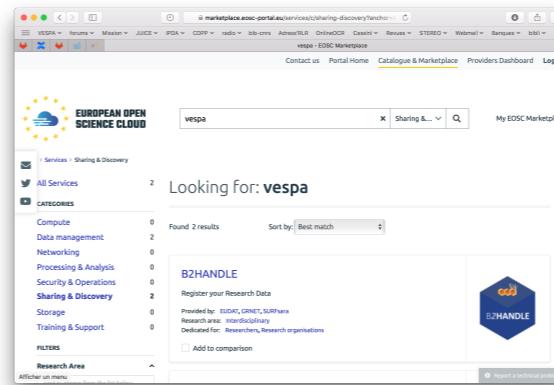
- advertise VESPA-Cloud on Marketplace
(need Service Level Agreement, Privacy Statements, Terms of Use...)

Service configuration and metadata management

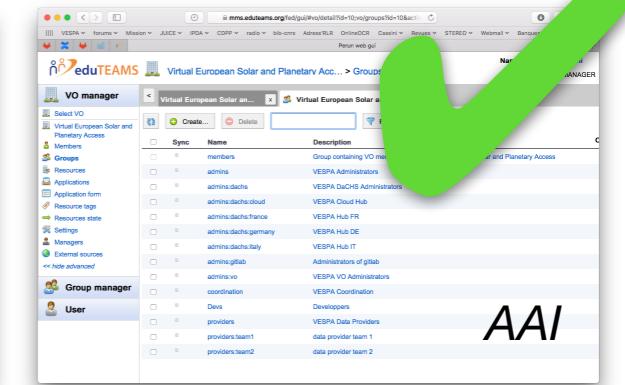
VESPA-Cloud Workflow

- Provider orders a VESPA-Cloud service
- VESPA-Cloud registers Provider in VESPA-Cloud VO (eduTEAMS)
- Provider is authenticated through eduTEAMS to access GitLab server, and authorised based on group membership (*virtual organisation*, or sub-group), as managed by *virtual organisation* admins.
- Provider manages his service configuration and metadata in GitLab
- VESPA-Cloud deploys the service configuration on server instances (DaCHS on EGI, Storage on B2SAFE...)
- Deployment through docker (to be independent of underlying OS availability at data center)

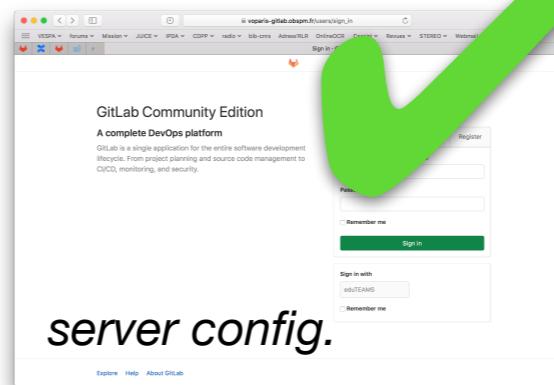
Marketplace



eduTEAMS

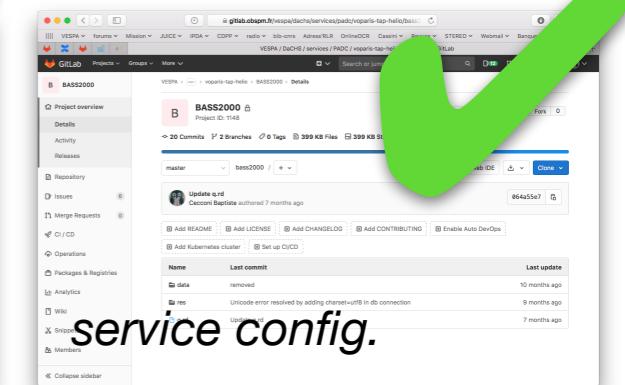


GitLab



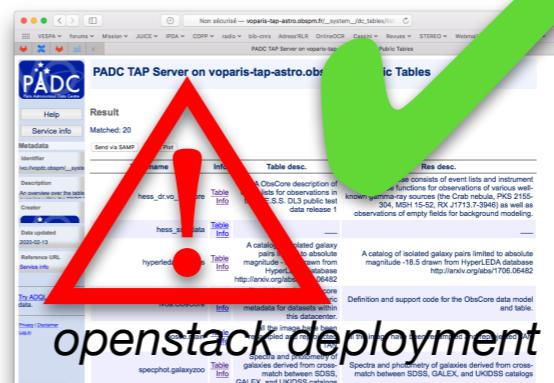
server config.

GitLab



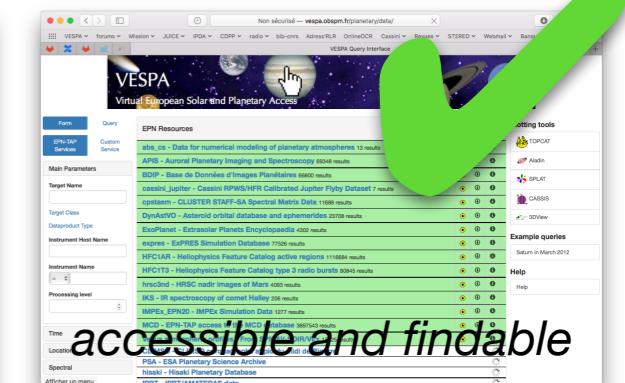
service config.

DaCHS



openstack deployment

VESPA



(not failsafe, redeploy script needed)

Remaining issue: Data Deployment

VESPA-Cloud allows to deploy service

- Using DaCHS+docker, possibly with OpenStack
Service configuration: ok
- How to import service metadata in DaCHS?
 - *prepare metadata table (CSV file) + upload on git repository,*
 - *prepare metadata table (CSV file) + upload on server,*
 - *mount a data volume on server+ build the metadata,*
 - *publish data or metadata + provide PID to scripts for retrieving data or metadata.*
- Last option under study with EUDAT, using B2Drop and/or B2Share and/or B2Safe.
 - B2Drop (Nextcloud), Webdav client, Option to publish to B2Share
 - B2Share (InvenioRDM). Rest API for access. PIDs (DOI en collection, Handle on individual files)
 - B2Safe (IRODS), distributed data management.



EUDAT/B2Drop (Nextcloud)

 A screenshot of a web browser displaying a Nextcloud interface. The title bar shows the URL "b2drop.eudat.eu/apps/files/?dir=LOFAR4SW-test-products/files/BFS&fileid=2". The main content area shows a list of files in a folder named "LOFAR4SW-test-products". The files listed are:

File Name	Size	Last Modified
validation-report	9 KB	il y a 4 jours
14sw_uk902c_20210408T094403_SUN_bfs_lod3.png	50 KB	il y a un mois
14sw_uk902c_20210408T094403_SUN_bfs_IQUV.png	122 KB	il y a un mois
14sw_uk902c_20210408T094403_SUN_bfs_IQUV_lod3.h5	670.6 MB	il y a un mois
14sw_uk902c_20210408T094403_SUN_bfs_IQUV_lod6.h5	670.6 MB	il y a un mois

At the bottom, it shows "1 dossier et 4 fichiers" and "1,3 GB".

WebDAV

EUDAT/B2Share (InvenioRDM)

A screenshot of a web browser displaying a B2Share InvenioRDM interface. The title bar shows the URL "b2share.eudat.eu/records/new". The main content area shows a form for creating a new record. The "Title" field is empty. Below it, there's a "Community" section with various logos for different research communities like Aalto, BBMRI, CLARIN, CompBioMed, DRIMH, EISCAT, EPOS, EUDAT, EUON, GBIF, HPC-Europa3, InGRID, KICOS, LIFE+Respira, LTER, NRM, OPENCoast, RDA, and STARS4ALL. At the bottom, it says "Please use https://trng-b2share.eudat.eu for testing or training." and "PIDs (DOI + Handle)".



Next step: Federating services

- Consolidate Provider/User emboarding workflow
 - decide on various options and level of service (e.g., VESPA-Hub hosting services?)
 - Advertise service on EOSC Marketplace.
 - Need redirecting queries to EOSC-hosted resources (HAProxy or similar)
- EUDAT as a solution for data publication
 - B2Share metadata = Datacite & schema.org
 - “Europlanet” Community in EUDAT
<https://b2share.eudat.eu/communities/Europlanet-VESPA>
Specific set of metadata (e.g., observed target, data product type, waveband, instrument)
 - Review workflow for submissions (not available yet)
 - Generic registry service with B2Find (extra, but not required)



Summary & Conclusions

- EOSC exploration (thanks to GÉANT and EOSC-Hub)
 - => consolidation of VESPA workflow
 - => valid option for hosting services
- Data/metadata publication through EUDAT/B2Share (+community) is promising, but not fully assessed

Ongoing test of B2Safe on other project (NenuFAR: radio astronomy) for cold storage (IRODS+tape at MPCDF), through EOSC-DICE

- Not explored yet:
 - online notebooks (e.g., Jupyter)
 - run-on-demand interfaces to provide compute resources to users (data processing, modelling...)
 - hosting query portal replicas on cloud (elastic-search)
- Sustainability: still a question. For VESPA: support through Europlanet-Society?
NB: if small volume, it is free of charge (and should stay so)

Opportunités *programmes en cours*

- DICE-EOSC: <https://www.dice-eosc.eu/call-service-requests>
- EGI-ACE: <https://www.egi.eu/projects/egi-ace/call-for-use-cases/>
- EOSC-Pillar: <https://www.eosc-pillar.eu/news/resources-offered-thematic-services-integrate-eosc-national-catalogues>
- EOSC-Future: <https://eoscfuture-grants.eu>
- OpenAIRE-Nexus, DARE (Earth Science / EPOS)...
- FAIR-IMPACT (<https://dans.knaw.nl/en/news/consortium-led-by-dans-acquires-a-major-european-grant-to-make-eosc-more-fair/>)
=> starts May 1st 2022 (CNRS & Obs Paris are beneficiaries)

En résumé, pourquoi EOSC

- Participer en tant que **fournisseur de service**:
 - Opportunités de développer nouveaux services ou de les consolider
 - Nouvelles technologies de orientées service
 - utilisation d'infrastructures existantes pour Science Ouverte et FAIR
- Participer en tant qu'**institution**:
 - rendre visibles nos besoins pour s'assurer que les services conviennent à nos communautés.
 - politique science-ouverte au niveau européen et français (collège EOSC, partenaire direct ministère)
- Participer en tant qu'**utilisateur**:
 - ressources disponibles (et offertes) dédiées à Science-Ouverte, en particulier Zenodo ou EUDAT pour préservation/publication de données
 - ressources disponible pour calcul et partage