The EOSC EU Node

https://open-science-cloud.ec.europa.eu/

Peter Szegedi

DG CNECT C.1

What is EOSC

A process

- Accelerate Open Science, FAIR data management and use of digital methods and services
- Stimulate co-operation in science and research, new insights and innovations, higher research productivity and improved reproducibility in science.

An open, trusted, federation of infrastructure

- Access existing Research Infrastructures in Europe;
- Enable circa 2 million European researchers to store, share, process, analyze, and reuse research digital objects (e.g. data, publications and software)

An evolving ecosystem

- Bringing together the European Commission, the governments and the many R&I stakeholders involved in the European Research Area
- Co-created across European, national, and institutional levels

European Commission

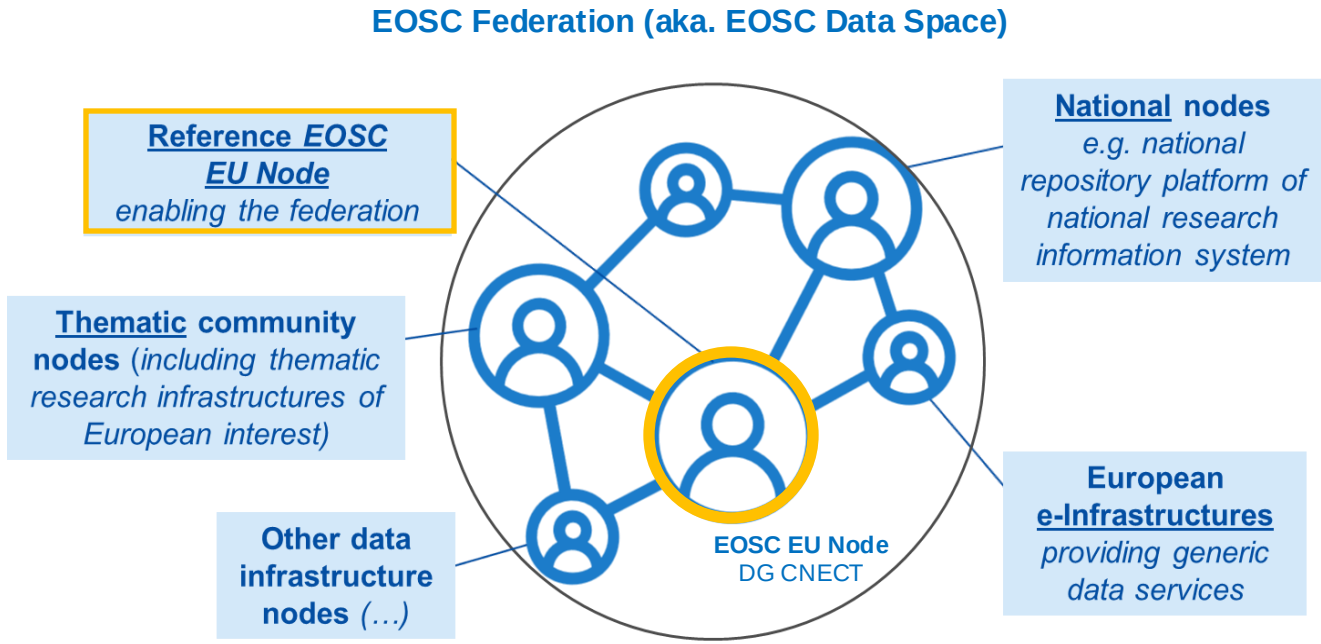
European Open Science Policy

1. Open Data: FAIR (Findable, Accessible, Interoperable and Re-usable data) and open data sharing should become the default for the results of EU-funded scientific research.
2. **European Open Science Cloud (EOSC**): a 'federated ecosystem of research data infrastructures' will allow the scientific community to share and process publicly funded research results and data across borders and scientific domains.
3. New Generation Metrics: New indicators must be developed to complement the conventional indicators for research quality and impact, so as to do justice to open science practices.
4. Future of scholarly communication: all peer-reviewed scientific publications should be freely accessible, and the early sharing of different kinds of research outputs should be encouraged.
5. Rewards: research career evaluation systems should fully acknowledge open science activities.
6. Research integrity: all publicly funded research in the EU should adhere to commonly agreed standards of research integrity.
7. Education and skills: all scientists in Europe should have the necessary skills and support to apply open science research routines and practices.
8. Citizen science: the general public should be able to make significant contributions and be recognised as valid European science knowledge producers.

European Commission

EOSC EU Node's role in the EOSC Federation

- EOSC Federation must be established as a **European Common Data Space** for Research and Innovation
- EOSC Data Space is a distributed system of system with **multiple EOSC Nodes**.
- EOSC Nodes are being formulated as we speak, driven by the EOSC Tripartite Governance via the official Node Candidates Dialogue process
- **EOSC EU Node is just the first reference implementation of an operational node**



EOSC EU Node

- EOSC EU Node has been kick-started by DG CNECT (procurement and deployment)
- EOSC EU Node currently offers core federating capabilities (operations, business-as-usual)
- **The future role of the EOSC EU Node depends on the build-up phase and capabilities of the EOSC Federation**

European Commission

EOSC EU Node: Technical and Public Launch

18 September 2024 – ERA Stakeholders Conference, Brussels, Belgium

During the ERA Stakeholder Conference held on 18-19 September 2024 in Brussels, the upcoming launch of the European Open Science Cloud (EOSC) EU Node was announced. *Iliana Ivanova, the European Commissioner for Innovation, Research, Culture, Education, and Youth, highlighted EOSC and the EU Node in her keynote speech as an example of collaborative efforts aimed at promoting Open Science across Europe*.

10 October 2024 – Technical Launch Event, Brussels, Belgium

This event marked a significant milestone and provided the opportunity for panel discussions surrounding the EOSC Federation build-up and European data spaces.

https://www.youtube.com/watch?v=67mirPt-FhY

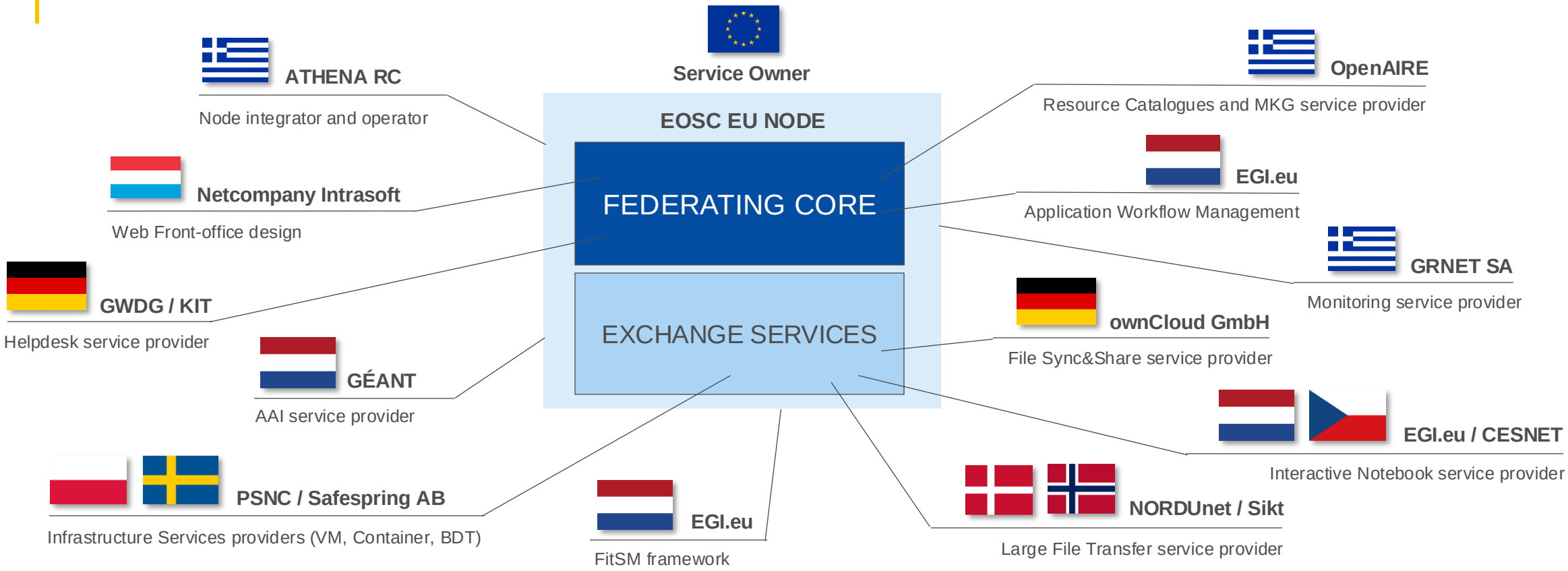
22 October 2024 – EOSC Symposium, Berlin, Germany

The recent EOSC Symposium in Berlin (October 21-23) was a landmark event, marking the **official launch** of the EOSC EU Node and showcasing its potential to enhance the development of an integrated and effective digital research ecosystem.

https://open-science-cloud.ec.europa.eu/

European Commission

EOSC EU Node



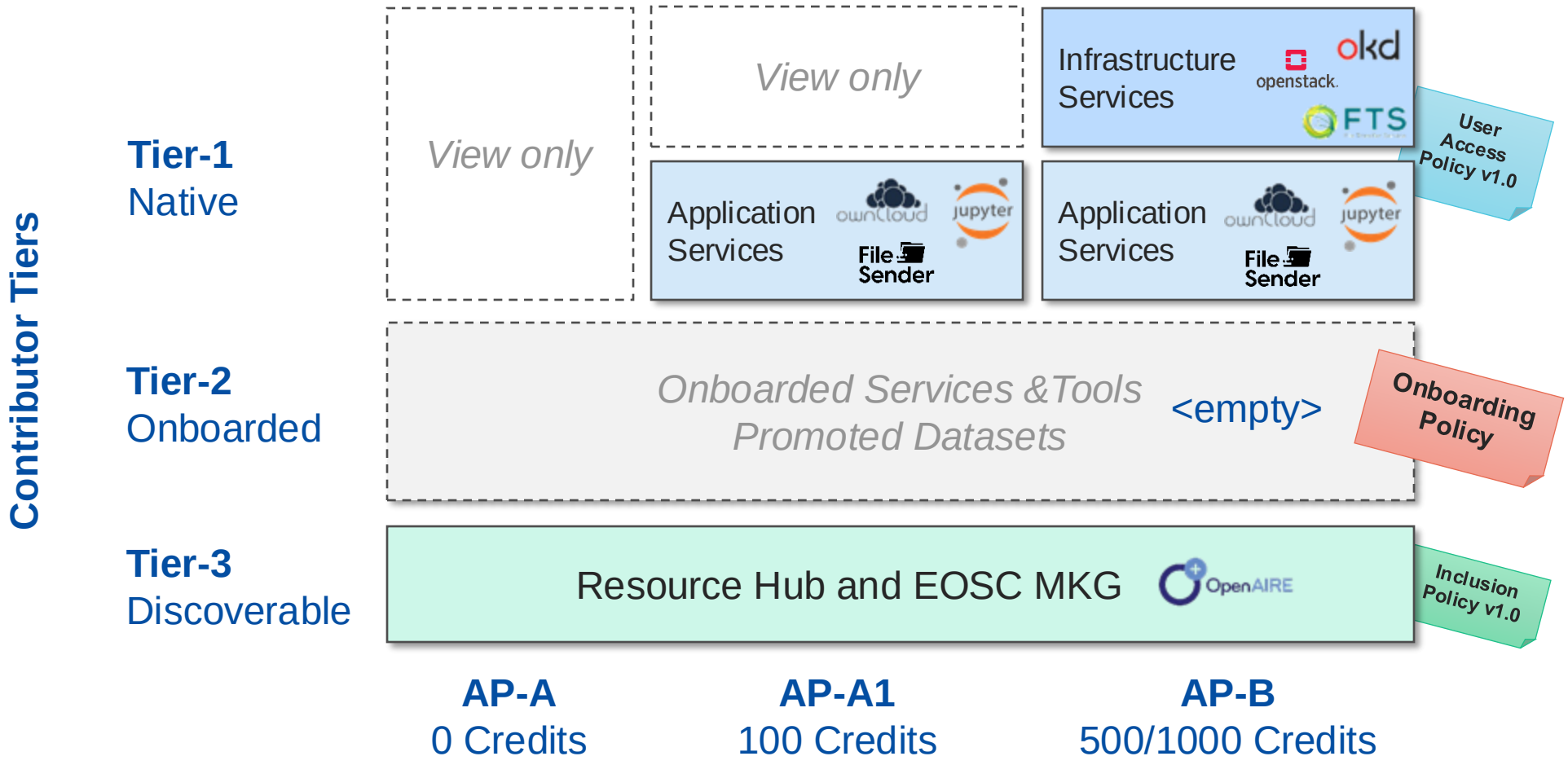
SELECTED NODE CANDIDATES

BBMRI Node · Blue-Cloud Node · CERN Node · Dutch Node · EU Node · EUDAT Node · Finnish Node · French Node · German Node · Italian Node · Life Sciences Node · PaNOSC Node · Polish Node · Slovakian Node

Unique Features - New User Experience

- **Authentication, Authorization, Accounting (AAA)**
  - eduGAIN and EU Login (with eIDAS) integration
  - Policy-based Access Control (PBAC) retrieving user attributes from home IdP
  - Virtual Credits and Wallets (personal, group)
- **Contributor tiers (discoverable, onboarded, native)**
  - Resource Hub collecting 127 mil research objects from OpenAIRE, CORDIS, data.europa.eu, Software Heritage and more
  - Curation service for resource object owners
  - Recommendations, Favourites, Persistent Identifiers
- **Integrated User Space with Automated deployment workflows**
  - TOSCA templates into Virtual Machines and Kubernetes containers
  - Application and Data to Infrastructure
- **Monitoring and Helpdesk**
  - Availability dashboard and support for end-users

Access Policy and Contributor tiers



Services procured for the EOSC EU Node

ORDERING FUNCTION FOR GATED RESOURCES

Piloted with Candidate Nodes in 2025

Virtual credits and access model

ATTRIBUTE-BASED AAA

European Commission

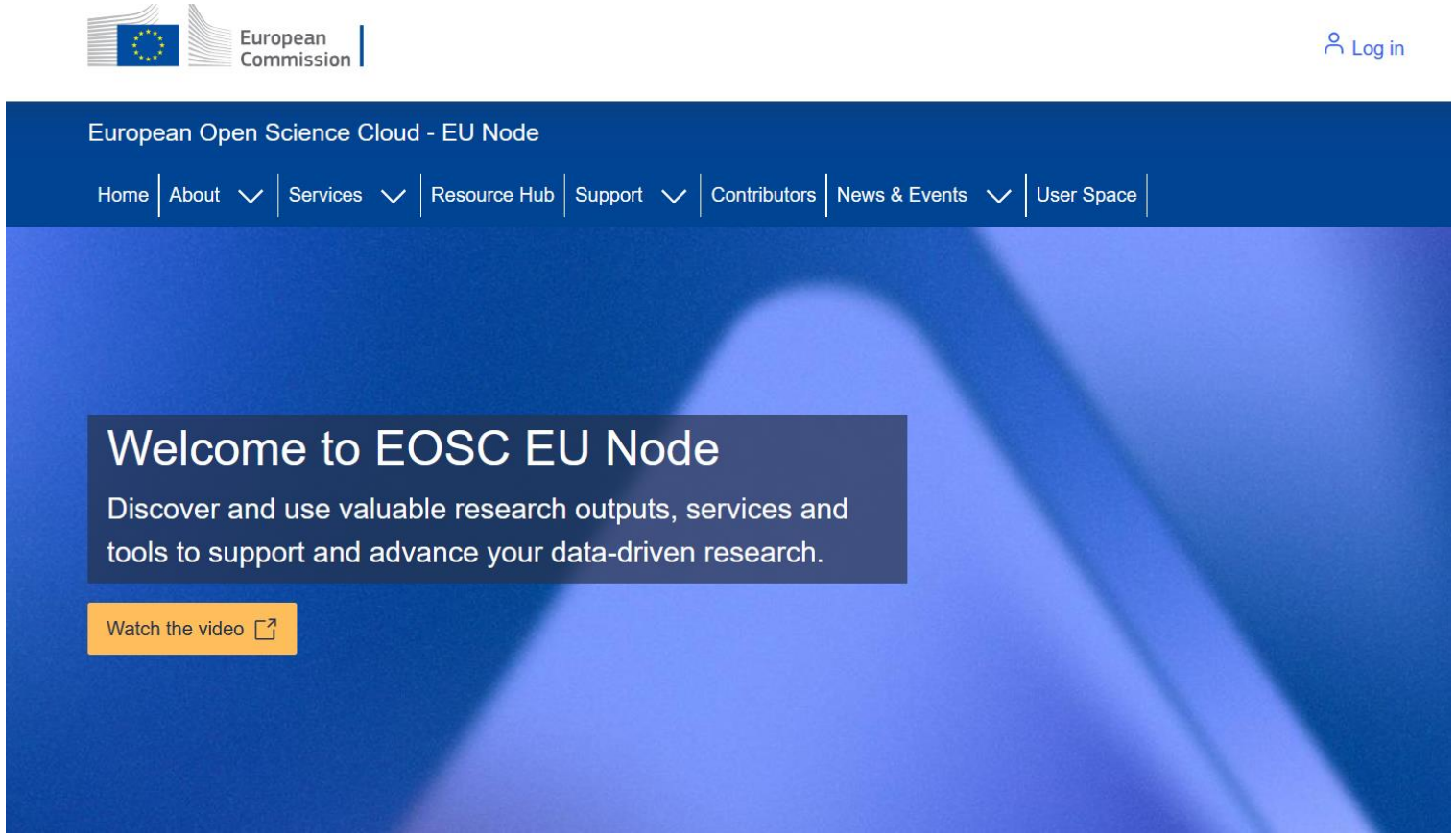
EOSC EU Node

Services

European Commission

Front Office

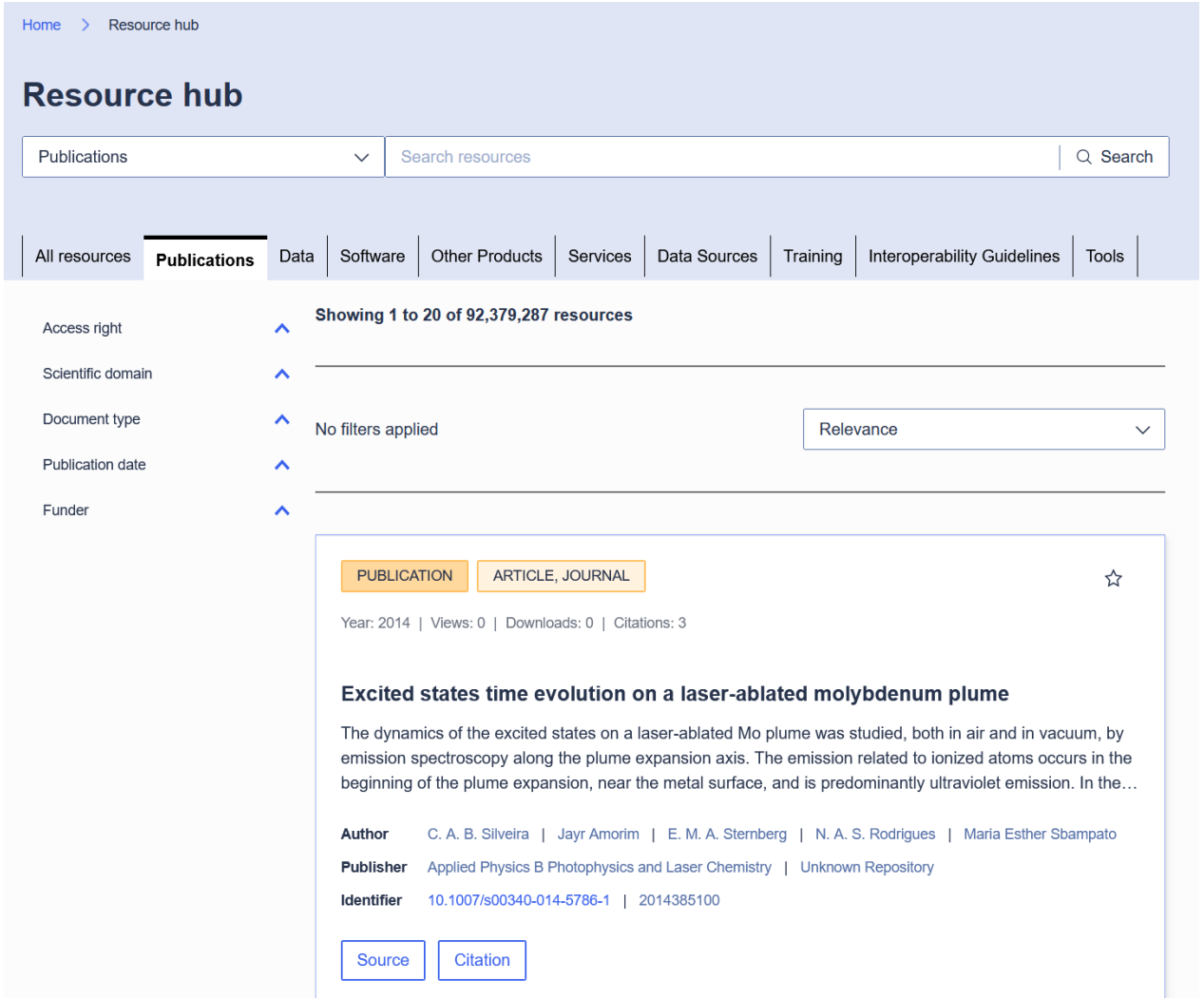
- Your **entry point** to the EOSC EU Node
- **Resource Hub**
- **EOSC EU Node Services**
  - Application Services
  - Infrastructure Services
- **Support**
  - Helpdesk
  - FAQ
  - Documentation
  - Training material
- **User Space**



European Commission

Resource Hub

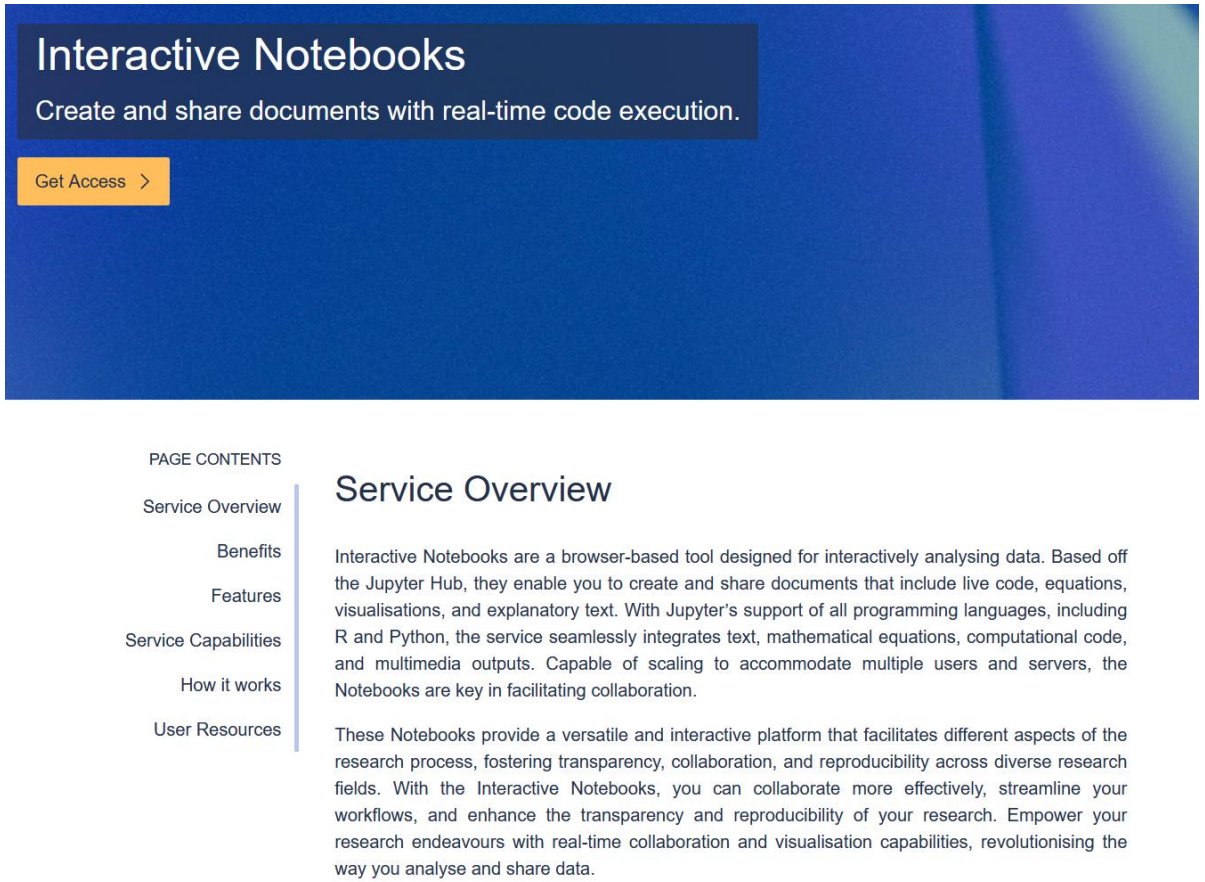
- **Discover ~130M resources**
  - OpenAIRE, EC data sources
  - Harvested & indexed
- **Resources**
  - Publications
  - Data
  - Software
  - Services
  - Data Sources
  - Training
  - Tools



European Commission

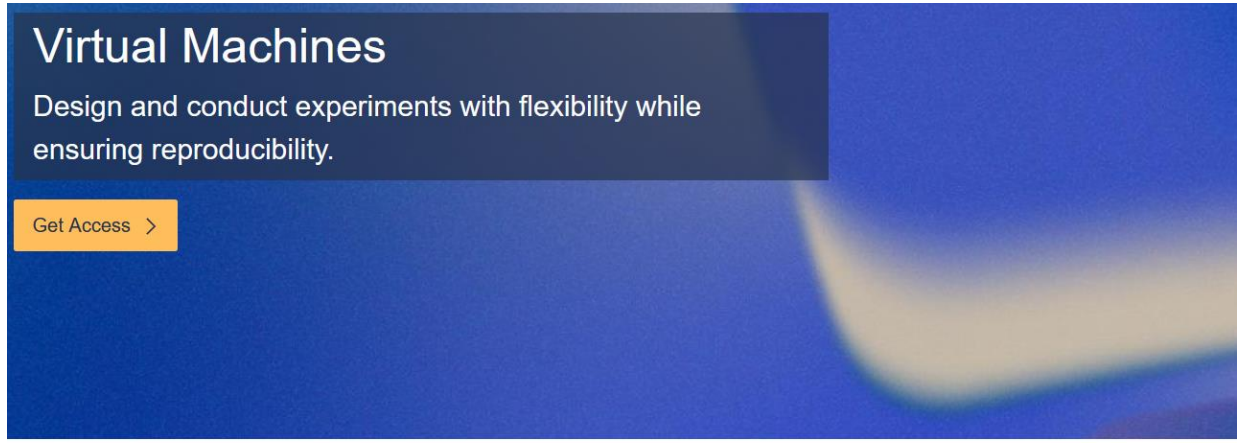
Application Services

- **File Sync and Share**
  - Your personal cloud storage
  - Upload and share files
  - Productivity suite
- **Interactive Notebooks**
  - Jupyter
  - Multiple environments
  - Multiple kernels
- **Large File Transfer**
  - Securely share files



Infrastructure Services

- **Virtual Machines**
  - Open Stack
  - Multiple environments
  - VM templates
  - GPU support
- **Cloud Container Platform**
  - OKD
  - Multiple environments
  - GPU support
- **Bulk Data Transfer**
  - Site-to-site large data transfer



PAGE CONTENTS

Service Overview

Benefits

Features

Service Capabilities

How it works

User Resources

Service Overview

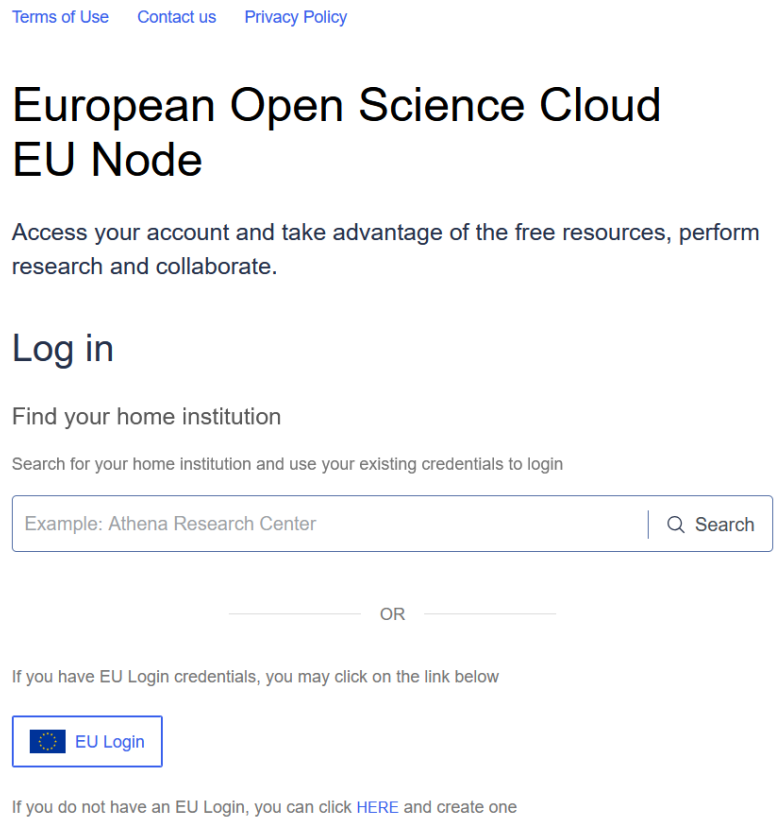
Virtual Machines (VM) offer a dynamic approach to computing and storing data in the cloud. The service is delivered through the industry standard open-source implementation OpenStack. Researchers are provided compute resources to launch their own VMs to create isolated environments for experimenting with different configurations, software setups, or algorithms. The compute resources can be used to create reproducible research environments. By packaging the entire software stack and data dependencies within a VM image, researchers can ensure that their experiments can be easily replicated by others, enhancing the credibility and transparency of their research.

Virtual Machines offer researchers a flexible, scalable, and secure computing environment for conducting experiments, analyzing data, and collaborating with colleagues in various research disciplines.

European Commission

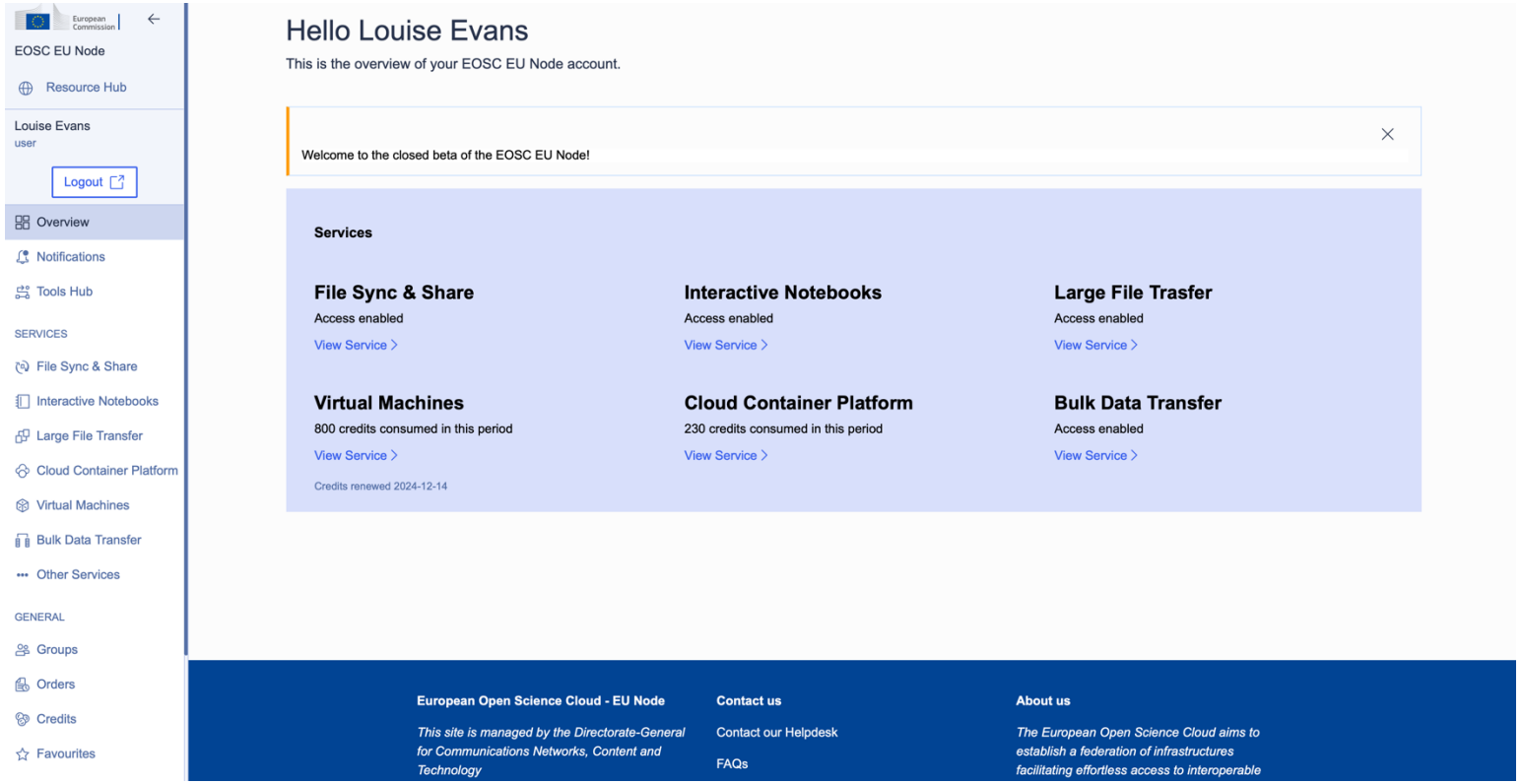
Log in

- **Home organization credentials**
  - eduGAIN
  - EU Login
- **Automated Access Policies**
  - 0 credits; view only (AP-A)
  - 100 credits; FSS, NBs (small) (AP-A1)
  - 500 credits (AP-B)



User Space

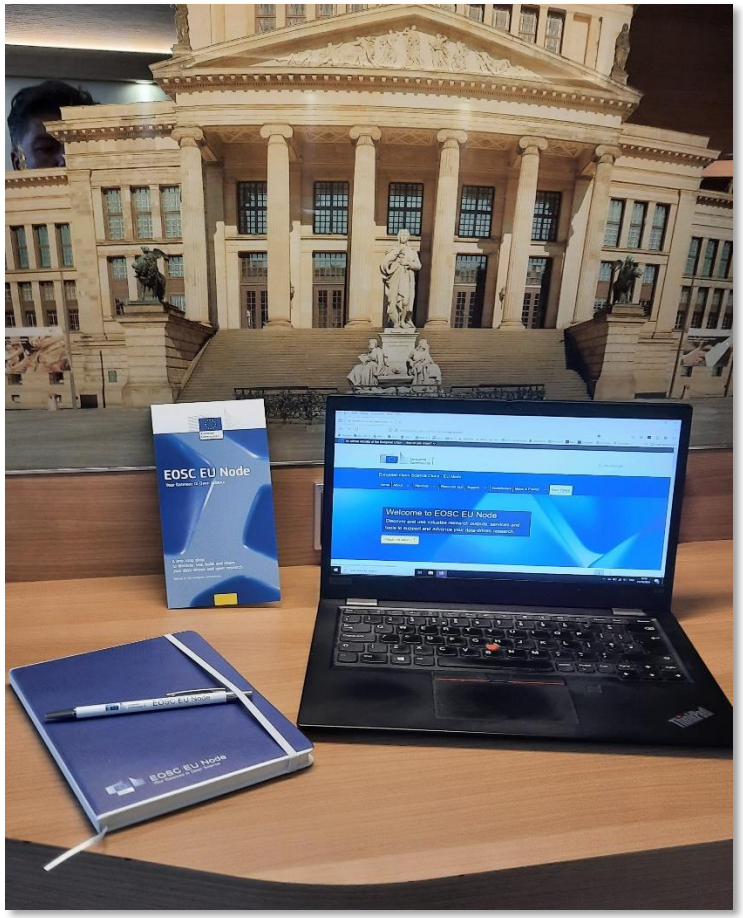
- **Your personal environment**
- Application Services
- Infrastructure Services
- Wallet (Credits)
- Orders
- Groups
- Favorites
- Notifications
- Settings



European Commission

Uptake from users*

- The EOSC EU Node has completed almost **5 months** in production
  - **~2K active users** and **12K visitors** (~20% better than our projections, steady growth)
    - Top-11 visitors from: SE, DE, ES, FR, USA, NL, GR, PL, BE, UK, CH
    - **114** users/hour (peak)
  - Break-down of users per AP Level: **AP-A: 29%, AP-A1: 52%, AP-B: 18%** (stable)
  - **36K credits consumed** (12-14 weekly VM/OKD projects, 10% opt-in for EFSS)
  - Uptime **>99.5%**, scheduled downtime **<4 hours**, **no** security incidents, ~**500** Helpdesk tickets
- A few interesting insights:
  - **Automated APs** and **credit** economy a **success** (fair, equitable, dependable, and transparent); we will (soon) **increase credits** to users
  - **Users still learning our offerings** (recipes, groups, collaboration, data/file transfer)
  - Re-occurring expressed **needs** (more resources/credits, serve non-ephemeral needs of projects & groups, offer software for others)



** March 2025*

European Commission

Thank you!

European Commission