

RESEARCH

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European Open Science Cloud (EOSC)

as an European ecosystem for open science and research data

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Funded by
the European Union

Scope of the presentation



01

Why EOSC matters



02

What is EOSC



03

The structure of EOSC
Governance



04

How EOSC transforms
research



05

EOSC Federation



06

EOSC EU Node, EOSC National,
Thematic and E-Infrastructure Nodes

01 Why EOSC matters

Current challenges

- Challenge with isolated systems, data inaccessible to others
- That create a problem with verification of results and building upon previous work
- EC Study on the European Research Data Landscape (2022): Highlighted significant gaps in the research community
- **Ambition of EOSC is to connect connect existing data, research, and e-infrastructure nodes.**

02 What is EOSC

European Open Science Cloud

A pan-European initiative to support open science and open innovation.

EOSC Goal: To create a federation of research infrastructures that enables scientists to share, access, and utilize publications, data, and software across countries and scientific disciplines.

Most research data is not online and is not easily accessible to researchers—data is stored in various systems according to a multitude of different standards and methodologies.

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History of EOSC

2015

European Commission proposed EOSC creation to the Competitiveness Council (COMPET).

2020

The EC invested approximately €320 million into the initial prototyping of EOSC through project calls under the Horizon 2020 programme.

2020

The EOSC Association was established to coordinate the EOSC initiative.

2021

COMPET include Open Science and EOSC in the European Research Area (ERA) Policy Agenda for 2022-2024

2024

The first EOSC Node (EOSC EU Node) established.

2025

The EC confirmed EOSC as a key structural element of the ERA Policy Agenda for 2025-2027

2025

EOSC starts to work in functional mode through EOSC Federation (EOSC Nodes)

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Political framework

EU Strategy for Data: „EOSC is the basis for a science, research and innovation data space that will be connected and fully articulated with the sectoral data spaces“.

EOSC = pillar of the digital transition

EOSC = Data space within the framework of the European Data Strategy.

European Research Area Policy Agenda 2025–2027

ERA structural policy: Enabling open science via sharing and re-use of data, including through the EOSC

- Open science practices and skills = the new normal and are highly valued.
- standards, tools, and services enable researchers to find, access, reuse, and combine R&D results,
- A community-governed federated infrastructure that enables the open sharing of scientific results,
- Europe will hold a leading position in the web of FAIR data.
- researchers – access to and reuse of publicly funded research results, and the use of publications and data for scientific purposes.

Main principles of EOSC

Research must be at the center of the EOSC initiative!

1. **A multi-stakeholder approach** – a wide range of stakeholders must be involved in building the EOSC.
2. **Openness** – data as open as possible, as closed as necessary.
3. **FAIR Principles** – research data must be:
 - **F** (indable): Findable
 - **A** (ccessible): Accessible
 - **I** (nteroperable): Interoperable
 - **R** (eusable): Reusable
4. **Federation of Infrastructures** – EOSC federates (groups) existing and new data and e-infrastructures.
5. **Machine-actionable** – the right balance between technologies and humans in providing services that serve the needs of European scientists.

Why is EOSC needed

(Not just) 5 reasons to care about EOSC:

1. **EOSC will facilitate collaboration and reduce gaps in open science** readiness across different countries.
1. **Scientific outputs can be stored and searched in accordance with the FAIR principles**, thereby improving the quality and productivity of science.
1. **EOSC will facilitate integration both within and across scientific disciplines** by supporting interdisciplinary research
1. **EOSC will provide access to datasets and platforms** to ensure the long-term preservation and availability of research data and tools.
1. **The EOSC network of FAIR data and services** will be used to build a wide range of new, innovative value-added services

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Who is EOSC for?

The goal of the EOSC initiative is to support European scientists from all scientific disciplines.

How does EOSC support scientists?

- It improves scientific research.
 - It supports innovation.
 - It improves the transparency and reproducibility of research.
 - It reduces the duplication of scientific effort.
 - It facilitates interdisciplinary research and cross-sectoral collaboration.
-

Individual researchers will benefit from EOSC through existing channels (e.g., universities, research institutes, research infrastructures, science clusters, etc.), which will act as intermediaries, as well as through the EOSC Nodes.

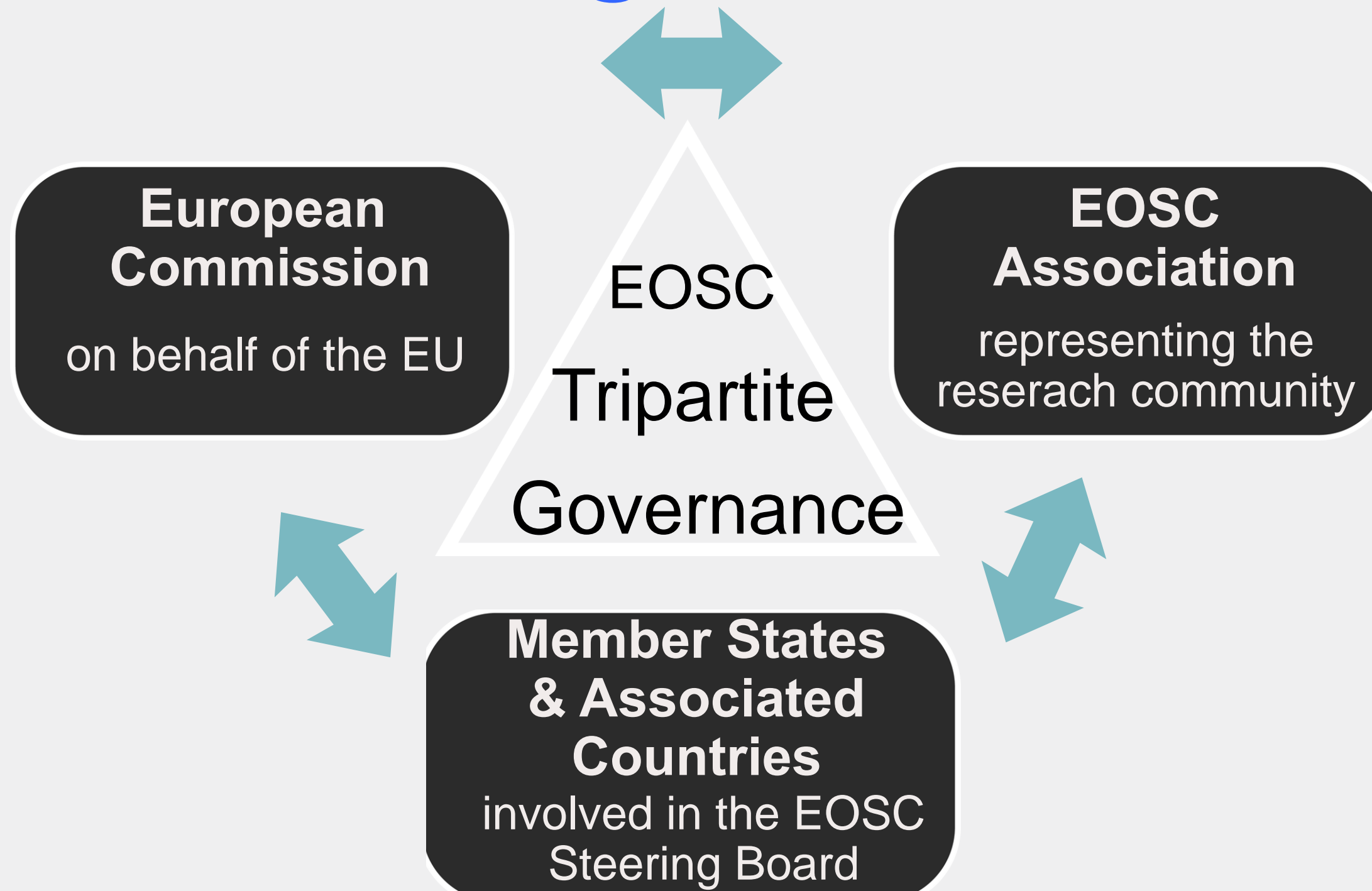


Contributing to the EOSC EU Node

- The opportunity to participate in the shaping of EOSC.
- The opportunity to increase the visibility of research.
- Support for research and the possibility of future investments.

03

The structure of EOSC governance



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EOSC Association

Coordinating the development and management of the initiative.

- Legal entity representing more than 250 member organisations.

Members and Observers categorise into four main types:

- Research Performing Organisations
 - Research Funding Organisations
 - Service Providing Organisations
 - Others Organisations: e.g. Intergovernmental bodies and thematic clusters
- Helping to coordinate and steer these investments via its Task Forces and other governance structures.
 - Delivering the objectives agreed in the Memorandum of Understanding signed by the European Union and EOSC Association

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EOSC Steering Board

Representing EU Member States and Associated Countries

- Expert Group of the European Commission, composed of representatives from the 27 EU Member States and countries associated with the Horizon Europe programme.
- Represents the "policy pillar" of the Tripartite governance.
- Ensures that the initiative remains aligned with the national interests of EU Member States and Associated Countries



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European Commission

Funding body and policy driver

- Ensuring EOSC integrates into the broader European Research Area (ERA).
- Represents the European Union's interests within the Tripartite Governance model, working alongside the Member States (Steering Board) and the research community (EOSC-A).
- Operational provider through the management of the EOSC EU Node.



04

How EOSC transforms research community

1. Unified Access

1. FAIR Data by
Design

1. Improved
Reproducibility

1. Cross-
disciplinary
Collaboration

1. Innovation
Acceleration

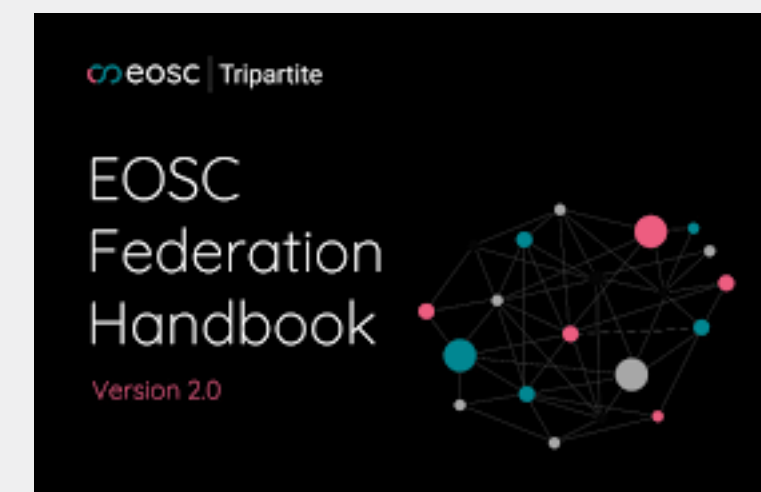
05 EOSC Federation

= an open and trusted federation of collaborative and autonomous infrastructures.

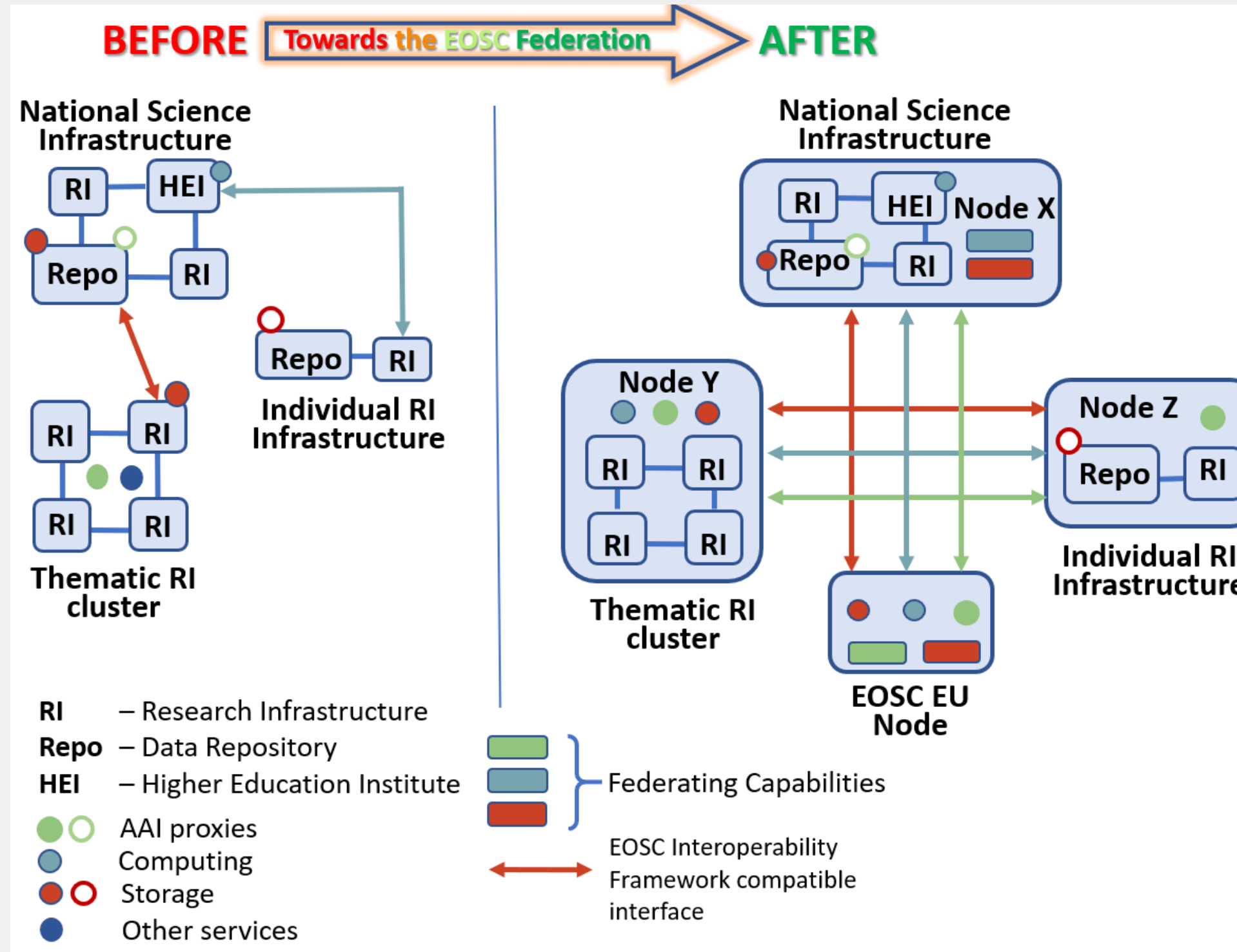
- The EOSC Federation is composed of multiple interconnected EOSC nodes designed for: Sharing and management of research data, knowledge, and resources.
- **Collaboration** to achieve common scientific goals.

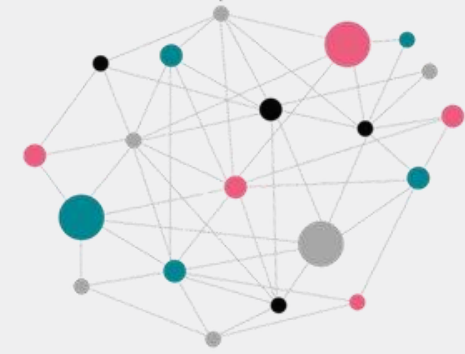
Entry Points: EOSC Nodes serve as the primary access points for users.

In March 2025 the build-up phase of the EOSC Federation kicked off in Brussels, followed by the publication of the first edition of the EOSC Federation Handbook.



EOSC Federation





The benefits of EOSC Federation

- **Interdisciplinarity:** Breaking down disciplinary silos
 - Increased visibility and reuse of discipline-specific data and services.
 - This fosters collaboration both within individual scientific fields and across different disciplines.
- **Research Security = Trusted Environment:** EOSC provides a secure and sovereign environment for the safe storage, analysis, and sharing of Research and Development (R&D) results.
- **Enabling AI: Driving AI for Science:**
 - By pooling vast amounts of high-quality FAIR research data, software, and computing power—and linking them with other Common European Data Spaces—EOSC positions Europe as a leader in AI-driven scientific discovery.
- **Economic Benefits: Resource Pooling**
 - EOSC Nodes benefit from the advantages of shared resources and functions, leading to significant economies of scale and operational efficiency.

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EOSC Federation

Enrollment of EOSC Nodes



Memorandum of Understanding (MoU)

Developed in 2025 by the first wave Nodes of the EOSC Federation build-up phase

- Collaborate voluntarily
- Establish approaches and frameworks
- Participate in interim governance
- Appoint individuals to key roles

- The organisations representing the 13 Candidate EOSC Nodes
- The next-wave enrollment call was launched on 03 November 2025 and closed on 18 February 2026. Submitted applications are currently being evaluated, with results expected in April 2026.

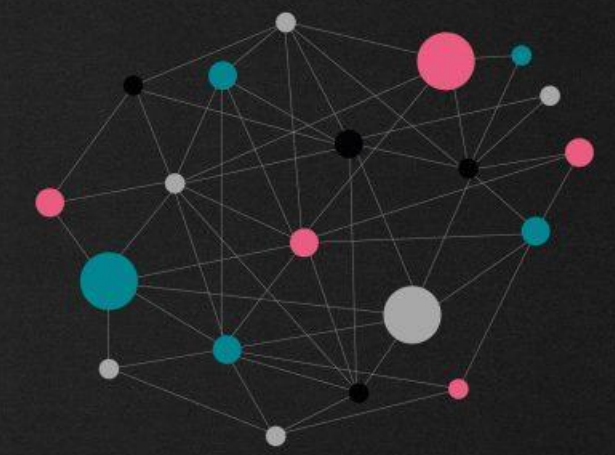
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eOSC | Tripartite

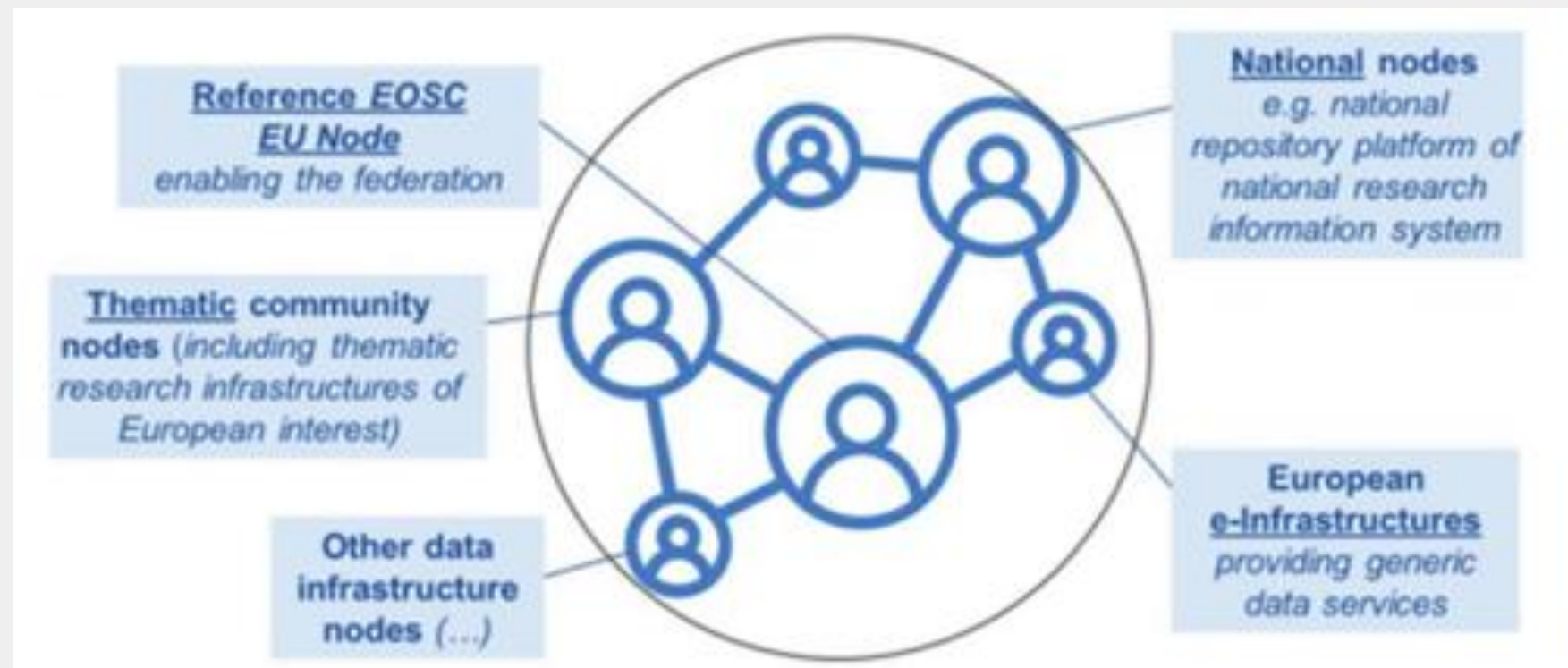
Building the
EOSC Federation



EOSC Federation

The Basic Unit: EOSC Nodes

- The fundamental building block of the EOSC Federation is the EOSC Node. It consists of a network of distributed nodes organized as a "system of systems."




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EOSC Nodes


National EOSC Nodes


 EOSC Node | Finland

 EOSC Node | Germany


 EOSC Node | Italy

 EOSC Node | Poland


 EOSC Node | Slovakia

 EOSC Node | SURF
The Netherlands

Thematic EOSC Nodes

 EOSC Node | BBMRI-ERIC
Health & Food

 EOSC Node | CERN
Physical Sciences & Engineering

 EOSC Node | Data Terra
Environment

 EOSC Node | Digital Twin of the Ocean
Environment

 EOSC Node | Life Sciences Connect
Health & Food

 EOSC Node | PaNOSC
Physical Sciences & Engineering

e-Infrastructure EOSC Nodes

 EOSC Node | EUDAT
Data, Computing and Digital

EOSC Infrastructure Node

EOSC Node | European Commission

The architecture of EOSC is based on the concept of a federation of nodes implementing a system-of-system type architecture. The first node to be developed was the EOSC EU Node, promoted and financed by the European Commission. The EOSC EU Node was procured by the European Commission and is hosted and implemented by third-party sub-contractors.

EOSC Nodes

Scientific use-cases

Use case	Short description	Nodes involved
Marine microbiomes	Exploring the impact of marine microbiomes on carbon sequestration	EOSC-DTO, EOSC-LSC, EOSC-IT, EOSC-PL, EOSC-Data Terra
Reana	Cross-node workflow for the analysis of CERN's ATLAS/CMS experiment's open data on the REANA data platform.	EOSC-FI, EOSC-SURF(NL), EOSC-EU-Node, EOSC-IT, EOSC-PL, and CERN (nascent)
Galaxy*	Cross-node workflow for the processing of imaging data from the environmental and life sciences using the Galaxy platform	EOSC-CERN, EOSC-Data Terra, EOSC-EUDAT, EOSC EU Node, EOSC-PL, EOSC-LSC, EOSC-DE(nascent), EOSC-SURF(NL)
PaN-Finder	The Photon and Neutron federated knowledge finder, PaN-Finder, an AI-enabled data search tool for navigating the large data sets of European Research Infrastructures	EOSC-PaNOSC, EOSC-DE(nascent)
MCVAL*	A prostate cancer screening tool, MCVAL, that employs multi-centric validation of AI models	EOSC-IT, EOSC-SK, EOSC-PL, EOSC-SURF (NL), EOSC-FI
AMR	Federated analysis of pathogen genomes	EOSC-SK, EOSC-PL

* Cross-node use cases displayed in figure 4.4.

- The EOSC Nodes have developed six use cases to demonstrate the added value brought by the EOSC Federation to scientific work.
- EOSC Federation is enabling cross-disciplinary collaboration, empowering researchers, and supporting the creative reuse of FAIR data to accelerate discovery and innovation in Europe.

<https://eosc.eu/building-the-eosc-federation>

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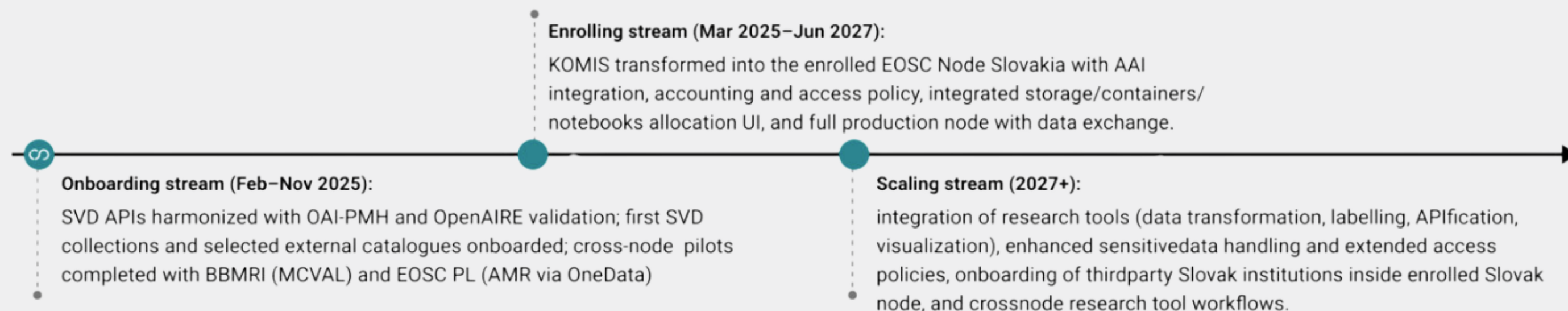
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eOSC Node | Slovakia

Candidate national EOSC Node (build-up phase)

- The [Slovak Centre of Scientific and Technical Information](#) (CVTI SR) is building the Slovak EOSC Node to integrate national research resources into the EOSC Federation.
- **Key objective:** To enhance Slovakia's research capabilities, contribute Slovak resources and expertise, address the fragmentation of Slovak research data, and improve data accessibility.



Scientific use-cases

USE CASE - Federated pathogen analysis (AMR)

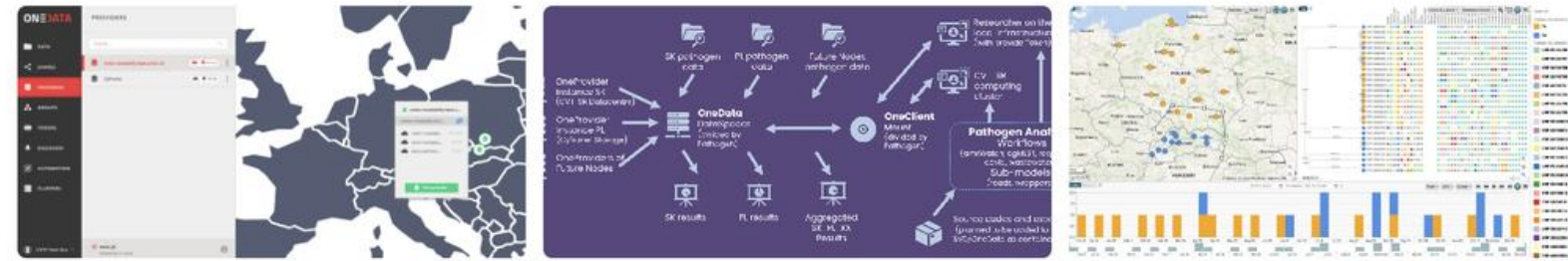
Leading the use case related to antimicrobial resistance (AMR) research

Staged approach:

- ✓ Stage 1 – Technical Feasibility (public datasets, pilot within SK and PL)
- ✓ Stage 2 – Private Data Integration (private repos and value for data owners)
- ✓ Stage 3 – Public Health Adoption (real time pathogen monitoring)

Federated approach:

- Harmonized analysis and interpretation
- Computation executed on data providers' servers
- Preserving local control over sensitive data



microreact.org (data altered)
SK PL Pilot Workflow

Workflow
AMR Watch

Workflow
cgMLST Outbreaks

Workflow
Respiratory

Workflow
COVID Lineage

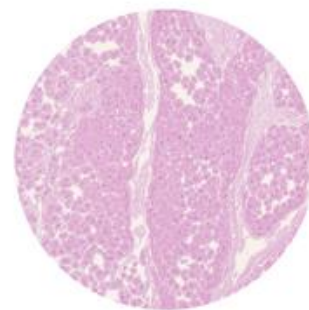
Workflow
Wastewater Lineage

Submodule
Reads Processing

Submodule
Rule Wrapper



USE CASE - Contribution to MCVAL



Participation in multicentric validation of AI-Based evaluation of prostate cancer screening images (MCVAL by BBMRI)

SK Node role will be collecting, processing screening data (WSI) from Slovak sources, aggregating datasets and creating pipelines for sharing to RationAI and results distribution to medical evaluators. Cooperation with Faculty of Medicine of Comenius University Bratislava.



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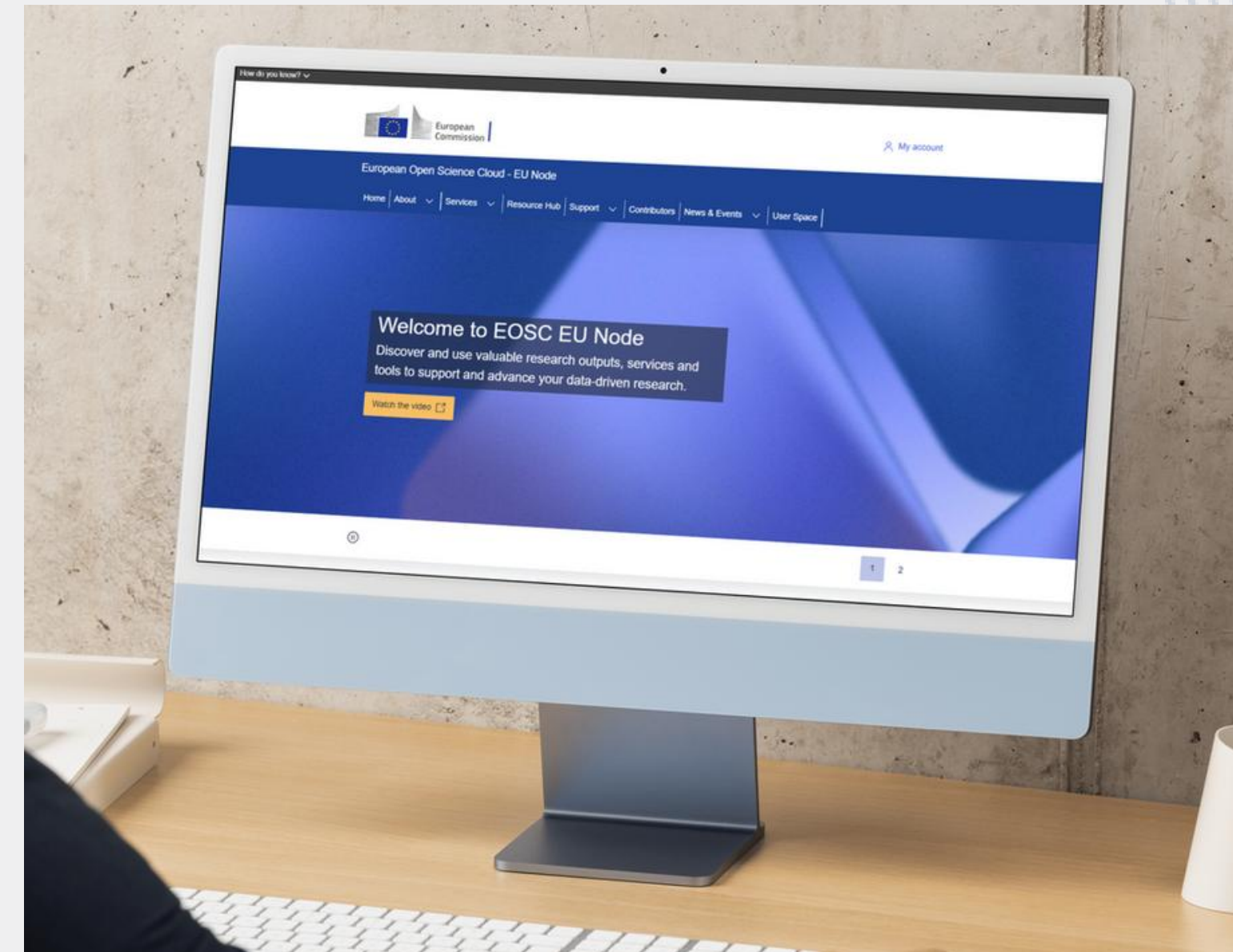
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EOSC EU NODE

[Home](#) | [European Open Science Cloud - EU Node](#)

- **The first EOSC Federation Node**, owned by the EC (DG CONNECT) and operated by service providers.
- A significant milestone in the support of Open Science in Europe.
- Supports multidisciplinary and international research based on FAIR data.
- Serves as a model for other EOSC nodes; architecture and open-source software.
- Commitment to FAIR data and Open Science.
- Integration with the EOSC ecosystem.
- **The central point of the EOSC Federation**, one of the many nodes to be established.



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EOSC EU NODE

[Home](#) | [European Open Science Cloud - EU Node](#)

The EU EOSC Node serves:

- **Researchers and Research Groups** (across all disciplines).
- **Citizen Scientists** (raising awareness of scientific results).
- **Service Providers** (discovery, access, and ordering of services).
- **Research Infrastructures** (computing and storage resources).
- **Nodes** (registration and federation).

Categories:

- Repositories
- Research Infrastructures
- Technology and Infrastructure Providers
- Software Developers and IT Professionals
- Industry Partners

Interest Form

I am interested to join the *

User Forum Technology Forum

Full name *

Email *

Organisation *

Please keep me updated for any EOSC EU Node developments

[Privacy Statement](#)

CAPTCHA *

Antispam Audio version

Select the number **twenty-three** or **21** by moving the slider.

You've selected: 0

This question is for testing whether or not you are a human visitor and to prevent automated spam submissions.

<https://open-science-cloud.ec.europa.eu/about/eosc-eu-node#interest-form>



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EOSC EU NODE

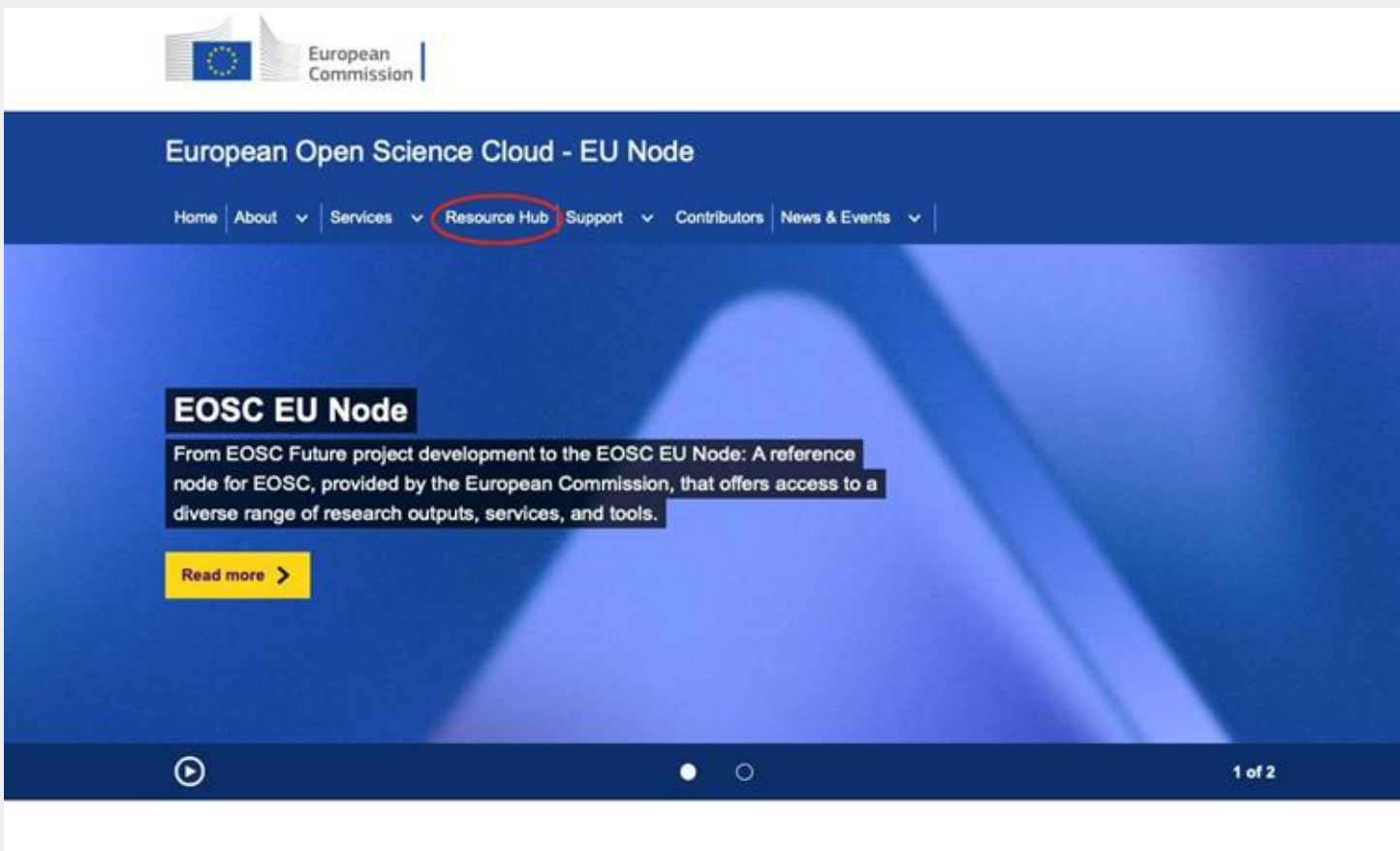
RESOURCE HUB

[Resource Hub | European Open Science Cloud - EU Node](#)

- **The Core EOSC Platform:** A centralized digital environment providing access to more than 180 million research resources.

Key Features and Purpose:

- Access to Research Data, Publications, and Software: Seamless discovery of scholarly outputs.
- Utilization of Community Services: Leveraging tools and services offered by the global research community.
- Support and Training Materials: Providing guidance and educational resources for users.
- Deployment of Data Science Workflows: Enabling the execution of complex analytical processes.
- FAIR Data and Open Science: Full alignment with the principles of findability, accessibility, interoperability, and reusability.
- Integration with the EOSC Ecosystem: Ensuring connectivity across the entire federation.



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RESOURCE HUB

User Interface

The screenshot shows the user interface of the EOSC EU Node Resource Hub. At the top, there is a header with the European Commission logo and a 'Log in' button. Below this is a navigation bar with the title 'European Open Science Cloud - EU Node' and a menu with items: Home, About, Services, Resource Hub (selected), Support, Contributors, News & Events, and User Space. The main content area is titled 'Resource hub' and features a search bar with a dropdown menu set to 'All resources' and a search button. Below the search bar is a horizontal menu with categories: All resources (selected), Publications, Data, Software, Other Products, Services, Data Sources, Training, Interoperability Guidelines, and Tools. The main content area displays 'Showing 1 to 20 of 141,630,772 resources'. On the left, there are filter options for 'Access right', 'Scientific domain', 'Horizontal service', and 'Document type', each with an upward arrow. On the right, there is a 'No filters applied' message and a 'Relevance' dropdown menu. The first resource shown is 'INTEROPERABILITY GUIDELINE' with a star icon, dated 'Year: 2022'. The title is 'EOSC Security Operational Baseline 2022'. The description states: 'To fulfil its mission, it is necessary for the European Open Science Cloud (EOSC) to be protected from damage, disruption, and unauthorised use. This Security Baseline supports these goals by defining minimum expectations and requirements of the behaviour of those offering services to users and communities...'. The organization is listed as 'Nikhef (Stichting Nederlands Wetenschappelijk Onderzoek Instituten)'.

Types of Available Resources:

- Publications
- Research Data
- Software
- Other Research Products
- Services
- Training and Interoperability Guidelines



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EOSC CREDIT SYSTEM

- Credits are the "**virtual currency**" of the EOSC EU Node.
 - They represent the relative (and actual) costs of services but have no real monetary value.
 - They ensure fair and transparent access to the services of the EOSC EU Node.
- The costs of individual services are expressed in credits.
 - Credits are refreshed every 3 months (90 days); unused credits cannot be carried over to the next period.
- Credits are assigned automatically based on the affiliation provided by the user's home organization.
- The specific affiliation provided by the home organization also determines the access levels and the total number of credits granted.



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ACCESS GROUP TYPES

Explorer

No Login Required

Best for: First-time visitors exploring available resources and learning about the EOSC EU Node.

- Browse public content anonymously
- View datasets and software
- Access educational materials

Credits: Not applicable

Observer

View Access

Best for: Users who want to browse content, view their dashboard, and get familiar with the platform.

- View personalised dashboard
- Browse services and features
- No compute or storage capabilities, unless you are a member of a group

Credits: 0

Collaborator

Limited Access

Best for: Institutional employees needing modest compute and storage capabilities.

- Use collaboration tools
- Upload and share data
- Run small and medium services

Credits: 1,000

Investigator

Full-Featured Access

Best for: Academic researchers needing full-scale computing, GPU support, and team management.

- Access all computing resources
- Use GPU-enabled services
- Create and manage teams

Credits: 2,000 (individual) / 6,000 (group)



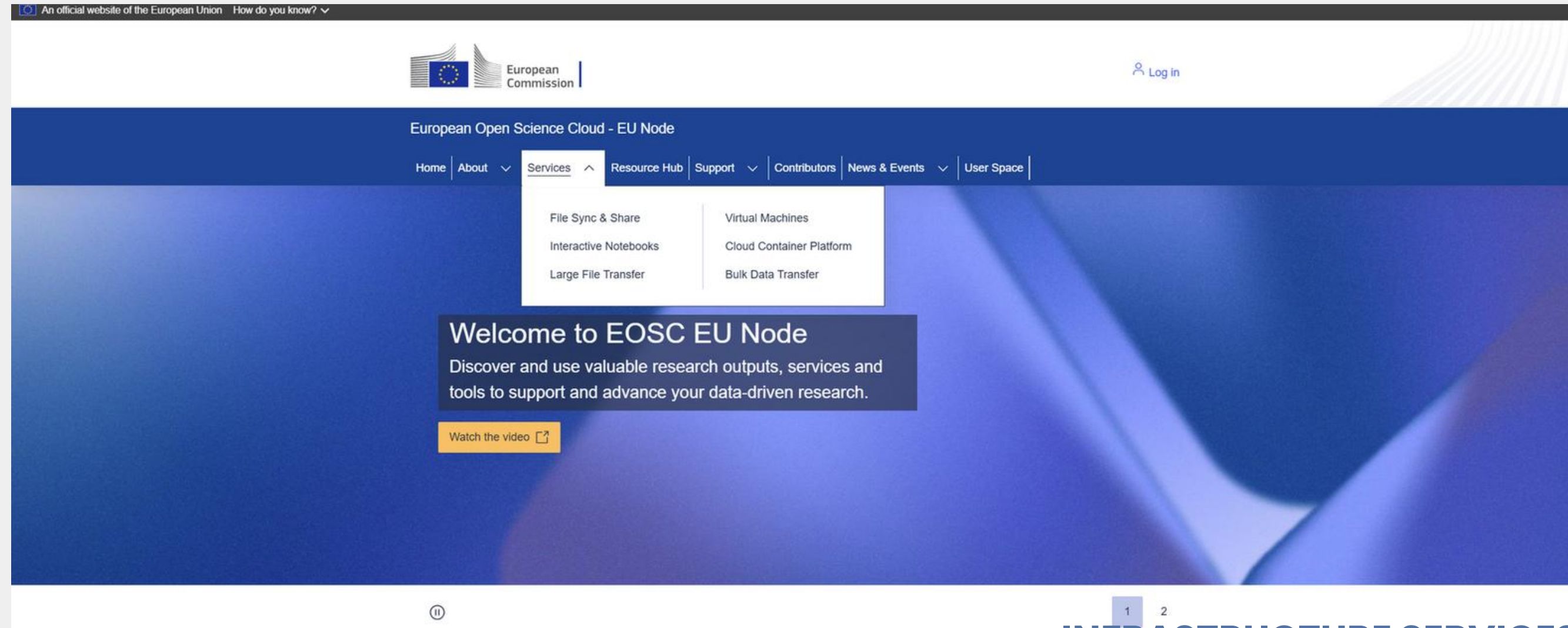
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SERVICES



APPLICATION SERVICES

File Sync & Share

Interactive Notebooks

Large File Transfer

INFRASTRUCTURE SERVICES

Virtual Machines

Cloud Container Platform

Bulk Data Transfer



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Thank you for your attention



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