

EOSC Academy - Course 2: Applying the EOSC Federation Handbook

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for the **EOSC Academy**



<https://doi.org/10.5281/zenodo.18454649>

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Published January 30, 2026 | Version 2.0

EOSC Federation Handbook

EOSC Association (Editor)

The EOSC Federation Handbook provides an overview of the organisational and operational structure and technical characteristics of the EOSC Federation. It aims to serve as a practical guideline for organisations that are interested in making their resources available within and across the EOSC Federation. Such organisations can achieve this objective by creating and operating an "EOSC Node", and "enrolling" it as part of the EOSC Federation, and/or by "onboarding" their resources in one or more EOSC Nodes operated by other organisations.

The intended users of the Handbook include primarily facility managers, policy makers and technical staff of research performing and funding organisations, research infrastructures, providers of scientific services and other resources, and e-infrastructures.

The "end-users" of the resources accessible through the EOSC Federation, i.e. the researchers, are not directly targeted by the Handbook, but they may still find useful information about the scope and organisation of the EOSC Federation. It is important to build the EOSC Federation in the most transparent manner and with the understanding of the research community.

Files

EOSC_Federation_Handbook_V2_20260130.pdf

EOSC Federation Handbook

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Version	Date
Version 2.0 10.5281/zenodo.18454649	Jan 30, 2026
Version 1.0 10.5281/zenodo.1499577	Mar 27, 2025

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DOI

DOI 10.5281/zenodo.18454649

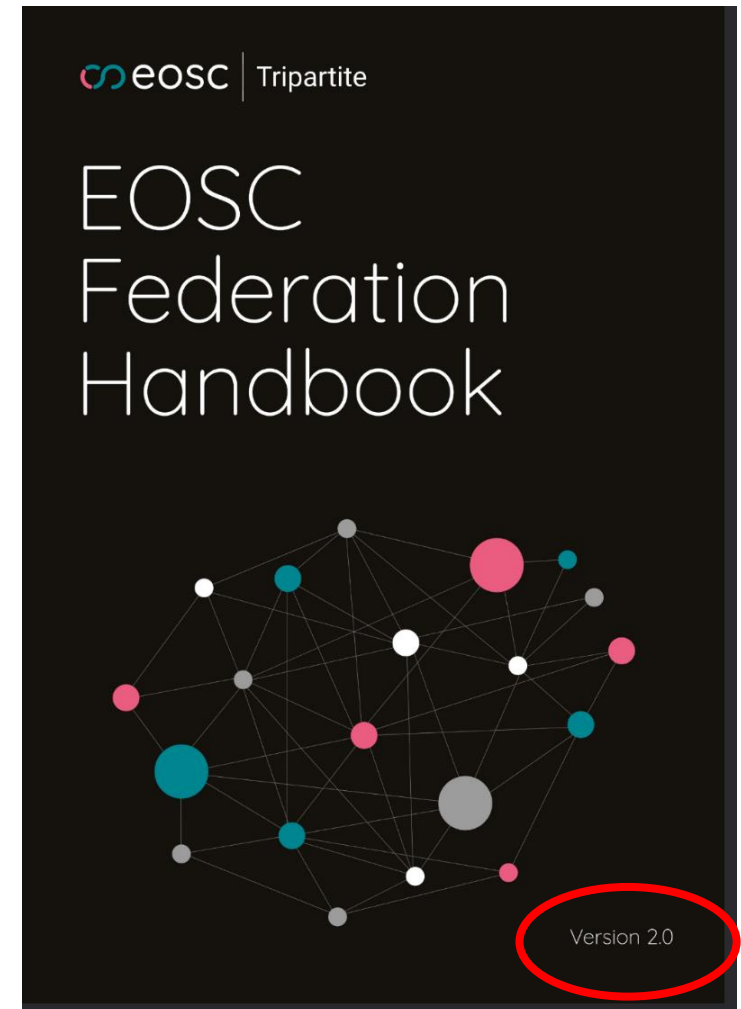
Resource type

Book

Publisher

EOSC Association

<https://zenodo.org/records/18454649>



Module 4

Architecture of the EOSC Federation

How to get to this architecture ?

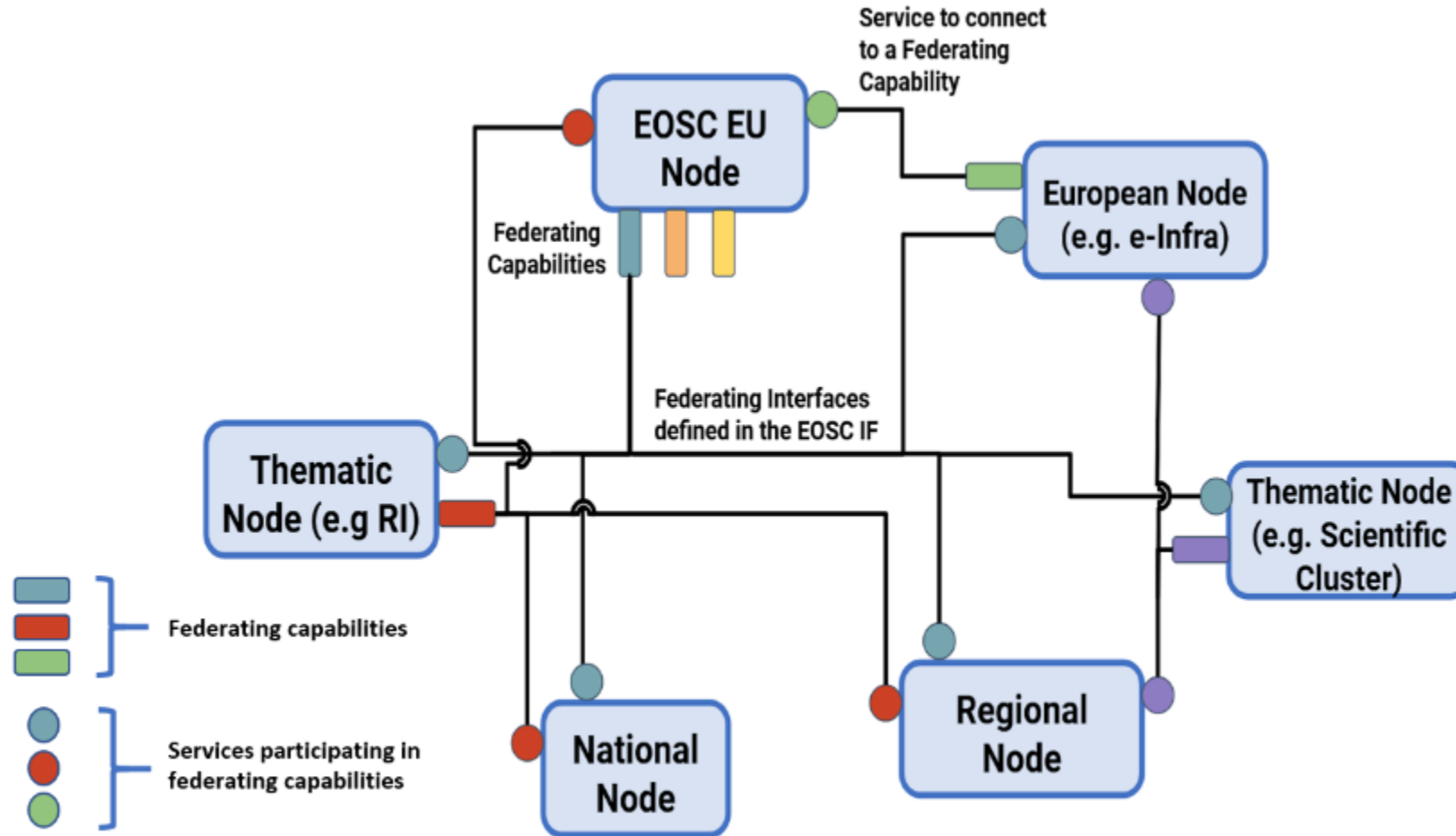


Figure 4.1 - Schematic (or **conceptual**) view of the EOSC Federation Architecture

Typical architecture

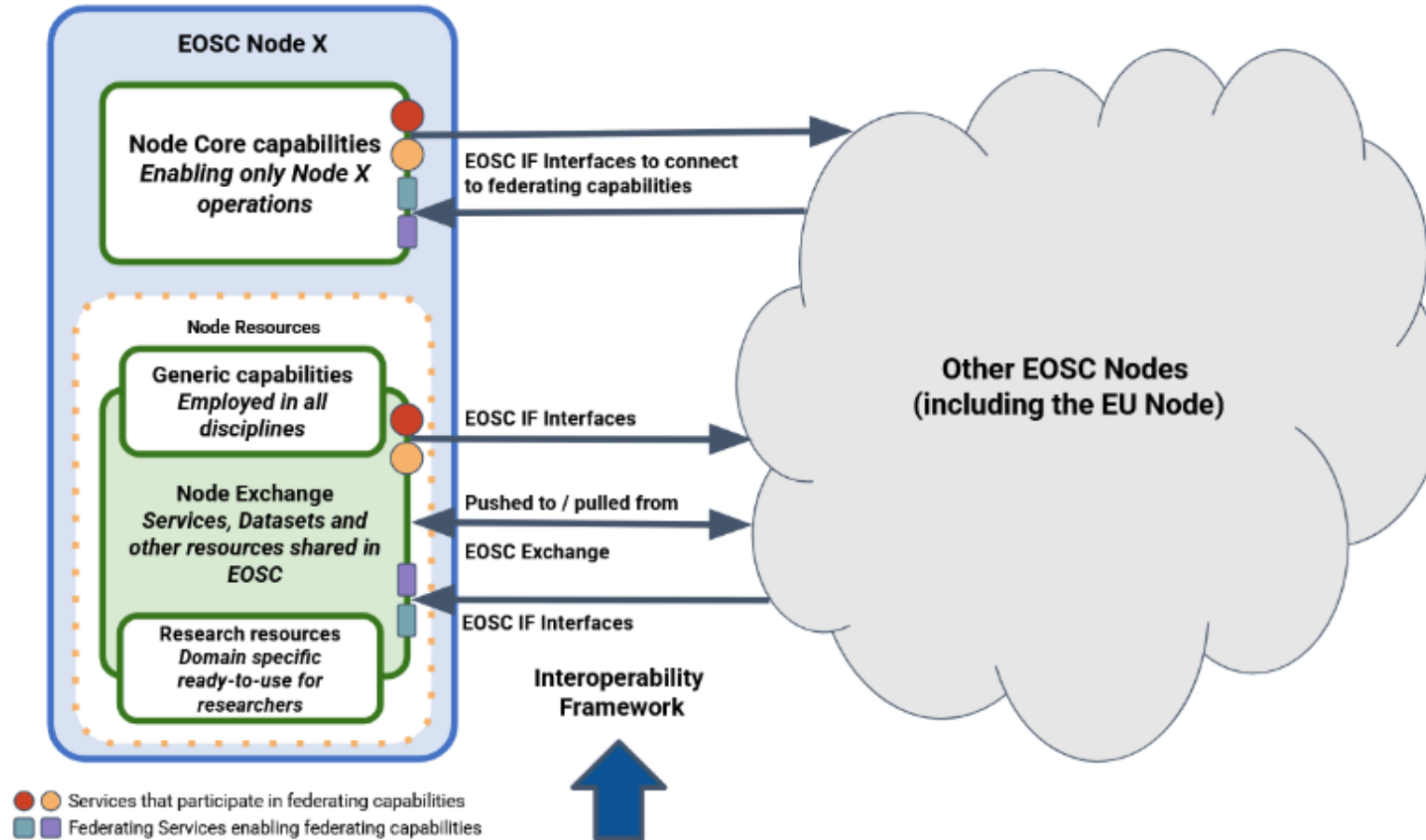
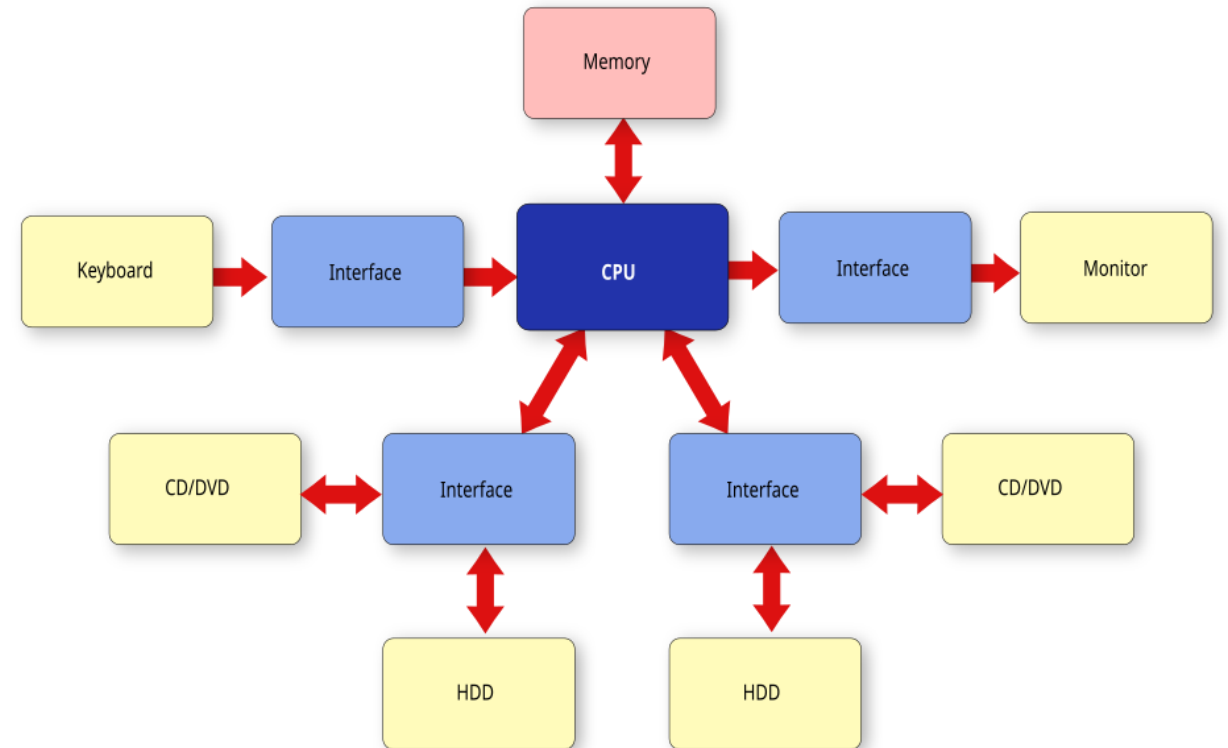


Figure 4.2: EOSC Node Architecture

→ [Systems Architecture](#):

A **system architecture** is the [conceptual model](#) that defines the [structure](#), [behavior](#), and [views](#) of a [system](#).^[1] An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the [structures](#) and [behaviors](#) of the system.

Wikipedia



- EOSC Nodes
- Capabilities
- Federating Capabilities
- Interfaces
- Interoperability Framework
- Node Core Capabilities
- Node Resources
- Node Generic Capabilities
- Node Research Resources
- Node Exchange
- Node Capability

Node Core Capabilities

Node Core Capabilities	Description
Resource Catalogue and Registry services	Catalogue of resources that can be accessed through the EOSC Node with a search engine to discover, access and order them
AAI	AAI (AARC Blueprint compliant) enabling access to Node resources (Core and Exchange) via federated credentials (i.e. community AAI and Infrastructure Proxy)
Helpdesk	Support incident response and service requests for services and other integrated resources
Service Monitoring	Monitor the availability and quality of the Node services
Service and Research Product Accounting	Track and record usage of resources
Order Management	A framework for providers to define offers and a unique interface for end-users to request access to resources
Configuration Management System	Shared space to store information on Node capabilities and on how services are provided through the node to ensure consistent service delivery (only for internal use)
User space	Dynamic customisable dashboard, where the node user logs-in, offering easy access to the Node resources
Application Deployment Management	Automated deployment and execution of services on the underlying Node provisioned infrastructure
Resource provisioning	Support users in identifying all available resources for a project and then assign a subset of them to the project

Table 4.1: EOSC Node Core Capabilities

The eOSC Federating Capabilities can be:

- **Mandatory:** Federated Capabilities which all eOSC Nodes must implement in order to join the eOSC Federation;
- **Recommended:** Federated Capabilities which eOSC Nodes should consider to federate with (i.e. connect to), but which are optional for eOSC Nodes joining the eOSC Federation

EOSC Nodes can contribute to the delivery of a Federating Capability by either:

- A. Enabling a Federating Capability** that can be used by other EOSC Nodes (e.g. act as a federator, a Node enabling a federation of cloud resources); or
- B. Participating in the delivery of a Federating Capability** by integrating one or more services provided by the Node in a Federating Capability enabled by another Node (e.g. for example a Node participating in the federated AAI by integrating its AAI proxy with the AAI Federation enabled by the EOSC EU Node).

Identified by the research communities to perform everyday research data management tasks, and **are therefore expected to be offered by all EOSC Nodes to allow users to manage and process research data from the Node where they access the Federation.**

Node Capabilities	Description
Data Management and Transfer	Management of data between storage locations
Interactive Notebooks	Support for data analysis
Compute and storage resources (including middleware)	Support for data analysis with relevant middleware (e.g. support for containers)
File Sync & Share	Syncing automatically data across devices (e.g. PCs, tablets, or smartphones) and securely sharing them within research teams

Table 4.2: EOSC Node Generic capabilities

EOSC Federating Capabilities

ID	Federating Capability	Description	Classification
FC-1	AAI	Ensures the AAI interoperability across the EOSC Nodes	Mandatory ²⁹
FC-2	Resource Catalogues and Registry services	Enables the discovery and access of resources (e.g. Services and Research Products) provided through EOSC Nodes within the EOSC Federation.	Mandatory ^{30,31}
FC-3	Helpdesk	Integrates the helpdesks of EOSC Nodes within the EOSC Federation to provide a federated support channel between users and providers from nodes.	Recommended (Will become Mandatory in 2026)
FC-4	Service Monitoring	Provide information about the quality and availability of services and resources made available through EOSC Nodes into the EOSC Federation.	Recommended (Will become Mandatory in 2026)
FC-5	Service Management System	EOSC Federation FitSM-based Service Management System, defining the essential processes between EOSC Nodes to enable efficient IT service management within the EOSC Federation. It also includes Security Coordination between Nodes.	Recommended (Will become Mandatory in 2026)

ID	Federating Capability	Description	Classification
FC-6	Service Accounting	Provide information about the usage of services offered by EOSC Nodes within the EOSC Federation.	Recommended
FC-7	Research Product Accounting	Provide information about the usage of research products made available through EOSC Nodes in the EOSC Federation.	Recommended
FC-8	Order Management	Provides a framework that allows providers and users to manage the full lifecycle of service and resources requests and access granting across federated Nodes.	Recommended
FC-9	Application Deployment Management	Automated deployment and execution of services across multiple federated nodes.	Recommended

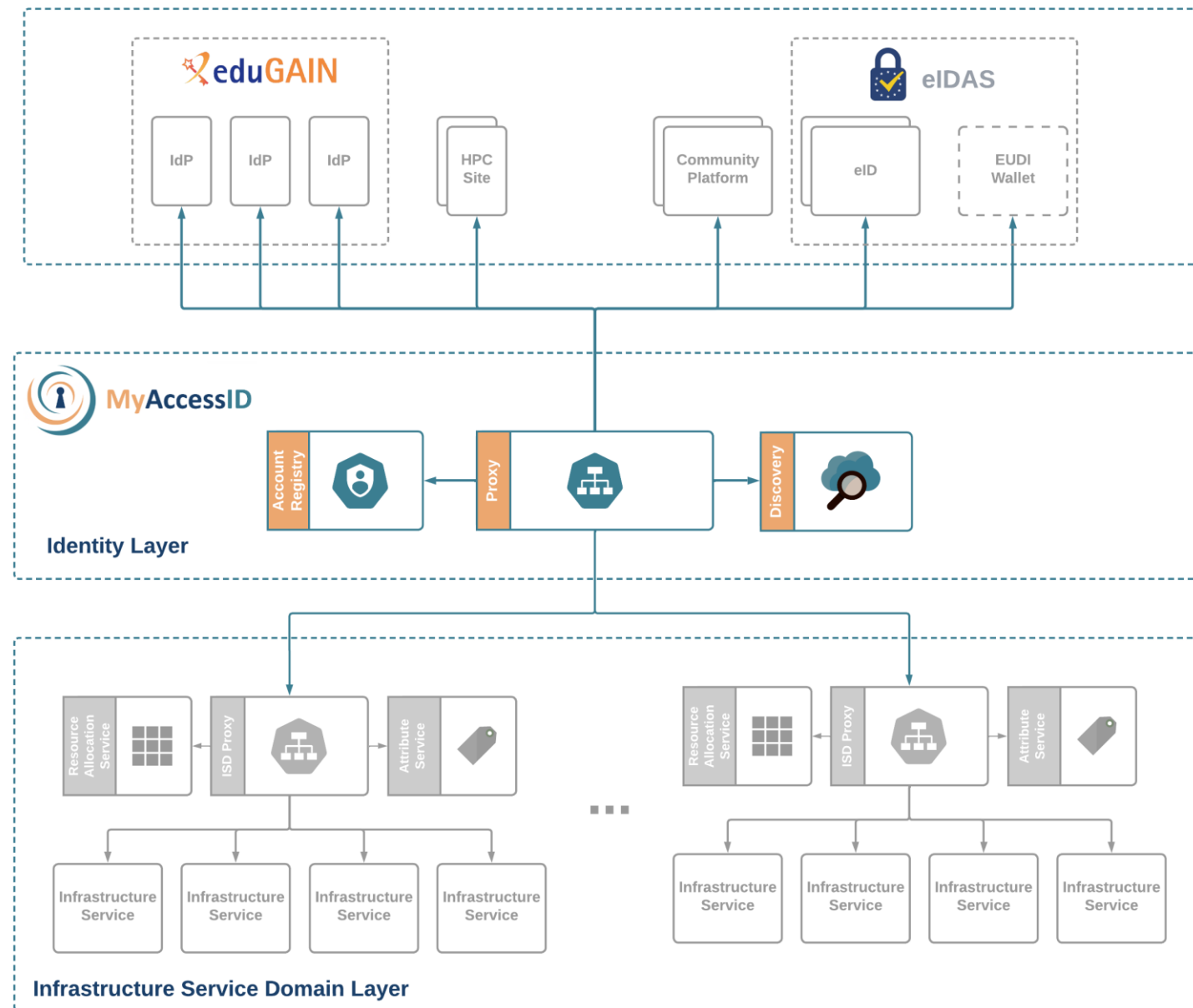
Table 4.3: Federating Capabilities identified during the interim phase

Needs specialist knowledge of AAI

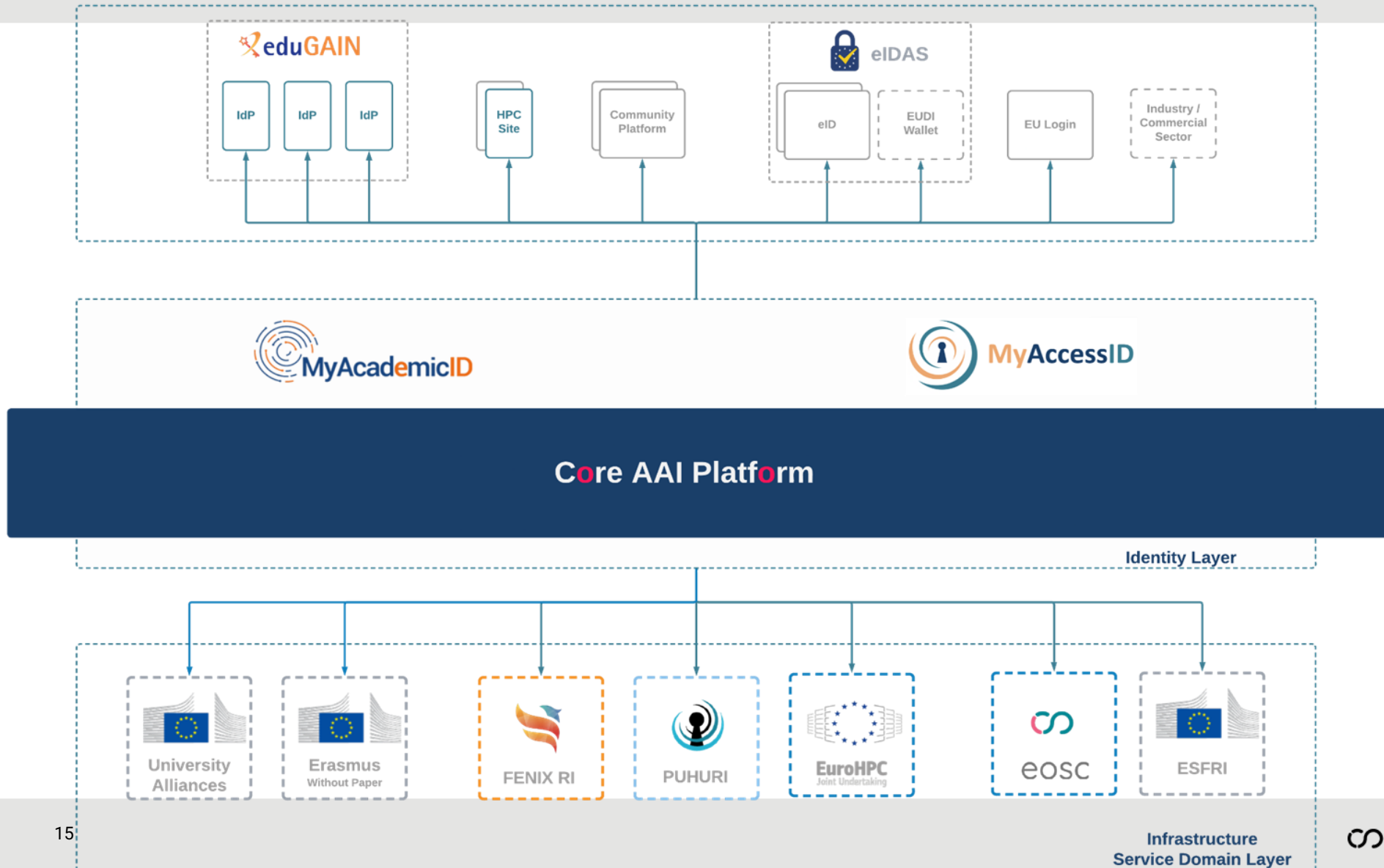
AAI is a Mandatory FC

Goal: allow Researchers to login with their institute login and also move transparently between Nodes while staying authenticated via SSO

Implication: Researchers can login any node and then navigate to another node without having to authenticate again

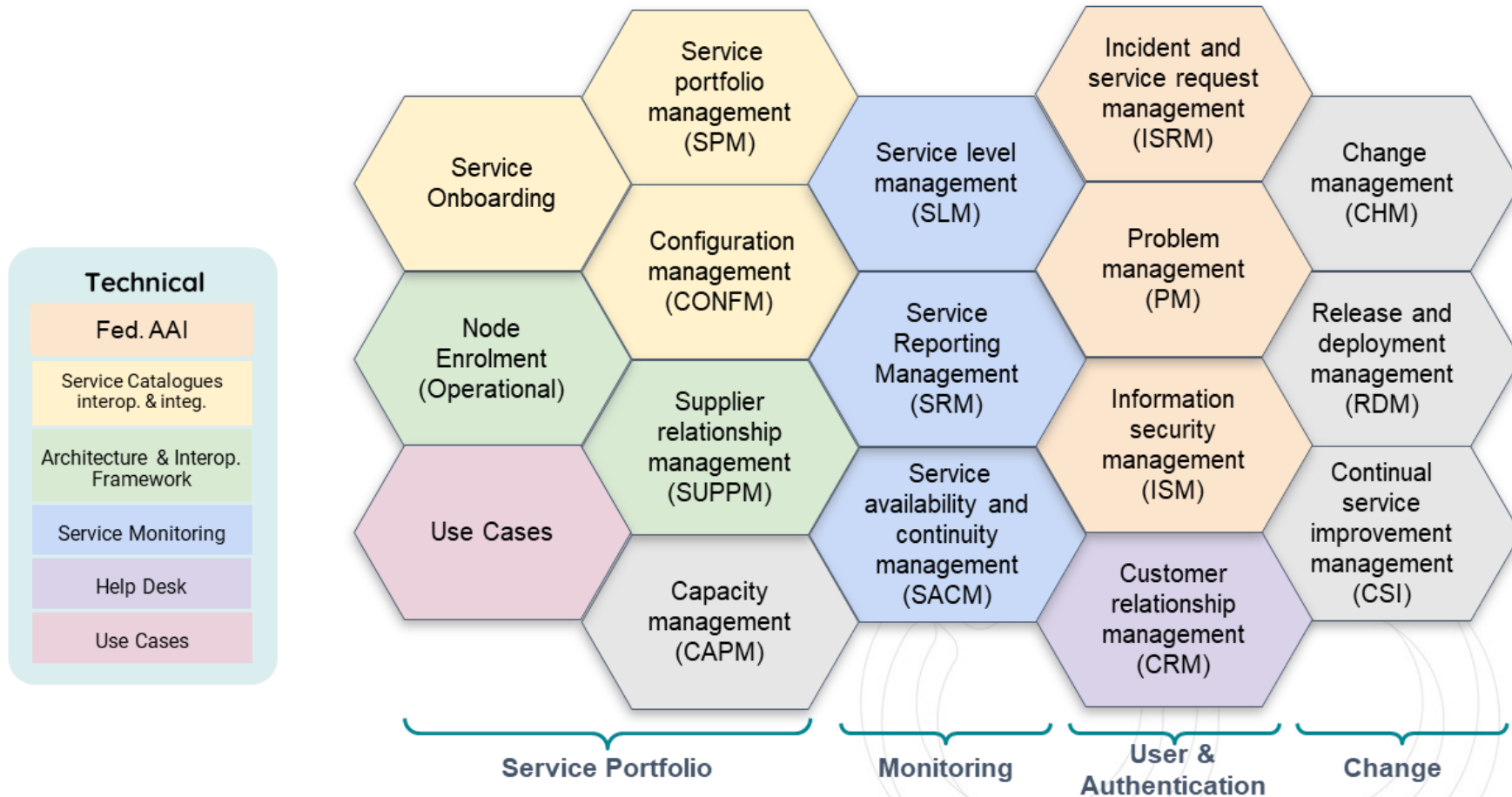


eOSC Academy Authentication Authorisation Infrastructure (AAI)



- Both are **mandatory** in **2026**
- Every Node has an **Operations Manager**
- Meet in the **Node Operations Committee**
- Use **FitSM** for Service Management
- Training in FitSM is being provided by EGI

Preliminary FitSM mapping to EOSC interim WGs



- **Mandatory FC in 2026**
- **Goal:** be able to pass helpdesk issues between Nodes to the persons who can deal with them
- First phase will exchange issues via email (probably)
- Some Nodes are using Zammad e.g. EU Node, Germany

Helpdesk

Whether you are troubleshooting or seeking guidance, our support team is here to assist you. If your question is not already addressed in the [Frequently Asked Questions](#) get in touch directly for personalised assistance.

Full name *

Email *

Subject

Your message *

5000 character(s) remaining

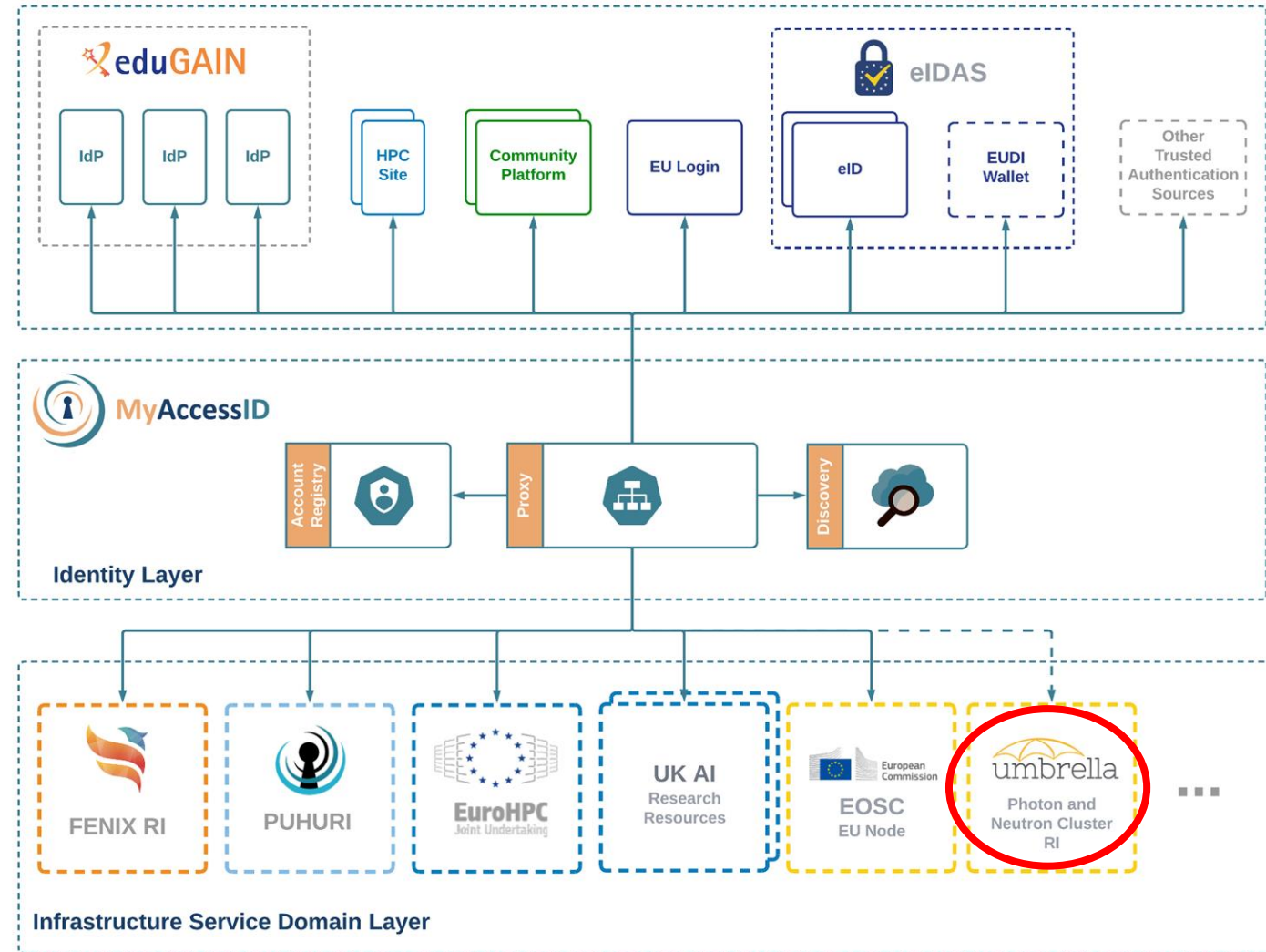
[Privacy Statement](#)

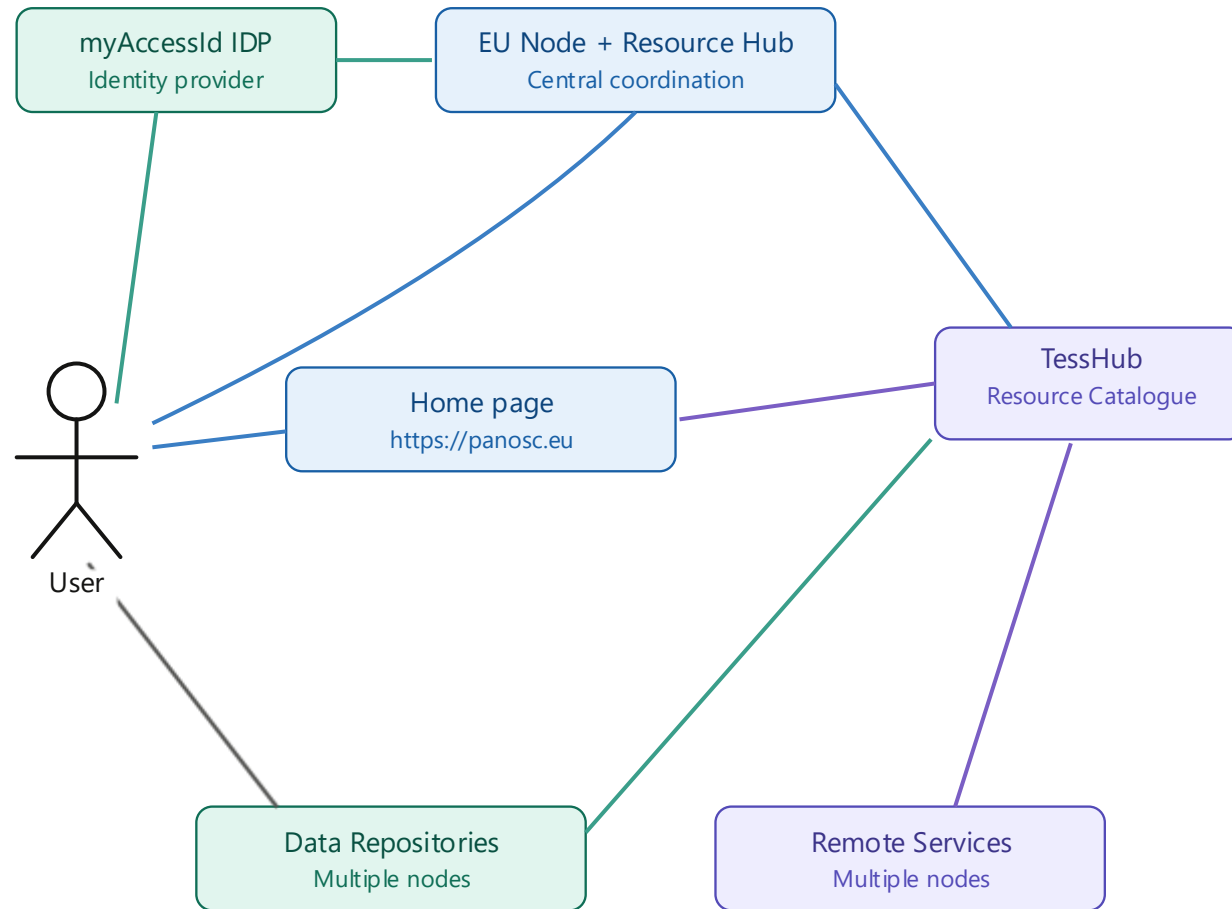


- **AAI** – switch UmbrellaID to myAccessID
- **Resource Catalogues and Registry** – TessHub
- **Helpdesk** – Zammad (planned)
- **Service Monitoring** – Not defined yet
- **Service Management** – FitSM (LITE!)



- PaN has a community AAI since ~2010 called **UmbrellaId** (umbrellaId.org)
- Work started in the PaNOSC EU project with GÉANT to replace Identity Proxy (IdP)
- Switching to **MyAccessID** will be straight forward

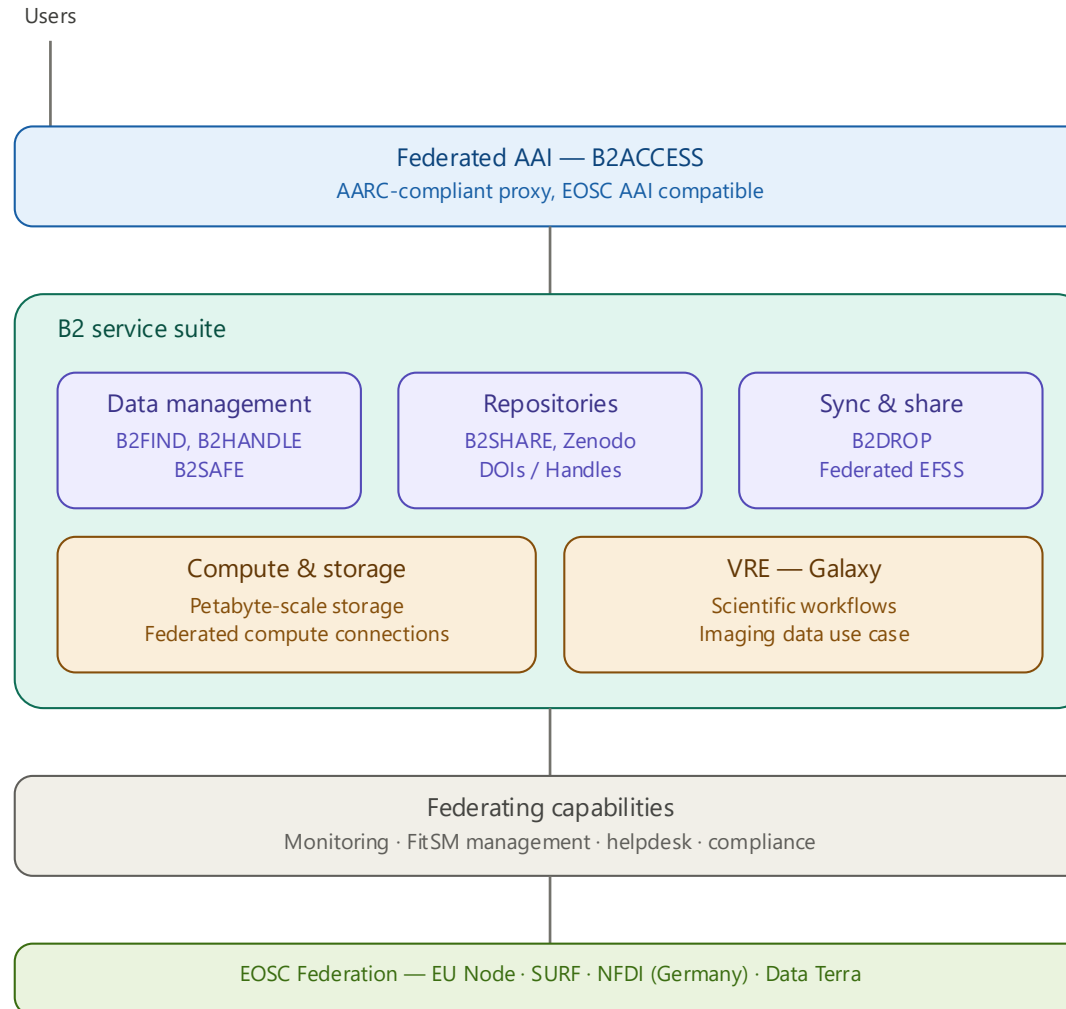






Conceptual Architecture

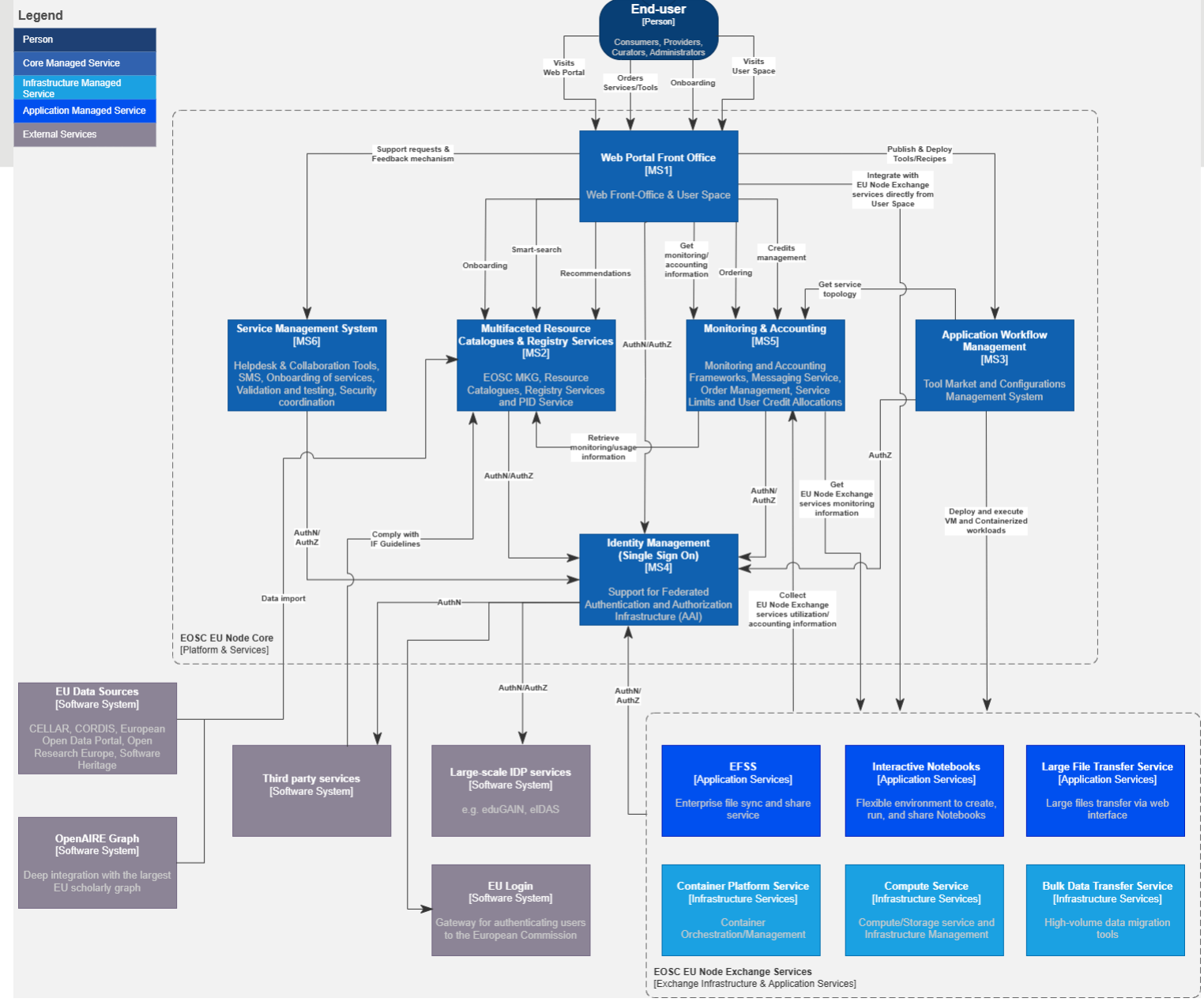
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EU Node – Conceptual Architecture

[System Landscape] EU Node
Conceptual view



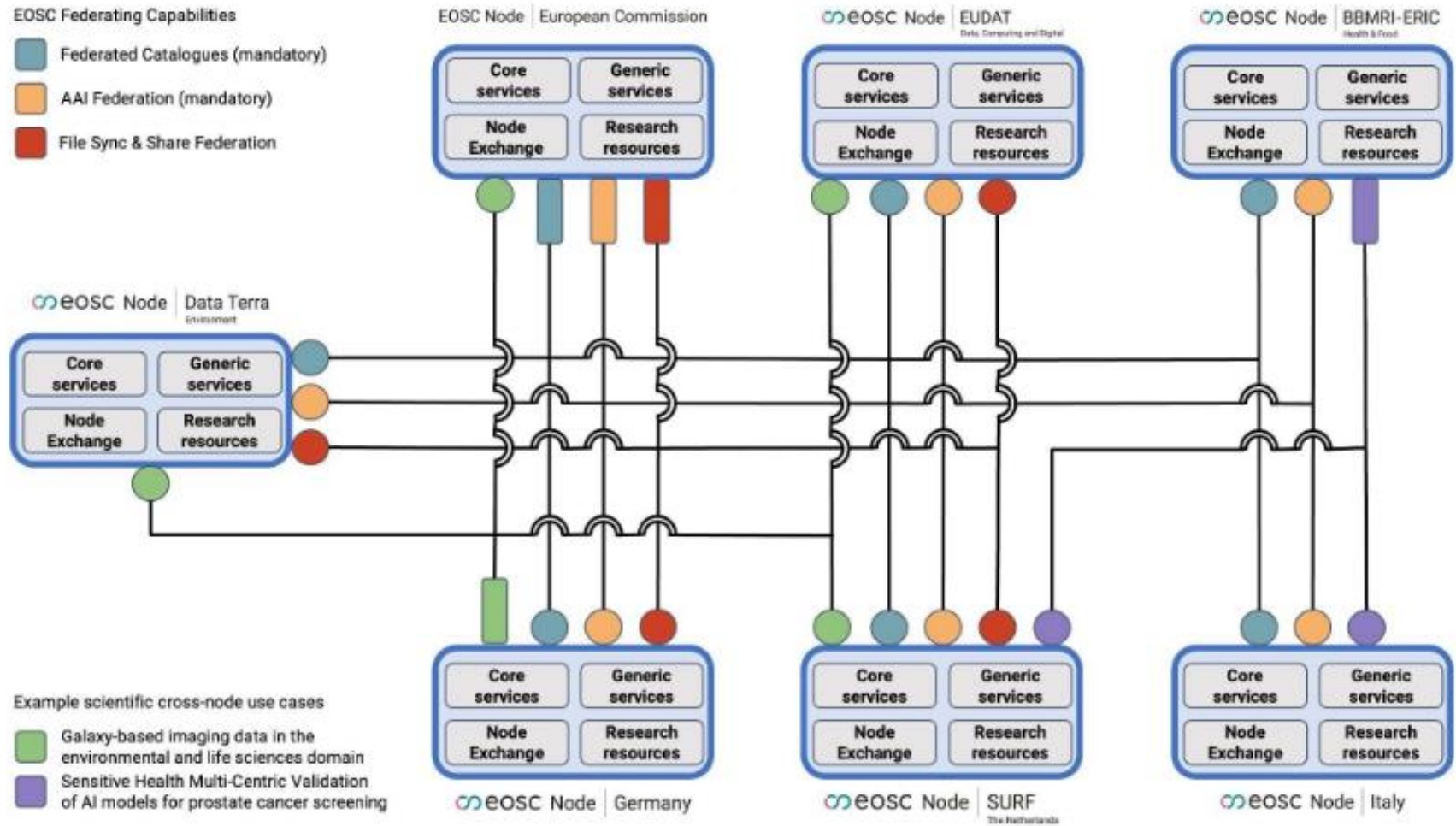


Figure 4.4: Schematic of eOSC Nodes interconnecting through Federating Capabilities to support two cross-node use case examples during the build-up phase.

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.		

Table 4.4: Overview cross-node use cases implemented during the first EOSC Federation build up phase

- **Data protection – GDPR compliance**
 - Nodes must clarify their specific role under the EU **General Data Protection Regulation (GDPR)**⁵¹ (e.g. Data Controller, Data Processor, or Third Party) for the services they offer and implement the corresponding legal requirements.
- **Cybersecurity**
 - EOSC Nodes must ensure that their operations, as well as those of their service providers, comply with all applicable cybersecurity regulations, policies, standards, and guidelines relevant to their activities, operations, and services
 - Any non-compliance with the Node security policy or relevant regulations must be promptly handled and reported to security@eudat.eu. Incidents must be promptly handled and reported to csirt@eudat.eu



- **Data Protection**

- GDPR is implemented by each partner
- Onboarded Services must agree to and implement GDPR



- **Cybersecurity**

- Has become a major topic in all our facilities
- PaN community has setup a Cybersecurity Forum which is very active, see [presentation](#) on cybersecurity at Symposium 2025

eOSC | Federation

Cybersecurity: An RI perspective

Jean-François Perrin (ESRF, PaNOSC Node)
EOSC Symposium Nov 4th, 2025



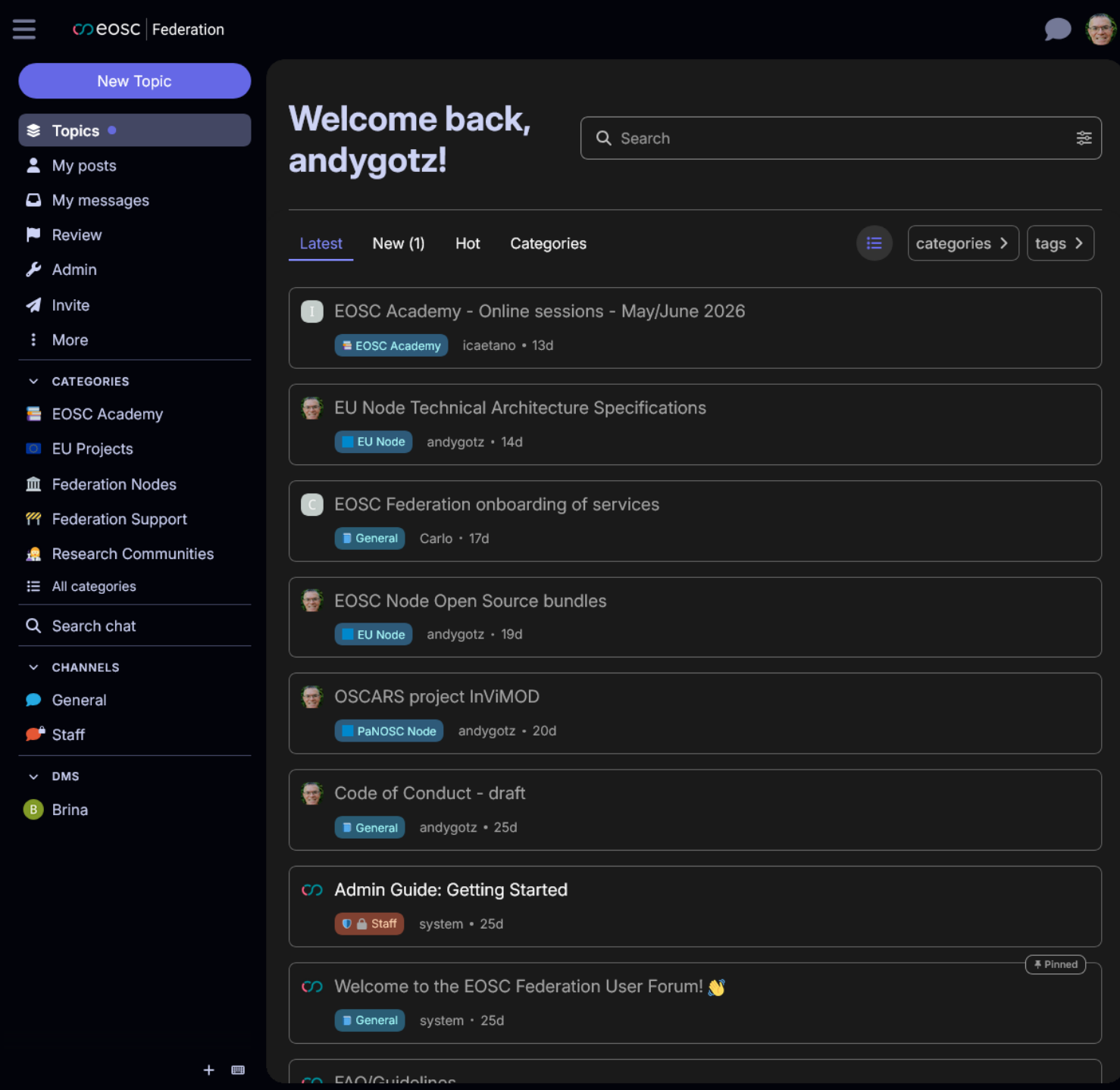
Photo by Leeloo The First on Pexels

Flashcards

- Question 4.1:** What resources does a Node have to make available to the EOSC Federation?
- Question 4.2:** Define what a Federating Capability is and give an example
- Question 4.3:** What Federating Capabilities will be mandatory in 2026?

Further Questions + Discussions on the EOSC Federation User Forum

<https://user-forum.eosc.eu/>



The screenshot shows the EOSC Federation User Forum interface. The top navigation bar includes a hamburger menu, the EOSC logo, and the text "Federation". Below this is a "New Topic" button. A sidebar on the left contains navigation options: "Topics", "My posts", "My messages", "Review", "Admin", "Invite", and "More". Under "CATEGORIES", there are links for "EOSC Academy", "EU Projects", "Federation Nodes", "Federation Support", "Research Communities", and "All categories". Under "CHANNELS", there are "General" and "Staff". Under "DMS", there is "Brina". The main content area displays a list of forum posts. The first post is "EOSC Academy - Online sessions - May/June 2026" by icaetano, 13 days ago. The second is "EU Node Technical Architecture Specifications" by andygotz, 14 days ago. The third is "EOSC Federation onboarding of services" by Carlo, 17 days ago. The fourth is "EOSC Node Open Source bundles" by andygotz, 19 days ago. The fifth is "OSCARS project InViMOD" by andygotz, 20 days ago. The sixth is "Code of Conduct - draft" by andygotz, 25 days ago. The seventh is a pinned post: "Admin Guide: Getting Started" by system, 25 days ago. The eighth is another pinned post: "Welcome to the EOSC Federation User Forum!" by system, 25 days ago. The interface includes a search bar at the top right, sorting options (Latest, New (1), Hot, Categories), and buttons for "categories" and "tags".