The NFDI National Node and EOSC Beyond Pilot Node in the EOSC federation.

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17th March 2026
International Symposium on Grids and Clouds ISGC 2026
Academia Sinica, Taipei, Taiwan

In cooperation with

EOSC Beyond receives funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101131875.

EOSC in a nutshell.

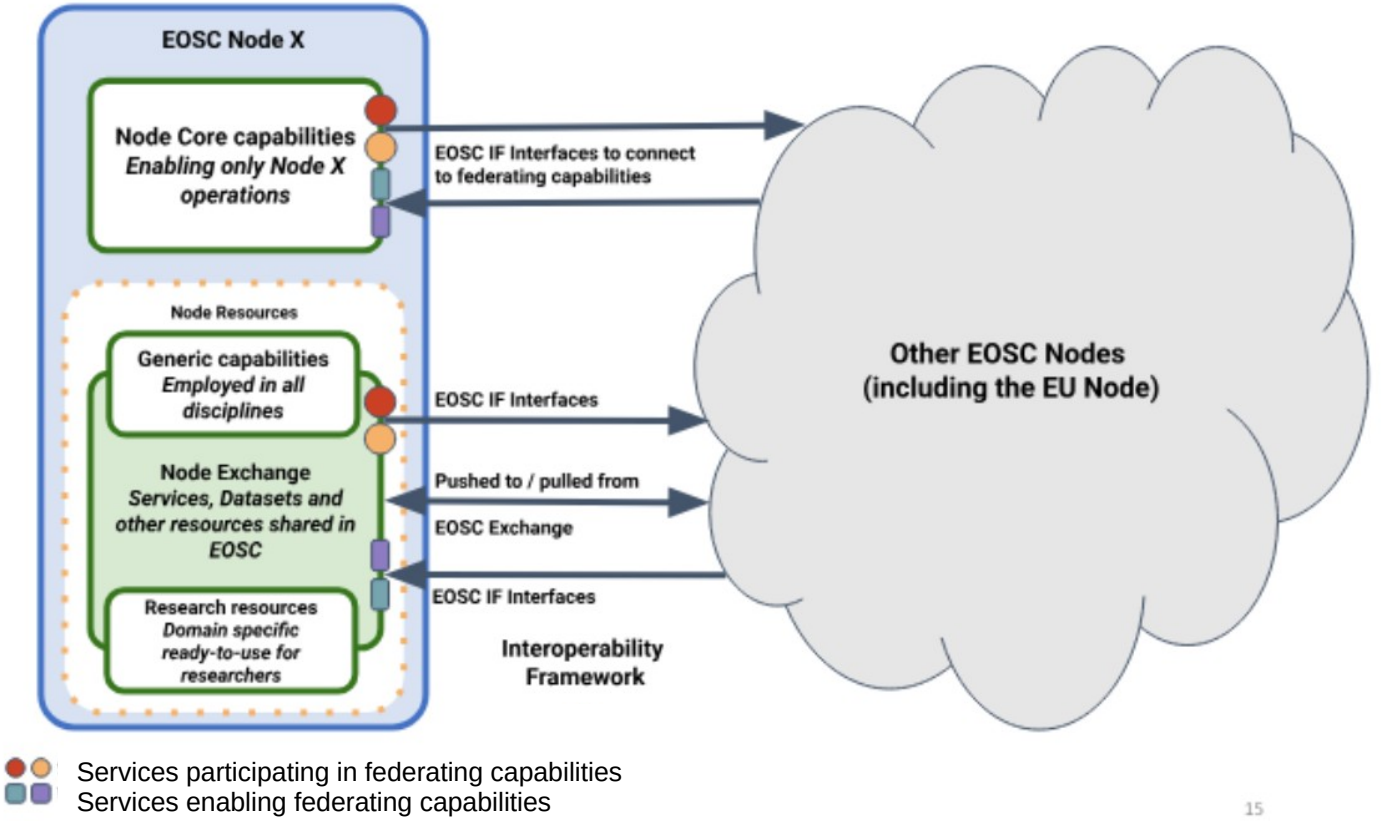
Nodes at a glance

How to EOSC

The European Open Science Cloud (EOSC) aims to make collaborative & scientific services (web- and terminal-based), data and training knowledge easily accessible and available to researchers in Europe through a network of „Nodes“.

What is a „Node“

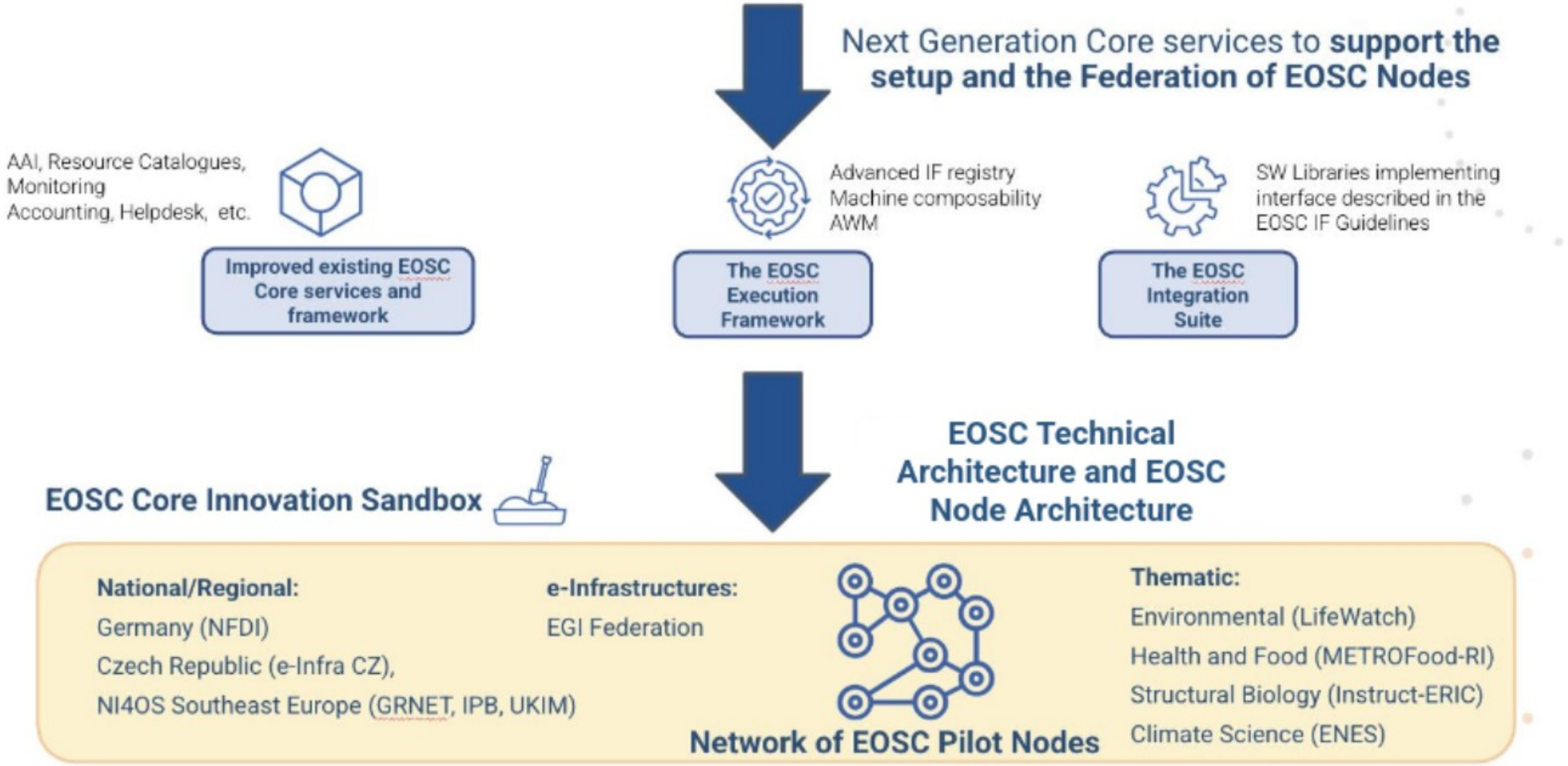
- Collection of services for the benefit of science and scientists
- Provided by Research Infrastructures & Institutions
- Available to researchers from Europe belonging to that node
- Accessible through common AAI and mutual trust



Source: EOSC Federation Handbook, fig 4.2, https://doi.org/10.5281/zenodo.18454649

EOSC Beyond.

EOSC Beyond builds pilot nodes, a.k.a. prototyping in complex systems but without real users



What is the NFDI?

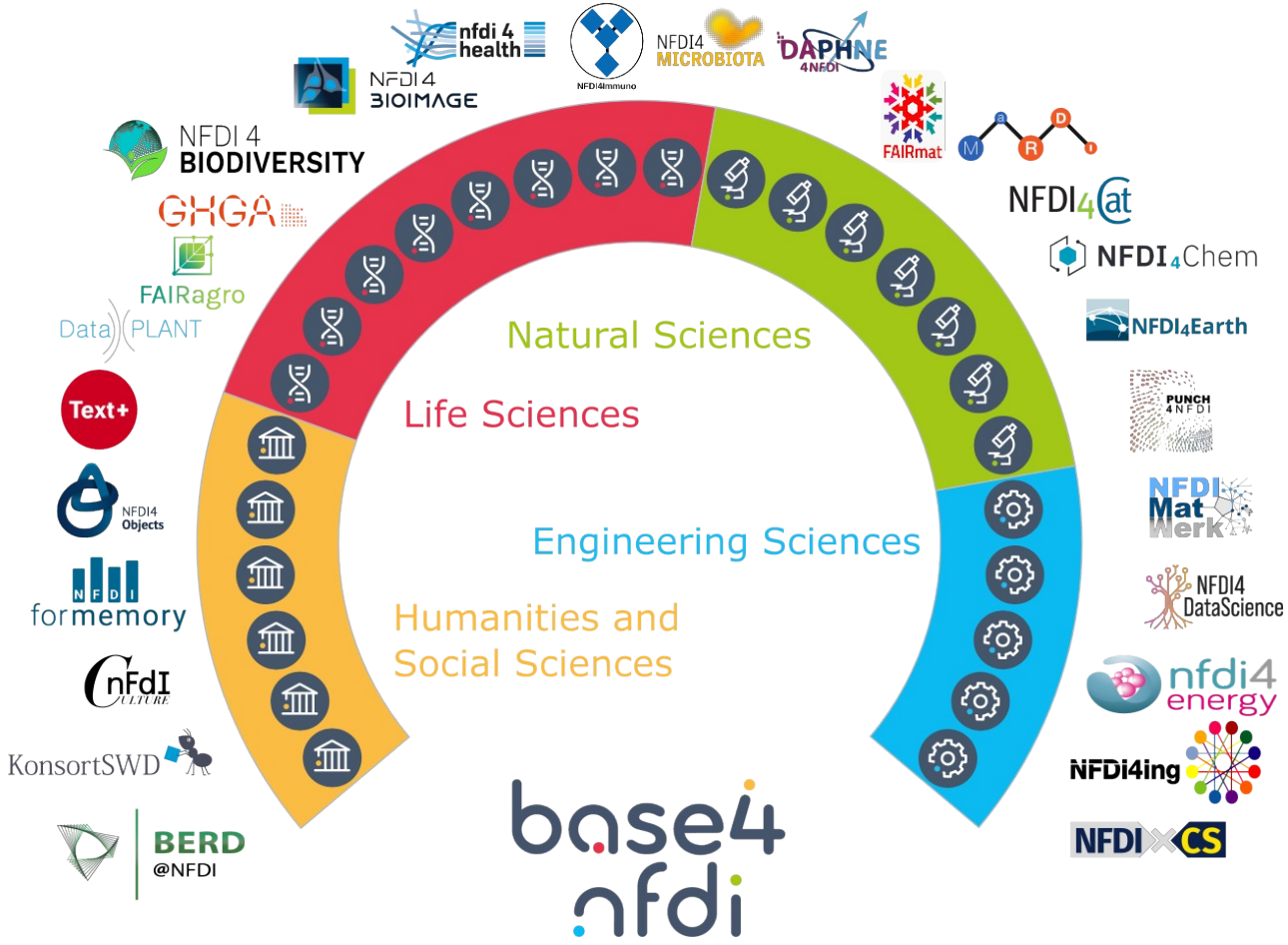
The German National Research Data Infrastructure

The motto

The vision of NFDI is data as a common good for excellent research, organised by the scientific community in Germany.

Bottom-up driven initiative

- founded in 2020 with a federated structure covering the entire research system of Germany
- 306 member institutions in the association,
- 26 consortia with various organisations from all research fields,
- 1 cross-consortia initiative for basic services (Base4NFDI),
- 90 Mio. € per year at least until 2028.
- **Mandated Organisation** of Germany in EOSC-A



The NFDI EOSC node.

NFDI goes EOSC

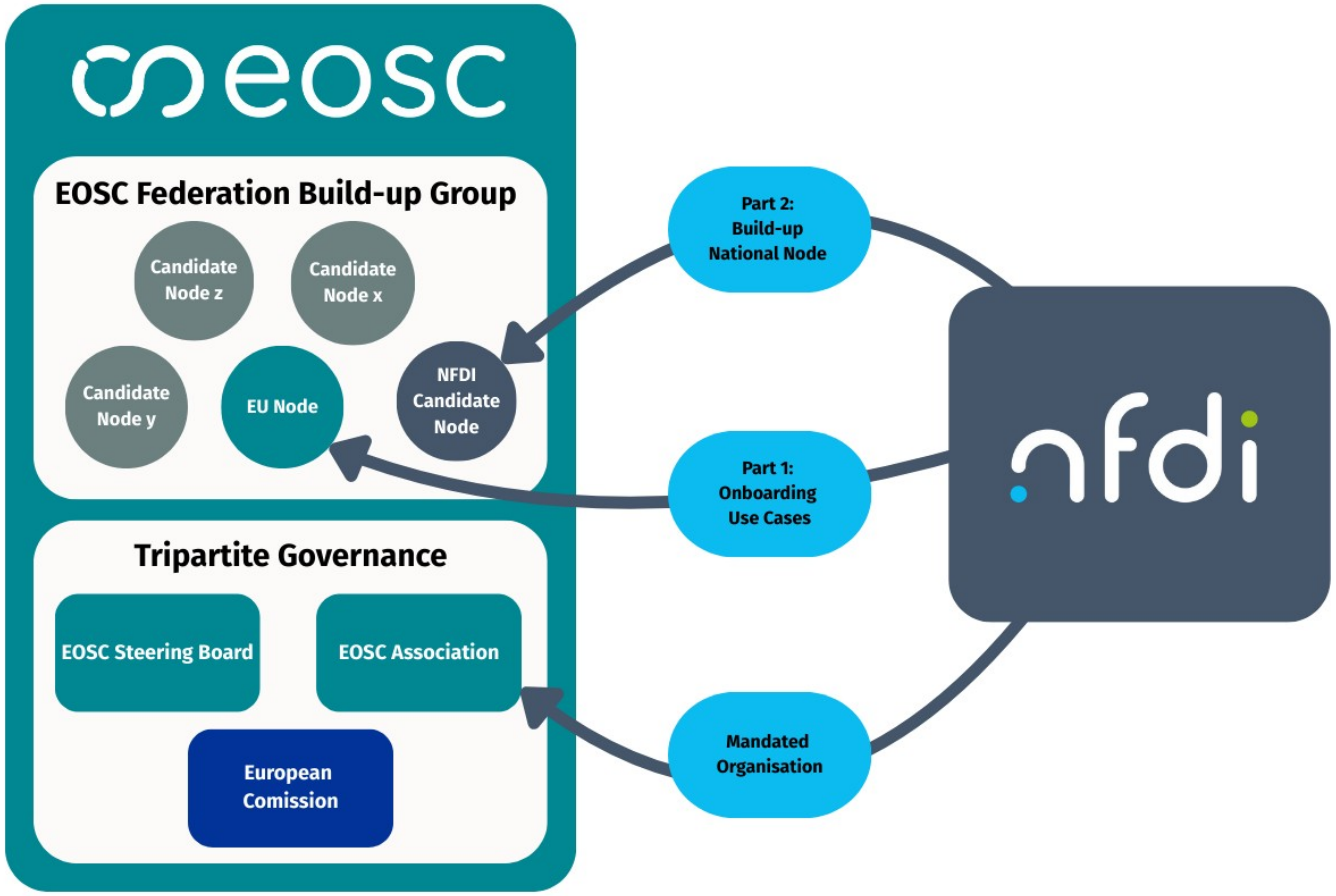
The why

Developed as a **central institution** to enable the connection of the infrastructures, data, and services of NFDI and, in the future, other national actors to the European EOSC network.

Creating an interface that facilitates exchange and integration between national and European research infrastructures.

The who

Members of the NFDI's consortia found themselves together building up the Node by starting to define processes, a service portfolio, the governance and the architecture details



The tower of Babel.

Building an EOSC Node is a matter of organization(s)

Speaking the same language and getting the terminology right.

The entry point to a Node is it's public frontend and needs to be accessible, comprehensible and intuitively controllable.

„There are only two hards things in computer science: cache invalidation and naming things." -Phil Karlton

How do we call this entry point? EOSC Beyond has been through some terms now...

- Marketplace
- User Space
- Front Office
- Service Catalogue
- Discovery Hub
- ... more to come, probably!?

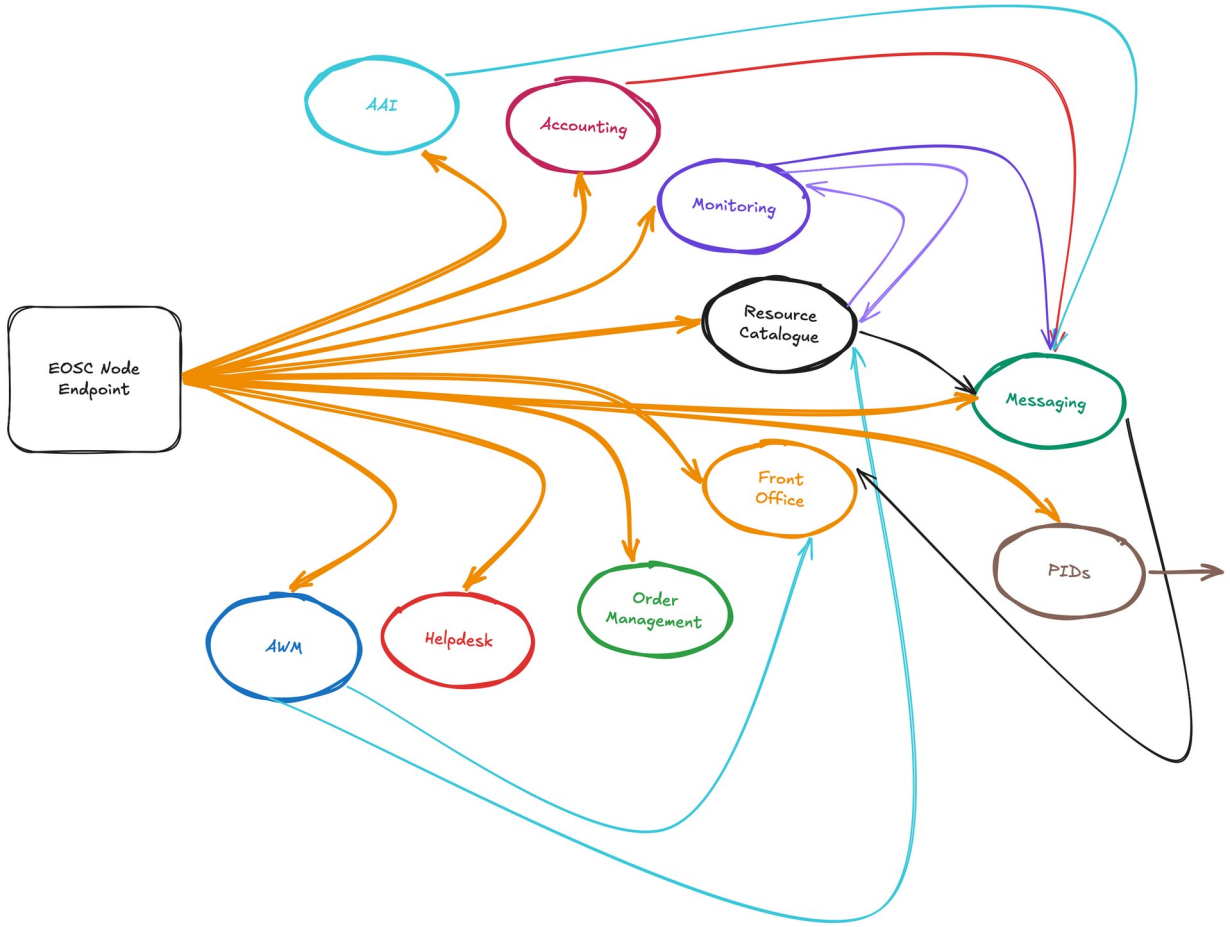


Diagram of components around an EOSC node, EOSC Beyond Workshop, Athens, 27th Feb 2026

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**)
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

EOSC Federation Handbook.

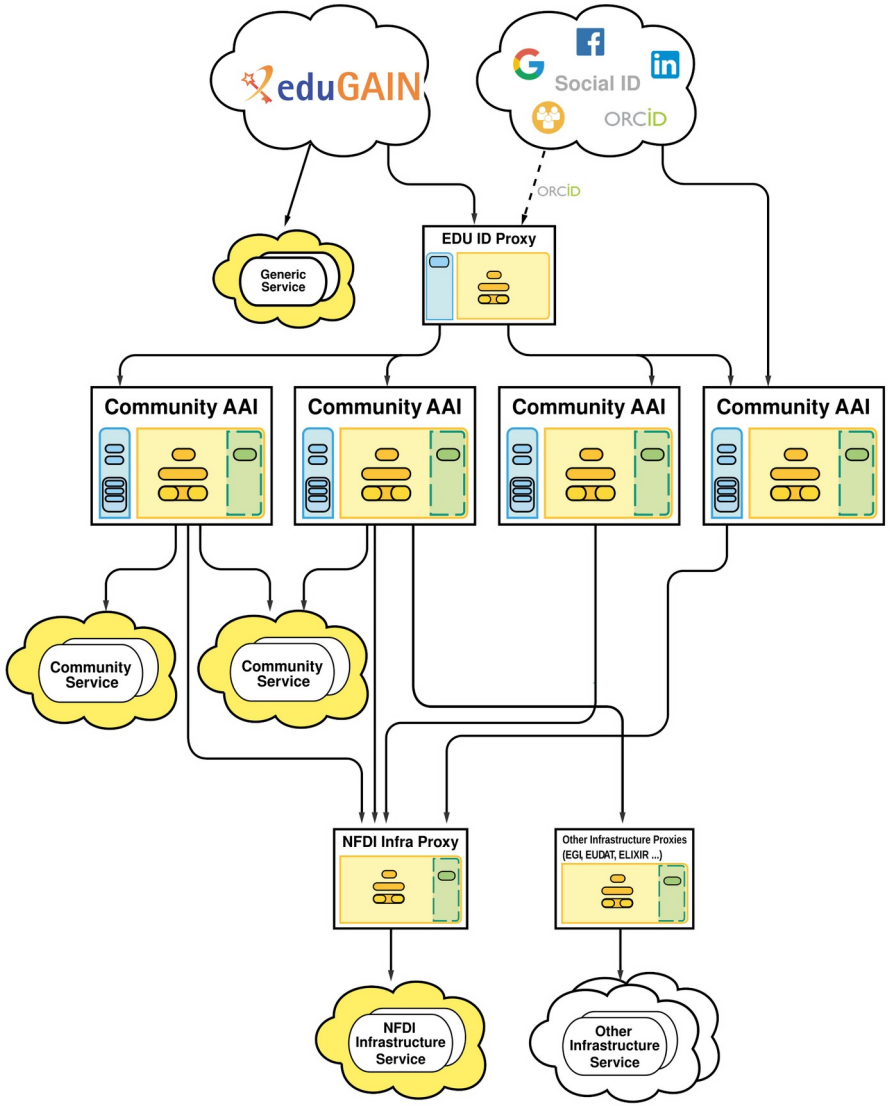
- Lists mandatory and recommended node capabilities (aka services, tools)
- „Reference manual" for the implentation of the EOSC federation and nodes.
- Governance, operational structure, federation and node architecture, research resources & joining the federation
- Editorial by EOSC Association management and their technical experts

- EOSC Federation Handbook v2.0: https://doi.org/10.5281/zenodo.18454649

AAI.

Authentication and Authorisation Infrastructure

- Every node ideally has their own AAI to be integrated with the overall EOSC AAI.
- AAI setup according to **AARC Blueprint Architecture** ensures seamless integration for community AAIs, infrastructure proxies & attribute authorities.
- Multiple **community AAIs** under a common umbrella become possible.
- **Transparency** for the users even if they change their affiliation during their work life.
- User identity mapping and account linking are the crucial functions to get access rights correctly everywhere (which attribute or link uniquely identifies a user everywhere?)

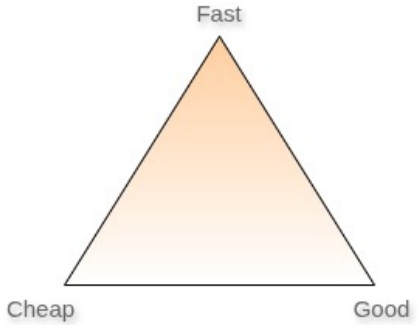


What is the service catalogue, ideally?

Available
Navigable
Intuitive
Informative
Interoperable
Maintainable
Visible
…

It should show the selection of services available to the user and a comprehensive description as well as possible requirements and limitations/quotas.

Information on ways to access a service is a must-have.

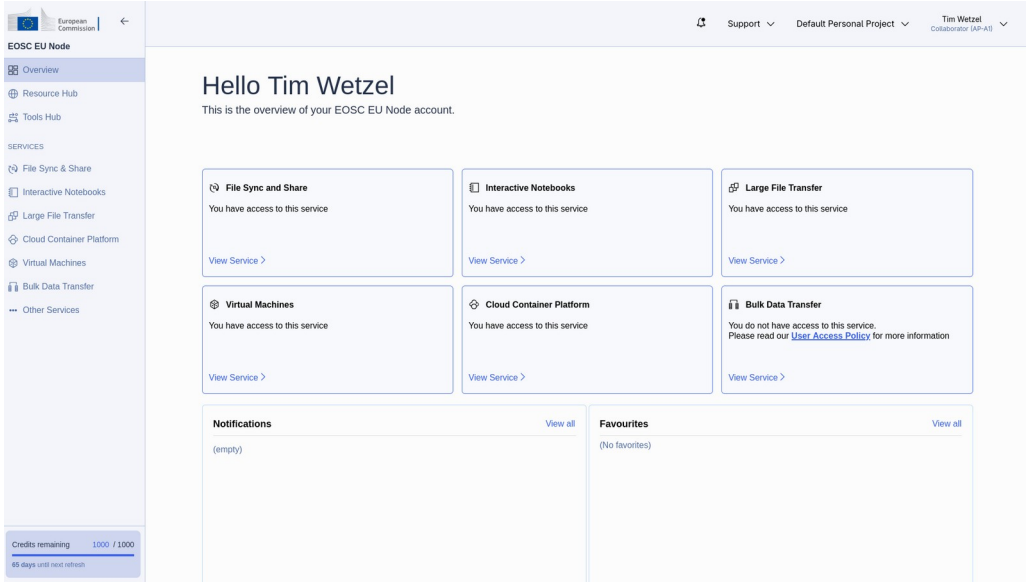


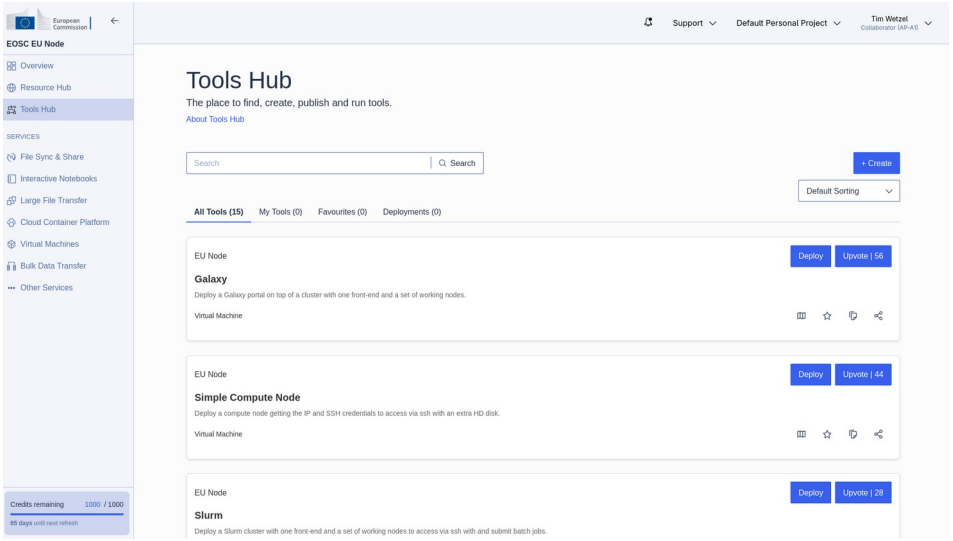
Triangle of quality
As always, we can put an emphasis on only two of the three attributes. It's our choice.

Visibility
The service catalogue needs to be visible to all users and service providers and unmistakeably be the first point of interaction.

Interoperability
It also needs to be interoperable with other nodes' catalogues in order to enable the full advantage of joining the EOSC federation

EOSC EU Node catalogue.

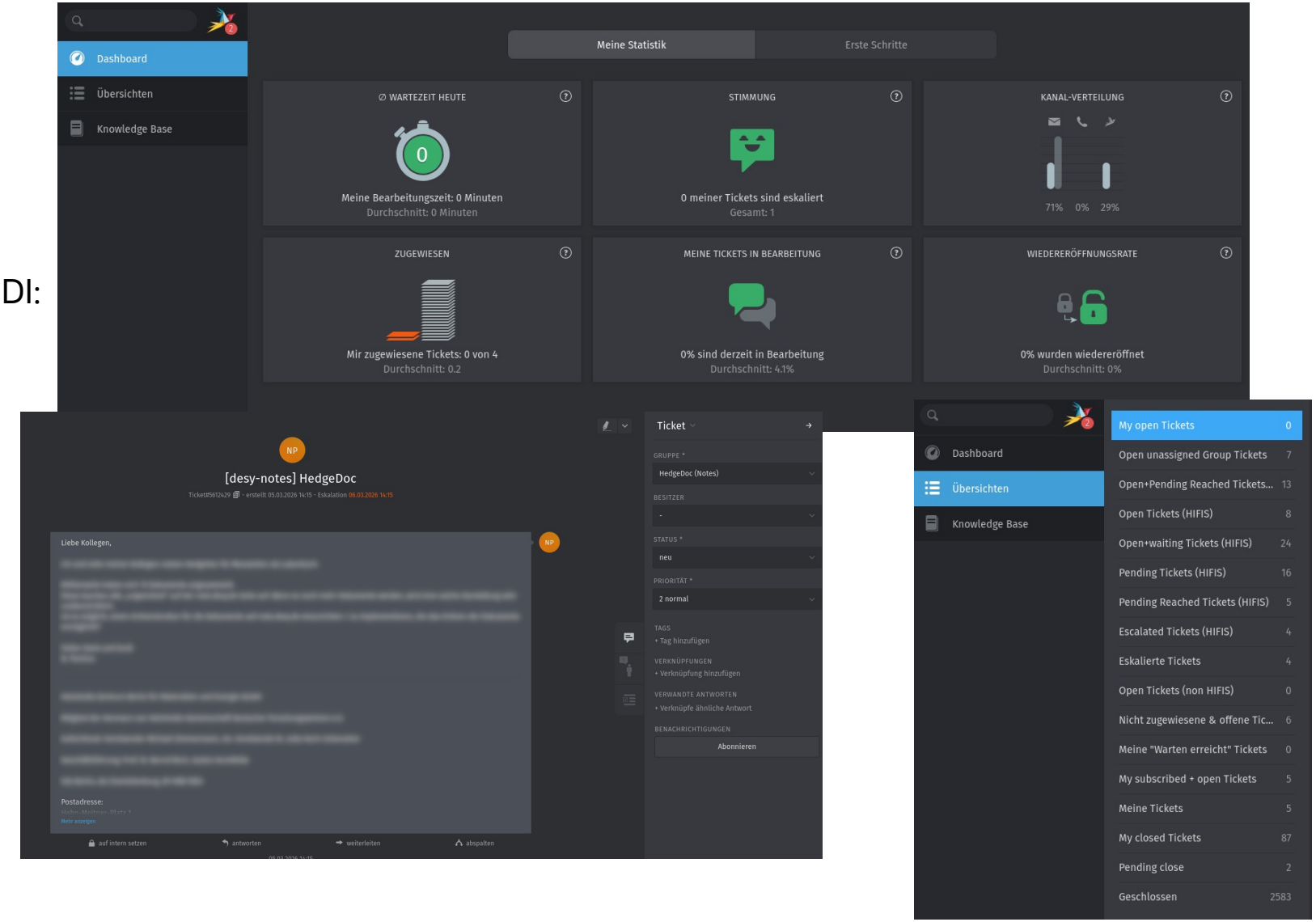




- Developed by *AthenaRC*, Greece for LOT-1 tender
- https://open-science-cloud.ec.europa.eu/
- Source code: https://github.com/EOSC-lot-1
- Licensed under Apache2.0
- Public releases packaged and available on github
- Written mostly in Java, includes build instructions and scripts
- *EOSC credit system* included

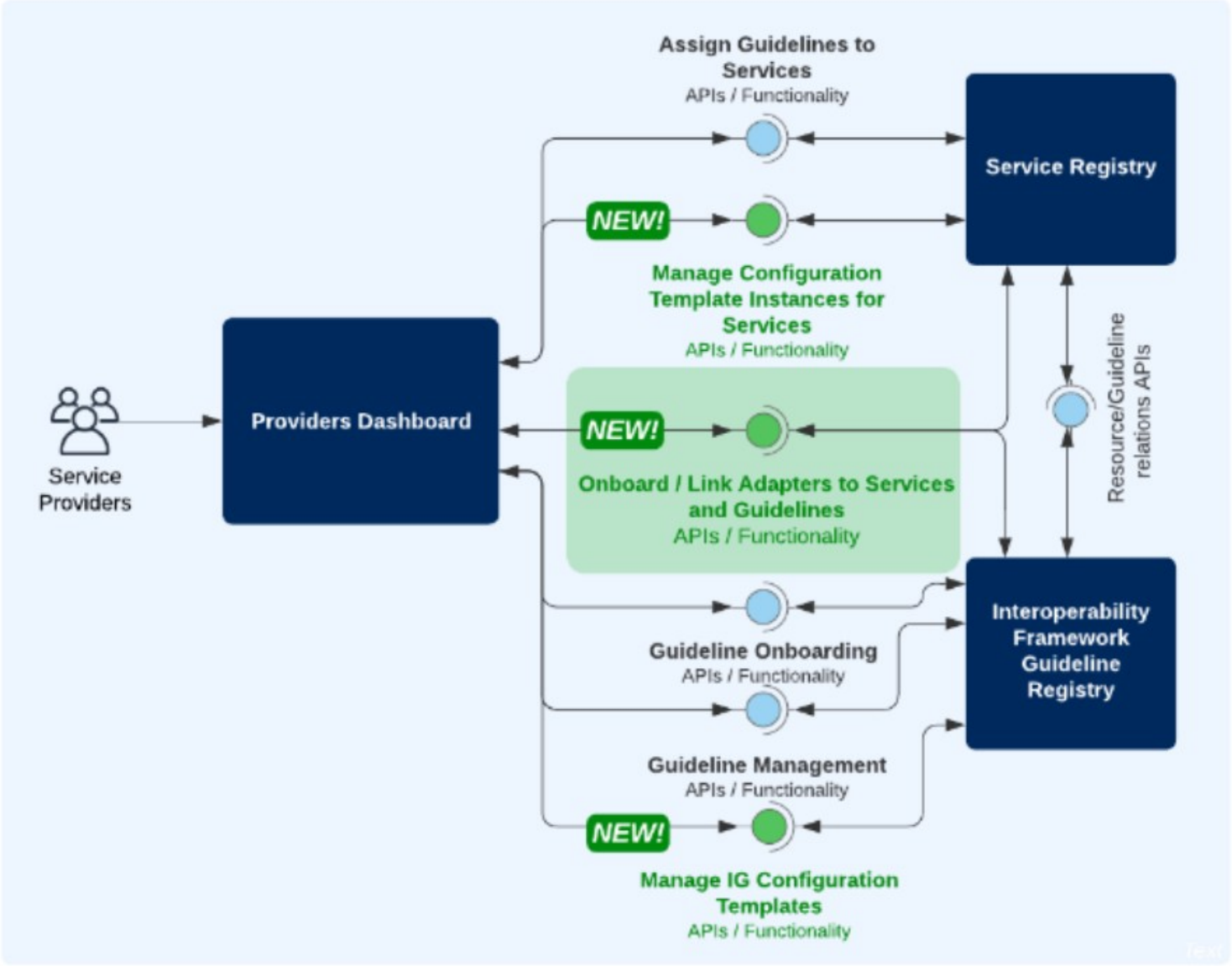
Helpdesk.

- Currently proposed solution for NFDI: Zammad
- Provided by KIT (P. Weber)
- Interoperable with other solutions (xGUS, …)
- Federated integration possible
- Communication by email and
- web interface
- Knowledge base, statistics, reminder, …

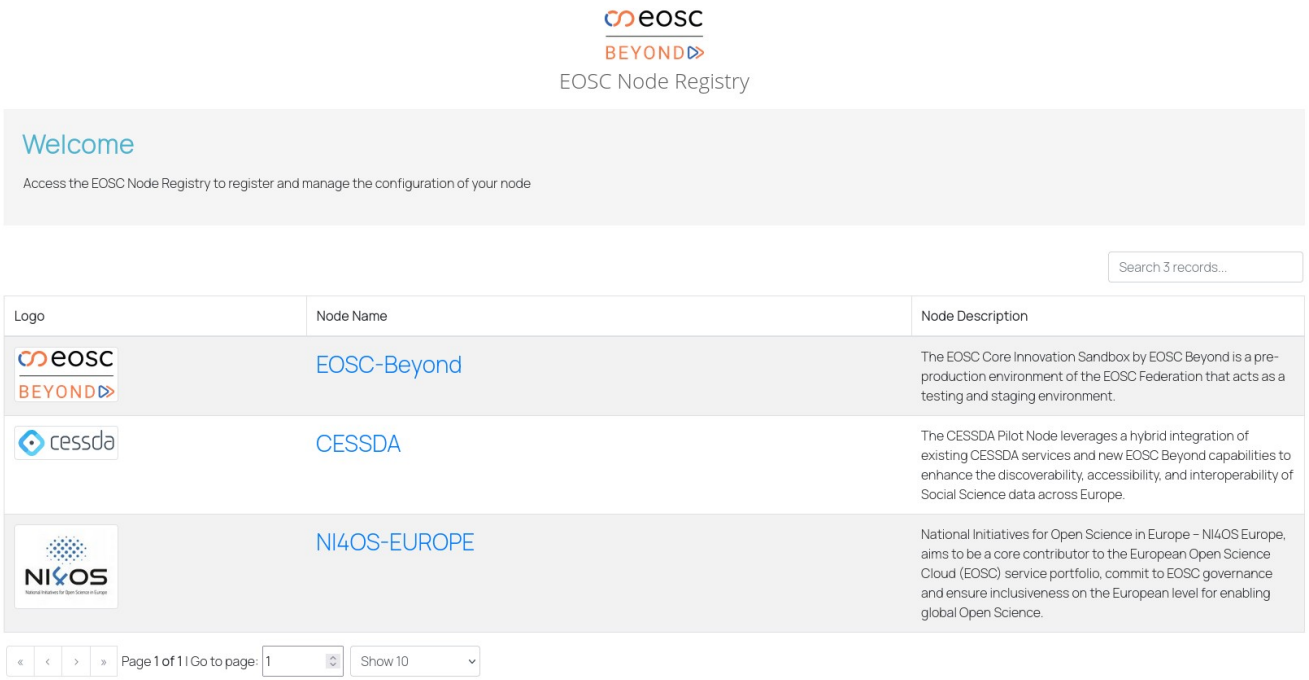


Interoperability aspects.

- EOSC Beyond Integration Suite
- Interoperability framework and guidelines
- Defining a common vocabulary and interfaces for services to work together
- Implemented in adapters (wrappers) for services and data sources to be interoperable
- Registration of adapters for their reusability across services and providers



Testing, testing, testing.



Pilot node tests upcoming in EOSC Beyond

- EOSC Beyond node registry as central record keeper of nodes' services and capabilities
- „EOSC-Beyond" listed there is a testing environment!
- Catalogues, users, monitoring services & (performance) testing applications can find the entry points to each node
- Registration with node endpoint and mirror of node catalogue necessary
- Automated, reusable & reliable way of assessing nodes fitness
- Registry as examplary development for current developments in EOSC?

Next steps.

- Service portfolio and FitSM
- Node governance & legal aspects
- Process definitions
- Service monitoring
- Service and research product accounting
- KPI definitions
- …

Thank you for listening.
Questions?

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