

POSITION PAPER

GÉANT and the NRENs have a long history in scalable, federated environments that can support the creation of EOSC Nodes

The GÉANT Association and Europe's National Research and Education Networks (NRENs) are fully supportive of a European Open Science Cloud (EOSC) that is centred on the research community, where EOSC Nodes place research and researchers at the centre of their mission. This helps them to work more efficiently and effectively, follow FAIR principles, and ensure research artefacts are easily available while observing full academic sovereignty of research data. For example, FAIR-enabled trustworthy repositories which act as a key part of the full data lifecycle.

GÉANT and the NRENs strongly encourage the creation of EOSC Nodes, however it is important to recognise that there is a lot of pre-existing work which needs to be considered, and therefore we would like to bring it into context. Specifically, we refer to the strong history in our community of building a scalable, yet federated environment that works seamlessly for the user.

Trust is an important part of the [GÉANT Association strategy](#) and has been identified as one of our core values as an Association. Our services use a variety of scalable technical and policy-based trust structures to ensure that our federated services are safe, secure, and appropriate for our users. We have a long history of using a federated trust model as built by the European and global NREN community. This model has grown and expanded over the years to meet new user needs, without ever compromising the trust that must exist when collaborative environments are to function and deliver results.

Therefore, based on the community driven principle, any decision process should include all operators of the nodes and be consensus driven.

The establishment of national nodes is likely to follow existing delivery models already in place or planned, which in some cases will result in hierarchical national models and in others a more 'loosely coupled' model. We propose that an EOSC Node should be loosely coupled to the EOSC EU node (rather than this serving as the Master Node), and independently governed by the users whilst adhering to the Rules of Participation.

Additionally, the decision process should follow the 'subsidiarity' of policy decisions and the established and successful example of eduGAIN. The maximum value gained in a federated architecture is the distribution of control through the federation. The decision making at Node level should be most beneficial for the community it serves. But the responsibility for the policies and enforcement of the policies of the core components and resources should be taken by the federator.

Guiding principles for EOSC Nodes

- **Community driven:** any decision process should include all operators of nodes and be consensus driven.
- **Existing channels:** EOSC Nodes should be able to follow natural existing channels for delivery of services for scientific processes, data, and metadata for both new and existing users. The establishment of national nodes should follow existing delivery models in place or planned, which will result in some cases in hierarchical national models and in others a more loosely coupled model.
- **Subsidiarity** of policy decision.
- **Build on the strength of scalability offered by a federated model:** a good example of success of this model is eduGAIN, which defines a thin layer of policies for all members to comply with and offers some central tools to support the exchange of metadata among all the parties. Fully operational since 2009, eduGAIN today comprises over 80 participant federations worldwide, connecting more than 8,000 Identity and Service Providers and helps nearly 27,000,000 students, researchers, and educators access online services, reducing complexity. Although not an easy exercise to accomplish, it has demonstrated the success of this model, and continues to evolve to suit user requirements.
- **Add value for the users:** a loosely coupled federation is the gateway to adding value for the community it serves. A federated (national/thematic) node would make it easier to 'connect' the outputs of researchers, including those that do not belong to well established research centres or clusters. Each node individually should add value, i.e., by connecting the researcher to specific resources such as services and research products (publications, datasets, metadata, and software).
- **Funding:** clear procedures and funding models for all nodes. Steps to support nodes to reach the baseline could be considered via a 'Node incubator' concept.

Why do we need EOSC Nodes and what is their mission/objective?

GÉANT and the NRENs believe that 'recognisable channels', i.e., existing and established channels deliver the support to the scientific process. EOSC Nodes should be able to take advantage of these. While it is important to deliver value, it is equally important to consider both scalability and interoperability as key elements of EOSC Nodes.

The value proposition of an EOSC Node (in addition to the natural 'nodes' already serving science) is access to the federation layer, interoperability, and FAIRness. The mission of the EOSC Node is to provide the researcher with services and components in a trusted and secure environment to do their work in a FAIR, open and trusted way. A national EOSC Node will provide researchers with resources etc. that are only available at a national level, however it may also provide internationally available or relevant thematic resources. This is also important for national funders

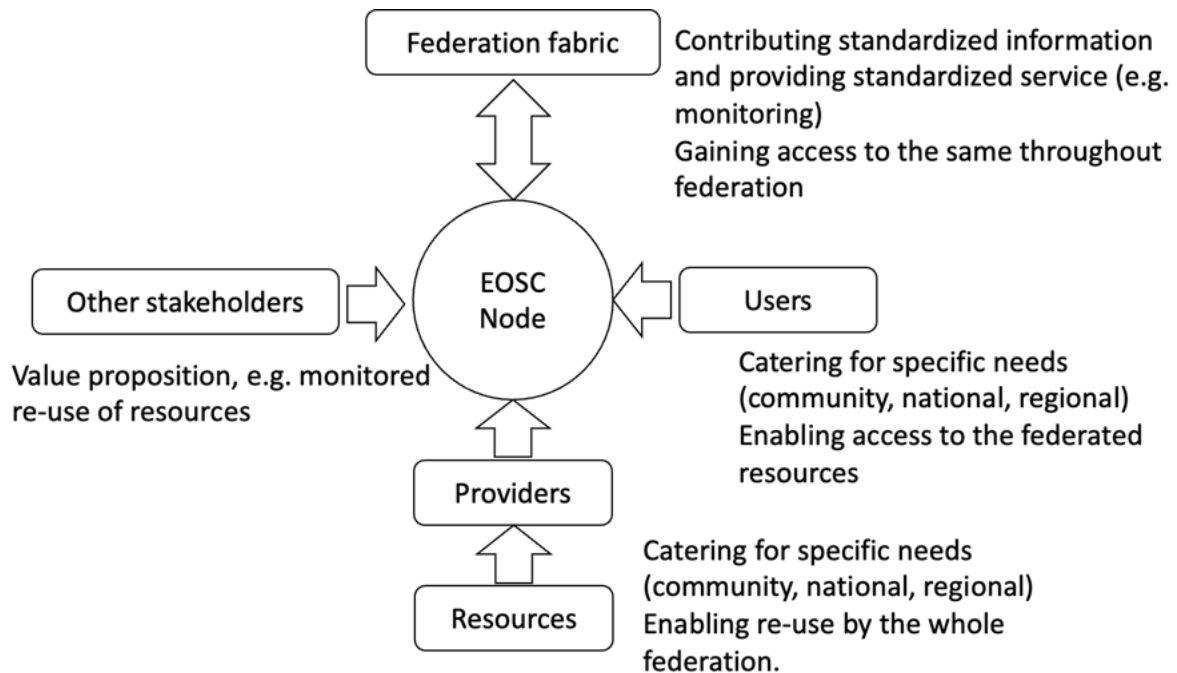
who need to be able to document uptake of the services, data, or other resources they provide.

EOSC Node objectives could be as follows:

- **Federation** of a set of providers, resources, and/or users:
 - This federation may be thematic, national, regional or by any other suitable criteria enabling the value proposition of a Node.
 - Standardisation of resources, research products, etc., to improve FAIRness.
 - Node may serve a particular set of users, based on the specific criteria, e.g., thematic, national, etc. that could not be catered for elsewhere.

- **The link to the federation fabric**, ensuring flow of resources within and across nodes above the research networks that add value to scientific use under clear rules and guidelines:
 - Node should contribute to the federation by supplying the necessary information about their resources to the federation layer in accordance with the standards adopted by the community. It may include information about services, monitoring, policies, etc.
 - Findability and access to the resources through their usual access point (node) that researchers currently cannot get.
 - Making it possible to find and access resources outside of your discipline, possibly from other nodes, to improve the options and output of research. The use of resources of other/multiple nodes by users, needs to be possible.
 - Standardisation of resources, research products etc. to improve FAIRness with PIDs of federated objects and services adhering to the EOSC PID Policy.
 - Nodes should represent their constituencies in the governance of the federation.

- **Value proposition**
 - Node should have a reason to exist and be THE gateway to add value for the community it serves - the federating layer to an existing resource or service. The federated EOSC (national/thematic) Node would make it easier to connect the researcher to specific resources such as services and research products (publications, datasets, metadata, and software).



Key Elements of EOSC Nodes

For each node, be it thematic, national, regional, or otherwise - there should be some key elements including:

- **Baseline:** a baseline should be defined to ensure that each node can have a minimum working set of features and supports a minimum set of policies. The baseline should identify what nodes should support to “enable the federation of existing and planned research infrastructures” (SRIA 4.5.1), other business objectives, and technical challenges. Technical specifications, standards, and community best practices are key to ensure that nodes can be seamlessly federated. Some of these aspects (such as EOSC Profiles, AAI, security, etc.) are covered by the EOSC Interoperability Framework and by the rule of participations. It is important to mandate compliance with protocols and standards, but to give freedom to each node on how to support them.
- **Governance:** a governance should include all the representatives of the nodes. Governance should also be defined to (i) manage the baseline and evolve that in an open and collaborative manner, and (ii) to define a process to add and remove EOSC Nodes.

Summary

In summary, it is the position of GÉANT and the NRENs that the EOSC Nodes should be loosely coupled to the EOSC EU node (rather than this serving as the Master Node), and independently governed by the users whilst adhering to the Rules of Participation. The GÉANT community forms a large proportion of mandated organisations of EOSC and has a strong history of successful federations, and as

such we believe we have an important role to play in the continuation of EOSC as a research community centred initiative and where EOSC Nodes place research and researchers at the centre of their mission.