A large, faint network diagram in the background, consisting of light blue lines connecting several light blue circular nodes.

D2.5a

Inventory of Core Functions and Inclusion Criteria

Version 1.0
November 2021 Year

D2.5a / Inventory of Core Functions and Inclusion Criteria

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Abstract

EOSC Future uses a model of the makeup of EOSC based on the Minimum Valuable EOSC view established by the former EOSC Working Groups, updated through subsequent experience and negotiation with the EC. This defines key capabilities needed to operate and sustain EOSC. EOSC Future populates one of these elements, the *EOSC-Exchange* through soliciting submission of EOSC Providers and Resources and onboarding them into a registry which is exposed through EOSC Portal. This onboarding follows a set of Inclusion Criteria which are based on high level EOSC Rules of Participation, which will be updated and made more specific next year.

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Glossary

EOSC Future project Glossary is incorporated by reference: <https://wiki.eoscfuture.eu/x/JOCK>

List of Abbreviations

Acronym	Definition
EAWG	EOSC Architecture Working Group
EIF	EOSC Interoperability Framework
EPOT	EOSC Portal Onboarding Team
EOSC	European Open Science Cloud
ESWG	EOSC Sustainability Working Group
FQDN	Fully Qualified Domain Names
GA	General Assembly
MVE	Minimum Viable/Valuable EOSC
RI	Research Infrastructure
RoP	Rules of Participation
SOB	Strategy and Oversight Board
TCB	Technical Coordination Board (TCB)
TF RoP-CM	EOSC Association Task Force on Rules of Participation & Compliance Monitoring
WG-RoP	Working Group on Rules of Participation

1 Executive Summary

The makeup of the European Open Science Cloud (EOSC) has developed over time through multiple projects, including plans in EOSC Pilot, Implementation in EOSC-hub and EOSC Enhance, and work on regional and thematic EOSC cluster projects. However, it had not converged on a view developed and supported through the EOSC Working Group on Sustainability and EOSC Architecture Working Group. EOSC Future builds on this vision, and presents EOSC in four areas of activity:

- ***EOSC-Core*** is the set of internal services which allow EOSC to operate. It includes a Core technical platform (i.e. *Core platform*) and non-technical coordination functions (i.e. *Core coordination*) which operate and facilitate the technical platform, such as the onboarding and security coordination.
- ***EOSC-Exchange*** is the set of federation services and other resources registered into the EOSC by Research Infrastructures and Science Clusters to serve the needs of research communities and will widen its offering to the public and private sector.
- ***EOSC Interoperability Framework (EIF)*** provides a flexible framework of standards and guidelines to support the interoperability and composability of resources in the *EOSC-Core* and *EOSC-Exchange*. The *EIF* will act as the glue to connect services and research products (e.g. publications, datasets, software) across resources and providers.
- ***EOSC Support activities*** sit alongside the *EOSC-Core* and *EOSC-Exchange*, and comprise the training, engagement, and other human-centric activities which make EOSC more attractive and easier to use, and help users benefit from it more easily once engaged.

Within these sections, EOSC Future defines a set of capabilities which must be delivered to make EOSC effective and support the European Research Area. These are mapped to activities in the project, and are areas which will need some level of ongoing support from national and European authorities in the long term.

One specific area of work is to populate the EOSC Exchange by onboarding EOSC Providers and Resources, through soliciting such information from community members, then assessing these submissions for their provided information and appropriateness for inclusion in EOSC. These involve implementing EOSC inclusion criteria. These are currently based on the published high level EOSC Rules of Participation (RoP), but will be further developed and revised once updated RoP from the new EOSC Association Task Force on Rules of Participation and Compliance Monitoring delivers new results in 2022.

2 Introduction

During the previous EOSC Governance organisational phase the EOSC Sustainability Working Group (ESWG) and EOSC Architecture Working Groups (EAWG) provided definitions for the EOSC-Core, EOSC-Exchange, EOSC-Federation and the Minimum Viable EOSC (MVE). The EAWG report *EOSC Architecture Working Group View on the Minimum Viable EOSC*¹, published in February 2021, describes the first iteration of the capabilities of the *EOSC-Core*. In parallel, the EOSC Rules of Participation (RoP) WG defined the initial rules for EOSC participants. Via projects such as EOSC-hub², eInfraCentral³, OpenAIRE-Advance⁴ and EOSC-Enhance⁵, the EOSC Portal Resource Catalogue has been established, which has been in operation since November 2018. To allow the onboarding of resource providers and resources into the EOSC Portal Resource Catalogue (The EOSC Marketplace⁶), a set of practical inclusion criteria has been developed by EOSC-hub and is being maintained by the EOSC Portal Onboarding Team (EPOT) - a collaboration between multiple projects involved in EOSC Portal, currently EOSC Future and EOSC Enhance.

One of the main objectives of the EOSC Future project is to *deliver and to operate the EOSC-Core* and to *expand the EOSC-Exchange with resources across disciplines*. The definition of the *EOSC-Core* capabilities and inclusion criteria are instrumental to achieve these objectives. In this deliverable, EOSC Future proposes an updated set of capabilities and for the *EOSC-Core*, which includes some changes and additions to the capabilities proposed by the EAWG, based on the EOSC Future work plan and discussions between the Science Clusters and e-Infrastructure providers in EOSC Future (section 3). The deliverable also provides an overview of the inclusion criteria, how these relate to the rules defined by the EOSC Working Group on Rules of Participation (WG-RoP) and an agreement structure to apply these across the various catalogues in the EOSC landscape (section 4).

¹ <https://op.europa.eu/s/uVYU>

² <https://cordis.europa.eu/project/id/777536>

³ <https://cordis.europa.eu/project/id/731049>

⁴ <https://cordis.europa.eu/project/id/777541>

⁵ <https://cordis.europa.eu/project/id/871160>

⁶ <https://marketplace.eosc-portal.eu/>

3 EOSC capabilities

This section seeks to explain the historical, current and planned capabilities for EOSC Platform, and the current view of them from EOSC Future. Please note that this document generally discusses *capabilities of components*⁷ and not the specific implementation of these capabilities through a technical service.

Within EOSC Future, we are going to deliver a set of services to fulfil these capabilities. The resource provider-facing components are being developed by WP4 *Design and Development of Portal Supply Layer*, while the user-facing components are being developed in WP5 *Design and Development of Portal Demand Layer*, and WP7 *EOSC Service Delivery and Planning* will bring and operate these services in production. This deliverable, partly as it is to be used as input to consideration of future funding of EOSC, will stick to discussion of capabilities rather than specific services, though it will link the capabilities to tasks within the project.

This document will be updated in D2.5b, later in the project. The final version will extend first to consider the 'business case' or justification for each capability, and then a comparison with the services offered by EOSC Future. It will also look at the progress made by EOSC Future since the project launch, and comment on the intended state of the capability when EOSC Future concludes.

3.1 Development of EOSC capabilities

EOSC, began as an idea to move towards a more united ecosystem for IT in research across Europe, bridging provider communities and increasing cohesion within and between scientific and research communities. This launched a project series including the EOSC Pilot⁸ project to make initial EOSC Plans, and the EOSC-hub⁹ project to begin initial large-scale implementation including creating EOSC Portal and listing services there. EOSC-hub developed the initial 'Federating Core' of internal services in order to operate, support and implement EOSC. Most were based on similar tools in use within the federations brought together in EOSC-hub: EGI¹⁰, EUDAT¹¹ and Indigo Datacloud¹². Later work in EOSC Enhance brought in partners from eInfraCentral and OpenAIRE Advance. All are federations themselves and had their own internal services which were repurposed, expanded and integrated to provide similar services for EOSC. The selection of needed services was therefore based on what these communities needed previously and amended based on experience throughout the project. Prior to EOSC Future, many discussions on the needed content of EOSC occurred in different communities and projects, but there was no broad agreement on what internal capabilities EOSC required as a minimum. At the same time there was community consensus that for researcher facing services it was up to 'the market' i.e. the researchers to decide which services or other resources were needed.

3.2 EOSC Working Groups and the Minimum Viable EOSC

The EOSC Executive Board of the previous EOSC Governance system established six working groups on aspects of EOSC¹³ (i.e. Landscape, FAIR, Architecture, Rules of Participation, Skills and Training and Sustainability) established under the EOSC Executive Board. The discussion of a 'Minimum Viable EOSC' (MVE) has been an active topic in the Sustainability and Architecture WGs. The main focus of the Sustainability WG was to provide a set of recommendations concerning the implementation of an operational, scalable and sustainable EOSC federation after 2020, focusing on examining suitable business models for EOSC, governance structure and legal entity. The focus of the Architecture WG was to propose a technical framework to enable and sustain an evolving federation of systems.

⁷ 'Capabilities' are the desired abilities that the components of the EOSC Platform should provide while 'functions' are the technical realisation of the capabilities to operate and exploit the EOSC Platform (noting that a capability can be realised by multiple functions)

⁸ <https://cordis.europa.eu/project/id/739563>

⁹ <https://cordis.europa.eu/project/id/777536>

¹⁰ <https://www.egi.eu/>

¹¹ <https://eudat.eu/>

¹² <https://cordis.europa.eu/project/id/653549>

¹³ <https://www.eoscsecretariat.eu/eosc-working-groups>

Via a broad and open consultation process and via different iterations, the Sustainability WG developed the report on *Solutions for a Sustainable EOSC*¹⁴ (i.e. the 'FAIR Lady' report). In the FAIR Lady report, the ESWG proposes a first iteration of the MVE and first definition of the *EOSC-Core* components as a set of frameworks, services for PIDs, operational support, security policies and procedures and a web portal with supply and demand facing services to offer and access EOSC resources.

On the basis of the FAIR Lady report, and earlier work done in EOSC-hub on describing the community's view on the EOSC Federated Core¹⁵ and the EOSC-hub & OpenAIRE position paper¹⁶ on the vision and contributions to EOSC, the EAWG developed the *EAWG View on the Minimum Viable EOSC*¹⁷ which includes:

- definitions on the MVE, *EOSC-Core*, *EOSC-Exchange* and EOSC Federation,
- architecture diagram of EOSC, identifying the demand and supply side of the EOSC Platform, EOSC functional overview and the Interoperability Framework, and
- table with proposed functions of the *EOSC-Core* and MVE.

The EAWG defined the *EOSC-Core*, *EOSC-Exchange*, EOSC Federation and the MVE as follows:

- ***EOSC-Core***: the set of enabling services required to operate the EOSC;
- ***EOSC-Exchange***: the set of services registered to the EOSC by RIs and clusters to serve the needs of research communities and widening the resource offering through EOSC to the general public and private sector;
- ***EOSC Federation***: the set of scientific services provided by RIs and Clusters to the respective communities¹⁸.

The **Minimum Viable EOSC** is intended as a dynamic set of EOSC resources¹⁹:

- The subset of EOSC resources necessary for forming the added-value and opportunities considered essential to be provided by the EOSC at a given moment in time, i.e., to allow essential services and research products (e.g., publications, datasets, software) to be discovered, composed, accessed and analysed via the EOSC, which could not be otherwise;
- The subset of *EOSC-Core* components/services required to operate and deliver such resources.

The relationship between *the EOSC-Core*, *EOSC-Exchange*, EOSC-Federation and the MVE as a subset of the EOSC resources is depicted in Figure 3.1. Publication, Data, Software and Services are used as exemplar resources made available through EOSC bridging across the different layers.

¹⁴ <https://dx.doi.org/10.2777/870770>

¹⁵ <https://www.eosc-hub.eu/sites/default/files/EOSC%20Federating%20Core%20Community%20Position%20Paper%20v1.1.pdf>

¹⁶ <https://zenodo.org/record/3475076>

¹⁷ <https://dx.doi.org/10.2777/492370>

¹⁸ It is assumed that RIs and the Cluster communities do not make all resources available through EOSC, only those research products and services that are of interest to the broader research community to support cross-disciplinary research.

¹⁹ The EAWG regards the MVE as something which will evolve over time: the first iteration of the MVE focuses, as the ESWG says, on the initial implementation of EOSC that brings value to users beyond their current use of the infrastructures. In future however, a more extensive definition of MVE may apply to meet the requirements of the particular scientific challenges at that time.

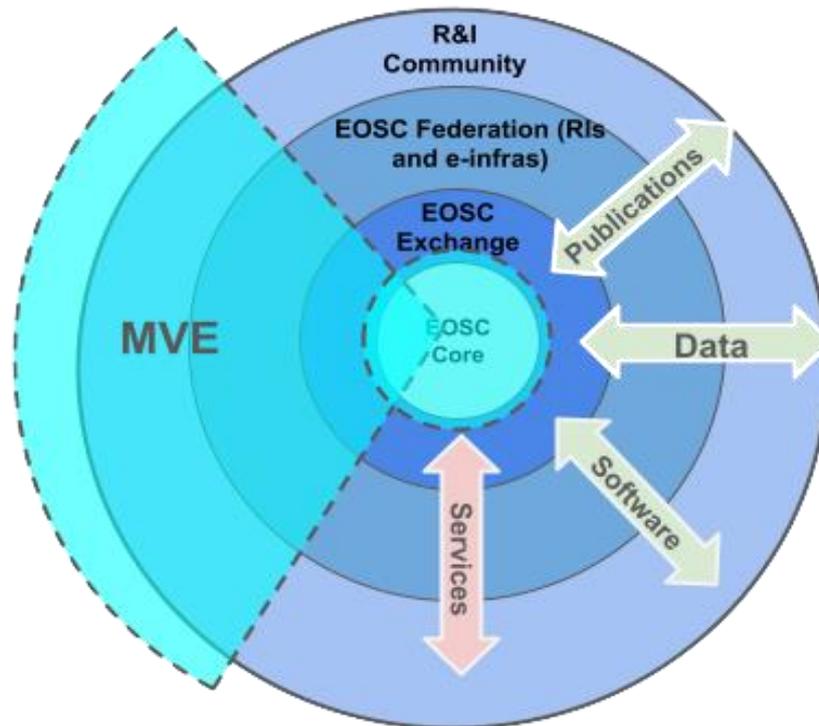


Figure 3.1: High-level diagram of the EOSC depicting the relationship between elements

In section 3.3 the EOSC Future interpretation and development of the EOSC high-level architecture diagram will be explained. Section 3.4 provides an overview of the EOSC Future proposed update of the EOSC MVE capabilities and in section 3.5 the proposed adjustments and additions are explained.

3.3 EOSC Future proposed Architecture

On basis of the high-level architecture diagram developed by the EAWG, EOSC Future has developed an expanded adaptation of this diagram, shown in Figure 3.2. The EOSC Future high-level architecture diagram has been developed to also show the relationship between the thematic and regional platforms developed by the ESFRI clusters^{20,21} and the regional coordinating initiatives^{22,23}, the horizontal services provisioned through Virtual Access via the projects²⁴ granted via the INFRAEOSC-07-2020²⁵ call and the EOSC supporting activities.

²⁰ <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/infraeosc-04-2018>

²¹ https://cordis.europa.eu/programme/id/H2020_INFRAEOSC-04-2018

²² <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/infraeosc-05-2018-2019>

²³ https://cordis.europa.eu/programme/id/H2020_INFRAEOSC-05-2018-2019

²⁴ https://cordis.europa.eu/programme/id/H2020_INFRAEOSC-07-2020

²⁵ <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/infraeosc-07-2020>

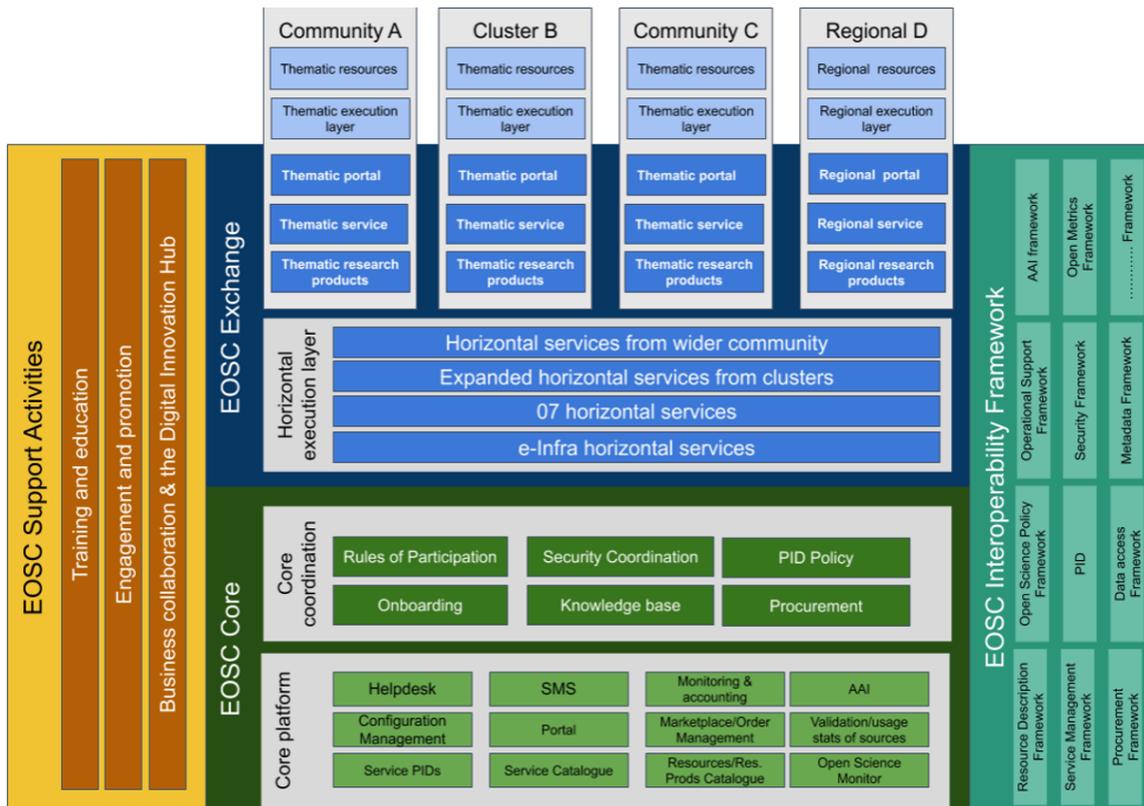


Figure 3.2: EOSC Future High-level Architecture diagram

This high-level architecture for EOSC comprises the following elements:

- **EOSC-Core** is the set of internal services which allow EOSC to operate. It includes a Core technical platform (i.e. *Core platform*) which facilitates EOSC operations in which the researcher-facing resources in the *EOSC-Exchange* can be integrated as appropriate. It also includes non-technical coordination functions (i.e. *Core coordination*) which operate and facilitate the technical platform, such as the onboarding and security coordination.
- **EOSC-Exchange** is the set of federation services and other resources registered into the EOSC by Research Infrastructures and Science Clusters to serve the needs of research communities and will widen its offering to the public and private sector. Generic services and resources which target heterogeneous scientific domains and research communities are identified as *Horizontal Services*. Resources which target users from a specific science, community and/or regional domain are identified as *Thematic and/or Regional Resources*. The capability to compose, meaning the ability to combine research products and services, across horizontal and thematic and/or regional resources in compliance with the EOSC Interoperability Framework is defined as the *Execution Framework*. While it is expected that the majority of the horizontal services (e.g. compute, storage, data, network and scholarly communication services) are provided by the e-Infrastructures (e.g. EGI, EUDAT, OpenAIRE, GEANT), also generic services and resources offered by the Science Cluster communities will be offered as a horizontal service.
- **EOSC Interoperability Framework (EIF)** provides a flexible framework of standards and guidelines to support the interoperability and composability of resources in the *EOSC-Core* and *EOSC-Exchange*. The EIF will act as the glue to connect services and research products (e.g. publications, datasets, software) across resources and providers. The EIF is defined as a *Reference Architecture Framework* which offers the freedom to providers to develop and operate provider-specific implementations while conforming to the EIF guidelines and standards.
- **EOSC Support activities** sit alongside the *EOSC-Core* and *EOSC-Exchange*, and comprise the training, engagement, and other human-centric activities which make EOSC more attractive and easier to use, and help users benefit from it more easily once engaged.

- **Science Clusters and Communities** will be embedded in EOSC through the work of *EOSC Future*, but will continue to work outside of EOSC to serve their specific communities and researchers. These include the Science Clusters (from the INFRAEOSC-04 call) the Regional Initiatives (from the INFRAEOSC-05 call) as well as national communities, other research communities and less organised groups from the long tail of science. They will bring a rich set of resources to EOSC but will also have resources and other elements outside EOSC which are targeted only to their own communities, including richer ontologies and domain-specific information and support.

In section 3.4 an overview is provided of the EOSC MVE Capability Map describing the *EOSC-Core* (i.e. Core platform and coordination) and components of the *EOSC-Exchange*, EOSC Support Activities and EOSC Interoperability Framework to be included in the MVE.

3.4 The Capability Map

On the basis of the high-level architecture diagram, this section is organised around 5 tables identifying the EOSC Future proposed capabilities organised according to the architecture components: *EOSC-Core* platform, *EOSC-Core* coordination, EOSC Interoperability Framework, EOSC Support activities and *EOSC-Exchange*.

The information in the tables are organised around 6 columns:

1. *Proposed revised function name*: At time of proposal writing and after discussions in the first 6 months of EOSC Future, the capability names are defined more precisely. Therefore it is proposed to revise the capability name to be consistent within EOSC and across EOSC Future deliverables;
2. *Discussed by EAWG*: Yes/No, indicates whether the capability has been discussed by the EAWG or not;
3. *EAWG proposed part of the MVE*: Yes/No/NA, indicates whether the proposed capability is part of the MVE, not part of the MVE, or the capability has not been discussed by the EAWG;
4. *Proposed for EOSC MVE by EOSC Future*: Yes/No, Indicates deviations between the proposed decision by the EAWG and EOSC Future, deviations are explained in section 3.5;
5. *Current status in EOSC Future in M6*: Indicates the development stage:
 - *Not yet developed*: development has not yet started on the capability.
 - *In development*: development on the capability has started but no production service is available.
 - *Initial version delivered*: development has started and an initial version of the production service is available.
6. *Expected capabilities*: A short description describing the capability.

Additional information for these entries is found in Appendix A – Additional information to EOSC platform capabilities.

Table 3-1: Proposed EOSC-Core platform capabilities to be included in the MVE

Proposed revised capability name	Discussed by EAWG	EAWG proposed part of MVE	Proposed for EOSC MVE by EOSC Future	Current Status in EOSC Future in M6	Expected capabilities
PIDs for EOSC Services	Yes	Yes	Yes	Not yet developed	Provide a method to uniquely identify services in <i>EOSC-Exchange</i> , and avoid duplication of services despite multiple entry points through which services can be onboarded (directly to <i>EOSC-Exchange</i> , via regional or thematic catalogues). This is a service for providers to mint PIDs for their services or for catalogue owners to generate and mint PID for services onboarded within EOSC approved catalogues.

EOSC Resource registry and catalogues: Services	Yes	Yes	Yes	Initial version delivered	<p>The EOSC Service catalogues are a part of the overall EOSC Resource registry and catalogue ecosystem. A database of records, for providers, services and external catalogues, compatible with the EOSC Profiles specifications. Accessible via the Web from the Provider Portal, or the EOSC Provider Portal APIs to deposit or update provider and service records. It is a content provider to the Marketplace, Resource Registry or other connected catalogues (e.g. thematic and regional catalogues) and is exposed to researchers, research communities and 3rd catalogues. The EOSC Service catalogue will incorporate an AI-based recommendation. The AI-based recommendation system allows advanced discovery capabilities for the EOSC resource catalogues and connected catalogue, drawing on both the EOSC resource catalogues and also on research products through the OpenAIRE Research Graph.</p>
Data sources in EOSC Resource registry and catalogue as a subtype of services within the EOSC Profiles.	Yes	Yes	Yes	In development	<p>Data sources are specific EOSC services, providing deposition, preservation, and discovery functionality for research products. The EOSC Registry data model (the EOSC Profiles) will be extended with additional metadata needed for data sources (EOSC Registry, Provider Portal, Marketplace, API support). Hence this will likely be combined with 'EOSC Resource registry and catalogue: Services' in a future version of this list.</p>
EOSC Resource registry and catalogues : Research Products	Yes	Yes	Yes	In development	<p>The EOSC Research Product catalogues are a part of the overall EOSC Resource registry and catalogue ecosystem. The EOSC Research Product catalogue collects and interlinks EOSC research products (publications, data, software, etc.) and EOSC services with authors, communities, organizations, services, funders, and projects. The EOSC Research Product catalogue supports the onboarding (and validation) of EOSC research product profiles (collected from EOSC data sources) and of EOSC service profiles (collected from the EOSC Service registry). It also supports discovery and navigation of EOSC resources, as well as statistics.</p> <p>The EOSC research product catalogue will incorporate an AI-based recommendation. The AI-based recommendation system allows advanced discovery capabilities for the EOSC resource catalogues and connected catalogue, drawing on both the EOSC resource catalogues and also on research products through the OpenAIRE Research Graph.</p>

EOSC Order management system	Yes	No	Yes	Initial version delivered	System to manage orders for services made through the central EOSC catalogue (Directly from researcher-facing portal or potentially passed from other catalogues which display services pulled from central catalogue). Collect customer/user requests with relevant data, pass to providers via API, email or other means. Support collection of order metrics.
EOSC AAI Federation	Yes	Yes	Yes	In development	Providing a distributed federated AAI infrastructure which allows for sharing of login and access to services and data across EOSC.
Connecting EOSC-Core components to the EOSC AAI Federation	Yes	Yes	Yes	Initial version delivered	Provides shared login capabilities to <i>EOSC-Core</i> services. Providing a connector for the <i>EOSC-Core</i> Platform services to the EOSC AAI Federation.
EOSC-Core helpdesk	Yes	Yes	Yes	Initial version delivered	Helpdesk platform and support units to support incidents and service requests for the <i>EOSC-Core</i> platform services.
EOSC Collaboration systems	Yes	Yes	Yes	Initial version delivered	Internal tools needed to coordinate <i>EOSC-Core</i> and Exchange operations. These likely include collaborative information management (e.g. a Wiki, document db), task and issue tracking (a ticketing system), and communication management (email, chat, mailing list, video conferencing). While individual organisations may have these capabilities, they will be needed at a larger scale to support <i>EOSC-Core</i> and Exchange operations.
EOSC Monitoring	Yes	Yes	Yes	Initial version delivered	The ability to check the status, availability and reliability of EOSC service resources, both in the Core and in the Exchange. Supports the ability to monitor and observe EOSC resource availability as a measure of resource quality. Basic monitoring based on service endpoint or web page accessibility. Advanced monitoring based on special probes developed as part of integration with the resource. Requires configuration management capabilities. Requires Messaging Service capabilities
EOSC Accounting	Yes	Yes	Yes	In development	The ability to track and record usage of EOSC resources, i.e. research products and services, both in the Core and in the Exchange. Core service usage to show the uptake of Core services. Exchange service accounting is based on integration with thematic services and the Accounting service, to record service usage and show impact to funders. EOSC research product usage based on aggregation of usage events collected, according to the COUNTER data usage metrics, from EOSC data sources. Requires configuration management capabilities.

					Requires Messaging Service capabilities
EOSC Configuration Management System	Yes	Yes	Yes	Initial version delivered	<p>A shared store of information on which other <i>EOSC-Core</i> services depend and use (such as Monitoring, Accounting Helpdesk etc).</p> <p>Lists resources, resource components and configuration items which must be controlled (including data about them and changes to them) to effectively deliver EOSC at a federation level.</p>

Table 3-2: Proposed EOSC-Core coordination capabilities to be included in the MVE

Proposed revised capability name	Discussed by EAWG	EAWG proposed part of MVE	Proposed for EOSC MVE by EOSC Future	Current Status in EOSC Future in M6	Expected capabilities
PID Policy Compliance Assessment Framework	Yes	Yes	Yes	Initial version delivered	A flexible compliance assessment framework to verify and measure PID service providers and PID minting organisations and services with the EOSC PID Policy.
EOSC Security Coordination	Yes	Yes	Yes	Initial version delivered	Provide community security coordination. Ensure coordination and investigation of security incidents in <i>EOSC-Core</i> platforms and coordinate security incident response activities between the Core and Exchange providers. Provide guidelines for security risk assessment for providers in the Exchange, manage the security baseline for the EOSC AAI proxy and the EOSC AAI Federation, and provide policy guidelines for security, usage and data supporting secure usage of EOSC resources and exchange of data.
EOSC Service Management System	Yes	Yes	Yes	Initial version delivered	Service management System that allows services and operational roles in delivering core services and supporting external services to be delivered. Includes a set of roles, responsibilities, procedures, policies and other documentation and tooling to support management of services.

Table 3-3: Proposed EOSC Interoperability Framework capabilities to be included in the MVE

Proposed revised capability name	Discussed by EAWG	EAWG proposed part of MVE	Proposed for EOSC MVE by EOSC Future	Current Status in EOSC Future in M6	Expected capabilities
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EOSC Interoperability Framework management	Yes	Yes	Yes	In development	<p>A structure to manage, update, circulate and promote the EOSC Interoperability Frameworks, which are created through the projects and task forces to support and enable interoperability within EOSC. Interoperability includes technical, policy, process and administrative interoperability.</p> <p>IF areas include:</p> <ul style="list-style-type: none"> - Resource Description Framework - Open Science Policy Framework - Operational Support Framework - AAI Framework - Service Management Framework - PID Framework - Security Framework - Open Metric Framework- Procurement Framework - Data Access Framework - Metadata Framework - Helpdesk Integration Framework - Other frameworks (TBD)
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Table 3-4: Proposed EOSC Support activities to be included in the MVE

Proposed revised capability name	Discussed by EAWG	EAWG proposed part of MVE	Proposed for EOSC MVE by EOSC Future	Current Status in EOSC Future in M6	Expected capabilities
EOSC Web presence	Yes	Yes	Yes	Initial version delivered	The EOSC web presence should provide basic information on EOSC, its elements (such as the Core, Exchange, Supporting activities and EIF), its governance, and the opportunities to participate in it. This information may be split across multiple sites (e.g. eoscfuture.eu and eoscfuture.eu) but they should be linked.
EOSC-Core Support	Yes	Yes	Yes	In development	Support for use of or integration with <i>EOSC-Core</i> resources, including training and specialist consultancy. Needed to support researchers to use <i>EOSC-Core</i> elements (e.g. using EOSC AAI to access a thematic service) or by providers (e.g. a Thematic provider using EOSC Accounting to show usage for Virtual Access repayment).
EOSC Open Science support	Yes	Yes	Yes	In development	Support for researchers and providers to better embed open science practices and services in their work. Provide support and alignment to national, regional and thematic to ensure a unified approach in data stewardship/legal and ethical knowledge of using the EIF to better understand how to publish and use data and services. Build the EOSC knowledge Hub that will allow trainers and all relevant actors to share and discover related information (courses, support material, tutorials, etc.)
EOSC Open Science Help Desk and	Yes	Yes	Yes	In development	A decentralized and coordinated Helpdesk to support service and content providers to share their resources in EOSC, and to help researchers in finding support from the most

Collaborative tools					relevant source (ideally closer to them geographically and/or thematically).
EOSC Open Science metrics	Yes	Yes	Yes	Initial version delivered	Access to first level statistics regarding Open Science, such as production of open/FAIR artifacts, FAIRness and openness indicators of research data and research software by organization, provider, data source, country, community, funder, funding stream, project, etc. Ability to define new indicators by analysing content of the EOSC resource catalogue graph.
EOSC Digital Innovation Hub	Yes	Yes	Yes	Initial version delivered	A structure to co-design and deploy experiments with the commercial sector, to benefit from, exploit or contribute to EOSC. Support the uptake of EOSC by the commercial sector in multiple ways.
EOSC Observatory	No	N/A	Yes	In development	An interactive dashboard that will facilitate the monitoring of (1) EOSC readiness by MS/AC (2) indicators for the EOSC Partnership (3) contributions to the EOSC Partnership and EOSC ecosystem (4) national policies on Open Science and EOSC. The observatory will publicly present results of the monitoring and provide an overview of the implementation of EOSC.
EOSC Knowledge hub: training catalogue and learning platform	No	N/A	Yes	In development	The EOSC Knowledge Hub (KH), seamlessly integrated with the EOSC Portal, has two essential components: a training resource catalogue and a learning platform, both intended to support FAIR sharing and reuse of training resources in EOSC.

Table 3-5: Proposed horizontal services to be included EOSC-Exchange as component of the MVE

Proposed revised capability name	Discussed by EAWG	EAWG proposed part of MVE	Proposed for EOSC MVE by EOSC Future	Current Status in EOSC Future in M6	Expected capabilities
EOSC Data Transfer	Yes	No	Yes	Not yet developed	A possible horizontal service to be offered via <i>EOSC-Exchange</i> . Enable the movement of data files asynchronously between source and destination storage endpoints, including mechanisms to ensure automatic retry in case of failure and for optimisation of performance for large files or large numbers of files.
EOSC Research data as a service	Yes	Yes	Yes	Not yet developed	A possible horizontal service to be offered via <i>EOSC-Exchange</i> . A data access framework combining curated data with supporting crosswalks, tools, services, training and other assets to enable packaging and exploitation of the data. Supports the concept of Dataspaces as supported in Horizon Europe.
EOSC Helpdesk as a service	Yes	Yes	Yes	In development	A helpdesk platform where providers can deploy a support unit using their own staff and a helpdesk to support their own services. Prevents them needing their own technical platform and ensures their help desk is compatible and integrated with the

					Helpdesk Integration Framework.
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3.5 Proposed deviations from the EAWG MVE

The MVE report by the EAWG published in February 2021 provided²⁶ an overview of the first iteration of the MVE. As commented in footnote 6 of the MVE report,²⁷ the EAWG does not regard the MVE as static, but rather as potentially evolving over time. This section describes proposed changes to the MVE from EOSC Future.

Table 3-6: EOSC Future proposed changes to the first iteration of the MVE from the EAWG

Function name	Expected capability	Proposed change	Justification
EOSC Order management system	System to manage orders for services made through the central EOSC catalogue (Directly from researcher-facing portal or potentially passed from other catalogues which display services pulled from the central catalogue). Collect customer/user requests with relevant data, pass to providers via API, email or other means. Support collection of order metrics.	To be included in the MVE as an <i>EOSC-Core</i> component	The Order management system has not been included in the MVE because, in the opinion of the EAWG, the initial focus is on free accessible resources for which no ordering is required. With the launch of the INFRAEOSC-07 projects, significant resources are made available via Virtual Access ²⁸ (VA). To allow the provisioning of these kinds of resources, the resources must be ordered. The EOSC Order management system supports the ordering of these resources through the EOSC Resource catalogue to the INFRAEOSC-07 providers.
EOSC Data Transfer	A possible horizontal service to be offered via <i>EOSC-Exchange</i> . Enable the movement of data files asynchronously between source and destination storage endpoints, including mechanisms to ensure automatic retry in case of failure and for optimisation of performance for large files or large numbers of files.	To be included in the MVE as a community based horizontal service made available through the <i>EOSC-Exchange</i>	The Data Transfer capability was not included in the MVE because, in the opinion of the EAWG, community-specific solutions are in place. During discussions between representatives from the science clusters and the e-Infrastructures, the ability to support movement of large volumes of data between different kinds of resources (e.g. computing, storage and data services) is seen as an important capability to be supported in EOSC.
EOSC Observatory	An interactive dashboard for facilitating and presenting the results of	To be included in the MVE as a component supporting the EOSC Support	The EOSC Steering Board and EOSC Association see the EOSC Observatory as

²⁶ <https://op.europa.eu/s/uV8Y>

²⁷ Ibid. Page 3

²⁸ https://ec.europa.eu/research/participants/data/ref/h2020/other/legal/unit_costs/unit-costs_virtual-access_infra.pdf

	the monitoring of EOSC policies and readiness by MS/AC and the EOSC Partnership.	activities	the definitive tool for the collection and presentation of results of the various monitoring activities necessary for EOSC. The EOSC Observatory is not an essential component to operate the EOSC-Core but is a key policy intelligence tool for EOSC.
EOSC Knowledge hub: training catalogue and learning platform	The EOSC Knowledge Hub (KH), seamlessly integrated with the EOSC Portal, has two essential components: a training resource catalogue and a learning platform, both intended to support FAIR sharing and reuse of training resources in EOSC.	To be included in the MVE as a component supporting the EOSC Support activities	To support the uptake and efficiency of EOSC it is seen as essential to provide support. Therefore the KH is seen as an essential component of the EOSC Supporting activities to provide a rich platform to all kinds of documentation and training material, including material from providers and resources made available through EOSC, how to make use of <i>EOSC-Core</i> capabilities and how to make resources interoperable with the EOSC IF. Therefore it is proposed to include the KH in the MVE, as an EOSC Support Activities component.

The proposed deviations include two changes to capabilities listed in the first iteration of the MVE and two additions. The proposed changes are coming forth out of the planned activities and out of technical discussions within EOSC Future. The changes have been discussed within the Technical Coordination Board²⁹ (TCB) and agreed on the basis of consensus by the Strategy and Oversight Board³⁰ (SOB).

3.6 EOSC MVE portfolio management

The first iteration of the MVE was established by the EAWG which consisted of 50 representatives from member states and EOSC related projects. The MVE was established via extensive discussions and on the basis of consensus among the members of the EAWG. The proposed deviations from EOSC Future have been accepted by consensus of the SOB. The SOB is in the EOSC Future organisational structure the highest decision body after the General Assembly³¹ (GA) and responsible for the strategic alignment of the project activities, decisions and priorities of key external stakeholders (e.g. EC and EOSC Association).

As indicated by the EAWG, the MVE is not a static set of capabilities and can evolve over time. Because of this, the MVE portfolio must be managed in a structured way and not via temporary initiatives such as the EAWG and EOSC Future SOB.

To manage the EOSC MVE portfolio in a structured way, EOSC Future proposes to establish a group of experts in the EOSC Association organisation to oversee the assessment and evolution of EOSC MVE Capabilities. The

²⁹ The **Technical Coordination Board** (TCB) oversees the technological and interoperability development of the project so that the EOSC platform meets the needs of the scientific community. The TCB consists of technical experts from e-Infrastructures, scientific clusters, technical WPs, and Science Projects.

³⁰ The **Strategy and Oversight Board** (SOB) oversees the strategic orientation and alignment of the project, the outputs of the WPs, the interactions between WPs, and the alignment between the project and external stakeholders.

³¹ The **General Assembly** (GA) forms the highest decision-making body in the project, with representation of all beneficiaries.

experts in this 'MVE Capability Assessment Group' should be selected from key stakeholders in the EOSC community.

3.7 Next steps

Deliverable D2.5a is the first iteration which provides an overview of the MVE capabilities and structures according to the EOSC Future defined Architecture components. The second iteration of this deliverable (i.e. D2.5b) planned in M25 will provide an overview of the next iteration of the MVE and the justification of capabilities via exemplar use cases.

Deliverable D2.5a has a close relationship with the deliverable *D2.9 Co-designed Architecture Description* planned in M9. This deliverable will provide specifications to support the European Commission in drafting the call for the procurement of the *EOSC-Core* in the Horizon Europe Work Programme 2021-2022 for EOSC. While D2.5a focuses on identifying the MVE capabilities, deliverable D2.9 will describe the capabilities in more technical detail. D2.9 will also indicate what capabilities are most eligible to be procured and how.

4 EOSC Inclusion criteria

In order to make EOSC effective, it must be clear what providers and resources (Services, Research products such as data, publications, identities) are and should be in EOSC, and what should be excluded. This needs to be both based on some community consensus of what EOSC is, and be supported by some way to practically implement it in different places to achieve a common result. EOSC is intended to be open, but this still leaves the need for some boundaries. For instance, in what way should commercial providers be involved? How specific to research should services be? Should only free services be included? How can resources be proven FAIR?

These issues are the province of the EOSC Rules of Participation and the Inclusion Criteria derived from them, which are described in the following sections.

4.1 EOSC-hub and the EOSC Working Group on Rules of Participation

EOSC launched in a practical sense with the initiation of the EOSC-hub project, and the subsequent launch of EOSC Portal as a collaboration between EOSC-hub, OpenAIRE and eInfraCentral. At this point there was no real definition of EOSC and its components, or obvious boundary conditions bar what was or was not in the relevant approved project proposals.

In the absence of such consensus rules, EOSC-hub onboarded services to the listing in EOSC Portal, and eInfraCentral brought the listings it had collected through its work. This generated an initial set of resources but the criteria for them was based on a best guess at what should be a part of the Portal. The experience in doing this onboarding led to the creation of onboarding procedures on how to look at, assess and include or not the providers and resources coming to be listed. This developed into a set of initial inclusion criteria which formed the basis for discussion with providers, requests to improve the information they submitted, and occasional refusal of requests for onboarding.

In 2019, EOSC governance became more cohesive, with the formation of the EOSC Governing Board and Executive Board. It also saw the launch of a number of Working Groups under the authority of the Executive Board being formed, including one on the Rules of Participation. They began the formal work of defining boundary conditions for EOSC, and took input from the wider community, as well as from the projects such as EOSC-hub and the regional cluster projects which were trying to practically implement EOSC.

The Working Group on Rules of Participation³² discussed and debated EOSC boundaries and ultimately generated a set of Rules of Participation proposed for EOSC. These rules took the form of very high level principles published in 2020³³. The proposed Rules of Participation (RoP) were:

- EOSC is based on the principle of openness;
- EOSC resources align with FAIR principles;
- EOSC services align with EOSC architecture & interoperability guidelines;
- EOSC is based on principles of ethical behaviour and research integrity;
- EOSC users are expected to contribute to EOSC;
- EOSC users adhere to terms and conditions associated with the resources they use;
- EOSC users reference the resources they use in their work;
- Participation in EOSC is subject to applicable policies and legislation.

These principles are broadly supported by the EOSC community, and represent an aspiration for how EOSC can exist, however they did not and do not address the practical, operational concerns of defining clear boundaries for EOSC, and measures to enforce those boundaries.

4.2 EPOT and onboarding

In parallel to the work on rules of participation, the EOSC-hub project, and later the EOSC Enhance project continued to onboard providers and resources to EOSC, and for this some set of guidelines was required to do so, which could not be provided by the high level RoP mentioned above. This led to the development of EOSC Inclusion Criteria that were used by those performing onboarding to make decisions on individual applications.

³² See <https://www.eoscsecretariat.eu/working-groups/rules-participation-working-group>

³³ See <https://op.europa.eu/s/juP6k>

Over time the group performing this transitioned from teams in multiple projects to a multi-project collaborative EOSC Portal Onboarding Team (EPOT). The initial EPOT brought together EOSC-hub, eInfraCentral and OpenAIRE-Advance. EOSC Enhance and EOSC Future joined when each launched, while the others dropped out as the projects concluded.

In practice, the boundary conditions imposed on providers and resources come in two parts, the first is the information gathered by the metadata schema used for provider and resources, and the second is the EOSC Portal Inclusion criteria which were used to process applications. These are considered in the following sections.

4.3 EOSC Profiles

The EOSC Provider and Resource profiles were formed by the combination of the EOSC Hub Service Description Template and the eInfraCentral Service Description Template, as a way to offer a first consensus method to describe and expose EOSC services initially, and later broaden this to EOSC Resources and the EOSC Providers who contribute or channel them through EOSC. These were implemented under EOSC Enhance, and now support the registry and catalogue services visible through EOSC Portal.

The EOSC Profiles request a significant amount of metadata on providers and resources, in both cases with a core of required data to provide basic information and a large amount of optional information which is intended to support a wide range of uses and use cases. The required fields in the EOSC Profiles represent a minimal set of information needed to meaningfully manage services and to expose them to researchers and research communities.

In essence, complying with the EOSC Profiles required fields reflects a significant proportion of the EOSC inclusion criteria. It involves making available key information which effectively describes providers and resources, but also provides the input that the EPOT can use in order to assess the suitability or compliance with the more complex or nuanced parts of the inclusion criteria. If the profiles are correctly filled this likely amounts to 50% compliance with the inclusion criteria already.

The Profiles are set out in sections as seen in Figure 4.1:

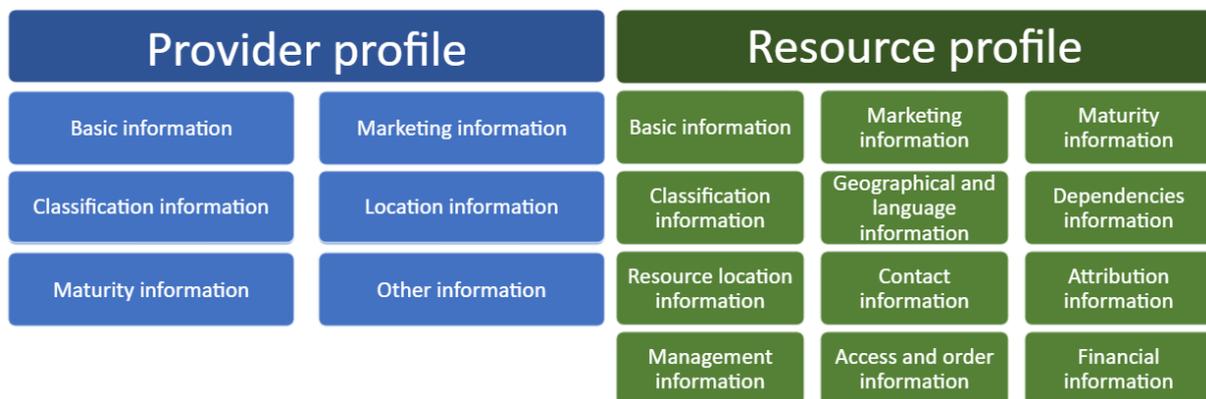


Figure 4.1: Section structures of the EOSC Provider and Resource profiles

Each of these sections then requires a set of pieces of information, including an identifier, a type, multiplicity, definition, recommendation and requested value, along with whether the data is mandatory or optional. An example can be seen in Figure 4.2. Providers submit data using the profiles formats via a web portal or by API, which are then assessed by the EPOT for approval, amendment or rejection.

Code	Attribute Name	Value	Recommendation	Definition	Type	Multiplicity	Required	Public
Basic Information								
ERP.BAL0	ID	openaire.zenodo	OK	A persistent identifier, a unique reference to the Resource in the context of the EOSC Portal.	String (max 30)	1	Mandatory (Assigned by the EOSC Portal)	Yes
ERP.BAL1	Name	B2DROP	OK	Brief and descriptive name of Resource as assigned by the Provider.	String (max 80)	1	Mandatory	Yes
ERP.BAL2	Resource Organisation	OpenAIRE	OK	The name (or abbreviation) of the organisation that manages or delivers the resource, or that coordinates resource delivery in a federated scenario.	Provider ID	1	Mandatory (Filled in by the EOSC Portal)	Yes
ERP.BAL3	Resource Providers	CERN, GRNET	OK	The name(s) (or abbreviation(s)) of Provider(s) that manage or deliver the Resource in federated scenarios.	Provider IDs	Multiple	Optional	Yes
ERP.BAL4	Webpage	http://Resource-name.Provider.eu	OK	Webpage with information about the Resource usually hosted and maintained by the Provider.	URL	1	Mandatory	Yes

Figure 4.2: Example section of the EOSC Profiles

The initial version of the profiles was marked 'version 3.0' as it built on versions 2.0 of the elnraCentral templates and 1.3 of the EOSC-hub templates. It was then the basis for the development of the technical platforms in the EOSC Enhance and now EOSC Future projects to support the collection, processing and publishing of providers and resources on EOSC Portal.

Version 4.0 of the EOSC Profiles is currently in preparation as part of the conclusion of the EOSC Enhance project, and brings a number of improvements based on initial experiences implementing them, and supporting new use cases that have arisen through implementation of EOSC components. This will be released in the coming weeks, as the effort in maintaining the profiles transfers from EOSC Enhance, and EOSC Future takes on governance of the profiles.

This starts the planning for both version 5.0 of the profiles, which will be a significant alteration, and also the longer term governance of the profiles. Initial discussion suggests that governance must spread beyond the EOSC Future project from the start, as there is an expectation that groups outside the project adopt the format (as a part of the EOSC Interoperability Framework). We imagine this will involve the EOSC Association Task Force on Rules of Participation (See section 4.6) and also a set of representatives from groups owning and operating catalogues within the EOSC ecosystem, such as the regional and thematic EOSC cluster projects. Governance must ensure that changes to the profiles are supported by the community and adopted by them. This also implies that developments must be planned significantly in advance, and notice given between publication and adoption.

For version 5.0 of the profiles, there is also an intention to move to a more modular structure, which concentrates required fields and separates them from sections for optional fields of interest to some communities but not others. This also opens the option for inclusion of other community or technology specific extensions to the profiles in order to address specific community needs, which reduces the length of the required sections to make them more accessible.

The versions of the EOSC Profiles in use currently are detailed on the EOSC Provider Documentation page³⁴.

4.4 EOSC Inclusion Criteria

While correctly filling the EOSC Profiles covers a significant amount of the inclusion criteria for EOSC, it still leaves a number of other issues to consider. In order to capture these, the EOSC-hub project published a set of EOSC onboarding Inclusion Criteria as a living set of requirements or guidance on onboarding in order to explain what would or would not be included in EOSC. This was necessary due to both a significant number of 'spam' type submissions under EOSC-hub, and some requests which did not break any rule in place but still did not

³⁴ <https://eosc-portal.eu/providers-documentation>

seem appropriate for EOSC. The current full text of the Inclusion Criteria is provided in Appendix B. This section, however, provides the key points and commentary on them.

The following sections are the current criteria for inclusion in EOSC. The italic bullet points are the current criteria, followed by commentary and explanation.

4.4.1 Criteria 1: What groups can onboard to EOSC as a provider?

- *Any group can onboard to EOSC as a Provider, as long as it fills the necessary information in the EOSC Provider Profile.*
- *Those onboarding as a provider should either be a legal entity or connect to the registration of a hosting legal entity already onboarded as a provider under their own profile.*

There is a need to identify which groups are onboarding to EOSC as providers. This requirement has generated a large amount of discussion, as there are significant advantages and disadvantages to requiring only legal entities to onboard, or to allowing more arbitrary groups to onboard.

Allowing non legal entities to onboard tends to drive significant onboarding from less formally constituted groups, especially from funded projects. These are keen to promote themselves and their outputs, but are fundamentally transitory, and tend to stop updating information once projects conclude. This means their submissions would have a tendency to drown out currently available providers with expired ones. In addition, as EOSC catalogues become more formalised, non legal entities are not able to enter into agreements and contracts. This means, for instance, that they could not make a contract to deliver a service against payment. It also means they could not sign a Data Processing Agreement with a Data Controller in order to conform with the structures of the GDPR legislation or its local equivalents.

In dealing with this issue, the EPOT were initially considering to allow only legal entities, but there were a number of organisations that this might exclude who were significant contributors to EOSC. As a result, the EPOT adopted a compromise position, backed up by changes in the EOSC Profiles. Onboarding providers who are legal entities can start this. Groups that are not legal entities can onboard, but must link to another onboarded provider which *is* a legal entity to act as a hosting organization. This means that e.g. a project coordinator can be the host for a funded project they run. This lets them promote projects or other transitory entities but gives a legal entity that can be dealt with. This gives EOSC a group to follow up with in case a provider record goes out of date when a project concludes, and offers bodies that can potentially sign agreements where this might be required. As a downside, it does require that the hosting legal entity is onboarded first.

Open issues:

- Check approach to legal entities with the Task Force on Rules of Participation & Compliance Monitoring (TF RoP-CM) and EOSC Association,
- Consider how to validate legal entity status,
- Clarify how to deal with providers already onboarded which are non legal entities without hosting legal entities, from before the rule was in place.

4.4.2 Criteria 2: Who can onboard resources to EOSC

- *Providers onboarding a resource must assert that they are able to ensure the resource is delivered by them or their collaborators and agree to remove resources that are no longer operational or available.*
- *Resources should be onboarded by the coordinating or lead provider in case of a federated or jointly provided resource (they are the Resource Organisation). Other onboarded providers may be added as supporting or supplementary providers (Resource providers).*

A common challenge for inclusion criteria and rules of participation is the authority or right to represent a group or resources. While this cannot be entirely guaranteed, the EPOT decided it was good to explicitly state that providers needed to assert some level of responsibility for services, and to maintain the information in a correct state.

Beyond this, there is a need to accommodate multi-provider and federated services. This included both situations where there is a lead provider and supplementary providers, and also those where one group promotes a service, but actual delivery is by another member of their federation or cluster of organisations.

Open issues:

- The procedures imply or require an order of actions, so that Resource Providers cannot be added unless they are already onboarded themselves as Providers. Hence, for now Resource Organisation must be onboarded first, then other Resource Providers are onboarded and can be linked. Resource Providers can only be linked during initial resource onboarding if they were already onboarded themselves. This may provide some issues when moving profile records between catalogues.

4.4.3 Criteria 3: What resources may be connected to EOSC?

- *Services. At present only services are being onboarded:*
 - *It must be a specific service offered 'live' to customers. This may be an IT service, or a human service (e.g. training, consultancy).*
 - *It may not be a research product, for instance, a document, a dataset or a piece of software. The Service must be discrete. It must be available and offer value on its own. It may not be only a feature of a larger service available while already using that service.*
 - *The Service must be of a reasonable maturity, Technology Readiness 7 or above in order to be listed in the catalogue (and TRL8 or above to allow for integration of ordering)*
 - *Services must meet at least one of:*
 - *The service must be targeted to EOSC and EOSC communities.*
 - *The service must build on or leverage EOSC capabilities to serve some other community.*
- *Other resources, such as research products (data sets, publications, software and other types) will be able to be onboarded at a later date.*
 - *NOTE: while research products are not being directly onboarded yet, services that contain them such as data, software or publication repositories can be onboarded as services.*

EOSC must support a wide range of resources, but much of the early work on onboarding resources concentrated solely on services, and not on other forms of resources such as research products. As a result, the current platform for onboarding and the initial versions of the EOSC Profiles were very much service-focussed, and initial inclusion criteria only covered services. There has been work to consider this under EOSC Enhance and EOSC Future, and several approaches have been discussed by those involved in onboarding and in the technical platforms related to it.

First, there is work on a specific extension to the EOSC Profiles to describe Data Sources, i.e. a form of service which exposes a set of data sets within it. This would allow linking of the onboarded resources to the many data set listed in e.g. the catalogues managed by OpenAIRE. This is also likely to be the pattern for onboarding of research products in general. While the number of services in Europe is small enough to consider onboarding all of them to EOSC, the number of research products is astronomical, and individually onboarding each one is likely to prove practically impossible. As a matter of pragmatism and to not replicate the data, software and publication indexing and cataloguing, it seems that the main way to onboard research products into EOSC will be via services that expose them.

For services, there is a need to ensure that the items onboarded are of a similar broad 'type'. First it needs to be a value generating service, which brings relatively discrete benefit to a customer, i.e. something you would take 'on its own' rather than which requires you to already use some larger service first. Hence providers cannot onboard elements of a platform, just the platform itself. To avoid research products masquerading as services, it should also include some form of operational activity (not e.g. a 'service' which simply shows a pdf).

Service maturity is also requested, and a minimum maturity of Technology Readiness Level 7 according to the EC H2020 definitions of TRL³⁵ in order to be listed. TRLs below this are not sufficiently mature for wide use. A minimum TRL of 8 is required to support some additional integration with services, such as ordering through EOSC.

Finally, and most complex, there is the need to work out what the 'suitability' of a service to EOSC is. This is a factor which was initially instinctive rather than clearly stated, but has since been partially codified in the inclusion criteria.

While there has been consensus that spam shopping pages which have attempted to onboard to EOSC be refused, there is a grey area of providers and resources that require clarification. In theory any IT service could be offered for onboarding, but many IT would be too generic for EOSC, yet if any are excluded, there needs to be done so, on some specific basis.

The Inclusion criteria offer two potential requirements, one of which should be met for a resource to be valid.

If a service is *targeted to EOSC or EOSC communities* this means that it is explicitly addressing particular needs of the research community, or in a more generic service, markets and targets itself in such a way as to address the research community. This might be a service which e.g. simulates fundamental particles in a particle accelerator (the service addresses a research function) or a generic data management platform which highlights the features relevant to clinical research use and provides some combination of added value features, informational materials, training and support which make it attractive to researchers.

The second path to inclusion is services which built on top of EOSC capabilities, such as some form of analysis service built on top of the open science catalogues brought into EOSC by OpenAIRE, or connecting commercial services to be able to use publicly funded infrastructure in the backend for customers who have access to such public infrastructures. This also accommodates cases from the EOSC Digital Innovation Hub which exploit EOSC but may not always be creating typical services for EOSC researchers.

Open issues:

- Confirm agreement to the inclusion of research products via services, not on their own.
- Agree and increase the clarity of the description of 'EOSC suitability' - especially regarding listing commercial providers and resources.

4.4.4 Criteria 4: A provider profile and resource profiles for each resource must be filled, including at a minimum all required fields.

- *URLs must be Fully Qualified Domain Names (FQDN).*
- *Key information must be in English due to the limitations of current project resources (thought this may change in future):*
 - *The provider and resource profiles must be in English.*
 - *The basic information in the User Interface for the service must be available in English.*
 - *Privacy statements, terms of use and Service Level Agreements, Specifications and Descriptions must be available in English. Other documentation may be in the native language only.*
 - *The Helpdesk or support function must be able to answer queries in English at a minimum.*
- *Resources must be both available in Europe and available in a European language.*

As stated above, filling in the EOSC Profiles should cover many of the pieces of information required to be onboarded to EOSC. There are, however, some restrictions on how they should be filled in.

To ensure that services are identifiable, when links are provided, they need to be actual domain names not e.g. just IP addresses. This can be checked in the Provider Portal but is also highlighted here.

³⁵ https://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/annexes/h2020-wp1415-annex-g-trl_en.pdf

Other issues relate to language and location. First, there is a requirement that the service is available to researchers in Europe and in one of the European languages, otherwise it is unlikely to benefit the EOSC community. From here, there is the practical requirement that key information, including key required documents and support structures, can present information and process requests in English. This is not to say that English is the required language for EOSC in the long term, but that practically this is the language in which EOSC Future is operating. Validation and auditing of provide and resource profiles by EOSC is in English, and there is no capacity to provide such validation and auditing reliably in other languages.

Open issues:

- Clarify what information must be available in English and what can be in local languages.
- Consider whether restriction on services on for Europeans makes sense in light of efforts on a Global Open Science Cloud.
- Discuss at what point validation and auditing in languages other than English might be possible.

4.4.5 Criteria 5: The provider must agree to periodically update data on themselves and their resources to keep it current

There is a need to consider what agreements are needed to support the onboarding of providers and resources, and the publishing of these resources and providers through the EOSC Marketplace on EOSC Portal and elsewhere. See the following section on this topic.

4.5 Agreement structure with other catalogues and shared validation and auditing

Currently, while onboarding has become increasingly structured, there has been no clear agreement between providers and EOSC operators about the 'service' offered in collecting provider and resource profiles, and exposing them to the community. This must change during the lifetime of EOSC Future, and the work is in scope for Task 2.2. Discussions to support such an agreement have already begun, between EOSC Future and the other organisations who may run catalogues in the EOSC domain, and who might want to exchange provider and resource profile records with the central registry of providers and services held as part of *EOSC-Core*. In order to exchange such records, there is a need that agreements are aligned between catalogues, that they implement compatible rules and procedures so records can flow between them. A provider agreement is perhaps the most urgently needed agreement, but is only one of several. In addition, while ultimately this may be an agreement, at present the landscape lacks the network of legal entities needed for binding agreements, so initial efforts may be closer to Terms of Use or Service Specifications than formal agreements, but the content in them is needed to help push EOSC maturity forward. These agreements often flow from the Rules of Participation, which is a major reason why the current high level principles require further development and increased specificity. As the RoP become more concrete, the other agreements or terms of use in the larger agreement and policy framework can develop.

As an initial step in making this a collaborative process, representatives of the other EOSC Catalogues from thematic and regional EOSC projects will be included in meetings within EOSC Future that discuss inclusion criteria and the emerging agreement framework.

The agreements needed are shown in the table below. Where the *EOSC-Core* Operator is mentioned, this is the group operating the Core after EOSC Future, which may be the EOSC Association or some group or consortium answering a procurement for Core operation.

Table 4-1: Agreements and policies in the EOSC Agreement framework

Entity	Governance	Provider → Customer (Owner → Addressee for rules)	Notes
Rules of Participation	Task Force: Rules of Participation Compliance Monitoring (TF RoP-CM)	EOSC Association → community members	High level rules and policies

EOSC Profiles	EOSC Enhance, shifting to EOSC Future and later to EOSC Association	EOSC Association (Currently EOSC Future) → Catalogue owners/providers	Metadata format for provider and resources, filling this in will likely cover 75% of RoP for Providers
EOSC Provider agreement / ToU	EOSC Future shifting to the ultimate EOSC-Core operator	EOSC-Core operator → Resource Providers	Input from Rules of Participation, requires using EOSC Profiles, Feedback from providers and catalogue owners
Catalogue Integration Agreement	EOSC Future shifting to the EOSC-Core operator	EOSC-Core operator → Other EOSC Catalogue Owners	Consensus with catalogue owners, requires them to be compatible with EOSC Provider Agreement
Community Provider Agreements	Other EOSC Catalogue owners (Community Catalogues)	Other EOSC Catalogue owners (Community Catalogues) → Their providers	Aligned to Catalogue Integration Agreement (and so EOSC Provider Agreement)
EOSC User Agreement	EOSC Future shifting to the EOSC Association	EOSC Association / EOSC-Core Operators → All community members, with focus on researchers / customer	Input from Rules of Participation, Draw in community contributions

4.6 Relationship to the Task Force on Rules of participation and Compliance Monitoring

The inclusion criteria for EOSC as implemented through EOSC Future are based on two main sources: the practical experience from onboarding and the high level input from the currently published Rules of Participation from the previous Working Group.

From Autumn 2021, new task forces have been set up under the auspices of the EOSC Association to tackle different elements of EOSC implementation and policy. One such is the Task Force on Rules of Participation & Compliance Monitoring. This initial charter of the Task Force³⁶ proposes the following main aims:

- *To ensure that the entry requirements of EOSC bridge from the principles expressed in the current high-level EOSC RoP to more practical criteria for implementation in EOSC.*
- *To define at what level RoP and other entry requirements can be reasonably monitored, and set in place a framework to enable such monitoring alongside other key stakeholders and to create a structure for 'appeals' against exclusion from EOSC.*
- *To draw in community involvement in the setting of RoP and other entry requirements from the EOSC community.*
- *To establish a durable structure that can take on the ongoing activities and continue them after the task force concludes, through an RoP Board as proposed by the Working Group on Rules of Participation.*

These aims are well aligned with the approach taken by EOSC Future and the practical onboarding of providers and resources the project undertakes. Going forward, EOSC Future expects this to be the major input used to improve and update the inclusion criteria it uses, and also expects to provide significant input to the Task Force to help ensure its results are practically implementable. The Task Force is not expected to provide new RoP until early 2022, but these will trigger an update to inclusion criteria, which will be covered in the second iteration of this deliverable (D2.5b), later in the project lifetime.

³⁶https://www.eosc.eu/sites/default/files/tfcharters/eosca_tfrulesofparticipationcompliancemonitoring_draftcharter_2021_0614_0.pdf

5 Conclusions

EOSC Future is not a project which starts from scratch in a 'green field' environment, instead it is the evolution and continuation of multiple streams of activity, among infrastructures, funders & governing bodies, and among the thematic EOSC cluster projects which bring in the Research Infrastructure communities. Through EOSC Future, there is significantly increased agreement on the high level structure and architecture of EOSC, comprising *EOSC-Core*, *EOSC-Exchange*, EOSC Supporting Activities and the EOSC Interoperability Framework (EIF).

EOSC Future implements the Core, Supporting Activities and EOSC Interoperability Framework and supports the population of the Exchange through integrating horizontal resources from the INFRAEOSCo-07 projects & e-Infrastructures, and the onboarding of providers and resources directly into *EOSC-Exchange* as accessed via the EOSC Marketplace.

The project takes a view of the makeup of EOSC based on the MVE document which was the final result of the EOSC Architecture Working Group, with minor amendments based on experience and negotiated in the course of putting EOSC Future together and agreeing its aims with the European Commission. These capabilities are and will be further realised through the development and improvement work in Work Packages 4 and 5, the Onboarding and Integration in WP6 and the operations overseen in WP7.

These capabilities will be assessed in the coming months and the project will try and map where plans must be adjusted to meet new needs or respond to new circumstances. This will also involve clearer justifications or 'business cases' for these capabilities.

One specific aspect of these capabilities is to populate *EOSC-Exchange* through onboarding providers and resources to EOSC and publishing them through the EOSC Marketplace as well as making the registry of providers and resources available for access by other catalogues. In doing so, this involved imposing boundary conditions on EOSC and approving or denying requests to onboard to EOSC. In the absence of prior clear rules on what should and should not be in EOSC, previous onboarding efforts created the Inclusion Criteria used by the EOSC Portal Onboarding Team. These were aligned with (and informed the creation of) the high-level principles currently published by the EC as Rules of Participation. The RoP will now be updated and made more specific and implementable by a Task Force under the EOSC Association which will create the more specific RoP and a framework to monitor adherence to them. EOSC Future will provide input to this Task Force and will align its inclusion Criteria to their updated rules when they become available.

6 Appendix A – Additional information to EOSC platform capabilities

In assessing the MVE capabilities information is collected about references to the EOSC Strategic Research and Innovation Agenda, existing and past EOSC related Working Groups and Task Forces, and to relevant key documents. One of the main objectives of the EOSC Future project is to *deliver and to operate the EOSC-Core* and to *expand the EOSC-Exchange with resources across disciplines*, also the relevant EOSC Future work package and tasks involved in enabling the capability are listed. The development of EOSC is supported via the EC Horizon Europe work program. After the granting call³⁷ for the EOSC Future project, a funding call for future developments of EOSC has been passed, the submission deadline of this call was on the 23rd of September 2021. The table provides references to calls which address activities on a specific capability.

Information in the following table are organised in the following columns:

1. *Proposed revised capability name*: At time of proposal writing and after discussions in the first 6 months of EOSC Future, the capability names are defined more precisely. Therefore it is proposed to revise the capability name to be consistent within EOSC and across EOSC Future deliverables;
2. *Function name from EAWG MVE report*: Provided as reference to map the EOSC Future names to the function names used in the EOSC EAWG MVE report.
3. *Reference to SRIA per v1.0*: relates a capability to areas of the EOSC Strategic Research and Innovation Agenda v1.0³⁸ published in February 2021.
4. *Relevant Governance/Task forces/Working Groups*: relates a capability to relevant EOSC Association Task forces, to Working Groups of the previous EOSC Governance organisation and to relevant other organisations.
5. *Key Published documents*: provides references to relevant documents for a capability
6. *Planned activities under EOSC Future incl. WP/Task*: Indicates the EOSC Future Work package and/or tasks that are involved in enabling a capability
7. *Planned under other initiatives*: Future developments of EOSC are supported via the EC Horizon Europe work program. This column provides references to EC future work program calls in which developments of a capability is being addressed.

³⁷ <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/infraeosc-03-2020>

³⁸ https://www.eosc.eu/sites/default/files/EOSC-SRIA-V1.0_15Feb2021.pdf

Table 6-1: Additional information related to the proposed EOSC-Core platform

Proposed revised capability name	Function name from EAWG MVE report	Reference to SRIA per v1.0	Relevant Governance / Task forces /Working Groups	Key Published documents	Planned activities under EOSC Future inc WP/Task	Planned under other initiatives
PIDs for EOSC Services	PID for EOSC services	5.1. Identifiers (first bullet in priorities)	EOSC Association Task Force on PID Policy and Implementation	A Persistent Identified (PID) Policy for the European Open Science Cloud (EOSC) https://op.europa.eu/s/uZMA	T4.2:EOSC Back-Office Management Tools for Providers includes activities on assigning PIDs to resource profiles and to extend resource catalogue software to support PIDs.	
EOSC Resource registry and catalogues : Services	EOSC Portal Service Catalogue and federated portfolio	Frontend: 5.5. User environments (first bullet in priorities) Backend: 5.6. Resource provider environments (first bullet in priorities) 7.3 Improved impact of research in addressing societal challenges	EOSC Future, with plans to transfer to EOSC Association. No specific Task Force on topic but several touching on aspects of it: EOSC Association Task Force on Technical Interoperability of Data and Services EOSC Association Task Force on PID Policy and Implementation EOSC Association Task Force on Semantic Interoperability"	EOSC Enhance Deliverables https://eoscfuture.eu/eosc-enhance-deliverables : D2.2 EOSC processes development and consensus D2.3 EOSC processes development and consensus (update) D2.4 EOSC Service Catalogue Analysis D2.5 EOSC Service Catalogue Analysis (update) D3.1 EOSC Portal Functional and Non-Functional Specifications D3.2 EOSC Portal Open APIs Specifications D4.1/4.2 UX Model and verification of EOSC Portal development EOSC Future WP5 D5.1aEOSC Front-Office Design, Functional and Technical Specification	WP4-T4.2.1.Extend\Evolve the registry with Catalogue Onboarding\Integration Support Assign PID to services New functionality for providers New functionality for EOSC Onboarding Teams APIs adaptation to the evolution of the profiles WP5 Front Office D5.1aEOSC Front-Office Design, Functional and Technical Specification	

Data sources in EOSC Resource registry and catalogue as a subtype of services within the EOSC Profiles.	EOSC Portal Service Catalogue and federated portfolio	Frontend: 5.5. User environments (first bullet in priorities) Backend: 5.6. Resource provider environments (first and third bullets in priorities)	EOSC Task Force on Rules of Participation and Compliance Monitoring.	EOSC Enhance Deliverables https://eosc-portal.eu/eosc-enhance-deliverables EOSC Enhance Deliverables D4.1/4.2 UX Model and verification fo EOSC Portal development EOSC Enhance D4.3 - Analysis of existing research data cataloguing efforts towards integrated discovery / D4.4 - Guidelines for RIs to enable discoverability of research data	Part of A3.2.1 and A4.2.2 and A4.2.3 WP5 Front Office	HORIZON-INFRA-2021-EOSC-01-03
EOSC Resource registry and catalogues : Research Products	EOSC Portal scientific product portfolio/catalogue	Frontend: 5.5. User environments (first bullet in priorities) Backend: 5.6. Resource provider environments (first and third bullets in priorities) 7.3 Improved impact of research in addressing societal challenges	EOSC-Future plans to transfer to EOSC Association: EOSC Association Task Force on Technical Interoperability of Data and Services and/or EOSC Association Task Force on Semantic Interoperability and/or EOSC Task Force on Rules of Participation and Compliance Monitoring.	EOSC Enhance Deliverables https://eosc-portal.eu/eosc-enhance-deliverables EOSC Enhance Deliverables D4.1/4.2 UX Model and verification fo EOSC Portal development OpenAIRE Guidelines: http://guidelines.openaire.eu EOSC Future WP5 D5.1aEOSC Front-Office Design, Functional and Technical Specification	Part of A3.2.1 and A4.2.2 and A4.2.3WP5 Front Office	HORIZON-INFRA-2021-EOSC-01-03

EOSC Order management system	EOSC Order Management Tool	5.5. User environments (first bullet in priorities)	TF Defining Funding Models for EOSC	<p>EOSC Future Deliverables: D4.1a Back-Office design, functional and technical specifications D4.3a Back-Office Software</p> <p>EOSC Enhance Deliverables https://eoscfuture.eu/eosc-enhance-deliverables EOSC ENhance D3.2 - EOSC Portal Open APIs</p> <p>EOSC-hub Deliverables https://www.eosc-hub.eu/deliverables : EOSC-hub D5.5 Second report on maintenance and integration of federation and collaboration services</p>	WP4, A4.2.4 EOSC Resources Order Management Software.	
EOSC AAI Federation	EOSC AAI in support of EOSC Service portfolio	5.4. Authentication and authorisation infrastructure (first bullet in priorities)	EOSC Association Task Force on AAI Architecture EOSC Future AAI implementation XWG https://wiki.eoscfuture.eu/display/EOSCF/EOSC+AAI+Implementation+XWG	EOSC Authentication and Authorization Infrastructure (AAI) https://op.europa.eu/s/uZL9	Task 7.3 - EOSC Federated Authorisation and Authentication	
Connecting EOSC-Core components to the EOSC AAI Federation	EOSC AAI for EOSC-Core services	5.4. Authentication and authorisation infrastructure (fifth and sixth bullet in priorities)	EOSC Association Task Force on AAI Architecture EOSC Future AAI implementation XWG https://wiki.eoscfuture.eu/display/EOSCF/EOSC+AAI+Implementation+XWG	EOSC Authentication and Authorization Infrastructure (AAI) https://op.europa.eu/s/uZL9	Task 7.3 - EOSC Federated Authorisation and Authentication Linked to work in WP4 / 5 evolving core services.	
EOSC-Core helpdesk	EOSC AAI for EOSC-Core services	5.5. User environments (first bullet in priorities) but not explicitly mentioned	None		<p>Currently Delivered: GGUS from KIT. Plans for update to underlying technology.</p> <p>Task 4.4 - EOSC Back-Office Helpdesk System</p> <p>WP5 Front Office</p>	
EOSC Collaboration systems	EOSC-Core Collaboration Software	5.6. Resource provider environments (first and third bullets in priorities)	Likely under the EOSC Association		Provided under EOSC Future/T7.4 for project support, but not as a long-term capability.	

EOSC Monitoring	EOSC Service monitoring	5.6. Resource provider environments (first bullet in priorities)	EOSC Association Task Force on Technical Interoperability of Data and Services EOSC Association Task Force on Rules of Participation and Compliance Monitoring.	An initial version of the Interoperability Guide is available at: https://wiki.eoscfuture.eu/display/PUBLIC/Monitoring+Architecture+and+Interoperability+Guidelines	Core Service developed in T4.3, Initial versions already in place, integration support through T6.2	
EOSC Accounting	EOSC Accounting	5.6. Resource provider environments (second bullet in priorities)	EOSC Association Task Force on Technical Interoperability of Data and Services	EOSC-hub Deliverables https://www.eosc-hub.eu/deliverables : EOSC Hub D5.6 Final report on the integration of federation and collaboration services	Core services developed by T4.3 Initial Interoperability guidelines are available soon, with integration support through T6.2. VA metrics informal Working Groups are set up. COUNTER of practice frameworks to be included in the discussion (RDA WG).	
EOSC Configuration Management System	Core Services CMDB	5.6. Resource provider environments (second bullet in priorities)	EOSC Association Task Force on Technical Interoperability of Data and Services	None	T4.4.1 of the Future Proposal: A CMDB that will include the description of EOSC-Core services and will be integrated with a ticketing system to enable easy tracking.	

Table 6-2: Additional information related to the proposed EOSC-Core coordination

Proposed revised capability name	Function name from EAWG MVE report	Reference to SRIA per v1.0	Relevant Governance / Task forces /Working Groups	Key Published documents	Planned activities under EOSC Future inc WP/Task	Planned under other initiatives
PID Policy Compliance Assessment Framework	PIDs for research entities in EOSC	5.1. Identifiers (first bullet in priorities)	EOSC Association Task Force on PID Policy and Implementation	A Persistent Identified (PID) Policy for the European Open Science Cloud (EOSC): https://op.europa.eu/s/uZMc	T3.3 EOSC Interoperability Framework Task Forces will support work on areas including PIDs. WP9 training will include materials on PIDs.	HORIZON-INFRA-2021-EOSC-01-03

EOSC Security Coordination	EOSC Security Policies and Security Coordination Functions	5.4. Authentication and authorisation infrastructure (seventh bullet in priorities) 5.7. EOSC Interoperability Framework (second bullet in priorities on technical level)	EOSC Association Task Force on AAI Architecture WISE Information Security, AEGIS EOSC Association Task Force on Rules of Participation and Compliance Monitoring	Trust Coordination for Research Collaboration in the EOSC era https://doi.org/10.5281/zenodo.3674676	Task 7.5 - EOSC Security Operations and Policy	
EOSC Service Management System	Service Management and Access Framework	4.5.2. <i>EOSC-Core</i>	EOSC Association Task Force on Rules of Participation and Compliance Monitoring. - SPM process EOSC Association Task Force on AAI Architecture - ISM process	EOSC-hub Deliverables https://www.eosc-hub.eu/deliverables EOSC-hub D1.7 Report on EOSC-hub Service Management System EOSC-hub D4.3 Procedures and policies for the production infrastructure	SMS deployed as part of work in WP7 with support of elements/processed in WP4,5,6	Rules of Participation to be partially covered in the project funded under HORIZON-INFRA-2021-EOSC-01-02

Table 6-3: Additional information related to the proposed EOSC Interoperability Framework

Proposed revised capability name	Function name from EAWG MVE report	Reference to SRIA per v1.0	Relevant Governance / Task forces / Working Groups	Key Published documents	Planned activities under EOSC Future inc WP/Task	Planned under other initiatives
EOSC Interoperability Framework management	EOSC Interoperability Frameworks (previously multiple entries)	5.7 EOSC Interoperability Framework 5.6. Resource provider environments (3rd bullet in priorities)	EOSC Association Task Force on Technical Interoperability of Data and Services Specific groups on the EIF forthcoming from EOSC Future WP3.	Multiple documents for the different areas e.g. those from the EOSC Working Groups and Task Forces.	WP3	

Table 6-4 Additional information related to the proposed EOSC Support Activities

Proposed revised capability name	Function name from EAWG MVE report	Reference to SRIA per v1.0	Relevant Governance / Task forces /Working Groups	Key Published documents	Planned activities under EOSC Future inc WP/Task	Planned under other initiatives
EOSC Web presence	EOSC Portal (website)	5.5. User environments (first bullet in priorities)	EOSC Association Board of Director. EOSC Association Task Force on Researcher Engagement and Adoption	<p>EOSC Portal Collaboration Agreement https://wiki.eosc-hub.eu/display/EOSC/Collaboration+Agreements+and+MoUs?preview=/23233414/78316718/EOSC-hub___Enhance___OpenAIRE.pdf</p> <p>EOSC Enhance Deliverables https://eoscfuture.eu/eosc-enhance-deliverables</p> <p>D4.1/4.2 UX Model and verification of EOSC Portal development</p>	<p>WP10 on Stakeholder Engagement, Outreach & Marketing</p> <p>Connection with EOSC Association in WP2. Work on Architecture and other high level structures in WP3.</p> <p>WP5 Front Office</p>	
EOSC-Core Support	EOSC Support Services	5.5. User environments (first and second bullets in priorities)	<p>EOSC Association Task Force on Technical Interoperability of Data and Services</p> <p>EOSC Association Task Force on Rules of Participation and Compliance Monitoring.</p>	<p>EOSC Hub Integration Handbook https://zenodo.org/record/3826907#.XsOqEmgzY2w</p> <p>EOSC-SYNERGY EU DELIVERABLE: D2.2 Intermediate report on integration efforts http://hdl.handle.net/10261/223465</p> <p>EOSC Future Architecture & interoperability Guidelines https://wiki.eoscfuture.eu/display/EOSCF/Architecture+and+Interoperability+Guidelines</p>	<p>Support for integration of Core Services in T6.2, training coordination through WP9. Interoperability guidelines from t3.2</p>	

EOSC Open Science support	EOSC Open Science training and support	5.3 FAIR metrics and certification (priority 6 in FAIR metrics, priority 6 in FAIR certification) 5.6. Resource provider environments (second bullet in priorities)	EOSC Association Task Force Researcher Engagement & Adoption EOSC Association Task Force data stewardship and curricula EOSC Association Task Force on upskilling countries to engage in EOSC Task Force	Digital Skill for FAIR and open science - https://op.europa.eu/en/publication-detail/-/publication/af7f7807-6ce1-11eb-aeb5-01aa75ed71a1 LIBER Skills working group - https://libereurope.eu/strategy/digital-skills-services/digitalskills EOSC-Pilar training catalogue webinar - https://www.youtube.com/watch?v=CRbrrP5pOKo	Develop the EOSC Knowledge Hub: a Learning Management System to host courses and material and a catalogue of training material for all things around EOSC in WP5/WP9. Develop training material for onboarding and using services and data (WP9). WP5 Front Office	INFRA-2021-EOSC-01-01
EOSC Open Science Help Desk and Collaborative tools	EOSC Open Science Help Desk and Collaborative tools	5.6. Resource provider environments (forth bullet in priorities)	EOSC Association Task Force Researcher Engagement & Adoption	N/A	Development (adoption and adaptation) of a helpdesk platform to be used as a service (WP4)	
EOSC Open Science metrics	EOSC Open Science metrics	5.6. Resource provider environments (forth bullet in priorities) 4.7 Recommendations (4.7.6 Develop and monitor adequate policies for FAIR data and research objects)	EOSC Association Task Force on Research careers, recognition and credit	web site: http://osmonitor.openaire.eu "2020 Final Report of the Open Science Policy Platform https://ec.europa.eu/research/openscience/pdf/ec_rtd_ospp-final-report.pdf Indicator frameworks for fostering open knowledge practices in science and scholarship: https://op.europa.eu/s/uZMI	Open Science Monitor (WP5) EOSC Observatory (WP2)	Related calls (potential use of results) HORIZON-WIDERA-2021-ERA-01-40 Modelling and quantifying the impacts of open science practice HORIZON-WIDERA-2021-ERA-01-45 Support to changes in the assessment of research and researchers to reward the practice of open science HORIZON-INFRA-2022-EOSC-01-01 Services and tools to underpin a research assessment system that incentivises open science practices

EOSC Digital Innovation Hub	EOSC Digital Innovation Hub and Procurement	2.3.1 Europe-wide common data spaces	No current direct participation, but the following could be relevant to industry involvement: - EOSC Task Force on Rules of Participation - TF Defining Funding Models for EOSC	EOSC DIH Website: www.eosc-dih.eu Business Pilot Success Stories Publication: https://eoscdih.eu/wp-content/uploads/2021/04/EOSC_DIH_Business_Success_Stories_WEB_Mar2021.pdf EOSC Future D8.4 "EOSC DIH Strategy and Plans": when published	WP8 - T8.2 (DIH)	
EOSC Observatory	N/A	6.2. Landscape monitoring	EOSC Association Task force on Upskilling Countries to Engage in EOSC EOSC Association Task Force on Rules of Participation and Compliance Monitoring.	Working Proposal for Living Indicators to Monitor MS Progresses towards EOSC Readiness https://www.eoscsecretariat.eu/sites/default/files/working_proposal_for_living_indicators_to_monitor_ms_progresses_towards_eosc_readiness.pdf Landscape of EOSC-related infrastructures and initiatives https://op.europa.eu/s/uZMu	WP2 Observatory	
EOSC Knowledge hub: training catalogue and learning platform	N/A	6.4 Skills and Training, priority 3	EOSC Association Task Force on Researcher Engagement and Adoption	EOSC Future WP5 D5.1a EOSC Front-Office Design, Functional and Technical Specification	WP5 Front Office	

Table 6-5: Additional information related to the proposed EOSC-Exchange

Proposed revised capability name	Function name from EAWG MVE report	Reference to SRIA per v1.0	Relevant Governance / Task forces /Working Groups	Key Published documents	Planned activities under EOSC Future inc WP/Task	Planned under other initiatives
EOSC Data Transfer	Function name from EAWG MVE report	None	None	Based on ESCAPE Data Lake concept, see https://projectescape.eu/deliverables-and-reports/d22-assessment-and-analysis-performance-first-pilot-data-lake	Plans to try and horizontal data transfer services from similar services from thematic clusters (ESCAPE).	Work on related DataLake in ESCAPE project

EOSC Research data as a service	Research Data as a Service	5.7. EOSC Interoperability Framework (fifth bullet in priorities)	None	None	None	
EOSC Helpdesk as a service	EOSC Helpdesk as a service	5.5. User environments (implied in fourth bullets in priorities)	None	EOSC-hub Deliverables https://www.eosc-hub.eu/deliverables EOSC Hub D5.6 Final report on the integration of federation and collaboration services	Helpdesk activities in T4.4 in collaboration with other relevant tasks, see also https://docs.google.com/document/d/1tDdpPOxRUr5wIQ2gmH41AfCOABcENU7qqXJoHzsxxPA	

7 Appendix B: Current EOSC Inclusion criteria

The following criteria are currently used to validate Providers and Resources to be onboarded within the EOSC Service Portfolio. The criteria are still under development by a joint team consisting of members of EOSC Future and EOSC Enhance (and formerly EOSC-hub). The EOSC AISBL may define broader criteria, therefore the criteria are subject to change in the future.

- What groups can onboard to EOSC as a provider?
 - Any group can onboard to EOSC as a Provider, as long as it fills the necessary information in the EOSC Provider Profile.
 - Those onboarding as a provider should either be a legal entity or connect to the registration of a hosting legal entity already onboarded as a provider under their own profile.
- Who can onboard resources to EOSC
 - Providers onboarding a resource must assert that they are able to ensure the resource is delivered by them or their collaborators and agree to remove resources that are no longer operational or available.
 - Resources should be onboarded by the coordinating or lead provider in case of a federates or jointly provided resource (they are the 'Resource Organisation'). Other onboarded providers may be added as supporting or supplementary providers ('Resource providers').
- What resources may be connected to EOSC?
 - Services. At present only services are being onboarded.
 - It must be a specific service offered 'live' to customers³⁹. This may be an IT service, or a human service (e.g. training, consultancy).
 - It may not be a research product, for instance, a document, a dataset or a piece of software⁴⁰.
 - The Service must be discrete. It must be available and offer value on its own. It may not be only a feature of a larger service available while already using that service.
 - The Service must be of a reasonable maturity, Technology Readiness 7 or above in order to be listed in the catalogue (and TRL8 or above to allow for integration of ordering).
 - Services must meet at least one of:
 - The service must be targeted to EOSC and EOSC communities⁴¹.
 - The service must build on or leverage EOSC capabilities to serve some other community⁴².
 - Other resources, such as research products (data sets, publications, software and other types) will be able to be onboarded at a later date.
 - NOTE: while research products are not being directly onboarded, services that contain them such as data, software or publication repositories can be onboarded as services.

³⁹ Filling e.g. the definition according to FitSM-o - Service: Way to provide value to customers through bringing about results that they want to achieve. Note: In the context of the FitSM standard series, when referring to services, usually IT services are meant. From <https://www.fitsm.eu/download/280/> It should not be a generic menu of services from a provider, but the specific services themselves.

⁴⁰ A data repository service providing some annotation, tools over the data sets, enhanced features is likely a service. A simple link to a data file is not.

⁴¹ For instance, could be a service from the research community for researchers, or if a commercial service, includes a clear offer targeted at EOSC and research customers which addresses them, rather than be a generic commercial service. One example of the latter is a joint procurement framework targeting EOSC.

⁴² For instance, services through the Digital Innovation Hubs which build on EOSC expertise, resources and capabilities to create new, innovative commercial services.

- A provider profile and resource profiles for each resource must be filled, including at a minimum all required fields.
 - URLs must be Fully Qualified Domain Names (FQDN).
 - Key information must be in English due to the limitations of current project resources (thought this may change in future).
 - The provider and resource profiles must be in English.
 - The basic information in the User Interface for the service must be available in English.
 - Privacy statements, terms of use and Service Level Agreements, Specifications and Descriptions must be available in English. Other documentation may be in the native language only.
 - The Helpdesk or support function must be able to answer queries in English at a minimum.
 - Resources must be both available in Europe and available in a European language⁴³.
 - The provider must agree to periodically update data on themselves and their resources to keep it current (to be covered in an EOSC Provider agreement, under development).

⁴³ See https://europa.eu/european-union/about-eu/eu-languages_en

These criteria are managed by the EOSC Portal Onboarding Team: A collaboration of EOSC Future and EOSC Enhance (Formerly also including EOSC-hub, OpenAIRE Advance and eInfraCentral). They are developed in light of the evolving EOSC Rules of Participation, which provide higher-level guidance. If you have an enquiry or concern about these criteria please contact onboarding@eosc-portal.eu.