



EOOSC-hub

D2.3 First Governance and Sustainability Implementation Roadmap

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Deliverable Abstract

This deliverable describes the EOOSC-hub Governance and Sustainability Roadmap, outlining the plan for an effective collaboration between EGI, EUDAT and INDIGO-DataCloud beyond the end of 2020 in the provision of functions of the EOOSC Federating Core. It details the activities taking place between July 2019 and December 2020, addressing collaboration (activities), governance (oversight) and sustainability (funding).



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TERMINOLOGY

<https://wiki.eosc-hub.eu/display/EOSC/EOSC-hub+Glossary>

Terminology/Acronym	Definition
AAI	Authentication and authorisation infrastructure
Cluster Projects	Collaborative projects between ESFRI research infrastructures in similar disciplines, providing a gathering point for connecting to the EOSC
EC	European Commission
ECI	European Cloud Initiative
EDI	European Data Infrastructure
EGI	Federated e-Infrastructure to provide advanced computing services for research and innovation
EOSC	European Open Science Cloud
EOSC-hub PMB	Project Management Board of EOSC-hub project
EOSC Portal	The EOSC Service providing online access to and use of the EOSC Resources [Glossary 1.0]
EOSC Service	An EOSC Resource providing ready-to-use capabilities. EOSC Services are supplied by an EOSC Service Provider in accordance with the EOSC Rules of Participation for EOSC Service Providers. [Glossary 1.0]
EOSC Service Management System	Entirety of interconnected policies, processes, procedures, roles, agreements, plans, related Resources and other elements needed and used by a Service Provider to effectively manage the delivery of services to EOSC Customers
eInfraCentral	European E-Infrastructure Services Gateway, Horizon2020 project contributing to EOSC
ERAC	The European Research Area and Innovation Committee
ESFRI	European Strategy Forum on Research Infrastructures
EUDAT CDI	EUDAT Collaborative Data Infrastructure
EuroHPC JU	Joint collaboration between European countries and the European Union about developing and supporting exascale supercomputing
FAIR	Guiding principles to make data Findable, Accessible, Interoperable and Reusable
FAIRsFAIR	Fostering Fair Data Practices in Europe project, Horizon2020 project contributing to EOSC
FREYA	Connected Open Identifiers for Discovery, Access and Use of Research Resources project, Horizon2020 project contributing to EOSC
GÉANT	Pan-European data network for the research and education community
Horizon 2020	The EU Framework Programme for Research and Innovation Horizon 2020
HPC	High-performance computing
INDIGO-DataCloud	Integrating Distributed data Infrastructures for Global Exploitation
INFRAEOSC	Call dedicated to the implementation of the EOSC in the 2018-2020 Work Programme of Horizon 2020
OpenAIRE	Initiative to support the implementation of Open Access in Europe
OpenAIRE-Advance	OpenAIRE Advancing Open Scholarship, Horizon2020 project contributing to EOSC

PRACE	Partnership for Advanced Computing in Europe
SMEs	Small and medium-sized enterprises
WP	Work Programme of Horizon 2020

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Executive summary

This deliverable describes the EOSC-hub Governance and Sustainability Roadmap, outlining the plan for an effective collaboration between EGI, EUDAT and INDIGO-DataCloud beyond the end of 2020 in the provision of functions of the EOSC Federating Core, with the intention that this will lead towards a pan-European multi-disciplinary research e-Infrastructure for the provision of data and compute resources to European researchers. The Roadmap is driven by the expectation that collaboration between EGI, EUDAT and INDIGO-DataCloud which is seen to add value to the EOSC will help encourage the provisioning of resources to the EOSC by the national e-infrastructure systems and community/thematic services which is necessary to build critical mass for the EOSC

The roadmap is a set of activities, together with actors and proposed timings, considered necessary to achieve the above objective. The main steps of the roadmap are

- Formulating and publishing proposals for the definition of the EOSC Federating Core and its governance and sustainability
- Gathering and incorporating community input on the proposals and updating them in response
- Developing proposals for the participation of EGI, EUDAT and INDIGO-DataCloud in the INFRAEOSC-03 and -07 funding calls in agreement with GÉANT and OpenAIRE
- Incorporating considerations relating to procurement and business models into the proposals to produce a first business plan for the Federating Core
- Defining governance and sustainability arrangements for EGI, EUDAT and INDIGO-DataCloud suitable for the expected future participation and collaboration.

The roadmap includes in its scope the definition of the EOSC Federating Core – its composition and the effort required to deliver it, and the means of governing and funding it. Initial proposals for the EOSC Federating core services, were put forward by the EOSC-hub project in the Briefing Paper delivered to the EC during summer 2019¹.

The work is taking place in the broader context of ongoing collaboration between EOSC implementation projects, including the EOSC-hub-OpenAIRE Advance collaboration, and evolution of the overall European e-Infrastructures and EOSC landscape including the work of the EOSC Executive Board Working Groups, and also considering networking (GÉANT) and HPC (PRACE and EuroHPC). The process and considerations are focussed on understanding and responding to the needs and desires of the research community and the member states; the Roadmap therefore includes activities to consult across the community and incorporate feedback received.

Deliverables D2.4 (February 2020) and D2.5 (December 2020) will report on progress in implementing the roadmap and elaborate roadmap steps from March 2020 onwards in more detail, and will also update the roadmap if necessary, to adapt to changes in the EOSC landscape.

¹ <https://www.eosc-hub.eu/sites/default/files/EOSC-hub%20Briefing%20Paper%20-%20EOSC%20Federating%20Core%20Governance%20and%20Sustainability%20Public.pdf>

1 Introduction

This deliverable describes the Governance and Sustainability Roadmap process agreed between EGI, EUDAT and INDIGO-DataCloud, addressing the aspects of collaboration (activities), governance (oversight) and sustainability (funding). It details the scope, main phases, activities and milestones of the Roadmap process taking place between July 2019 and December 2020.

The EOSC-hub project contributes to the development of the European Open Science Cloud. The project mobilises providers from the EGI Federation, EUDAT CDI, INDIGO-DataCloud and other major European research infrastructures to deliver a common catalogue of research data, services and software for research. As well as having a wide representation of the research community within the EOSC-hub project partners, EOSC-hub collaborates widely with the research community in the many other Horizon2020 EOSC implementation projects and via the EOSC Executive Working Groups² to deliver a consistent service offer for research communities across Europe developed from understanding of the community's requirements.

Work Package 2 (WP2) of EOSC-hub is concerned with the overall policy, business and service strategy of the project. Its activities include defining and managing the overall project strategy, supporting evolution of services by managing the service roadmap, service portfolio and service catalogue, and defining a sustainability plan for organising and sustaining the provision of data and compute resources to European researchers in the context of the EOSC.

Set within this broader context and guided by the overall project strategy³, the objectives of Task 2.3 (Governance and Sustainability) of EOSC-hub WP2 are

- to identify and prepare the means to sustain collaboration between EGI, EUDAT and INDIGO-DataCloud and their associated communities beyond the lifetime of the EOSC-hub project, in concertation with the EOSC governance and the EDI⁴, and
- to engage with initiatives such as OpenAIRE, GÉANT, PRACE and EuroHPC to align strategies.

The intention is that this will lead towards

- an effective governance, operational and cost model of the EOSC Federating Core, and
- a pan-European multi-disciplinary research e-Infrastructure for the provision of data and compute resources to European researchers.

The main output of Task 2.3 will be the definition and implementation of a Sustainability Roadmap for organising and sustaining the provision of data and compute resources to European researchers in the context of the European Open Science Cloud.

² <https://www.eoscsecretariat.eu/eosc-working-groups>

³ Deliverables D2.1 - see <https://www.eosc-hub.eu/deliverable/first-eosc-hub-strategy-plan> - and D2.2 <https://www.eosc-hub.eu/deliverable/d22-final-eosc-hub-strategy-plan-submitted>

⁴ European Data Infrastructure. Part of the EC's European Cloud Initiative. For a brief introduction, see <https://ec.europa.eu/digital-single-market/en/%20european-cloud-initiative>

Task 2.3 is responsible for producing three Deliverables. The first of these is the current Deliverable, D2.3, which outlines the plan agreed for achieving sustainable collaboration, i.e. it defines and describes the Roadmap process which will take place from July 2019 until December 2020.

This will be followed in February 2020 by Deliverable D2.4, Detailed Sustainability Implementation Roadmap, which will provide an update and further details of progress in implementing the plan, and in December 2020 by Deliverable D2.5, Final Governance and Sustainability Implementation Roadmap, which will report on the outcome of the implementation of the roadmap.

In the chapters which follow, Chapter 2 describes the Roadmap's objective, scope, motivating factors, main contributors and the overall consultation process which will be undertaken. Chapter 3 contains a detailed description of the Roadmap, in the form of a table describing the Roadmap's steps and their outputs, the partners who will be involved and the audience for each. Chapter 5 contains some brief concluding remarks. The Appendices contain a summary of initial feedback received on the EOSC-hub Briefing Paper on the EOSC Federating Core Governance and Sustainability⁵, discussion of relevant European and EOSC-hub documents of relevance to the T2.3 work, and relevant timelines from the EOSC Strategic Implementation Plan⁶.

⁵ https://www.eosc-hub.eu/sites/default/files/EOSC-hub%20Briefing%20Paper%20-%20EOSC%20Federating%20Core%20Governance%20and%20Sustainability%20Public_0.pdf

⁶ <https://publications.europa.eu/en/publication-detail/-/publication/78ae5276-ae8e-11e9-9d01-01aa75ed71a1/language-en>

2 Roadmap Motivation and Definition

2.1 Objective and Scope

This document describes the EOSC-hub Governance and Sustainability Roadmap. The objective of the Roadmap is to outline the plan for an effective collaboration between EGI, EUDAT and INDIGO-DataCloud beyond the end of 2020 in the provision of functions of the EOSC Federating Core. The Roadmap process is being approached in an open-minded manner, without pre-conceived ideas of what the eventual outcome should be. It is possible it will produce proposals which carry significant implications for the legal form and function of EGI, EUDAT and INDIGO-DataCloud. The proposals will need to meet the approval of the respective governing bodies – and therefore the members - of EGI, EUDAT and INDIGO-DataCloud.

The roadmap is a set of activities, together with actors and proposed timings, considered necessary to achieve the above objective.

The main steps of the roadmap are

- Formulating and publishing proposals for the definition of the EOSC Federating Core and its governance and sustainability
- Gathering and incorporating community input on the proposals and updating them in response
- Developing a coherent set of proposals for the participation of EGI, EUDAT and INDIGO-DataCloud in the INFRAEOSC-03 and -07 funding calls in agreement with GÉANT and OpenAIRE
- Incorporating considerations relating to procurement and business models into the proposals to produce a first business plan for the Federating Core
- Defining governance and sustainability arrangements for EGI, EUDAT and INDIGO-DataCloud suitable for the expected future participation and collaboration.

The roadmap considers in its scope the definition of the EOSC Federating Core – its composition and the effort required to deliver it, and the means of governing and funding it. Initial proposals for the EOSC Federating core services, were put forward by the EOSC-hub project in the Briefing Paper delivered to the EC during summer 2019⁷, which developed concepts from the EC EOSC Roadmap documents⁸ and drew on outputs of the EOSCpilot project⁹, in particular the conclusions and recommendations of its Science Demonstrator pilots.

The Roadmap will draw on the work of EOSC-hub on Thematic Services (WP7), Competence Centres (WP8) and Digital Innovation Hubs (WP9) as well as EGI and EUDAT existing sustainability plans, and leverage work on Business Models and Procurement (WP12) to translate viable funding

⁷ <https://www.eosc-hub.eu/sites/default/files/EOSC-hub%20Briefing%20Paper%20-%20EOSC%20Federating%20Core%20Governance%20and%20Sustainability%20Public.pdf>

⁸ https://ec.europa.eu/research/openscience/pdf/swd_2018_83_f1_staff_working_paper_en.pdf and https://ec.europa.eu/research/openscience/pdf/eosc_strategic_implementation_roadmap_large.pdf

⁹ <http://eoscpilot.eu>

and business models into formal governance requirements and investigate legal constraints and opportunities. The work will take place in the broader context of ongoing collaboration between EOSC implementation projects, including the EOSC-hub-OpenAIRE Advance collaboration, and an evolution of the overall European e-Infrastructures and EOSC landscape including the work of the EOSC Executive Working Groups, and also considering networking (GÉANT) and HPC (PRACE and EuroHPC). The roadmap will therefore be regularly reviewed and adapted where needed in response to developments in this wider environment. The work will also be influenced by the INFRAEOSC-03 and -07 funding calls¹⁰. The INFRAEOSC-03 call is expected to fund the successor project to EOSC-hub. The INFRAEOSC-07 call is expected to fund several other projects which will also contribute towards the EOSC.

The process and considerations are focussed on understanding and responding to the needs and desires of the research community and the member states.

2.2 Roadmap Drivers and Barriers

The investigation of closer collaboration between EGI, EUDAT and INDIGO-DataCloud is driven by several factors, including

- the fundamental vision of the EC for the EOSC, that it will provide users with open and **seamless** services, **overcome fragmentation** of scientific data infrastructures and **federate** existing infrastructures¹¹
- the push by governmental and funding agencies, which ultimately provide the funding for European e-Infrastructures, for greater interoperability of services and data to **optimise the use of resources** and **foster interdisciplinary research** as a catalyst of scientific breakthroughs and innovations¹²
- there is sustained encouragement from the European Commission, via the Horizon 2020 Work Programmes, for **consolidation and integration** of the European e-Infrastructures¹³, leading to the collaboration in EOSC-hub of EGI, EUDAT and INDIGO-DataCloud and to collaboration agreements between EOSC-hub and other projects, notably OpenAIRE Advance¹⁴
- the EOSC-hub project **vision**¹⁵ is that researchers from all disciplines have **easy, integrated and open access** to the advanced digital services, scientific instruments, data, knowledge and expertise they need to collaborate to achieve excellence in science, research and

¹⁰ See https://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-infrastructures_en.pdf

¹¹ COM(2016) 178 final, April 2016

<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016DC0178&from=EN>

¹² See for example the European Research Area Roadmap 2015-2020 <http://data.consilium.europa.eu/doc/document/ST-8975-2015-INIT/en/pdf>

¹³ See for example https://ec.europa.eu/research/participants/data/ref/h2020/wp/2016_2017/main/h2020-wp1617-infrastructures_en.pdf page 31

¹⁴ See <https://wiki.envri.eu/download/attachments/23233414/CA%20EOSC-hub%20OpenAIRE%20v1.1.pdf?version=1&modificationDate=1527073752407&api=v2>

¹⁵ Referenced in <https://www.eosc-hub.eu/sites/default/files/EOSC-hub%20D2.1%20FINAL.pdf>

innovation. For this vision to be sustained and progressed beyond the EOSC-hub project requires discussion of continued collaboration between EGI, EUDAT and INDIGO-DataCloud.

Taken together, these factors lead to the conclusion that effective collaboration between EGI, EUDAT and INDIGO-DataCloud which is seen to add value to the EOSC will help encourage the provisioning of resources to the EOSC by the national e-infrastructure systems and community/thematic services which is necessary to build critical mass for the EOSC.

Factors which discourage or act as barriers to closer collaboration between EGI, EUDAT and INDIGO-DataCloud include

- lack of a defined business model for the EOSC – demonstrating for example how the demand- and supply-side needs of EOSC stakeholders will be met - causing lack of clarity about the EOSC as the entity to which the European e-Infrastructures contribute, including the nature of the relationship between their governance and that of the EOSC itself
- lack of clarity about the scope of the INFRAEOSC-03 and -07 calls, which poses challenges for determining how activities and collaboration should be arranged across different project proposals
- the spectrum of different national landscapes across European countries, with developments which are not always in precisely the same direction¹⁶
- trust in the longevity of the EOSC, although trust could in fact be enhanced by stronger collaboration between European e-Infrastructures.

The work of Task 2.3 takes place within a rapidly evolving policy and project landscape and amidst the challenges of multiple project collaborations. Since the EOSC-hub project was initially planned during 2017, using the European Cloud Initiative Communication and the Horizon 2020 2016-17 Work Programme as its basis, the EOSC landscape has evolved. The EC has published its EOSC Implementation Roadmap (EC Staff Working Document, March 2018)¹⁷ and the EOSC Phase I governance has been established (November 2018)¹⁸. The 2019 update to the Horizon2020 Research Infrastructures Work Programme¹⁹ has been published (July 2019), including information about the INFRAEOSC-03 and -07 funding calls which are expected to fund continuing activities of relevance to EGI, EUDAT and INDIGO-DataCloud, and the EOSC Executive has also very recently published its Strategic Implementation Plan²⁰ which describes the five priority areas it will address via its first five Working Groups (Architecture, FAIR, Landscape, Rules of Participation and Sustainability) which are all now up and running, and provides a timeline of key outputs, the most

¹⁶ See for example the e-IRG study on the National Nodes <http://e-irg.eu/catalogue/eirg-1006>

¹⁷ See

https://ec.europa.eu/research/openscience/pdf/swd_2018_83_f1_staff_working_paper_en.pdf

¹⁸ See <https://www.eosc-portal.eu/governance>

¹⁹ https://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-infrastructures_en.pdf

²⁰ <https://publications.europa.eu/en/publication-detail/-/publication/78ae5276-ae8e-11e9-9d01-01aa75ed71a1/language-en>

relevant of which are replicated in Appendix III. The Plan also includes a list of current Horizon2020-funded projects which are contributing to the implementation of the EOSC.

Within the EOSC-hub project itself, the first EOSC-hub Strategy Plan (D2.1) has been published (September 2018), the first informal joint EC review of EOSC-hub, OpenAIRE Advance and eInfraCentral has taken place (January 2019), the EOSC-hub-OpenAIRE Advance Collaboration Agreement has entered into force (April 2018), and the EOSC-hub-OpenAIRE Advance JAM3.3 White Paper on a Common Vision, Service Provision and Role in the EOSC Governance has been published (March 2019)²¹. The final EOSC-hub Strategy Plan (D2.2)²² and an analysis of procurement requirements and associated business models (D12.1)²³ were also both published in June 2019.

Relevant aspects of these initiatives and activities are reviewed in Appendix II to describe in some more detail the context within which the T2.3 work is taking place.

The EOSC landscape is very complex for a number of reasons

- the large number of actors involved in the European Open Science arena
- the variety of e-infrastructures, research infrastructures, projects and initiatives which are already or may be related to the EOSC
- the usually uncorrelated funding streams for the different activities which have often led to thematic silos or, in the worst case, to competing actions
- the difficulty of harmonising services and other activities which have originated from independent environments
- many different, and sometimes overlapping, projects and initiatives to define what the EOSC should be in practice and which form for its governance may be effective.

This document aims at providing a contribution to addressing this situation, based on experience in the EOSC-hub project, also taking into consideration the roles of the main actors in the EOSC arena and the project collaborations established so far.

2.3 Contributors and Consultation

The work to draft and implement the Roadmap is being conducted by Task 2.3 (Governance and Sustainability) of EOSC-hub but an important part of the Roadmap is gathering input and feedback on the proposals for the EOSC Federating Core from a wide variety of stakeholders across the research community, including European research infrastructures and international scientific collaborations, potential commercial service providers, other EOSC implementation projects, the EOSC Executive Board Working Groups, and the European Commission. The Roadmap includes activities to consult across the community and incorporate feedback received so as to develop proposals for the Federating Core on which there is broad consensus. This will provide a sound basis on which to develop the governance and sustainability proposals for EGI, EUDAT and INDIGO-

²¹ See <https://documents.egi.eu/public/ShowDocument?docid=3443>

²² <https://www.eosc-hub.eu/deliverable/d22-final-eosc-hub-strategy-plan-submitted>

²³ <https://www.eosc-hub.eu/deliverable/d121-procurement-requirements-and-demand-assessment-submitted>

DataCloud. The Federating Core Briefing Paper published in July was the subject of a public webinar and online consultation and will be updated based on feedback received from these and other activities. The proposals have already received feedback from five respondents – 4 EOSC implementation projects including GÉANT and a national e-Infrastructure provider – via the online consultation up to 26 August 2019²⁴ and this first set of feedback is summarised in Appendix I, from the FREYA and FAIRsFAIR projects, from the EOSC Executive Sustainability Working Group via their strawman paper published on 9 September 2019, from the Science Business Cloud Consultation Group during discussion in their meeting on 11 September, and also in general from discussions at the EC EOSC Concertation meeting on 9 and 10 September in Brussels. The Briefing Paper was also sent to PRACE in July for comment, but no response was received. Further consultation and discussion already planned or underway includes gathering feedback from the EOSC-hub WP7 Cluster Projects at a meeting on 20 September, discussing the Federating Core proposals at the EOSC-hub Strategy Board meeting on 25 September, and combining the Federating Core Briefing Paper and the OpenAIRE Advance “OpenAIRE in EOSC” White Paper²⁵ to produce an updated paper forming the basis of a community position paper. Discussions with the Sustainability Working Group co-chair led to an agreement to continue to liaise and provide input to one another’s work.

EGI, EUDAT and INDIGO-DataCloud are primarily collaborations undertaken and sustained by national actors or members and it is they who are ultimately responsible for the collaborations. The governance and sustainability proposals produced by the Roadmapping process will need to be approved by these national members. They will be consulted on proposals produced during the journey, helping to provide input from national Research Infrastructures. The governing bodies of EGI, EUDAT and INDIGO-DataCloud will be kept informed throughout the process and will be consulted on and, finally, asked to approve the governance and sustainability proposals developed by the Roadmap.

²⁴ See <https://www.eosc-hub.eu/news/federating-core-governance-and-sustainability>

²⁵ To be published

3 Roadmap Step-by-Step

The table below summarises the main activities envisaged as forming the Roadmap. The proposed timings may vary. D2.4 will provide an update, reporting on how activities have unfolded, and presenting an updated set of milestones and/or their timings if necessary.

Timeline	Milestone and Partners	Output and Audience
Development and publication of proposals on EOSC Federating Core definition, governance and sustainability		
June 2019	First discussion of proposals on the EOSC federating core Partners: EOSC-hub WP2	D2.3 Draft Audience: EOSC-hub PMB, EC
July 2019	Drafting and publication of EOSC-hub Briefing Paper on EOSC Federating Core Governance and Sustainability, approved by EGI, EUDAT and INDIGO-DataCloud Chairmen Partners: EOSC-hub WP2	EOSC-hub Briefing Paper on EOSC Federating Core Governance and Sustainability Audience: EGI, EUDAT, INDIGO-DataCloud; research community
Consultation, discussion and feedback on Federating Core proposals		
August 2019	Webinar and online open consultation on EOSC-hub Briefing Paper on EOSC Federating Core Governance and Sustainability Partners: EOSC-hub WP2 and WP3	Survey responses Audience: research community, EOSC implementation projects
September 2019	Gather input from Science Business Cloud Consultation Group Partners: EOSC-hub and Science Business Cloud Consultation Group	Feedback on proposals Audience: Science Business members including commercial cloud providers
September 2019	Gather input from Cluster Projects via EOSC-hub WP7 (Thematic Services) meeting and EOSC-hub Strategy Board meeting Partners: EOSC-hub WP2, WP7 and Strategy Board	Feedback on proposals Audience: EOSC-hub WP7, Strategy Board
September-October 2019	Consultation with EGI, EUDAT and INDIGO-DataCloud members on EOSC-hub Briefing Paper on EOSC Federating Core Governance and Sustainability Partners: EOSC-hub WP2, EGI, EUDAT, INDIGO members	National e-Infrastructures perspective (via survey responses?) Audience: EGI, EUDAT and INDIGO-DataCloud members
October 2019	Gather input from EOSC-hub WP8 Competence Centres (EOSC early	Feedback on position paper proposals

Timeline	Milestone and Partners	Output and Audience
	adopter research communities) on joint position paper Partners: EOSC-hub WP2 and WP8	Audience: WP2 and WP8
November 2019	Gather input from EOSC-hub WP9 Joint Digital Innovation Hub (SMEs, industry, startups etc) on joint position paper Partners: EOSC-hub WP2 and WP9	Feedback on position paper proposals Audience: WP2 and WP9
November-December 2019	Consultation of EuroHPC/PRACE about EOSC Federating Core proposals Partners: EOSC-hub WP2, EuroHPC/PRACE	Feedback from EuroHPC/PRACE on Federating Core proposals Audience: WP2, EuroHPC/PRACE
Updated Briefing Paper and Community Position Paper		
October 2019	Combination of procurement, business modelling and incentives considerations with Federating Core proposals to update Briefing Paper with how procurement of the federating core should be organised Partners: EOSC-hub WP2 and WP12	Input to EOSC Federating Core community position paper Audience: EOSC-hub, OpenAIRE-Advance, ESFRI Cluster projects, FAIRsFAIR
By mid-November 2019	Drafting and publication of EOSC community position paper, 1st draft, incorporating feedback received to date	EOSC community position paper, v1.0 Audience: (1) EOSC Governance, (2) EOSC Community
December 2019	EOSC Community Position Paper, final, including proposing which services should be adopted by EOSC as part of the Minimal Viable Ecosystem (Federating Core) Partners: EOSC-hub, EOSC community	EOSC community position paper, final Audience: (1) EOSC Governance, (2) EOSC Community (3) EGI, EUDAT, INDIGO-DataCloud governance/members
EOSC-hub-OpenAIRE-Advance Collaboration activity		
September 2019	Drafting and publication of Aligned Roadmap(s) for Service Positioning and Sustainability within EOSC Partners: EOSC-hub and OpenAIRE-Advance	JAM3.4 Briefing Paper Audience: EOSC-hub PMB, OpenAIRE-Advance Executive Office, EC
October 2019	Incorporating feedback to date and combination of Federating Core Briefing Paper with OpenAIRE White Paper	EOSC-hub-OpenAIRE Advance EOSC position paper

Timeline	Milestone and Partners	Output and Audience
	<p>“OpenAIRE in EOSC” to produce a joint position paper</p> <p>Partners: EOSC-hub and OpenAIRE Advance</p>	<p>Audience: EC, EOSC governance, research community, EOSC implementation projects</p>
Development of a first Federating Core Business Plan		
November-December 2019	<p>Research and analysis of EGI, EUDAT and INDIGO-DataCloud existing businesses including business models and sustainability plans</p> <p>Partners: EOSC-hub WP2, EGI, EUDAT, INDIGO-DataCloud</p>	<p>Identify inefficiencies, overlaps, key success factors and opportunities including joint use cases</p> <p>Audience: EGI, EUDAT, INDIGO-DataCloud governance</p>
December 2019	<p>First federating core business plan:</p> <p>Federating Core composition, cost model and process for selecting providers – identifying business opportunities for EGI, EUDAT, INDIGO-DataCloud</p> <p>Partners: WP2</p>	<p>Federating Core Business plan</p> <p>Audience: EOSC-hub PMB; EGI, EUDAT, INDIGO-DataCloud governance/members</p>
Preparation of INFRAEOSC-03 and -07 proposals and projects		
Mid-November 2019	<p>Sustainability discussion meeting – mapping activities/outputs for the INFRAEOSC-03 and -07 proposals</p> <p>Partners: EGI, EUDAT, INDIGO-DataCloud, OpenAIRE, GÉANT</p>	<p>Functions/activities for inclusion in -03 proposal and in -07 proposals</p> <p>Audience: EGI, EUDAT, INDIGO-DataCloud, EOSC-hub partners, OpenAIRE, GÉANT</p>
November 2019	<p>Present proposals of which of EGI, EUDAT and INDIGO-DataCloud’s services/activities and other project stakeholders will be continued in which of the -03 and -07 projects (key exploitable result) at EOSC-hub General Assembly 25 Nov</p> <p>Partners: EOSC-hub WP2 and Project Office</p>	<p>Proposed services/activities for the -03 and -07 projects</p> <p>Audience: EOSC-hub GA 25 Nov</p>
To end of March 2020	<p>Contribution to project proposals for H2020 calls INFRAEOSC-03 and -07 –</p>	<p>INFRAEOSC-03 and -07 project proposals</p> <p>Audience: EC</p>

Timeline	Milestone and Partners	Output and Audience
	drawing on community position paper and business plan Partners: INFRAEOSC-03 and -07 proposals partners	
April 2020	INFRAEOSC-03 and -07 proposals submission deadline Partners: proposal partners	INFRAEOSC-03 and -07 project proposals Audience: EC
August/September 2020	Result of evaluation of INFRAEOSC-03 and -07 proposals Partners: EC	Evaluation results Audience: proposals' project partners
September-December 2020	Preparation for INFRAEOSC-03 and -07 project implementations within EGI, EUDAT and INDIGO-DataCloud – including agreeing any alterations which may be required to legal forms, governance or sustainability Partners: EGI, EUDAT, INDIGO-DataCloud	Possibly, agreed new legal forms, governance, sustainable funding flows Audience: EC, EGI, EUDAT, INDIGO-DataCloud
January 2021	Start of INFRAEOSC-03 project	
EOSC-hub WP2 project commitments		
November 2019	(Fulfilment of EOSC-hub Milestone M2.4: “Sustainability Roadmap Implementation Kick-off Summit”) EOSC Federating Core Workshop, EOSC Symposium, Budapest, 26-28 Nov Partners: EOSC-hub WP2 and WP3, EOSC Exec WGs (Sust and Arch)	Input towards final EOSC community position paper Audience: EOSC community
February 2020	Drafting and publication of Deliverable D2.4 (Detailed Sustainability Implementation Roadmap) - updated roadmap reporting on progress and elaborating activities for March-October 2020/EOSC-hub WP2	D2.4 Detailed Sustainability Implementation Roadmap Audience: EOSC-hub PMB, EC; EGI, EUDAT and INDIGO-DataCloud governance
December 2020	Drafting and publication of EOSC-hub deliverable D2.5 Final Governance and Sustainability Roadmap	D2.5 Final Governance and Sustainability Roadmap

Timeline	Milestone and Partners	Output and Audience
	Partners: EOSC-hub WP2	Audience: EOSC-hub PMB, EC; EGI, EUDAT and INDIGO-DataCloud governance

4 Concluding Remarks

The Roadmap process is being approached in an open-minded manner, without pre-conceived ideas of what the eventual outcome should be. The Roadmap has been defined without any bias towards any given model for sustainability or governance. Based on the current landscape and expectations, success of the Roadmap process would be formulation of governance and sustainability proposals which are adopted and implemented from 2021 onwards. This includes the possibility of agreeing that the existing structures and funding flows are continued unaltered.

The policy and political landscape of the EOSC continues to evolve rapidly and, particularly with the new European Parliament now in place and a new European Commission college taking office in November 2019, the EOSC may develop in a different direction to that currently mapped out in European policy documents.

Deliverables D2.4 (February 2020) and D2.5 (December 2020) will report on progress in implementing the roadmap and elaborate roadmap steps from March 2020 onwards in more detail, and will also update the roadmap if necessary, to adapt to changes in the EOSC landscape.

Appendix I. Briefing Paper Consultation Analysis

The “EOSC-hub Briefing Paper – EOSC Federating Core Governance and Sustainability” was the subject of an online consultation which was open from 22 July until 26 August 2019. Five responses were received. Four were from Horizon2020 EOSC-relevant implementation projects. The fifth response was from a national e-Infrastructure (compute and data services) and associated services provider.

I.1 Shared Resources

Respondents had difficulty understanding the proposed Shared Resources, and particularly the distinction between the Shared Resources and the Service Portfolio, and it was observed that Shared Resources should perhaps be outside the Federating Core altogether. One respondent stated that the Resource Tier should include access to scientific output but not scientific outputs themselves. Another felt the Shared Resources should include data and scientific outputs but not services. The relationship between the Shared Resources and the Hub Portfolio was also felt to be unclear.

One respondent suggested that the Shared Resources could include generic compute and data services functionalities such as cloud IaaS, HTC farms, HPC farms, accelerated computing, container execution, machine learning, map-reduce, Jupyter notebooks, data catalogues and data storage both short-term and long-term.

It was also observed that the delivery of Shared Resources will be influenced by the EC Procurement Directive.

I.2 Hub Portfolio

There were differing views of the purpose of the Hub Portfolio, depending on the respondent’s opinion about the composition of the Shared Resources.

One opinion is that the Hub Portfolio should be an interoperable integrating layer facilitating the combined exploitation of the Shared Resources such as infrastructure-wide orchestration, scheduling, workflows, data discovery and management and other functions facilitating seamless access. There was a suggestion that collaboration software should include a code repository. The proposals should recognise that the Hub Portfolio may evolve over time as technologies and practices change.

One firmly expressed opinion on the Federating Core was that it should be minimal and should focus on enabling federation rather than on integrating services. The Hub Portfolio should provide a set of functionalities rather than a set of services. For example, core AAI, into which federated AAI services will plug (rather than federated AAI services, which would be available through the Service Portfolio). This respondent states that the core functions should be limited to network architecture, security, Rules of Participation, access management, APIs (interacting with a centrally branded and managed Portal), interoperability guidelines, and support and appropriate usage “accounting”/reporting to achieve a federated EOSC. One specific recommendation is that service packaging does not need to be part of the EOSC Hub Portfolio, but that “Service Packaging as a

Service” could be offered by service providers if there was demand for it. The standard (Matchmaker) and advanced (One Stop Shop) levels of integration should be left for future stages of the EOSC.

PID services, specifically PID creation, assignment, resolution, description and search, should have a place in the Federating Core, but it was pointed out that the governance proposals don’t take account of the place of existing infrastructures/services with established governance mechanisms and possibly a global reach. They caution against “reinventing the wheel”: duplicating existing services just to have them in the EOSC and subject to it.

I.3 Compliance Framework

There was agreement that the Compliance Framework should be governed by the EOSC. Exclusivity should be avoided, and established practices and tools of communities should be acknowledged. One response envisages the Compliance Framework capabilities - service management, policies, procedures, interoperability, standards compliance, quality assurance - being provided under the coordination of existing pan-European initiatives such as EGI while actual delivery is contracted to the national digital infrastructures. Quality Assurance was seen as important.

Compliance tracking should work across all three elements of the Federating Core.

One respondent felt the service management platform seemed to introduce a superfluous layer in the existing supply chain whose value or need is not clear. This respondent also felt a single AUP was unrealistic and recommended following the principle of subsidiarity for AUP.

I.4 Access, Governance and Sustainability

It was considered important to look at the incentives for suppliers to make their resources available through the EOSC, and to look at the costs involved for potential suppliers, particularly commercial cloud providers, to integrate their current mechanisms for advertising and accessing their offerings.

There was agreement with the proposal to make the Hub Portfolio and Compliance Framework elements of the Federating Core accessible through the Wide Access mode to all suppliers participating in the EOSC federation, with the caveat that there should be no charge for access.

There were no objections to the proposals for access modes applicable to the Shared Resources, but there was some restraint in agreeing to them due to the need to understand funding/compensation models (WP12), and to address service governance proposals (e.g. in light of observations made about PID service provision).

There was agreement to the proposal that services in the EOSC service portfolio are independently owned by their respective providers, with a reminder from one respondent that discoverability and accessibility should not be exclusively through the EOSC portal.

Where the EOSC intends to provide services, there needs to be recognition that there are significant operational requirements (and costs) including supply market analysis, marketing to the supply market and the procurement/contracting effort.

I.5 Next steps

Based on the feedback received to date via the survey and via other routes, points to address in future iterations of the paper include procurement and business models; supplier incentives; certification; clarification and elaboration of the helpdesk function; detailed description of the service management system; further elaboration of the Compliance Framework including the interoperability guidelines; prioritisation of federating core services based on requirements of cluster projects and thematic service providers; increased emphasis on security; further consideration of the role and definition of Shared Resources; updated cost estimates to include further activities such as marketing, supply market analysis and procurement; and inclusion of further use cases.

Appendix II. European Policy Context

Relevant aspects of some recent EU policy developments and of relevant EOSC-hub activities are described below.

II.1 European Policy Documents

II.1.1 European Cloud Initiative

The EOSC-hub (Integrating and Managing Services for the European Open Science Cloud) project contributes to the development of the European Open Science Cloud as described by the European Commission in its April 2016 Communication “European Cloud Initiative – Building a Competitive Data and Knowledge Economy in Europe”²⁶. The European Cloud Initiative (ECI), part of the EC’s Digital Single Market policy, aims to strengthen Europe’s position in data-driven innovation, improve its competitiveness and cohesion, and help create a Digital Single Market in Europe. It will provide European science, industry and public authorities with:

- a world-class data infrastructure to store and manage data
- high-speed connectivity to transport data
- ever more powerful High-Performance Computers to process data.

The ECI proposes a European Open Science Cloud (EOSC), to offer Europe’s 1.7 million researchers and 70 million science and technology professionals a virtual environment to store, share and re-use the large volumes of information generated by the big data revolution. Key points in the EC’s vision for the EOSC laid out in the ECI are that it will provide users with open and **seamless** services, and that it will **overcome fragmentation** of scientific data infrastructures and **federate** existing infrastructures. One of the concrete actions the ECI proposed for realising the EOSC was use of the Horizon 2020 Work Programmes to provide funding to *integrate and consolidate* European e-infrastructure platforms – i.e. in general terms, to increase collaboration between the European e-Infrastructures. The ECI also anticipates that the EOSC governance “will oversee long-term funding, sustainability, data preservation and stewardship”.

II.1.2 EC EOSC Implementation Roadmap and Strategic Implementation Roadmap

The EC’s EOSC Implementation Roadmap Staff Working Document²⁷ provided further detail of the implementation of the EOSC including structuring it along six action lines. It contains many points of relevance to the T2.3 work but in particular its description of the EOSC architecture (see page 10) informed the proposals for the EOSC federating core, structured to include shared resources and a compliance framework. The roadmap also defines key milestones in the implementation of the EOSC which inform the workplans of the EOSC-hub project and the EOSC Executive Working Groups (see Appendix III).

²⁶ COM(2016) 178 final, April 2016

<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52016DC0178&from=EN>

²⁷ https://ec.europa.eu/research/openscience/pdf/swd_2018_83_f1_staff_working_paper_en.pdf

The Strategic Implementation Roadmap²⁸ provides further detail, including some description of the EC's view of the Federating Core (see pages 38 and 39), but also including information about business models.

II.1.3 Horizon 2020 Work Programme(s)

The European e-Infrastructures, such as EGI, EUDAT, OpenAIRE and GÉANT, are in part funded by the European Commission through the Research Infrastructures (RI) section of the Horizon 2020 Work Programmes. The 2016-17 RI Work Programme, in the e-Infrastructures call H2020-EINFRA-2016-2017, included a theme called “Integration and consolidation of e-infrastructure platforms supporting European policies and research and education communities” which led to the funding of the EOSC-hub and OpenAIRE Advance projects as a result of the EINFRA-12-2017 call for proposals. Both projects started on 1 January 2018 and will last for three years. The projects were required to conclude a Collaboration Agreement with one another whose purpose was to work on potential synergies, overlaps and gaps in the overall service offering, to develop a set of services and resources that will become part of the EOSC. Collaboration Agreements were also required with related projects including eInfraCentral²⁹ and GÉANT (GN4-2 and GN4-3).

The 2018-20 RI Work Programme has already led to numerous EOSC-relevant projects, a summary of which is included in EOSC-hub Deliverable D2.2³⁰. The Work Programme has recently been updated³¹ to elaborate details of calls to be published in autumn 2019 and in 2020, expected to fund further projects of relevance to the EOSC and to the European e-Infrastructures.

II.2 EOSC-hub Outputs

II.2.1 EOSC-hub Strategy

Deliverable D2.1, the First EOSC-hub Strategy Plan³², was published in September 2018. The EOSC-hub vision is that researchers from all disciplines have easy, integrated and open access to the advanced digital services, scientific instruments, data, knowledge and expertise they need to collaborate to achieve excellence in science, research and innovation. In other words, making data and infrastructure sharing the default. D2.1 observed that technical integration and common standards are needed to achieve this, but organisational and human factors will also contribute, including stronger and better-developed collaboration between the European e-Infrastructures which will form the core of the EOSC.

D2.1 proposes a vision where EOSC stakeholders, in particular data and service providers, collaborate to establish the Hub as an access channel to data and services – coming both from research infrastructures and e-Infrastructures – which are made “open” to the entire research

²⁸ https://ec.europa.eu/research/openscience/pdf/eosc_strategic_implementation_roadmap_large.pdf

²⁹ <https://einfracentral.eu/>

³⁰ <https://www.eosc-hub.eu/deliverable/d22-final-eosc-hub-strategy-plan-submitted>

³¹ https://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-infrastructures_en.pdf

³² See <https://www.eosc-hub.eu/deliverable/first-eosc-hub-strategy-plan>

community. It details areas which should be the focus of development in EOSC-hub, under the headings of Architecture, Data capabilities, Services, Access and interfaces, Business model and Stakeholder engagement. It observes that EOSC-hub must be able to articulate a clear value proposition to research communities' generic and thematic platforms and service providers.

D2.1 views EOSC-hub as a key instrument for achieving progress in the six action lines defined in the EC's Implementation Roadmap for the European Open Science Cloud³³ and describes five roles the Hub should play to contribute towards the action lines.

The Final EOSC-hub Strategy Plan, Deliverable D2.2, updates the EOSC-hub strategy to take account of progress in the definition and implementation of the EOSC since D2.1, specifically publication of the report of the Second EOSC High Level Expert Group in November 2018³⁴ and the start-up of various other EOSC-related Horizon 2020 projects. D2.2 highlights the importance of being attuned to other EOSC implementation initiatives and to the expectations of EOSC service providers, funders and end-users, and performed extensive research to gather this information. The strategy proposes ten key exploitable results the project can offer to the EOSC, and 15 strategic actions by which EOSC-hub can facilitate the generation of a sustainable EOSC beyond 2020. The work of T2.3 is in line with the proposed strategy and contributes towards several of its strategic actions including defining the components of the EOSC Federating Core, preparing and validating a conceptual model for it, and clarifying the value proposition of the EOSC-hub Federating Core services.

II.2.2 EC Joint Review of EOSC-hub, OpenAIRE and eInfraCentral

An informal joint EC review of the EOSC-hub, OpenAIRE Advance and eInfraCentral projects took place from 22 to 24 January 2019. The resulting report encouraged continued implementation, but also updating, of the Joint Activity Plan (see below). The review report noted the differing approaches to the gradual definition of the EOSC underway within different projects, the challenges involved in cross-project working and in particular the difficulties in altering static project plans in response to cross-project collaboration or for other reasons, but it also firmly urged the projects – in particular EOSC-hub and OpenAIRE Advance – to put more emphasis on their collaboration.

The report also identified that success of the EOSC will depend amongst other things on agreements being reached on provisioning of resources to the EOSC by the national e-infrastructure systems, and on community/thematic services being brought into the EOSC. The engagement in EOSC of member states in particular, but also of research infrastructures, is made more likely by federation in the EOSC being seen to add value, which is more likely to be the case if strong and effective collaboration occurs and is visible between the European e-Infrastructures. As observed in D2.1, governmental and funding agencies “have been pushing for greater interoperability of services and data to optimise the use of resources and foster interdisciplinary research as a catalyst of scientific breakthroughs and innovations”.

³³ See

https://ec.europa.eu/research/openscience/pdf/swd_2018_83_f1_staff_working_paper_en.pdf

³⁴ See <https://publications.europa.eu/en/web/eu-law-and-publications/publication-detail/-/publication/5253a1af-ee10-11e8-b690-01aa75ed71a1>

II.2.3 JAM3.3 White Paper

The EOSC-hub-OpenAIRE Advance Collaboration Agreement³⁵ entered into force on 30 April 2018. Its Joint Activity Plan (JAP) incorporates tasks addressing service integration; communications, engagement, support and training; and governance and strategy. Its Task 3.2 on Strategy is relevant to the present Deliverable. JAP Task 3.2 is responsible for defining “a common vision for EOSC, service placement, and the projects’ role in upcoming EOSC governance”. The task also assures alignment of roadmaps on service positioning and sustainability within EOSC.

Two milestones (“Joint Activity Milestones”) are assigned to JAP Task 3.2:

- JAM3.3 White paper outlining common vision for EOSC, service placement, and role in upcoming EOSC governance (due December 2018)
- JAM3.4 Aligned roadmap(s) for service positioning and sustainability within EOSC (due June 2019).

The EOSC-hub-OpenAIRE Advance JAM3.3 white paper outlining a common vision for EOSC, service placement, and role in upcoming EOSC governance was published in March 2019³⁶. It observes that many of the motivations which led to the adoption of the JAM3.3 milestone have become obsolete, and as a result it presents a short position paper rather than a full white paper, whose observations and recommendations are addressed primarily at the EOSC Governance Board via the European Commission.

The White Paper identifies opportunities presented by the EOSC from the point of view of academic information and research infrastructure providers. It lists four priority challenges on which the EOSC governance and the EOSC implementation projects need to collaborate to realise tangible progress in creating the EOSC, recognising that these are beyond the current remit of infrastructural service providers in the EOSC but that infrastructures can contribute concretely towards addressing them. They concern:

- increasing accessibility, usability and capacity of facilities for researchers
- providing an operational budget for necessary activities of the EOSC
- identifying sources and mechanisms for long-term funding
- definition and agreement of a clear involvement of infrastructures in strategic steering of the EOSC.

The paper proposes four ways in which infrastructures can contribute to addressing the challenges, if they are mandated to do so by the EOSC Governance Board:

- provide input to an EOSC Charter
- provide strategic advice in the form of a research and academic infrastructure situation report

³⁵See <https://wiki.enfri.eu/download/attachments/23233414/CA%20EOSC-hub%20OpenAIRE%20v1.1.pdf?version=1&modificationDate=1527073752407&api=v2>

³⁶ See <https://documents.egi.eu/public/ShowDocument?docid=3443>

- provide business plans for EOSC services operations
- form a strategic point of contact to infrastructures for the EOSC Governance Board.

It then defines concrete actions in four areas which EOSC-hub and OpenAIRE Advance will take jointly, as part of their Joint Activity Plan, and individually within the respective projects. The actions in two of these areas are of most direct relevance to Task 2.3:

- Area C: towards an EOSC service portfolio and business plan
- Area D: towards a coalition of infrastructures offering a single strategic point of contact.

In addition, the two projects commit to further formalising the cooperation of their constituent legal entities.

II.2.4 Procurement Requirements and Business Models

EOSC-hub Deliverable D12.1 presents the results of the first phase of the work of WP12 to contribute to the design of future business models and procurement frameworks for acquiring digital services from publicly funded and commercial providers. It presents detailed research into the level of demand for digital services for research and the ways they are currently being met, and identifies three main business models for acquiring digital services which may be suitable in the EOSC context and which will be analysed further in future Deliverables of WP12. The business models are the “Cloud Coin” or Voucher Access Model, sponsored use, and aggregated procurement.

Appendix III. Timelines from EOSC Strategic Implementation Plan

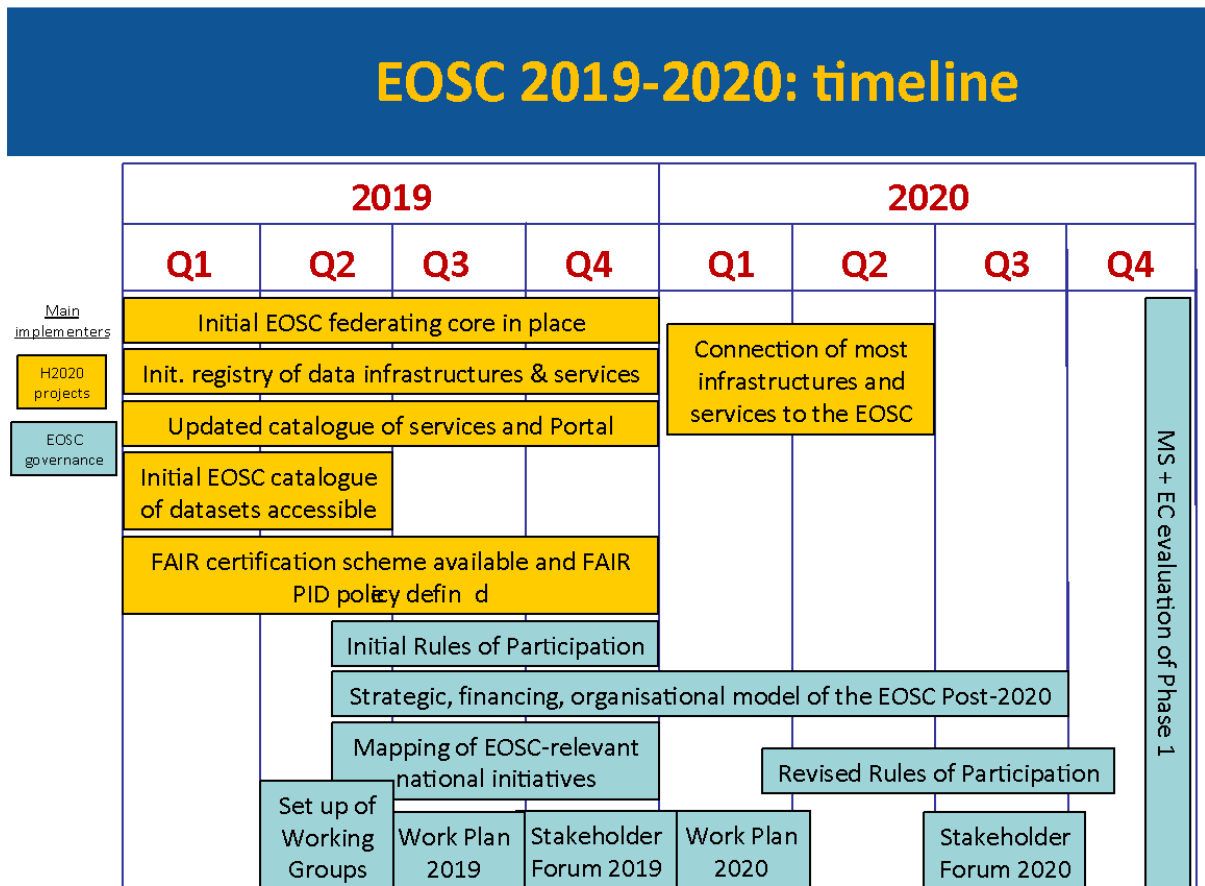


Fig.1 - EOSC Strategic Implementation Plan - EOSC 2019-2020 timeline diagram

Starting from	Committed resources (non-exhaustive)	Action	Milestones
2018, Q1	<ul style="list-style-type: none"> • EOSC-hub project • OpenAIRE-Advance • FREYA project 	Develop initial EOSC federating core including the EOSC shared resources	Q4 2019: Initial EOSC federating core in place
2019, Q1	<ul style="list-style-type: none"> • EOSCpilot project • INFRASUPP-01 (b3) 	Develop catalogue of interested and eligible (per Rules of Participation) data infrastructures to be federated into the EOSC and identify EOSC federate centres	Q4 2019: Registry of data infrastructures of the EOSC (initial)
2018, Q4	<ul style="list-style-type: none"> • INFRAEOSC-04-2018 	Connection the research infrastructures identified in the ESFRI Roadmap to the EOSC. Support to this activity will be provided through cluster projects.	Q2 2020: Preliminary connection of most infrastructures and services to the EOSC

Fig.2 - EOSC Strategic Implementation Plan – Architecture WG Timeline – Horizon 2020 Resources

Starting from	Committed resources (non-exhaustive)	Action	Milestones
2018, Q1	EC, with support of EOSCpilot project, High Level Expert Group EOSC, OSPP and other sources	Set up the EOSC governance framework in consultation with MS	Q4 2018: EOSC Governance established
2019, Q1	EOSCsecretariat	Prepare legacy for 2nd implementation phase (post 2020)	Q3 2020: Recommendations on strategic and financing orientations and organisational settings for the future of the EOSC, post 2020

Fig.3 - EOSC Strategic Implementation Plan – Sustainability (RoP) WG Timeline