

# European Open Science Cloud – *From vision to useful services*

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## The vision of the European Commission

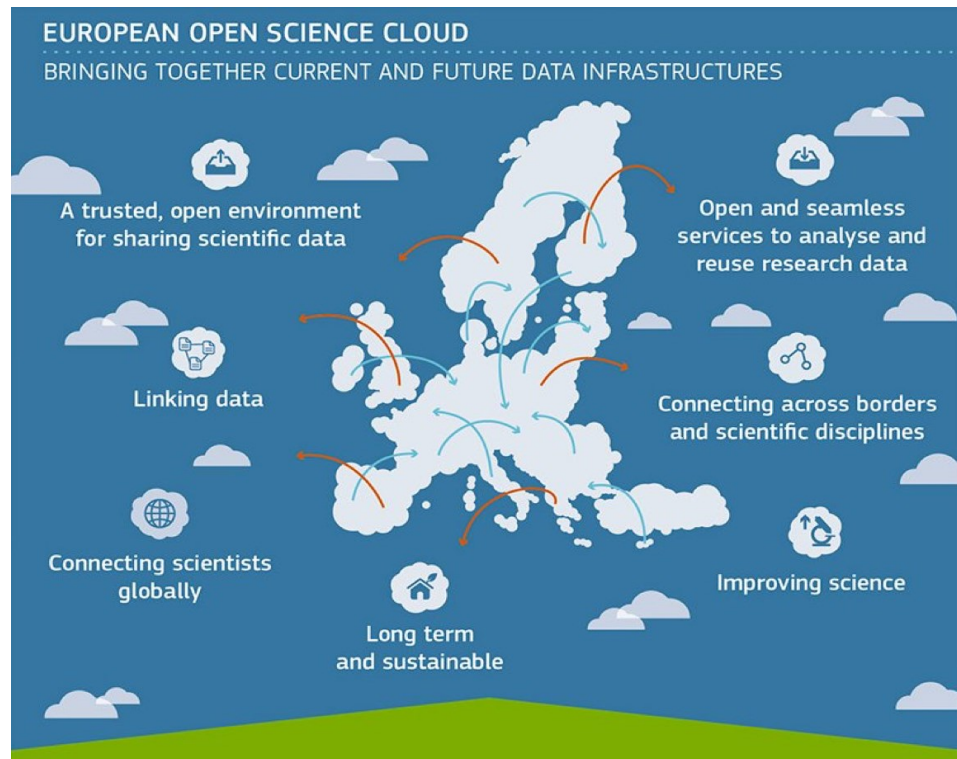


"Europe's final transition must be one from fragmented data sets to an integrated European Open Science Cloud. By 2020, we want all European researchers to be able to deposit, access and analyse European scientific data through a European Open Science Cloud.."

Speech by Commissioner Carlos Moedas in Amsterdam, NL:  
"Open science: share and succeed", 4 April 2016

# EOSC - European Commission's vision for Federating Data Infrastructures

- Vision for the European Open Science Cloud (EOSC) presented in the Commission communication on the '*European Cloud Initiative*', as a part of the Digital Single Market Strategy, April 2016



# EOSC Declaration 10 July 2017

Ref. Ares(2017)3488418 - 11072017

- RECOGNISING the challenges of data driven research in pursuing excellent science;
- GRANTING that **the vision of European Open Science is that of a research data commons**, widely inclusive of all disciplines and Member States, sustainable in the long-term,
- CONFIRMING that the **implementation of the EOSC is a process**, not a project, by its nature iterative and based on constant learning and mutual alignment;
- UPHOLDING that the EOSC Summit marked the beginning and not the end of this process, one based on continuous engagement with scientific stakeholders, the European Commission,
- PROPOSES that all EOSC stakeholders consider sharing the following intents and will actively support their implementation in the respective capacities: ...



EUROPEAN COMMISSION  
DIRECTORATE-GENERAL FOR RESEARCH & INNOVATION  
The Director-General

Brussels, 10 July 2017

## **EOSC Declaration**

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PROPOSES that all EOSC stakeholders consider sharing the following intents and will actively support their implementation in the respective capacities:

### **Data culture and FAIR data**

- **[Data culture]** European science must be grounded in a common culture of data stewardship, so that research data is recognised as a significant output of research and is appropriately curated throughout and after the period conducting the research. Only a considerable cultural change will enable long-term reuse for science and for innovation of data created by research activities: no disciplines, institutions or countries must be left behind.
- **[Open access by-default]** All researchers in Europe must enjoy access to an open-by-default, efficient and cross-disciplinary research data environment supported by FAIR data principles. Open access must be the default setting for all results of publicly funded research in Europe, allowing for proportionate limitations only in duly justified cases of personal data protection, confidentiality, IPR concerns, national security or similar (e.g. 'as open as possible and as closed as necessary').
- **[Skills]** The necessary skills and education in research data management, data stewardship and data science should be provided throughout the EU as part of higher education, the training system and on-the-job best practice in the industry. University associations, research organisations, research libraries and other educational brokers play an important role but they need substantial support from the European Commission and the Member States.
- **[Data stewardship]** Researchers need the support of adequately trained data stewards. The European Commission and Member States should invest in the education of data stewards via career programmes delivered by universities, research institutions and other trans-European agents.
- **[Rewards and incentives]** Rewarding research data sharing is essential. Researchers who make research data open and FAIR for reuse and/or reuse and reproduce data should be rewarded, both

# Data Commons?

commons |'kɒmənz|

Plural noun

1 (**the Commons**) short for [House of Commons](#).• *historical* the common people regarded as a part of a political system, especially in Britain: *the state was divided into clergy, nobility, and commons | both lords and commons won some important concessions.*

2 [*treated as singular*] land or **resources belonging to or affecting the whole of a community**: *the mismanagement of a commons | the global commons of Antarctica.*• *US* a dining hall in a school or college.3 *archaic* provisions shared in common; rations.



## e-Infrastructure Reflection Group



About / Commons

### Navigation

### About

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The term *e-Infrastructure Commons* was initially presented in the e-IRG Roadmap 2012 of the Commons for the e-Infrastructure resources and related services, which among computing, storage, data and software, along with digital tools and collaboration opportunities. Roadmap 2012, e-IRG outlines Europe's need for a single "e-Infrastructure Commons" and science. The e-Infrastructure Commons is the political, technological, and administrative cost-effective shared use of distributed electronic resources across Europe. The e-IRG can be defined as an integrated living ecosystem of resources and services that is open to European researchers and scientists, and continuously adapts to the changing needs of research and science.

The e-IRG Roadmap presents the principles of the framework needed for the e-IRG Roadmap 2016 to be published this Summer, will give guidance on technical discussions on the main European Open Science Cloud topics. The e-IRG concept of the e-Infrastructure Commons in the new Roadmap and explain in more detail the commitment for developing the European Open Science Cloud, consistent with established national priorities.

Begin

**e-IRG** is a strategic body to facilitate integration in the area of European e-Infrastructures and connected services, within

“The e-Infrastructure Commons is the political, technological, and administrative framework for an easy and cost-effective shared use of distributed electronic resources across Europe.”

development of convergent and sustainable e-Infrastructure services.

- "...an "e-Infrastructure Commons" should **liberate scientists** from the often complex and distracting business of moving, storing and processing data. They need services that are coherent, managed and above all integrated so that they can **get on with the business of research and science.**"
- "...we must be careful to not become constrained and stifle innovation in the development, provision and use of these services. The idea that there will be just "one way" of supplying or using any service through an "efficient" mandated or "voluntary" monopoly, has to be avoided."



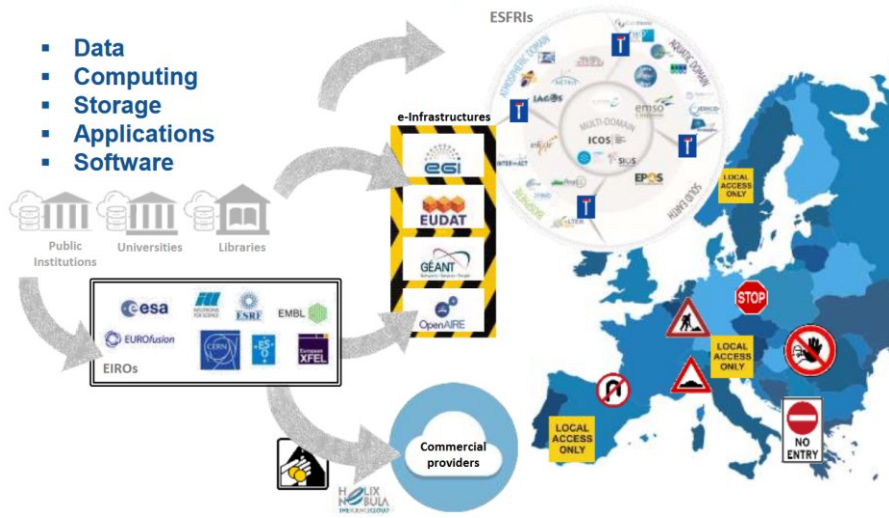
# European Open Science Cloud: how

- Set-up of an **High Level Group** of Experts on EOSC
  - to advise on its implementation
- Launch of a **Pilot action** for EOSC in 2016 under the H2020 Research Infrastructure part
  - To demonstrate how to ensure availability of scientific data and data-analysis services through a cloud infrastructure and design a stakeholder driven governance framework.
- E-Infrastructures topics in 2017 H2020 calls for federation & interoperability of data infrastructures
- Further substantial investments in the 2018-2020 WP



*Involvement of MS & engagement of science communities is crucial*

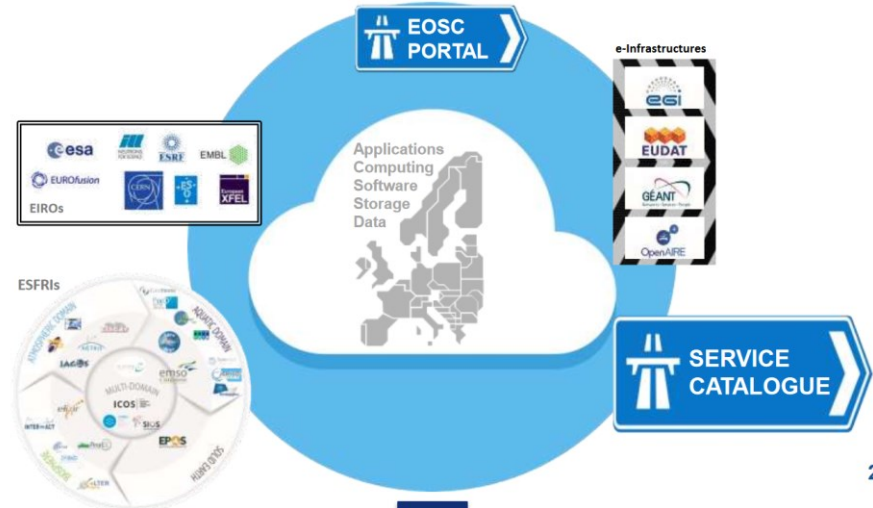




Current model of European data infrastructures

Source: EOSC Strategic Implementation Roadmap 2018-2020, May 2018, European Commission

*From fragmentation and uneven access to information to a federated model, where access to data would be universal, building on a strong legacy*



Future EOSC model: federation of data infrastructures

# Implementation Roadmap For the European Open Science Cloud

- “A seamless environment enabling interdisciplinary research, an environment to foster data-intensive innovation. The EOSC will allow for universal access to data and a new level playing field for EU researchers.”  
[EOSC Strategic Implementation Roadmap 2018-2020]
- Fully operational 2021



# EOSC model will provide these services for European researchers

[EOSC Strategic Implementation Roadmap 2018-2020]

1. Identification and authentication, and access to the resources of the EOSC
2. A protected & personalised work environment/space (e.g. logbook, settings, compliance record and pending issues)
3. Access to relevant information (e.g. status of EOSC, list of infrastructures, policy-related information, compliance framework) and specific guidelines (e.g. how to make data FAIR, certify a repository or service, procure joint services)
4. Services to find, access, store, re-use and analyse (e.g. analytics, data merge/fusion, mining) the data generated by others, catalogued appropriately
5. Services to make their own data FAIR, to store them and ensure long-term preservation

# EOSC Governance framework

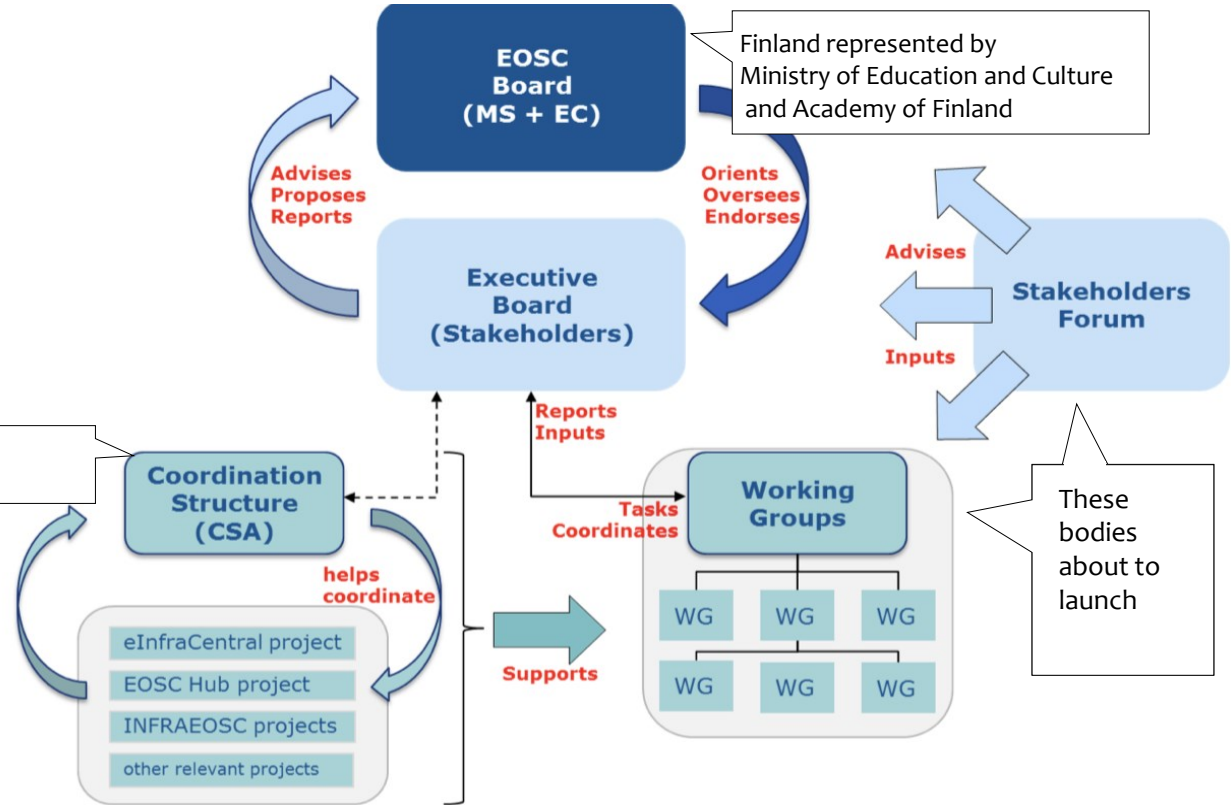


Brussels, 14.3.2018  
SWD(2018) 83 final

COMMISSION STAFF WORKING DOCUMENT  
Implementation Roadmap for the European Open Science

EOSCsecretariat.eu

EN





## EUROPEAN OPEN SCIENCE CLOUD



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**Jan Hrusak,**  
**Individual Expert**



**Jan Hrusak**

## Chair



**Sarah Jones**

## Chair



**Jean-Francois  
Abramatic**

# EOSC Working Groups



## Chair



**Juan  
Bicarregui**

## Chairs



**Rupert Lueck**



**Stefan Kuster**





## EOSCsecretariat.eu

- 360° support to EOSC Governance, working openly & inclusively with communities to co-create all-encompassing EOSC
- Independency & neutrality
- Interim character, with an enabling and advisory approach
- Supporting a user centric EOSC implementation, with the Co-creation budget at the command of the EB
- Flexibility & agility
- Transparency & openness

# EOSC projects' contribution to the EOSC implementation roadmap (2017- )

## *EOSC Implementation Roadmap action line*

## *On-going initiatives and EOSC projects contributing to the implementation*





# EOSCportal.eu - Gateway for European Services for Research



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## ACCESS EOSC SERVICES & RESOURCES



NETWORKING



COMPUTE



STORAGE



SHARING & DISCOVERY



DATA MANAGEMENT



PROCESSING & ANALYSIS



SECURITY & OPERATIONS



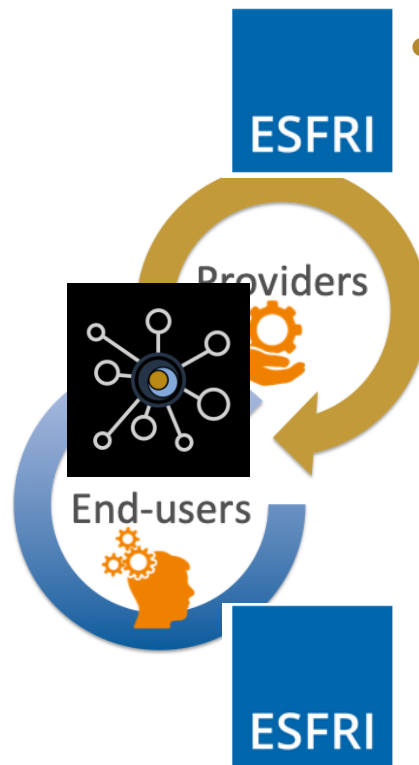
TRAINING & SUPPORT

|                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EOSC-hub</b>  <ul style="list-style-type: none"> <li>2018-2020 / 30M€</li> <li>Multiple service providers creating the Hub: an opportunity for researchers and innovators to discover, access, use and reuse a broad spectrum of resources for advanced data-driven research.</li> </ul>                 | <b>EOSCpilot</b>  <ul style="list-style-type: none"> <li>2017-2019 / 10M€</li> <li>Piloting the EOSC, governance, stakeholder engagement</li> </ul>                                                                                                                                                         | <b>EOSCsecretariat.eu</b>  <ul style="list-style-type: none"> <li>2019-2021 / 10M€</li> <li>360° support to EOSC Governance, working openly &amp; inclusively with communities to co-create all-encompassing EOSC</li> </ul>                                                                       | <b>EOSC Nordic</b>  <ul style="list-style-type: none"> <li>From Sept. 2019 – 2022 / 6M€</li> <li>Coordinates EOSC relevant initiatives in Nordic and Baltic countries to exploit synergies &amp; obtaining harmonization at policy and service provisioning</li> <li>Strong consortium with unique capacity to realise outcomes of EOSC design</li> </ul> |
| <b>eInfraCentral</b> <ul style="list-style-type: none"> <li>2017-2019 / 1,5M€</li> <li>European catalogue of e-Infrastructure services and resources. A standardised registry makes it easier to discover and access services and resources.</li> </ul>                                                                                                                                   | <b>FREYA</b> <ul style="list-style-type: none"> <li>2017-2020 / 5,3M€</li> <li>Extends the infrastructure for persistent identifiers (PIDs) as a core component of open research, in the EU and globally. Improves discovery, navigation, retrieval, and access to research resources.</li> </ul>                                                                                         | <b>OCRE</b> <ul style="list-style-type: none"> <li>2019-2021 / 14,4M€</li> <li>Open Clouds for Research Environments (OCRE) gives the European research community access to commercial digital services (IaaS, SaaS and PaaS cloud services), as well as Earth Observation (EO) services.</li> </ul>                                                                               | <b>OpenAIRE-Advance</b>  <ul style="list-style-type: none"> <li>2018-2021 / 10M€</li> <li>Facilitates the move to a more open and reproducible scientific landscape by offering a unique set of services to embed Open Science into researcher workflows for opening up, sharing &amp; reusing of research outcomes</li> </ul>                         |
| <b>RDA Europe 4.0</b>  <ul style="list-style-type: none"> <li>2018-2020 / 3,5M€</li> <li>European plug-in to RDA, focuses on the need for open and interoperable sharing of research data and builds social, technical and cross-disciplinary links to enable such sharing on a global scale.</li> </ul> | <b>FairsFair</b>  <ul style="list-style-type: none"> <li>2019 – 2022 / 10M total budget</li> <li>Supplies practical solutions for the use of the FAIR data principles throughout the research data life cycle. Fosters FAIR data culture and the uptake of good practices in making data FAIR</li> </ul> | <b>PaNOSC</b> <ul style="list-style-type: none"> <li>2018-2022 / 12M€</li> <li>Photon and Neutron Open Science Cloud builds on top of the existing local meta-data catalogues and data repositories to provide federated services for making data easily FAIR, and develops data analysis services</li> </ul>                                                                      | <b>EOSC-Life</b>  <ul style="list-style-type: none"> <li>2019-2022 / 24M€</li> <li>Part of EOSC tackling challenges in analyzing and reusing the prodigious amounts of data produced by life-science</li> <li>Providing an open collaborative space for digital biology in Europe</li> </ul>                                                           |
| <b>ENVRI-FAIR</b>  <ul style="list-style-type: none"> <li>2019-2022</li> <li>Connection of the ESFRI Cluster of Environmental Research Infrastructures (ENVRI) to EOSC. All participating RIs is to build a set of FAIR data.</li> </ul>                                                                 | <b>ESCAPE: Astronomy &amp; Particle Physics</b> <ul style="list-style-type: none"> <li>2019-2022 / 16M€</li> <li>Implementing Science Analysis Platforms for EOSC researchers to stage data collections, analyse them, access ESFRI's software tools, bring their own custom workflows</li> </ul>                                                                                         | <b>Social Sciences &amp; Humanities Open Cloud (SSHOC)</b>  <ul style="list-style-type: none"> <li>2019- 2022 / 14,5M€</li> <li>Provide a full-fledged Social Sciences and Humanities Open Cloud where data, tools, and training are available and accessible for users of SSH data.</li> </ul> | <b>+ 3 regional EOSC-projects and 1 thematic EOSC-project to be launched + other EOSC-related upcoming calls for proposals</b>                                                                                                                                                                                                                                                                                                            |

# The Hub – A Collaboration Platform for ESFRIs

- Research communities

- Discover services through a secure online catalogue with a central access point.
- Access services via harmonised access policies and Service Level Agreements. Depending on the customer's needs, access will be provided through a centrally managed credit-based allocation system and/or through long-term resource allocation.
- Leverage a large portfolio of generic and thematic services via standard interfaces
- Provide requirements, co-design, testing



- Research Infrastructures - Providers

- Contribute to EOSC with services based on a harmonised corpus of access, security and provisioning policies.
- Integrate and Federate services by relying on harmonised processes and tools for service integration and management.
- Scale-up in-house capacity by procuring services via a centrally run procurement and purchase framework.
- Reach out to user communities and support
- Collaborate with other providers

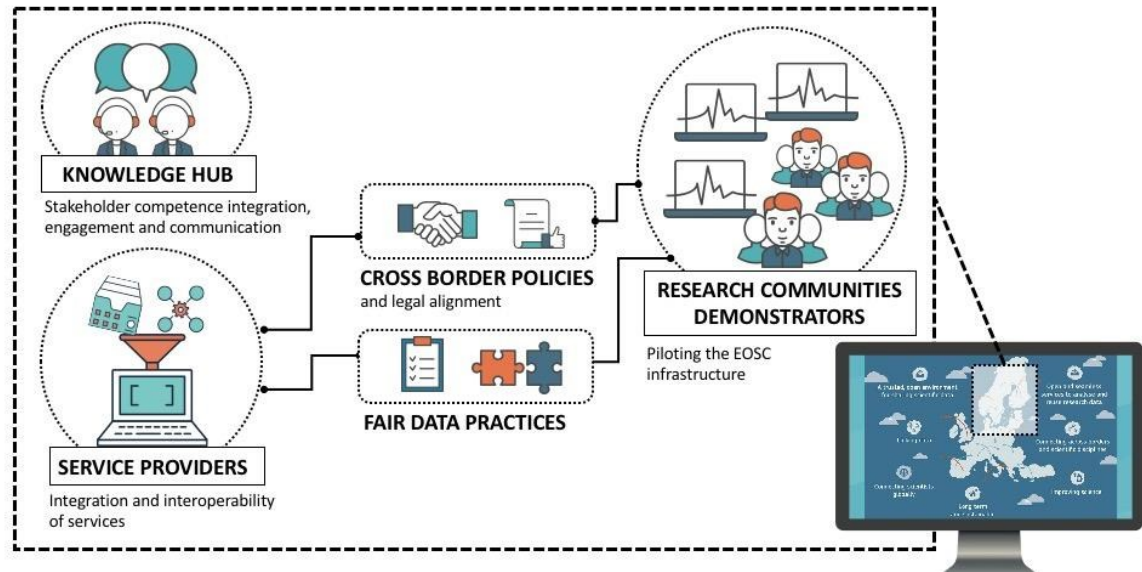


# EOSC Nordic – bringing the EOSC into reality in the Nordics

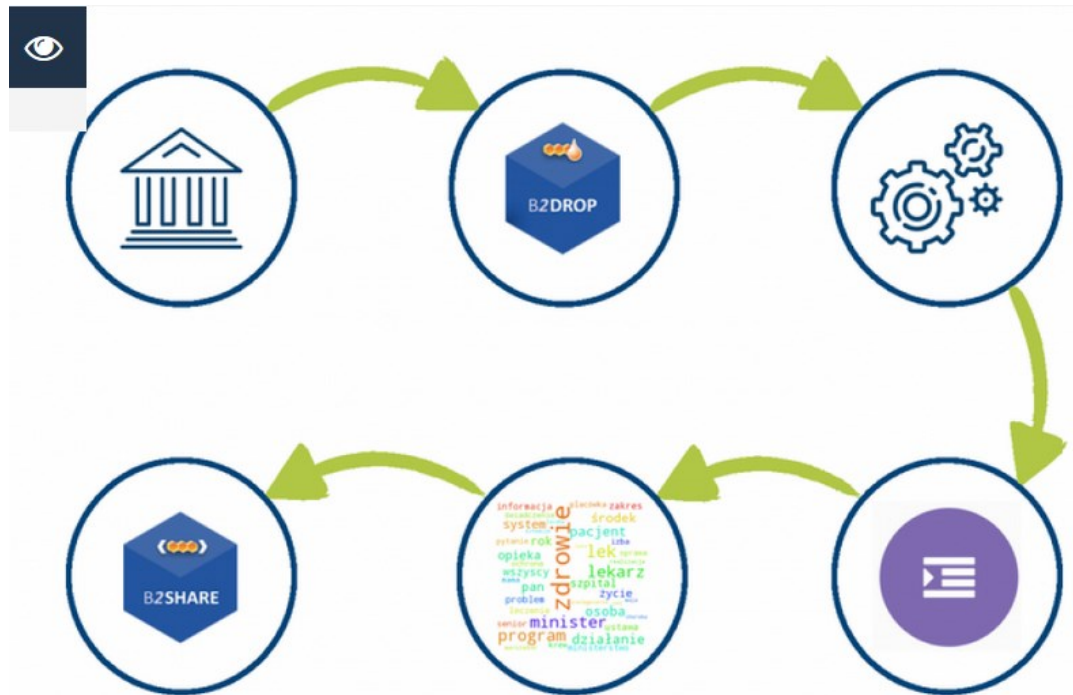
- Coordinator: NeIC (NordForsk)
- Budget: 5.99 M€
- Duration: 36 Months, starting September 2019
- Effort: 550 PM
- 24 Partners from Nordics + DE, NL, LV, EE, and LT

## EOSC NORDIC

CATALYSING THE TAKE-UP OF EOSC IN THE NORDIC REGION



# CLARIN use case: From language data to insight

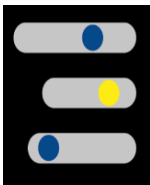


- Integration of the CLARIN infrastructure into the EOSC portal facilitates the study of language data
- How the Portal itself can support the Social Sciences and Humanities (SSH) community at large in the future

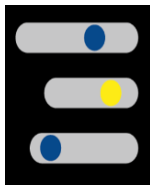
[CLARIN use case](https://youtu.be/_lomkr4GtdM)  
([https://youtu.be/\\_lomkr4GtdM](https://youtu.be/_lomkr4GtdM))

# What you can do?

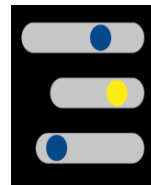
The EOSC Secretariat is at the heart of the activities happening around EOSC. Sign up to our community to receive immediate updates. Here's how you can take a more active role under the EOSC Secretariat:



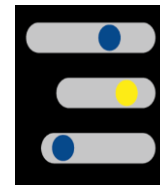
Benefit from  
the co-  
creation  
funding



Contribute to  
the Working  
Groups



Bring your  
assets to  
EOSC



Shape the EOSC 2021  
by joining the EOSC  
Stakeholder Forum



# Acknowledgment

- Sara Kontro (CSC and EOSC Secretariat)
- Damien Lecarpentier (CSC and EOSC Secretariat)
- <http://EOSCsecretariat.eu>
- <http://EOSC-hub.eu>
- <http://EOSC-portal.eu>





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