

Please check our [wiki](#) for help on navigating the form.

Horizon 2020

Call: H2020-INFRAEOSC-2018-2020
(Implementing the European Open Science Cloud)

Topic: INFRAEOSC-05-2018-2019

Type of action: RIA

Proposal number: 857652

Proposal acronym: EOSC-Nordic

Deadline Id: H2020-INFRAEOSC-2018-3

Table of contents

<i>Section</i>	<i>Title</i>	<i>Action</i>
1	General information	
2	Participants & contacts	
3	Budget	
4	Ethics	
5	Call-specific questions	

How to fill in the forms

The administrative forms must be filled in for each proposal using the templates available in the submission system. Some data fields in the administrative forms are pre-filled based on the steps in the submission wizard.

Proposal ID **857652**

Acronym **EOSC-Nordic**

1 - General information

Topic **INFRAEOSC-05-2018-2019**

Type of Action **RIA**

Call Identifier **H2020-INFRAEOSC-2018-2020**

Deadline Id **H2020-INFRAEOSC-2018-3**

Acronym **EOSC-Nordic**

Proposal title **EOSC-Nordic**

Note that for technical reasons, the following characters are not accepted in the Proposal Title and will be removed: < > " &

Duration in months

36

Free keywords

EOSC, services, service management, data infrastructure, data, repositories, FAIR

Abstract

EOSC-Nordic aims to facilitate the coordination of EOSC relevant initiatives within the Nordic and Baltic countries and exploit synergies to achieve greater harmonisation at policy and service provisioning across these countries, in compliance with EOSC agreed standards and practices. By doing so, the project seeks to establish the Nordic and Baltic countries as frontrunners in the take-up of the EOSC concept, principles and approach. EOSC-Nordic brings together a strong consortium of 24 partners including e-Infrastructure providers, research performing organisations and expert networks, with national mandates with regards to the provision of research services and open science policy, and wide experience of engaging with the research community and mobilising national governments, funding agencies, international bodies and global initiatives and high-level experts on EOSC strategic matters.

Remaining characters

1097

Has this proposal (or a very similar one) been submitted in the past 2 years in response to a call for proposals under Horizon 2020 or any other EU programme(s)?

Yes No

Please give the proposal reference or contract number.

XXXXXX-X

Proposal Submission Forms

Proposal ID 857652

Acronym EOSC-Nordic

Declarations

1) The coordinator declares to have the explicit consent of all applicants on their participation and on the content of this proposal.	<input checked="" type="checkbox"/>
2) The information contained in this proposal is correct and complete.	<input checked="" type="checkbox"/>
3) This proposal complies with ethical principles (including the highest standards of research integrity — as set out, for instance, in the European Code of Conduct for Research Integrity — and including, in particular, avoiding fabrication, falsification, plagiarism or other research misconduct).	<input checked="" type="checkbox"/>
4) The coordinator confirms:	
- to have carried out the self-check of the financial capacity of the organisation on http://ec.europa.eu/research/participants/portal/desktop/en/organisations/lfv.html or to be covered by a financial viability check in an EU project for the last closed financial year. Where the result was “weak” or “insufficient”, the coordinator confirms being aware of the measures that may be imposed in accordance with the H2020 Grants Manual (Chapter on Financial capacity check); or	<input checked="" type="radio"/>
- is exempt from the financial capacity check being a public body including international organisations, higher or secondary education establishment or a legal entity, whose viability is guaranteed by a Member State or associated country, as defined in the H2020 Grants Manual (Chapter on Financial capacity check); or	<input type="radio"/>
- as sole participant in the proposal is exempt from the financial capacity check.	<input type="radio"/>
5) The coordinator hereby declares that each applicant has confirmed:	
- they are fully eligible in accordance with the criteria set out in the specific call for proposals; and	<input checked="" type="checkbox"/>
- they have the financial and operational capacity to carry out the proposed action.	<input checked="" type="checkbox"/>
The coordinator is only responsible for the correctness of the information relating to his/her own organisation. Each applicant remains responsible for the correctness of the information related to him and declared above. Where the proposal to be retained for EU funding, the coordinator and each beneficiary applicant will be required to present a formal declaration in this respect.	

According to Article 131 of the Financial Regulation of 25 October 2012 on the financial rules applicable to the general budget of the Union (Official Journal L 298 of 26.10.2012, p. 1) and Article 145 of its Rules of Application (Official Journal L 362, 31.12.2012, p.1) applicants found guilty of misrepresentation may be subject to administrative and financial penalties under certain conditions.

Personal data protection

The assessment of your grant application will involve the collection and processing of personal data (such as your name, address and CV), which will be performed pursuant to Regulation (EC) No 45/2001 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data. Unless indicated otherwise, your replies to the questions in this form and any personal data requested are required to assess your grant application in accordance with the specifications of the call for proposals and will be processed solely for that purpose. Details concerning the purposes and means of the processing of your personal data as well as information on how to exercise your rights are available in the [privacy statement](#). Applicants may lodge a complaint about the processing of their personal data with the European Data Protection Supervisor at any time.

Your personal data may be registered in the Early Detection and Exclusion system of the European Commission (EDES), the new system established by the Commission to reinforce the protection of the Union's financial interests and to ensure sound financial management, in accordance with the provisions of articles 105a and 108 of the revised EU Financial Regulation (FR) (Regulation (EU, EURATOM) 2015/1929 of the European Parliament and of the Council of 28 October 2015 amending Regulation (EU, EURATOM) No 966/2012) and articles 143 - 144 of the corresponding Rules of Application (RAP) (COMMISSION DELEGATED REGULATION (EU) 2015/2462 of 30 October 2015 amending Delegated Regulation (EU) No 1268/2012) for more information see the [Privacy statement for the EDES Database](#).

2 - Participants & contacts

#	Participant Legal Name	Country	Action
1	NordForsk	NO	
2	DANMARKS TEKNISKE UNIVERSITET	DK	
3	CSC-TIETEEN TIETOTEKNIKAN KESKUS OY	FI	
4	UNINETT SIGMA2 AS	NO	
5	UPPSALA UNIVERSITET	SE	
6	TARTU ULIKOOL	EE	
7	HASKOLI ISLANDS	IS	
8	VILNIAUS UNIVERSITETAS	LT	
9	RIGAS TEHNISKA UNIVERSITATE	LV	
10	SYDDANSK UNIVERSITET	DK	
11	NORDUNET A/S	DK	
12	VETENSKAPRADET - SWEDISH RESEARCH COUNCIL	SE	
13	HELSINGIN YLIOPISTO	FI	
14	KEEMILISE JA BIOLOGILISE FUUSIKA INSTITUUT	EE	
15	TAMPEREEN YLIOPISTO	FI	
16	GOETEBORGS UNIVERSITET	SE	
17	NSD - NORSK SENTER FOR FORSKNINGSDATA AS	NO	
18	RIGSARKIVET	DK	
19	ILMATIETEEN LAITOS	FI	
20	ITA-SUOMEN YLIOPISTO	FI	
21	Stichting GO FAIR	NL	

Proposal Submission Forms

Proposal ID **857652**

Acronym **EOSC-Nordic**

22	DEUTSCHES KLIMARECHENZENTRUM GMBH	DE	
23	KOBENHAVNS UNIVERSITET	DK	
24	REGION HOVEDSTADEN	DK	

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **NordForsk**

2 - Administrative data of participating organisations

PIC	Legal name
996819725	NordForsk

Short name: NordForsk

Address of the organisation

Street STENSBERGSGATA 25
 Town OSLO
 Postcode 0170
 Country Norway
 Webpage www.nordforsk.org

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyyes	Legal personyes
Non-profityes	
International organisationunknown	
International organisation of European interestunknown	Industry (private for profit).....no
Secondary or Higher education establishmentno	
Research organisationyes	

Enterprise Data

SME self-declared status..... unknown
 SME self-assessment unknown
 SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID **857652**

Acronym **EOSC-Nordic**

Short name **NordForsk**

Department(s) carrying out the proposed work

Department 1

Department name

NeIC

not applicable

Same as proposing organisation's address

Street

STENSBERGSGATA 25

Town

OSLO

Postcode

0170

Country

Norway

Dependencies with other proposal participants

Character of dependence	Participant	

Proposal Submission Forms

Proposal ID **857652**

Acronym **EOSC-Nordic**

Short name **NordForsk**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Sex Male Female

First name **Gudmund**

Last name **Høst**

E-Mail **gudmund.host@nordforsk.org**

Position in org.

Department

Same as organisation name

Same as proposing organisation's address

Street

Town

Post code

Country

Website

Phone

Phone 2

Fax

Other contact persons

First Name	Last Name	E-mail	Phone
Kine	Nordstokka	kine.nordstokka@nordforsk.org	+4790810670

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **DTU**

PIC

999990655

Legal name

DANMARKS TEKNISKE UNIVERSITET

Short name: DTU

Address of the organisation

Street ANKER ENGELUNDSVEJ 1 BYGNING 101 A

Town KGS LYNGBY

Postcode 2800

Country Denmark

Webpage www.dtu.dk

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyyes

Legal personyes

Non-profityes

International organisationno

International organisation of European interestno

Industry (private for profit).....no

Secondary or Higher education establishmentyes

Research organisationyes

Enterprise Data

SME self-declared status.....01/01/2001 - no

SME self-assessment unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID 857652

Acronym

EOSC-Nordic

Short name DTU

Department(s) carrying out the proposed work

Department 1

Department name

IT Service

not applicable

Same as proposing organisation's address

Street

Asmussens Allé Building 305, room 206

Town

Kgs. Lyngby

Postcode

2800

Country

Denmark

Dependencies with other proposal participants

Character of dependence	Participant	

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **DTU**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Sex

Male

Female

First name **Lene**

Last name **Krøl Andersen**

E-Mail **lene.krøl.andersen@deic.dk**

Position in org.

Head of e-Science Center

Department

IT Service

Same as organisation name

Same as proposing organisation's address

Street

Asmussens Allé Building 305

Town

Kgs. Lyngby

Post code

2800

Country

Denmark

Website

Phone

+4535888205

Phone 2

+xxx xxxxxxxxx

Fax

+xxx xxxxxxxxx

Other contact persons

First Name	Last Name	E-mail	Phone
Charlotte	Kruse	chakr@dtu.dk	+xxx xxxxxxxxx
Faton	Avdijaj	proposal@adm.dtu.dk	+xxx xxxxxxxxx
Claus	Gohr	clgo@dtu.dk	+xxx xxxxxxxxx

Proposal Submission Forms

Proposal ID 857652

Acronym

EOSC-Nordic

Short name CSC-TIETEEN TIETOTEKNIIKAN KESKUS

PIC

999645820

Legal name

CSC-TIETEEN TIETOTEKNIIKAN KESKUS OY

Short name: CSC-TIETEEN TIETOTEKNIIKAN KESKUS OY

Address of the organisation

Street Keilaranta 14

Town ESPOO

Postcode 02101

Country Finland

Webpage www.csc.fi

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyno

Legal personyes

Non-profityes

International organisationunknown

International organisation of European interestunknown

Industry (private for profit).....no

Secondary or Higher education establishmentunknown

Research organisationunknown

Enterprise Data

SME self-declared status..... unknown

SME self-assessment unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID 857652

Acronym EOSC-Nordic

Short name CSC-TIETEEN TIETOTEKNIKAN KESKUS

Department(s) carrying out the proposed work

No department involved

Department name

Name of the department/institute carrying out the work.

not applicable

Same as proposing organisation's address

Street

Please enter street name and number.

Town

Please enter the name of the town.

Postcode

Area code.

Country

Please select a country

Dependencies with other proposal participants

Character of dependence	Participant	

Proposal Submission Forms

Proposal ID **857652**

Acronym **EOSC-Nordic**

Short name **CSC-TIETEEN TIETOTEKNIKAN KESKUS**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Sex Male Female

First name **Damien**

Last name **Lecarpentier**

E-Mail **damien.lecarpentier@csc.fi**

Position in org.

Department

Same as organisation name

Same as proposing organisation's address

Street

Town

Post code

Country

Website

Phone

Phone 2

Fax

Other contact persons

First Name	Last Name	E-mail	Phone
Heli	Autere	heli.autere@csc.fi	+358903819065
Kimmo	Niittuaho	kimmo.niittuaho@csc.fi	+358503819427
Minna	Hahl	minna.hahl@csc.fi	+358503819031
Inkeri	Utunen	inkeri.utunen@csc.fi	+358503819054

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **SIGMA2**

PIC

932252354

Legal name

UNINETT SIGMA2 AS

Short name: SIGMA2

Address of the organisation

Street ABELS GATE 5

Town TRONDHEIM

Postcode 7465

Country Norway

Webpage www.sigma2.no

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyno

Legal personyes

Non-profityes

International organisationno

International organisation of European interestno

Industry (private for profit).....no

Secondary or Higher education establishmentno

Research organisationno

Enterprise Data

SME self-declared status.....11/02/2015 - no

SME self-assessment unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **SIGMA2**

Department(s) carrying out the proposed work

Department 1

Department name

Uninett Sigma2 AS

not applicable

Same as proposing organisation's address

Street

ABELS GATE 5

Town

TRONDHEIM

Postcode

7465

Country

Norway

Dependencies with other proposal participants

Character of dependence	Participant	

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **SIGMA2**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Mrs

Sex

Male

Female

First name **Maria Francesca**

Last name **iozzi**

E-Mail **maria.iozzi@uninett.no**

Position in org.

Advisor

Department

UNINETT SIGMA2 AS

Same as organisation name

Same as proposing organisation's address

Street

ABELS GATE 5

Town

TRONDHEIM

Post code

7465

Country

Norway

Website

https://www.sigma2.no/

Phone

+4798874568

Phone 2

+XXX XXXXXXXXX

Fax

+XXX XXXXXXXXX

Other contact persons

First Name	Last Name	E-mail	Phone
Janne	Loberg	janne.loberg@uninett.no	+XXX XXXXXXXXX

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **UU**

PIC

999985029

Legal name

UPPSALA UNIVERSITET

Short name: *UU*

Address of the organisation

Street VON KRAEMERS ALLE 4

Town UPPSALA

Postcode 751 05

Country Sweden

Webpage www.uu.se

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyyes

Legal personyes

Non-profityes

International organisationno

International organisation of European interestno

Industry (private for profit).....no

Secondary or Higher education establishmentyes

Research organisationyes

Enterprise Data

SME self-declared status.....31/12/2015 - no

SME self-assessment31/12/2015 - no

SME validation sme.....29/10/2008 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **UU**

Department(s) carrying out the proposed work

Department 1

Department name not applicable

Same as proposing organisation's address

Street

Town

Postcode

Country

Dependencies with other proposal participants

Character of dependence	Participant	
<input type="text"/>	<input type="text"/>	

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **UU**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Sex

Male

Female

First name **Hans**

Last name **Karlsson**

E-Mail **hans.karlsson@kemi.uu.se**

Position in org.

Please indicate the position of the Contact Point above in the organisation.

Department

Name of the department/institute carrying out the work.

Same as organisation name

Same as proposing organisation's address

Street

Please enter street name and number.

Town

Please enter the name of the town.

Post code

Area code.

Country

Please select a country

Website

Phone

+xxx xxxxxxxxx

Phone 2

+xxx xxxxxxxxx

Fax

+xxx xxxxxxxxx

Other contact persons

First Name	Last Name	E-mail	Phone
Patrik	Armuand	patrik.armuand@uadm.uu.se	+46184711807
Per-Olov	Hammargren	per-olov.hammargren@it.uu.se	+xxx xxxxxxxxx

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **UNIVERSITY OF TARTU**

PIC

999895013

Legal name

TARTU ULIKOOL

Short name: UNIVERSITY OF TARTU

Address of the organisation

Street ULIKOOLI 18

Town TARTU

Postcode 50090

Country Estonia

Webpage www.ut.ee

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyyes

Legal personyes

Non-profityes

International organisationno

International organisation of European interestno

Industry (private for profit).....no

Secondary or Higher education establishmentyes

Research organisationyes

Enterprise Data

SME self-declared status.....27/02/2003 - no

SME self-assessment unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID 857652

Acronym

EOSC-Nordic

Short name UNIVERSITY OF TARTU

Department(s) carrying out the proposed work

Department 1

Department name

High Performance Computing Center

not applicable

Same as proposing organisation's address

Street

Juhan Liivi 2

Town

Tartu

Postcode

50409

Country

Estonia

Dependencies with other proposal participants

Character of dependence	Participant	

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **UNIVERSITY OF TARTU**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Sex Male Female

First name **Ilja**

Last name **Livenson**

E-Mail **ilja.livenson@ut.ee**

Position in org.

Department

Same as organisation name

Same as proposing organisation's address

Street

Town

Post code

Country

Website

Phone

Phone 2

Fax

Other contact persons

First Name	Last Name	E-mail	Phone
Ivar	Koppel	ivar.koppel@ut.ee	+xxx xxxxxxxxx
Urmas	Koljag	urmas.koljalg@ut.ee	+xxx xxxxxxxxx

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **University of Iceland**

PIC

999884246

Legal name

HASKOLI ISLANDS

Short name: University of Iceland

Address of the organisation

Street SAEMUNDARGOTU 2

Town REYKJAVIK

Postcode 101

Country Iceland

Webpage www.hi.is

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyyes

Legal personyes

Non-profityes

International organisationno

International organisation of European interestno

Industry (private for profit).....no

Secondary or Higher education establishmentyes

Research organisationyes

Enterprise Data

SME self-declared status.....28/10/2015 - no

SME self-assessment05/03/2014 - no

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID 857652

Acronym

EOSC-Nordic

Short name University of Iceland

Department(s) carrying out the proposed work

Department 1

Department name

Faculty of Industrial Engineering, Mechanical Engineering and Com

not applicable

Same as proposing organisation's address

Street

Hjardarhagi 2-6

Town

Reykjavik

Postcode

IS-107

Country

Iceland

Dependencies with other proposal participants

Character of dependence	Participant	

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **University of Iceland**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Sex Male Female

First name **Ebba**

Last name **Hvannberg**

E-Mail **ebba@hi.is**

Position in org.

Department Same as organisation name

Same as proposing organisation's address

Street

Town

Post code

Country

Website

Phone

Phone 2

Fax

Other contact persons

First Name	Last Name	E-mail	Phone
Gréta Björk	Kristjánsdóttir	greta@hi.is	+354-525-5492
Úlfar Kristinn	Gíslason	ulfarg@hi.is	+354-525-4926
Helmut	Neukirchen	helmut@hi.is	+354-525-5423
Morris	Riedel	morris@hi.is	+xxx xxxxxxxxx

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **Vilniaus universitetas**

PIC

999893170

Legal name

VILNIAUS UNIVERSITETAS

Short name: Vilniaus universitetas

Address of the organisation

Street UNIVERSITETO G. 3

Town VILNIUS

Postcode 01513

Country Lithuania

Webpage <http://www.vu.lt>

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyyes

Legal personyes

Non-profityes

International organisationno

International organisation of European interestno

Industry (private for profit).....no

Secondary or Higher education establishmentyes

Research organisationyes

Enterprise Data

SME self-declared status.....31/12/2015 - no

SME self-assessment31/12/2015 - no

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID 857652

Acronym

EOSC-Nordic

Short name Vilniaus universitetas

Department(s) carrying out the proposed work

Department 1

Department name

Institute of Computer Science

not applicable

Same as proposing organisation's address

Street

Didlaukio 47

Town

Vilnius

Postcode

LT-08303

Country

Lithuania

Dependencies with other proposal participants

Character of dependence	Participant	

Proposal Submission Forms

Proposal ID **857652**

Acronym **EOSC-Nordic**

Short name **Vilniaus universitetas**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Sex Male Female

First name **Linas**

Last name **Bukauskas**

E-Mail **linas.bukauskas@mif.vu.lt**

Position in org.

Department

Same as organisation name

Same as proposing organisation's address

Street

Town

Post code

Country

Website

Phone

Phone 2

Fax

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **RTU**

PIC

999920718

Legal name

RIGAS TEHNISKA UNIVERSITATE

Short name: RTU

Address of the organisation

Street **KALKU IELA 1**

Town **RIGA**

Postcode **1658**

Country **Latvia**

Webpage **www.rtu.lv**

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyyes

Legal personyes

Non-profityes

International organisationno

International organisation of European interestno

Industry (private for profit).....no

Secondary or Higher education establishmentyes

Research organisationyes

Enterprise Data

SME self-declared status.....09/10/2008 - no

SME self-assessment unknown

SME validation sme.....09/10/2008 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID 857652

Acronym

EOSC-Nordic

Short name RTU

Department(s) carrying out the proposed work

Department 1

Department name

Office of Vice-Rector for Research

not applicable

Same as proposing organisation's address

Street

KALKU IELA 1

Town

RIGA

Postcode

1658

Country

Latvia

Dependencies with other proposal participants

Character of dependence	Participant	

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **RTU**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Dr.

Sex

Male Female

First name **Lauris**

Last name **Cikovskis**

E-Mail **lauris.cikovskis@rtu.lv**

Position in org.

Department

Same as organisation name

Same as proposing organisation's address

Street

Town

Post code

Country

Website

Phone

Phone 2

Fax

Other contact persons

First Name	Last Name	E-mail	Phone
Sandra	Vasilevska	sandra.vasilevska@rtu.lv	+XXX XXXXXXXXXX

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **SDU**

PIC

999904616

Legal name

SYDDANSK UNIVERSITET

Short name: SDU

Address of the organisation

Street CAMPUSVEJ 55

Town ODENSE M

Postcode 5230

Country Denmark

Webpage www.sdu.dk

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyyes

Non-profityes

International organisationno

International organisation of European interestno

Secondary or Higher education establishmentyes

Research organisationyes

Legal personyes

Industry (private for profit).....no

Enterprise Data

SME self-declared status.....31/12/2014 - no

SME self-assessment unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **SDU**

Department(s) carrying out the proposed work

Department 1

Department name

Department of Mathematics and Computer Science

not applicable

Same as proposing organisation's address

Street

CAMPUSVEJ 55

Town

ODENSE M

Postcode

5230

Country

Denmark

Dependencies with other proposal participants

Character of dependence	Participant	

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **SDU**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Sex

Male Female

First name **Claudio**

Last name **Pica**

E-Mail **pica@cp3.sdu.dk**

Position in org.

Department



Same as organisation name

Same as proposing organisation's address

Street

Town

Post code

Country

Website

Phone

Phone 2

Fax

Other contact persons

First Name	Last Name	E-mail	Phone
Conny	Wang Hansen	cwhansen@sdu.dk	+45 65502432
Arne	Hansen	arbh@sdu.dk	+45 65507355
Lone Storm	Pedersen	lonesp@sdu.dk	+45 65502392
Harald	Hasler-Sheetal	hasler@sdu.dk	+xxx xxxxxxxxxx

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **NORDUNET A/S**

PIC

999580442

Legal name

NORDUNET A/S

Short name: NORDUNET A/S

Address of the organisation

Street KASTRUP LUNDGADE 22 1

Town KASTRUP

Postcode 2770

Country Denmark

Webpage www.nordu.net

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyno

Legal personyes

Non-profityes

International organisationno

International organisation of European interestno

Industry (private for profit).....no

Secondary or Higher education establishmentno

Research organisationno

Enterprise Data

SME self-declared status.....24/03/2009 - yes

SME self-assessment unknown

SME validation sme.....24/03/2009 - yes

Based on the above details of the Beneficiary Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID **857652**

Acronym **EOSC-Nordic**

Short name **NORDUNET A/S**

Department(s) carrying out the proposed work

No department involved

Department name not applicable

Same as proposing organisation's address

Street

Town

Postcode

Country

Dependencies with other proposal participants

Character of dependence	Participant	
<input type="text"/>	<input type="text"/>	

Proposal Submission Forms

Proposal ID **857652**

Acronym **EOSC-Nordic**

Short name **NORDUNET A/S**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Sex Male Female

First name **Lars**

Last name **Fischer**

E-Mail **lars@nordu.net**

Position in org.

Department

Same as organisation name

Same as proposing organisation's address

Street

Town

Post code

Country

Website

Phone

Phone 2

Fax

Other contact persons

First Name	Last Name	E-mail	Phone
Thomas	Hyllested	hyllested@nordu.net	+45 31621407

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **VETENSKAPSRADET - SWEDISH RESEAR**

PIC 999586165 **Legal name** VETENSKAPSRADET - SWEDISH RESEARCH COUNCIL

Short name: VETENSKAPSRADET - SWEDISH RESEARCH COUNCIL

Address of the organisation

Street VASTRA JARNVAGSGATAN 3

Town STOCKHOLM

Postcode 111 64

Country Sweden

Webpage www.vr.se

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyyes

Legal personyes

Non-profityes

International organisationno

International organisation of European interestno

Industry (private for profit).....no

Secondary or Higher education establishmentno

Research organisationno

Enterprise Data

SME self-declared status.....01/01/1900 - no

SME self-assessment unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID 857652

Acronym

EOSC-Nordic

Short name VETENSKAPSRADET - SWEDISH RESEAR

Department(s) carrying out the proposed work

Department 1

Department name not applicable

Same as proposing organisation's address

Street

Town

Postcode

Country

Dependencies with other proposal participants

Character of dependence	Participant	
<input type="text"/>	<input type="text"/>	

Proposal Submission Forms

Proposal ID **857652**

Acronym **EOSC-Nordic**

Short name **VETENSKAPSRADET - SWEDISH RESEAR**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Dr.

Sex

Male Female

First name **Valter**

Last name **Nordh**

E-Mail **valter@sUNET.se**

Position in org. Chief Technology Officer

Department SUNET

Same as organisation name

Same as proposing organisation's address

Street Tulegatan 11 3tr

Town Stockholm

Post code 11353

Country Sweden

Website www.sunet.se

Phone +XXX XXXXXXXXXX

Phone 2 +XXX XXXXXXXXXX

Fax +XXX XXXXXXXXXX

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **HELSINGIN YLIOPISTO**

PIC

999994535

Legal name

HELSINGIN YLIOPISTO

Short name: HELSINGIN YLIOPISTO

Address of the organisation

Street **FABIANINKATU 33**

Town **HELSINGIN YLIOPISTO**

Postcode **00014**

Country **Finland**

Webpage **www.helsinki.fi**

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyyes

Legal personyes

Non-profityes

International organisationno

International organisation of European interestno

Industry (private for profit).....no

Secondary or Higher education establishmentyes

Research organisationyes

Enterprise Data

SME self-declared status.....09/02/2009 - yes

SME self-assessment unknown

SME validation sme.....09/02/2009 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID 857652

Acronym

EOSC-Nordic

Short name HELSINGIN YLIOPISTO

Department(s) carrying out the proposed work

Department 1

Department name not applicable

Same as proposing organisation's address

Street

Town

Postcode

Country

Dependencies with other proposal participants

Character of dependence	Participant	
<input type="text"/>	<input type="text"/>	

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **HELSINGIN YLIOPISTO**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Mr.

Sex

Male Female

First name **Ville**

Last name **Tenhunen**

E-Mail **ville.tenhunen@helsinki.fi**

Position in org. Team leader

Department Center for Information Technology

Same as organisation name

Same as proposing organisation's address

Street PL 28 (Koetilantie 3)

Town Helsingin yliopisto

Post code 00014

Country Finland

Website <https://www.helsinki.fi/en/it/center-for-information-technology>

Phone +358505762862

Phone 2 +xxx xxxxxxxxx

Fax

+xxx xxxxxxxxx

Other contact persons

First Name	Last Name	E-mail	Phone
Pirjo	Kontkanen	pirjo.kontkanen@helsinki.fi	+358504086925
Pauli	Assinen	pauli.assinen@helsinki.fi	+358 504154483
Saara	Vihko	saara.vihko@helsinki.fi	+358 294124820

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **KBFI**

PIC 999605856 **Legal name** KEEMILISE JA BIOLOOGILISE FUUSIKA INSTITUUT

Short name: KBFI

Address of the organisation

Street AKADEEMIA TEE 23

Town TALLINN

Postcode 12618

Country Estonia

Webpage www.kbfi.ee

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyyes

Legal personyes

Non-profityes

International organisationno

International organisation of European interestno

Industry (private for profit).....no

Secondary or Higher education establishmentno

Research organisationyes

Enterprise Data

SME self-declared status.....23/09/2002 - no

SME self-assessment unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **KBFI**

Department(s) carrying out the proposed work

Department 1

Department name

Laboratory of High Energy and Computational Physics

not applicable

Same as proposing organisation's address

Street

AKADEEMIA TEE 23

Town

TALLINN

Postcode

12618

Country

Estonia

Dependencies with other proposal participants

Character of dependence	Participant	

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **KBFI**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Dr.

Sex

Male Female

First name **Andi**

Last name **Hektor**

E-Mail **andi.hektor@kbfi.ee**

Position in org.

Senior researcher

Department

Laboratory of High Energy and Computational Physics

Same as organisation name

Same as proposing organisation's address

Street

AKADEEMIA TEE 23

Town

TALLINN

Post code

12618

Country

Estonia

Website

http://www.kbfi.ee

Phone

+37256150288

Phone 2

+xxx xxxxxxxxx

Fax

+xxx xxxxxxxxx

Other contact persons

First Name	Last Name	E-mail	Phone
Mario	Kadastik	mario.dadastik@ut.ee	+3725037434

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **UTA**

PIC

999903161

Legal name

TAMPEREEN YLIOPISTO

Short name: UTA

Address of the organisation

Street Kalevantie 4

Town TAMPERE

Postcode 33014

Country Finland

Webpage www.uta.fi

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyyes

Non-profityes

International organisationno

International organisation of European interestno

Secondary or Higher education establishmentyes

Research organisationyes

Legal personyes

Industry (private for profit).....no

Enterprise Data

SME self-declared status.....03/03/2014 - no

SME self-assessment03/03/2014 - no

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID 857652

Acronym

EOSC-Nordic

Short name UTA

Department(s) carrying out the proposed work

Department 1

Department name

Finnish Social Science Data Archive

not applicable

Same as proposing organisation's address

Street

Kalevantie 4

Town

TAMPERE

Postcode

33014

Country

Finland

Dependencies with other proposal participants

Character of dependence	Participant	

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **UTA**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Ms

Sex

Male

Female

First name **Mari**

Last name **Kleemola**

E-Mail **mari.kleemola@uta.fi**

Position in org. Development Manager, Deputy Director at FSD

Department TAMPEREEN YLIOPISTO

Same as organisation name

Same as proposing organisation's address

Street Kalevantie 4

Town TAMPERE

Post code 33014

Country Finland

Website

Phone

+XXX XXXXXXXXX

Phone 2

+XXX XXXXXXXXX

Fax

+XXX XXXXXXXXX

Other contact persons

First Name	Last Name	E-mail	Phone
Katri	Aarnio	katri.aarnio@uta.fi	+XXX XXXXXXXXX
Susanna	Heikkila	susanna.m.heikkila@uta.fi	+XXX XXXXXXXXX

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **UGOT**

PIC

999981925

Legal name

GOETEBORGS UNIVERSITET

Short name: UGOT

Address of the organisation

Street VASAPARKEN

Town GOETEBORG

Postcode 405 30

Country Sweden

Webpage www.gu.se

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyyes

Legal personyes

Non-profityes

International organisationno

International organisation of European interestno

Industry (private for profit).....no

Secondary or Higher education establishmentyes

Research organisationyes

Enterprise Data

SME self-declared status.....19/08/2008 - no

SME self-assessment unknown

SME validation sme.....19/08/2008 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID 857652

Acronym

EOSC-Nordic

Short name UGOT

Department(s) carrying out the proposed work

Department 1

Department name

Swedish National Data Service

not applicable

Same as proposing organisation's address

Street

PO Box 463

Town

Gothenburg

Postcode

40530

Country

Sweden

Department 2

Department name

Gothenburg Global Biodiversity Centre

not applicable

Same as proposing organisation's address

Street

PO Box 461

Town

Gothenburg

Postcode

40530

Country

Sweden

Dependencies with other proposal participants

Character of dependence	Participant

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **UGOT**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Dr.

Sex

Male Female

First name **Ulf**

Last name **Jakobsson**

E-Mail **ulf.jakobsson@gu.se**

Position in org.

Data Manager Humanities

Department

Swedish National Data Service

Same as organisation name

Same as proposing organisation's address

Street

PO Box 463

Town

Gothenburg

Post code

40530

Country

Sweden

Website

<https://snd.gu.se/en/about-us/staff>

Phone

+46 (0)31 - 786 65 5

Phone 2

+xxx xxxxxxxxx

Fax

+xxx xxxxxxxxx

Other contact persons

First Name	Last Name	E-mail	Phone
Maria	Enge	maria.enge@gu.se	+46317866473
Matthias	Obst	matthias.obst@marine.gu.se	+4631-7863827

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **NSD - NORSK SENTER FOR FORSKNING**

PIC 999740104 **Legal name** NSD - NORSK SENTER FOR FORSKNINGSDATA AS

Short name: NSD - NORSK SENTER FOR FORSKNINGSDATA AS

Address of the organisation

Street HARALD HAARFAGRES GATE 29

Town BERGEN

Postcode 5007

Country Norway

Webpage www.nsd.no

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyno

Legal personyes

Non-profityes

International organisationno

International organisation of European interestno

Industry (private for profit).....no

Secondary or Higher education establishmentno

Research organisationno

Enterprise Data

SME self-declared status.....04/07/2008 - yes

SME self-assessment unknown

SME validation sme.....04/07/2008 - yes

Based on the above details of the Beneficiary Registry the organisation is an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID 857652

Acronym EOSC-Nordic

Short name NSD - NORSK SENTER FOR FORSKNING

Department(s) carrying out the proposed work

Department 1

Department name Faculty of Industrial Engineering, Mechanical Engineering and Com not applicable

Same as proposing organisation's address

Street HARALD HAARFAGRES GATE 29

Town BERGEN

Postcode 5007

Country Norway

Dependencies with other proposal participants

Character of dependence	Participant

Proposal Submission Forms

Proposal ID **857652**

Acronym **EOSC-Nordic**

Short name **NSD - NORSK SENTER FOR FORSKNING**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Sex Male Female

First name **Vigdis**

Last name **Kvalheim**

E-Mail **vigdis.kvalheim@nsd.no**

Position in org.

Department

Same as organisation name

Same as proposing organisation's address

Street

Town

Post code

Country

Website

Phone

Phone 2

Fax

Other contact persons

First Name	Last Name	E-mail	Phone
katrine	Utaaker Segadal	katrine.segadal@nsd.no	+4755582117
Heidi Margrethe	Tvedt	heidi.tvedt@nsd.no	+4755582376

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **RIGSARKIVET**

PIC

999756012

Legal name

RIGSARKIVET

Short name: RIGSARKIVET

Address of the organisation

Street RIGSDAGSGARDEN 9

Town KOBENHAVN

Postcode 1218

Country Denmark

Webpage www.sa.dk

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyyes

Legal personyes

Non-profityes

International organisationno

International organisation of European interestno

Industry (private for profit).....no

Secondary or Higher education establishmentno

Research organisationyes

Enterprise Data

SME self-declared status.....01/01/1900 - yes

SME self-assessment unknown

SME validation sme.....01/01/1900 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID 857652

Acronym

EOSC-Nordic

Short name RIGSARKIVET

Department(s) carrying out the proposed work

No department involved

Department name

Name of the department/institute carrying out the work.

not applicable

Same as proposing organisation's address

Street

Please enter street name and number.

Town

Please enter the name of the town.

Postcode

Area code.

Country

Please select a country

Dependencies with other proposal participants

Character of dependence	Participant	

Proposal Submission Forms

Proposal ID **857652**

Acronym **EOSC-Nordic**

Short name **RIGSARKIVET**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Dr.

Sex

Male

Female

First name **Anne Sofie**

Last name **Fink Kjeldgaard**

E-Mail **asf@sa.dk**

Position in org.

Department

Same as organisation name

Same as proposing organisation's address

Street

Town

Post code

Country

Website

Phone

Phone 2

Fax

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **FMI**

PIC

999591306

Legal name

ILMATIETEEN LAITOS

Short name: FMI

Address of the organisation

Street Erik Palmenin aukio 1

Town HELSINKI

Postcode 00560

Country Finland

Webpage www.fmi.fi

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyyes

Legal personyes

Non-profityes

International organisationno

International organisation of European interestno

Industry (private for profit).....no

Secondary or Higher education establishmentno

Research organisationyes

Enterprise Data

SME self-declared status..... unknown

SME self-assessment unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **FMI**

Department(s) carrying out the proposed work

Department 1

Department name

CLIMATE RESEARCH PROGRAMME

not applicable

Same as proposing organisation's address

Street

Erik Palmenin aukio 1

Town

HELSINKI

Postcode

00560

Country

Finland

Dependencies with other proposal participants

Character of dependence	Participant	

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **FMI**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Dr.

Sex

Male

Female

First name **Sanna**

Last name **Sorvari**

E-Mail **sanna.sorvari@fmi.fi**

Position in org. Research manager

Department ILMATIETEEN LAITOS

Same as organisation name

Same as proposing organisation's address

Street Erik Palmenin aukio 1

Town HELSINKI

Post code 00560

Country Finland

Website www.fmi.fi

Phone +358504154729

Phone 2 +xxx xxxxxxxxxx

Fax

+xxx xxxxxxxxxx

Other contact persons

First Name	Last Name	E-mail	Phone
Anna	Salonen	anna.salonen@fmi.fi	+358415446223
Anca	Hienola	anca.hienola@fmi.fi	+358407753868

Proposal Submission Forms

Proposal ID 857652

Acronym

EOSC-Nordic

Short name University of Eastern Finland (UEF)

PIC

991207984

Legal name

ITA-SUOMEN YLIOPISTO

Short name: University of Eastern Finland (UEF)

Address of the organisation

Street YLIOPISTONRANTA 1 E

Town KUOPIO

Postcode 70211

Country Finland

Webpage www.uef.fi

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyyes

Legal personyes

Non-profityes

International organisationno

International organisation of European interestno

Industry (private for profit).....no

Secondary or Higher education establishmentyes

Research organisationyes

Enterprise Data

SME self-declared status.....09/09/2009 - no

SME self-assessment09/09/2009 - no

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID 857652

Acronym EOSC-Nordic

Short name University of Eastern Finland (UEF)

Department(s) carrying out the proposed work

Department 1

Department name not applicable

Same as proposing organisation's address

Street

Town

Postcode

Country

Dependencies with other proposal participants

Character of dependence	Participant	
<input type="text"/>	<input type="text"/>	

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **University of Eastern Finland (UEF)**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Dr.

Sex

Male

Female

First name **Jarmo**

Last name **Saarti**

E-Mail **jarmo.saarti@uef.fi**

Position in org. Library Director

Department Library

Same as organisation name

Same as proposing organisation's address

Street YLIOPISTONRANTA 1 E

Town KUOPIO

Post code 70211

Country Finland

Website

Phone +358 40 515 7973

Phone 2 +xxx xxxxxxxxx

Fax

+xxx xxxxxxxxx

Other contact persons

First Name	Last Name	E-mail	Phone
Ritva	Väyrynen	ritva.vayrynen@uef.fi	+358 40 487 176
Jukka	Monkkonen	jukka.monkkonen@uef.fi	+xxx xxxxxxxxx
Tiina	Reinikainen	tiina.reinikainen@uef.fi	+xxx xxxxxxxxx

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **GO FAIR FOUNDATION (GFF)**

PIC

906139178

Legal name

Stichting GO FAIR

Short name: GO FAIR FOUNDATION (GFF)

Address of the organisation

Street Poortgebouw N-01 Rijnsburgerweg 10

Town Leiden

Postcode 2333 AA

Country Netherlands

Webpage www.go-fair.org

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyno

Legal personyes

Non-profityes

International organisationno

International organisation of European interestno

Industry (private for profit).....no

Secondary or Higher education establishmentno

Research organisationno

Enterprise Data

SME self-declared status..... unknown

SME self-assessment unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID 857652

Acronym

EOSC-Nordic

Short name GO FAIR FOUNDATION (GFF)

Department(s) carrying out the proposed work

No department involved

Department name

Name of the department/institute carrying out the work.

not applicable

Same as proposing organisation's address

Street

Please enter street name and number.

Town

Please enter the name of the town.

Postcode

Area code.

Country

Please select a country

Dependencies with other proposal participants

Character of dependence	Participant	

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **GO FAIR FOUNDATION (GFF)**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

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Last name **Meerman**

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Position in org.

Department



Same as organisation name

Same as proposing organisation's address

Street

Town

Post code

Country

Website

Phone

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Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **DEUTSCHES KLIMARECHENZENTRUM GM**

PIC

998692310

Legal name

DEUTSCHES KLIMARECHENZENTRUM GMBH

Short name: DEUTSCHES KLIMARECHENZENTRUM GMBH

Address of the organisation

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Town HAMBURG

Postcode 20146

Country Germany

Webpage <http://www.dkrz.de>

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyyes

Legal personyes

Non-profityes

International organisationno

International organisation of European interestno

Industry (private for profit).....no

Secondary or Higher education establishmentno

Research organisationyes

Enterprise Data

SME self-declared status.....03/11/2008 - no

SME self-assessment unknown

SME validation sme.....03/11/2008 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID 857652

Acronym

EOSC-Nordic

Short name DEUTSCHES KLIMARECHENZENTRUM GM

Department(s) carrying out the proposed work

Department 1

Department name

Data Management

not applicable

Same as proposing organisation's address

Street

BUNDESSTRASSE 45A

Town

HAMBURG

Postcode

20146

Country

Germany

Dependencies with other proposal participants

Character of dependence	Participant	

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **DEUTSCHES KLIMARECHENZENTRUM GM**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

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Dr.

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Department Data Management

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Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **UCPH**

PIC

999991043

Legal name

KOBENHAVNS UNIVERSITET

Short name: *UCPH*

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Town KOBENHAVN

Postcode 1165

Country Denmark

Webpage www.ku.dk

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyyes

Legal personyes

Non-profityes

International organisationno

International organisation of European interestno

Industry (private for profit).....no

Secondary or Higher education establishmentyes

Research organisationyes

Enterprise Data

SME self-declared status.....01/01/2005 - no

SME self-assessment unknown

SME validation sme..... unknown

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **UCPH**

Department(s) carrying out the proposed work

Department 1

Department name

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not applicable

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Town

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Postcode

2200

Country

Denmark

Dependencies with other proposal participants

Character of dependence	Participant	

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **UCPH**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

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Sex

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Last name **Brunak**

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Position in org.

Department

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Same as proposing organisation's address

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Town

Post code

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Website

Phone

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Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **REGIONH**

PIC

999654744

Legal name

REGION HOVEDSTADEN

Short name: REGIONH

Address of the organisation

Street KONGENS VAENGE 2

Town HILLEROD

Postcode 3400

Country Denmark

Webpage www.regionh.dk

Legal Status of your organisation

Research and Innovation legal statuses

Public bodyyes

Legal personyes

Non-profityes

International organisationno

International organisation of European interestno

Industry (private for profit).....no

Secondary or Higher education establishmentno

Research organisationno

Enterprise Data

SME self-declared status.....23/02/2009 - no

SME self-assessment unknown

SME validation sme.....23/02/2009 - no

Based on the above details of the Beneficiary Registry the organisation is not an SME (small- and medium-sized enterprise) for the call.

Proposal Submission Forms

Proposal ID 857652

Acronym

EOSC-Nordic

Short name REGIONH

Department(s) carrying out the proposed work

Department 1

Department name not applicable

Same as proposing organisation's address

Street

Town

Postcode

Country

Dependencies with other proposal participants

Character of dependence	Participant	
<input type="text"/>	<input type="text"/>	

Proposal Submission Forms

Proposal ID **857652**

Acronym

EOSC-Nordic

Short name **REGIONH**

Person in charge of the proposal

The name and e-mail of contact persons are read-only in the administrative form, only additional details can be edited here. To give access rights and basic contact details of contact persons, please go back to Step 4 of the submission wizard and save the changes.

Title

Sex Male Female

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Last name **Bundgaard**

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Position in org.

Department

Same as organisation name

Same as proposing organisation's address

Street

Town

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Country

Website

Phone

Phone 2

Fax

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Proposal Submission Forms

Proposal ID **857652**

Acronym **EOSC-Nordic**

3 - Budget

No	Participant	Country	(A) Direct personnel costs/€	(B) Other direct costs/€	(C) Direct costs of sub- contracting/€	(D) Direct costs of providing financial support to third parties/€	(E) Costs of inkind contributions not used on the beneficiary's premises/€	(F) Indirect Costs / € (=0.25(A+B-E))	(G) Special unit costs covering direct & indirect costs / €	(H) Total estimated eligible costs / € (=A+B+C+D+F +G)	(I) Reimburse- ment rate (%)	(J) Max.EU Contribution / € (=H*I)	(K) Requested EU Contribution/ €
			?	?	?	?	?	?	?	?	?	?	?
1	Nordforsk	NO	370300	95800	0	0	0	116525,00	0	582625,00	100	582625,00	582625,00
2	Danmarks Tekniske Universitet	DK	442926	37600	0	0	0	120131,50	0	600657,50	100	600657,50	600657,50
3	Csc-tieteen Tietotekniikan Keskus Oy	FI	619038	145000	0	0	0	191009,50	0	955047,50	100	955047,50	955047,50
4	Uninett Sigma2 As	NO	792000	52000	0	0	0	211000,00	0	1055000,00	100	1055000,00	1055000,00
5	Uppsala Universitet	SE	552000	24000	0	0	0	144000,00	0	720000,00	100	720000,00	720000,00
6	Tartu Ülikool	EE	371000	36000	0	0	0	101750,00	0	508750,00	100	508750,00	508750,00
7	Haskoli Íslands	IS	170791	7600	0	0	0	44597,75	0	222988,75	100	222988,75	222988,75
8	Vilniaus Universitetas	LT	8800	1600	0	0	0	2600,00	0	13000,00	100	13000,00	13000,00
9	Rīgas Tehniskā Universitāte	LV	33000	2400	0	0	0	8850,00	0	44250,00	100	44250,00	44250,00
10	Syddansk Universitet	DK	54568	3200	0	0	0	14442,00	0	72210,00	100	72210,00	72210,00

Proposal Submission Forms

Proposal ID **857652**

Acronym **EOSC-Nordic**

11	Nordunet A/s	DK	58000	2000	0	0	0	15000,00	0	75000,00	100	75000,00	75000,00
12	Vetenskapsrådet - Swedish Research	SE	45000	2000	0	0	0	11750,00	0	58750,00	100	58750,00	58750,00
13	Helsingin Yliopisto	FI	139550	8800	0	0	0	37087,50	0	185437,50	100	185437,50	185437,50
14	Keemilise Ja Bioloogilise Fuusika	EE	67500	3600	0	0	0	17775,00	0	88875,00	100	88875,00	88875,00
15	Tampereen Yliopisto	FI	30200	1600	0	0	0	7950,00	0	39750,00	100	39750,00	39750,00
16	Goetheborgs Universitet	SE	97100	4800	0	0	0	25475,00	0	127375,00	100	127375,00	127375,00
17	Nsd - Norsk Senter For Forskningsdat	NO	25800	1200	0	0	0	6750,00	0	33750,00	100	33750,00	33750,00
18	Rigsarkivet	DK	48307	2800	0	0	0	12776,75	0	63883,75	100	63883,75	63883,75
19	Ilmatieteen Laitos	FI	72000	3600	0	0	0	18900,00	0	94500,00	100	94500,00	94500,00
20	Ita-suomen Yliopisto	FI	28000	1600	0	0	0	7400,00	0	37000,00	100	37000,00	37000,00
21	Stichting Go Fair	NL	160000	4000	0	0	0	41000,00	0	205000,00	100	205000,00	205000,00
22	Deutsches Klimarechenzentrum GmbH	DE	49800	2400	0	0	0	13050,00	0	65250,00	100	65250,00	65250,00
23	Kobenhavns Universitet	DK	68800	3200	0	0	0	18000,00	0	90000,00	100	90000,00	90000,00
24	Region Hovedstaden	DK	40500	2000	0	0	0	10625,00	0	53125,00	100	53125,00	53125,00
	Total		4344980	448800	0	0	0	1198445,00	0	5992225,00		5992225,00	5992225,00

4 - Ethics

1. HUMAN EMBRYOS/FOETUSES		Page
Does your research involve Human Embryonic Stem Cells (hESCs) ?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Does your research involve the use of human embryos?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Does your research involve the use of human foetal tissues / cells?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
2. HUMANS		Page
Does your research involve human participants?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Does your research involve physical interventions on the study participants?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
3. HUMAN CELLS / TISSUES		Page
Does your research involve human cells or tissues (other than from Human Embryos/ Foetuses, i.e. section 1)?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
4. PERSONAL DATA		Page
Does your research involve personal data collection and/or processing?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Does your research involve further processing of previously collected personal data (secondary use)?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
5. ANIMALS		Page
Does your research involve animals?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
6. THIRD COUNTRIES		Page
In case non-EU countries are involved, do the research related activities undertaken in these countries raise potential ethics issues?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Do you plan to use local resources (e.g. animal and/or human tissue samples, genetic material, live animals, human remains, materials of historical value, endangered fauna or flora samples, etc.)?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Do you plan to import any material - including personal data - from non-EU countries into the EU?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Do you plan to export any material - including personal data - from the EU to non-EU countries?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
In case your research involves low and/or lower middle income countries , are any benefits-sharing actions planned?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Could the situation in the country put the individuals taking part in the research at risk?	<input type="radio"/> Yes <input checked="" type="radio"/> No	

Proposal Submission Forms

Proposal ID 857652

Acronym EOSC-Nordic

7. ENVIRONMENT & HEALTH and SAFETY		Page
Does your research involve the use of elements that may cause harm to the environment, to animals or plants?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Does your research deal with endangered fauna and/or flora and/or protected areas?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
Does your research involve the use of elements that may cause harm to humans, including research staff?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
8. DUAL USE		Page
Does your research involve dual-use items in the sense of Regulation 428/2009, or other items for which an authorisation is required?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
9. EXCLUSIVE FOCUS ON CIVIL APPLICATIONS		Page
Could your research raise concerns regarding the exclusive focus on civil applications?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
10. MISUSE		Page
Does your research have the potential for misuse of research results?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
11. OTHER ETHICS ISSUES		Page
Are there any other ethics issues that should be taken into consideration? Please specify	<input type="radio"/> Yes <input checked="" type="radio"/> No	

I confirm that I have taken into account all ethics issues described above and that, if any ethics issues apply, I will complete the ethics self-assessment and attach the required documents.

[How to Complete your Ethics Self-Assessment](#)

5 - Call-specific questions

Extended Open Research Data Pilot in Horizon 2020

If selected, applicants will by default participate in the [Pilot on Open Research Data in Horizon 2020¹](#), which aims to improve and maximise access to and re-use of research data generated by actions.

However, participation in the Pilot is flexible in the sense that it does not mean that all research data needs to be open. After the action has started, participants will formulate a [Data Management Plan \(DMP\)](#), which should address the relevant aspects of making data FAIR – findable, accessible, interoperable and re-usable, including what data the project will generate, whether and how it will be made accessible for verification and re-use, and how it will be curated and preserved. Through this DMP projects can define certain datasets to remain closed according to the principle "as open as possible, as closed as necessary". A Data Management Plan does not have to be submitted at the proposal stage.

Furthermore, applicants also have the possibility to opt out of this Pilot completely at any stage (before or after the grant signature). In this case, applicants must indicate a reason for this choice (see options below).

Please note that participation in this Pilot does not constitute part of the evaluation process. Proposals will not be penalised for opting out.

We wish to opt out of the Pilot on Open Research Data in Horizon 2020.

Yes

No

Further guidance on open access and research data management is available on the participant portal: http://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/open-access-dissemination_en.htm and in general annex L of the Work Programme.

¹ According to article 43.2 of Regulation (EU) No 1290/2013 of the European Parliament and of the Council, of 11 December 2013, laying down the rules for participation and dissemination in "Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020)" and repealing Regulation (EC) No 1906/2006.



EOSC

A graphic consisting of three overlapping, rounded rectangular shapes in red, blue, and yellow, arranged horizontally.

NORDIC

Proposal full title:	European Open Science Cloud - Nordic
Proposal acronym:	EOSC-Nordic
Call Identifier:	H2020-INFRAEOSC-2018-2020
Topic Identifier:	INFRAEOSC-05-2018-2019
Type of action:	Research and Innovation action (RIA)
Specific Challenge:	(b) Coordination of EOSC-relevant national initiatives across Europe and support to prospective EOSC service providers
Coordinator:	NeIC
Person in charge of the proposal:	Gudmund Høst, NeIC Director - Gudmund.Host@nordforsk.org

List of participants

Participant No	Participant organisation name	Name in proposal	Country
1	NORDFORSK	NeIC	Norway
2	DANMARKS TEKNISKE UNIVERSITET	DeiC Computerome	Denmark
3	CSC – TIETEEN TIETOTEKNIIKAN KESKUS OY	CSC	Finland
4	UNINETT SIGMA2 AS	Sigma2	Norway
5	UPPSALA UNIVERSITET	SNIC	Sweden
6	TARTU ULIKOOL	UT/ ETAIS	Estonia
7	HASKOLI ISLANDS	UICE	Iceland
8	VILNIAUS UNIVERSITETAS	VU	Lithuania
9	RIGAS TEHNISKA UNIVERSITATE	RTU	Latvia
10	SYDDANSK UNIVERSITET	SDU	Denmark
11	NORDUNET A/S	NORDUnet	Denmark
12	VETENSKAPRADET – SWEDISH RESEARCH COUNCIL	SUNET	Sweden
13	HELSINGIN YLIOPISTO	UH	Finland
14	KEEMILISE JA BIOLOOGILISE FUUSIKA INSTITUUT	KBFI/ETAIS	Estonia
15	TAMPEREEN YLIOPISTO	UTA/ FSD	Finland
16	GOETEBORGS UNIVERSITET	UGOT/ SND UGOT/GGBC	Sweden
17	NSD – NORSK SENTER FOR FORSKNINGSDATA AS	NSD	Norway
18	RIGSARKIVET	DNA	Denmark
19	ILMATIETEEN LAITOS	FMI	Finland
20	ITA-SUOMEN YLIOPISTO	UEF	Finland
21	Stichting GO FAIR FOUNDATION	GFF	Netherlands
22	DEUTSCHES KLIMARECHENZENTRUM GMBH	DKRZ	Germany
23	KØBENHAVNS UNIVERSITET	UCPH CGG/UCPH	Denmark
24	REGION HOVEDSTADEN	RH	Denmark

Table of Contents

1	EXCELLENCE	5
1.1	OBJECTIVES	6
1.2	RELATION TO THE WORK PROGRAMME	7
1.3	CONCEPT AND METHODOLOGY	11
1.3.1	<i>Overall approach</i>	11
1.3.2	<i>Methodology</i>	19
1.4	AMBITION	22
2	IMPACT	24
2.1	EXPECTED IMPACTS	24
2.1.1	<i>Contribution to the impacts listed in the Work Programme</i>	24
2.1.2	<i>Contribution to other environmental and socially important impacts</i>	25
2.1.3	<i>Key performance indicators</i>	25
2.1.4	<i>Barriers/obstacles & other framework conditions</i>	26
2.2	MEASURES TO MAXIMISE IMPACT	26
2.2.1	<i>Dissemination and exploitation of results</i>	27
2.2.2	<i>Communications Activities</i>	32
3	IMPLEMENTATION	35
3.1	WORK PLAN — WORK PACKAGES, DELIVERABLES	35
3.2	MANAGEMENT STRUCTURE, MILESTONES AND PROCEDURES	58
3.2.1	<i>Project Management</i>	58
3.2.2	<i>Decision-making Mechanisms</i>	59
3.2.3	<i>Conflict Management</i>	59
3.2.4	<i>Innovation Management</i>	60
3.3	CONSORTIUM AS A WHOLE	63
3.4	RESOURCES TO BE COMMITTED	64

List of tables

Table 1.1: Alignment of EOSC-Nordic with the challenges and scope of INFRAEOSC 5(b)	8
Table 1.2: Provisional list of EOSC-relevant projects	10
Table 1.3: EOSC related national initiatives covered by the project.....	12
Table 1.4: EOSC-Nordic initial list of candidate services for EOSC	13
Table 1.5: List of initial repositories that will undergo FAIR practice improvements in EOSC-Nordic	17
Table 1.6: Relevant existing efforts & initiatives in the Nordics	18
Table 2.1: The expected impact addressed by EOSC-Nordic	24
Table 2.2: EOSC-Nordic Key Performance Indicators.....	25
Table 2.3: Exploitation of results in EOSC-Nordic.....	27
Table 2.4: Measures to communicate project activities	33
Table 2.5: The EOSC-Nordic set of indicative KPIs.....	35
Table 3.1: List of work packages	37
Table 3.2: Work plan	39
Table 3.3: List of Deliverables.....	56
Table 3.4: List of milestones	60
Table 3.5: Critical risks for implementation.....	62
Table 3.6: Summary of staff effort	65
Table 3.7: ‘Other direct cost’ items (travel, equipment, other goods and services).....	66

List of figures

Figure 1.1: The EOSC-Nordic objectives	6
Figure 1.2: EOSC-Nordic high-level approach.....	11
Figure 1.3: The high-level technical concept of EOSC-Nordic	20
Figure 2.1: The relevance of the different work packages’ activities to each key stakeholder community.....	33
Figure 3.1: EOSC-Nordic PERT chart representing the relationship and high-level interaction between work packages	37
Figure 3.2. Project organisation	59

1 Excellence

The EOSC-Nordic project aims to facilitate the **coordination of EOSC relevant initiatives within the Nordic and Baltic countries and exploit synergies to achieve greater harmonisation at policy and service provisioning across these countries, in compliance with EOSC agreed standards and practices.** The project brings together a strong consortium of 24 complementary partners including e-Infrastructure providers, research performing organisations and expert networks, with national mandates and experience with regards to the provision of research data services, and a unique capacity to realise the outcomes of the EOSC design as outlined by the EOSC Implementation Roadmap.

Science is changing, both in the way it is performed and the way it is communicated. Driven by remarkable advances in information and communication technologies, today's scientific infrastructures offer researchers unprecedented access to data sources, data-intensive sensors, and increasingly comprehensive analysis and simulation facilities that have revolutionized scientific methods in a remarkably short space of time. Research services, processes and outputs are becoming accessible to all levels of society. Enormous amounts of data are being generated, bringing extraordinary new opportunities for their innovative reuse in novel scientific, commercial, and citizen-science contexts. This is *Open Science*.

To harness its full value and reap the fruits of public and private, national and European investment, the European Commission has launched the European Open Science Cloud (EOSC) initiative. EOSC will foster an open, collaborative platform for the management, analysis, sharing, reuse and preservation of research data on which innovative services can be developed and delivered. For this, Europe can build on decades of public investment in scientific infrastructures—experimental facilities, networking, high-performance and high-throughput computing, cloud services, scientific software and institutional and community data repositories—by connecting national and international infrastructures and services.

Much of the technology to achieve EOSC already exists. Challenges remain, of course, but they are more ones of policy than technology, of agreement between resource providers, of adoption of common approaches, in particular concerning the delivery of services and the management of research data. In this regard, coordination between member states and national initiatives is of utmost importance.

Over the past few years, European member states have developed national open science programmes and have invested massively in their national infrastructures to support these programmes. They have embraced the open science principles and are looking positively towards the development of the EOSC. Yet, the current national initiatives are largely working in isolation, which hampers the development of an integrated EOSC.

The EOSC-Nordic project will foster & advance the take-up of the European Open Science Cloud at the Nordic & Baltic level by **coordinating the EOSC relevant initiatives taking place in Finland, Sweden, Norway, Denmark, Iceland, Estonia, Lithuania and Latvia** and bringing them to bear in the context of the EOSC. The project will facilitate the coordination between these initiatives focusing on policies, service provisioning and research data, in light of the anticipated future EOSC requirements.

The Nordic and Baltic countries are particularly well suited for collaboration among each other due to social and cultural similarities. They have a unique experience of organising efforts across borders and addressing issues which need to be addressed by EOSC such as governance, resource sharing, coordination & harmonisation of infrastructure policies, cross-border funding, etc. As such they offer a unique and functional cross-border environment to coordinate efforts but also to provide solutions and recipes to address issues at the European level, for the benefit of EOSC.

The fundamental principles and values to be honoured and pursued within EOSC-Nordic are articulated in the EOSC Declaration¹ (European Commission 2017) and the EOSC Implementation Roadmap² (European Commission 2018). They put across a strong commitment, expressed by the EOSC-Nordic participants, to the common culture of data stewardship and FAIR principles, e.g. to make data Findable, Accessible, Interoperable, and Reusable. They also display a firm dedication to develop user driven data infrastructure commons, determined by emerging use cases and

¹ Available: https://ec.europa.eu/research/openscience/pdf/eosc_declaration.pdf

² Available: https://ec.europa.eu/research/openscience/pdf/swd_2018_83_fl_staff_working_paper_en.pdf

needs of the research communities, and providing access to a wide range of publicly funded services supplied at national, regional, and institutional levels. These principles strongly guide all strategic goal setting and permeate through all subsequent implementation actions of this project.

1.1 Objectives

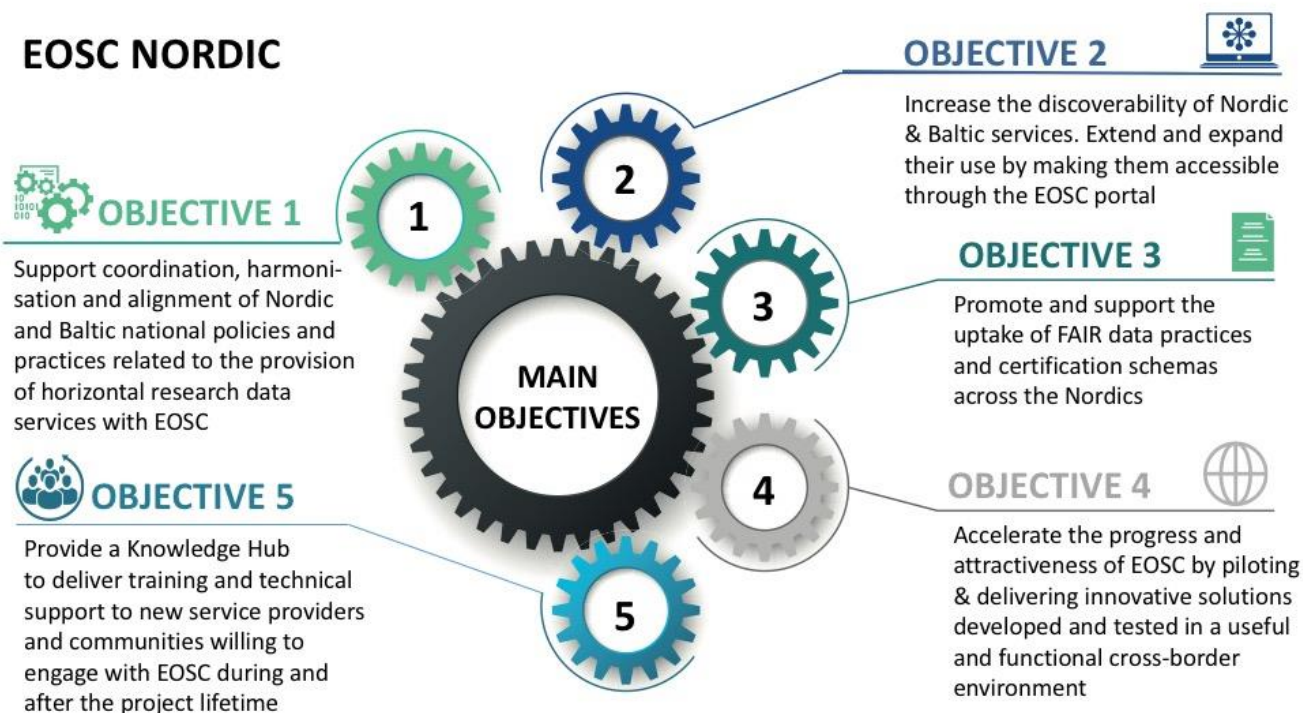


Figure 1.1: The EOSC-Nordic objectives

Objective 1: Support the coordination, harmonisation and alignment of Nordic and Baltic national policies and practices related to the provision of horizontal research data services with EOSC

EOSC-Nordic aims to facilitate the alignment of the delivery of horizontal services by improving interoperability practices across the national initiatives to **establish a truly coherent environment where services can work and be combined together to enable seamless access to resources**. This project addresses interoperability issues at the four levels identified by the European Interoperability Framework (EIF) (organisational, semantic, legal and technical) in order to facilitate the integration of the services with EOSC and the federation on a multiple service providers coming from different countries.

Main measurable outcome: a) periodic assessments of the status of open science policies and the provisioning of infrastructure resources and services in the Nordic and Baltic countries (WP2), b) recommendations with regards to the organisation of infrastructure collaboration and access to resources in a cross-border environment (WP2), recommendations with regard to the legal implementation of EOSC standards and policies in the Nordics, d) recommendations for improving service interoperability across Nordic and Baltic organisations (WP3), e) policy workshops (WP2)

Objective 2: Increase the discoverability of Nordic & Baltic services and extend and expand their use by making them accessible through the EOSC portal

This will include identifying and **engaging with prospective service providers and supporting their integration with the EOSC catalogue**, service management framework and operational environment. Particular attention will be paid to services, which can be “opened up” to users beyond their initial, local customer base. By

<p>integrating services with EOSC core components, such as EOSC portal, federated AAI, marketplace, and helpdesk, our goal is also to simplify access to these services across the Nordics and beyond.</p>
<p>Main measurable outcomes: a) EOSC service compliance checklist and maturity model (WP3), b) identification and description of prospective EOSC service providers and candidate services to be integrated into EOSC portal (WP3), c) hands-on support to service providers for integrating EOSC core components (WP3).</p>
<p>Objective 3: Promote and support the uptake of FAIR data practices and certification schemas across the Nordics</p> <p>EOSC-Nordic will work in close collaboration with FAIRsFAIR (an INFRAEOSC-05c-2018-2019 supported project) and other relevant initiatives (such as GoFAIR) on data management to promote best practices and support the adoption of relevant certification schemas. We will also address the question of incentives and develop a set of recommendations for the uptake of FAIR practices across EOSC.</p>
<p>Main measurable outcomes: a) identification of EOSC relevant repositories (WP4); b) recommendations and guidelines for improving data management practices and FAIR metrics (WP4), c) hackathons and hands on training and support (WP4), d) recommendations on the development of incentives for facilitating the uptake of FAIR practices in the Nordic and Baltic countries (WP4).</p>
<p>Objective 4: Accelerate the progress and attractiveness of EOSC by piloting & delivering innovative solutions developed and tested in a useful and functional cross-border environment</p> <p>The project will demonstrate the potential of EOSC by piloting innovative solutions, designed to support cross border research collaboration, using the Nordic and Baltic countries as a testbed environment. We will focus on a series of demonstrators addressing different parts of the research and data life cycle: discovery and re-use, analysis and post-processing, data management (including sensitive data management), sharing and archiving. The solutions which will be tested and validated by research communities leverage existing services (from national e-infrastructures and/or research communities as well as core EOSC services and components provided by from pan-European initiatives involved in EOSC) and are suitable <i>by-design</i> to spin-off on a cross-border environment such as EOSC.</p>
<p>Main measurable outcomes: a) foster the discoverability and re-use of research data in the EOSC (WP5); b) facilitate the integration of community specific portals with large scale computing facilities and pilot usage of computing resources seamlessly across borders (WP5); c) pilot an actionable data management planning tool to broker and manage services and data in a cross border, cross disciplinary setting. (WP5), d) demonstrate an orchestration mechanism that brings national secure servers together, thus allowing the analysis of personal data without moving data away from the custodian (WP5).</p>
<p>Objective 5: Provide a Knowledge Hub to deliver training and technical support to new service providers and communities willing to engage with EOSC during and after the project lifetime</p> <p>EOSC-Nordic will consolidate and expand a distributed network of experts and service operators at local and national levels. A distributed team will be created involving experts within and from outside the consortium to deliver training and technical support to new service providers and communities willing to engage with EOSC, during and after the project lifetime.</p>
<p>Main measurable outcomes: a) establishment of the knowledge hub as a virtual competence center, b) plan to sustain the Hub beyond the project.</p>

1.2 Relation to the work programme

The EOSC-Nordic proposal addresses the subtopic (b) “*Coordination of EOSC-relevant national initiatives across Europe and support to prospective EOSC service providers*” of the INFRAEOSC-05-2018-2020 Call on “Support to the EOSC Governance”. The table below show how EOSC-Nordic aims to address specific challenges and scope of the call in detail.

Table 1.1: Alignment of EOSC-Nordic with the challenges and scope of INFRAEOSC 5(b)

Specific challenge and scope mentioned in INFRAEOSC-5-b	How it is addressed by the project
“The topic aims to support a decisive shift in service provisioning from the current fragmented setting of national and European e-Infrastructures and thematic data infrastructures to a new federated European ecosystem for research data, fully taking into account the global environment”	EOSC-Nordic will address this challenge by supporting the coordination, harmonisation and alignment of Nordic and Baltic national policies and practices related to the provision of horizontal research data services with EOSC and establish a truly coherent environment where services can work and be combined together to enable seamless access to resources.
“Sub-topic b aims to coordinate and support the gradual alignment of policies and practices of EOSC national and/or thematic initiatives to EOSC standards”	This will be addressed through an active engagement activity with national policy makers to discuss and streamline open science policies relevant to EOSC (WP2), concrete support to EOSC providers to integrate and align with EOSC standards (WP3), and the promotion of the uptake of FAIR practices (WP4).
“Enable EOSC-relevant, non-commercial services to be accessed through the EOSC portal.”	This will be tackled through a dedicated onboarding activity supporting the integration of prospective service providers and the discovery of their services via the EOSC portal (WP3).
“facilitate the development and adoption of common rules and best practices for harmonising the delivery and take-up of the EOSC core functions”	The project will facilitate the harmonisation of the delivery and take up of EOSC core functions by a) setting up a support group which will provide assistance to prospective service providers to align and comply with EOSC service management and operational requirements (WP3), and b) by looking at EOSC from the perspective of the delivery chain to identify the different actors that belong to the EOSC chain and map their roles and responsibilities in the delivery of EOSC services. (WP2)
“supporting interoperability with other EOSC services”	The project addresses interoperability issues at the four levels identified by the EIF: organizational, legal, semantic and technical
“enabling cost efficiency”	The project leverages the existing collaboration between Nordic & Baltic countries thereby reducing the risks of duplication of effort and promoting a more cost-efficient R&D activity. Knowledge and skills transfers will also induce greater synergies and cost savings for users and service providers.
“enable the mainstreaming of standards for data management and of certification schemes for data repositories,”	The project will work in close collaboration with FAIRsFAIR and other relevant initiatives on data management (e.g. GoFAIR) to promote best practices and support the adoption of relevant certification schemas.
“supporting activities (e.g. technical, organisational and legal training and capacity building)”	A number of activities (workshops, hackathons and hands on training) will be carried out to support service providers to engage with EOSC (WP3/6) and to help repositories improving their data management practices (WP4/6). In addition a Knowledge Hub will be established to work on competence building and knowledge sharing among stakeholders and relevant professional environments (WP6).
“develop and promote incentives for the uptake of FAIR data practices across national scientific communities”	The question of incentives is addressed by a specific task in the project (as part of WP4) which will review existing incentives among the Nordic countries, as enforced by the institutions, the scientific

	disciplines, and the relevant funding bodies such as ministries and research councils, and develop a set of recommendations for the uptake of FAIR practices across EOSC.
“mapping and harmonisation of the procedures regulating the delivery of horizontal services related to research data by prospective EOSC service providers and by national initiatives located in different Member States”	The project includes an activity which will investigate how horizontal IT services and resources are being provided and accessed in the Nordic and Baltic countries, with a view to fostering coordination across the countries (WP2). We will also run a support group which will provide assistance to Nordic service providers to improve and harmonise service management and operations (WP3)
“Evolution, training and adoption of standards for federated services and interoperability at all levels, as indicated in the European Interoperability Framework , should also be addressed”	A general objective of the project is precisely to foster the adoption of standards for federated services in line with the interoperability approach. As presented above, we will address interoperability issues at the four levels identified by the EIF (WP2, 3)
“Proposals should involve real user communities and research infrastructures in the testing and fine-tuning of the solutions proposed”	User communities are actively involved in the project through a series of demonstrators focusing on the different stages of the research data lifecycle (WP5). The solutions which will be tested and validated by research communities leverage existing services and are suitable <i>by-design</i> to spin-off on a cross-border environment such as EOSC.
“The projects funded under this topic should establish clear links among themselves and with all relevant and EOSC related projects funded under previous and current Horizon 2020 Work Programmes, in order to collaborate and address potential synergies, overlaps and gaps in the overall service offering.”	The engagement strategy with the other projects funded under this call, and more generally with all the EOSC funded projects, is described in the following section. Relevant activities will be carried out by WP2, WP3 and WP4.
“Only EOSC-relevant initiatives and services of wide European interest and at appropriate maturity level, and which are not addressed by other topics under this call, should be considered.”	The initiatives and services which are covered by this project are all of wide European interest and relevant to EOSC. They have been selected based on these criteria as well as on their level of maturity. Particular attention will be paid to services which can be “opened up” to users beyond their initial, local customer and are all at least TRL 8, with the vast majority being TRL9. The list of initiatives and candidate services are presented in section 1.3.1
“The successful proposals will also be called to interact closely among themselves and with the EOSC coordination structure (see sub-topic a).”	The engagement strategy with the other projects funded under this call, in particular subtopic a, is described in the following section. Relevant activities with subtopic a will be carried out by WP2.
“Proposals will exploit synergies with grants resulting from other topics of this call and will build on and complement related work on the EOSC hub undertaken by projects resulting from EINFRA-12-2017 topic”	The engagement strategy with the other projects funded under this call, in particular EOSC-hub and the projects resulting from EINFRA-12-2017 (such as OpenAIRE Advance, and FREYA), is described in the following section. Relevant activities with EOSC-hub and FREYA will be carried out by WP3 (support to prospective EOSC providers). The project includes representatives of OpenAIRE who will be involved in our FAIR activities (WP4).
“Building on the activities supported by sub-topic (c),”	The engagement strategy with the other projects funded under this call, in particular subtopic c, is described in the following section. Relevant activities with subtopic c will be carried out by WP4

“Close collaboration with projects resulting from ICT-21-2019 calls is also recommended.”	The consortium will identify the projects resulting from this call and actively engage with them on areas of common interest.
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The EOSC-Nordic project sees many ongoing and upcoming projects as major enablers of the EOSC and will pursue an active engagement strategy with them. A list of relevant ongoing (only projects which will be still ongoing in 2019 are listed) and upcoming projects, with focus and relevant action line they address, is presented below.

Table 1.2: Provisional list of EOSC-relevant projects

TOPIC	Project Title	start	Related activities
Ongoing projects			
EINFRA-12-2017	EOSC-hub	Q1/2018	Integration of candidate services with the marketplace and EOSC core functions provided by the hub (WP3, WP5), coordination of training and events (WP6), sharing of information wrt national policies and frameworks (WP2).
EINFRA-12-2017	OpenAIRE Advance	Q1/2018	Collaboration on FAIR practices and training activities related to open access and data management (WP4).
EINFRA-21-2017	FREYA	Q1/2018	Collaboration on persistent identifiers (WP3, WP5).
INFRASUPP-03-2016	e-INFRA Central	Q1/2017	Collaboration on service description (re-use and contribution to the development of e-INFRA Central service description template).
INFRASUPP - 2017-1	RDA-Europe	Q1/2018	Participation of project members to relevant RDA working group (e.g. PIDs, Metadata, DMPs, etc.)
Upcoming projects (INFRAEOSC calls)			
INFRAEOSC-01-2018	Access to commercial services through the EOSC hub	Q1/2019	Procurement activities (WP2, WP3, WP6)
INFRAEOSC-03-2020	Integration and consolidation of pan-European access mechanisms to public e-infrastructures and commercial services through the EOSC hub	TBD	Integration of candidate services with EOSC core functions provided by the hub (WP3, WP5)
INFRAEOSC-04-2018	Connecting ESFRI Infrastructures through cluster projects	Q1/2019	Collaboration on FAIR data (coordination of domain specific input), dissemination of project results and solutions tested by research communities (WP4, WP5)
INFRAEOSC-05-2018-2019	Support to the EOSC governance	Q3/2019	Collaboration at policy level, dissemination of project output relevant to EOSC (WP2)
	(a) Setup of an EOSC Coordination structure		
	(c) FAIR data uptake and compliance in all scientific communities	Q3/2019	Collaboration on FAIR data (WP4). The proposal includes dedicated activities related to FAIR and has an ambitious engagement programme with Nordic & Baltic repositories to improve their awareness of FAIR and their data management practices. These activities nicely complement the activities of the FAIRsFAIR

INFRAEOSC-06-2020:	Enhancing the EOSC portal and connecting thematic clouds (a) Support to the EOSC portal	Q1/2020	Supporting the integration of prospective service providers with EOSC portal (WP3)
	(b) Connecting thematic clouds into the EOSC	tbd	Dissemination of project results and solutions tested by research communities (WP4, WP5)

In order to ensure effective collaboration with all the relevant stakeholders, EOSC-Nordic will establish joint work plans with the most relevant initiatives. This has been already agreed with the EOSC-Hub and FAIRsFAIR projects (see Letters of Supports in section 6), which we see as two key projects to engage with on service provisioning and data management practices.

1.3 Concept and methodology

1.3.1 Overall approach

EOSC-Nordic is organised around five main stands of activities, each leading to specific, tangible output which will help catalysing the take-up of EOSC in the Nordic & Baltic region: a **policy** stand focusing on the coordination of national policies, including legal issues, in the context of the provision of services in a cross-border environment; a **service** activity aiming at supporting the integration and interoperability of services with EOSC; a **research data** strand, focusing on developing FAIR data management practices across the countries; a **demonstration** activity aiming at showcasing the potential of EOSC and the solutions developed by the project with research communities; and a **competence building** activity through the establishment of a Knowledge Hub.

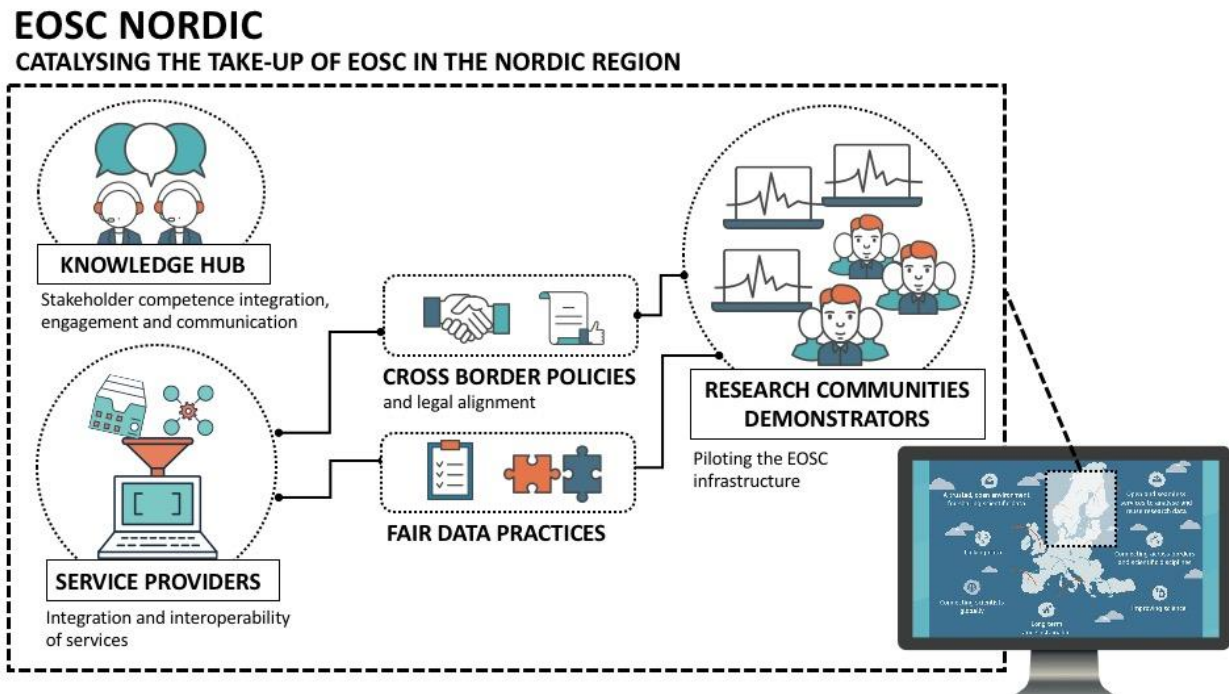


Figure 1.2: EOSC-Nordic high-level approach

Exploiting the value of Nordic and Baltic national initiatives, services and research data

Over the past few years, the Nordic countries have spent significant effort to develop national open science programmes and have invested massively in their national infrastructures to support these programmes³. However, there has been so far little coordination between the countries on these issues. National policies & principles related to the provisioning and delivery of horizontal services, national provisioning agreements, sustainability & business models, legal frameworks remain largely domestic topics. A lack of coordination between countries on these may hamper future cross-border collaboration and constitute an obstacle to the realisation of EOSC. **EOSC-Nordic aims precisely to foster this coordination, by leveraging the existing collaboration platforms and efforts** in the region and bringing them to bear in the broader European context.

EOSC related national initiatives

It is possible to identify in each country covered in this proposal a set of national open science policies or programmes which are related to EOSC and national initiatives responsible for the delivery of horizontal IT services related to research data. The table below provides an initial list of the EOSC relevant national initiatives and infrastructures in the Nordic and Baltic countries that EOSC-Nordic will engage with and connect to EOSC. Due to the relatively small size of the countries involved and a culture of proximity with policy makers and funders, the consortium is able well placed to engage with any national representatives, at the highest level, on issues relevant to the project. The consortium has received a joint letter of support from the Research Councils of Norway, Iceland, Denmark, Sweden, Finland, as well as a letter of support from the Science Council of Latvia and the Research Council of Estonia (see section 6) and will seek to engage actively with other high level national representatives. The project will problem facilitate discussions across the Nordic and Baltic countries around the coordination of national initiatives and infrastructures through dedicated workshops, and by advising on directions they should take to implement or align with relevant EOSC policies and roadmap. During the course of the projects, additional initiatives and infrastructures may be involved.

Table 1.3: EOSC related national initiatives covered by the project

Country	Relevant National Initiatives/Policies	National Infrastructures/Service providers
FINLAND	Open Science and Research Initiative (Ministry of Education & Culture), Open Science and Data Action Plan (Academy of Finland & Universities)	CSC, University of Helsinki, Finnish National Library, Finnish Meteorological Institute, University of Eastern Finland, Finnish Museum of Natural History, Finnish Social Science Data Archive
SWEDEN	National assignment on open access to research data (Swedish Research Council), National assignment to coordinate open access to scientific publications (National Library of Sweden), National working group for research data (The Association of Swedish Higher Education Institutions)	SNIC, Uppsala University, Lund University, KTH Royal Institute of Technology, University of Gothenburg, Swedish University of Agricultural Sciences, Gothenburg Global Biodiversity Center, Swedish National Data Service, Linköping University, Stockholm University, SUNET. Umeå University
NORWAY	National Strategy on Access to and Sharing of Research Data (Ministry of Education and Research), Policy on Open Access to Research Data (Research Council)	Sigma2, Unit (The Norwegian Directorate for ICT and Joint Services in Higher Education and Research), University of Oslo, University of Bergen, Norwegian Institute for Nature Research, Uni Research Climate, Meteorological Institute of Norway, NSD
DENMARK	National Strategy for Open Access. National policy of data management. Digital Humanities Lab	DTU/DeIC, University of Aarhus, University of Southern Denmark, Technical University of Denmark, University of Copenhagen, Aalborg University, Royal Library

³ See A. Jaansen, the State of Open Science in the Nordics, 2018.

https://wiki.neic.no/w/ext/img_auth.php/e/ef/The_state_of_open_science_in_the_Nordic_countries_spreads.pdf

ICELAND	Open Access Policy	RHnet, University of Iceland, Icelandic Institute of National History, The Institute of Archaeology, Iceland
ESTONIA	Policy on Open Data in public sector (NGO Open Knowledge, Ministry of Economic Affairs & Communications), Policy on Open Access to Research Data (Research Council)	ETAIS via University of Tartu, University of Tartu (Natural, History Museum), University of Tartu (Genome Bank), University of Tartu (CS, department), HITSA, NICPB
LATVIA	Latvian European Research Area Roadmap	University of Latvia, Riga Technical University
LITHUANIA	Law on Higher Education and Research of the Republic of Lithuania	Vilnius University

EOSC prospective service providers and candidate services

There are a vast number of state of the art services in the Nordic and Baltic countries which are of true European interest and could really benefit European researchers. In many areas, such as services to process sensitive data, the Nordics even have a head start. EOSC offers a unique opportunity and a new market to increase the uptake of these services at a wider scale and develop new collaborations, but also provides an incentive for service providers to align with best practices and standards. Therefore EOSC can be used to improve and harmonise practices across organisations, thereby facilitating the creation of a coherent ecosystem of services which can more easily work and be combined together, across organisations and countries.

An initial list of candidate services has been compiled during the project preparation and is presented below. These candidate services are all mature services of European interest and can be integrated to the EOSC catalogue through this project. We will also use this initial list to engage with service providers to discuss integration and interoperability aspects.

Table 1.4: EOSC-Nordic initial list of candidate services for EOSC

#	Service provider	Service name	Service category	Service description	URL	TRL
FINLAND						
1	CSC	cPouta and ePouta	Cloud computing	cPouta and ePouta offer high performance computing via Infrastructure as a Service. ePouta is secure cloud suitable for personal research data.	https://research.csc.fi/cpouta	9
2	CSC	Container cloud	Cloud computing	Container cloud "rahti" (OpenShift based)	https://rahti-user-guide.readthedocs.io/en/latest/	8
3	CSC	Chpister Analysis Software	Data Management & Analytics	Chipster offers a broad range of easy-to-use analysis tools for bioscience and medical science research.	https://chipster.csc.fi	9
4	CSC	The Language Bank of Finland	Data Management & Analytics	The Language Bank of Finland is a service for researchers using language resources.	https://www.kielipankki.fi/language-bank/	9
5	CSC	B2Safe	Data Management	Allows community and departmental repositories to implement data management policies on their research data	https://www.eudat.eu/b2safe	9

				across multiple administrative domains.		
6	CSC	Avaa	Data Management	An open data publishing platform for research data. It serves both the producers and users of open data	https://avaa.tdata.fi	9
7	CSC	ETSIN	Data Management	Etsin is a research data finder. Anyone may browse and use the metadata.	https://openscience.fi/etsin	9
8	CSC	Notebooks by CSC	Analytics	Notebooks by CSC is an easy-to-use environment for working with data and programming, based on Jupyter notebooks.	https://notebooks.csc.fi/	9
9	University of Helsinki	The Collaborative Datacloud of the UH	Data management & Analytics	Data storage and sharing services for researchers		
SWEDEN						
10	SNIC	HPC	HPC	National High Performance Computing infrastructure hosted at SNIC data centers.	http://snic.se/resources/	9
11	SNIC	Swestore	Data Management	dCACHE and iRODS-based storage systems distributed across the SNIC data centers.	http://snic.se/resources/swestore/	9
12	SNIC	SNIC Science Cloud	Cloud Computing	Open-stack based IaaS offering from SNIC data centers.	http://snic.se/allocations/ssc/	8
13	SNIC	SNIC SENS	Sensitive Data	Compute and storage for sensitive data for research.	http://snic.se/allocations/snic-sens/	9
NORWAY						
14	Sigma2	NIRD project storage	Data Management	Storage for research data at Sigma2.	https://www.sigma2.no/content/storage-scientific-project-data	9
15	Sigma2	Fram	HPC	High Performance Computing facility hosted at Sigma2.	https://www.sigma2.no/content/high-performance-computing-0	9
16	Sigma2	NIRD Toolkit	Cloud Computing	Kubernetes-based infrastructure for on-demand computing, visualization, post-processing, GPU-computing and data analytics.	https://apps.sigma2.no	8
17	Sigma2	NIRD Archive	Archiving	Data archive. Harvestable. Supports CC4, DOI and promotes Open Access.	https://archive.sigma2.no	9
18	Sigma2	NIRD easyDMP	Data Management	Tool for creating data management plans.	https://easydmp.sigma2.no	8

19	Sigma2/ UiO	TSD	Sensitive Data	Remote access solution to store and process sensitive data for research.	https://www.uio.no/english/services/it/research/sensitive-data/	9
20	NSD	Nordi	Data Management	Platform to administering research social data.	http://www.nsd.uib.no/nordi/english.html	8
20	NSD	NSD Data Management Plan Tool	Data Management	Tool for creating Data Management Plans	http://www.nsd.uib.no/arkivering/en/data_management_plan.html	8
20	NSD	NSD Archive	Archiving	Certified data archive for long-term storage. Supports DOI, provides access control of sensitive data and promotes Open Access.	http://www.nsd.uib.no/arkivering/en/index.html	9
20	NSD/ SSB	Microdata.no	Analytics	Remote access solution for analyzing registry data in an anonymous interface.	https://microdata.no/	9
20	NSD	NSD Data Protection Services	Data Management	Service assisting the research institutions in fulfilling their statutory duties relating to GDPR.	http://www.nsd.uib.no/personvernombud/en/index.html	9
21	UiO	IaaS	Cloud Computing	Open-stack based IaaS.	https://www.usit.uio.no/om/aktuelt/2016/iaas.html	7
ICELAND						
22	UICE	HPC	HPC	National HPC infrastructure for research.	http://ihpc.is/	9
DENMARK						
23	DTU/ DeiC	Data.DeiC.dk	Data Management	Storage for active research data.	https://www.deic.dk/da/dاتا_deic_dk	9
24	DeiC @SDU	ABACUS2.0	HPC	HPC infrastructure for research.	https://escience.sdu.dk/index.php/hpc-user-portal/	9
25	DeiC @SDU	SDUCloud	Cloud services	A common platform for data storage and sharing services for research, project management, data management. Application portal. / in development	https://cloud.sdu.dk	8
ESTONIA						
27	NICPB	HPC	HPC	HPC batch processing tuned for CPU-heavy computations.	https://hep.kbfi.ee	9
28	NICPB	IaaS	Cloud computing	OpenStack-based IaaS with IPv4 and IPv6 connectivity.	https://hep.kbfi.ee	8

29	UT	HPC	HPC	HPC processing for heterogeneous payloads.	https://hpc.ut.ee	9
30	UT	IaaS	Cloud computing	UT provides OpenStack-based IaaS with IPv4 and IPv6 connectivity.	https://hpc.ut.ee	9
31	UT	Archival	Data Management	Tiered system for storing data on tapes.	https://hpc.ut.ee	9
32	UT	SAPU	Analytics	VRE with controlled access and logged operations. Aimed at processing of sensitive data in multi-stakeholder environment.	https://sapu.cs.ut.ee	7
33	UT	Managed web presence	Web services	A common service for setting up, designing and upkeep of websites for courses, conferences and other education and R&D related projects.	https://web.cs.ut.ee	9
34	TTU	HPC	HPC	HPC batch processing tuned for CPU-heavy computations.	https://wiki.ttu.ee/it/en/hpc	9
35	TTU	IaaS	Cloud computing	OpenStack-based IaaS with IPv4 connectivity.	https://wiki.ttu.ee/it/en/hpc	7
LATVIA						
36	RTU	HPC	HPC	HPC batch processing services.	http://hpc.rtu.lv/	9
37	National Library of Latvia	Services for Researchers	Data Management	National Library of Latvia offers 2 main types of services for the research community: Digital Humanity and Expert librarian.	https://www.lnb.lv/en/services/researchers	9
NORDIC						
	NORDU net	Kaltura	Media hosting	Service for media hosting aimed at remote education, lecture capture, video hosting, media archiving, media management.	https://video.nordu.net/	9
	NORDU net	Zoom	Conferencing, online classroom	Services of video conferencing, remote classroom and webcasting.	https://nordu.net.zoom.us/	9

Research data and repositories

At the level of research data, there are also considerable benefits to facilitate the discovery (and reuse) of research data hosted in Nordic and Baltic repositories. By harvesting Nordic and Baltic repositories into EOSC, valuable bodies of material collected can be made visible (and potentially accessible) for broader international use. Increased visibility and availability of Nordic & Baltic scientific data from various sources – wider availability of data – is a prerequisite for better, faster research and innovation. A recent study of repositories located in the Nordic countries⁴ has found that more than 60 repositories actually deal with research data, and therefore could be relevant for EOSC.

However, according to the study, many repositories do not follow best data management practices and standards, which represents an obstacle to the wide dissemination and reuse of their data within EOSC. For example, the study shows that about 60% of the repositories do not provide unique persistent identifiers, which severely reduces the

⁴ See A. Jaunsen, the State of Open Science in the Nordics, 2018, cited above.

discoverability of the data. And while nearly all repositories provide access to metadata, the majority (70%) do not provide access to all data. A typical scenario for a repository, is that a certain fraction of the data is shared, while the rest is restricted. There may be a number of reasons for this, e.g. copyright or licensing restrictions or the fact that some data may be sensitive (containing person sensitive information) and therefore cannot be shared openly. It is important to note, however, that there is no conflict in requiring restricted access to data and being compatible with FAIR. Finally, around 80% of the repositories are not certified or do not follow established archive/repository standards. Therefore, there is a great opportunity for improving FAIR practices.

We will start from this initial list – which we will enrich in the course of the project with additional repositories from the Baltic countries – to address the uptake of good data management and FAIR practices in the region. Because it would be difficult - and probably inefficient - to engage with all these repositories at the same time, we have selected an initial list of 14 repositories which we will use as our starting base. They were selected based on the criteria that the repository provides a PID and supports at least one metadata standard.

Table 1.5: List of initial repositories that will undergo FAIR practice improvements in EOSC-Nordic

#	Repository name	URL	Scientific domain	Country
3	Danish Data Archive	https://www.re3data.org/repository/r3d100010486	SSH, LS	DK
6	The Language Bank of Finland	https://www.re3data.org/repository/r3d100011807	SSH	FI, EU
9	Dataverse Network Norway	https://www.re3data.org/repository/r3d100012538	SSHs, LS, NL, ES	NO
10	Norwegian Centre for Research Data	https://www.re3data.org/repository/r3d100010493	SSH, LS, NS	NO
16	Speech & Language Data Bank	https://www.re3data.org/repository/r3d100012256	SSH	NO, EU
18	Tromsø Repository of Language and Linguistics	https://www.re3data.org/repository/r3d100011623	SSH	NO, EU, US
20	UiT Open Research Data Dataverse	https://www.re3data.org/repository/r3d100012053	SSH, LS, NS, ES	NO, US
26	Stockholm University repository for data	https://www.re3data.org/repository/r3d100012147	SSH, LS, NS, ES	SE, International
28	Swedish National Data Service	https://www.re3data.org/repository/r3d100010146	SSH, LS	SE
33	Global Biodiversity Information Facility	https://www.re3data.org/repository/r3d100000039	LS	DK
35	Database of Vascular Plants of Canada	https://www.re3data.org/repository/r3d100010730	LS	CA, DK
53	Norwegian Polar Data Centre	https://www.re3data.org/repository/r3d100012291	NS	NO
58	NorStore Research Data Archive	https://www.re3data.org/repository/r3d100011678	HSS, LS, NS, ES	NO
67	DataDOI	https://www.re3data.org/repository/r3d100012333	NS	EE

Interdisciplinary considerations

The approach taken by the project is fundamentally interdisciplinary. The national initiatives involved in the project are addressing multiple research communities coming from the whole spectrum of science. In addition, our

demonstrators have been selected to ensure representation from different disciplines and have been designed to foster interdisciplinary exchange. These communities come from the field of biodiversity, natural language analysis and climate modelling and will be involved together in a series of pilots demonstrating how to support cross border research collaboration, using the Nordic and Baltic countries as a testbed environment. Finally, the repositories targeted by the project cover different scientific fields such as social science and humanities (30), life sciences (29), natural sciences (27) and engineering (10) and we will bring them together as part of workshops and hackathons to develop recipes for good data management.

Leveraging existing collaboration & initiatives in the Nordics

There is already a long tradition of collaboration in the areas of e-infrastructure, research, innovation and policy at Nordic level, which the project can leverage. Indeed, they provide a strong basis for an ambitious and well-anchored regional plan for a strong EOSC-focused activity. We present below a list of existing Nordic projects / initiatives which are relevant for EOSC-Nordic and which will be engaged by the project.

Table 1.6: Relevant existing efforts & initiatives in the Nordics

	Project Initiative /	URL	Project Focus	Countries Involved
NeIC projects	Glenna	https://neic.no/glenna2/	Federated cloud computing	Norway, Finland, Sweden, Denmark
	Tryggve	https://neic.no/tryggve/	Life science, sensitive data	Norway, Finland, Sweden, Denmark
	Dellingr	https://dellingr.neic.no/partners/	Resource sharing across borders	Finland, Sweden, Denmark, Iceland, Estonia
	CodeRefiney	https://coderefinery.org	Software preservation	Norway, Finland, Sweden, Denmark
	EISCAT_3D Data Solutions	https://neic.no/e3dds/	The NeIC EISCAT_3D technically supports the EISCAT_3D community on network, computing and storage challenges.	Finland, Sweden, Norway
	NICEST	https://neic.no/nicest/	Nordic Infrastructure Collaboration on Earth System Tools	Norway, Finland, Sweden, Denmark
	NLPL	https://neic.no/nlpl/	Nordic Language Processing Laboratory	Norway, Finland, Sweden, Denmark
	Nordic WLCG Tier-1 Facility	https://neic.no/nt1/	The Nordic distributed tier-1 facility for the worldwide computing grid serving the	Norway, Finland,

			large hadron collider at CERN.	Sweden, Denmark
	DeepDive	https://neic.no/deepdive/	Nordic-Baltic Collaboration on e-Infrastructures for Biodiversity Informatics	Norway, Finland, Sweden, Denmark, Iceland, Estonia
Other initiatives	Nordunet	https://www.nordu.net	Network, AAI	Norway, Finland, Sweden, Denmark, Iceland
	Nordugrid	http://www.nordugrid.org	Grid middleware technology	Norway, Finland, Sweden, Denmark, Iceland
	Nordic Commons for Health Data	https://www.nordforsk.org	Nordic collaboration for Health Data	Denmark, Sweden, Norway, Finland

1.3.2 Methodology

In order to achieve the continual interactions between different parts of the project, we have aggregated the main project tasks into a relatively small number of work packages with regard to three activity-types.

Management, networking and service activities

Management: Project Management (WP1) activities will cover the administrative and financial management of the project. The activity will be also responsible for the management of quality and risk aspects, as well as for liaising with the EC.

Networking Activities: Policies, legal issues and sustainability (WP2) activities will steer the consolidation of EOSC by harmonising policies, investigating, and helping removing, any legal barriers, and facilitating the discussion around EOSC future in the Nordics in collaboration with policy makers and funders. The overall objective of WP2 is to foster the coordination of and connection between the national initiatives at policy level, in the context of EOSC.

Engagement, communication and competence building (WP6) activities will capture project results, support the definition of the best IP protection approach, and maintain the dissemination and exploitation plan, and will ensure the alignment of the key stakeholders. A Knowledge Hub will also be established to work on competence building and knowledge sharing among stakeholders and relevant professional environments.

Service Activities: Support to prospective EOSC service providers (WP3) activities will ensure the harmonisation of processes and procedures across service providers, facilitate the integration of their services into the EOSC portal and foster interoperability across EOSC. **FAIR data (WP4)** activities will engage with Nordic-Baltic repositories, help them becoming FAIR compliant/certified, and promote incentives for the uptake of FAIR data across the region. Finally, a number of **Open Research Data and Services – demonstrators (WP5)** will foster the use of the advanced digital capabilities and resources provided by the national facilities to engage research collaborations in piloting innovative solutions for data access and reuse, data processing, data sharing and sensitive data management.

Service integration and interoperability approach

At the technical level, the project will work with services and repositories and establish a lightweight integration and interoperability support platform which will facilitate automated registration and lifecycle management of Nordic and Baltic resources within EOSC. The platform will provide an API-driven way to describe service providers and

services, and automatically publish them in the EOSC Portal. The support platform will make sure that changes in services (e.g. contact information, service features etc.) is consistently updated in the EOSC Portal, without any manual intervention. On the provisioning side, the support platform will allow services to integrate with a common provisioning interface thereby reducing the effort for integrating with the EOSC Marketplace and other core EOSC components. Nordic data repositories will be aligned with FAIR policies and harvested with EOSC metadata harvester for increased exposure. The Knowledge Hub will provide support to service providers, service consumers and data repository managers on the best practices of integration.

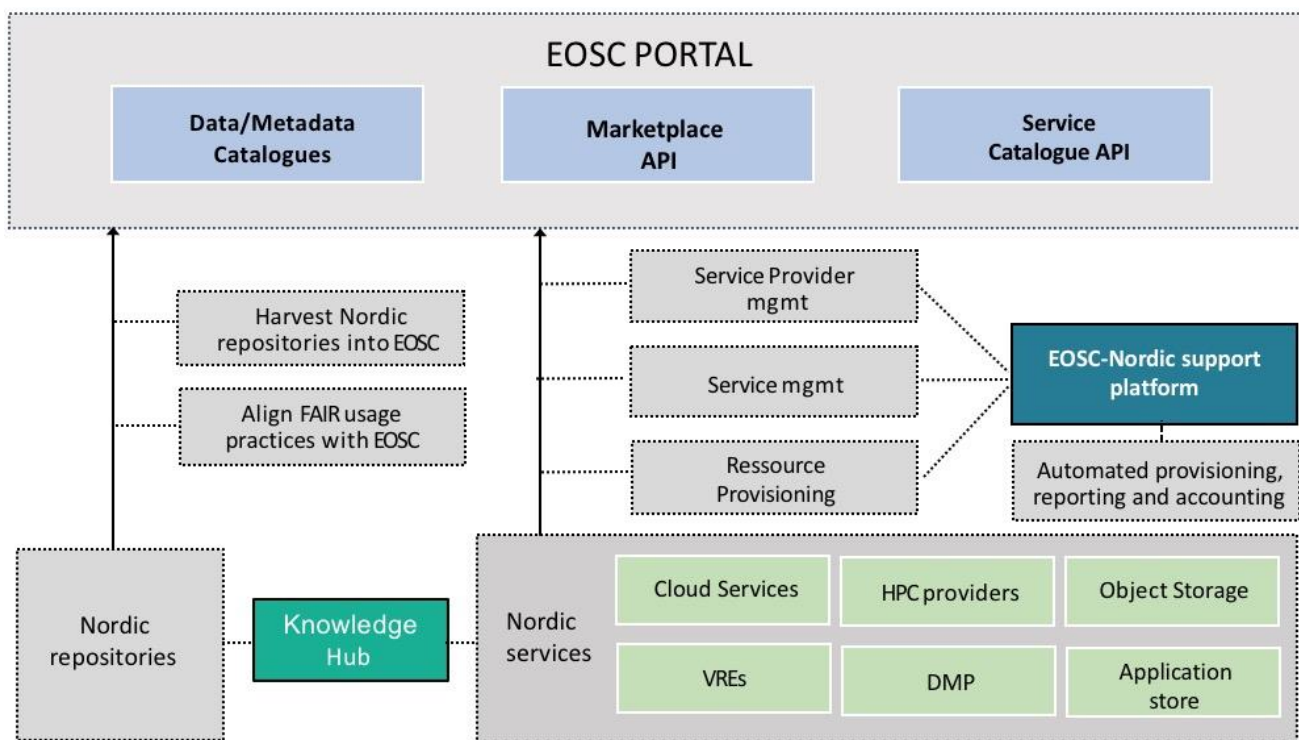


Figure 1.3: The high-level technical concept of EOSC-Nordic

Involving users and the community of stakeholders

A number of research communities coming from different scientific domains, have joined the consortium as a full partner and beneficiary, through representatives mandated to officially represent the community in the consortium. They bring with them specific requirements and knowledge regarding the development of EOSC and its services, and a concrete wish to pilot and take up these services within their own research infrastructure. Their requirements range from registration and replication of data objects across multiple EOSC nodes for greater availability, safety and preservation of the data, to the ability to move large volumes of data to distributed computational facilities, through better discovery and sharing of the data beyond the initial community.

EOSC-Nordic will focus on facilitating the uptake of the corresponding services by these communities through specific *demonstrators* and the active involvement of community experts in the development and deployment of solutions within their community. By exposing solutions to others, we also expect to enrich the services so that they match the needs of the greatest number and demonstrate the potential of EOSC. The selected communities and service cases are described below:

Table 1.6: Research communities and infrastructure services selected for EOSC-Nordic

Research Community	Discipline	Service case /solution tested	Infra / services involved
DeepDive	Biodiversity	Enable thematic portal (PlutoF) to access and orchestrate distributed computing resources provided by national service providers / EOSC	National HPC resources, National Cloud resources, National Storages, Cloud Orchestration services (to be identified)

Nordic Language Processing Laboratory	Social Sciences & Humanities	Create a virtual laboratory able to consume resources from the national service providers /EOSC, and enable cross-border resource allocations and account management	National HPC resources, National Cloud Resources, EOSC Docker Hub services, National Storage Resources, EUDAT HTTP API, B2SAFE (EOSC), PaaS services (to be identified), EOSC Data sharing services (e.g. B2SHARE)
NICEST	Climate Science	Provide a trusted EOSC Virtual Research Environment for Earth System Modeling with direct connection to the Nordic High Performance Computing Centers (HPC), Nordic e-Infrastructure for Research Data and Nordic Data archive for long-term data preservation	Galaxy Europe, National Storage services, EOSC Data sharing services (e.g. B2SHARE), Data metadata harvesting (B2FIND), Archiving services, ESGF nodes, EOSC or national DMP Tools (es: easyDMP)
Precision Cardiology	Biomedical science	Pilot the provisioning of a secure cloud infrastructure for sensitive data as part of EOSC	DTU/Computerome, TSD, Bianca, ePouta

To help drive forward and implement the EOSC, EOSC-Nordic will also pursue an active engagement strategy with service providers, end-users, and funders and policy makers. The table below further presents our “natural” stakeholders and how we will involve them in delivering the output of the project.

Table 1.7: The EOSC-Nordic stakeholders

Stakeholders	Involvement
Service and data providers	
National e-Infrastructures providers & generic service providers	<ul style="list-style-type: none"> • Involvement of service providers through WP2 and WP3 for the harmonisation of policies, service and resource provisioning, and through WP5 for supporting demonstrators. • Involvement of prospective EOSC service providers and support for publishing services into the EOSC portal (WP3) • Involvement of service providers through demonstrators (WP5) • Involvement of repositories through the FAIR programme (WP4) • Involvement in communications activities (WP6)
Data repositories	
Research communities & End users	
Research Organisations & Performing research communities and researchers	<ul style="list-style-type: none"> • Involvement in the gathering of input for the studies on policies, legal issues and business models (WP2) • Involvement of research communities in pilot demonstrators (WP5) • Involvement in communications activities (WP6)
Universities & Libraries	
Funders & Policy-makers	
Research Councils & Research Funding Agencies	<ul style="list-style-type: none"> • Involvement in the gathering of input for the studies on policies, legal issues and business models (WP2)

Governmental agencies and Ministries	<ul style="list-style-type: none"> • Consultation activities in order to bring in a Nordic / Baltic perspective to EOSC (WP2) • Involvement in communications activities (WP6)
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Engaging with other regional/national initiatives and with EOSC

As explained in section 1.2, EOSC-Nordic will actively engage with other initiatives funded under the call topic to coordinate activities and look for possible synergies. Example of joint activities could include sharing methodology and recipes for gathering local information from service providers and repositories, organising joint workshops and events aiming at disseminating knowledge and results, and consulting each other on strategy and policy matters. The liaison activities will not be limited to funded initiatives but could also reach out to national initiatives which are not participating directly to similar projects. Our international advisory committee which consists of representatives from the Netherlands, Germany, France, Bulgaria, Australia and USA (see section 3) can help us identify relevant initiatives and points of contacts in these regions.

Active collaboration with EOSC actors and “coalition of doers” is also fundamental in order to effectively support the integration of service providers in the EOSC portal and marketplace and facilitate the uptake of the solutions designed in the project across EOSC. To achieve this, the consortium will leverage the existing strong links that partners have with existing initiatives (in particular EOSC-Hub, OpenAIRE Advance, Freya, e-Infra Central and EOSC Secretariat) and will seek to establish memoranda of understanding with each initiative at the beginning of the project to agree on a joint work plan.

Addressing the gender dimension

EOSC-Nordic sets itself to achieve gender balance in project teams and decision-making and integrating gender/sex perspective in the all relevant content. Each of the supporting partners has strong, female roles as part of the core team collaborating on EOSC-Nordic. Project Management activities (gathered in WP1) will include the promotion of specific actions and control over gender issues along the project, including them, annually, in the periodic reports.

1.4 Ambition

This section describes how EOSC-Nordic contributes to advance beyond state-of-the-art. We have identified key topics and for each “BEFORE” describes the state-of-art, and “AFTER” the advancement that is expected to be achieved by the end of the project. We also summarise the innovation potential of the project with regards to the development of interoperability solutions, data analytics and cloud orchestration.

Coordination of national policies and practices

BEFORE: national EOSC-relevant policies are developed in isolation, which hampers cross-border collaboration.

AFTER: Nordic and Baltic countries regularly consult each other through the policy workshops established by the project and sustained by NeIC, and coordinate EOSC-relevant policies. Their national policies are fully in line with EOSC requirements and rules of participation which makes it easier for service providers to participate to EOSC.

Service access and provisioning models

BEFORE: national services are developed and delivered in isolation. Cross-border collaboration suffers from lack of discoverability, interoperability, and accessibility of services.

AFTER: EOSC-Nordic has fostered a coherent, interoperable environment, and facilitated the delivery of services that work together, within and across organisations or domains. Services are provided according to harmonised policies and procedures and are easily discoverable and accessible through the EOSC portal.

Re-use of research data

BEFORE: a majority of repositories hosted in the Nordic and Baltic do not follow best data management practices (for example most repositories do not use persistent identifiers or have not clear licencing policies), are not certified or do not follow established archive/repository standards.

AFTER: EOSC-Nordic has boosted the uptake of FAIR practices among the Nordic repositories which facilitates the discovery and reuse of data hosted by the repositories. A greater number of repositories use PIDs, has doped data licences and metadata standards, and are certified.

EOSC awareness

BEFORE: a majority of stakeholders do not know about EOSC or are unclear about how to engage with it and what benefits it can bring to them.

AFTER: EOSC-Nordic has raised awareness about EOSC value proposition. The Knowledge hub established by the project delivers training and technical support to new service providers and communities willing to engage with EOSC.

Innovation potential with regards to interoperability solutions

The lack of interoperability is a major obstacle to progress on the EOSC. Using the European Interoperability Framework as a reference framework, we intend to contribute to the development of a coherent environment, in which services can work together, within and across organisations or domains. The project addresses interoperability issues at the four levels identified by the EIF: *organizational* (focusing on identifying and harmonising business processes from service providers, in WP3), *legal* (by screening existing national legislations on research data, in WP2), *semantic* (by looking at the data models, persistent identifiers, and metadata schema being used by service providers and *technical* (by assessing the technical standards in place for the implementation and integration with EOSC catalogues and services). Our ambition is twofold: first, to harmonise interoperability practices across the national initiatives to further improve a truly coherent environment to enable seamless access to resources; secondly to raise awareness within EOSC about the benefits of adopting such an approach for the sustainability of EOSC itself. Indeed, we believe it is the only approach that will allow the federation on a multiple service providers coming from different countries in an easy and sustainable way.

The project also intends to pilot innovative solutions to effectively enable services to interoperate between them and with the EOSC system. Our work will focus first on APIs: we aim to enable a common service management API for the Nordic services to simplify registration and provisioning of services from the EOSC Portal. Furthermore, we aim at reducing the integration effort by fostering the reuse and adoption of common interfaces for different types of services. For that, we leverage the HTTP API work conducted in EUDAT to lower the barrier to using EOSC data management resources, AppStore work done by SIGMA2 for scientific application management and scientific VRE management based on SDUcloud service from SDU.

In addition, we will investigate whether the successful X-Road approach adopted by Finland and Estonia for connecting state and public databases (such as population registries, census, tax registers, etc.) could be applied to research data. X-Road⁵ is an open source data exchange layer solution that enables organizations to exchange information over the Internet and provides a standardized and secure way to produce and consume services with the software ensuring confidentiality, integrity and interoperability between data exchange parties. Within the EOSC-Nordic project we will initiate a pilot focusing on selected databases from the partners' institutions. If successful, this could lead to a new approach for connecting and federating services within EOSC.

Innovation potential with regards to artificial intelligence-based data analytics and cloud orchestration across borders

Ground breaking research is more and more based on the analysis of large data sets. In the project, several communities, in the field of natural language analysis⁶, climate modelling⁷ and biodiversity⁸ will work on data-driven analysis based on Artificial Intelligence (AI) methodologies and will attempt to enable complex analytical workflow through *data fusion* – integrating multiple data sources to produce more consistent, accurate, and useful information than that provided by any individual data source – across national boundaries.

As data fusion cannot be achieved through transferring of large data volume across organisations, due to network capacity, the project will ensure the compatibility of the computing algorithm in the different processing environments and investigate cloud orchestration technologies and approaches such as Cloud Native Workflow Execution mechanisms to deploy cloud instances across resources. The outcome of such investigation will also provide inputs and recommendations for the establishment and the operation of a future cross domain and cross-border orchestration infrastructure within EOSC.

⁵ <https://e-estonia.com/solutions/interoperability-services/x-road>

⁶ <https://neic.no/nlp/>

⁷ <https://neic.no/nicest/>

⁸ <https://neic.no/deepdive>

In the data explosion era, the huge data volume has opened innovative scientific frontiers in several disciplines such as rare diseases medicine and personalised medicine. The aggregation of data from cohorts located in different countries, combined often with AI methodologies, can significantly increase the scientific outcomes, with huge direct impact for the society in its whole. However, research on health and medical personal data, i.e. data contain sensitive information about human beings, poses several challenges due to the limitations dictated by ethical or privacy legislations. To protect the personal privacy the computation environments shall be highly secure and compliant with international regulations and statutory acts. Although the Nordic countries have been pioneers in developing national solutions for computing and storing sensitive data, these solutions are only fully operational within the national boundaries, and there is presently no mechanism for doing cross-border research with sensitive medical data as this requires high homogeneity of legal frameworks in the region, high degree of coordination and mechanism in place to build trust among different domains. The Nordic setting is from this point of view an ideal sandbox to explore solutions that would enable scientific cross borders research on sensitive medical data. In the project, orchestrations technologies will be tested to enable cross borders scientific investigations in the field of personalized hearth medicine by mean of AI analysis on aggregated dataset located on different Nordic countries.

2 Impact

2.1 Expected impacts

This section highlights the contribution that the EOSC-Nordic project brings to the expected impact set by the work program (see Table 2.1). It addresses all the listed impacts expect the first one which is exclusive to subtopic a) and has therefore been omitted from the table.

2.1.1 Contribution to the impacts listed in the Work Programme

Table 2.1: The expected impact addressed by EOSC-Nordic

Expected impact	How it is addressed by the project	WP involved
I2 Providing a recognized governance and implementation framework to identify priorities at EU level for new or upgraded research data services, thus avoiding proliferation of isolated, separated and overlapping initiatives.	We understand this impact will be mostly realised by the coordination structure funded under subtopic a. EOSC-Nordic will pursue an active collaboration with the successful consortium to advise on how to streamline and better coordinate national initiatives based on the experience coming from the project.	WP1, WP2
I3: Streamlining advice to policy making and funding authorities concerning the EOSC, including preparation of financial plans and regular update of the EOSC roadmap initially developed by the European Commission	EOSC-Nordic will contribute to this impact through its engagement activities with national policy-makers and funding authorities, as part of WP2. By facilitating discussions across the Nordic and Baltic countries around the coordination of policy activities through dedicated policy workshops, and advising on directions the national initiatives should take to implement or align with relevant EOSC policies and roadmap, we will maintain a close and consistent relationship with policy-makers and funding authorities throughout the project and ensure their engagement and commitment to EOSC.	WP2
I4: Piloting and establishing future (co)funding strategies and business/usage models to ensure long-term sustainability.	Funding & business models and strategies will be regularly discussed with policy makers and funding authorities as part of our sustainability task. Resource usage across borders will be piloted as part of the demonstrators (WP5), supported by WP3. The services that will be onboarded into EOSC catalogues may also be used to pilot new business/usage models for EOSC.	WP2, WP3, WP5

15: Wide adoption of processes and practices for optimal use of the resources ensuring open, fair and unbiased access of services through the EOSC hub.	EOSC-Nordic will provide hands on support to prospective EOSC service providers to integrate and make their services accessible through the EOSC-hub, and through the establishment of the Knowledge Hub.	WP3, WP6
16: Progressive removal of technical and organisational barriers to ensure findability, accessibility, interoperability and re-use of research data.	The project will foster an interoperability approach with regards to services and data. This, includes working on technical and organisational aspects, as explained in section 1.4, and providing direct support to repositories for increasing their discoverability within EOSC.	WP2, WP3, WP6
17: Enhancement of FAIR data uptake and contribute to harmonisation of related policies in Europe and facilitate alignment with international initiatives on research data sharing.	This impact will be realized through a dedicated activity which will foster the development and uptake of FAIR practices across the Nordic and Baltic countries. This will be done in close collaboration with FAIRsFAIR and other relevant initiatives on data management (such as GO-FAIR) to promote best practices and support the adoption of relevant data standards and certification schemas. The state of the incentives in the region will be investigated and promoted to further the stimulation of FAIR uptake. Finally, the project will also address the question of incentives and develop a set of recommendations for the uptake of FAIR practices across EOSC.	WP4

2.1.2 Contribution to other environmental and socially important impacts

The project will also contribute to environmental and socially important areas, mainly through the activities of its demonstrators by widening the user base of the thematic services operating in the areas of biodiversity, Human Language Technology, climate science and precision cardiology.

The work done with regards to sensitive data is particularly noteworthy as the proposed innovative solution address important issues with direct impact on the societies in the Nordic and possibly beyond. Globally, the leading cause of years of life lost is coronary artery disease (CAD) and about 750.000 patients in the Nordic countries are diagnosed with CAD. Research in the Nordic countries has contributed significantly to our comprehensive knowledge about the multitude of risk factors for development of CAD and for progression of existing CAD. The majority of these risk factors are “automatically” registered in various systems in Nordic health care systems. However, an advanced systems medicine and medical informatics platform is needed to integrate these data for “bed-side”, i.e. clinical use.

The EOSC-Nordic project will help designing an Analysis and Data Cloud Infrastructure, leveraging EOSC resources, which ensures that clinicians and researchers have an easy and secure access to working with large amount of health data seamlessly under uniform conditions across the countries. The platform will work as framework for an adequate computational decision support system, based on machine learning techniques and other advanced data mining tools, to identify clinical, biological, epidemiological and genetic factors affecting the CAD manifestations and therefore improving and personalising the treatment.

2.1.3 Key performance indicators

Table 2.2: EOSC-Nordic Key Performance Indicators

Key Performance Indicator (KPI)	Year 1	Year 2	Year 3
KPI-1 # published services in EOSC Portal	5	15	30
KPI-2: # repositories assisted with the aim to boost their FAIRness by the use of hackathons (collaborative events or one-on-one)	2	8	20

KPI-3: # additional repositories with adopted data standards or certification schema	N/A	2	5
KPI-4: # repositories harvested by EOSC (e.g. B2find)	3	7	12
KPI-5: # organisations/stakeholders (service providers, universities, research councils, etc.) reached out / consulted by the project studies & activities	30	60	90
KPI-6: # stakeholders from different countries actively participating in the policy workshops (measured as number of individuals)	20	40	60
KPI-7: # trained providers / communities (hackathons, workshops, one to one trainings)	20	40	60
KPI-8: # requests handled by the Knowledge Hub	20	45	70
KPI-9: # computing facilities accessible through community specific portals	2	6	7
KPI-10: # artificial intelligence based projects enabled on distributed cloud resources	N/A	2	8
KPI-11: # institutional/community-specific/funding body-specific DMP templates integrated in the DMP tools	2	6	12

2.1.4 Barriers/obstacles & other framework conditions

A number of external factors may influence our capacity to realise the expected impacts of the project. These include:

- The extent to which long term financial commitment for the European Open Science Cloud are secured across the countries covered by the project. At the moment, Member States are being engaged to collaborate and join forces; nevertheless, a concrete plan for long-term financial commitment to support this vision is still missing. The consortium will work on influencing the public authorities and funding agencies to better communicate the importance of this initiative and to collaborate in shaping a suitable implementation plan.
- The extent to which the processes for onboarding services within the EOSC portal are sufficiently defined and endorsed by the community. At the moment, there are no clear specifications about the requirements that EOSC prospective service providers need to comply with to qualify as an EOSC service provider.
- The extent to which the FAIR certification schema is being made available. We understand it is expected to be delivered during the course of the project. For the project to be able to support the certification of targeted repositories it will be important to have this certification schema in place as early as possible, and ideally at the beginning of the project.
- The extent to which ethical & legal regulations at national level may affect the sharing of resources and data across national borders.

2.2 Measures to maximise impact

In this section, we identify an initial list of the expected results from the project and their related key target groups. It is worth noting that in addition to the exploitation of results by the national stakeholders, the project can and will leverage existing collaboration platforms (such as the one provided by NeIC) to further exploit and sustain any relevant result and product. In short, NeIC provides us with a natural home where project outputs can be further exploited after the project.

2.2.1 Dissemination and exploitation of results

Table 2.3: Exploitation of results in EOSC-Nordic

Expected result	Owner	Protection	Targeted stakeholder	Link to impact	Exploitation & dissemination paths
Policies, recommendations and technical specifications					
Reports & studies on open science policies and resource provisioning in the national countries (incl. related recommendations) (D2.1, D2.7, D2.8) and on cross-border collaboration (D2.2, D2.6)	WP2	Creative Commons or similar	National Policy-makers and EOSC governance board & stakeholders	I3. Reports will be used as input to facilitate discussions around the coordination of policy activities	<u>Dissemination</u> through project workshops (in particular policy workshops) and other relevant EOSC related events. <u>Exploitation</u> by NeIC and national initiatives to foster the discussion around the topic (incl. after the project), by national ministries and governments for better coordination of policies, and by EOSC governance.
Legal studies and recommendations collaboration (D2.3, D2.7)	WP2	Creative Commons or similar	National Policy-makers and legal advisers, EOSC governance board & stakeholders (e.g, working groups on legal issues)	I3. Reports will be used as input to facilitate discussions around the coordination of policy activities, through taking into account legal issues.	<u>Dissemination</u> through project workshops (in particular policy workshops) and other relevant EOSC related events. <u>Exploitation</u> by NeIC and national initiatives to foster the discussion around the topic (incl. after the project) and by national ministries and governments for better coordination of policies, and by EOSC governance.
Sustainability plan (D2.9)	WP2	Creative Commons or similar	National Policy-makers and legal advisers, EOSC governance board & stakeholders	I4: Plan will be used to present the EOSC value proposition and will propose recommendations for sustaining this collaboration in	<u>Dissemination</u> through project workshops (in particular policy workshops) and other relevant EOSC related events.

				the context of EOSC.	<u>Exploitation</u> by NeIC and national initiatives to foster the discussion around the topic (incl. after the project) and by national ministries and governments for discussing funding strategies
Service compliance checklist and maturity model (D3.1)	WP3	Creative Commons or similar	Service providers	I5: Compliance checklist and maturity model will be used for regular assessing of Nordic services against EOSC requirements.	<u>Dissemination</u> through project website, workshops and relevant EOSC-related events. <u>Exploitation</u> by Service Providers and Knowledge Hub for validating compliancy of services to latest EOSC requirements.
Candidate service descriptions (D3.2, D3.3, D3.4)	WP3	Creative Commons or similar	Service providers, EOSC portal, EOSC hub	I5: Service descriptions will be used for populating EOSC portal and opening up services to EOSC user groups.	<u>Dissemination</u> through EOSC portal and Service Provider websites. <u>Exploitation</u> by Service Consumers via EOSC Portal.
Service interoperability framework (D3.5)	WP3	Creative Commons, MIT or similar	Service providers	I6: Service interoperability framework will lead to harmonisation of service descriptions and operations in the Nordic region according to EOSC regulations.	<u>Dissemination</u> through project website, workshops and relevant EOSC-related events. <u>Exploitation</u> by Service Providers for maintaining service registrations and by users of EOSC portal for integrating provisioning of services.
Report on the implementation of X-Road in the Nordics and recommendations to EOSC (D3.9)	WP3	Creative Commons or similar	EOSC governance board & stakeholders (e.g, working groups on legal issues)	I6: Adoption of X-Road for using government registry data for research can lead to new methods of cross-border research.	<u>Dissemination</u> through project workshops (in particular policy workshops) and other relevant EOSC related events.

					<u>Exploitation</u> by NeIC and national initiatives to foster the discussion around the topic (incl. after the project), by national ministries and governments for better coordination of policies, and by EOSC governance.
Overview of data repositories and FAIR practices (FAIR metric scores) in the Nordic+Baltic region	WP4	Creative Commons or similar	Communities, repository providers, NeIC and national initiatives, EOSC	I7: Foster the development and uptake of FAIR practices across the Nordic and Baltic countries.	<u>Dissemination</u> through project workshops, community networks and project ambassadors. <u>Exploitation</u> by NeIC, national initiatives and EOSC to monitor the development of FAIR uptake in the region.
Recommendations on alignment of policies and incentives to optimise the uptake of FAIR practices	WP4	Creative Commons or similar	Repository stakeholders, policy makers and funding agencies	I7: The effects of existing policy-based incentives and the expected impact of new incentives that target FAIR practices uptake.	<u>Dissemination</u> through project workshops (in particular policy meetings with stakeholders and policy makers). <u>Exploitation</u> by NeIC and national initiatives to strengthen the FAIR uptake and change practices for research transparency and data sharing; by national ministries and governments for better coordination of policies, and by EOSC governance
Report on mainstreaming the uptake of data standards and certification processes	WP4	Creative Commons or similar	Repository stakeholders, EOSC portal and EOSC-hub	I7: Best practices and experiences for the adoption of relevant FAIR data standards and certification schemas.	<u>Dissemination</u> through project workshops and other relevant EOSC events. <u>Exploitation</u> by NeIC and national initiatives and EOSC

					for the continued support of deploying FAIR data standards and certification processes.
Cross borders operations for a nordic sensitive data distributed infrastructure – technical recommendations (D5.8)	WP5	Creative Commons or similar	<ul style="list-style-type: none"> •WP2 •Sensitive Data Service Providers •NeIC 	16. / 15. Recommendations will facilitate the definition of the required, common operation layers for a future distributed eHealth Cloud infrastructure	<u>Dissemination</u> through reports and EOSC relevant events <u>Exploitation</u> by NeIC and national ministries and governments to foster the discussion around the topic (incl. after the project), on how to establish and operate a nordic eHealth Cloud.
Software, Services & Tools					
Service compliance validator	WP3	MIT or similar	EOSC service providers, Knowledge Hub	15: Compliance checklist and maturity model will be used for regular assessing of Nordic services against EOSC requirements.	<u>Dissemination</u> through project website, workshops and relevant EOSC-related events. <u>Exploitation</u> by Service Providers and Knowledge Hub for validating compliancy of services to latest EOSC requirements.
Service interoperability platform	WP3	MIT or similar	EOSC service providers, Portals using EOSC services, Knowledge Hub	16: Service interoperability framework will lead to harmonisation of service descriptions and operations in the Nordic region according to EOSC regulations.	<u>Dissemination</u> through project website, workshops and relevant EOSC-related events. <u>Exploitation</u> by Service Providers for maintaining service registrations and by users of EOSC portal for integratin
FAIR evaluation tool	WP4	CC or similar	Communities, repository providers,	17: Best practices and experiences for the adoption of relevant FAIR data standards and	<u>Dissemination</u> through project workshops and communication channels, incl EOSC.

				certification schemas.	<u>Exploitation</u> by WP4, NeIC and national initiatives and EOSC for the continued support to providers and communities to monitor FAIR uptake.
Machine actionable, modular DMP tool (D5.5)	WP5	Creative Commons or similar	Research communities, Service Providers, Funding bodies Policy makers, Governmental agencies	15. The machine actionable DMP tool will support adoption of processes and practices for optimal use of the resources, ensuring open access of the data and FAIRness of data and services	<u>Dissemination</u> through reports and EOSC relevant events, RDA forum, GoFAIR events <u>Exploitation</u> by NeIC, EOSC and national initiatives to support adoption of DMP, by national ministries and governments and funding bodies.
Cross borders orchestration of sensitive data infrastructure (D5.6)	WP5	Restricted	Nordic Commons for Health Data – National Ministries and governments	16. This pilot will showcase the possibility of doing scientific investigations on sensitive data cohort located in different countries without moving the data away from the custodian, thus enhancing the re-usability of sensitive data.	<u>Dissemination</u> through reports <u>Exploitation</u> by NeIC and national ministries, EU governmental bodies to build up a knowledge on how to create a distribute eHealth data cloud
Knowledge Hub	WP6	N/A	Research communities, Service Providers, Funding bodies Policy makers, Governmental agencies	15-6: The Knowledge Hub will contribute to wider adoption of processes and practices and optimal use of the resources and help removing barriers to update of EOSC	<u>Dissemination</u> through events and virtual helpdesk <u>Exploitation</u> by NeIC and national ministries, service providers and user communities. The Knowledge Hub will be supported by NeIC after the project.
www.EOSC-Nordic.eu	WP6	N/A	Research communities, Service Providers, Funding bodies Policy makers,	15-6: The web platform will contribute to wider adoption of processes and practices and	<u>Dissemination</u> through the web platform and tools <u>Exploitation</u> by NeIC and national ministries, service

			Governmental agencies	optimal use of the resources and help removing barriers to update of EOSC	providers and user communities. The website will be supported by NeIC after the project.
Publications					
EOSC-nordic branding elements (logos, etc.)	WP6	copyright	EOSC-Nordic consortium	15-7	<u>Dissemination</u> via marketing materials and project related documents. <u>Exploitation</u> possible trademark for future collaboration across Nordic & Baltic countries.
Training material	WP6	copyright	EOSC-nordic consortium	15-7	<u>Dissemination</u> through training workshops and project events <u>Exploitation</u> via the knowledge hub.

Data Management Plan & Open Access Strategy

The EOSC-Nordic project participates in the Pilot on Open Research Data in Horizon 2020, in line with the Commission's Open Access to research data policy for facilitating access, re-use and preservation of its research data. For this purpose, a data management plan (DMP) will be developed by month 6 and documented in a deliverable according to the EC guidelines on FAIR data management. This will outline how research data will be handled during and after the project, describing what data will be collected, processed or generated and following what methodology and standards, whether and how this data will be shared and/or made open, and how it will be curated and preserved. The DMP will also provide the dataset metadata specification that will be used in the data registry, following an appropriate relevant standard. It will specify the recommended licensing schemes, preferably using the Creative Commons Public Domain (CC0) and Attribution (CC BY) licenses as suggested by H2020. In the cases where the datasets cannot be publicly shared, the reasons will be mentioned in its metadata description (e.g. ethical, rules of personal data, intellectual property, commercial, privacy-related, security-related).

Knowledge management & IPR strategy

In achieving this aim, the EOSC-Nordic project recognizes the importance of intellectual property and the proper treatment of them. An EOSC-Nordic Intellectual Property Policy will be drafted by WP1 at the beginning of the project. The purpose of this policy is to clarify the rules and principles regarding the intellectual property aspects of the Collaboration as well as to set recommendations regarding such aspects. The following principles will be put forward: a) a party of the EOSC-Nordic owns the IP created by it and, b) EOSC-nordic consortium will (non-exclusively) manage and exploit the IP for the benefit of the project. Regarding the licensing, the policy will recommend that, if permitted by the license terms and conditions applied, the software IP is licensed under an OSI approved open source license Particular license recommendations are given: a) The MIT License for software, and b) Creative Commons BY 4.0 license, Open Data Commons Attribution License v. 1.0 or Open Data Commons Open Database License (ODbL) v. 1.0 for non-software.

2.2.2 Communications Activities

Communication activities will support in maximising the project impact by focusing to engage and communicate within the consortium and with external audiences. A well-defined stakeholder identification of the EOSC-Nordic engagement and communication strategy for 36 months will coordinate the communication, dissemination and engagement activities. The engagement and communication strategy will exist as a live document subject to updates.

Work package 6 will establish channels and deliver content to ensure that outputs of EOSC-Nordic are disseminated effectively to all relevant stakeholder communities. Special attention will be paid to the identified stakeholders and engagement and communication strategy will ensure that the right message is presented to the right stakeholder via the correct channel.

Identifying target stakeholders

EOSC-Nordic will address a wide range of potential users, including e-Infrastructure and service providers, data repository managers, research communities and research performing organisations, University and libraries, as well as policy makers and funding agencies. We have mapped below the relevance of the different work packages activities to each key stakeholder communities:

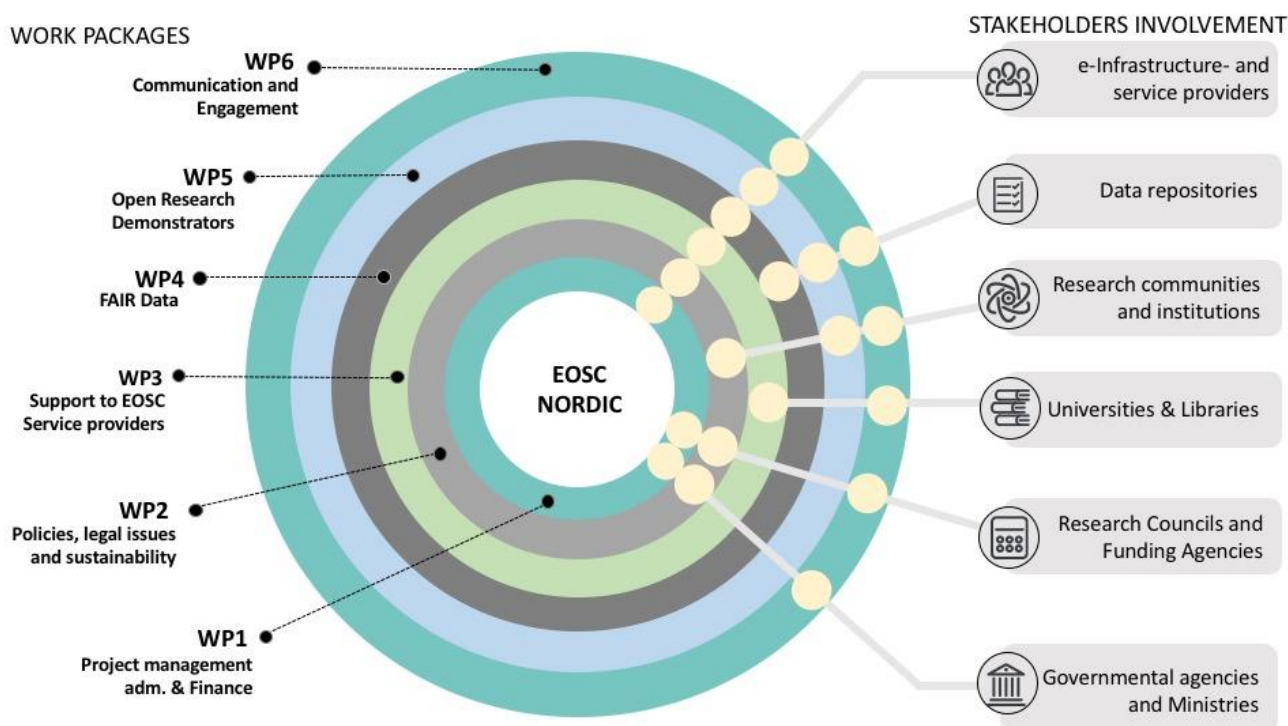


Figure 2.1: The relevance of the different work packages' activities to each key stakeholder community

Table 2.4: Measures to communicate project activities

OBJECTIVE: DEFINE THE IMAGE FOR THE PROJECT	
Develop the project identity	<ul style="list-style-type: none"> EOSC-Nordic branding and graphic design package including communication materials, presentation and document templates
Establish the key messages about the project to ensure consistency	<ul style="list-style-type: none"> Targeted messaging, value proposition and a pitch to each target audience Promotional project materials (flyers and information sheets in digital and traditional format)
OBJECTIVE: SET UP AND OPERATE THE COMMUNICATION CHANNELS	
Develop a platform to be the backbone	<ul style="list-style-type: none"> EOSC-Nordic web portal and collaboration communication tools (intranet, mailing lists and wikis) The project website present as the primary tool to communication
Develop contacts to be deployed in dissemination & exploitation	<ul style="list-style-type: none"> Compile an EOSC-Nordic stakeholder profiled database

Establish communication channels and keep them up to date	<ul style="list-style-type: none"> • Creating continuously relevant content in different formats (news, interviews, reports, blogs, videos, success stories) to EOSC-Nordic web portal and Social media (Twitter, LinkedIn, SlideShare, Instagram, Youtube) • External newsletter for ongoing & planned work, achievements, use cases digital training materials
OBJECTIVE: CREATE FACE-TO-FACE OPPORTUNITIES FOR COLLABORATION	
Organise the project events	<ul style="list-style-type: none"> • Two project flagship events • Internal project briefs
Organise targeted events to support project activities	<ul style="list-style-type: none"> • Specific outreach events E.g. hackathons, workshops • E.g. Train the trainers tutorials

WP 6 will Support the dissemination & exploitation of project results by carrying a number of outreach activities and events each tailored to specific target audience and purpose. The outreach activities give an overview of plans to implement the activities in support of dissemination.

Outreach to SERVICE PROVIDERS

This will promote the EOSC implementation and its benefits for service providers. In particular we will:

- Promote the benefits of joining the EOSC service catalogue and integrating with other relevant EOSC core functions
- Inform and make all instructions and material (incl. training material) available to service providers to facilitate their onboarding.
- Organise onboarding and training events

This work will be conducted in collaboration with WP3.

Outreach to RESEARCH COMMUNITIES

This will target to communicate project results with following activities:

- Create use cases to illustrate success stories of uptake of EOSC Services, focused on research result
- Produce support publications: Service catalogue with overview of what is available, materials to promote FAIR principles, materials for highlighting what is available for the X field, guide to how to get started
- Participate in and engage with specific (third-party) events promoting the project
- Organise onboarding and training events

This work will be conducted in collaboration with WP4 and WP5.

Outreach to DECISION MAKERS

This will interact and engage with policy makers and funding agencies and governance bodies to make them informed about the project's strategy plans, roadmaps and demonstrate added values and successes. This work will be conducted in collaboration with WP2.

Outreach to INDUSTRY/SME

This will raise awareness of the project by participating in industry-related events, promoting EOSC and potential usage scenarios of the public infrastructure and research data. This work will be conducted in collaboration with WP3 and WP5.

EOSC-Nordic KPIs for communication

Stakeholder interactions and effectiveness of the communication strategy can be reviewed by number of involved or interested stakeholders, project activities and materials, participants in the activities, visitors in website and social media followers. The initial set of indicative KPIs are set below and the criteria will be detailed during the execution of the project according to opportunities of maximizing value and impact vs efforts. Usage of marketing software will allow to monitor the real-time effectiveness of the targeted newsletters and social media activities.

Table 2.5: The EOSC-Nordic set of indicative KPIs

Action	KPI	Measure
A profiled database of contacts	<ul style="list-style-type: none"> Number of contacts 	<ul style="list-style-type: none"> 2,000 by end of year one and over 4,000 contacts by the project end
Content in the web portal	<ul style="list-style-type: none"> Number of published news, articles, blog posts, interviews, reports, videos, success stories, webinars, information sheets etc 	<ul style="list-style-type: none"> At least 3 / month
Marketing materials	<ul style="list-style-type: none"> Number of targeted newsletters The amount of the newsletter orders 	<ul style="list-style-type: none"> 10 yearly newsletters At least 500 / year Other metrics: click through rates
Project website	<ul style="list-style-type: none"> Total Site Visits the goal is converting anonymous visitors to registered visitors 	<ul style="list-style-type: none"> At least 1000 visits per month Other metrics followed: interactions per visit, new visitors, referrals, country, organic keywords, source: direct visitors or organic/search traffic
Social Media Channels	<ul style="list-style-type: none"> Number of followers Number of tweets 	<ul style="list-style-type: none"> >700 outside of the project At least 500 tweets per year (unique and retweeted)
Support publications	<ul style="list-style-type: none"> Number of leaflets/fliers/brochures Number of posters 	<ul style="list-style-type: none"> 15 for the lifetime of the project 10 for the lifetime of the project
Engagement with stakeholders	<ul style="list-style-type: none"> Number of stakeholders involved Number of external events participated 	<ul style="list-style-type: none"> Over 500 end-users in the science demonstrators and other events by the project end 200 participants in each EOSC-Nordic stakeholder engagement event at least 15 for the lifetime of the project

3 Implementation

3.1 Work plan — Work packages, deliverables

In order to achieve the continual interactions between different parts of the project, we have aggregated the main project tasks into six work packages.

WP1-Project Coordination and Management (NeIC) will cover the administrative and financial management of the project. The activity will be also responsible for the management of quality and risk aspects, as well as for liaising with the EC Supporting all activities, this WP provides overall co-ordination for EOSC-Nordic and will manage

project reporting through a management team located at NeIC/DeiC. The management team has experience in coordinating large scale international projects and will receive financial and administrative management support from the project management office.

WP2-Policies, legal issues and sustainability (CSC) will steer the consolidation of EOSC by harmonising policies, investigating, and helping removing, any legal issues, and facilitating the discussion around EOSC future in the Nordic and Baltic countries in collaboration with national policy makers and funders. It will foster the coordination of and connection between the national initiatives at policy level, in the context of EOSC. It will address open science policies and the delivery of horizontal services and access to related resources in a cross-border environment, the legal aspects associated with the sharing of resources, and the sustainability of the coordination. WP2 is fundamentally policy-oriented and its main external stakeholders are national policy-makers and funders which will be engaged through dedicated workshops, leveraging the national connections of the partners.

WP3- Support to EOSC-Nordic service providers (UT/ETAIS) will support the concrete integration and interoperability of prospective EOSC service providers from the Nordic and Baltic countries with EOSC service management framework and operational environment. It will identify candidate services to integrate into the EOSC portal and engage with service providers through workshops to help them integrate with EOSC core components and foster the harmonisation of processes and procedures across service providers. It will also go beyond aligning processes and practices by piloting innovative tools and solutions to effectively enable services to interoperate between them and with the EOSC system, thereby fostering the development of a coherent environment, in which services can work together, within and across organisations or domains.

WP4 FAIR data (NeIC) will engage with Nordic-Baltic repositories, help them becoming FAIR compliant/certified, and promote incentives for the uptake of FAIR data across the region. WP4 will work in close collaboration with FAIRsFAIR and GO-FAIR to promote best practices and support the adoption of relevant certification schemas. Activities will be conducted through workshops and hackathons.

WP5 Open Research data and services – demonstrators (SIGMA2) will demonstrate the potential of EOSC by piloting innovative solutions, designed to support cross border research collaboration, using the Nordic and Baltic countries as a testbed environment. The solutions which will be tested and validated by research communities leverage existing services (from national e-infrastructures and/or research communities as well as core EOSC services) and are suitable *by-design* to spin-off on a cross-border environment such as EOSC. The solutions will be piloted at Nordic level before being made available in the EOSC environment.

WP6-Engagement, communication and competence building (CSC) will capture project results, support the definition of the best IP protection approach, and maintain the dissemination and exploitation plan, as well as ensure the alignment of the key stakeholders. WP6 will organise project events (workshops, training) to disseminate the results of the project and engage with stakeholders, and will establish a Knowledge Hub to foster competence building and knowledge sharing among stakeholders and relevant professional environments.

Our overall aim is to foster and catalyse the take-up of the EOSC in the Nordic region, by approaching the providers and the users through their respective EOSC interaction pathways: a) the (federated) infrastructure service integration activities from the service providers point of view (WP3) and b) the adaptation of EOSC infrastructure services in research communities (piloted through demonstrators) (WP5). In order for these two pathways to become operational, research data management practices (WP4) and cross border policies (WP2) need to be aligned/cleared/accessible. WP1 and WP6 ensures the coordination and the stakeholder competence integration, respectively.

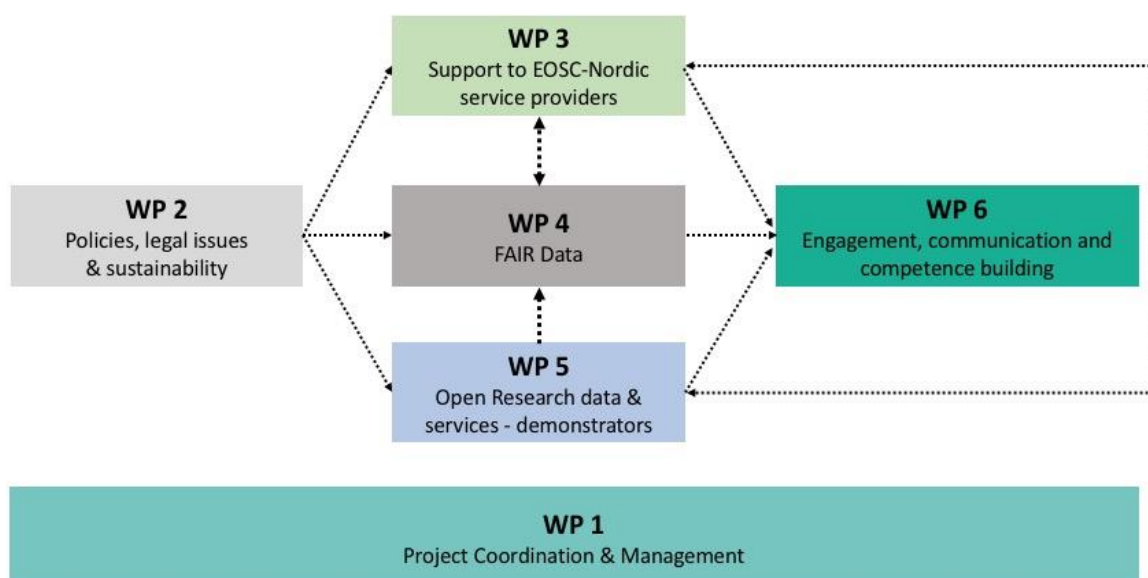


Figure 3.1: EOSC-Nordic PERT chart representing the relationship and high-level interaction between work packages

Table 3.1: List of work packages

WP	Work Package Title	Lead	Short Name	PM	Start	End
1	Project Administration and Finance	1	NeIC	36	M1	M36
2	Policies, legal issues and sustainability	3	CSC	75	M1	M36
3	Support to prospective EOSC service providers	6	UT/ETAIS	102	M1	M36
4	FAIR data	1	NeIC	87	M1	M36
5	Open research data & services - demonstrators	4	SIGMA2	195	M1	M36
6	Engagement, communication and competence building	3	CSC	55	M1	M36
			Total PM	550		

ID	Activity	Activity name	Start date	End date	Duration	PROJECT MONTH																																				
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
1	WP1	Project finance and management	1	36	36	M1.1	◆	◆	M1.2	◆		◆	◆		◆	◆		◆	M1.12	◆		◆	◆	◆	◆		◆		◆	◆		◆	◆		◆	M1.18	◆					
2	Task 1.1	Management	1	36	36	D1.1	◆			M1.3				M1.4				M1.5			M1.11	D1.3	◆			M1.7			M1.10			M1.15			M1.8			M1.17	D1.4	◆		
3	Task 1.2	Quality Control and Risk Management	1	36	36									M1.6				M1.9									M1.13			M1.14						M1.16						
4	Task 1.3	Financial Management	1	36	36																																					
5	Task 1.4	Internal Communication	1	36	36																																					
6	Task 1.5	Governance Support	1	36	36																																					
7	WP2	Policies, legal issues and sustainability	1	36	36																																					
8	Task 2.0	Coordination of the work package activities	1	36	36																																					
9	Task 2.1	Open science policies & resource provisioning in the Nordic and Baltic countries	1	30	30																																					
10	Task 2.2	Opening up and delivering services in a cross border environment	1	36	36																																					
11	Task 2.3	Fostering a coordinated policy approach towards EOSC	1	36	36																																					
12	WP3	Support to prospective EOSC service providers	1	36	36																																					
13	Task 3.0	Coordination of the work package activities	1	36	36																																					
14	Task 3.1	Integrating service providers & services in EOSC	1	36	36																																					
15	Task 3.2	Improving service interoperability across EOSC	1	36	36																																					
16	WP4	FAIR data	1	36	36																																					
17	Task 4.0	Coordination of the work package activities	1	36	36																																					
18	Task 4.1	State of FAIR practices in the Nordics	1	36	36																																					
19	Task 4.2	Support to the adoption of standards and certification	1	36	36																																					
20	Task 4.3	Incentives for the uptake of FAIR practices	12	36	25																																					
21	WP5	Open research data & services - demonstrators	1	36	36																																					
22	Task 5.0	Coordination of the work package activities	1	36	36																																					
23	Task 5.1	Discovery and Re-use of research data in EOSC	1	36	36																																					
24	Task 5.2	Analysis and Post-processing across borders	1	36	36																																					
25	Task 5.3	Data management planning in a distributed environment	1	36	36																																					
26	Task 5.4	Sensitive Data	1	36	36																																					
27	WP6	Engagement, communication and competence building	1	36	36																																					
28	Task 6.0	Coordination of the work package activities	1	36	36																																					
29	Task 6.1	Engagement and communication Strategy	1	36	36																																					
30	Task 6.2	Web portal, communication tools and branding	1	36	36																																					
31	Task 6.3	Communication and dissemination	1	36	36																																					
32	Task 6.4	Knowledge Hub, Capacity Building and Training	1	36	36																																					

Work package detailed description

Table 3.2: Work plan

Work package number	1	Lead beneficiary	1 – NeIC
Work package title	Project Finance and Management		
Participant number	1	2	3
Short name of participant	NeIC	DeiC	CSC
Person months per participant	8	18	10
Start month	1	End month	36
<p>Objectives</p> <p>The overall objective of WP1 is to ensure progress towards and achievement of project goals through efficient and structured management, ensuring adherence to plans while at the same time paying due attention to each partner’s needs and targets. In particular, WP1 will:</p> <ul style="list-style-type: none"> • Organise the overall project administration, finance and project management including definition and coordination of the quality and risk management. • Monitor resources and financial expenditures, contractual obligations and reporting. • Supervise work packages, internal review of deliverables and plans, monitoring of risk analysis, contingency plans, procedures, KPIs and metrics. 			
<p>Description of work:</p> <p>Task 1.1 Management (M1-36) Lead: NeIC (1PM): Participants: DeiC (13PMs), CSC (1PM)</p> <p>The day to day operation and the implementation of the goals will be performed through a Project Office (PO) consisting of all the partners in WP1, in collaboration with the Project Management Board (PMB). The PO, headed by the Project Manager (PM) will ensure that work assigned to the different work package leaders progresses according to schedule and within the allocated budget and resource plan. The Coordinator will be the primary point of contact between the project and its EC Project Officer. Periodic management reports will be prepared and submitted to the Commission including certificates of the financial statements when required. The PM will be responsible for the submission of the formal deliverables as defined by the contract. The PM will prepare and organise the annual project reviews.</p> <p>Task 1.2 Quality Control and Risk Management Lead: NeIC (1PM). Participant: DeiC (1PM)</p> <p>This task will ensure that project results, milestones, and formal deliverables undergo a quality control process of internal verification and document reviews prior to submission to the EC. The PO will also set up a shared risk register containing descriptions, analysis and strategies for reducing risk in the project. The register will be maintained by WP leaders and the PM.</p> <p>Task 1.3 Financial Management Lead: NeIC (1PM). Participants: CSC (5PMs), DeiC (1PM)</p> <p>The PO will be responsible for processing all grant claims and receipts, including timely distribution of money in accordance with the EC Grant Agreement and the Consortium Agreement. The financial status reflecting actual vs. planned effort and actual vs. planned expenditures will be maintained by the coordinator and reported to the Executive Board (EB) on a quarterly basis.</p> <p>Task 1.4 Internal Communication Lead: NeIC (4PMs). Participants: DeiC (1PM)</p> <p>A project wiki page, hosted by NeIC, and a video and teleconferencing infrastructure will be made available to the project and will be used for the secure exchange of project information, project results, deliverables, meeting minutes and mailing lists.</p> <p>Task 1.5 Governance Support Lead: NeIC (1PM). Participants: CSC (4PMs), DeiC (2PMs)</p>			

This task will be responsible for organising and providing any relevant information required by the governance bodies as described in section 3.2, and for liaising with other bodies outside the project (EOSC governance, other projects funded under this call, etc.) on governance related issues.

Number	Deliverables	Month
D1.1	EOSC-Nordic Quality Plan and Risk Register will present the quality control processes and templates for internal verification and document review for all project results and formal deliverables. Furthermore, the deliverable presents the project-wide register of risks which includes analysis of their potential effect on the project, steps that have been taken or are planned to reduce the effects and steps to be taken should the risk transpire and create an issue for the project.	M3
D1.2	Data Management Plan [M6]: A report that will specify how the project results and necessary data will be collected, processed, monitored, catalogued, and disseminated during the project lifetime.	M6
D1.3	Periodic Report, 1st reporting period [M18] Contractual requirement	M18
D1.4	Periodic and Final Reports, 2nd reporting period [M36] Contractual requirement	M36

Work package number	2				Lead beneficiary	CSC							
Work package title	Policies, legal issues and sustainability												
Participant number	1	2	3	4	5	6	7	8	9	11	6	19	20
Short name of participant	NeIC	DeiC	CSC	SIGMA2	SNIC	UT/ETAIS	UICE	VU	RTU	NORDUnet	UH	FMI	UEF
Person months per participant	3	4	14	7	11	8	3	3	3	5	6	4	4
Start month	1				End month	36							

The overall objective of WP2 is to foster the coordination of and connection between the national initiatives at policy level, in the context of EOSC. The tasks in WP2 address open science policies and the delivery of horizontal services and access to related resources in a cross-border environment, the legal aspects associated with the sharing of resources, and the sustainability of the coordination. WP2 is fundamentally policy-oriented and its main external stakeholders are national policy-makers and funders.

In particular, WP2 will:

- Identify & map the open science policies & resource provisioning principles applied in the Nordic and Baltic countries;
- Investigate models, roles and responsibilities for the coordinated provisioning and delivery of EOSC services and resources at national level
- Identify current and potential legal hurdles associated with the sharing of data & opening up of resources across national borders, and suggest possible solutions to overcome the aforementioned hurdles;
- Coordinate and foster discussions across the Nordics around the coordination of policy activities, and advise on directions the Nordic national initiatives should take to implement or align with relevant EOSC policies.

T2.0 Coordination of the work package activities (M1-36) Lead: CSC (4PMs)

This task provides the effort required for effective work package coordination.

T2.1 Open science policies & resource provisioning in the Nordic and Baltic countries (M1-30) Lead: SNIC (5PMs). Participants: CSC (2PMs), UEF (2PMs), SIGMA2 (3PMs), NORDUnet (1PMs), UT/ETAIS (3PMs), DeIC (2PMs), UICE (1PMs), RTU (1PM), VU (1PM), FMI (2PM)

T2.1.1 Open science policies in the Nordic and the Baltic countries (M1-30) SNIC, UEF, SIGMA2, UT/ETAIS, DeIC, UICE, RTU, VU

This task will identify, describe and assess the open science policies currently in place or being planned in the Nordic and Baltic countries in anticipation of EOSC future requirements. We will carry out a comparative analysis looking at similarities but also divergences across the different countries. The purpose of this task is a) to identify & describe open science policies in order to be able inform the relevant EOSC stakeholders about the situation in the Nordic and Baltic countries; and b) to foster the coordination of EOSC related policies across the Nordic and Baltic countries with a view to support their alignment with EOSC policies. Output of this task will also directly feed other strands of activities such as the work carried out in T2.3 and in WP4 with regards to FAIR practices.

T2.1.2 Resource provisioning & access policies (M1-30) SNIC, CSC, NORDUnet, SIGMA2, UT/ETAIS, DeIC, UICE, RTU, VU

This task will investigate how horizontal IT services and resources are being provided and accessed in the Nordic and Baltic countries. National regulations, agreements, principles, as well as business models and procurements schemas will be in scope. The task will look at interoperability frameworks in place, in particular organisational and technical interoperability, and also describe the different actors being involved in the delivery chain, from national service providers to universities and end users. We will apply a methodology similar to that of T2.1.1 with a comparative analysis of national resource provisioning & access policies (national delivery chain) across the countries with an emphasis on similarities and divergences and an outward looking to EOSC requirements. The purpose is again both to inform about the situation in the Nordic and Baltic countries and to foster coordination across the countries. Output of this task will directly feed WP3 on supporting prospective EOSC providers.

T2.2. Opening up and delivering services in a cross border environment (M1-M36) Lead: NORDUnet (4PM)-Participants: SNIC (5PMs), CSC (4PM), SIGMA2 (2PM), UH (6PM), UT/ETAIS (4PM), DeIC (1PM), UICE (1PM), RTU (1PM), VU (1PM)

T2.2.1 Assessment of cross-border collaboration models NORDUnet, CSC, UT/ETAIS, SNIC

The Nordics and the Baltics have a long history of collaboration at research policy and infrastructure level and have tackled over the years several challenges which are very much relevant for EOSC, such as governance, resource sharing, coordination & harmonisation of policies, cross-border funding, etc. This task will review the past experience and draw up lessons which will be valuable to share in the context of the emerging EOSC environment. It will also review the different collaboration models that are being discussed in EOSC and assess their value and relevance in the Nordic and Baltic context. Particular attention will be paid to cost-recovery and business models for EOSC, which will be assessed in the light of the previous experience at Nordic level and tested against the demonstrators carried out in WP5 and the concrete usage of services made available via the EOSC catalogue.

T2.2.2 Legal issues UH, SIGMA2, SNIC, UT/ETAIS, DeIC, UICE, RTU, VU

This task will assess the legal frameworks in the Nordic and Baltic countries with regard to the implementation of EOSC standards and policies in the Nordics. The sharing and safe processing of both open and “restricted” data from across borders will be in scope. In particular, the task will screen existing legislations to identify: a) barriers to the implementation of the FAIR data principles (e.g. sectorial or geographical restrictions, different and vague data licence models, etc.), and b) opportunities to comply in a simple, clear and harmonised way to the applicable legal frameworks. It will also follow the existing national frameworks with regard to the emerging codes of conduct associated with the introduction of the GDPR, in particular the Code of Conduct on use of medical/health data in research and the Code of Conduct on cloud service providers, and also take advantage of having a non-EU country in the consortium (Norway) to compare GDPR rules and their implementation. The main outputs of this task will be an input for the policy recommendations and approaches for the safe sharing and processing of research data across borders and for aligning with EOSC developments This work will contribute to creating a coherent framework for addressing the legal interoperability issues, as outlined in the European Interoperability Framework.

T2.2.3 Roles and responsibilities in the overall EOSC delivery chain NORDUnet, CSC, UT/ETAIS, SNIC

This task will look at EOSC from the perspective of the delivery chain. EOSC cannot be reduced to a relationship between a service provider and an end-user. Indeed, many actors are present in the delivery chain, many working as

intermediaries or providing support and consultancy work for the actual delivery of resources (e.g. universities, research and education networks, etc.). This is especially the case when complex services are being delivered. In a cross border environment this chain becomes even more complex, involving actors from different countries operating from different administrative domains. This task aims to identify the different actors that belong to the EOSC chain and map their roles and responsibilities. By doing this, this task will directly contribute to the setup of the Knowledge Hub in WP6.

T2.3 Fostering a coordinated policy approach towards EOSC Lead: CSC (4PM) - Participants: NeIC (3PM), FMI (2PM), UEF (2PM), SIGMA2 (2PM), DeiC (1PM), SNIC (1PM), UT/ETAIS (1PM), UICE (1PM), RTU (1PM), VU (1PM)

T2.3.1 Ensuring engagement and commitment from policy-makers FMI, UEF, SIGMA2, DeiC, SNIC, UT/ETAIS, UICE, RTU, VU, CSC

A set of policy workshops will be set up to in the early phase of the project, to give active input on policy related matters relevant to EOSC. The policy workshops will not be static, but will grow as the project moves along, initially targeting a selected group of high level national representatives from ministries, research councils and universities, and changing in response to the needs of the circle of stakeholders, which may get wider. They will be organised in conjunction with the project’s events and will be developed in close connection with WP6. The task will draw lessons from the project activities (including the demonstrators) to inform relevant stakeholders in the forum about EOSC relevant topics and foster a coordinated approach and position across the countries regarding policy and funding aspects. This requires a dedicated activity, which includes a translation exercise for turning the project output into formats that are understandable from a higher- level policy perspective, and for bringing forward national considerations at European level.

T2.3.2 Making the case for a Nordic-Baltic collaboration NeIC, CSC

To ensure sustainable national commitments to EOSC, the expected benefits of EOSC need to be articulated taking into considerations national and regional specificities. Indeed, arguments are often not perceived in the same way depending on the countries and the values they cherish. This task will clarify the possible benefits and impacts of EOSC for the national initiatives involved in the project and discuss the “Nordic Added Value” (*Nordisk nytte*) of a coordinated approach around EOSC. This activity will facilitate a dialogue between policy-makers, funders and the communities, aiming at a common, coherent understanding of the EOSC value proposition.

T2.3.3 Sustaining the coordination of national initiatives NeIC, CSC

This task will seek and prepare the means to sustain the coordination of national initiatives and the project results (including the Knowledge Hub designed in WP6) beyond the project life. This will be done in consultation with a) the national stakeholders (policy makers, service providers and research communities) involved in the project; b) the EOSC stakeholders, in particular the EOSC governance board, the coordination structure, and the other consortia funded under this subtopic projects. NeIC offers a natural platform for exploiting the project’s activities and outputs work and this task will investigate options for sustaining the collaboration within NeIC.

Number	Deliverables	Month
D 2.1	Open science policies and resource provisioning in the Nordic and Baltic countries (first report): This deliverable will provide a first assessment of the status of open science policies and the provisioning of infrastructure resources and services in the Nordic and Baltic countries. The report will identify gaps with regards to EOSC practices and propose a set of recommendations and a roadmap for aligning with EOSC	M6
D 2.2	Cross border collaboration models – the Nordic experience: This task will review the past experience of organising cross-border collaboration and access to resources and draw up lessons which can be reused in EOSC. Governance, resource sharing, coordination & harmonisation of policies, as well as cross-border funding will be in scope. The deliverable will assess the past developments against the anticipated EOSC model and provide national initiatives involved in the project an initial set of recommendations as how to further develop cross-collaboration in light of EOSC developments	M18
D 2.3	Open Science in the Nordics: legal insights This deliverable will assess the legal frameworks in the Nordic and Baltic countries with regard to the implementation of EOSC standards and policies. The sharing and safe processing of both open and “restricted” data from across borders will be in	M12

	scope	
D 2.4	The EOSC delivery chain: This deliverable will look at EOSC from the perspective of the delivery chain and identify the different actors that belong to the EOSC chain and map their roles and responsibilities.	M12
D 2.5	Open Science policies and resource provisioning in the Nordic and Baltic countries (second report): This deliverable will provide an updated assessment of the status of open science policies and the provisioning of infrastructure resources and services in the Nordic and Baltic countries. It will provide an interim report on the adoption of EOSC perspective within the national policies, following recommendations set in D2.1 and update the roadmap	M18
D 2.6	Cross-border collaboration in the context of EOSC: This deliverable will review and assess the value and impact of the collaboration model proposed by EOSC in the Nordic and Baltic countries. Particular attention will be paid to cost-recovery and business models, which will be tested against the demonstrators carried out in WP5 and the concrete usage of services made available via the EOSC catalogue. The deliverable will assess the real costs of opening up services as part of EOSC and propose relevant funding and business models to sustain these services as part of EOSC.	M24
D 2.7	Open Science in the Nordics: recommendations on legal issues: This deliverable will provide recommendations with regard to the implementation of EOSC standards and policies in the Nordics	M24
D 2.8	Open Science policies and resource provisioning in the Nordic and Baltic countries (final report): This deliverable will provide an updated assessment of the status of open science policies and the provisioning of infrastructure resources and services in the Nordic and Baltic countries and will report on the adoption of the EOSC perspective within the national policies	M30
D 2.9	Sustaining the coordination of EOSC national initiatives at Nordic level: This deliverable will wrap up the project outputs which are relevant for policy-makers and present the benefits and positive impacts of EOSC for the Nordics. It will assess the “Nordic Added Value” (<i>Nordisk nytte</i>) of a coordinated approach around EOSC and propose recommendations for sustaining this collaboration in the context of EOSC.	M36

Work package number	3				Lead beneficiary				UT/ETAIS			
Work package title	Support to prospective EOSC service providers											
Participant number	2	3	4	5	6	7	8	9	10	5	14	
Short name of participant	DeiC	CSC	SIGM A2	SNIC	UT/ETAIS	UICE	VU	RTU	SDU	SUNET	KBFI/ETAIS	
Person months per participant	8	17	14	11	27	5	1	1	6	5	7	
Start month	1				End month				36			
Objectives												
<p>The overall objective of WP3 is to support the integration and interoperability of prospective EOSC service providers in the Nordic and Baltic countries with EOSC service management framework and operational environment. WP3 will organise the participation of service providers in EOSC ensuring that the candidate services are properly described according to EOSC operational and policy guidelines, and supporting their integration to the EOSC system. WP3 is also concerned with interoperability and will seek to develop solutions aiming at fostering organisational, technical and semantic interoperability within EOSC.</p> <p>In particular, WP3 will:</p> <ul style="list-style-type: none"> Identify existing Nordic generic and thematic service providers and support their integration and the discovery of their services via the EOSC portal and other relevant catalogues. 												

- Foster the organizational, semantic and technical interoperability of service providers and propose solutions for improving the interoperability approach within EOSC.

Description of work

T3.0 Coordination of the work package activities (M1-36) Lead: UT/ETAIS (4PMs)

This task provides the effort required for effective work package coordination.

T3.1 Integrating service providers & services in EOSC (M1-36) Lead: SIGMA2 (12PM) - Participants: CSC (11PM), KTH/SNIC (7PM), LU/SNIC (1PM), UmU/SNIC (1PM), UT/ETAIS (6PM), DeiC (6PM), UICE (4PM), RTU (1PM), KBFI/ETAIS (2PM), SUNET (4PM), VU (1PM), SDU (4PM)

T3.1.1 Identification & description of EOSC prospective service providers & candidate services (M1-M24) - SUNET, CSC, SNIC, SIGMA2, UT/ETAIS, DeiC, UICE, RTU, KBFI/ETAIS, VU, SDU

This task will produce a map of EOSC candidate services in the Nordic-Baltic region covered by the project. We will start from the initial list presented in section 1.3 which will be consolidated over the course of the project. Particular attention will be paid to services which can be “opened up” to users beyond their initial, local customer base. Interaction with interested service providers will be organized by this task and services will be described following the agreed EOSC templates with a view to integrating them to the EOSC portal.

T3.1.2 EOSC service compliance checklist and capacity maturity model (M1-24) - SNIC, CSC, SIGMA2, DeiC, KBFI/ETAIS, SUNET

The task will create a checklist to assess the degree of compliance of the candidate services with EOSC rules of participation and standards, and develop a capacity maturity model to guide prospective service providers for complying with EOSC requirements. The checklist is intended to be created both as offline and online document, and will take into account regional support infrastructure. Based on the checklist and maturity model, the task will identify a) mature services which comply with EOSC service management & operational environment and can be integrated to the portal and; b) less mature services which need additional effort and hands-on support to comply with EOSC standards. The task will also initiate an assessment of the degree of FAIRness of the services described, with the assumption that greater discoverability, accessibility, interoperability and reusability of services (and software) is also a driver and enabler of open science. Service assessment will use the same approach as within T4.1.2 (WP4). Management aspects such as service policies, user licenses, the use of open source platforms to avoid vendor lock-in and succession plans will be scrutinized

T3.1.3 Support to the integration of mature services into EOSC portal (M6-18) – DeiC, CSC, SNIC, SIGMA2, UT/ETIAS, UICE, SUNET

This task will be responsible for liaising with relevant EOSC integrators to facilitate the concrete integration of mature services into the EOSC portal. This will include integration effort related to EOSC requirements for achieving the levels of integration desired, from low to high, in particular with regards to the integration with EOSC core components such as AAI, helpdesk, and service monitoring. This will be done according to an integration roadmap which will be agreed at the beginning of the project between the consortium and the relevant service providers, and between the consortium and EOSC integrators.

T3.1.4 Support to aligning with EOSC service management & operational environment (M12-36) – SIGMA2, CSC, SNIC, UT/ETAIS, UICE, SDU

This task will also provide the resources to establish and run a support group, which will provide assistance to Nordic service providers which do not meet EOSC service management and operational requirements or are not fully aligned with these requirements to improve their practices with a view to align in the short to medium term with EOSC standards. The type of expertise which will be included in this task focuses on service management and operations. In particular, we will leverage the expertise from the most advanced national centers to inform about best practices and help service providers to improve their own practices, with a focus on service level management and user support. The work in this task will draw on the analysis of T2.1 and will contribute to providing the necessary resources to the Knowledge Hub platform established in WP6, for all matters related to service management and operations.

T3.2 Improving service interoperability across EOSC (M1-M36) Lead: UT/ETAIS (17PM) - Participants: CSC (6PM), KTH/SNIC (2PM), SIGMA2 (2PM), DeiC (2PM), UICE (1PM), KBFI/ETAIS (5PM), SUNET (1PM), SDU (2PM)

T3.2.1 Organisational, semantic and technical interoperability of services (M1-12)- CSC, SNIC

The delivery of European services that work together, within and across organisations or domains can only be achieved if these services follow basic interoperability principles. This task will focus on fostering the organizational, semantic and technical interoperability of the Nordic services that are relevant for EOSC. On the organizational side, we will look at the way in which service providers document their business processes and make their services available, easily identifiable, accessible and user-focused. On the semantic side, we will look at the data models, persistent identifiers, and metadata schema being used by service providers, and on the technical side, we will assess the technical standards for the implementation and integration with EOSC catalogues such as REST / JSON or XML and Linked data on the API level, and OAI-PMH or ResourceSync for harvesting protocols. The output of this task will be a set of recommendations for fostering interoperability in the Nordics and across EOSC. As such this task will provide a direct input to the discussion on EOSC interoperability model.

T3.2.2 Connecting services to EOSC through the interoperable approach (M1-36) – UT/ETAIS, CSC, SNIC, SIGMA2, DeiC, UICE, KBFI/ETAIS, SUNET

The task will support integration of Nordic services with EOSC platform, in particular the EOSC Portal, Service Catalogue and Marketplace through the development of a lightweight registration and resource provisioning interface. We will address the integration of Nordic services with EOSC core services and policies in an automated way, thereby offloading the central platform from unnecessary integration effort and ensuring the sustainability of the service integration. Work will be based on activities carried out within the NeIC Dellinger project, which initially focused on cross-border sharing and monitoring of HPC and cloud resources. The developed platform is going to be used also by Knowledge Hub to provide efficient support to Service Providers.

T3.2.3 Federating services and databases (M12-36) - CSC, UT/ETAIS, SDU

This task will investigate the feasibility of applying the X-Road approach, which has been successfully adopted by Finland and Estonia for connecting state and public databases (such as population registries, census, tax registers, etc.), to research data. The X-Road software is a centrally governed distributed integration layer between information systems developed which is used as an open source data exchange layer solution that enables organizations to exchange information over the Internet. We will initiate a pilot focusing on selected databases from the partners' institutions. If successful, this could lead to a new approach for connecting and federating services within EOSC.

Number	Deliverables	Month
D 3.1	EOSC Service compliance checklist and maturity model: This deliverable will present the service compliance checklist and the capacity maturity model that will be used to guide prospective service providers for complying with EOSC requirements. The checklist and maturity model will be a live document that will be updated according to EOSC developments.	M6
D 3.2	First report on mapping of EOSC prospective service providers and candidate services: This deliverable will provide a list of EOSC prospective service providers and candidate services coming from the Nordic and Baltic countries. Candidate services will be described in this deliverable according to the EOSC agreed template and assessed against the compliance checklist and maturity model developed in D3.1.	M12
D 3.3	Service interoperability framework: This deliverable will provide a set of recommendations for improving service interoperability across services providers. Organisational, semantic, technical and legal (leveraging work from WP2) will be in scope.	M14
D 3.4	Programmatic access and resource provisioning of services: This deliverable will report on the development of a programmatic access and resource provisioning interface for connecting services to a central catalogue.	M18
D 3.5	Second report on mapping of EOSC prospective service providers and candidate services. This deliverable will provide a list of additional EOSC prospective service providers and candidate services and will report on the work done to integrate the first set of services and the result of this integration.	M24
D 3.6	Feasibility assessment of the implementation of X-Road for research data. The deliverable will report on the analysis and initial proof-of-concept for connecting EOSC providers with data source over X-Road protocols in a cross-border setup.	M24

D 3.7	Report on the implementation of X-Road in the Nordics and recommendations to EOSC. This deliverable will summarise the proof-of-concepts and lessons learnt when integrating data registries and EOSC-compliant service providers in a cross-border environment. The deliverable will also include recommendation for treating such scenarios on a wider scale.	M30
D 3.8	Programmatic access and resource provisioning of Nordic services via EOSC Marketplace: This deliverable will report on the results of connecting services to EOSC marketplace through the programmatic interface.	M36
D 3.9	Final report on the integration of services into EOSC: This deliverable will review the integration of services into EOSC and report on their uptake within EOSC.	M36

Work package number	4				Lead beneficiary				NeIC					
Work package title	FAIR data													
Participant number	1	2	3	4	5	7	9	13	14	15	16	17	18	21
Short name of participant	NeIC	DeiC	CSC	SIGMA2	SNIC	UICE	RTU	UH	KBFI/ ETAIS	UTA /FSD	UGOT	NSD	DNA	GFF
Person months per participant	24	2	13	2	7	2	2	8	2	4	4	3	7	7
Start month	1				End month				36					
Objectives														
<p>The objective of WP4 is to foster the development and uptake of FAIR practices across the Nordic and Baltic countries. A recent study surveying data repositories in the Nordics shows that there is a great potential for improvement, as the majority of repositories do not provide PIDs, data licences, nor do the majority employ metadata standards or support machine-actionable assessment of its metadata or services. WP4 will work in close collaboration with FAIRsFAIR and other relevant initiatives on data management to promote best practices and support the adoption of relevant certification schemas. The state of the incentives in the region will be investigated and promoted to further the stimulation of FAIR uptake. WP4 will also address the question of incentives and develop a set of recommendations for the uptake of FAIR practices across EOSC.</p> <p>In particular, WP4 will:</p> <ul style="list-style-type: none"> Investigate and inform about the state of FAIR practices in the Nordics and the Baltics, looking at national policies and practices. Enable the mainstreaming of standards for data management & certification schemas for data repositories Develop and promote incentives for the uptake of FAIR data practices across national scientific communities 														
Description of work (where appropriate, broken down into tasks), lead partner and role of participants														
T4.0 Coordination of the work package activities (M1-36) Lead: NeIC (4PMs)														
This task provides the effort required for effective work package coordination.														
T4.1 State of FAIR practices in the Nordics (M1-M36) Lead: NeIC(6PM) – Participants: CSC(3PM), UH(2PM), LU/SNIC(2PM), SIGMA2(2PM), DeiC(2PM), KBFI/ETAIS(2PM), UICE(2PM), RTU(2PM), GFF(4PM)														
This task will report on the status of FAIR practices with the Nordic and Baltic countries.														
<i>T4.1.1 Overview of Nordic data repositories and their functionalities (M1-M36) NeIC, CSC, UH, SNIC, SIGMA2, DeiC, KBFI/ETAIS, UICE, RTU, GFF</i>														

This first subtask will gather a representative and quality controlled sample of data repositories across the Nordics using a combination of the re3data.org registry, previously funded initiatives, knowledge from our partner network, and project outreach activities. To engage the communities behind the repositories we will call for two workshops with the aim to kick-start the project by engaging with the community early on in the project and to begin the task of securing commitments and candidates for implementation of FAIR data standards and certification schemas. We will liaise with the GO FAIR Foundation (GFF) to provide FAIR seminars for the community workshop(s) and an optimal survey strategy to secure the interest and engagement with as many communities as possible. Particular attention will be paid to collect relevant and verifiable attributes that can be used to assess their FAIR compliance. This work will employ national contact points (FAIR ambassadors) to follow-up the specific repositories for each respective country. The task will also provide a selection of community specific data repositories for use in T5.1.1, using the attributes collected.

T4.1.2 FAIR Gap Analysis (M1-M36) NeIC, CSC, GFF

Building on the output of the initial attribute mapping in T4.3.1, this task will assess the attributes of identified Nordic repositories with regards to FAIR practices by employing FAIR metrics to quantify compliance level within the F, A, I and R segments. A framework for converting the repository attributes to a FAIR metric score will be established by adopting the FAIR evaluation tool currently in development by GFF, enabling a streamlined FAIR evaluation based on metric scores⁹. The results of this study will be summarized in a first report (D4.1). The attributes (and scores) will be updated at a minimum of 18 months after the initial probe in T4.3.1. An updated report (D4.3) will be produced to document the impact of the project efforts on FAIR uptake in the region. This task will also collaborate with T3.1.2 for the FAIR assessment of services using the evaluation tool.

T4.1.3 Boosting FAIR metric scores (M1-M36) NeIC, UH, SNIC, SIGMA2, DeiC, KBF/ETAIS, UICE, RTU, GFF

Following the gap analysis this task will focus on prioritizing FAIRification objectives, identifying and addressing improvements that are achievable with modest efforts. These recommendations will be presented to the relevant repositories with the aim to most efficiently increase their metrics scores. Use of hackathons has proven to be an effective way to realise swift improvements that require a relatively small amount of effort, but with a potentially significant impact on the levels of achieved FAIRness. A total of three hackathons (two days each in the period M10-M28) will be executed targeting a well-defined community (encompassing one or several repositories). The FAIR evaluation tool of T4.1.2 will be provided to enable user-friendly and reproducible evaluations. The results from the three hackathons will be captured in a repository FAIR improvement model which can then in turn be used for additional repository communities to benefit from the 'lessons learned', using the national FAIR ambassadors to propagate the model to the repositories. This provides for a scalable dissemination of knowledge and expertise with minimum extra effort.

T4.2 Support to the adoption of standards and certification (M1-M36) Lead: NeIC (7PM) – Participants: CSC (5PM), UTA/FSD(4PM), UH(2PM), UGOT/SND(4PM), NSD(3PM), DNA(4PM), GFF(3PM)

T4.2.1 Selection of data repositories for the advancement of FAIR data standards and certification (M6-M18) NeIC, CSC, UGOT/SND, NSD, DNA

Data repositories identified as mature and suitable candidates for the deployment of FAIR data standards and/or certification will be offered support from the project to develop these topics.

This task seeks to identify qualified repositories that are suitable and willing to adopt data standards and/or commit to a certification process. Building on initial studies (T4.1.1) and a screening process, this task will make use of outreach activities such as workshops and, after a preselection, begin a more active engagement by conducting community interviews to explore the suitability and maturity level of candidates. When the evaluation is completed, a collaboration agreement will be established and ramp up towards the implementation phase.

T4.2.2 Support for adoption of FAIR data standards (M12-M36) NeIC, CSC, UTA/FSD, UH, UGOT/SND, NSD, DNA, GFF

A future FAIR standard is likely include requirements that are largely covered by the FAIR metrics, including issues such as PIDs, licences, data formats and metadata standards. Machine-actionable metadata are core to the FAIR Principles and will require serious advancement toward the routine deployment of machine-actionable metadata

⁹ See Wilkinson et al, A design framework and exemplar metrics for FAIRness, 2018, available at <https://www.nature.com/articles/sdata2018118>

within numerous knowledge domains. The project will collaborate with GO FAIR and leverage its ongoing series of open, community workshops called “Metadata for Machines” (M4M). The M4M workshops are agile, hackathon-style events that bring together domain experts with metadata and technical specialists, to accomplish 3 objectives: (1) Using the FAIR principles as a guide, define essential (minimal) metadata elements and standards for that particular research community; (2) formulate these decisions as machine-actionable templates; (3) register these templates such that they are openly accessible and available for re-use by tools that can render these templates as familiar, easy to use web forms (or APIs). Working actively with the selected repositories / communities we will provide the necessary support to address the ‘FAIR data standard’ requirements, in particular the machine-actionable metadata and provide a guideline by which other communities or repositories can follow in future adaptations. The repositories with which agreements have been obtained in T4.2.1 will be invited to an initial workshop that will establish a reference framework for the adoption, including an M4M session if needed. The procedure will be fine-tuned following this initial meeting to provide a documented recipe for multiple scalable deployments.

T4.2.3 Support for adoption of FAIR certification schema (M12-M36) UTA/FSD, NeIC, CSC, UGOT/SND, NSD, DNA, GFF

This task will rely heavily on the expertise and experience of the data centres for survey and registry data in Finland, Norway and Sweden (UTA/FSD, NSD, UGOT/SND). With their combined experience with certification processes and corresponding schemas, specifically CoreTrustSeal and its predecessor Data Seal of Approval, we expect to have an effective and successful support process with the selected communities. We will also partner with GFF to investigate the provisioning of an alternative lighter certification process if that should be needed. Once the FAIR certification schema is ready, this task will assist communities to adopt these and align with established best practices. This will be done in collaboration with FAIRsFAIR and other relevant initiatives. A workshop will also be organised for participating communities in the certification process (M18). This event will allow the participating repositories to voice concerns, issues and pose questions about the process.

T4.3 Incentives for the uptake of FAIR practices (M12-M36) Lead: NeIC (7PM) – Participants: CSC (5PM), UH (4PM), LU/SNIC (5PM), DNA (3PM)

This task aims to develop and promote a series of incentives for the uptake of FAIR data practices in the Nordic and Baltic countries, and possibly across Europe.

T4.3.1 Mapping of policy implemented incentives within the Nordic and Baltic members states (M12-M36) CSC, NeIC, SNIC, DNA

This task will liaise with WP2 (T2.1) on mapping policies and review existing incentives among the Nordic countries, as enforced by the institutions, the scientific disciplines, and the relevant funding bodies such as ministries and research councils. This will raise awareness across the Nordics and the Baltic countries about what is being done in neighbouring countries. It will give insight to the extent of alignment of policy driven incentives and practices within the region.

T4.3.2 Identifying effective incentives that increase uptake of FAIR practices (M12-M36) NeIC, CSC, UH, SNIC, DNA

This task will not limit itself in understanding the state of the art but will also actively pursue the objective of developing and proposing new sets of incentives and tactics for implementation of FAIR practices. This will be done by conducting a qualitative study across the countries involved, leveraging the partner’s network and the contacts established in the course of the project (in particular with repositories). Demonstration of results achieved by hackathons (T4.1.3) will be integrated in the study to support the development of new practices. The study will gather evidence, examples and opinions on current and future incentives and practices for research data sharing according to FAIR from the researchers’ point of view. A draft report will be created for use in T4.3.3.

T4.3.3 Dialog with stakeholders and policy makers (M12-M36) NeIC, CSC, UH, SNIC

The incentives along with an impact analysis and implementation strategy will be delivered to WP2 for dissemination and feedback. Meetings with community stakeholders and policy makers will be carried out in an attempt to strengthen and harmonise policies in the region (M30). We will present findings and recommendations on how to maximise the uptake of FAIR practices through highlighting indirect incentives and policy-driven incentives. A revised version of the report results will be published in a report (D4.4).

Number	Deliverables	Month
D 4.1	Initial report on Nordic repositories and their FAIR practices: This report will provide an overview of data repositories in the region, including updated details on their supported features relevant to FAIR practices and calculated FAIR metrics to quantify each repository's support for F, A, I and R. The report will provide an overview of the state of FAIR in the Nordics at an early point in time of the project.	M12
D 4.2	Implementation plan for the adoption of data standards and certification schemas : This plan will provide a plan for the implementation of the data standards and certification schemas. It will also assess the progression and timeliness of the external dependencies (FAIR data standards and certification schema), the readiness of the repositories / communities and point to preparatory steps required, including any mitigation actions.	M16
D 4.3	Report on Nordic repositories and their uptake of FAIR: This report will be a direct follow-up of D4.1 at approximately 18 months later, providing updated details on repositories supported features and the state of FAIR (as in the previous report). This provides a direct measurement of the difference between FAIR uptake and thereby an indication of the impact of actions initiated in the project.	M30
D 4.4	Report and recommendations on FAIR incentives and expected impacts in the Nordics, Baltics and EOSC: This deliverable will provide a report on existing and suggested incentives, their expected impacts on data sharing and recommended actions to facilitate the implementation of these incentives. The report will also include comments resulting from meetings with stakeholders and policy makers in the region.	M32
D 4.5	Report on completed FAIR data standard adoption and certifications of data repositories in the region: This report will summarise the efforts that have gone into supporting selected communities to adopt a FAIR data standard. It will also summarise the process and lessons learned from communities that agreed to perform a certification process of their respective data repository.	M36

Work package number	5							Lead beneficiary	SIGMA2						
Work package title	Open research data & services – demonstrators														
Participant number	2	3	4	5	6	7	10	13	16	19	21	22	23	24	
Short name of participant	DeiC/ C.rome	CSC	SIG MA2	SNIC	ETAI S	UICE	SDU	UH	UGO T	FMI	GFF	DKR Z	UCP H	RH	
Person months per participant	17	22	65	25	12	9	2	8	8	5	3	6	8	5	
Start month	1							End month	36						
Objectives															
The overall objective of work package 5 is to demonstrate the potential of EOSC by piloting innovative solutions, designed to support cross border research collaboration, using the Nordic and Baltic countries as a testbed environment. The activities involve several demonstrators addressing different areas of the research and data life cycle such as discovery, re-use, analysis, post-processing, data management (including sensitive data management), sharing and archiving. The solutions which will be tested and validated by research communities leverage existing services (from national e-infrastructures and/or research communities as well as core EOSC services) and are															

suitable *by-design* to spin-off on a cross-border environment such as EOSC. The solutions will be piloted at Nordic level before being made available in the EOSC environment.

In particular, WP5 will:

- Foster the discoverability and re-use of research data by working on the “translation layer” and semantic mapping for harvesting metadata in the future EOSC metadata catalogue.
- Facilitate the integration of community specific portals with large scale computing facilities and pilot usage of computing resources seamlessly across borders.
- Pilot an actionable data management planning tool to broker and manage services and data in a cross border, cross disciplinary setting.
- Demonstrate an orchestration mechanism that brings national secure servers together, thus allowing the analysis of personal data without moving data away from the custodian.

Identification of the mature repositories to be harvested in the EOSC will be supported by WP4. Provisioning, accounting and reporting of the services included in the proposed solutions will be to large extent automated through the interoperability framework proposed and developed in WP3. Wherever relevant, WP3 will facilitate the on-boarding of the proposed solutions within the EOSC environment. The strategies adopted by the demonstrators to do cross border accounting will be reported to WP2 for future policy work. The Knowledge Hub (WP6) will be a broker of knowledge for the Nordic communities and service providers that, in perspective, will adopt the proposed solutions.

The communities involved in the demonstrators are working on different fields, from archeology/viking age discipline to biodiversity (DEEPDIVE, <https://neic.no/deepdive/>), language analysis (NLPL <https://neic.no/nlpl/>), climate modeling (NICEST, <https://neic.no/nicest/> and FMI) and personalised heart medicine.

Description of work

T5.0 Coordination of the work package activities (M1-36) Lead: SIGMA2 (6PMs)

This task provides the effort required for effective work package coordination.

Task 5.1 Discovery and Re-use of research data in EOSC (M1-36) - Lead: DeiC (6PM). Participants: UICE (2PM), CSC (3PM), DKRZ (6PM)

This task aims at developing solutions and recipes that enhance the re-usability of research data through facilitating their discoverability in the EOSC portal. The activities in this task will focus on harvesting metadata from Nordic repositories to EOSC metadata catalogues (such as EOSC-Hub/ EUDAT B2find and OpenAIRE) by working on harvesting protocols and on the “translation layer” (or semantic mappings) between local/subject-specific databases, central horizontally accessible community specific portal and EOSC generic catalogues. We will also address data access (beyond metadata) to enable EOSC users to efficiently reuse the data from the exposed repositories.

T5.1.1 Discovery and re-use of Nordic community specific data in EOSC (M1-36) - Lead: DeiC Participants: UICE

This task will demonstrate mechanisms for making Nordic community specific data discoverable and reusable by providing recipes for harvesting metadata from local/regional repositories to EOSC metadata catalogues. The task will initially focus on a number of repositories containing “intrinsically” Nordic datasets, such as archaeological data from the Viking-age period. But the approach will be *by design* discipline a-specific so that it will be later extended to other mature repositories identified and selected in WP4.

T5.1.2 Semantic mapping procedures and quality standards (M1-36) - Lead: DKRZ Participants: DeiC, CSC

This task will investigate solutions for mapping technical, repository-specific harvesting endpoints to jointly agreed domain-specific standards. Focus will also be put into the coordination and the alignment of semantic concepts between discipline specific research area and relevant core areas, in alignment with EOSC-hub/B2FIND requirements. In coordination between researchers and repositories and with regard to B2FIND guidelines, concepts for interdisciplinary quality features of metadata are presented and prototypically implemented. This task will be conducted in close collaboration with WP3 for the aspects related to the semantic and the technical interoperability.

Task 5.2 Analysis and Post-processing across borders (M1-36) - Lead: SIGMA2[11PM]. Participants: CSC(6PM), UT/ETAIS(12PM), SNIC(7PM), UICE(5PM), SDU(2PM), FMI(3PM), UIO-USIT/SIGMA2(3PM), UGOT/GGBC(5PM), UIO-GEO/SIGMA2(5PM), UIO-INF/SIGMA2(7PM), UH(5PM), CGG/UCPH (3)

This task aims at enhancing cross-border usage of data and processing services offered by the Nordic e-infrastructures to enable complex research workflows and facilitate optimal utilization of the resources across discipline and geographical boundaries. The goal of the demonstrator is both to pilot the integration of data and computing services with thematic services, leveraging the Nordic national infrastructures and discipline specific services, and to offer some recipe for doing this in a cross-border environment. Our ultimate objective is to demonstrate how thematic portals can concretely build on distributed data and computing resources offered by EOSC to scale out their storage and computing environment.

T5.2.1: Cross-border data processing workflows (M1-36) - Lead: UT/ETAIS Participants: UIO-USIT/SIGMA2, UICE, SNIC, UGOT/GGBC, FMI, SU/SNIC, UIO-GEO/SIGMA2

In this subtask, we will facilitate data pre- and post-processing workflows (High Performance computation or High Throughput computation) on distributed data and computing resources by enabling community specific or thematic portals, such as PlutoF [<https://plutof.ut.ee/>] and Galaxy-based [<https://usegalaxy.eu/>] geoportal, traditionally designed to submit jobs on local clusters, to allow scheduling of jobs on remote resources. The API modules that will be developed to support the most commonly and widely used Distributed Resource Managers (DRMs) will be designed to become a generic solution, i.e. independent from the architecture and the technology of any given portal.

T5.2.2: Code Repositories, Containerization and “virtual laboratories” (M1-36) - Lead: SIGMA2 Participants: UICE, CSC, UIO-GEO/SIGMA2, UIO-INF/SIGMA2, UH

In this subtask, we will pilot solutions for cross-borders “virtual laboratories” to allow researchers to work in a common software and data environment regardless which computing infrastructure the analysis is performed on, thus ensuring the highest reproducibility of the results. The work will encompass evaluations of different Docker Hub technologies provided by the EOSC-hub as well as mechanisms for build automation, package management and containerization. The subtask will focus on building a natural language processing laboratory, but the overall goal will be to create a generic recipe for building virtual laboratories.

T5.2.3: Platform as a Service for Scientific Cloud Computing and Cloud Native Execution mechanisms (M1-36) - Lead: SIGMA2 Participants: SNIC, CSC, UGOT/GGBC, UT/ETAIS, UIO-INF/SIGMA2, UH, SDU

This subtask will investigate and showcase innovative platform for making scientific tools able to discover and consume cloud computing resource (IaaS and Kubernetes solutions on premises and on public clouds). The solution, which is based on previous work carried out in Glenna2 [<https://neic.no/glenna/>] and SIGMA2 [<https://apps.sigma2.no>], will provide a platform for researchers to deploy and run a variety of tools on user-selected data and cloud computing resources. The solution will enable artificial intelligence/machine learning workflows for natural language analysis initially, and later will be tested by other communities involved in the demonstrators (biodiversity and climate modelling). The subtask will also investigate Cloud Native Workflow Execution mechanisms to deploy cloud instances across resources in close collaboration with T5.4.

Task 5.3 Data management planning in a distributed environment (M1-36) - Lead: SIGMA2 (13PM). Participants: CSC (6PM), GFF (3PM), UICE (2PM), FMI (2PM), UIO-INF/SIGMA2 (5PM), SNIC (7PM), UH (3PM), UIO-GEO/SIGMA2 (2PM), UGOT/SND(3PM)

The task aims at facilitating cross-borders data sharing by enabling data management on a distributed environment. The task will look at enhancing the integration between generic/thematic data sharing platform with active data storage solutions, computing services and archiving solutions and will optimize the data workflow over these distributed environments by piloting actionable data management planning tools to broker cross borders resources.

T5.3.1: Integrated Data Management Workflows (M1-36) Lead: CSC – Participants: UIO-INF/SIGMA2, UH, SNIC, UICE, UIO-GEO/SIGMA2, FMI, SIGMA2

This task will provide solutions for facilitating complex data workflows involving disciplines specific repositories, data sharing portals (such as Earth System Grid Federation, ESGF) and storage for active computing. An emerging HTTP API solution integrated with B2SAFE workflows will be adopted to streamline the creation of replicas of community specific data repositories towards the computing sites, where computations can be performed. This task will comprise also the adaptation of portals normally used for computing (such as Galaxy) to enable data management and data aggregation workflows.

T5.3.2: Machine actionable DMPs (M1-36) Lead: SIGMA2 – Participants: GFF, SNIC, UGOT/SND

This task will pilot solutions for integration of machine actionable data management planning tools with data services and data repositories to facilitate the data management process and to enable brokering of the resources.

The DMP tool (currently in use in EOSC-hub and several Nordic countries) will translate elements of the plan (such as repository storage or computing needs) into verifiable objects that can be aligned semantically across the Nordic region (with the support of WP3) and consumed by service provisioning agents such as the EOSC Data Project Management Tool (EUDAT/DPMT) to enforce stages of the plan. The design of the solution will also exploit and reuse some of the experiences gained through the implementation of the [FAIR Datastewardship Wizard](#) (DSW). Investigations on how to integrate the FAIR metrics used in the DSW with the proposed solutions in a modular fashion (templates) will be conducted. Furthermore, community/domain specific template or funding bodies specific templates will also be integrated to facilitate the process of data management by guiding the end users through a set of customised, pre-answered questions. The solution will be primarily tested on the data management workflow of the climate community NICEST. The FAIRness of the results of said automatically created machine readable datastewardship plans will be evaluated using the FAIR Evaluator created by the GO FAIR Foundation.

Task 5.4 Sensitive Data (M1-36) - Lead: SIGMA2 (2PM). Participants: UIO-USIT/SIGMA2 (11PM), CSC (7PM), SNIC (11PM), Computerome (11PM), RH (5PM), UCPH (5PM)

This task will address the issue of sensitive data and investigate whether a secure cloud infrastructure for sensitive data could be provided as part of EOSC. The goal of the infrastructure is to ensure that researchers have an easy and secure platform to work with large amounts of sensitive data under uniform conditions across the countries without moving the data from their original location. The use case stems from communities working on personalized heart medicine but the solution will be applicable by design to any research community handling sensitive personal data. This task builds on the report from the Expert Group on Nordic Commons for Health Data solicited by the Norwegian Chairmanship of the Nordic Council of Ministers. It is intended as a pilot for a future *Nordic health cloud* and will pave the way for a future Nordic Commons for Health Data.

T5.4.1: Cross borders orchestration of sensitive data clouds (M1-36) Lead: DeiC – Participants: SNIC, CSC, DeiC, UIO-USIT/SIGMA2, RH, UCPH

This subtask will develop the technical design of a distributed cloud that brings secure application and data servers together through a set of orchestration engines – across multiple clouds located at the Nordic partners’ sites. This task comprises the investigation and testing of technologies for cloud orchestration / distributed workflows inside each secure appliance and across appliances. The ultimate goal is to pilot the designed architecture in a real environment.

T5.4.2: AAI and operations procedure for a Nordic eHealth Cloud (M1-36) Lead: SIGMA2 – Participants: SNIC, CSC, DeiC, UIO-USIT/SIGMA2

This subtask will collect the work and experience done in piloting the Nordic eHealth Cloud into a set of recommendations and checklists addressing critical aspects of the sensitive data management across domains and national borders. The task will primarily address issues related to: the authentication, authorization and vetting across different domains; cross borders operational model for a highly secure cloud; security response operations. The outcome will be highly relevant for future activities of the Nordic Program on Health and Welfare, for relevant activities in WP2 (e.g. code of conduct for sensitive data services) and for future EOSC activities related to sensitive data.

Number	Deliverables	Month
D 5.1	Discovery and re-use of Nordic community specific data in EOSC: This deliverable will present the receipt for harvesting metadata from Nordic repositories to EOSC metadata catalogue (B2FIND). Preliminary work on how to adopt the recipe to expose viking-age repositories will be reported, together with a list of candidate repositories to be harvested in the EOSC.	M18
D 5.2	Cross borders computing through portals: This deliverable will present a list of API modules designed to support submission of computations from community specific portals to a variety of scheduling systems. The modules will be applied to achieve the integration between the Galaxy and the PlutoF portals with the different schedulers present in the Nordic HPC clusters.	M18
D 5.3	Virtual Computing Laboratories. This deliverable will present the recipe to provide researchers with a persistent environment, consisting of versioned tools, data and job-scripts, to reproduce the same results regardless what is the computational facility the analysis is conducted on. Preliminary results will be presented to enable Natural Language Processing workflows.	M24

D 5.4	Integrated data management workflow: The deliverable will present how to support cross borders data management and data driven distributed computing through workflow that creates replicas of the community data repositories on the different computing sites and foster data aggregation and interlinkage of sharing and active data storages. Report on how to apply the demonstrator for language analysis and climate modelling workflows will be also provided in the deliverable.	M24
D 5.5	Actionable Modular Data Management for brokering distributed resources: The deliverable will report the experience gained in building an actionable DMP tool able to translate the DMP elements into a set rules to operate across data repositories, services and governmental bodies. The experience gained on the translation of the plan elements into verifiable objects, and the enforcement and verification of the plan elements will feed to the data management RDA working group.	M24
D 5.6	Cross borders orchestration of sensitive data infrastructures: The deliverable will describe the solution implemented to showcase the eHealth Nordic Cloud orchestration to connect secure computing resources and allow complex artificial intelligence analysis on patient data from different cohort without moving the data away from the custodian.	M30
D 5.7	Mapping of technical, repository-specific harvesting endpoints to jointly agreed domain-specific standards and coordination of semantic mapping procedures: In this deliverable, reusable instructions for mapping repository-specific endpoints to OAI-PMH endpoints are created, taking into account domain-specific requirements and B2FIND requirements. In alignment with B2FIND requirements, semantic concepts are analysed in the research areas and aligned in relevant core areas. [M36]	M36
D 5.8	Cross borders operations for a Nordic sensitive data distributed infrastructure: The deliverable will report a set of recommendations regarding authentication, authorization and vetting, cross borders operations and security response procedure. The report will be provided as input for the follow up activities of the Nordic Program on Health and Welfare.	M36
D 5.9	Service deployment and cloud computing on distributed Nordic cloud resources: This deliverable will describe the solution showcased to enable service deployment and cloud computing on distributed Nordic cloud resources. The demonstrator will be applied to leverage computing workflows involving artificial intelligence algorithm for language analysis and post-processing of biodiversity data.	M36

Work package number	6		Lead beneficiary	CSC	
Work package title	Engagement, communication and competence building				
Participant number	2	3	5	6	
Short name of participant	DeiC	CSC	SNIC	ETAIS	
Person months per participant	17	26	6	6	
Start month	1		End month	36	
<p>Objectives</p> <p>The purpose of WP6 is to raise awareness on EOSC within the Nordic and Baltic countries and on the EOSC-Nordic project's activities and results. WP6 will be responsible for providing the web platform, organising project related events, and providing high-level training and advice through the framework of the EOSC-Nordic Knowledge Hub. It will also manage internal communications and messaging ensuring all members of the consortium have the correct messages and tools to effectively promote the project and its goals. The aim is to accelerate the progress and attractiveness of EOSC in a real cross-border environment and ensure with coordinated and continued communication of the EOSC-Nordic project that an engaged community of stakeholders (both users and providers) can provide input for enhanced knowledge and services in the future. In particular, WP6 will:</p> <ul style="list-style-type: none"> • Develop and implement an effective stakeholder-oriented engagement and communication strategy 					

- Build on the already existing network of the consortium partners to create awareness and engagement around EOSC
- Ensure that project results are captured and disseminated to targeted stakeholders
- Develop and implement the necessary tools (website, social media, face to face events) to keep stakeholders continually engaged and updated
- Implement EOSC-Nordic Knowledge Hub for competence building and knowledge sharing among stakeholders and relevant professional environments.

Description of work

Task 6.0 Coordination of the work package activities Lead: CSC (4PMs)

This task provides the effort required for effective work package coordination.

Task 6.1. Engagement and communication Strategy - Lead CSC (6PMs)

Communication activities will support in maximising the projects impact by focusing to engage and communicate within the consortium and with external audiences. A well-defined stakeholder identification and EOSC-Nordic engagement and communication strategy will coordinate the communication, dissemination and engagement activities. This strategy will be created in close collaboration with the other WP leaders as a part of coordination of the work package activities.

This task will generate and implement a rolling communication and outreach plan mapping messaging, activities and collateral to each of the target stakeholders addressed by EOSC-Nordic for 36 months. This plan will be a living document according to activities, time plans and outputs of the other WPs, to ensure timely delivery and release of communications.

This plan will include EOSC-Nordic contact database of the classification of contacts according to country, organisation type, domain and community. The task will ensure utilisation of the already existing networks of the EOSC-Nordic consortium partners. The representation of national e-infrastructure providers from Finland, Denmark, Norway, Sweden, Iceland, Estonia, Latvia and Lithuania in the consortium ensures the coverage and reach of key stakeholders in the Nordic and Baltic region. NeIC, the Nordic collaboration for e-infrastructure research and development, will use its network in the Nordic region to strengthen the communication and dissemination activities of the EOSC-Nordic project. Finally, this task will also liaise with the other communication teams belonging to the other EOSC-related funded projects to ensure coordination of messages

Task 6.2 Web portal, communication tools and branding Lead CSC (7PMs)

Production of EOSC-Nordic web portal, branding materials as well as generic and targeted communication tools will be part of implementing the project's engagement and communication strategy and will be one of the main ways the project will disseminate its results and create awareness of the project actions and to promote the project activities

One of the key objectives of this task is to design, develop and manage a visible, attractive and user-friendly EOSC-Nordic web portal for project promotion and awareness raising. Also, a set of collaboration communication tools will be created for project partners (intranet, mailing lists, wikis etc.) Other online tools, such as newsletters and social media accounts will be set up in order to continually disseminate project results and updates to interested parties.

This task will focus on the design of a EOSC-Nordic branding and graphic design package including a series of communication materials, templates, stylesheets to ensure a consistent graphic brand identity across all WPs for their interaction with stakeholders. Promotional materials, such as flyers and information sheets will be developed for dissemination at events and various stakeholder meetings.

Task 6.3 Communication and dissemination Lead: DeiC (9PMs). Participants: CSC (9PMs), UT/ETAIS (6PM) M1-M36,

The objective of this task is both to ensure high level generic and targeted content about EOSC-Nordic and its offer and to promote EOSC-Nordic as the European point of contact for EOSC related matters. Effort will be dedicated to maintain and leverage EOSC-Nordic's visibility at third party events as well as organise project own events targeting different stakeholders.

T6.3.1 Targeted Content Generation DeiC, CSC

This task focuses both on general and targeted communication activities to raise awareness and engage communities and users. EOSC-Nordic stakeholders (as outlined in Section 2.2.) will have a series of dedicated communication and outreach actions. Activities will include monthly newsletters, generation of targeted interviews, success stories, position papers, best practices and other content to illustrate EOSC-Nordic and how EOSC can benefit the targeted users.

Task 6.3.2 Digital Presence CSC, DeIC

This task will coordinate and manage the digital presence of the EOSC-Nordic project through a web portal and the social media. The goal is to disseminate relevant high quality and up-to date content based on information from the other WP and publish it on EOSC-Nordic web portal and in suitable social media channels (for example twitter, LinkedIN, SlideShare, Instagram, Youtube)

T6.3.3 EOSC-Nordic & Third Party Events DeIC, CSC

This task will organise and manage both EOSC-Nordic specific events and the participation of EOSC-Nordic at third party events. EOSC-Nordic will carry out two flagship project events; the project kick off - which will be organised with the aim of creating awareness around the project and its ambitions and engage with stakeholders - and the final event - which will be used to disseminate the final results of the project. Where feasible EOSC-Nordic will organise co-located event or session with other relevant initiatives (e.g., EOSC stakeholder forum, EOSC-hub, OpenAIRE advance, etc.). Event impact reports will be generated after each event, providing calls for action emerging as a result of discussions and decisions. According to the subject topic and status of developments these reports will be used internally or made publically available to the participants and a wider stakeholder audience.

T6.4 Knowledge Hub, Capacity Building and Training - Lead: DeIC (8PMs), UmU/SNIC (6PMs)

T6.4.1 Knowledge hub Coordination and Strategy, M1-M36

This task will establish a knowledge hub, which will act as a virtual center for competence building and knowledge sharing among stakeholders and relying on expertise coming from the partner network. The knowledge hub concept, strategy, design, planning, programme, logistics and coordination, will be managed by this task.

T6.4.2 Knowledge hub content generation M1-M36

This task will coordinate the content related information provided by the hub. This will be done in close collaboration with the WP2, WP3, WP4, and WP5 leaders and their nominated knowledge hub interface. The scope of the knowledge hub will focus on EOSC related issues, targeting service provisioning, data management and competence building dissemination of the project output, recommendations and guidelines coming from WP3 and WP4.

T6.4.3 Training events M1-M36

Once the knowledge hub and initial content are established, formats for the training events will be defined: for example, online webinars, physical meetings, etc. A priority list of learning goals and target groups will be produced. A total of five training activities will be delivered from M13-36. The principle of “fit for purpose” will be applied when judging the format of training activities. As digital online learning modules potentially reach a large audience and can be attended any time, this training format will be preferred.

Number	Deliverables	Month
D 6.1	Stakeholder identification, engagement and communication strategy This deliverable will include a draft strategy on the engagement with stakeholders with clear communication and outreach activities in support of the engagement targets and plans and a stakeholder map	M6
D 6.2	Knowledge Hub planning: This deliverable will outline the concept, strategy, design, planning, programme, logistics and coordination of the knowledge hub	M9
D 6.3	Communication and outreach strategy report. This deliverable summarises WP6 activities and tangible outputs and achievements at project midterm, including concrete examples of success stories and metrics and assessment on the KPIs	M18
D 6.4	Knowledge Hub establishment: This deliverable will provide a detailed presentation and assessment of the implementation of the knowledge hub within the project, and include a plan for sustaining the hub after the project lifetime.	M24
D 6.5	Final communications and outreach strategy report: This deliverable will wrap up WP6	M36

	activities and tangible outputs and achievements at the end of the project, highlighting recommendations for future developments and emphasising future trends that emerged in the course of the event	
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Table 3.3: List of Deliverables

Deliverable (number)	Deliverable name	Work package number	Short name of lead participant	Type	Dissemination level	Delivery date (in months)
D1.1.	EOSC-Nordic Quality Plan and Risk Register	1	NeIC	Report	CO	3
D1.2.	Data Management Plan	1	NeIC	Report	CO	6
D1.3.	Periodic Report, 1st reporting period	1	NeIC	Report	CO	18
D1.4.	Periodic and Final Reports, 2nd reporting period	1	NeIC	Report	CO	36
D2.1.	Open science policies and resource provisioning in the Nordic and Baltic countries (first report)	2	SNIC	Report	PU	6
D2.2.	Cross border collaboration models – the Nordic experience	2	NORDUnet	Report	PU	18
D2.3.	Open Science in the Nordics: legal insights	2	UH	Report	PU	12
D2.4.	The EOSC delivery chain	2	NORDUnet	Report	PU	12
D2.5.	Open Science policies and resource provisioning in the Nordic and Baltic countries (second report)	2	SNIC	Report	PU	18
D2.6.	Cross-border collaboration in the context of EOSC	2	NORDUnet	Report	PU	24
D2.7.	Open Science in the Nordics: recommendations on legal issues	2	UH	Report	PU	24
D2.8.	Open Science policies and resource provisioning in the Nordic and Baltic countries (final report)	2	SNIC	Report	PU	30
D2.9.	Sustaining the coordination of EOSC national initiatives at Nordic level	2	CSC	Report	PU	36
D3.1.	EOSC Service compliance checklist and maturity model	3	SIGMA2, SNIC	Report	PU	6
D3.2.	First report on mapping of EOSC prospective service providers and candidate services	3, 4	SIGMA2, SUNET	Report	PU	12
D3.3.	Service interoperability framework	3	UT/ETAIS, CSC	Report	PU	14

D3.4	Programmatic access and resource provisioning of services	3	UT/ETAIS	Report	PU	18
D3.5	Second report on mapping of EOSC prospective service providers and candidate services	3	SIGMA2, DeIC	Report	PU	24
D3.6	Feasibility assessment of the implementation of X-Road for research data	3	UT/ETAIS, CSC	Report	PU	24
D3.7	Report on the implementation of X-Road in the Nordics and recommendations to EOSC	3	UT/ETAIS, CSC	Report	PU	30
D3.8	Programmatic access and resource provisioning of Nordic services via EOSC Marketplace	3	UT/ETAIS	Report	PU	36
D3.9	Final report on the integration of services into EOSC	3	SIGMA2	Report	PU	36
D4.1	Initial report on Nordic repositories and their FAIR practices	4	NeIC	Report	PU	M12
D4.2	Implementation plan for the adoption of data standards and certification schemas	4	NeIC	Plan	CO	M16
D4.3	Report on Nordic repositories and their uptake of FAIR	4	NeIC	Report	PU	M30
D4.4	Report and recommendations on FAIR incentives and expected impacts in the Nordics, Baltics and EOSC	4	NeIC	Report	PU	M32
D4.5	Report on completed FAIR data standard adoption and certifications of data repositories in the region	4	NeIC	Report	PU	M36
D5.1	Discovery and re-use of Nordic community specific data in EOSC	5	DeIC	Report	PU	M18
D5.2	Cross borders computing through portals	5	UT/ETAIS	Report	PU	M18
D5.3	Virtual Computing Laboratories	5	SIGMA2	Report	PU	M24
D5.4	Integrated data management workflow	5	CSC	Report	PU	M24
D5.5	Actionable Modular Data Management for brokering distributed resources	5	SIGMA2	Report	PU	M24
D5.6	Cross borders orchestration of sensitive data infrastructure	5	SIGMA2	Report	CO	M30
D5.7	Mapping of technical, repository-specific harvesting endpoints to jointly agreed domain-specific standards and	5	DeIC	Report	PU	M36

	coordination of semantic mapping procedures					
D5.8	Cross borders operations for a Nordic sensitive data distributed infrastructure	5	SNIC	Report	CO	M36
D5.9	Service deployment and cloud computing on distributed Nordic cloud resources	5	SIGMA2	Report	PU	M36
D6.1.	Stakeholder identification, engagement and communication strategy	1-6	CSC	report	CO	M6
D6.2.	Knowledge Hub planning	1-6	DeiC	Report	CO	M9
D.6.3	Communication and outreach strategy report	6	CSC	Report	CO	M18
D6.4	Knowledge Hub establishment	6	DeiC	Report	PU	M24
D.6.5	Final communications and outreach strategy report	6	CSC	Report	PU	M36

3.2 Management structure, milestones and procedures

3.2.1 Project Management

The management structure is based on the principles of the [DESCA model](#) and leverages the long standing collaboration between many partners of the consortium.

The Coordinator is the legal entity acting as the intermediary between the partners and the EC and will perform the tasks assigned to it as described in the Grant Agreement and the Consortium Agreement. The Coordinator of this project is NordForsk. The Coordinator will in this project be represented through its unit NeIC by the NeIC Director Gudmund Høst.

A Project Manager (PM), will be responsible for the day-to-day operations of the project, in close collaboration the work package leaders. She will maintain and periodically update the Project Plan, assign specific responsibilities to the most suitable partner when new events require it; provide fine-grained progress-monitoring based on checkpoint reporting (progress/achievements, problems, deviations) at milestone points; evaluate and make recommendations to the EB regarding changes to the Consortium Plan, Consortium budget and, where necessary, the contractual Description of Work. NeIC Executive Manager, Lene Krøl Andersen, currently employed by DTU/DeiC, will fulfill this role.

Work Package Leaders are responsible for managing the project's work packages. The WP Leader will, in consultation with other members of the work package team: allocate work package resources among the members of the work package and between deliverables; meet obligations for timely checkpoint reporting; identify WP-level risks in the Risk Register, track them and propose corrective actions in the event of problems; monitor progress towards the outcomes defined in the work plan; make recommendations for changes to the schedule of deliverables or execution of the work package, through the Project Manager, to the Executive Board.

The General Assembly (GA) is the ultimate decision-making body of the project consortium. It consists of one representative from each partner. The GA will be chaired by the Coordinator.

The Executive Board (EB) shall monitor the effective and efficient implementation of the project. It is the supervisory body for the execution of the project, which shall report to and be accountable to the GA. The EB is appointed by the GA. The EB shall be responsible for the proper execution and implementation of the decisions of the GA. The EB will hold an International Liaison (IL) operated by CSC.

The Project Management Board (PMB) consists of the PM and the Work Package Leaders, whereas **the Project Office (PO)** consists of the PM, a financial officer affiliated at CSC and an administrative officer affiliated at NeIC. The PMB shall assist and facilitate the work of the GA and the EB. The PMB is headed by the Project Manager (PM), who also leads WP1.

The **International Advisory Committee (IAC)** consists of international experts to advise and support the EB in its effort to carry out the project. The EOSC-Nordic project is represented in the IAC by the Coordinator, the PM and the International Liaison, all three as ex officio members. The PO will act as the secretariat of the IAC. The following members has accepted to join the EOSC-Nordic International Advisory Committee: Ana Proykova, Professor, Atomic and Molecular Physics, University of Sofia (Bulgaria), Francoise Genova, Senior Researcher at Strasbourg astronomical data centre (France), Wilco Hazeleger, Director, Netherlands eScience Center, Ingrid Dillo, Deputy Director, Data Archiving and Networked Services (DANS) (Netherlands), Daniel Mallmann, Head of Data Services, Juelich (Germany), Andrew Treloar, Director Projects, Engagements and International, The Australian Research Data Commons (ARDC) (Australia), Christine Kirkpatrick, Executive Director, National Data Service (US).

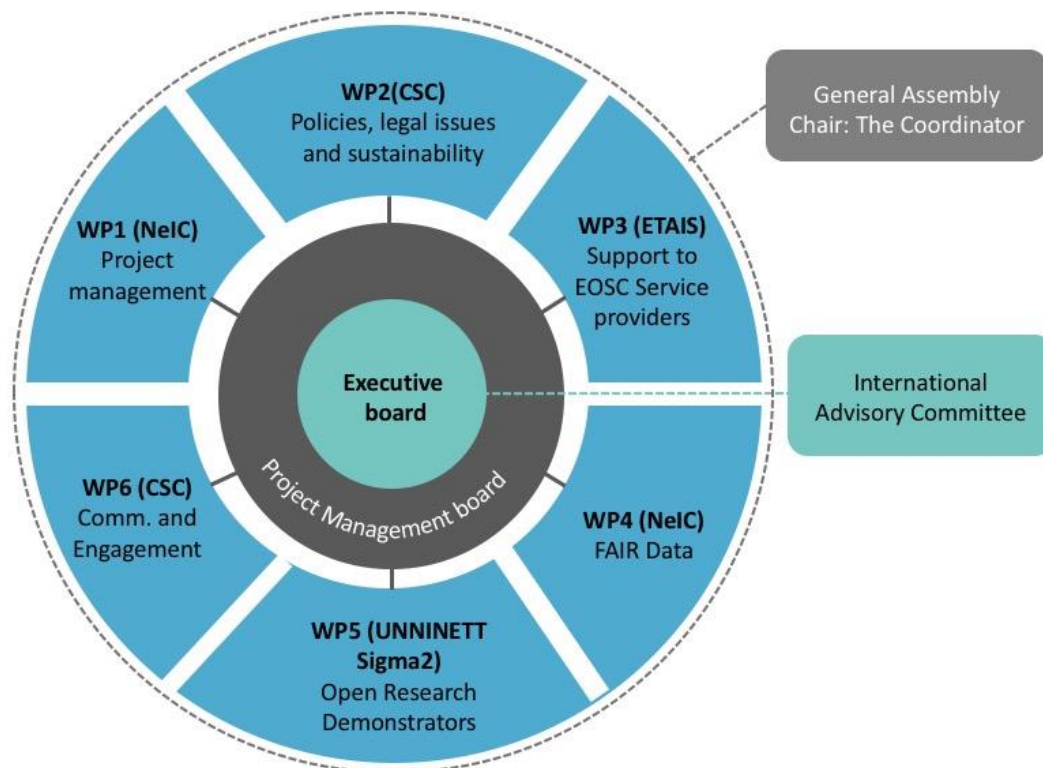


Figure 3.2. Project organisation

3.2.2. Decision-making Mechanisms

EOSC-Nordic’s organisational and decision-making approach is based on best practices such as delegation of responsibility to the work package and task levels (within agreed tolerances of time and effort) and exception-based reporting. It reflects the consortium’s collective experience from long standing collaboration activities at Nordic and Baltic level. While the General Assembly and the Executive Board remain the main decision-making bodies, much of daily decisions are taken at work package level and between work packages. The scale of the project requires strong interaction between the Project Manager and all the work package leaders who will gather monthly to review the state of the project, deliverables and milestones, and undertake the necessary measures to ensure good progress of the project through the Project Management Board.

3.2.3 Conflict Management

The primary mechanism for decision-making within the project will be by consensus. When a work package leader is unable to resolve sustained disagreement within its work package, the Project Management Board provides the platform where such disagreements can be resolved. The Project Manager will be invited to make a decision that is binding on the work package. Conflicts between work packages will, in the first instance, be mediated by the Project Manager. If the Project Manager is unable to reach consensus, the disagreement shall be referred to the Executive Board, whose decision shall be final. Conflicts between a work package and the Project Manager shall be referred to the Executive Board. Conflicts between the Project Coordinator and another Consortium Member, or between Consortium Members, shall be referred directly to the General Assembly (although the Project Coordinator may first

be invited to mediate disputes between Consortium Members). The General Assembly shall be the final point of decision for all conflicts.

3.2.4 Innovation Management

Addressing innovation management is a key aspect of the service management approach adopted in EOSC-Nordic following best practices laid down in ITIL and ISO/IEC 20000. An Innovation Manager role will be assigned to the leader of Task 3.1. A lightweight innovation management system will be developed to ensure that 1) rights to access and use of background and side ground are identified; 2) the project results are captured, assessed and protected; 3) appropriate dissemination, exploitation and communication measures are agreed as well as developing interim and final dissemination and exploitation plans starting from the draft provided in Section 2.

Table 3.4: List of milestones

MS#	Milestone Name	Related WPs	Due Date	Means of verification
MS1.1	EOSC-Nordic Kick-off mtg	WP1 & WP6	M2	Meeting minutes
MS1.2-5.	Executive Board mtgs year 1 (quarterly)	WP1	M3, M6, M9, M12	Meeting minutes
MS1.6-8	International Advisory Committee mtg (1/year)	WP1	M9, M21, M30	Meeting minutes
MS1.9-10	General Assembly meetings	WP1	M12, M24	Meeting minutes
MS.1.11-14	Executive Board meetings year 2 (quarterly)	WP1	M15, M18, M21, M24	Meeting minutes
MS.1.15-18	Executive Board meetings year 3 (quarterly)	WP1	M27, M30, M33, M36	Meeting minutes
MS2.1	First policy workshop	WP2	M6	Workshop summary made available
MS2.2	Second policy workshop	WP2	M18	Workshop summary made available
MS2.3	Consensus on post-project sustainability plan	WP2	M24	Agreement with NeIC Board
MS2.4	Third policy workshop	WP2	M30	Workshop summary made available
MS3.1	Support group for EOSC service integration has been established	WP3 and WP6	M4	Support group terms of reference
MS3.2	First services are published in EOSC portal	WP3 & WP4	M6	Services are visible in EOSC portal
MS3.3	Nordic service operability framework has been agreed	WP2, WP3, WP4 and WP5	24	Framework is accessible for service providers
MS4.1	Community engagement workshop(s) completed	WP4, WP3, WP5	M9	Workshop summary made available

MS4.2	Completion of initial interviews and commitments of participating repositories for T4.2	WP4	M10	Interview summary and agreements
MS4.3	Assessment of initial FAIR metrics for each of the Nordic data repositories	WP4, WP3, WP5	M10	Published FAIR metric scores
MS4.4	First FAIRification hackathon completed	WP4, WP6	M16	Event summary report, publicly published
MS4.5	Completion of first FAIR certification of a repository	WP4	M20	Certification seal/doc
MS4.6	Completed first Metadata-4-machines event	WP4;WP6	M20	Event summary report, publicly published
MS4.7	Completion of incentives study and draft report	WP2, WP4	M28	Draft report available
MS4.8	Completion of first FAIR data standards adoption in a repository	WP4	M30	Implementation summary made available
MS4.9	Workshop for stakeholders for the evaluation of FAIR incentives	WP2, WP4	M30	Workshop summary made available
MS5.1	Activities related to enhance the discoverability of Nordic repositories has been initiated	WP5	M6	First repository discoverable through B2FIND
MS5.2	Activities to enable cross border computing has been initiated	WP5	M12	First cross border analysis has been pilot tested
MS.6.1	EOSC-Nordic web portal initial version	WP6	M2	Review by Executive Board
MS.6.2.	First EOSC-Nordic branding package available	WP6	M3	Review by Executive Board
MS.6.3	EOSC-Nordic project Launch Event	WP6	M12	Participation of stakeholders
MS6.4	Knowledge Hub (TtT) event	WP6	M24	Participation of the instructors to the training
MS6.5	EOSC-Nordic End-of-Project Event	WP6	M36	Participation of the stakeholders

Table 3.5: Critical risks for implementation

Description of risk	Likelihood (low/medium/high)	Impact (low/medium/high)	WP(s) involved	Proposed risk-mitigation measures
Lack of response and cooperation from one individual partner preventing timely delivery of project results, including deliverables.	Low	Medium	WP1-6	Early intervention of Project Manager, leading to escalation to Executive Board and decision over corrective actions, such as reassessing responsibilities and tasks among the consortium.
Failure to engage effectively with stakeholders from policy and funding organisations (e.g., weak attendance to policy workshops)	Low	Medium	WP2	Consortium already has support from policy makers. National representatives in the project can step in to ensure that dialogue and commitment is continuous. Policy workshops can be co-organised with policy makers to ensure wider attendance
Failure to define the right organisational and business model required to ensure a sustainable uptake.	Low	Medium	WP2	Start work on this early and allow for several iterations. Involve stakeholders in the discussion. Define a contingency plan in case agreement cannot be achieved.
Lack of engagement from communities/repositories			WP4	Ambassadors to each country to engage community; disseminate added value justifying participation and time invested; get directors/managers on board early on
Inability to harmonise processes across all service providers	Low	Medium	WP2, WP3	Connect with maturity of services, maintain close link with governance (WP2)
Failure to agree on service descriptions across all service providers	Low	Medium	WP3	Early start with mapping and a separate activity on semantic harmonisation in WP3
Missing EOSC services for integration	Low	Medium	WP2, WP3	Close collaboration with other projects responsible for delivering EOSC portal and connected services
Lack of engagement from communities/ repositories	Low	Medium	WP4	Ambassadors to each country to engage community; disseminate added value justifying participation and time invested; get directors/managers on board early on
Delayed delivery of FAIR data standards (from ECs EG on FAIR) and FAIR	Medium	Medium	WP4	Implementation plan before mid-term evaluation will report on progress of FAIR data standards from

certification schemas (from FAIRsFAIR) in T4.2				EC and certification schemas from FAIRsFAIR. Fallback options are CoreTrustSeal or other data standards and certifications employed by GFF.
The successful promotion of incentives (T4.3) will be hard to measure (in terms of impact)	Medium	Low	WP4	Impact evaluation – identify expected impact from specific incentives and attempt to measure / estimate those impacts.
Lack of commitments from repositories to adopt data standards or perform certification	Medium	Medium	WP4	Engage ambassadors, directors/managers and national initiatives to highlight the immediate and long-term benefits. It is imperative to identify any policy-driven incentives early on.
National legal regulations on privacy and personal data prevents the implementation of the sensitive data demonstrator	Medium	Medium	WP5	The technology will be showcased only on de-identified/ anonymised data
Lack of commitment of national service resources to pilot demonstrators	Low	Medium	WP5	Resources allocation will be discussed and granted on a per-project basis to implement the pilot. Assessment of the problem and required mitigation will be reported in the deliverable D5.11
The national service providers are reluctant to disclose technical information about local architecture required to organise a cross border orchestration of the resources	Low	Medium	WP5	Not disclosure agreements might be considered to ensure business and technical confidentiality.
High technological heterogeneity of the services involved in the solutions prevent the implementation of general receipts	Medium	Medium	WP5	In the design of the solutions, orient the strategy towards interoperability with case-adapted APIs.

3.3 Consortium as a whole

EOSC-Nordic brings together a strong consortium of 24 partners including e-Infrastructure providers, research performing organisations and expert networks, with national mandates with regards to the provision of research services and open science policy, and wide experience of engaging with the research community and mobilising national governments, funding agencies, international bodies and global initiatives and high-level experts on EOSC strategic matters.

The consortium is coordinated by **NordForsk (Norway)**, an organisation under the Nordic Council of Ministers. NordForsk facilitates Nordic cooperation on research and research infrastructure across the Nordic region. NeIC is a

joint initiative between the Nordic countries to facilitate development and operation of e-infrastructure for Nordic research communities. NeIC is hosted by and, as such, forms part of NordForsk. NeIC is governed by five national e-Infrastructure providers, and most of the consortium partners have experience in working together through the NeIC network.

Partners already have experience with providing EOSC type of services at national level. **CSC– IT Center for Science (Finland)** has been implementing the Finnish Open Science agenda since 2011, and provides nationally the services funded under the Finnish national open science initiative which is directly steered by the Finnish Ministry of Research and Education. The **Swedish National Infrastructure for Computing- SNIC (Sweden)** manages and coordinates the national computing and storage Infrastructure in Sweden, funded by the Swedish Research Council and the SNIC consortium consisting of 10 universities, while **UNINETT Sigma2 AS (Norway)** manages the national infrastructure for computational science in Norway, and offers services in high performance computing and data storage, through research infrastructure projects, financed by the Research Council of Norway. The **Estonian Scientific Computing Infrastructure – ETAIS (Estonia)** provides infrastructure and application support services for researchers and companies in Estonia, while the **Danish e-Infrastructure Collaboration- DeiC** acts as a supporting organisation for the coordination of the Danish e-Infrastructure, working closely with the **University of Southern Denmark (SDU)** and the **Technical University of Denmark** for the provision of computing resources. The **University of Iceland (Iceland)**, the **Riga Technical University (Latvia)**, and the **Vilnius University (Lithuania)** play a key role in supporting open science and the delivery of horizontal IT services in their respective countries.

A number of partners come in the project with essential domain-specific expertise which constitutes a complementary asset for the project. The **Norwegian Center for Research Data- NSD (Norway)**, the **Finnish Social Science Data Archive- FSD (Finland)**, the **Danish National Archives (Denmark)**, and the **Swedish National Data Service- SND (Sweden)** bring knowledge from the social sciences and humanities as well as a proven expertise in data management at national level. The **Finnish Meteorological Institute (Finland)**, the **University of Oslo (Norway)**, the **Swedish Agricultural University (Sweden)**, the **University of Gothenburg (Sweden)**, **Rigshospitalet (Denmark)** and the **University of Copenhagen, the Novo Nordisk Foundation Center for Protein Research (Denmark)** contribute to the project with use cases coming from the environmental science, biodiversity, Human Language Technology and life sciences and also possess a solid experience of facilitating discussions around EOSC. The **University of Helsinki (Finland)** and the **University of Eastern Finland** are both very active at national level in the discussion and implementation of the open science agenda and bring the views from the universities in the overall EOSC chain.

The consortium also includes expert organisations specialising in networks such as **SUNET (Sweden)** which provides Swedish universities and colleges with access to well- developed and effective national and international data communication, and **NORDUnet** which coordinates the collaboration between the National Research and Education Networks (NRENs) at Nordic level. The **GOFAIR Foundation (Netherlands)** and the **German Climate Center - DKRZ (Germany)** have also accepted to join the consortium and will provide expertise and hands-on expertise and support on FAIR data and metadata management practices.

Through its wide-spread networks, the consortium is well-placed to timely facilitate the connection between national, thematic or institutional settings and the EOSC, in accordance with the 6 lines of actions of the SWD Roadmap. Specifically, the consortium has the necessary connections in place to swiftly build bridges to e-infra projects (EOSC-hub, OpenAIRE, FREYA, e-IRG, etc.), ESFRI and ESFRI cluster projects from the INFRAEOSC-04-2018, other members state initiatives including those resulting from the projects funded under INFRAEOSC-5-b, and FAIR related governance under INFRAEOSC-5c. as well as multilateral and global initiatives on FAIR research data and clouds.

3.4 Resources to be committed

The EOSC-Nordic Consortium is estimated to need 550 PMs during three years. The effort is distributed between 25 partners. The other direct costs in addition to the personnel costs will consists of dissemination costs, travel costs, costs for events and meetings and audit cost. The other direct costs represent 7% of the total budget.

Table 3.6: Summary of staff effort

	WP1	WP2	WP3	WP4	WP5	WP6	Total PMs per Participant
1 NeIC	8	3		24			35
2 DTU	18	4	8	2	17	17	66
3 CSC	10	14	17	13	22	26	102
4 SIGMA2		7	14	2	65		88
5 SNIC		11	11	7	25	6	60
6UT/ETAIS		8	27		12	6	53
7 UICE		3	5	2	9		19
8 VU		3	1				4
9 RTU		3	1	2			6
10 SDU			6		2		8
11 NORDUnet		5					5
12 SUNET			5				5
13 UH		6		8	8		22
14 KBFI/ETAIS			7	2			9
15 UTA/FSD				4			4
16 UGOT			4	8			12
17 NSD				3			3
18 DNA				7			7
19 FMI		4			5		9
20 UEF		4					4
21 GFF				7	3		10
22 DKRZ					6		6
23 UCPH					8		8
24 RH					5		5
Total PMs	36	75	102	87	195	55	550

Table 3.7: 'Other direct cost' items (travel, equipment, other goods and services)

1 NeIC	Cost (€)	Justification
Travel	26.800	Travel costs for the Project Coordinator and other NeIC staff at NordForsk.
Other goods and services	62.820	Project internal meetings, organised by WP1 and events related to WP2 (3policy workshops) WP4 (3 hackathons and 4 workshops), including travel costs for the external advisory board members
Audit	4.000	
Total	93.620	
3 CSC	Cost (€)	Justification
Travel	60.800	Travel costs to external events and project meetings, based on the number of PMs.
Other goods and services	80.200	Dissemination costs for WP6: Events organised by WP6 (4 events) 35.200€, dissemination material and web site 30.000€, Knowledge Hub related costs 15.000€.
Audit	4.000	
Total	145.000	
8 VU	Cost (€)	Justification
Travel	1.600	Travel costs to external events and project meetings, based on the number of PMs.
Total	1.600	



EOSC



Section 4 and 5

Contents

4	MEMBERS OF THE CONSORTIUM.....	2
4.1	PARTICIPANTS (APPLICANTS).....	2
4.1.1	NORDFORSK	2
4.1.2	DANMARKS TEKNISKE UNIVERSITET	3
4.1.3	CSC – TIETEEN TIETOTEKNIKAN KESKUS OY	5
4.1.4	UNINETT SIGMA2 AS.....	7
4.1.5	UPPSALA UNIVERSITET	8
4.1.6	TARTU ULIKOOL	10
4.1.7	HASKOLI ISLANDS.....	12
4.1.8	VILNIAUS UNIVERSITETAS.....	15
4.1.9	RIGAS TEHNISKA UNIVERSITATE	16
4.1.10	SYDDANSK UNIVERSITET.....	19
4.1.11	NORDUNET A/S.....	20
4.1.12	VETENSKAPSRADET – SWEDISH RESEARCH COUNCIL	21
4.1.13	HELSINGIN YLIOPISTO.....	22
4.1.14	KEEMILISE JA BIOLOGILSISE FUUSIKA INSTITUUT	23
4.1.15	TAMPEREEN YLIOPISTO	24
4.1.16	GOETEBORGS UNIVERSITET	25
4.1.17	NSD – NORSK SENTER FOR FORSKNINGSDATA AS	27
4.1.18	RIGSARKIVET.....	28
4.1.19	ILMATIETEEN LAITOS.....	29
4.1.20	ITA-SUOMEN YLIOPISTO.....	30
4.1.21	STICHTING GO FAIR.....	31
4.1.22	DEUTSCHES KLIMARECHENZENTRUM GMBH	32
4.1.23	KØBENHAVNS UNIVERSITET.....	34
4.1.24	REGION HOVEDSTADEN.....	35
4.2	THIRD PARTIES INVOLVED IN THE PROJECT (INCLUDING USE OF THIRD PARTY RESOURCES)	37
4.2.1	UNINETT SIGMA2 AS	37
4.2.2	UPPSALA UNIVERSITET	39
5	ETHICS AND SECURITY	42
6	LETTERS OF COMMITMENT.....	42

4 Members of the Consortium

4.1 Participants (applicants)

4.1.1 NORDFORSK

Description:

NordForsk provides funding for and facilitates Nordic cooperation on research and research infrastructure. NordForsk was established in 2005 by the Nordic Council of Ministers for the purpose of strengthening Nordic research. Through the financing and administration of research programmes NordForsk brings together national research groups and promotes research activities of the highest scientific quality.

NordForsk has coordinated and hosted the Nordic e-Infrastructure Collaboration (NeIC) from January 2012. NeIC is governed by national e-infrastructure organisations, the primary users being Nordic elite research teams. NeIC was established in the key area of e-infrastructure with two major roles. The first role is to assume operational responsibility for the Nordic distributed WLCG Nordic Tier-1 facility, which provides computing and storage for CERN to be used by high energy physicists worldwide. The second is to explore, evaluate, develop and deploy innovative infrastructure services in response to strategic priorities in the area of e-infrastructure and the needs of the national e-infrastructure providers, their users and selected ESFRI projects. This included projects in sensitive data, federated Cloud resources, software development skills and infrastructure for research software, resource sharing across the Nordic region, natural language processing, biodiversity, earth systems modelling, EISCAT_3D support and training

Role in EOSC-Nordic WPs:

- WP1: work package leader
- WP2: involved in T2.3
- WP4: work package leader

Key personnel:

Dr. Gudmund Høst (M) is Director of the NeIC. Before that he was Special Adviser to the Research Council of Norway, on e-Infrastructure, e-Science and computational mathematics. In 2011-2012, he was Chair of the e-Infrastructures Reflection Group (e-IRG). He was also involved the Steering Board of Nordic Data Grid Facility, the Nordic eScience Initiative and the development of the Nordic eScience Action Plan. He holds a Master's degree in Fluid Mechanics and a Doctorate in Mathematical Statistics, both from the University of Oslo.

Andreas O Jaunsen (M) is a special advisor with competence within research data, data management, data life-cycle, service provisioning, e-infrastructure and infrastructure design and architecture. He specialises in the FAIR principles, Internet of FAIR data and services and data stewardship plans. Andreas holds a Ph.D. in astrophysics with emphasis on data processing and analysis and five years experience from one of the largest research infrastructures in the world, the ESO Paranal Observatory. In the past decade he has managed multiple projects, coordinated large e-infrastructures including the national data Infrastructure in Norway and the creation of a national service platform for research services.

Kine Bugge Halvorsen (F) is a Senior Advisor at NordForsk and the Administrative Coordinator of NeIC. In her role she oversees finance and administration for the NeIC projects. In her previous role as the Programme and Partnership Manger at the Social Innovation Exchange (UK) she was the project manager of European Commission projects (Social Innovation Europe (SIE), Social Innovation Community (SIC) and Latin America Social Innovation Network (LASIN)). Prior to this Kine held various positions at the Young Foundation, a think tank based in London.

Relevant publications:

- Jaunsen, A., The state of open science in the Nordic countries: Enabling data-driven science in the Nordic countries. NordForsk, 2018
- Holmgren, S., Open access to research data: status, issues and outlook. NordForsk, 2016.

4.1.2. DANMARKS TEKNISKE UNIVERSITET

Description:

The Technical University of Denmark (in Danish: Danmarks Tekniske Universitet) often simply referred to as DTU, is a university in Kongens Lyngby, just North of Copenhagen in Denmark. It was founded in 1829 at the initiative of Hans Christian Ørsted as Denmark's first polytechnic, and is today ranked among Europe's leading engineering institutions. DTU, along with École Polytechnique Fédérale de Lausanne, Eindhoven University of Technology and Technical University of Munich, is a member of EuroTech Universities Alliance. The Technical University of Denmark hosts two of the EOSC-Nordic partners; 1) The Danish eInfrastructure Cooperation (referred to as DTU/DeiC) and 2) The National Life Science Supercomputing Center (referred to as DTU/Computerome).

The Danish eInfrastructure Cooperation (DeiC) is a national university cooperation of research infrastructure, established under the Ministry of Higher Education and Science in 2012. DeiC's purpose is to deliver research eInfrastructures (computing, storage and network) to all Danish universities.

The National Life Science Supercomputing Center at DTU hosts the national Life Science Supercomputing facility; **Computerome**. Computerome is a HPC facility specialised for Life Science. Users include research groups from all Danish universities and large international research consortiums as well as users from industry and the public health care sector. Computerome is physically installed at the DTU Risø campus and managed by a strong team of specialists from DTU

Role in EOSC-Nordic WPs:

- WP1: Project Manager
- WP2: Policy
- WP3: Service provider
- WP4: FAIR data
- WP5: Data and Meta data services & Sensitive data management
- WP6: Communications & Knowledge Hub

Key personnel:

Key Personnel from DTU/DeiC:

Dr. Steen Pedersen (M): Ph.D., M.Sc., CEO DeiC, and Deputy Director and CIO at DTU. Background in Electrical Engineering and Applied Physics at DTU. Managing director of National Research Network since 1999 and of DeiC since 2012. National Danish board member in NORDUNet A/S and NeIC. Board member in UNINETT A/S.

Dr. Lene Krøl Andersen (F): Ph.D., MBA. Head of DeiC eScience Center and Executive Manager, NeIC. Andersen has lead the establishment of the national eScience Center in Denmark. DeiC eScience Center is the national platform for all eScience parties to share expertise, best practices and challenges, hence creating cross fertilisation over disciplines, research communities and universities throughout the country. Alongside her managing role at DeiC's eScience Center, Andersen is also one of the driving forces behind the integration process towards Open Science in the Nordics. Her Nordic focus for Open Science integration is carried out through her role as Executive Manager at NeIC, leading to the appointment as the acting *EOSC-Nordic Project Manager* on behalf of the Coordinating organisation, NeIC.

Martin Bech (M): M.Sc.EE. Head of the Danish National Research and Education Network(NREN) and responsible for DeiC operations, the Danish Research Network (Forskningsnettet) and the Danish Internet Exchange (DIX). In the past, he has been a developer of natural language processing systems at IBM, a security advisor for the Danish Police, he was responsible for creating a nation-wide portal for educational material (emu.dk), organizing the contribution of the Ministry of Education to a scientific expedition around the globe (Galathea3), designing and implementing the national health sector network, including its security design. He has been in charge of the Danish NREN (Forskningsnettet) from 2001, where he has transformed the network from a leased capacity structure into a dark fibre footprint reaching 275 locations, while at the same time changing the financing of the NREN from government subsidies into a 100% user-financed operation.

Anders Sparre Conrad (M): Chairman of the National Forum for Research Data Management in Denmark. COO for data management in DeiC. Background as MA in musicology and many years' experience as IT developer and project manager. Department manager/senior consultant at Royal Danish Library since 2003, specializing in digital library infrastructure and services. Since app. 2010 extensive involvement in research infrastructure and research data related projects. Work package and task leader in the implementation of the Danish CLARIN data centre (clarin.dk). Task leader in H2020 project Parthenos, in task around data management and FAIR data. Participant in Danish data management project 2015-17, working on curation of large bodies of research data in astrophysics and humanities. Currently responsible for DeiC's activities around EUDAT, RDA and GO FAIR.

Gitte Julin Kudsk (F) Head of Management Secretariat and Communications at DeiC. Holds a Master of Business Administration and Strategic Planning. Certified IPMA-D in project management. Member of Steering Committee for European collaboration on Marketing and Communication – GÉANT SIG-MARCOMMs. Coordinator of the Nordic communication collaboration in NORDUnet COM.

Key Personnel from DTU/Computerome:

Peter Løngreen (M) is the Chief Technology Officer at the National Life Science Supercomputing Center, Technical University of Denmark. He is deputy head of the Danish ELIXIR ESFRI infrastructure for biological data and has prepared the framework for the Danish national supercomputing infrastructure that enable industry, life science groups and the leading hospitals in Denmark to collaborate on public and proprietary data. Furthermore, he is leading the teams that design, negotiate and procure the national Danish supercomputer for Life Sciences

Ali Syed (M) MSc. Technical Expert on HPC architecture. Ali Syed is the architect behind the National LifeScience Supercomputer in Denmark; *Computerome*. He is also the lead of the operations on *Computerome* and is one of the key driving forces in its integration into the health care section. Ali is responsible for driving the development of the Elixir-DK secure cloud solution as well as building a data platform at DTU.

Relevant publications:

- Andersen, L.K.; Thage, B.V.; Syed, A.; Andersen, B.; Løngreen, P.; Nielsen, K.G.; Pedersen, S. (2018): National Supercomputing in Denmark. *Proceedings of MIPRO 2018, DS-DC Data & Life Sciences supported by distributed computing*
- Thage, B.V. & Andersen, L.K. (2018): How to bring value of domain specific big data in an interdisciplinary way – a software landscape. *Proceedings of the IEEE eScience Conference 2018, Amsterdam.*
- Brunak, S.; Løngreen, P. Rapacki, K., M.M. Sperotto (2015). The Danish ELIXIR Node. *Biozoom*, 17(2), 8-9.
- Ison, J. et al (incl. Løngreen, P. & Brunak, S.) (2016): Tools and data service registry: a community effort to document bioinformatics resources. *Nucleic Acids Research*, 2016, Vol. 44. *Database issue*. *Doi: 10.1093/nar/gkv1116*

Relevant previous projects or activities:

- EOSC-hub
- EUDAT CDI

- PRACE AISBL
- GEANT
- ELIXIR
- NeIC projects: Dellinger, Glenna, Tryggve, Coderefinery

4.1.3. CSC – TIETEEN TIETOTEKNIKAN KESKUS OY

Description:

CSC is a Finnish centre of expertise in ICT, providing services at an internationally high level of quality, for research, education, culture, public administration and enterprises, to help them thrive and benefit the society at large. CSC is owned by the Finnish Government and the Higher Education Institutions. Established in 1971, CSC currently has over 320 employees, and supports a European-wide customer base of thousands of researchers in disciplines such as biosciences, environmental science, linguistics, physics, chemistry and mathematical modelling, as well as social sciences and humanities. CSC is listed on the Finnish Research Infrastructure Roadmap, hosting four national RIs: the CSC RI, including the national research network Funet, the energy efficient data centre Kajaani, and the HPC and Cloud computing facility; the Finnish node of the biomedical computing infrastructure ELIXIR; PRACE Finland; and a National Research Data Platform.

CSC has been in central role in many research data related European projects acting as initiator, work package leader and coordinator in several projects, such as RDA Europe and EUDAT. CSC currently hosts the Finnish National RDA Node and is a lead partner in the EOSC-hub project (2018-2020) that creates the integration and management system of the future European Open Science Cloud.

Role in the project:

- WP1: Financial support
- WP2: Work Package leader
- WP3: Service provider / integrator
- WP4: FAIR data
- WP5: Service provider
- WP6: Work Package leader

Key Personnel:

Dr. Kimmo Koski (M) received his Ph.D in Computer Science from Helsinki University of Technology in 1996 and spent 5 years at Nokia's Research Center and Technology Platform before joining CSC, where he is now Managing Director. During the recent years Koski has been active in building European HPC and data infrastructure through chair and vice-chair positions in major EU initiatives, such as PRACE and EUDAT. Currently he is Chair of the EUDAT Collaborative Data Infrastructure.

Dr. Per Öster (M) is Director at CSC – IT Center for Science Ltd, Finland where he is leading the Research Infrastructure and Policy unit. The unit is managing the relations with major research infrastructures and have responsibility for CSC's and Finland's participation in e-infrastructures and major initiatives such as EOSCpilot, EOSC-hub, EUDAT, EGI, PRACE, Research Data Alliance (RDA), and hosting of the Finnish node of the biocomputing infrastructure ELIXIR. Öster is one of the founders of EGI and was its first Council chair. He is presently chair of the Board of Directors of EUDAT Ltd and is the project director of the EOSC-hub project. Further he represents CSC in Knowledge Exchange, a partnership to promote open scholarship and improve services for higher education and research in Europe. He has more than 20 years of experience in computational science from both academia and industry. He has a background in theoretical atomic physics and received, in 1990, a doctorate in physics from the Department of Physics, University of Gothenburg/Chalmers University of Technology.

Dr. Damien Lecarpentier (M) is Programme Director for Research Data at CSC and has been managing the EUDAT initiative since its inception in 2011. Damien has an MA in Political Science and a PhD in Social Sciences from the Advanced School of Social Sciences in Paris. He joined CSC in 2009 as coordinator for international activities and was involved as work package and task leader in several FP7-funded projects in the areas of grids (EGI_DS), HPC (DEISA2, PRACE, EESI) and e-Infrastructure policy (e-IRG e-Infranet), before taking

responsibility of EUDAT. Damien has also contributed to the establishment of the Research Data Alliance (RDA) in Europe, and is currently involved in activities related to the European Open Science Cloud via the EOSCPilot, the EOSC-hub projects and the EOSC Secretariat.

Ms. Irina Kupiainen (F) works as a Programme Director, Open Scholarship at CSC. She has been involved in various data related projects on national, EU and global level, e.g. as a member of the OECD Expert Group on Sustainable business models for data repositories, as task leader for policy engagement in RDA Europe 3 project, as the chair of the Research Data Expert Group of the Knowledge Exchange initiative, and as a communications/policy specialist for the national research data initiative. She has expertise and knowledge in policy developments concerning the long term sustainability of open data infrastructures. Previously Ms. Kupiainen has been employed with policy related tasks in public administration, parliament and NGOs. She has a master's degree on Social Sciences from Helsinki University.

Ms. Heli Autere (F) works as a financial specialist at CSC. She has solid experience in EU and national cofounded project finance and administration. She has been responsible for the administrative and financial aspect of several EU co-funded projects (FP7 and H2020) that CSC has coordinated and has vast knowledge on the financial rules of EU funding. She is currently responsible for the financial and administrative activities of EUDAT2020 project and manages the finances and administration of the EUDAT Ltd company.

Relevant projects

- EOSCPilot (2017-2018)
- EOSC-hub project (2018-2020):
- EOSCSecretariat (2019-2021)
- RDAEurope 4.0 (2018–2020)

Relevant publications:

- Gentsch W., Lecarpentier D., and Wittenburg P., Big Data in Science and the EUDAT Project, Global, Conference (SRII), 2014 Annual SRII Proceedings, April 2014, p. 191 - 194, DOI=10.1109/SRII.2014.34 <http://dx.doi.org/10.1109/SRII.2014.34>
- Lecarpentier D., Micheline A., and Wittenburg P., The building of the EUDAT Cross- Disciplinary Data Infrastructure in EGU General Assembly Conference Abstracts, p. 7202, Vol. 15, 2013.
- Lecarpentier D., Reetz J., and Wittenburg P., EUDAT: Toward a Pan-European Collaborative Data Infrastructure (Case Study), T Critchlow and K. Kleese van Dam editors, Data-Intensive Science, Chapman & Hall/CRC Computational Science, 2013.
- Tommi Henrik Nyrönen, Jarno Laitinen, Olli Tourunen, Danny Sternkopf, Risto Laurikainen, Per Öster, Pekka T. Lehtovuori, Timo A. Miettinen, Tomi Simonen, Teemu Perheentupa, Imre Västriik, Olli Kallioniemi, Andrew Lyall, and Janet Thornton. 2012. Delivering ICT infrastructure for biomedical research. In Proceedings of the WICSA/ECSA 2012 Companion Volume (WICSA/ECSA '12). ACM, New York, NY, USA, 37-44. DOI=10.1145/2361999.2362006 <http://doi.acm.org/10.1145/2361999.2362006>
- D. Kranzlmüller, J. Marco de Lucas, and P. Öster. The European Grid Initiative (EGI). In F. Davoli et al., editors, Remote Instrumentation and Virtual Laboratories, Service Architecture and Networking, pages 61-66. Springer, 2010.
- P. Öster. The European Grid Initiative and the HPC Ecosystem. In High Speed and Large Scale Scientific Computing. W. Gentsch et al., editors, Advances In Parallel Computing, vol 18, pages 451-462, IOS Press, 2009.

Description of any significant infrastructure:

CSC provides general solutions for data storage, management and analysis needs. The Finnish university and research network (FUNET) operated by CSC serves almost 400,000 end users from 80 member organisations of the national network. CSC operates the national Identity Federation HAKA which provides AAI for more than 100 registered services and about 287,000 students. CSC's computing facilities include supercomputers and high-performance clusters with a computer environment upgraded regularly. Currently, the most powerful system is a Cray XC30, Sisu (sisu.csc.fi) with a total theoretical peak performance of more than 1 PFlop/s. In EOSC-Nordic, CSC will make

available its cloud environment, including its service to manage sensitive data (ePouta) and EUDAT storage, as part of the different pilots.

4.1.4. UNINETT SIGMA2 AS

Description:

Sigma2 is a non-profit limited company that was created in 2014 to coordinate the Norwegian infrastructure for computational science that is financed in part of the Research Council of Norway. This includes the national infrastructure for High-Performance Computing and a national infrastructure for research data (NIRD). The infrastructure is used by researchers at all Norwegian universities, university colleges and research institutes. Access to the resources is by application and similar to the peer review implemented by PRACE aisbl. The consortium that constitutes the national infrastructure includes the University of Oslo (UiO), the Norwegian University of Science and Technology (NTNU), the University of Bergen and University of Tromsø. The relationship between Sigma2 and these partners is regulated by a consortium agreement and renewable service level agreements.

Sigma2 coordinates the investments, operation and development of large scale compute resources and services. Sigma2 has in cooperation with the University in Oslo, made investments to create TSD, a Service for Sensitive Data in full production since 2014. Sigma2 has also launched in 2017 the NIRD – National Infrastructure for Research Data, a complete eco-system for collecting, storing, analysing, managing and archive research data. The NIRD is made by several components, such as: i) *easyDMP*, a web-based tool to easily create data management plan, developed in collaboration with EUDAT2020; ii) NIRD storage; iii) NIRD Toolkit, a new research platform-as-a-service in Norway to provide researcher easy access to tools for data driven analysis, such as AI/ML analysis, GPU computing, visualization and post-processing. This platform is using cloud technologies like Docker and Kubernetes; vi) NIRD Archive. Sigma2 is involved and supporting several activities coordinated by NEIC. The distributed nature of the Norwegian infrastructure and the cost-sharing between the Research Council and the partners implies Norway has substantial experience in aspects that are important to EOSC.

Role in EOSC-Nordic WPs:

- WP2: task member
- WP3: task member, subtask lead
- WP4: task member
- WP5: work package lead

Key personnel:

Maria Francesca Iozzi (F), holds a PhD (2004) in theoretical chemistry, material science from the University of Naples, Italy. After her PhD, she has worked several years in scientific research and signed highly ranked publication records, before moving into the IT-field in 2010 at the University Centre for Information Technology at the University of Oslo. There she was appointed group leader of the Research Services group and manager of the TSD – the Services of Sensitive Data. Since 2017 she works as a senior manager at Uninett/Sigma2, where she is responsible for the National Infrastructure for Research Data (NIRD). She supervises the operations, procurement, design of the research data services in the Sigma2 service portfolio, including active storage data service, data management planning tool, archiving service, on-demand computing and cloud-based services, sensitive personal data services. She is truly interested in security and she is coordinating National, Nordic and European initiatives related to data management and personal data. She is collaborating with NeiC since 2014, first as part of the Trygve project and later as member of the Provider Forum board.

Hans A. Eide (M), holds a PhD in Atmospheric Physics from University of Alaska, Fairbanks, USA (2000). Dr. Eide worked within the field of remote sensing and atmospheric modelling as a research assistant professor at Stevens Institute of Technology, Hoboken, New Jersey, USA before joining USIT at the University of Oslo (UiO), Norway in 2006. Dr. Eide has since worked, and from 2009 headed, the HPC and research support activities at the university. This includes responsibility for large e-infrastructure procurements and managing UiO's participation in high-profile projects, nationally and internationally. He has worked at Sigma2 as a special adviser since 2016

Adil Hasan (M), holds a PhD in High Energy Particle Physics, Queen Mary College, University of London, UK. Dr. Hasan has expertise in both short-term and long-term digital data management, distributed data management and digital repositories. He has architected and implemented low-maintenance digital repositories for research data using the SRB and iRODS data management systems and was responsible for the design and development of the Norwegian repository metadata schema, the development of the repository policies for storage, management and access and the architecture for the storage archive

Gurvinder S. Dahiya (M) has double master degree in security & mobile computing from NTNU, Norway and Aalto, Finland. He has worked in various fields in computer science ranging from security, distributed system and machine learning. His main expertise lies in distributed and large scale systems to manage and enable big data processing. He has been involved in national services e.g. Log analysis, NIRD Service platform as Technical lead role in Norway. He has been involved with Nordic e-infrastructure collaboration (NeiC) since 2015 under Glenna project and currently leading Aim2 activity in Glenna2 project.

Relevant previous projects or activities:

- EOSC-hub
- EUDAT CDI
- PRACE AISBL
- NeIC projects: Dellinger, Glenna, Tryggve, Coderefinery

Description of any significant infrastructure:

- NIRD – National Infrastructure for research data (including easyDMP, NIRD storage, NIRD Toolkit, NIRD Archive)
- National HPC Infrastructure

4.1.5. UPPSALA UNIVERSITET

Description:

The Swedish National Infrastructure for Computing (SNIC-UU)

The Swedish National Infrastructure for Computing (SNIC-UU), hosted by Uppsala University, is a national research infrastructure with a mission to provide a balanced set of generally available national services for large-scale computing and storage/management of active data sets, aiming at supporting all areas of research in need of access to such resources. SNIC-UU also provides a coordinated effort on advanced user support and training, facilitating the efficient use of the national and relevant international services by existing and new research communities and adapted to the local needs of the consortium members.

SNIC-UU is funded by the Swedish Research Council (Vetenskapsrådet) and by the SNIC consortium, which consists of ten university partners: UmU, SLU, UU, KTH, SU, KI, LiU, CTH, GU and LU. The SNIC-UU consortium is a Joint Research Unit (JRU).

SNIC-UU is the Swedish national research infrastructure that is responsible to ensure that the Swedish HPC infrastructure is adequately integrated into the European HPC ecosystem. Of the ten university partners forming SNIC-UU, six has an HPC center. These centers are responsible for delivering HPC services to the Swedish academic community. All ten SNIC-UU partners have many years of experience in collaborating with each other related to HPC, grids, large-scale storage and clouds. All ten SNIC-UU partners have expertise in adopting and maturing software systems for leading edge technologies, systems management tools development, including accounting systems for distributed environments, user training and support, performance tools, and application development. This in classical areas for HPC such as weather and climate applications, computational fluid dynamics, computational condensed matter and

material science, computational electro-magnetics and molecular systems simulations, as well as in new research areas within HPC, such as bioinformatics, biomedicine and neuro-informatics.

Five SNIC-UU partners participate as Third Parties: KTH Royal Institute of Technology (via its centre PDC), Linköping University (via its centre NSC), Lund University (via its centre LUNARC), Umeå University (via its centre HPC2N), and Stockholm University. Additionally, the Uppsala University HPC centre UPPMAX, which is a part of Uppsala University, participates. The SNIC-UU third parties are further described in the third-party descriptions. UPPMAX is described below. The coordination of these partners is done by SNIC-UU.

Uppsala University (UPPMAX)

Uppsala University also hosts the HPC centre UPPMAX (Uppsala Multidisciplinary Center for Advanced Computational Science) which is one of the national centres within SNIC. UPPMAX provides general purpose resources for high-performance computing and large scale high-performance storage as well as dedicated resources for secure processing of sensitive personal data. A large part of the national user base at UPPMAX consists of life science researchers (around 900 PIs). Therefore, the UPPMAX resources are aligned with the needs of data-intensive bioinformatics. In particular, all our compute resources are combined with large-scale storage, and our clusters have large memory nodes. UPPMAX also provides and supports around 500 software modules for bioinformatics. Another important part of the UPPMAX services is advanced user support and user training with a special emphasis on user groups that are new to the HPC area, with a total of eight application experts employed to provide this type of support. UPPMAX participates in the two Nordic projects Glenna2 on cloud services and Tryggve on sensitive data (partly funded by the Nordic ELIXIR nodes). Within SNIC, UPPMAX leads the SENS project, where the technical solutions for secure processing of sensitive data are developed, alongside the procedures around the data management needed for information security purposes. Current HPC systems at UPPMAX include the Rackham cluster with 486 compute nodes with 20 cores each and up to 1 TByte of memory per node. The cluster is connected with a fast 6.6 PByte nationally available storage system. Sensitive data is processed in the secure cluster Bianca with 200 compute nodes and up to 256 Gbyte of memory per node. Bianca is connected to two secure and fast storage systems with a total capacity of 10 PByte. UPPMAX is also one of the providers in the SNIC Science Cloud, currently giving access to around 50 nodes.

Role in EOSC-Nordic WPs:

- WP2: Policy
- WP3: Service provider
- WP4: FAIR data
- WP5: Data and Meta data services & Sensitive data management
- WP6: Communications & Knowledge Hub

Key personnel:

Prof Hans Karlsson (M), Director of SNIC-UU. Hans Karlsson is currently member of the Board for the Nordic eInfrastructure Collaboration (NeIC) and of the Council for the European Grid Infrastructure (EGI). Karlsson have a PhD degree in Quantum Chemistry from Uppsala University, Sweden. He has held a postdoctoral position at University of California Berkeley as well as research and teaching positions in Sweden. He is now Professor in Theoretical Chemistry at Uppsala University with active research in molecular quantum dynamics. Hans Karlsson has previously been the Director of the National Graduate School in Scientific Computing (NGSSC) and Director for the Uppsala Multidisciplinary Center for Advanced Computational Sciences (UPPMAX) at Uppsala University.

Ann-Charlotte Sonnhammer (F), is a technical coordinator at SNIC-UU. Ann-Charlotte holds a PhD in Scientific Computing from DTU, Denmark. Ann-Charlotte has previously worked as an application expert in bioinformatics for SNIC during 2005-2010. She joined SNIC-UU in 2013 as a technical coordinator and works mainly with issues relating to sensitive personal data both regarding policy and legal issues, as well as technical issues. Furthermore, she works with national storage and international activities.

Dejan Vitlacil (M), Dejan is the Swedish National Infrastructure for Computing (SNIC) Storage Coordinator. He holds position of Data Manager at PDC Center for High Performance Computing at the KTH Royal Institute of Technology. He holds a Master of Science in Computer Science in Cybernetics and Information Theory (2004) and Master of Science in Computer Science in Algorithms and Processing Systems (2006). His experience includes development and management, of storage infrastructures and data services, at the institutional, national and international level. As well as project management and information security. Previously, he was employed by INFN (Italian National Institute for Nuclear Physics) and NeIC (Nordic e-Infrastructure Collaboration).

Per-Olov Hammargren (M), is a coordinator at SNIC-UU. Per-Olov has two MA in Political Science from Uppsala University and a background as a research assistant in political science and law, both in national projects and ERC-funded research projects. He joined SNIC-UU in 2015 as coordinator and works mainly with national strategies, national agreements, national resource provisioning policies, and international activities.

Relevant previous projects or activities:

1. EOSC-hub
2. EUDAT CDI
3. ePIC
4. PRACE AISBL
5. EGI
6. NeIC projects: Dellinger, Glenna2, Tryggve2, Coderefinery, EISCAT-3D, Nordic WLCG tier-1 facility, Pool competencies, Ratatosk

Description of any significant infrastructure:

1. National HPC Infrastructure.
2. National Storage Infrastructure.

4.1.6. TARTU ULIKOOL

Description:

The University of Tartu (UT) belongs to the top 2% of the world's best universities, ranking 314th in the QS World University Rankings 2017 and within the 301–350 range in the Times Higher Education (THE) World University Rankings 2017. UT is placed 3rd in the QS University Rankings: Emerging Europe and Central Asia (QS EECA University Rankings 2018).

UT accounts for more than a half of all the doctoral degrees conferred (120 in 2016), research publications, and national R&D financing in Estonia. According to ESI (Essential Science Indicators), UT belongs to the top 1% of the world's most-cited universities and research institutions in nine research areas: Clinical Medicine, Plant and Animal Sciences, Chemistry, Social Sciences, Environmental Science and Ecology, Molecular Biology and Genetics, Biology and Biochemistry, Neuroscience and Behavioural Science, Psychiatry and Psychology. A total of 42 UT researchers belong to the top 1% of most-cited scientists in the world.

As Estonia's national university, UT places great importance on international co-operation and partnerships with reputable research universities all over the world. Institutional co-operation with 80 partner universities in 31 countries extends from the Baltic Sea area to North America, East Asia and Australia. As a member of several high-level research university networks such as the European University Association (EUA), the Coimbra Group, The Guild of research-intensive universities, and an associate member of the League of European Research Universities (LERU), UT actively participates in the formulation of European science policy.

According to the Estonian Research Information System, scholars associated with the University of Tartu publish more than 2,500 research publications annually (2,676 in 2016), close to 2,000 of which are classified as high-level publications (1,909 in 2016).

Role in EOSC-Nordic WPs:

- WP2: Representation of Estonia
- WP3: WP leader
- WP5: Support of integration from infrastructure side, DeepDive platform developer
- WP6: Knowledge Hub activities in Estonia

Key personnel:

Dr. Ivar Koppel (M) is the Head of University of Tartu HPC center and Estonian Scientific Computing Infrastructure. Has previously worked as Head of Infrastructure in Estonian Genome Center. He received his PhD from University of Tartu 2001. Author of more than 50 publications in high level journals. ESFRI SWG digit expert, member of the H2020 program committee.

Dr. Urmas Kõljalg (M) is a professor in mycology of the University of Tartu, Estonia since 2001. He is also serving as a director of the Natural History Museum of the same university since 2005. His major research area is biodiversity informatics and molecular taxonomy. During last seventeen years he has been developing online tools for the managing open and linked biodiversity data (<https://plutof.ut.ee>) and for the metabarcoding of fungi (<https://unite.ut.ee>). He is leading Estonian research infrastructure roadmap project NATARC (<http://natarc.ut.ee/en/>), which is developing national e-infrastructure for the natural and earth sciences. He was leading data management work package of the 7th framework project EUBON (<http://eubon.eu>, Building the European Biodiversity Observation Network).

Ilja Livenson (M) is an IT expert specialising in cloud solutions. Ilja works at the University of Tartu as well as acts as an architect in OpenNode - an Estonian-based company building private and public cloud solution. He has been active in the area of analysis, design and implementation of distributed systems for over 12 years both in academic sector and industry. Over the last 5 years his main activities involved design and implementation of the government clouds, in Sultanate of Oman and Estonia. Currently Ilja acts as an architect of the Estonian Government Cloud - a public-private partnership for a hybrid cloud platform - and a Estonian Scientific Computing Infrastructure project (ETAIS) aimed at providing core infrastructure for all Estonian data-driven R&D activities using computational, storage and operational resources of the major Estonian universities. Ilja has been actively involved in several European projects aimed at building infrastructure for academic and public sector: BalticGrid I, II, SITIO, Venus-C, EUDAT, STRATEGIC and SUNFISH.

Relevant publications:

- Nilsson et al (2018). The UNITE database for molecular identification of fungi: handling dark taxa and parallel taxonomic classifications. *Nucleic Acids Research*, 2018, doi: 10.1093/nar/gky1022
- Kõljalg et al. (2016). Digital identifiers for fungal species. *Science*, 352, 1182–1183, 10.1126/science.aaf7115.
- S. B. Ardestani, C. J. Hakansson, E. Laure, I. Livenson, P. Stranak, E. Dima, D. Blommesteijn, M. van de Sanden “B2SHARE: An Open eScience Data Sharing Platform.” *E-Science 2015*
- Tedersoo, et al. (2014). Global diversity and geography of soil fungi. *Science*, 346 (6213), 1078, *Science*. 1256688.

- Livenson and E. Laure, “Towards Transparent Integration of Heterogeneous Cloud Storage Platforms” ACM DIDC’11 (San Jose)
- Edlund, M. Koopman, Z. A. Shah, I. Livenson, F. Orellana, J. Kommeri, M. Tuisku, P. Lehtovuori, K. M. Hansen, H. Neukirchen and E. Hvannberg “Practical Cloud Evaluation from a Nordic eScience User Perspective”, ACM VTDC’11 (San Jose)

Relevant previous projects or activities:

- BalticGrid I, II
- ETAIS I, II (national projects)
- OpenAIRE
- PlutoF platform (plutof.ut.ee)
- RI self-service Waldur (minu.etais.ee)

Description of any significant infrastructure:

University of Tartu is a lead and one of the major data centers for the national research infrastructure. Its services include cloud and HPC infrastructure, multi-tiered storage, facilities for processing sensitive data. The services are used by major scientific infrastructures present in Estonia - ELIXIR, CLARIN, BBMRI - as well as a large number of scientific groups from Estonia. University of Tartu Library is providing DataDOI services for publishing research artefacts.

4.1.7. HASKOLI ISLANDS

Description:

The University of Iceland (UICE), founded in 1911, is a progressive educational and scientific institution, with a total revenue of 88.2 M€ per year. It is a research led state university, situated in the heart of Reykjavík, the capital of Iceland. A modern, diversified and rapidly developing institution, the University of Iceland offers opportunities for study and research in almost 400 programmes spanning most fields of science and scholarship: Schools for Social Sciences, Health Sciences, Humanities, Education, Natural Sciences and Engineering. The University employs over 1.300 people and has over 14.000 students of which there are more than 500 PhD students. In 2018, the University of Iceland was ranked among the 201-250 of the best universities in the world according to the Times Higher Education Supplement. The University of Iceland has participated in numerous projects under the 6th Framework programme, the 7th Framework Programme, and Horizon 2020, both as a coordinator and as a project partner.

Around 300 highly qualified employees at the School of Engineering and Natural Sciences conduct cutting-edge research and teach in programs that offer diverse and ambitious courses in the field of Engineering and Natural Sciences. The school’s research institutes are highly sought after affiliates by international universities and serve a significant role in the scientific community. The school is supported by the University's Division of Information Technology (IT) that operates of the University's IT systems, including a high-performance computing cluster.

Role in EOSC-Nordic WPs:

In the project, UICE will contribute to

- WP2: Policies and legal issues
- WP3: Identification of services. Support of integration of mature services such as High Performance Computing
- WP4: Overview of Nordic data repositories and their functionalities. Incentives for the uptake of FAIR practices.
- WP5: Deep learning, findable resources and support the NICEST community (Infrastructure Collaboration on Earth System Tools)

Key personnel:

Prof. Dr. Ebba Thora Hvannberg (F) is a full professor of Computer Science, Faculty of Industrial Engineering, Mechanical Engineering and Computer Science, School of Engineering and Natural Sciences at the University of Iceland, Reykjavik, Iceland, University of Iceland. Dr. Hvannberg has a Ph.D. in Computer Science from Rensselaer Polytechnic Institute, New York. She earned a B.S. in computer science from University of Iceland, and an M.S. at Rensselaer Polytechnic Institute, New York. Her research areas include human computer interaction and software engineering. The main focus of research has been on methods for usability evaluation. She has participated in several European projects on advanced multimedia services to residential users, software process improvement, technology enhanced learning, air traffic control, usability evaluations, and software for crisis management: ROSE (NSF), NFMM (Nordic council of ministers), AMUSE(FP4), ESPICE/ESPINODE (FP4), UNIVERSAL(IST, FP5), ELENA (FP6), MAUSE and Twintide (COST), NHPC and CRISIS (FP7). Since 2000 she has been active in advocating improved eInfrastructures for the research community. She was a member of the board of RHNet, Icelandic University Research Network, for 15 years since its foundation in 2000, a member of the board for five years of NeIC, Nordic eInfrastructure Collaboration, since its foundation in 2012. She has also served as a member on eVita - Norwegian research fund on eScience and infrastructure and the Swedish Expert Group on Research Infrastructure eScience.

Prof. Dr. Helmut Neukirchen (M) is a full professor of Computer Science and Software Engineering at the Faculty of Industrial Engineering, Mechanical Engineering and Computer Science at the University of Iceland, Reykjavik, Iceland. He holds a doctoral degree in computer science on testing distributed systems from the University of Göttingen, Germany, and a Master's degree (Dipl.-Inform.) in Computer Science and Software Construction from the University of Aachen, Germany. He is since 2008 at the University of Iceland and his main research fields are in the domains of Software Engineering and Distributed Systems such as Distributed Computing, Cloud Computing, eScience, and High-Performance Computing with applications to Scientific Workflows and Big Data processing such as scalable, parallel Machine Learning. He has experience in various European and Nordic research projects (FP5 INTERVAL: Formal Design, Validation and Testing of Real-Time Telecommunications Systems, H2020 DEEP-EST: Dynamical Exascale Entry Platform – Extreme Scale Technologies, NDGF (Nordic DataGrid Facility) NEON–Northern Europe Cloud Computing initiative, and NordForsk Nordic Center of Excellence eSTICC: eScience Tools for Investigating Climate Change at High Northern Latitudes).

Prof. Dr. Morris Riedel (M) is an adjunct associate professor at the Faculty of Industrial Engineering, Mechanical Engineering and Computer Science of the University of Iceland. He received his PhD from the Karlsruhe Institute of Technology (KIT) and has held various positions at the Juelich Supercomputing Centre (JSC) in Germany. At this institute, he is retaining his position as the head of a specific scientific research group focused on "High Productivity Data Processing" as part of the Federated Systems and Data Division with PhD students at the University of Iceland. Morris Riedel has a large experience on European and international research projects such as DEEP-EST, GRIP, UniGrids, OMII-Europe and DEISA2 and he held the position of the Strategic Director of the European Middleware Initiative (EMI). Other project-related leadership activities include the role of leading the 'data replication task force' of the European data Infrastructure EUDAT and being one of the four core architects of the Extreme Science and Discovery Environment (XSEDE) flagship project in the US as the only European member. Morris Riedel acts as one of the co-chairs of the Research Data Alliance (RDA) Big Data (Analytics) Group. His current research focuses on 'high productivity processing of big data' in the context of scientific computing applications as well as innovative parallel and scalable (hierarchical) data structures.

Máni Maríus Viðarsson (M) is a system administrator of HPC and other Linux systems at the Division of Information Technology at University of Iceland since 2016. He has a M.Sc. and a B.S. in Mathematics from University of Iceland. Before he joined the university he was an HPC application specialist at ClusterVision. He currently participates in the Dellinger project (funded by NeIC/Nordforsk) on resource sharing of HPC and participated in the Nordic HPC (NHPC) project.

Dr. Guðbjörg Andrea Jónsdóttir (F) is managing director of the Social Science Research Institute, University of Iceland. She has a Ph.D. in Social psychology from London School of Economics and Political Science, London, UK. She has a MSc in Social Psychology from the same school and BA in Psychology from University of Iceland. She has an extensive experience in survey research, both methodological research and substantive applications of surveys. She is responsible for developing and maintaining research and development programmes to ensure that the

institute remains at the forefront in the industry, applies the most cost effective methods and approaches, provides leading-edge products and services and retains its competitive edge. She represents the institute to major customers and professional associations. Guðbjörg is a member of the ISSP (International Social Survey Programme), the Icelandic representative in the EVS Council of Program Directors (European Values Study), the Icelandic representative in the ESS ERIC General Assembly (European Social Survey) and was the Head of the Local Organising committee for the 6th Conference of the European Survey Research Association (ESRA) held in Reykjavik on the 13th to the 17th of July 2015.

Birna Gunnarsdóttir (*F*) is a project manager in the University of Iceland's Division of Science and Innovation. She has an M.A. degree in Archaeological Heritage Management from the University of York, focusing on legislation vs. practice in archaeology. Prior to joining the University in 2008, Birna worked for the Ministry of Education and Science as a National Contact Point for the European Culture Programme. Her duties at the UICE's Division of Science and Innovation include presenting and promoting the university's Policy on Open Access, cooperating with the University Library and other local universities on the management and further development of the University OA repository, as well as overseeing the the adoption of ORCID id by university staff, and working with the UICE's IT steering group on Open Science.

Aegir G. Sigmundsson (*M*) is a lawyer (attorney at law) working as a legal counsel at the Division of Science and Innovation at University of Iceland since February of 2018, specializing in intellectual property, contractual oversight and legal governance. He has a Cand. Jur. law degree from University of Iceland. Before he joined the university he was an attorney at law in the private sector for 20 years, specializing in intellectual property, copyright (including publishing), IT matters, contract law, corporate law, litigation and licensing.

Relevant publications:

- Shiraz Memon, Jens Jensen, Willem Elbers, Helmut Neukirchen, Morris Riedel, Matthias Book. *Towards Federated Service Discovery and Identity Management*. Journal of Grid Computing, Springer, Vol 16 (2018), DOI: [10.1007/s10723-018-9445-3](https://doi.org/10.1007/s10723-018-9445-3), 2018.
- Å. Edlund, M. Koopmans, Z.A. Shah, I. Livenson, F. Orellana, J. Kommeri, M. Tuisku, Ü. Lehtovuori, K.M. Hansen, H. Neukirchen, E. Hvannberg. Practical Cloud evaluation from a Nordic eScience user perspective. In *Proceedings of the 5th international workshop on Virtualization technologies in distributed computing* (pp. 29-38). ACM, 2011
- T. Lippert, D. Mallmann, M. Riedel: Scientific Big Data Analytics by HPC, Publication Series of the John von Neumann Institute for Computing (NIC) NIC Series 48, 417, ISBN 978-3-95806-109-5, pp. 1–10, 2016.
- W. Gentzsch, D. Girou, A. Kennedy, H. Lederer, J. Reetz, M. Riedel, A. Schott, A. Vanni, M. Vazquez, J. Wolfrat: DEISA - Distributed European Infrastructure for Supercomputing Applications, Journal of Grid Computing, 9 (2011) 2, pp. 259–277, 2011.
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Relevant previous projects or activities:

- EUDAT Collaborative Data Infrastructure and EUDAT2020 funded by EC.
- RDA (Research Data Alliance) Big Data (Analytics) Group funded from its constituent members' governments.
- Dellinger, Glenna and Glenna2, projects on HPC and cloud for the benefit of researchers, funded by NeIC/Nordforsk
- Nordic HPC (NHPC), funded by SNIC, SIGMA, DeIC and University of Iceland
- eSTICC (eScience Tools for Investigating Climate Change at High Northern Latitudes), NordForsk Nordic Center of Excellence

Description of any significant infrastructure:

University of Iceland hosts and operates the national Icelandic HPC cluster GARPUR: a production system with 3150 cores provided by Intel Xeon E2680v3, E5-2698v3, and Xeon Gold 6130 CPUs and with additional NVIDIA GPU accelerators. The system was originally acquired in 2016 with two extensions in 2017 and 2018. Garpur has 100TB of storage for its users and a mixture of Infinipath and Omniband high speed interconnect. <http://ihpc.is/>

4.1.8. VILNIAUS UNIVERSITETAS

Description:

Vilnius University – the first and largest university in Lithuania, one of the oldest and most prominent higher education institutions in Central and Eastern Europe, established in 1579 in Lithuania’s capital city Vilnius, with a faculty in the second largest city, Kaunas. Vilnius university fosters research with in areas Humanities, Lithuanian Studies, Structure and Development of Society, Biological and Sociopsychological Cognition and Evolution of Man, Healthy Man, Prevention, Diagnostics and Treatment of Diseases, Genomics, Biomolecules and Biotechnologies, New Functional Materials and Derivatives, Theoretical and Condensed Matter Physics, Laser Physics and Light Technologies, Fundamental and Applied Mathematics, Computer Science and Information Technologies. Also active member of International networks such as Erasmus, Nordplus, Utrecht, MAUI, AEN, BSRUN, CREPUQ, UNICA, ISEP, Scholars at Risk/New York University, EUA, IAU, EAIE, ALTE, BUP, Magna Charta Observatory, and COIMBRA Group.

Institute of Computer science is the largest subdivision of the Faculty of Mathematics and Informatics. Nowadays the Faculty is one of the biggest subdivisions of the University. Its main strategic goals are promoting high-level research as well as internationalisation of the study environment; improving the quality of teaching and learning processes by directing it towards a student-centred approach and acquiring new technological equipment; and fostering collaboration between the academic and business environments and participation in academic and scientific projects on both national and international level.

Role in EOSC-Nordic WPs:

WP3: Service provider

Key personnel:

Assoc. Prof. dr. Linas Bukauskas (M) - is a PhD in computer sciences from Aalborg University, Denmark. He is an associate professor at Vilnius University in the Institute of Computer Science. His research interests focus on Data Mining, Cyber Security and Digital Forensics. He is also the head of the Information Technologies Open Access Centre since 2014 and the head of Cybersecurity laboratory with the main research are of HPC in Cybersecurity. He was also involved in project FP7 BalticGrid. II and national initiatives of HPC.

Assoc. Prof. dr. Agnė Brilingaitė (F) holds a PhD in computer science from Aalborg University, Denmark. She is an associate professor at Vilnius University in the Institute of Computer Science. Her research interests focus on spatial data modelling, location-based services, cybersecurity training, and education in computer science. She was also involved in project FP7 BalticGrid. II and national initiatives of HPC. She is involved in the processes of quality assurance in studies at the university. She has been taking part in EU-funded projects related to the development of student-centred learning, teaching, assessment, and internationalisation.

MSc. Eduardas Kutka (M) holds a master of science in Computer Science from Vilnius University, Lithuania. He has long expertise within the area of Grid and Cloud infrastructures. Participated in projects FP6 and FP7 BalticGrid I and II, EGI-InSPIRE, National Lithuanian Grid projects and cross-border cooperation Lithuania-Belarus LT-BY Cloud Projects (LLB-2-142), and SESAME NET H2020.

MSc. Rolandas Naujikas (M) holds master degree in Applied Mathematics From Vilnius University. He has long experience in the Grid infrastructure projects as well as CERN. He has been active member of FP 6 and FP 7 projects BalticGrid I and II and National Lithuanian Grid projects.

Relevant publications:

1. **Brilingaitė, Agnė; Bukauskas, Linas; Kutka, Eduardas.** *Time-line alignment of cyber incidents in heterogeneous environments* // Proceedings of the 17th European Conference on Cyber Warfare and Security ECCWS 2018, University of Oslo, Norway, 28-29 June. Reading : Academic Conferences and Publishing International Limited, 2018. ISBN 9781911218852. eISBN 9781911218869. ISSN 2048-8602. eISSN 2048-8610. p. 57-65.
2. **Brilingaitė, Agnė; Bukauskas, Linas; Kutka, Eduardas.** *Development of an educational platform for cyber defence training* // Proceedings of the 16th European Conference on Cyber Warfare and Security ECCWS 2017, University College Dublin, Ireland, 29-30 June 2017. Reading : Academic Conferences and Publishing International Limited, 2017. ISBN 9781911218432. p. 73-81.
3. **Brilingaitė, Agnė; Bukauskas, Linas; Krinickij, Virgilijus; Kutka, Eduardas.** *Environment for cybersecurity tabletop exercises* // ECGBL 2017 : proceedings of the 11th European conference on game-based learning, FH JOANNEUM University of Applied Science Graz, Austria, 5 - 6 October 2017 / edited by Maja Pivec, Josef Gründler. Graz : Academic Conferences and Publishing International Limited, 2017. ISBN 9781911218562. eISBN 9781911218579. ISSN 2049-0992. eISSN 2049-100X. p. 47-55.
4. **Krinickij, Virgilijus; Bukauskas, Linas; Brilingaitė, Agnė.** *Table-top exercise gamification with dynamic scenario for cyber security qualification assessment* // Data analysis methods for software systems : 8th international workshop on data analysis methods for software systems, Druskininkai, December 1-3, 2016. Vilnius : Vilniaus universiteto leidykla, 2016. ISBN 9789986680611. p. 31-32.
5. **Hodeish, Mahmoud E.; Bukauskas, Linas; Humbe, Vikas T.** *An optimal (k,n) Visual Secret Sharing scheme for information security* // Procedia computer science. Amsterdam : Elsevier B.V. ISSN 1877-0509. 2016, Vol. 93, p. 760-767. DOI: [10.1016/j.procs.2016.07.288](https://doi.org/10.1016/j.procs.2016.07.288).

Relevant previous projects or activities:

1. LLB2 LT-BY Cloud Project LLB-2-142 (2007-2013)
2. H20 SESAME NET (2014-2017) EINFRA-2014-2015/H2020-EINFRA-2014-2
3. FP7 eInfraNET (2010-2013)
4. FP6 BalticGrid (2005-2008) and FP7 BalticGrid II (2008-2010)

Description of any significant infrastructure:

Vilnius University HPC centre is managed by two OpenAccess Centres. Information Technologies Open Access Centre (ITOAC) plays the main role in fostering development of new technologies and software for HPC among universities in Lithuania and other countries research institutions as well as hospitals. ITOAC has approx CPU 1920 cores, 3,6 TB RAM, 620 TB data storage with the peak performance approx. 25 TFLOPS and major software needed for CLOUD and HPC.

HPC infrastructure is designed to manage massive amounts of information, and do scientific calculations that model complex processes (nuclear reactions, biochemical processes). VU ITOAC supercomputers are dedicated for education purposes, scientific experiments and research, and also available for other academic and business institutions. At the moment, VU has two supercomputers of same capacity with fully integrated interoperability. VU ITOAC is coordinator and the main partner of Lithuanian parallel and distributed computing initiative and e-services network LithuanianGrid Infrastructure that was initiated over FP6 and FP7 projects BalticGrid I and II, FP7 Project eInfraNET and SESAME NET H2020.

4.1.9. RIGAS TEHNISKA UNIVERSITATE

Description:

Riga Technical University (RTU) is the largest technological university and the leading multidisciplinary research institution in the Baltic States. RTU is an accredited, internationally recognized European university that consists of 9 faculties and 35 institutes. At present RTU with about 16000 students serves the needs of rapidly growing industry of the Baltic region. The vision of Riga Technical University until 2020 is to become the leading University of science and innovation in the Baltic States. In order to achieve it, the strategy defines three objectives of the University –

high quality study process, excellence in research and sustainable innovation and commercialization activities. Scientific and organizational capacity of RTU is affirmed by participation in 18 “Horizon 2020” projects, 15 FP7 and 15 ERA-NET projects in period 2014-2018, for 13 being also as a project coordinator.

To enhance international visibility of research results, RTU is actively working on implementation of Open access policy and has Open data repository for scientific data. At the national level RTU is collaborating with Open access desk (part of OpenAIRE2020 project) which is the main promoter of Open access movement in Latvia. This experience will be used to promote and help national data repositories uptake FAIR practices.

Role in EOSC-Nordic WPs:

- WP2 in Task2.1, Task2.2 and Task 2.2
- WP3 in Task 3.1
- WP4 in Task 4.1

Key personnel:

Dr. Lauris Cikovskis (*M*) is head of High Performance Computing centre of Riga Technical University. Born in 1983, he graduated from Riga Technical University receiving master’s degree of engineering sciences in electronics in year 2008. In 2016 he received PhD from Riga Technical University in field of computer and network engineering. He has been involved in different supercomputing and e-infrastructures related activities since 2005 when he joined FP6 BalticGrid project (2005-2008). Has served as an expert in FP7 BalticGrid II project (2008-2010) and FP7 eInfraNET project (2010-2013) and since March 2018 is representative of Latvia in EuroHPC Joint Undertaking. He is elected as researcher and lecturer at Faculty of Electronics and Telecommunications, Riga Technical University. The research interests are wireless networks, network modelling and simulation, parallel computing. Author of 9 scientific publications and 7 of them are included in Scopus database.

Dr. Ilmars Slaidins (*M*) is Professor, at Faculty of Electronics and Telecommunications of the Riga Technical University. Born in Riga, Latvia in 1948 he graduated from RTU in 1971 as Dipl. Radio-engineer and received PhD in Engineering in 1982. He served as the Dean of the Faculty of Electronics and Telecommunications of the Riga Technical University (1995-2005). He is Latvian Delegate in e-Infrastructure Reflection Group (e-IRG) since 2003 and Deputy Delegate in e-Infrastructure Policy Forum (e-IPF). His research interests are in electronic technologies and technology enhanced learning. He has been involved in several distance education and e-learning development, as well as e-Infrastructure related projects in Latvia since 1994. He participated in FP6 NoE Kaleidoscope and The Enhanced Learning Unlimited (ELU) project. He was the manager of the BalticGrid and BalticGrid II projects (2005-2010) at RTU and was serving as an expert in FP7 eInfraNET project (2010-2013), Erasmus Network project SALEIE (2012-2015) and many more projects. He is author of over 70 publications on electronic technologies, distance education and e-learning.

Dr. Janis Kampars (*M*) is an Associate professor at the Faculty of Computer Science and Information Technology. He obtained his PhD in 2012 in Information and defended his dissertation “On Demand Data Integration Solutions for Remote Data Sources”. His main research areas are big data, data integration, and cloud computing and knowledge management using patterns. He has organized implementation of open-source cloud computing platform at RTU. He has experience on leading ERDF funding project and he has participated in multiple international and local EU funded research projects where he had a role of chief technical architect. Technology transfer wise he is a lead technical architect on the team developing real-time data stream processing platform (BaSeCaaS), which received commercialization funding from Latvian Investment and Development Agency for the first project phase. He also was a lead technical architect and senior programmer in EC FP7 project CaaS where he designed architecture of adaptive information system and developed pattern repository for performance-oriented knowledge management. He is an author of 28 scientific publications and 17 of them are included in Scopus database.

Relevant publications:

- Zdravkovic, J., Kampars, J. & Stirna, J. “Using open data to support organizational capabilities in dynamic business contexts”. Lecture Notes in Business Information Processing, vol. 316, 2018, pp. 28-39.
- Cikovskis, L., Slaidiņš, I. Smart antennas for multi-path routing in ad-hoc wireless networks. Proceedings of Advances in Wireless and Optical Communications (RTUWO), Riga: 2017, pp. 268-271.

- Kampars, J., Grabis, J. "Near Real-Time Big-Data Processing for Data Driven Applications", Proceedings of 2017 International Conference on Big Data Innovations and Applications (Innovate-Data), Prague: 2017, pp. 35.
- Kampars, J., Stirna, J. "A Repository for Pattern Governance Supporting Capability Driven Development". Workshops and Doctoral Consortium co-located with 16th International Conference on Perspectives in Business Informatics Research (BIR 2017). CEUR Workshop Proceedings. Vol.1898, Denmark, Copenhagen, 28-30 August, 2017.
- Cikovskis, L., Slaidiņš, I. "e-Infrastructure for Science". Baltic HPC and Cloud Computing Conference, Riga, Latvia, 2-4 June, 2015, Primeur Magazine, https://www.youtube.com/watch?v=1V11bFR_5J4
- Pattinson, C., Slaidins, I. and Counotte, A. (eds.) "Green Sustainable Data Centres", e-learning Open Educational Resource, 2014, <https://www.ou.nl/web/green-sustainable-data-centres>.
- Slaidins I., Cikovskis L. "Open Data and e-InfraNet Project", NroduGrid 2013 conference - Distributed systems and Big Data - towards new horizons, 2013, <http://indico.hep.lu.se/contributionDisplay.py?contribId=21&sessionId=11&confId=1273>.

Relevant previous projects or activities:

- Big Data Stream Processing Capabilities as a Service (BaSeCaaS), ERDF 1.2.1.2 (02/2018-07/2018)
- FP7 CaaS: Capability as a Service in digital enterprises (2013-2016)
- FP7 ERA-Net EISTER (2013-2014)
- FP7 eInfraNET (2010-2013)
- FP6 BalticGrid (2005-2008) and FP7 BalticGrid II (2008-2010)

Description of any significant infrastructure:

RTU HPC centre plays important role in Latvian e-infrastructure providing HPC services to other research organizations: Latvian University, Latvian Institute of Organic Synthesis, Latvian Biomedical Research and Study Centre and others. HPC Centre was established in 2012 under Office of Vice-Rector for Research. It provides access to modern computing infrastructure (HPC cluster, data storage facilities), linkage to European e-infrastructures, modelling and simulation services, scientific software for the university's research and studies, training and seminars. HPC centre is full member of SESAME Net (<http://sesamenet.eu>) which is network of HPC competency centres providing supercomputing expertise for small and medium enterprises. Centre also collaborates with KTH through HPCEuropa3 transitional access program and with University of Tartu HPC centre.

Academic data centre which is located in RTU campus provides hosting capabilities (up to 200 kW) for Latvian research institutions and high speed optical internet connection through the national level network hub.

RTU has participated in FP6 and FP7 projects **BalticGrid I** and **II**, which helped to establish links among the main universities of the Baltic countries, foster collaboration and coordination of efforts in development of infrastructure, research and staff training. It resulted in establishment of the HPC centre of RTU in 2012 which plays important role in Latvian e-infrastructure providing HPC services to several Latvian institutes and universities. RTU experts have been involved in FP7 ERA-NET project "European Network for co-ordination of policies and programmes on e-infrastructures" **e-InfraNET** (2010-2013) and following **EISTER** project "e-InfraNet Sustainability Training and Educational Resource" (2013-2014) assigned to the RTU. RTU had organized annual international Baltic HPC and Cloud computing conference (from 2012-2015) which attracted participants Baltics, Nordics and Russia. In 2015 RTU organized e-IRG Meetings and e-IRG Workshop "Open Science and e-Infrastructures" (June 3, 2015) in the framework of Latvian presidency of the Council of the European Union. More recently, collaboration between Baltic Countries has been concentrating on the topics, which have strong presence in the Baltics. NORDUnet driven Baltic Ring project for establishment of optical network, Estonian-Latvian Summer schools for Cryptography and more recently in Latvia was held Baltic **GROMACs** workshop for computational chemists. CERN was one of the BalticGrid project partners. In 2017 RTU re-engaged in closer cooperation with CERN which resulted in establishment of CERN Baltic Group aimed at fostering of joint HEP education, research and industry engagement.

4.1.10. SYDDANSK UNIVERSITET

Description:

The University of Southern Denmark (SDU) was founded in 1966 as a research and educational institution with strong contacts with regional industries and the international scientific community. The university offers teaching and research at 6 campuses. With more than 32,000 students and more than 4,000 employees, the university provides first-class educational opportunities and is cooperation partner for both public and private businesses and organizations for providing qualified labor.

The SDU eScience Center was established in 2013 with the mission to support research in all fields by the development and provision of advanced e-infrastructure, services and expertise. The SDU eScience center provides services to support research, educational and government institutions, as well as the business community, in the areas of High Performance Computing, Cloud computing, and Data analytics.

Role in EOSC-Nordic WPs:

- WP3: EOSC-compliant integrated research infrastructure; technical interoperability of services.
- WP5: PaaS for Scientific Cloud Computing

Key personnel:

Prof. Dr. Claudio Pica (M) is the CEO of the DeIC National HPC center, SDU and director of the SDU eScience center hosting the facility. He is a professor at the Dept. of Mathematics and Computer Science (IMADA) at SDU. He has authored 98 publications in international peer reviewed journals and proceedings of international conferences. Prof. Pica has 20 years of experience in HPC environments encompassing all aspects of large computing infrastructures not just limited to the users' perspective, but comprehensive of system administration and management of such infrastructure.

MSc. Dan Sebastian Thrane (M) is the leader Systems Architect at the SDU eScience center, IMADA. He is currently responsible for the design of the SDU Cloud solution and he has been the technical leader for the Danish national eInfrastructure project "National Science App Store" in 2016-2018.

Assoc. Prof Fabrizio Montesi (M) is associate professor of Computer Science at the Department of Mathematics and Computer Science (IMADA) at SDU, and the Head of section on Concurrency and Logic. He is the co-creator and maintainer of the Jolie programming language, a technology for the efficient programming of microservices. He funded the Microservices Community, an international community that promotes knowledge sharing on microservices. Fabrizio Montesi is a research leader in the development of programming languages and new methods for concurrent/distributed programming and software integration. Since 2018, he is the chair of Cloud Technologies at the SDU eScience center.

Relevant previous projects or activities:

- Delligr, a project on nordic sharing and sXchange of eInfrastructure resources, funded by NeIC/Nordforsk
- Danish national eInfrastructure project "National Science App Store" funded DeIC (Danish e-Infrastructure Cooperation) and DEFF (Denmark's electronic research library).
- PRACE 6th Implementation Phase.

Description of any significant infrastructure:

Since 2014 the SDU eScience center hosts the DeIC National HPC center, SDU, the only national general purpose HPC facility for research in Denmark. The current HPC production system called ABACUS2.0 consists of 14016 CPU cores and 144 nVidia K40 GPUs interconnected via Infiniband FDR. The main storage is provided by a fast 1PB GPFS system.

A new private cloud system called SDUCloud is in development and planned to enter in production in January 2019. The new system is built on a proprietary microservice architecture deployed on a Kubernetes cluster and it is designed

to offer researchers an integrated environment for (sensitive) data intensive research projects. This new cloud solution will make use of a new HPC cluster of 5000 CPU cores and fast persistent storage based on CEPH.

4.1.11. NORDUNET A/S

Description:

NORDUnet is the regional Research and Education Network for the five Nordic countries (Norway, Finland, Sweden, Denmark, Iceland) and is a joint collaboration between each country's National Research and Education Network (UNINETT, Funet, SUNET, DeIC and RHnet, respectively). NORDUnet has a more than 30-year history of state-of-the-art networking for the research and education community, is a leader in global R&E networking, and has participated in numerous advanced international initiatives. Globally, NORDUnet has a leading position in Global Network Architecture collaborations, is a founding member of the Global R&E Network CEO Forum, and has played a leading role in the ANA-300G project, bringing 100G capacities to trans-Atlantic networking. NORDUnet runs an emerging NREN program, supporting the evolution of NRENs and their services around the world. NORDUnet participates in the GÉANT collaboration on behalf of all the Nordic NRENs. NORDUnet operates an optical transport infrastructure across the Nordic countries, with extensions to Amsterdam, Hamburg and London. NORDUnet operates a state-of-the-art MPLS and IP network across this footprint, with additional extensions into both Central Europe, North America and Asia. NORDUnet offers a range of hybrid networking services at speeds up to 100 Gbps, operates a global peering fabric, and offers through the Nordic NRENs a range of above-the-net services such as videoconferencing, video recording and streaming, lecture capturing and media management, project hosting, dedicated community services, and provides operations and management services. As such, NORDUnet is a provider of infrastructure for education and (e)-science and acts as a global coordinator and facilitator for the Nordic R&E networking community. NORDUnet as a central hub, gateway, and service delivery agent for the Nordic NRENs.

Role in EOSC-Nordic WPs:

- WP2 in Task2.1 and ask 2.2

Key personnel:

René Buch, Chief Executive Officer (M) – joined NORDUnet in 2005. He has led the organisation's evolution into a service-oriented e-infrastructure company and is leading the development of the NORDUnet network into a dark-fibre-based, versatile infrastructure that enables a range of services for the Nordic and global user communities. He has added NUNOC (Nordic University Network and Infrastructure Operations Centre) to the NORDUnet portfolio of services. He heads the Nordic Data Grid Facility (www.ndgf.org), represented the Nordic countries on the GN3 NREN Policy Committee, and is a past member of the Nordic Council of Ministers eScience Workgroup. Before joining NORDUnet, René was Managing Director and board member of MCI in Denmark and Norway, and company representative at the Telecommunications Industry Association in Denmark. René has extensive experience in the design, installation and maintenance of high-availability computer and communications systems; in IT education and training; and in UNIX and Windows OS. René has a BSc in computer engineering from Odense University College of Engineering.

Lars Fischer, Chief Technology Officer (M) – is responsible for technology strategy, development initiatives, and international projects within NORDUnet. He leads NORDUnet's participation in European projects and initiatives (including GÉANT, FED4FIRE+, EuWireless), and its relationships with European NRENs and the European networking community. Lars leads a range of global efforts and is responsible for coordinating international efforts with Nordic NRENs. Lars is chair of GLIF TECH, was a member of the GN3plus Executive Committee and is a member of the GN4-1 and GN4-2 Programme Planning Committee. Before joining NORDUnet in 2004, Lars spent ten years in the Internet and telecommunications industry as Technical Director at Tele2 and COLT Telecom. Before this, Lars carried out research into programming systems and collaborative computing environments, helping to establish the network infrastructure at Danish academic institutions and early Research and Education Networks. Lars has worked with advanced networking and computing systems as a programmer, systems administrator, researcher and manager for the past 25 years.

Relevant previous projects or activities:

NORDUnet has been a leader in research networking in Europe since its beginning and continues to play a strong role in both European and global R&E networking. NORDUnet has played a leading role in planning and execution of GÉANT projects for the past 10+ years (GN2, GN3, etc) and is today a leading partner and contributor to GN4-2 and GN4-3. NORDUnet also been a partner in a number of other projects under current and previous frameworks programs. Recent initiatives include strong contributions to MANTYCHORE, NeXPreS, ORIENTplus, FED4FIRE+, Asi@Connect, and EuWireless.

In addition to EC projects, NORDUnet is active in other projects within the international research networking community, some of which are closely focused on user-community support, infrastructure creation, and future technologies. As a service development and delivery organisations, NORDUnet has been a lead partner in Nordic joint services, working closely with the Nordic NRENs. Through NORDUnet, the Nordic NRENs jointly procure, develop and deliver a range of above-the-network services. These range from services jointly procured in a Nordic partnership and delivered from Cloud providers, over services procured and delivered from central, on-premise installations at NORDUnet, to services jointly developed. Examples of such services include desktop synchronisation cloud storage, large-scale videoconferencing and remote lecture capabilities, and media hosting and streaming for lecture capturing.

In collaboration with GÉANT partners, NORDUnet had a leading role in establishing and delivering the GÉANT Infrastructure-as-a-service service for infrastructure cloud.

4.1.12. VETENSKAPSRÅDET – SWEDISH RESEARCH COUNCIL

Description:

Vetenskapsrådet - the Swedish Research Council - is a public agency under the authority of the Ministry of Education and Research. The Swedish Research Council has a leading role in developing Swedish research of the highest scientific quality, thereby contributing to the development of society. SUNET, the Swedish National Education and Research Network, is a unit within the Swedish Research Council. SUNET's aim is to provide Swedish universities and colleges with access to well-developed and effective national and international data communication, national academic identity infrastructure and related services that meet their needs, whatever their geographical location.

Role in EOSC-Nordic WPs:

- WP3 in Task3.1 and Task 3.2

Key personnel:

Valter Nordh, SUNET CTO (M), is part of the CTO team at SUNET and is responsible for the Swedish academic id federation (SWAMID) as well as the eduID service. Valter is currently the chair of the GÉANT Community Program and also serves on the GÉANT Board of Directors. Previously Valter was leading the creation of SWAMID as well as eduGAIN, the interfederation that interconnects higher eID federations all around the world.

Relevant previous projects or activities:

Experience relevant for the action:

- Development and continuous operations of Sweden's academic identity eduID
- Development and continuous operations of Sweden's academic identity federation SWAMID
- Development and operations of the Swedish eIDAS node
- Long experience in operating distributed trust infrastructures.

4.1.13. HELSINGIN YLIOPISTO

Description:

University of Helsinki (legal name: Helsingin yliopisto (UH)), established 1640, is a European research university with over 34,000 students and 8,000 employees. It operates on four campuses in Helsinki and at 17 other locations in Finland. The University of Helsinki is the largest and most versatile university in Finland and ranks among the top 100 universities worldwide and Europe's 10 to 15 best universities on worldwide ranking lists of research universities. It is a research university with many Academy of Finland designated National Centres of Excellence (10 for 2012-2017, 11 for 2014-2019).

Helsinki University Library (HULib) is the biggest multidisciplinary research library in Finland. The library operates on all of the university's four campuses with a staff about 160 people. HULib has had since 2010 many activities in relation to research data management and support. HULib has been and is NOAD in OpenAIRE, OpenAIRE+, OpenAIRE2020 and OpenAIRE Advance (2018-2020). It has been project.

IT Center at The University of Helsinki has over 50-year tradition in support for scientific computing, research IT and educational services. IT Center operates on all campuses of the university with a staff about 180 people. The IT Center is strongly connected to many European and international educational and research infrastructure organisations such as RDA, EUNIS and NUAS.

Role in EOSC-Nordic WPs:

- T2.2. Opening up and delivering services in a cross border environment
 - T2.2.2 Legal issues (leader)
- T4.1 State of FAIR practices in the Nordics
- T4.2 Support to the adoption of standards and certification
- T4.3 Incentives for the uptake of FAIR practices
- T5.2 Analysis and Post-processing across borders
- T5.3 Data management planning in a distributed environment

Key personnel:

M.Sc. Ville Tenhunen (M) is the team leader of the IT for Science group. The group is responsible for high performance computing environments of the University of Helsinki, consulting services and support services in the area of data intensive research and research data support services. He has been project manager in number of major IT development projects in the University of Helsinki since 2007. Latest strategic level projects were the Project Mildred sub projects "The Data Repository Service" and "The Data Storage and Backup". He has acted also as the chair of the services working group in Finnish National Open Science and Research Initiative (ATT). Tenhunen is also co-chair of the Research Data Architectures in Research Institutions IG of the Research Data Alliance (RDA).

Dr. Pirjo Kontkanen (F), Doctor of Laws, is a Legal Counsel at the University of Helsinki and works at the university central administration. She is expert on intellectual property rights, especially copyrights, and has over ten years of experience about legal matters and negotiations concerning university research projects and EU research funding. She has been involved in several ESFRI projects, like EATRIS, CLARIN, AnaEE and is currently involved in EPOS IP and ACTRIS PPP. She was involved in ICOS PPP helping to draft and negotiate all the relevant documents and agreements for the ICOS ERIC and ICOS RI and nowadays works as the legal counsel for ICOS ERIC. She has also been a member of the legal working group of the Open Science initiative under the Ministry of Education and Culture in Finland.

Pauli Assinen, (M) Last eight years working Helsinki University Library. First as IT-manager and now two and half years in several projects in different roles: e.g. OpenAIRE2020 NOAD, project manager in project Mildred, chair of the data model working group in Finnish National Open Science and Research Initiative, product owner in ATTX 2016 –project (<https://www.helsinki.fi/en/projects/attx-2016>). Earlier career including nine years working in the IT-department of the University of Helsinki, most of the time as IT-manager. One and half years as business consultant in a private company. Seven years in different positions in faculty level in the University of Helsinki.

Relevant previous projects or activities:

- HULib has been and is NOAD in several OpenAIRE-projects: OpenAIRE, OpenAIRE+, OpenAIRE2020 and OpenAIRE Advance (2018-2020). Project DARIAH Ambassador in Finland works in HULib.
- The Project Mildred, Research data infrastructure renewal project of the University of Helsinki: <https://blogs.helsinki.fi/mildred/theproject/>
- Tuuli-project, National level DMP-tool implementation (<https://wiki.helsinki.fi/display/Tuuli/DMPTuuli-project>)

Description of any significant infrastructure:

- Datacloud of the University of Helsinki; A new service and infrastructure to store, share and deliver data and datasets. Datacloud based on the results of the Project Mildred.
- Turso (turso.helsinki.fi) is a federated cluster which includes most of the computational resources of the University of Helsinki

4.1.14. KEEMILISE JA BIOLOOGILISE FUUSIKA INSTITUUT

Description:

The National Institute of Chemical Physics and Biophysics (NICPB) of Tallinn, Estonia, is a governmental research institute founded for developing leading-edge natural sciences. NICPB consists in total of 140 employees, 40 of them are senior scientists, the remaining are junior scientist, postdocs, PhD students, technicians and administrative staff. The research topics of NICPB are interdisciplinary covering particle physics, astrophysics, chemical and biological physics, medical physics and computing. Bibliometrically, NICPB is the most successful research institution in Estonia. NICPB is the representative of Estonia at the European Organization for Nuclear Research (CERN). NICPB is a member of the Compact Muon Solenoid (CMS) experiment at Large Hadron Collider (LHC) at CERN. NICPB is also a member of the Worldwide LHC Computing Grid (WLCG) collaboration and hosts the Estonian Tier 2 for the CMS experiment. The latter is the biggest research data centre in Estonia consisting of 7000 computing cores and 4.5 PB of storage. NICPB has participated in several EU projects and networks in computing, e.g. the Baltic Grid 1&2. Several spin-off companies have been initiated by NICPB: OpenNode OÜ which is building medium scale cloud platforms for industry and academia customers in Estonia, Sweden and the Middle East; Lingvist AS developing machine-learning-driven human training etc.

Role in EOSC-Nordic WPs:

- WP2: Representation of Estonia
- WP3: WP leader
- WP5: Support of integration from infrastructure side, DeepDive platform developer
- WP6: Knowledge Hub activities in Estonia

Key personnel:

Dr. Mario Kadastik (M) is the Research Director of NICPB and the head of the CMS physics group and the computing centre of NICPB. He was the Operational Director (2005-2011) of the BalticGrid 1&2 projects financed by the Frame Programme 6&7. He received his PhD from TalTech (former Tallinn University of Technology) in 2008. He is a co-author of more than 800 research publications.

Dr. Andi Hektor (M) is a senior researcher at NICPB. He was a member of the CMS experiment (2004-2010) and a researcher at CERN (2010-2013). He has participated in many different research and development projects involving distributed computing and big data (NordGrid, BalticGrid 1&2 etc). He is a co-author of more than 175 research papers with more than 37 000 citations. He is a founder of open research support group in Estonia.

Relevant publications :

- CMS Collaboration (...**A. Hektor**, ... **M. Kadastik**,...). Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC. Phys.Lett. B716 (2012) 30-61
- CMS Collaboration (...**A. Hektor**, ... **M. Kadastik**,...). MS technical design report, volume II: Physics performance. J.Phys. G34 (2007) no.6, 995-1579

Relevant previous projects or activities:

- BalticGrid I, II
- ETAIS I, II (national projects)
- RI self-service Waldur (minu.etais.ee).

Description of any significant infrastructure:

NICPB is manages one of the major data centre for the national research infrastructure. It services cloud and HPC solutions, research solutions (especially of the CERN CMS experiment). NICPB is a member of the national computing infrastructure for research, ETAIS (<http://etais.ee>).

4.1.15. TAMPEREEN YLIOPISTO

Description:

The Finnish Social Science Data Archive (UTA/FSD) provides a single point of access to a wide range of research data for learning, teaching and research. In addition, key services include data related information services as well as support and training for research data management. UTA/FSD promotes open access to research data as well as transparency, accumulation and efficient reuse of scientific research, and plays an active part in the development of research data lifecycle management both nationally and internationally. UTA/FSD is a trusted digital repository and has been awarded the CoreTrustSeal certification. UTA/FSD has participated in several EU funded projects, for example DwB, Dasish, SaW and SSHOC, and is an active member in international initiatives like the CoreTrustSeal, DDI Alliance, ISSP and IASSIST. UTA/FSD is a national resource centre that operates as a separate unit of the Tampere University. UTA/FSD is also the Finnish national Service Provider for CESSDA ERIC.

Role in EOSC-Nordic WPs:

- WP4

Key personnel:

Mari Kleemola (F) is Development Manager at the Finnish Social Science Data Archive (FSD), University of Tampere (UTA). She has 20 years of experience in digital data preservation and open science, and her expertise areas include metadata, standards, and certification of repositories. Recently she has been building CESSDA ERIC's services: she is leading CESSDA's Tools & Services Working Group and the CESSDA Metadata Management Project. She has participated in several FP7 and H2020 funded projects in the area of SSH research infrastructures, for example CESSDA PPP, Data without Boundaries (DwB) and CESSDA SaW, and will be working in the forthcoming INFRAEOSC-04-2018 project SSHOC that aims to provide a full-fledged Social Sciences and Humanities Open Cloud. She is one of the CoreTrustSeal Board Directors (the Secretary), a CTS reviewer, and a member of the DDI Alliance Expert Committee. She has Master's degree in Economics (1994) and is a PhD student at the University of Tampere.

Relevant publications:

- L'Hours Herve, Kleemola Mari, de Leeuw Lisa (2018). CoreTrustSeal: From academic collaboration, to sustainable services - IASSIST & CARTO 2018 conference: Once Upon a Data Poing: Sustaining our Data Storytellers - 01.06.2018.
https://www.openconf.org/IASSIST2018/modules/request.php?module=oc_program&action=summary.php&id=156

- Kvamme Trond, Kleemola Mari, Stebe Janez, Krügel Sybil. (2017). Overview of Data Management Policies in Social Science Data Archives. CESSDA Strengthening and Widening : Deliverable 4.3. <http://cessdasaw.eu/content/uploads/2017/11/SAW-D4.3..pdf>
- Tjalsma Heiko, l'Hours Hervé, Kleemola Mari, Schumann Natascha, Štebe Janez. (2017). CESSDA Strengthening and Widening : Deliverable 4.4 - Report on DSA Certification for CESSDA. <http://cessdasaw.eu/content/uploads/2017/11/SAW-D4.4..pdf>
- Kleemola Mari, Borschewski Kerrin (2017). The CESSDA Metadata Management Project – CMM1 in Retrospect and Forecast for CMM2. EDDI17 – 9th Annual European DDI User Conference 05.12.2017. Lausanne, Switzerland. <https://doi.org/10.5281/zenodo.1118373>
- Kleemola Mari. (2015). Improving the Quality of Digital Preservation Using Metrics. IASSIST Quarterly 39 (2). <https://doi.org/10.29173/iq780>
- Kiberg Dag, Kleemola Mari, Okuloff Annaleena, Stenvig Bodil, Klok Due Jeppe, Strandhagen Elisabeth (2016). Making Nordic health data visible. IASSIST 2016 conference: Embracing the 'Data Revolution': Opportunities and challenges for research - 02.06.2016. Bergen, Norway. <https://iassistdata.org/conferences/archive/2016?page=8>
- Kvalheim Vigdis, Fitzgerald Rory, Sommer Elena, Iljasic Versic Ivana, Kleemola Mari (2016). CESSDA Sets the Stage for the Data Infrastructure of the Future. IASSIST 2016 conference: Embracing the 'Data Revolution': Opportunities and challenges for research 02.06.2016. Bergen, Norway. <https://iassistdata.org/conferences/archive/2016?page=7>
- Hjelm Claus-Göran, Ekman Stefan, Irebäck Hans, Jordan Caspar, Sjögren Björn, Brandt Maurice, Croessmann Anja, Helmcke Thomas, Kleemola Mari, Moilanen Katja, Risnes Ornulf, Jensen Uwe. (2014). Standards with future relevance for European Social Science data infrastructure; Needs, Key Areas, Rules & Best Practices in Metadata Standard selection and usage. Data Without Boundaries: Integrated Deliverable D7.2 - D7.3: Data without Boundaries Project. http://www.dwbproject.org/export/sites/default/about/public_deliverables/dwb_d7-2_7-3_future-metadata-standards-usage-selection_integrated-report.pdf

4.1.16. GOETEBORGS UNIVERSITET

Description:

UGOT will participate in EOSC-Nordic with two separate units, UGOT- GGBC and UGOT- SND. UGOT is among the largest universities in Northern Europe (approx. 37,000 students and 6,000 employees). With its eight faculties, UGOT is also the most wide-ranging and versatile university in Sweden. UGOT is an active international university engaged in collaborative projects and partnerships all over the world. In FP7, UGOT participated in approximately 180 projects, both as a coordinator and a partner and is to date participating in about 80 projects in H2020.

The Department of Marine Sciences (<http://marine.gu.se/>) and the Department of Biological and Environmental Sciences (www.bioenv.gu.se) act at the forefront of research on biodiversity, evolution, ecosystems, and conservation. Both departments have established the Gothenburg Global Biodiversity Center (GGBC), a local infrastructure cluster for taxonomic, evolutionary and ecological research facilities, including the Gothenburg Herbarium, the Gothenburg Botanical garden, and the Gothenburg Natural History Museum (<http://ggbc.gu.se/>). GGBC holds modern high-throughput sequencing facilities and offer data and analysis services as a part of the Swedish LifeWatch infrastructure (<http://www.svenskalifewatch.se/>). Together, these facilities attract significant numbers of users from outside Sweden and generate a substantial number of scientific publications every year.

The Gothenburg Global Biodiversity Center is currently building a cross-disciplinary platform between Natural and Social Sciences to develop and implement effective Science-Policy interfaces as well as business models for the protection and management of biodiversity. An important element in this process is the development of e-science approaches.

GGBC is partner in many long-term e-Infrastructure programs since 2009, including ESFRI programs (<http://lifewatch.eu/>, <http://embrc.eu/>), H2020 projects (<http://envriplus.eu/>, <http://assembleplus.eu/>), and has had key roles in FP7 pilot programs such as BioVeL (www.biovel.eu). As a part of these initiatives we develop and maintain digital services such as the Biodiversity Catalogue (<http://biodiversitycatalogue.org/>), Data Management Plans

(DMPs), and virtual research environments (VREs). Some of these digital assets will be made available integrated into the Nordic Open Science Cloud.

Swedish National Data Service (SND) is a national data infrastructure in Sweden that facilitates access to new and existing Swedish research data within and outside of Sweden. SND's primary role is to support the accessibility, preservation, and re-use of data and related materials. As part of SND's support to researchers, they provide guidance on how to write a data management plan, and how to manage data over the lifespan of a project. SND also provides information on the legal aspects of research, such as research ethics and informed consent. SND is a service provider to CEESDA ERIC. SND is an active partner in DDI Alliance, DataCite, SWE-CLARIN (Swedish part of CLARIN ERIC) and other relevant international organizations. Staff members from SND participated in among others the EU projects CEESDA Saw, ARIADNE, e-Cloud, SERSCIDA and Data Without Boundaries.

Role in EOSC-Nordic WPs:

- WP4: UGOT/SND
- WP5: UGOT/GGBC and UGOT/SND

Key personnel:

Dr. Matthias Obst, PhD (M) is an Assoc Prof. University of Gothenburg. He is expert in marine biogeography, phylogeny, and conservation biology with many years of experience in e-science, modelling, infrastructure development, and biodiversity informatics. Obst is co-author of 49 publications in 4 languages, including highly cited publications in *Nature*, *Nature Communications*, *BMC Ecology*, *GigaScience*, and *Proceedings of the Royal Society* (Overall scientific citations = 3221, h-index = 20). He supervises 12 post-doctoral fellows, graduate and undergraduate students since 2006. A publication overview is available at <https://scholar.google.se/citations?user=WbsgDjsAAAAJ&hl=en>. Obst has acted as journal reviewer for >40 scientific journals. His professional duties include advisory to the Swedish Research Council (VR), The Swedish Agency for Marine and Water Management (SwAM), the British Research Council (NERC), and the Portuguese National Funding Agency (FCT). He acts currently as chair of the Swedish LifeWatch consortium (<http://svenskalifewatch.se>), as program manager of the Nordic e-Infrastructure program DeepDive (<https://neic.no/deepdive/>), and Associate Editor in *Frontiers in Marine Ecosystem Ecology* (www.frontiersin.org).

Dr. Henrik Nilsson (M), is a lecturer at University of Gothenburg, he is an expert in biology, evolution and, ecology of fungi, with many years of experience in bioinformatics software and e-infrastructure development. Nilsson is co-author of 108 publications, including highly cited publications in *Science* and *PNAS* (Overall scientific citations = 14007, h-index = 47). Nilsson is ranked among the top 1% highly cited scientists worldwide, according to Web of Science' list "Highly Cited Researchers". A publication overview is available at <https://scholar.google.se/citations?user=R9TtRLUAAAAJ&hl=en&oi=ao>. He is on the editorial board of five scientific journals and has reviewed scientific manuscripts and grant proposals for more than 90 journals and agencies (<https://publons.com/author/1198595/r-henrik-nilsson#profile>). He has co-supervised more than 10 Ph.D. students, Post Docs, Master's students and project students since 2006.

Ulf Jakobsson (M) Data Manager with archaeology as main academic area. Ulf has been responsible for the adaptation of SND's management system and web portal to archaeological data and vocabularies. He has also been responsible for the production of several Best Practice documents as well as a template for Data Management Plan now published via SND's portal. He was responsible for SND's production of several vocabularies, documents and materials used in the ARIADNE project.

Johan Fihn Marberg (M) Johan is the IT Director for the IT department at SND. He has a background in systems development and has worked with data management issues for 13 years. He is involved with various metadata standards developments and is a member of the DDI Technical Committee.

Relevant publications:

Hardisty et al (2016) BioVeL: A virtual laboratory for data analysis and modelling in biodiversity science and ecology. *BMC Ecology*. DOI: 10.1186/s12898-016-0103-y.

Gärdenfors et al (2014) Swedish LifeWatch — a biodiversity infrastructure integrating and reusing data from citizen science, monitoring and research. *Human Computation* 1(2): 147-161. DOI: 10.15346/hc.v1i2.6

Mathew et al (2014) A semi-automated workflow for biodiversity data retrieval, cleaning, and quality control. *Biodiversity Data Journal* 2: e4221. DOI: 10.3897/BDJ.2.e4221.

Kissling et al (2017) Building essential biodiversity variables (EBVs) of species distribution and abundance at a global scale. *Biological Reviews*. <http://onlinelibrary.wiley.com/doi/10.1111/brv.12359/full>

Antonelli et al (2017) Toward a Self-Updating Platform for Estimating Rates of Speciation and Migration, Ages, and Relationships of Taxa. *Systematic Biology* 66(2):152-166. DOI: 10.1093/sysbio/syw066

Relevant previous projects or activities:

- National LifeWatch infrastructure program 2010-2020 (www.swedishlifewatch.se)
- European ESFRI preparatory phase ppLifeWatch, 2008-2011, (<https://www.lifewatch.eu/>)
- FP7 project BioVeL, 2011-2014, a pilot implementation of the European ESFRI LifeWatch infrastructure for biodiversity and ecosystem research, (www.biovel.eu)
- Deep Relations in Biodiversity e-Infrastructures (<https://neic.no/deepdive/>), 2017-2019
- ENVRI+ (www.envriplus.eu/)

Description of any significant infrastructure:

- Swedish LifeWatch (www.swedishlifewatch.se)
- BiodiversityAtlas Sweden (<https://bioatlas.se/>)
- GBIF-Sweden (www.gbif.se/portal/)
- Biodiversity Virtual eLaboratory (<http://biovel.eu/>)

4.1.17. NSD – NORSK SENTER FOR FORSKNINGSDATA AS

Description:

NSD – Norwegian Centre for Research Data is a trusted digital repository (holds the CoreTrustSeal) and one of the largest social science data archives of its kind, both in terms of holdings and manpower, and is a service centre assisting researchers in multiple ways. NSD's principal mission is to facilitate access to data for empirical research by providing a variety of freely accessible services under terms and conditions that ensure equal treatment of researchers in Norway and abroad. This is achieved by collecting, processing, facilitating, archiving and maintaining data, and disseminating data to the research communities, and by ensuring that data are available in a form that enables them to be used for scientific purposes without users incurring major legal, financial or practical costs. The staff of NSD counts approximately 100 and a great majority hold degrees in social science or information technology, including about 30 software developers. NSD is the Norwegian service provider to CESSDA ERIC, an ESFRI landmark, and has been a prominent member of the Data Documentation Initiative (DDI) Alliance since its start in 1995. NSD is also a long-standing software vendor and has developed a substantial part of the technology behind the microdata.no-platform.

Role in EOSC-Nordic WPs:

- WP4

Key personnel:

Katrine Utaaker Segadal (F) is Head of the Section for Archiving and Dissemination of Research Data at NSD – Norwegian Centre for Research Data. She has been employed at NSD since 2006, and has earlier been Head of Section for the Data Protection Services. She was responsible for NSD's application for the CoreTrustSeal Data

Repository certification, and is currently leading the project of NSD applying for a Norwegian Research Data Alliance node. She holds a graduate degree in Administration and Organization Theory.

Ørnulf Risnes (M) is Associate Director for Department of IT and Development at NSD – Norwegian Centre for Research Data. He has among other things been the leader of CESSDA Technical Working Group for planning and implementation of pan-European solutions for CESSDA and leader of DDI Alliance working group on Data Description metadata in the DDI moving forward project (ddialliance.org). He is also the tech lead of the sub-project of Continuous Capture of Metadata (c2metadata.org) for interpretation of Stata transformation scripts. He is system architect of microdata.no. He holds a graduate degree in Information Science.

4.1.18. RIGSARKIVET

Description:

The Danish National Archives (DNA) collects, preserves and disseminates public records both paper-based records and born digital material. The mandate for the DNA is given from the archival act.

A research data archive for social science and health science has been part of the DNA since 1993. The research data archive dates back to 1973 (named the Danish Data Archive).

The DNA has a collection of research data sets of app. 3000 studies from social science and health science. The continuous thrive for the development of a culture for re-use of research data within social science and health science communities in Denmark and in Europe is mirrored by the number of studies delivered to students and researchers for secondary analysis/re-use. The number has been growing since 2015. The number will in 2018 be an all-time high of more than 1000 studies.

The research data archive has been actor in development of CESSDA – Consortium for Social Science Data Archives – as an ERIC – European Research Infrastructure Consortium. We take active part in the further development of CESSDA initiated activities for providing the research communities in Europe with high quality data for comparative research.

Among the research data archives in the Nordic countries exist a strong sense of network and partnership. The DNA is active in strengthening this network as legislation, research culture and data infrastructures have similarities to be exploited for the benefit of research.

The DNA plays a significant role in the research infrastructure in Denmark. We take part in the National Forum for Research Data Management (DM Forum), appointed by the Ministry for Education and Research. In 2018 the DNA has been project management and participant in the activity ‘FAIR across’ funded by the DM Forum.

In 2018 the DNA was lead on an application for a Research Data Alliance European National Node. The application was successful. Activities for implementation of the use of and contribution to RDA-knowledge products in Denmark will start up shortly.

Role in EOSC-Nordic WPs:

- WP4: FAIR Data, partner

Key personnel:

Anne Sofie Fink Kjeldgaard (F), Head of Research Data Dissemination Services, the Danish National Archives. ASF holds a Master of Science in International Marketing and a Ph.D. degree in History. She had until 2014 a position as researcher/senior researcher in the DDA/DNA. The DNA is appointed CESSDA ERIC service provider and she is heavily involved in CESSDA activities. She will be the main responsible party for the DK-RDA node activity under DM Forum and has contacts and experience with the Danish research community as well as with the Danish Ministry of Higher Education and Science.

Lea Sztuk Haahr (f), IT Archivist, Research Data Dissemination Services, the Danish National Archives. LSH holds a Master degree in Political Science focusing on national tests and how to use the outcome in a political context. LSH is taken part in a number of CESSDA projects and national projects with her competences on research data management and FAIR data and services.

Relevant publications:

- National Forum for Research Data management (2018): 'FAIR across': Exploring the FAIR data principles across disciplines (conference), https://vidensportal.deic.dk/da/FAIR_Toolbox_Event
- National Forum for Research Data management (2018): 'FAIR across': FAIR Toolbox, <https://vidensportal.deic.dk/da/FAIR>
- Search Service for social science and health science in the collection of Danish National Archives: <http://dda.dk/simple-search?lang=en>
- Marker, Hans Jørgen og Anne Sofie Fink (2017): CESSDA – a History of Research Data Management for Social Science Data (2017) (https://www.researchgate.net/publication/321169281_2_CESSDA_-_a_History_of_Research_Data_Management_for_Social_Science_Data), published in the book Kruse, Filip and Thestrup, Jesper Boserup (2017): Research Data Management - A European **Perspective**, DE GRUYTER SAUR

Relevant previous projects or activities:

- CESSDA ERIC
- FAIR Across (Exploring the FAIR data principles across disciplines)
- National Forum for Research Data management
- Research Data Alliance National Node

Description of any significant infrastructure:

- CESSDA ERIC

4.1.19. ILMATIETEEN LAITOS

Description:

The Finnish Meteorological Institute (FMI: <http://www.fmi.fi/en>) is a research and service agency employing about 600 people, about 320 in research. The objective of Finnish Meteorological Institute is to produce high-quality observational data and research knowledge about the atmosphere, combining its know-how into services to benefit of mankind and environment. FMI conducts research of high standard in the fields of meteorology, climate change, air quality, space physics, remote sensing and geomagnetism. Together with high-level research, FMI carries on competitive commercial activities based on the providing of expert services both in Finland and abroad, actively participate in national and international cooperation, develop end-user services and promptly disseminates information about matters related to the atmosphere. Current projects involve monitoring of air quality and atmospheric composition (e.g. WMO/GAW, EMEP, AMAP, HELCOM/EGAP, GMES, GEOSS), research in climate change, air chemistry and aerosol physics (incl. a National and three Nordic Centres of Excellence), and assessment and modelling of airborne pollutants from local to continental scale. FMI is participating in several environmental Research Infrastructures, such as in ICOS (hosting with Univ. Helsinki the ICOS head office in Helsinki), ACTRIS, SIOS, EISCAT_3D, ANAEE, EPOS, EMBRC and Euro-Argo. FMI is participating the Coupled Model Intercomparison Project phase 6 (CMIP6) with EC-Earth climate model. In addition, FMI is actively involved in several European projects of direct interest to the present proposal: EOscpilot WP2-Governance, RISCAPe – a H2020 funded project to map the international landscape of research infrastructures and the newly funded ENVRI-FAIR project, dealing with cluster strategy and connection to EOsc within WP3.

Role in EOsc-Nordic WPs:

- WP2
- WP5

Key personnel:

Dr. Sanna Sorvari Sundet (F), Research Manager, has over 15 years' experience in climate change research. She has experienced in coordinating, initiating and planning of international and national research activities in environmental science, especially in recent years she has worked to establish ESFRI Environmental Research Infrastructures at the national and European level (e.g. in setting-up ICOS RI and ICOS ERIC, supporting ANAEE and ACTRIS to develop their RI strategies). She has also facilitated the collaborative work of Env. RIs at the European level (WP leader for ENVRI, Chair of the ENVRI stakeholders' Advisory Board) and at the international level (WP leader for COOPEUS-project, member of Belmont Forum's Env. data management action). She is also a member of H2020 Expert Advisory Board for RIs and e-RIs. She is working on Joint Programming, especially in JPI Climate as a co-chair of Working Group on Mowing towards Reliable Climate Predictions and chair of the JPI Climate Management Board.^[1]_[SEP]

Dr. Anca Hienola formerly Gaman (F) has over 17 years' experience in atmospheric sciences and climate change research. Her expertise extends from new particle formation, contact phenomena, organic compounds nucleation to global and regional climate modelling. In the beginning of 2017 she got involved in research infrastructure activities and several projects of European dimensions (EOSCpilot WP2-Governance, RISCAPe WP2- Stakeholder interaction and quality assurance, ENVRIplus).

Dr. Risto Makkonen (M) is a tenure-track research professor in climate system research unit of FMI. He has been developing several climate models (EC-Earth, NorESM, MPI-ESM), also towards Coupled Model Intercomparison Project (CMIP). He has been a work package leader in European (FP7 BACCHUS), Nordic (Nordforsk eSTICC) and national projects, and he is coordinating projects on e.g. climate communication and Earth System feedbacks. Makkonen has 23 peer-reviewed publications with over 200 citations to his first-author papers, and two of his first-author papers were cited in IPCC AR5. He received the Finnish Association for Aerosol Research (FAAR) award for "pioneering work in global aerosol modeling" in 2015.

4.1.20. ITA-SUOMEN YLIOPISTO

Description:

The University of Eastern Finland is one of the largest universities in Finland. We show courage in crossing academic boundaries and our interdisciplinary approach is internationally recognised. Our research is ranked among the best in the world in several fields. As a multidisciplinary university, we train experts for the various sectors of society. We seek solutions to global challenges through multidisciplinary research and education. UEF is a multidisciplinary university, which offers teaching in more than 100 major subjects. We have four faculties: the Philosophical Faculty, the Faculty of Science and Forestry, the Faculty of Health Sciences, and the Faculty of Social Sciences and Business Studies. Our campuses are in Joensuu and Kuopio. We are home to approximately 15,500 students and 2,500 members of staff. The University of Eastern Finland is a smoke-free workplace.

Role in EOSC-Nordic WPs:

- WP2

Key personnel:

Dr. Jarmo Saarti (M) is the Library Director of the University of Eastern Finland (UEF) and adjunct professor (docent) both in the University of Oulu and in the University of Tampere. He graduated from the University of Jyväskylä in 1986 (MA). After that, he worked in several libraries, both in the public and academic sectors. He started to work on his doctoral thesis (information studies) in 1996 and was awarded his PhD at the beginning of 2000. He was awarded his second PhD at the end of the 2013 from the University of Jyväskylä (literature). He has been the chair of the board of the National Repository Library in Finland and a member of the board of the National Library of Finland. He has been a member of the IFLA's standing committee of the Academic Libraries and Other Research Libraries Section and is at the present member of the Standing Committee of the Section on Document Delivery and Resource Sharing. He was elected as the chair of the the Finnish Research Library Association (STKS) for the years

2014 - 2017 and as a board member for the Federation of the Finnish Learned Societies for the years 2017 - 2019. He has specialized in the knowledge organization of fiction and in the management of libraries. He has published about 300 professional and academic papers and he has written, co-written or edited about 50 books.

M.Sc. Tomi Rosti (M) is information specialist at the University of Finland library. He has been active both at the national and at the University level in building open science services and policies.

Relevant publications:

- Saarti, Jarmo. 2018. Collection policies for the post-digital era of academic publishing: future scenarios for the academic libraries. In: Vattulainen, Pentti; O'Connor, Steve (eds.) *Repositories for Print: Strategies for Access, Preservation and Democracy*. De Gruyter Saur. *Current Topics in Library and Information Practice* 9. Pp. 103-112.;
- Saarti Jarmo, Tuominen Kimmo. 2017. From paper-based towards post-digital scholarly publishing: an analysis of an ideological dilemma and its consequences. *INFORMATION RESEARCH* 22(3).

4.1.21. STICHTING GO FAIR

Description

The GO-FAIR FOUNDATION (GFF in short) has been established in February 2018 as a separate legal entity under Dutch law in order to support the GO-FAIR principles and metrics, as initially designed and defined by the GO-FAIR INTERNATIONAL SUPPORT & COORDINATION OFFICE (GFISCO). GFF is in the process of developing a comprehensive certification program for the FAIR community, including but not limited to certification of data files, FAIR Data Points (FDP's), software, algorithms, individuals consultants, trainers, service suppliers and organisations.

Role in EOSC-Nordic WPs:

- WP4 and WP5:
 - mapping repositories attributes to FAIR metrics,
 - boosting FAIR metric scores,
 - support to the adoption of standards and certification,
 - machine actionable DMPs.

Key personnel:

Bert Meerman (M) is the Director of the GO FAIR FOUNDATION (GFF). GFF supports the International GO FAIR Office, mainly by preparing the implementing a coherent certification program. Bert is a senior business executive with a successful track record in Finance, Network, Information and Data technology. Bert has worked in a variety of management roles in different countries, mostly for American software companies. In addition, Bert has been the Secretary General of the International Factors Group, a consortium of finance companies where he implemented a successful, worldwide data-exchange platform, based upon agreed network protocols and EDIFACT standards. Bert is a business economist, with an MBA from the Erasmus University in Rotterdam.

Mascha Jansen (F) holds a degree in biotechnology, and has an extensive background in communications and project management. From the start she was involved in FAIR data and services most recently as International Operations Coordinator for GO FAIR. Mascha has also had different roles in (inter)national projects for ELIXIR, FAIRdict, BBMRI and Open Phacts. Mascha currently works as assistant-director for GFF, the GO FAIR Foundation.

Erik Schultes (M) is an evolutionary biologist with a long-standing interest in data-intensive research questions. Erik has been affiliated with the University of California, Los Angeles; The Whitehead Institute for Biomedical Research (MIT); The Santa Fe Institute; Duke University Medical Centre and Department of Computer Science. Erik currently holds a visiting researcher appointment in the Human Genetics Department, Leiden University Medical Center, and

is International Science Coordinator at the GO FAIR International Support and Coordination Office (GFISCO). In recent years, Erik has been working with a diverse community of stakeholders to develop FAIR data and services within and outside the life sciences.

Luiz Bonino (M) is the International Technology Coordinator of the GO FAIR International Support and Coordination Office and Associate Professor of the BioSemantics group at the Leiden University Medical Centre in Leiden, the Netherlands. His background is in ontology-driven conceptual modeling, semantic interoperability, service-oriented computing, requirements engineering and context-aware computing. In the last 4 years Luiz has led the development of a number of technologies and tools to support making, publishing, indexing, searching and annotating FAIR (meta)data.

Relevant previous projects or activities:

Involved persons have been working in the FAIRDICT project and in GFISCO, whereby a number of relevant products have been prototyped. Examples of prototype products are: FAIRifier, FAIR Data Points, FAIR Metrics and the FAIR Metrics Evaluator. In addition, the individuals have been involved in running GO FAIR events, like Bring Your Own Data events and so-called Hackathons where participants are trained to start measuring fairness of datasets.

Operational capacity:

GFF has been recently founded and is in the process of hiring staff and building up capacity. It is expected that by 1st of January 2019, the planned capacity will be available.

4.1.22. DEUTSCHES KLIMARECHENZENTRUM GMBH

Description:

DKRZ, the German Climate Computing Centre, is a national service provider, providing state-of-the-art supercomputing, data services and other associated services to the German and international scientific community to conduct top of the line Earth System and Climate Modelling. DKRZ operates a fully scalable supercomputing system designed for and dedicated to Earth system modelling including mass storage systems to a capacity of more than 500 PBs. It provides its more than 1000 scientific users with the technical infrastructure needed for the processing and analysis of huge amounts of data from climate simulations, also covering training and support for related application software and data processing. DKRZ participates in many national and international projects aiming to improve the research infrastructure for climate modelling and beyond. It is partner in ENES (European Network for Earth System Modelling) and is one of the representatives of the Earth system research community in the EOSC-hub project. DKRZ is operating with its ICSU World Data Center Climate (WDCC) a certified, community specific long-term data archive. Connected with its WDCC, DKRZ provides best practice examples in scientific data life cycle management for the Earth system research community (federated data infrastructures, long-term archiving service, grid-based data processing workflows). Through its research group on scientific computing DKRZ is linked to the Department of Informatics of the University of Hamburg.

Role in EOSC-Nordic WPs:

- In WP5 DKRZ is leading task 5.1: Semantic mapping procedures and quality standards.

Key personnel:

Heinrich Widmann (M), Diplom in physics, is a scientific programmer at DKRZ. Following his diploma, he worked within compute intensive research projects and afterwards in software industry. Since 2003 he worked in different positions as a scientific programmer at the Max-Planck-Institute for Meteorology and DKRZ. He has 10 years+ experience in computing and data management in the environment of earth system modelling and research data management. He has very good skills in several programming languages (like python, java, C, ...) and knowledge about data management tools such as the OAI harvesting protocol, high volume and performance storage systems and data portal technologies. He is one of the main developers of EUDAT service 'B2FIND'. As a software engineer

he is not only responsible for the development, maintenance and operational implementation of the metadata service, but as well for the user documentation and the presentation of the product at user forums and conferences. In EOSC-hub he is a member of the technical advisory board and task leader in WP6 (Common Services).

Hannes Thiemann (M) is the Deputy Department Head of the Data Management Department at DKRZ. He leads the long-term archiving group which is responsible for the operation and further development of the ICSU World Data Center Climate at DKRZ. Following his degree as geophysicist he joined DKRZ in 1990 and specialized in data management soon after. He was involved in many national and international projects, most recently EOSC-hub and SeaDataCloud. In EUDAT and EUDAT2020 he was the product manager of the metadata service B2FIND for many years. In EOSC-hub he is elected member of the Project Management Board.

Claudia Martens (F) received her degree in Library and Information Science 2017 and is working at the DKRZ in the framework of EOSC-hub for the EUDAT service B2FIND since then. With a background in Social Sciences (Diploma in Political Economy and Master in European Labour Studies) she focusses on interdisciplinary aspects of research data management, in particular interoperability of metadata standards and -schemes. As main responsible person for B2FIND she integrates metadata records from divergent scientific communities, including both national and European research infrastructures. She has instigated several collaboration projects for cross-community discovery services and is involved in pan-european research infrastructure networks.

Relevant previous projects or activities:

- EU FP7 IS-ENES, IS-ENES2 and H2020 IS-ENES3: Infrastructure for the European Network for Earth-System-Modelling: Projects are fostering simulations with global earth system models. Further focus is on is the close integration of operational structures for high-volume data management structures.
- EUDAT2020: DKRZ acted as a community center within EUDAT representing the ENES community. EUDAT comprises more than 30 European partners, including data centers, technology providers, and research communities and funding agencies from 13 countries. The focus of the activities was the alignment of EUDAT services with community needs as well as service integration. DKRZ lead the development of and operated the EUDAT B2Find service also harvesting IS-ENES metadata records. DKRZ also lead the EUDAT persistent identifier task ensuring stable APIs for PID infrastructure services and contributed to technology exploration activities in the context of graph databases.
- ENVRI+: Harmonizing approaches for data identification, citation, data processing and data workflows for all domains of Earth System Science. DKRZ contributed by developing the ENVRIplus Flagship catalogue based on B2FIND for enabling cross-disciplinary search and access to data collections from divergent RIs, including guidance for metadata schemas and standards interoperability as well as testing and implementation of CSW harvesting endpoints and enhanced faceted search functionalities.
- EOSC-hub: EOSC-hub brings together multiple service providers to create the Hub: a single contact point for European researchers and innovators to discover, access, use and reuse a broad spectrum of resources for advanced data-driven research. DKRZ contributes to WP6 (Discovery and access; Data and metadata management) by offering the main discovery index B2FIND and with its ENES Climate Analytics Service to WP7
- SeaDataCloud: One focus of this project, involving 55 partners from 34 countries, is the further development of existing services and standards for research data from the SeaDataNet network, in which more than hundred oceanographic data centers have been organized. The DKRZ, together with four other partners from the EUDAT network, is involved in developing and operating services for the SeaDataCloud community on the basis of current IT infrastructures and technologies. These services are based on developments by EUDAT like the data storage services B2SAFE or B2SHARE and are the basis for the further growth of the SeaDataNet network.

Description of any significant infrastructure:

DKRZ is running one of Germany's most powerful high performance computers and world class data storage and archiving hardware. The current system is a BULL system with 80000 cores and 3.2 PetaFLOPS. The file system is based on lustre and has a net storage capacity of 50 PetaBytes.

For long term archiving of data DKRZ operates a tape library with the capacity to store more than 500 PetaByte of data.

Services

DKRZ supports complex and compute intensive national and international collaborative projects: simulations are carried out and resulting data are managed and made available through the World Data Center Climate (WDCC) operated by DKRZ. Data nodes and data portal of the Earth System Grid Federation (ESGF) are run by DKRZ.

4.1.23. KØBENHAVNS UNIVERSITET

Description:

The University of Copenhagen (UCPH) is the oldest university and research institution in Denmark. Founded in 1479 as a studium generale. The partner in EOSC-Nordic is Prof. Søren Brunak at the Novo Nordisk Foundation Center for Protein Research (CPR) at the University of Copenhagen Medical School. The Center is organised into four major programs; the Program for Disease Systems Biology (DSB) is led by Søren Brunak. It works as a multi-disciplinary basic research group within bioinformatics, systems biology and medical informatics with particular focus on large data sets of relevance to human health. CPR-DSB combines molecular level systems biology and the analysis of phenotypic data from the healthcare sector. A general aim is to understand disease mechanisms at the level of protein network biology using a wide range of molecular data integrated with clinical data such as electronic patient records, registry information and biobank questionnaires. Patient-specific adverse drug reaction profiles and the discrimination between treatment related disease correlations and other comorbidities are investigated in the context of human proteome variation. The program also has extensive experience in machine learning, data integration and text mining, of e.g. electronic patient records, free text in biobank questionnaires, and scientific papers.

Role in EOSC-Nordic WPs:

WP5: secure health data cloud implementation

WP5: support for DeepDive

Key personnel:

Søren Brunak (*M*), professor: Is a leading expert in bioinformatics and systems biology through invention and introduction of new computational strategies for analysis of biological data for use in molecular biology, medicine and biotechnology. Prof. Brunak has published 300+ peer reviewed papers, and has around 51,000 SCOPUS citations, h-factor 84. Søren Brunak heads the Danish ELIXIR node.

Mette Lademann (*F*) postdoc: PhD in Disease Systems Biology, expertise in population-wide registry analysis, population-wide disease trajectory analysis, biostatistics, and medical informatics technologies.

Piotr Chmura (*M*) research programmer: Lead team of developers building systems for gathering and analysing data for pan-European IMI clinical trials, designed and deployed multiple secure private cloud environments for computationally intensive projects with special emphasis on security and on-demand scalability. Has experience with optimizing pipelines, workflows and helping users transition their workloads into hybrid cloud-HPC solutions. Helped develop and oversaw implementation of data access and management policies for projects with patient-sensitive data.

Tobias Guldberg Frøslev (*M*) is a ph.d in biology, Assistant Professor at University of Copenhagen, working with DNA metabarcoding of various organism groups, biodiversity assessment from eDNA samples, and bioinformatics associated with species identification and biodiversity.

Relevant publications:

- Ison J, Rapacki K, Ménager H, Kalaš M, Rydza E, Chmura P, ... Rost B, Parkinson H, Løngreen P, Brunak S. Tools and data services registry: a community effort to document bioinformatics resources. *Nucleic Acids Res.* 44(D1) (2016 Jan).
- Jensen AB, Moseley PL, Oprea TI, Ellesøe SG, Eriksson R, Schmock H, Jensen PB, Jensen LJ, Brunak S. Temporal disease trajectories condensed from population-wide registry data covering 6.2 million patients. *Nat Commun.* 5:4022 (2014 Jun).
- Beck MK, Jensen AB, Nielsen AB, Perner A, Moseley PL, Brunak S. Diagnosis trajectories of prior multi-morbidity predict sepsis mortality. *Sci Rep.* 6:36624 (2016 Nov)
- Li T, Wernersson R, Brunak S, Jensen TS, Lage K. A scored human protein-protein interaction network to catalyze genomic interpretation. *Nat Methods.* 14(1) 61-64 (2017 Jan).
- Maretty L, Jensen JM, Petersen B, Sibbesen JA, Liu S, Villesen P, Skov L, Belling K, ..., Brunak S, Schierup MH. Sequencing and de novo assembly of 150 genomes from Denmark as a population reference. *Nature.* 548, 87-91 (2017 Aug.)
- Oprea TI, Bologna CG, Brunak S,...Westergaard D, Yang JJ, Zahoránszky-Köhalmi G. Unexplored therapeutic opportunities in the human genome. *Nat Rev Drug Discov.* 17(5):377 (2018 May).

Relevant previous projects or activities:

- ELIXIR (FP6): Preparatory phase project, now a ratified international infrastructure including a large number of European countries.
- Excelerate (H2020): Continuation of the ELIXIR project, focused on coordinating and extending national and international data resources to ensure the delivery of world-leading life-science data services. It supports a pan-European training programme, anchored in national infrastructures, to increase bioinformatics capacity and competency. Furthermore, it provides efficiencies in management and operation throughout the infrastructure, which is distributed amongst 17 countries.
- eTransafe (IMI2): The eTRANSafe project will develop an integrative data infrastructure and innovative computational methods and tools that aim to drastically improve the feasibility and reliability of translational safety assessment during the drug development process. This infrastructure will be underpinned by development of open standards and robust policies widely accepted by stakeholders, including regulatory agencies and international organisations.
- INNODIA (IMI2): The aim is to advance in a decisive way how we predict, stage, evaluate and prevent the onset and progression of type 1 diabetes (T1D). This will be achieved by creating novel tools, such as biomarkers, disease models and clinical trial paradigms. These tools will allow us to distinguish and understand at the cellular and molecular level distinctive paths of ontogeny and progression in this heterogeneous disease, thus impacting on the future management of T1D patients and at risk individuals.
- DIRECT (IMI1): This project identifies biomarkers that address current bottlenecks in diabetes drug development and aims at developing a stratified medicine approach to treatment of 'type 2 diabetes' (T2D) with either existing or novel therapies.
- Tryggve2 (Nordforsk): The aim is to enable sensitive data processing across Nordic using national infrastructure providers and secure cloud technology to enable the researchers can work on the Nordic data seamlessly. Currently the project is in its second terms after the successful completion of the first 3 year term.

4.1.24. REGION HOVEDSTADEN

Description:

Region Hovedstaden manages hospitals, performs research and services for the disabled and undertakes environmental duties. It collaborates with municipalities and the business community on developments concerning traffic, business and education. It is a public authority headed by democratically elected politicians and is a part of Greater Copenhagen. Copenhagen University Hospital, Rigshospitalet is Denmark's leading hospital for patients needing highly specialised treatment. The Heart Center of Copenhagen University Hospital, Rigshospitalet is a highly specialised unit that diagnoses and manages all kinds of heart diseases. The Heart Center manages >10,000 patients on a yearly basis – whereof a considerable part suffers from ischemic heart disease. The Heart Center is part of a

Clinical Academic Group which main purpose is to develop precision medicine and especially identify patients who are NOT benefitting for the current work-up, treatments and controls.

Role in EOSC-Nordic WPs:

- WP5: personalised cardiology

Key personnel:

Henning Bundgaard (M). Professor and consultant in cardiology at the Heart Center. He organised and established the area of inherited cardiac diseases in Denmark and heads The Capital Unit for Inheritable Heart Disease managing >3000 families with inherited cardiac diseases. He has a solid experience in epidemiology of heart disease. He is PI of major nationwide randomised clinical trials and heads the Scandinavian registry on PTSMA treated patients. He is PI of the Copenhagen Baby Heart study, which just finalised inclusion of 25,000 newborns in Copenhagen (2016-2018). He is Co-PI of clinical RCT of treatment of patients with infectious endocarditis (n=400 finalised) and initiator and head of the Clinical Academic Group “Precision diagnostics in cardiology”. Furthermore, he is co-author of more than 170 scientific publications.

Alex Hørby Christensen (M). Consultant in cardiology with extensive clinical and scientific experience in electrocardiography, inherited cardiac diseases, translational cardiology and genetic epidemiology. Organisational experience from multiple working groups and committees.

Amalie Dahl Haue (F). PhD student: Mapping coronary artery disease: Translating genomics and proteomics into clinical practice.

Marlene Beck (F). Special consultant. 11+ years as administrative project coordinator of both national and EU projects (FP6, FP7, H2020).

Relevant publications:

- Ranthe MF, Petersen JA, Bundgaard H, Wohlfahrt J, Melbye M, Boyd HA. A detailed family history of myocardial infarction and risk of myocardial infarction--a nationwide cohort study. PLoS One. 2015 May 26;10(5):e0125896. doi: 10.1371/journal.pone.0125896
- Hertz CL, Christiansen SL, Ottesen GL, Frank-Hansen R, Bundgaard H, Morling N. Post-mortem investigation of young deceased individuals with ischemic heart disease--outcome of supplementary genetic testing for dyslipidemia. Int J Legal Med. 2016 Jul;130(4):947-8. doi: 10.1007/s00414-015-1282-3.
- Ranthe MF, Diaz LJ, Behrens I, Bundgaard H, Simonsen J, Melbye M, Boyd HA. Association between pregnancy losses in women and risk of atherosclerotic disease in their relatives: a nationwide cohort study†. Eur Heart J. 2016 Mar 14;37(11):900-7. doi: 10.1093/eurheartj/ehv549
- Iversen K, Ihlemann N, Gill SU, Madsen T, Elming H, Jensen KT, Bruun NE, Høfsten DE, Fursted K, Christensen JJ, Schultz M, Klein CF, Fosbøll EL, Rosenvinge F, Schönheyder HC, Køber L, Torp-Pedersen C, Helweg-Larsen J, Tønder N, Moser C, Bundgaard H. Partial Oral versus Intravenous Antibiotic Treatment of Endocarditis. N Engl J Med. 2018 Aug 28. doi: 10.1056/NEJMoa1808312. [Epub ahead of print]
- Bundgaard H, Jøns C, Lodder EM, Izarzugaza JMG, Romero Herrera JA, Pehrson S, Tfelt-Hansen J, Ahlberg G, Olesen MS, Holst AG, Wellens H, de Villiers C, Hastings R, Stuart G, Brunak S, Wilde AAM, Watkins H, Christensen AH. A Novel Familial Cardiac Arrhythmia Syndrome with Widespread ST-Segment Depression. N Engl J Med. 2018 Nov 1;379(18):1780-1781. doi: 10.1056/NEJMc1807668.

Relevant previous projects or activities:

- Precision Diagnostics in Cardiology, The Capital Region’s Research Foundation
- Clinical Academic Group, Precision Diagnostics in Cardiology, Copenhagen Health Science Partners
- Copenhagen Babyheart, Børnehjertefonden, Candy’s Foundation, Gangsted Fonden
- POET, Partial Oral Endocarditis Treatment, Hjerteforeningen

4.2 Third parties involved in the project (including use of third party resources)

4.2.1. UNINETT SIGMA2 AS

Does the participant plan to subcontract certain tasks (please note that core tasks of the project should not be sub-contracted)	N
<i>If yes, please describe and justify the tasks to be subcontracted</i>	
Does the participant envisage that part of its work is performed by linked third parties ¹	Y

¹ A third party that is an affiliated entity or has a legal link to a participant implying a collaboration not limited to the action. (Article 14 of the [Model Grant Agreement](#)).

The University of Oslo (UiO) will be a linked third party to Sigma2, with contributions from three organizational units within UiO, viz. the Department of Geosciences, the Department of Informatics, and the University Centre of information Technology. The University of Oslo is an internationally renowned research university with currently some 28,000 students and around 6,600 employees.

The Department of Geosciences: The Department of Geosciences was formed in 2003 as a merger between the three earth sciences departments: the Geology Department, the Department of Physical Geography and the Department of Geophysics. The merger resulted in the widest ranging earth sciences department in Norway, covering a wide range of disciplines from deep mantle processes to atmospheric sciences.

The Department of Informatics: The Department of Informatics will participate in WP5 through its Division for Language Technology (LTG); LTG is a research group comprised of four faculty, two adjunct faculty, and ten doctoral and post-doctoral researchers (in late 2018). LTG has successfully utilized national HPC resources since 2009 and has repeatedly achieved top ranks in international system benchmarks based on its strong computational profile; LTG is the coordinator of the Nordic Language Processing Laboratory (NLPL), which provides an interface to the wider user community in Language Technology research in Northern Europe and beyond.

The University Centre of Information Technology (USIT): The University Centre for Information Technology (USIT) is responsible for providing the infrastructure and the IT-services that UiO needs to achieve its goals for research and education. The department of Research Computing (RC) at USIT is a competence-focused unit operating resources for researchers both inside and outside UiO. By not only providing traditional HPC infrastructure, but also high-level research services and technical competence, RC has been able to meet the researchers at their own level and efficiently facilitate research using advanced resources. Members of two groups within the department, the Research Infrastructure group and the Research Services group, will support the EUDAT activities directly, while drawing on the competences and technical skills of the wider USIT organization. These groups currently consist of 15 highly qualified people, of whom 13 hold a doctorate degree. The responsibilities of RC include performing the duties for UiO in national and international e-Infrastructure projects, including PRACE and EUDAT. At present, the RC department is doing research on accelerators, interconnect technologies, implementations of non-uniform memory access and computational portals.

Key Personnel:

Professor Stephan Oepen (M) studied Linguistics, German and Russian Philology, Computer Science, and Computational Linguistics at Berlin, Volgograd, and Saarbrücken. Between 2011 and 2017, he headed the Division for Language Technology at the University of Oslo. Prior to his current appointment, he worked, among others, at DFKI and Saarland University (both Germany), YY Technologies (Mountain View), and Stanford University (both USA). His research revolves around the integration of linguistics and computing, where he has published some ninety peer-reviewed research articles and conference papers and has co-founded the world-wide DELPH-IN network and the Nordic Language Processing Laboratory (NLPL). Oepen has supervised to completion five doctoral projects and a good dozen of Master of Science degrees. He is a member of the editorial board of Computational Linguistics and of the executive committee of the European Association for Computational Linguistics, as well as secretary of the ACL Special Interest Group on Natural Language Parsing and area co-chair for the 2017 Conference of the European Chapter of the Association for Computational Linguistics and for the 2018 Conference on Empirical Methods in Natural Language Processing. In the academic year 2017–18, Oepen co-directs an international research group at the Center for Advanced Studies of the Norwegian Academy of Science and Letter

Does the participant envisage the use of contributions in kind provided by third parties (Articles 11 and 12 of the General Model Grant Agreement)	N
<i>If yes, please describe the third party and their contributions</i>	
Does the participant envisage that part of the work is performed by International Partners ² (Article 14a of the General Model Grant Agreement)?	N
<i>If yes, please describe the International Partner(s) and their contributions</i>	

4.2.2. UPPSALA UNIVERSITET

Does the participant plan to subcontract certain tasks (please note that core tasks of the project should not be sub-contracted)	N
<i>If yes, please describe and justify the tasks to be subcontracted</i>	
Does the participant envisage that part of its work is performed by linked third parties ³	Y

² ‘International Partner’ is any legal entity established in a non-associated third country which is not eligible for funding under Article 10 of the Rules for Participation Regulation No 1290/2013.

³ A third party that is an affiliated entity or has a legal link to a participant implying a collaboration not limited to the action. (Article 14 of the [Model Grant Agreement](#)).

Royal Institute of Technology (KTH)

PDC – Center for High Performance computing at KTH operates leading-edge, high-performance computer and storage services in the framework of the Swedish National Infrastructure for Computing (SNIC). It seeks to offer easily accessible computational resources that primarily cater to the needs of Swedish academic research and education. PDC also takes part in major international projects to develop HPC for the future and stay a leading national resource in parallel computing.

To fulfil its mission, PDC operates leading edge computing and storage resources; provides advanced user support to enable efficient usage of these resources; has a strong educational program in use of computing technologies on both an introductory and an advanced level; and engages in international programs, most notably EUDAT and PRACE to embed Swedish developments in larger European infrastructures, as well as exascale projects (most notably the KTH coordinated EPiGRAM, ExaFLOW, and EPiGRAM-HS projects). PDC also coordinates the Centre of Excellence for Computational Biomolecular Research (BioExcel). Through industrial collaborations, e.g. with Scania, PDC offers its expertise to Swedish industry and contributes to technology transfer.

PDC operates a variety of systems ranging from a high-throughput foundation level cluster to a high-end European Tier-1 system. Most of the systems are funded by SNIC fully or in part with a few additional systems operated on behalf of individual user groups. The current flagship system is a 2,5 PFlops CRAY XC40, Beskow, that serves as Sweden's contribution to the PRACE Tier-1 network.

Linköping University (LiU)

National Supercomputer Centre (NSC) at Linköping University is a centre for high-performance computing for the Swedish academic community established in 1989. NSC partner organizations include Saab and SMHI, the Swedish Meteorological and Hydrological Institute and MetNorway, the Norwegian Meteorological Office. R&D activities at NSC are focused on HPC applications, eScience, improved user environments, rational operation of large HPC systems and technology for future HPC environments. Application areas of particular interest include bioinformatics, tools for large scale analyses, climate research and geoscience, materials sciences, visualisation, quantum chemistry and computational fluid dynamics. NSC also has interest in computational science and code optimisation for massively parallel systems, in particular in areas of flow mechanics and climate simulations.

NSC operates several HPC systems and large-scale storage solutions for SNIC, Saab, SMHI and MetNorway with a total of more than 100 000 cores with a current flagship system at 4 PF for academic use. NSC has over 600 users from all Swedish universities and is a central partner in the SNIC national storage infrastructure.

Lund University (LU)

LUNARC, the Lund University Center for Scientific and Technical Computing, which provide both SNIC and LU users with high performance computing (HPC) and storage resources. In addition to this LUNARC provides:

- Extensive training and courses ranging from entry level training to advanced courses in parallel programming.
- Application experts in data storage, parallel programming and remote visualization.
- Expertise in implementing research workflows together with research groups.

LUNARC also have extensive collaborations with MAX IV, High Energy Physics at LU, Lund Bioimaging Center, Bioinformatics at LU, Humanities Lab, Archeology and Virtuality Lab at LU.

Current systems at LUNARC are Aurora a 300 node cluster, Aurora-Grid, a smaller cluster for the LHCK project, 4 clusters for sensitive data and L-VIS a hardware accelerated interactive visualization cluster. LUNARC also operates storage resources for the national storage as well as for the WLCG collaboration.

Stockholm University

Stockholm University is characterized by openness, innovation and collaboration. Ranked among the world's top 100 universities, Stockholm University (SU) is one of Europe's leading centers for higher education and research in human science and science. Currently the university has 33,000 students, 1,600 doctoral students, and 5,500 members of staff active in the scientific areas of human science and science. The university offers 190 programs and 1,700 courses at 58 institutions in science, humanities, social sciences and law, including 75 master's programs taught in English.

Stockholm University is actively working to promote Open Science and the new paradigm shift which includes more comprehensive access to research results and research data when possible. The University is involved in various national and international Open Science work together with relevant stakeholders.

The University Library was in 2017 tasked with the responsibility of leading and coordinating the joint administrative work for initiating, developing and implementing services and support for managing, storing, making accessible and preserving research data in conjunction with relevant sections within the administration and core services <https://www.su.se/english/library/publish/research-data>. The work has been aligned with the national efforts being planned within the frameworks of The Universities' Reference Group for Infrastructure (URFI, The Research Council), as well as The Association of Swedish Higher Education (SUHF) and other stakeholders. By the end of the coordination task, the goal is for Stockholm University to have an established local infrastructure with functioning operations, relevant skills and an efficient and coordinated organization which can support researchers in the handling of their research data and relevant tools for this. Focus is on educating and supporting the researchers on research data management and providing them with a chain of services throughout the research process.

Umea University (UmU)

UmU's HPC centre HPC2N is a national center for scientific and parallel computing, and is one of the centres that constitute SNIC. HPC2N is organized as a collaboration between Luleå University of Technology, Mid Sweden University, the Swedish Institute of Space Physics (IRF), the Swedish University of Agricultural Sciences (SLU), and Umeå University (UmU). HPC2N provides a wide spectrum of services ranging from internationally competitive HPC resources, large scale storage resources and e-infrastructure to the Swedish research academia. HPC2N has a strong commitment to national and local HPC users as well as new users in emerging areas, with education and user training programs from introductory to advanced levels.

HPC2N participates in several international projects including EGI, PRACE, WLCG and EISCAT_3D. In close cooperation with the Computing Science department at UmU, HPC2N actively participates in several R&D projects. The HPC and parallel computing research focuses on effective (and thereby greener) algorithms and libraries (LAPACK, ScaLAPACK, SLICOT, ESSL and their successors) that handle memory hierarchies, many- multicore and parallel architectures efficiently. This research is since long performed in international collaborations (e.g., EPFL Lausanne, IBM T.J. Watson Research Center, Cornell, UC Berkeley) and currently in the Horizon 2020 FETHPC project NLAfet, coordinated by Umeå Univ., together with Univ. of Manchester, INRIA-Paris, and STFC-RAL (www.nalfet.eu). Another active area is interactive simulation methods for visual simulations in educational environments for vehicle simulators (in cooperation with Algoryx, Oryx, Volvo and Intel). The research topics in grid and cloud computing include generic tools for grid infrastructures, elastic virtual data center technology for federated clouds, and grid applications. The research is performed in broad international collaborations, e.g., including large-scale EU FP7 IP and Horizon 2020 projects.

Current HPC systems at HPC2N systems include a heterogeneous HPC cluster with 504 compute nodes (mix of Intel Broadwell and Skylake) including 20 with 3TB memory each, 46 GPU Nodes (mix of NVIDIA K80 and V100), and 36 Intel Knight Landing manycore processes. HPC2N is also operating storage resources for the SNIC data infrastructure and for the WLCG collaboration. HPC2N is coordinating the SNIC Science Cloud activity.

Does the participant envisage the use of contributions in kind provided by third parties (Articles 11 and 12 of the General Model Grant Agreement)	N
<i>If yes, please describe the third party and their contributions</i>	
Does the participant envisage that part of the work is performed by International Partners ⁴ (Article 14a of the General Model Grant Agreement)?	N
<i>If yes, please describe the International Partner(s) and their contributions</i>	

5 Ethics and Security

5.1 Ethics

One of the demonstrators in the proposal investigates orchestration mechanisms that brings national secure servers for sensitive data together, thus allowing the analysis of personal data without moving data away from the custodian. The demonstrator is connected to a case study regarding personalised cardiology, proposed by the Heart Centre of Copenhagen University Hospital, Rigshospitalet (DK). The EOSC Nordic project will never process any patient's directly identifiable personal data. The scope of the activities in the EOSC Nordic will be to connect, through orchestration mechanisms, analytical workflows occurring at the local secure sites by using an anonymised metadata layer.

5.2 Security

Please indicate if your project will involve:

- activities or results raising security issues: (NO)
- 'EU-classified information' as background or results: (NO)

6 Letters of Commitment

⁴ 'International Partner' is any legal entity established in a non-associated third country which is not eligible for funding under Article 10 of the Rules for Participation Regulation No 1290/2013.

Letter of Support

November 13th, 2018.

To whom it may concern,

The Nordic e-Infrastructure Collaboration (NeIC) is hosted by NordForsk, which provides for and facilitates Nordic cooperation on research and research infrastructure across the Nordic region. NeIC was established in the key area of e-infrastructure (digital infrastructure) in 2012. NeIC has two major roles. The first role is to participate in computing and storage operations for CERN in the digital infrastructure that is used by 7000 physicists worldwide. The second is to collaboratively explore, evaluate, develop and deploy innovative infrastructure services in response to national strategic priorities in the area of digital infrastructure for research in areas of joint Nordic interest. Funding of NeIC's activity is provided through national research funding agencies in Denmark, Finland, Iceland, Norway and Sweden; NordForsk and participating project partners.

We are familiar with the plans to submit a proposal EOSC-Nordic to the INFRAEOSC-05-2018-2020 subtopic (b) from the Nordic countries including Estonia with NeIC/NordForsk as coordinator.

Being governed by national e-infrastructure provider organisations, we regard NeIC as a one of the natural coordination bodies for common Nordic activities towards EOSC, such as the coordination of a project under the call referred to above. We are not familiar with any competing proposals from the Nordic countries. In case there are, also these might have received our support to the extent they intend to join Nordic and European efforts towards the EOSC

This Letter of Support does not hold any financial commitments.

On this basis, the Nordic Research Infrastructure Collaboration Committee (NRICC) supports the above mentioned proposal. This committee has the following members:

- Riitta Maijala, *Academy of Finland*
- Lars Christensen *Danish Agency for Science and Higher Education*
- Asbjørn Mo, *The Research Council of Norway*
- Björn Halleröd, *Swedish Research Council*
- Eirikur Stephenson, *Ministry of Education, Science and Culture*



Riitta Maijala
NRICC Chair



Our Ref: 06.11.2018. a nr 4-10/18/35

Letter of Support

To whom it may concern

The Nordic e-Infrastructure Collaboration (NeIC) is hosted by NordForsk, which provides for and facilitates Nordic cooperation on research and research infrastructure across the Nordic region. NeIC was established in the key area of e-infrastructure (digital infrastructure) in 2012. NeIC has two major roles. The first role is to participate in computing and storage operations for CERN in the digital infrastructure that is used by 7000 physicists worldwide. The second is to collaboratively explore, evaluate, develop and deploy innovative infrastructure services in response to national strategic priorities in the area of digital infrastructure for research in areas of joint Nordic interest. Funding of NeIC's activity is provided through national research funding agencies in Denmark, Finland, Iceland, Norway and Sweden, NordForsk and participating project partners.

The Estonian Research Council is familiar with the plans to submit a proposal "EOSC-Nordic" to the Horizon 2020 call INFRAEOSC-05-2018-2020 subtopic (b) from the Nordic countries including Estonia with NeIC/NordForsk as coordinator.

Being governed by national e-infrastructure provider organisations, Estonian Research Council regards NeIC as a natural coordination body for common Nordic activities towards European Open Science Cloud (EOSC), such as the coordination of a project under the call referred to above.

This Letter of Support does not hold any financial commitments.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Andres Koppel'.

Andres Koppel
Director General

Dr. Gudmund Host, NordForsk

Letter of Support to the EOSC nordic, H2020 INFRAEOSC-05 B

Dear Gudmund

EOSC-hub is one of the flagship EC projects contributing to the European Open Science Cloud implementation. It mobilises providers from the EGI Federation, EUDAT CDI, INDIGO- DataCloud and major research e-infrastructures offering services, software and data for advanced data-driven research and innovation. Access to these services are provided by the integration and management system of the European Open Science Cloud, acting as a single entry point for all stakeholders. The EOSC-hub service catalogue is open to new contributing communities and business organisations.

On behalf of EOSC-hub, I am pleased to offer our wholehearted support for the “EOSC nordic” project proposal.

EOSC-hub is willing to promote the integration and exploitation of the “EOSC nordic” services and resources for adoption by a large international group of users in EOSC.

Through the marketplace EOSC-hub will offer a mechanism to promote access and re-use of key exploitable results of “EOSC nordic”. In particular, the two projects will collaborate on the following areas:

- The integration of “EOSC nordic” services and resources within the EOSC-hub service portfolio.
- The integration of “EOSC nordic” services and resources with access enabling services like federated AAI, discovery and aggregator services like B2FIND and the Application Database, the marketplace, accounting and monitoring, the helpdesk, as applicable.
- The coordinated promotion and adoption of services and resources towards user communities, through a joint event programme and communication plan aiming at harmonizing and strengthening the projects’ presence online (websites, social media, newsletters etc.).
- The coordinated delivery of training to users through an integrated training programme and corpus of training resources, and training infrastructure to be shared and jointly maintained.
- The coordinated technical support to users. The projects will be responsible in their respective service provisioning areas for technical support in the thematic and competency areas in scope in the respective descriptions of work.
- The technical integration of services from the “EOSC nordic” with general and thematic services of EOSC-hub, as applicable.
- The sharing of information on national policies and best practices for service procurement and access provisioning.

I strongly believe the collaboration between the two projects will be of great benefit to the advancement of the implementation of the European Open Science Cloud initiative.

Amsterdam, 15 November 2018

Yours sincerely,



Dr. Tiziana Ferrari
EOSC-hub Project Coordinator



Gudmund Høst
Director, Dr.Scient.
Nordic e-Infrastructure Collaboration (NeIC)
c/o NordForsk
Stensberggata
25 NO-0170 Oslo
e-mail: Gudmund.host@nordforsk.org

Subject: **Letter of Support**
Our reference: 20181120_001

The Hague, 20 November 2018

Dear Gudmund,

I am writing to express my support to your proposal called "EOSC-nordic" which you intend to submit to address subtopic (b) "*Coordination of EOSC-relevant national initiatives across Europe and support to prospective EOSC service providers*" of the INFRAEOSC-05-2018-2020 Call on "Support to the EOSC Governance".

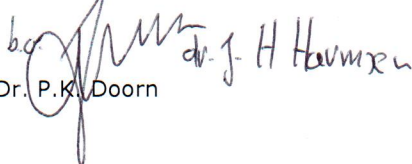
I understand that EOSC-nordic aims to facilitate the coordination of EOSC relevant initiatives within the Nordic and Baltic countries and exploit synergies to achieve greater harmonisation at policy and service provisioning across these countries, in compliance with EOSC agreed standards and practices.

The proposal includes dedicated activities related to FAIR and has an ambitious engagement programme with Nordic & Baltic repositories to improve their awareness of FAIR and their data management practices.

These activities nicely complement the activities of the FAIRsFAIR project which has been funded under the same call and which is coordinated by DANS.

Therefore I warmly welcome the EOSC-nordic initiative and I look forward to working with the project consortium to exploit the outcomes of your activities.

Yours Sincerely,


Dr. P.K. Doorn

DANS promotes sustained access to digital research data. Please visit www.dans.knaw.nl for more information.

Data Archiving and Networked Services (DANS)
Anna van Saksenlaan 51 | 2593 HW The Hague | The Netherlands
+31 (0)70 349 44 50 | info@dans.knaw.nl | www.dans.knaw.nl
KVK 54667089 | DANS is an institute of KNAW and NWO



Latvijas Zinātnes padome

Latvian Council of Science

Zigfrīda Annas Meierovica boulevard 14, Rīga, LV - 1050, phone 67228421, fax 67228421, e-mail lzp@lzp.gov.lv, www.lzp.gov.lv

Rīga, November 20, 2018

To whom it may concern

Letter of Support

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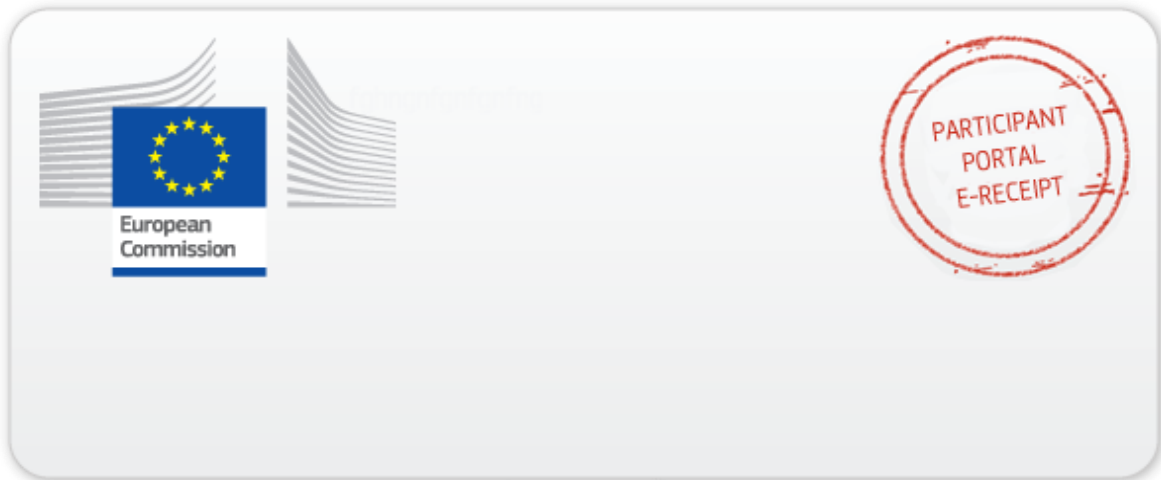
We are familiar with the plans to submit a proposal EOSC-Nordic to the INFRAEOSC-05-2018-2020 subtopic (b) from the Nordic countries including Latvia with NeIC/NordForsk as coordinator.

Being governed by national e-infrastructure provider organisations, we regard NeIC as a natural coordination body for common Nordic activities towards EOSC, such as the coordination of a project under the call referred to above.

This Letter of Support does not hold any financial commitments.

Jānis Kloviņš

The Chairman



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