Bulgarian contribution to the EOSC (NI4OS-Europe, EGI-ACE and Skills4EOSC)

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EuroCC Conference:
HPC for the benefit of researchers and society,
Sofia, 21-22 November 2022

Project administrative summary

- Име: ***Национални инициативи за отворена наука в Европа***
- Акроним: ***NI4OS-Europe*** (произнася се “НИФОС”)
- Конкурс: INFRAEOSC-05 (b) *Координация на национални инициативи, свързани с EOSC в цяла Европа и подкрепа за потенциални доставчици на услуги към EOSC* – научни и иновационни дейности
  - Финансирани са 4 регионални проекта: EOSC-Pillar, EOSC-Synergy, EOSC-Nordic, NI4OS-Europe
- 22 партньорски организации + 2 организации като „third party“ от общо 15 държави
- Регионален контекст: 16 години успешно сътрудничество в широк регион
  - Страни-членки на ЕС: България, Гърция, Кипър, Румъния, Хърватия, Словения, Унгария
  - Западните Балкани
  - Източното Средиземноморие
  - Южен Кавказ

Цели

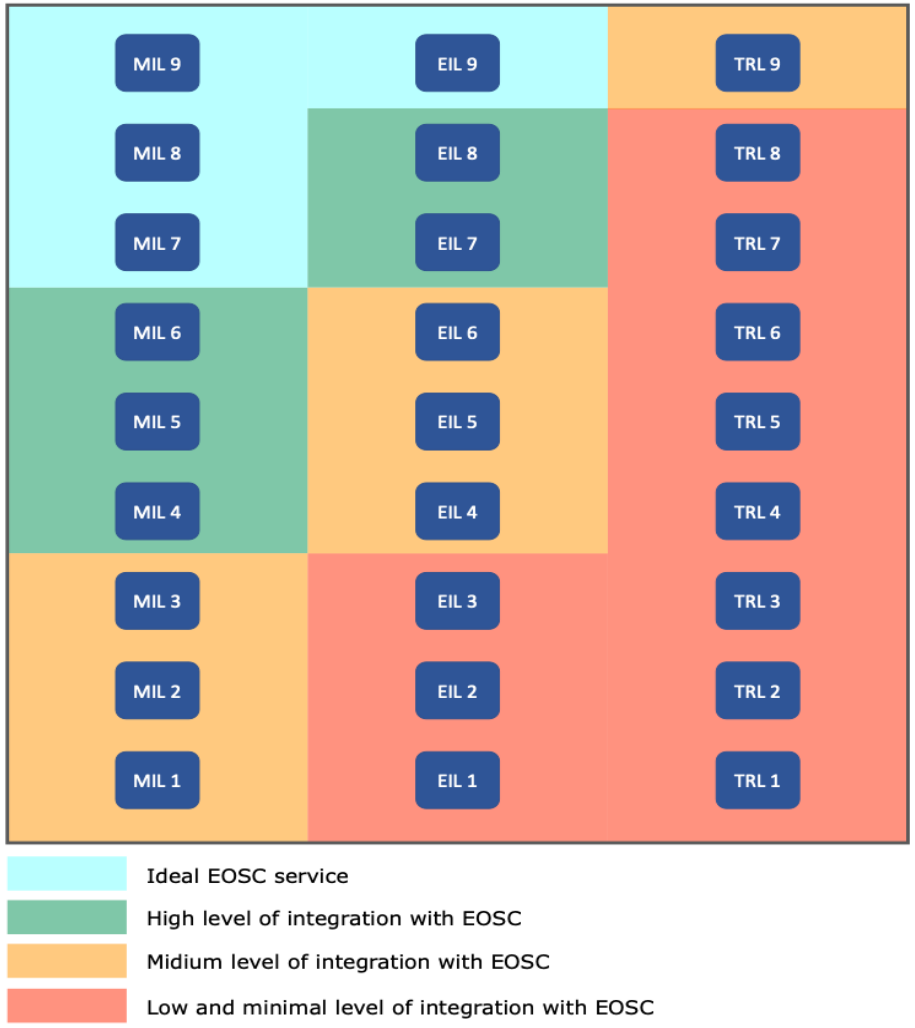
Подкрепа за развитието и включването на националните облачни инициативи за отворена наука (OSC) в 15 страни-членки и свързани страни към цялостната схема на управление на EOSC

Разпространение на принципите на EOSC и FAIR в общността и обучението ѝ

Осигуряване на техническа поддръжка и подкрепа за създаване на политики за приобщаване на съществуващи и бъдещи доставчици на услуги към EOSC

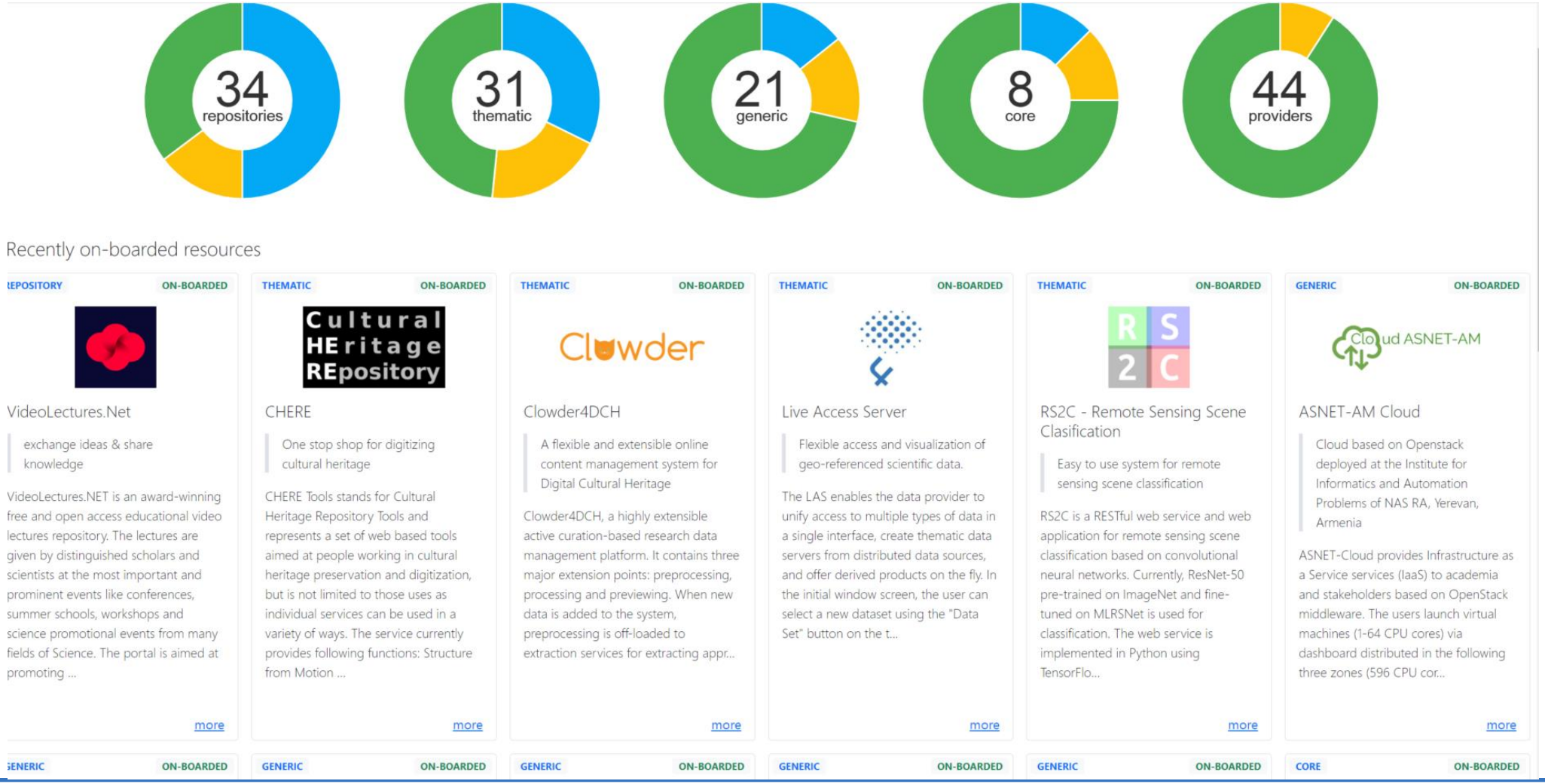
Service Integration levels /Нива на интеграция на услугите

- NI4OS-Europe използва следната категоризация на услугите:
  - Technology Readiness Levels (TRL)
  - EOSC Integration Levels (EIL)
  - Management Integration Levels (MIL)
- Тези три категоризации се използват за оценка на готовността за включване в EOSC на всички услуги, които предлагаме.
- Процес на присъединяване (On-boarding) – 5 основни стъпки.
- Представителство (ИИКТ) в EOSC-A Task Force: „Technical Interoperability of Data and Services“.

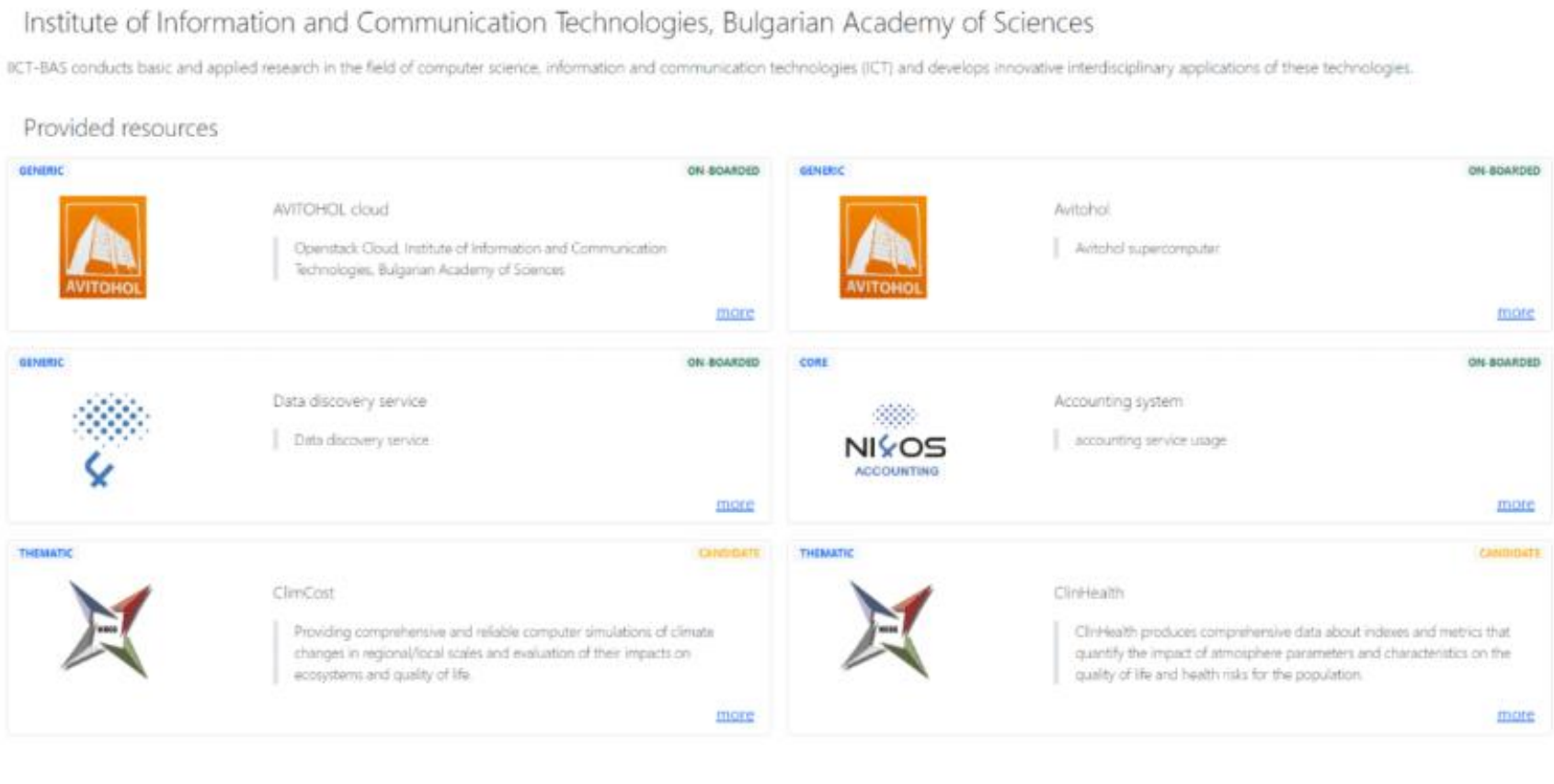


NI4OS-Europe каталог на услугите

- https://catalogue.ni4os.eu/

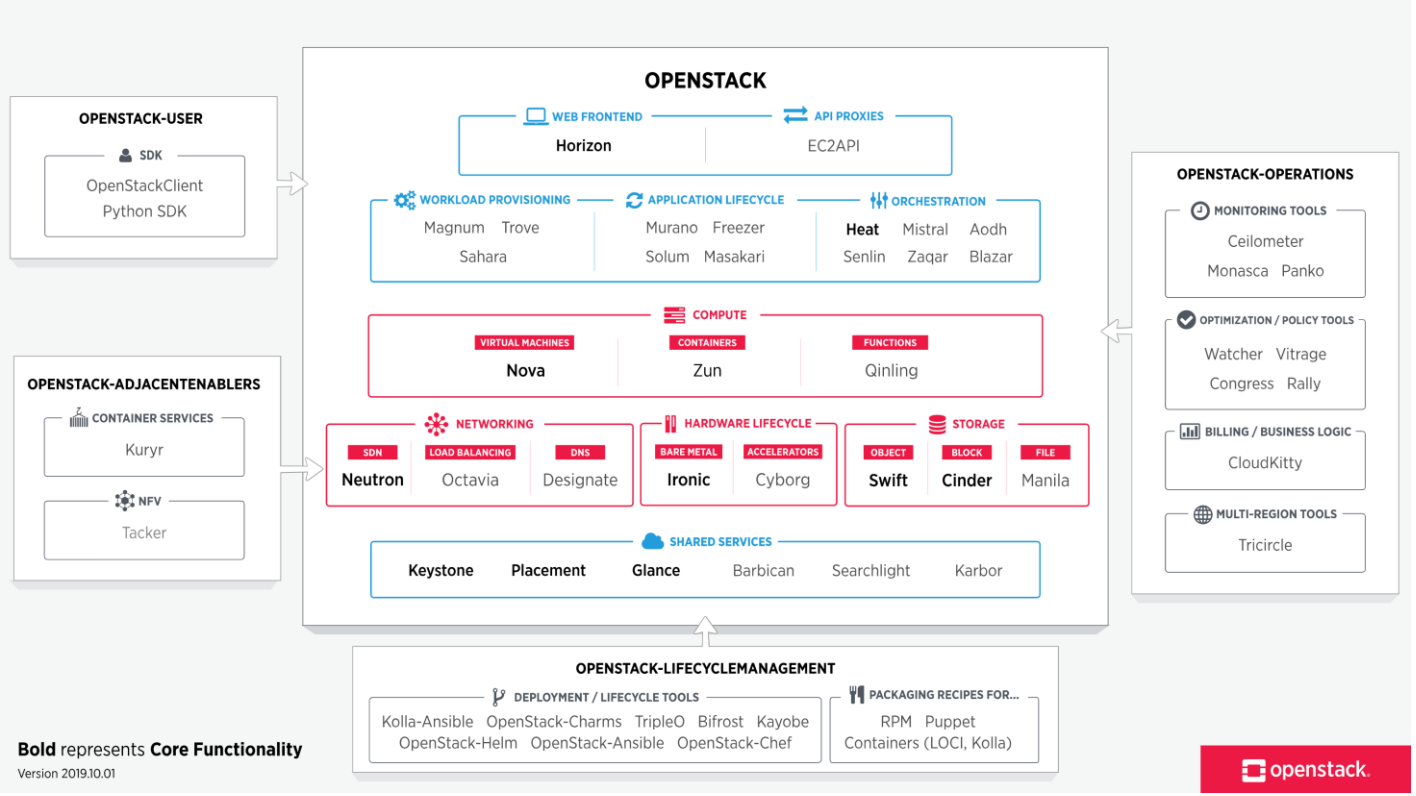


Bulgarian services visible in NI4OS-Europe catalogue



Services using Avitohol

- Two types of services using Avitohol
  - Direct HPC access, using all the supercomputing features
  - Cloud-based access



АВИТОХОЛ

Високопроизводителна изчислителна сиситема – Авитохол в списъка ТОП500 (388-мо място, ноември 2015).

Общ преглед на системата

АВИТОХОЛ се състои от 150 сървъра от платформата HP Cluster SL250S GEN8, всеки с по 2 Intel Xeon E2650v2 процесора и 2 копроцесора Intel Xeon Phi 7120P.

Местоположение: ИИКТ-БАН/Авитохол

Производител: Hewlett-Packard

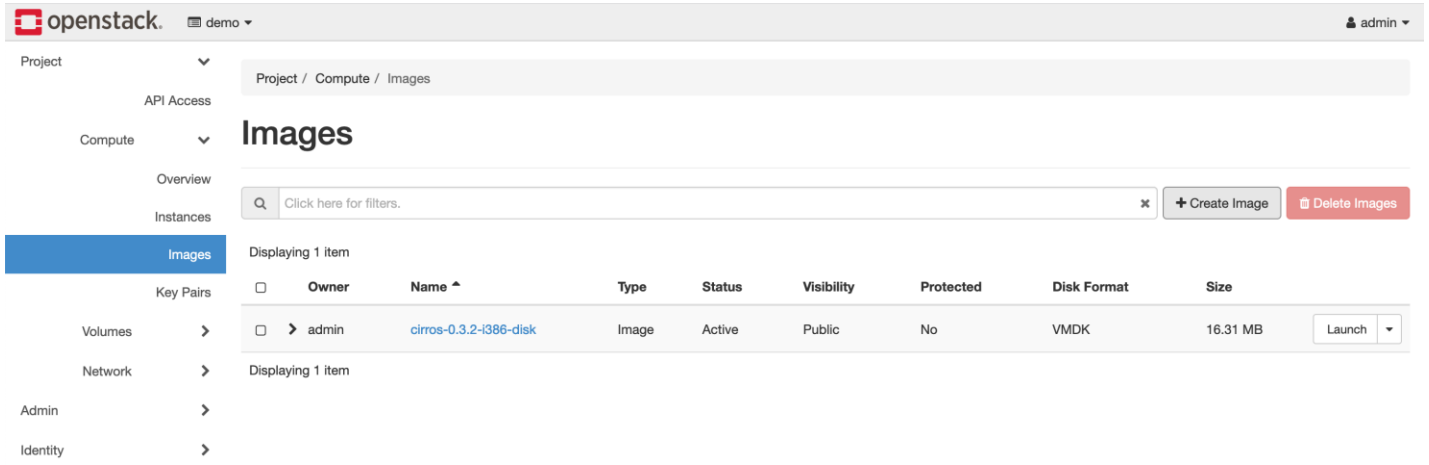
Брой ядра: 20700

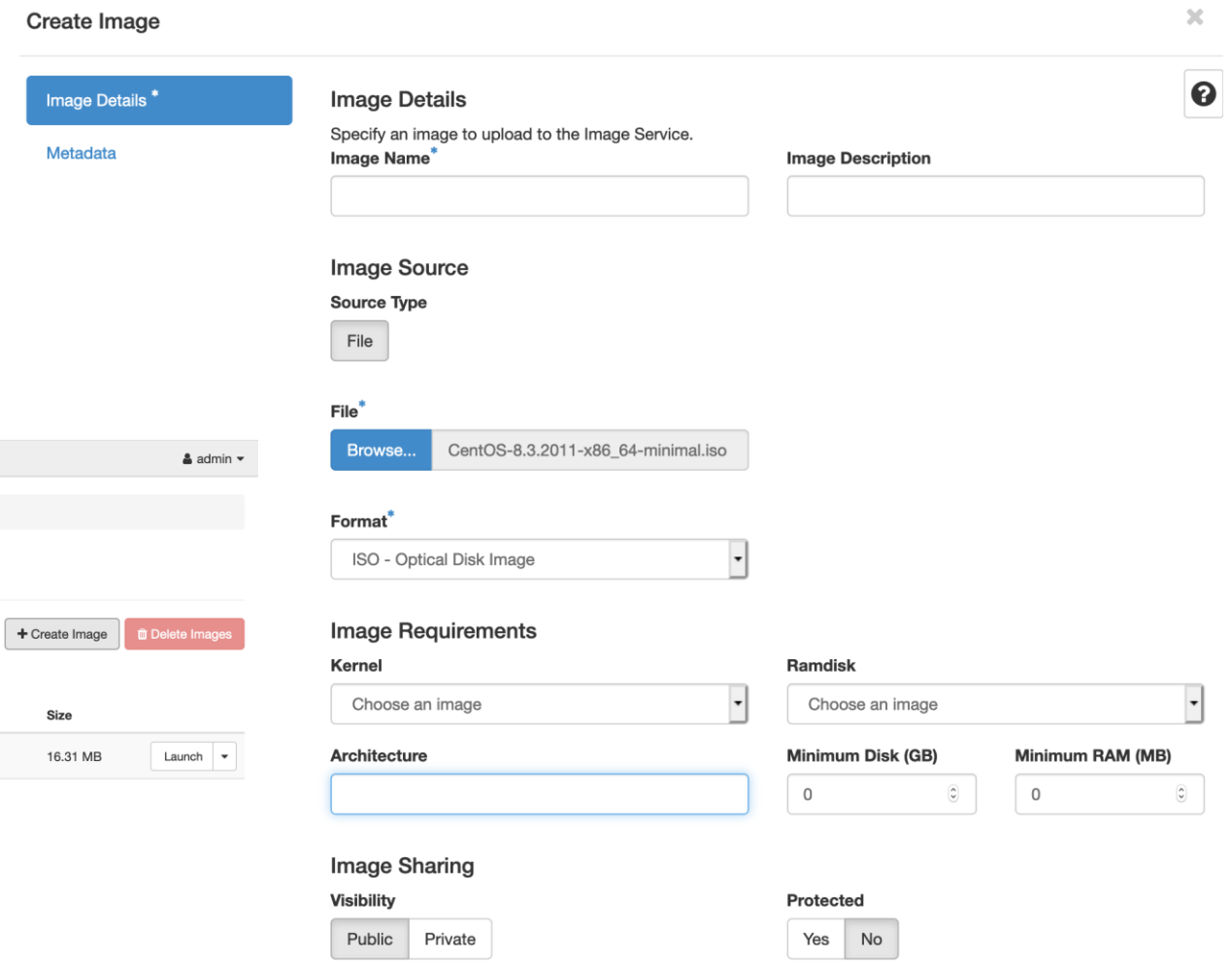
Свързаност: FDR InfiniBand

Cloud-based access to Avitohol

Navigate to Project > Compute > Images

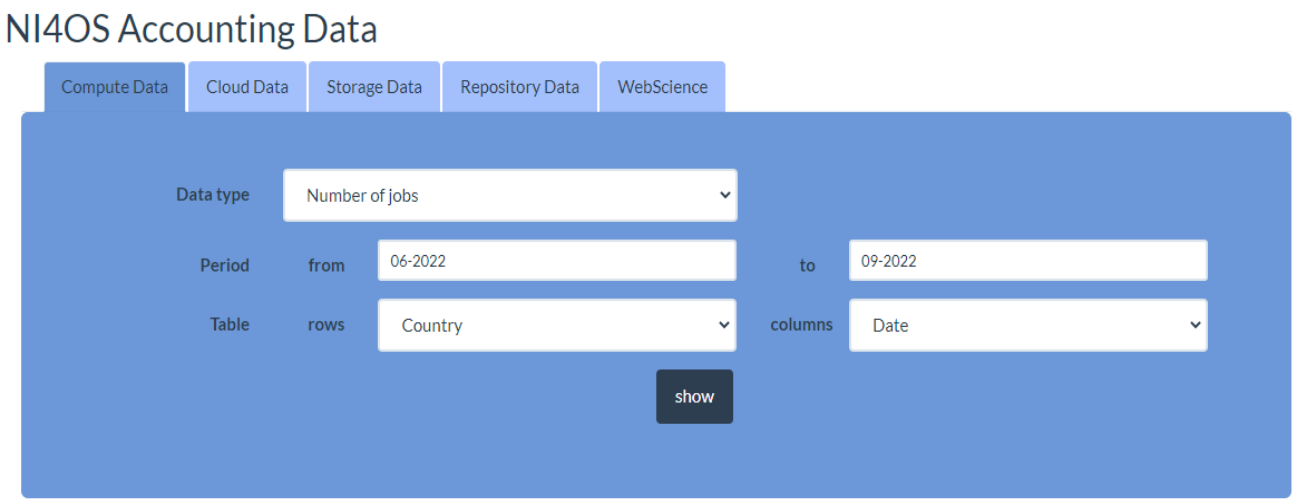
- Create New Image
- Browse filesystem image (ISO, QCOW2, etc.)





Accounting

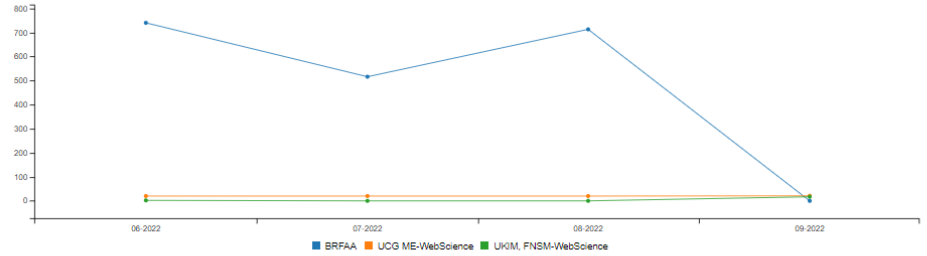
- The accounting service collects information about the usage of the services in the infrastructure



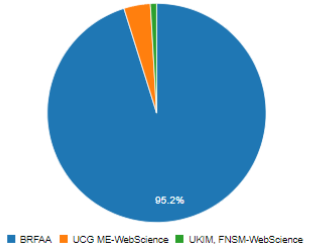
resource	06-2022	07-2022	08-2022	09-2022
BRFAA	740	516	713	0
UCG ME-WebScience	20	20	20	21
UKIM, FNSM-WebScience	2	0	0	17

Showing 1 to 3 of 3 entries CSV Excel

webscience usage by Resource name and Date

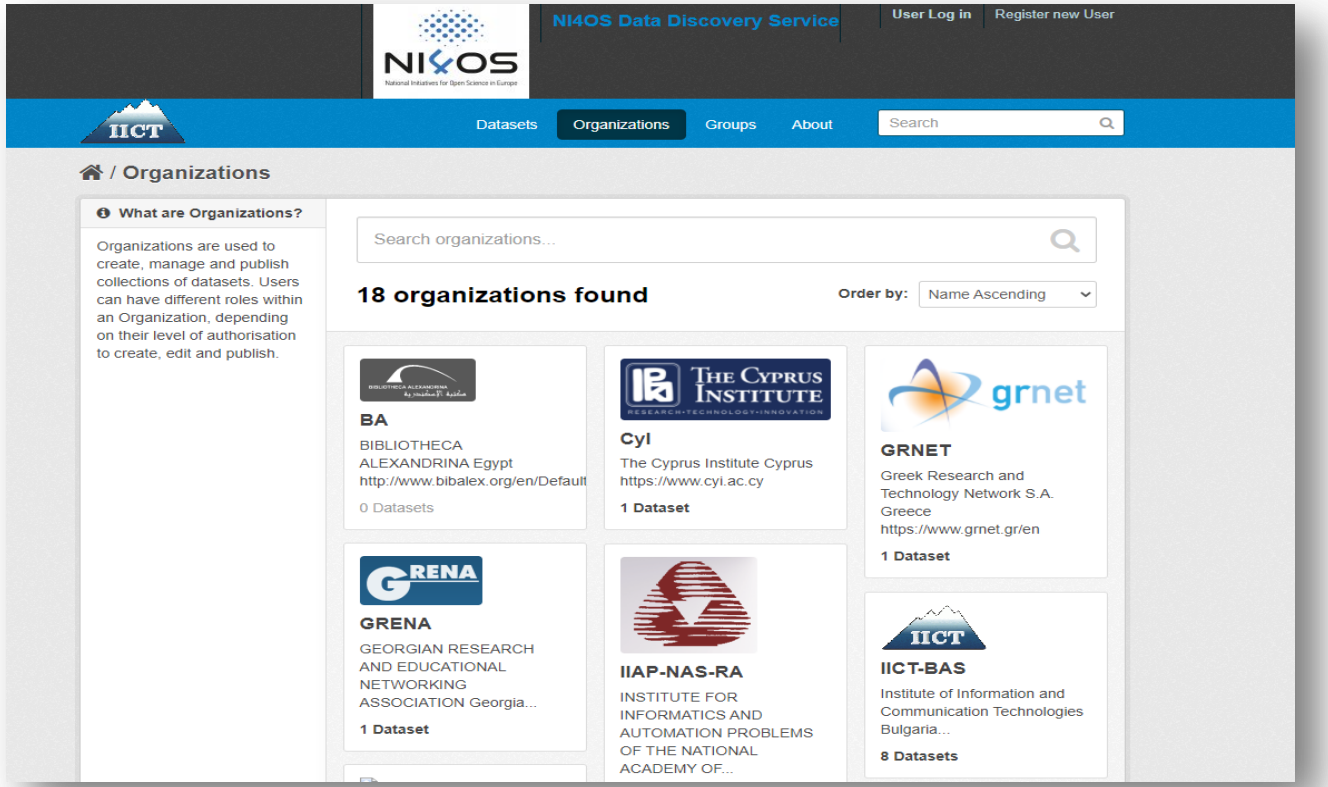


webscience usage by Resource name

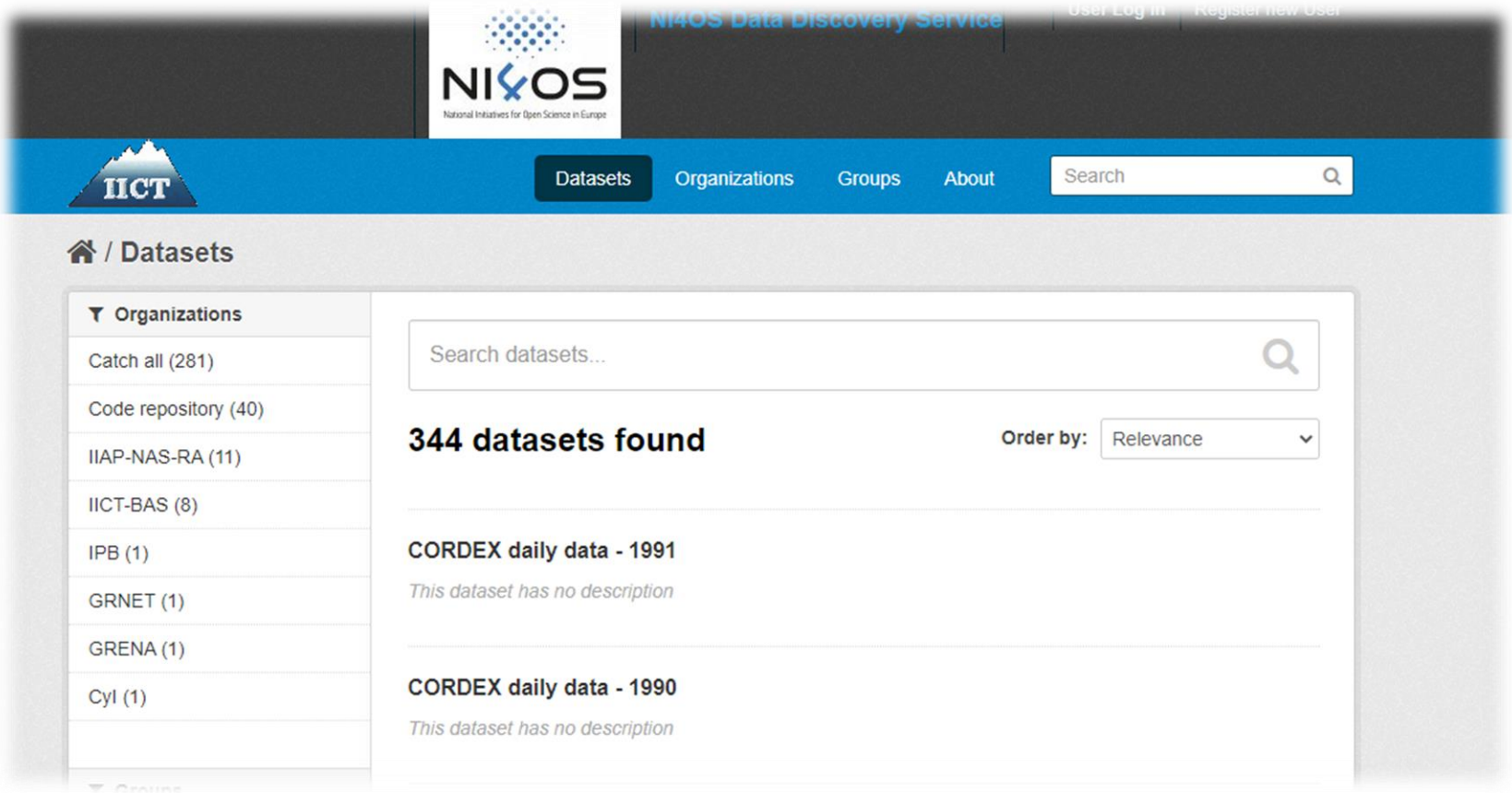


NI4OS Data Discovery Service

- https://search.vi-seem.eu/
- Developed by IICT-BAS. Ensures powerful metadata search within datasets.
- Can be used to share and search for datasets of different types, using metadata

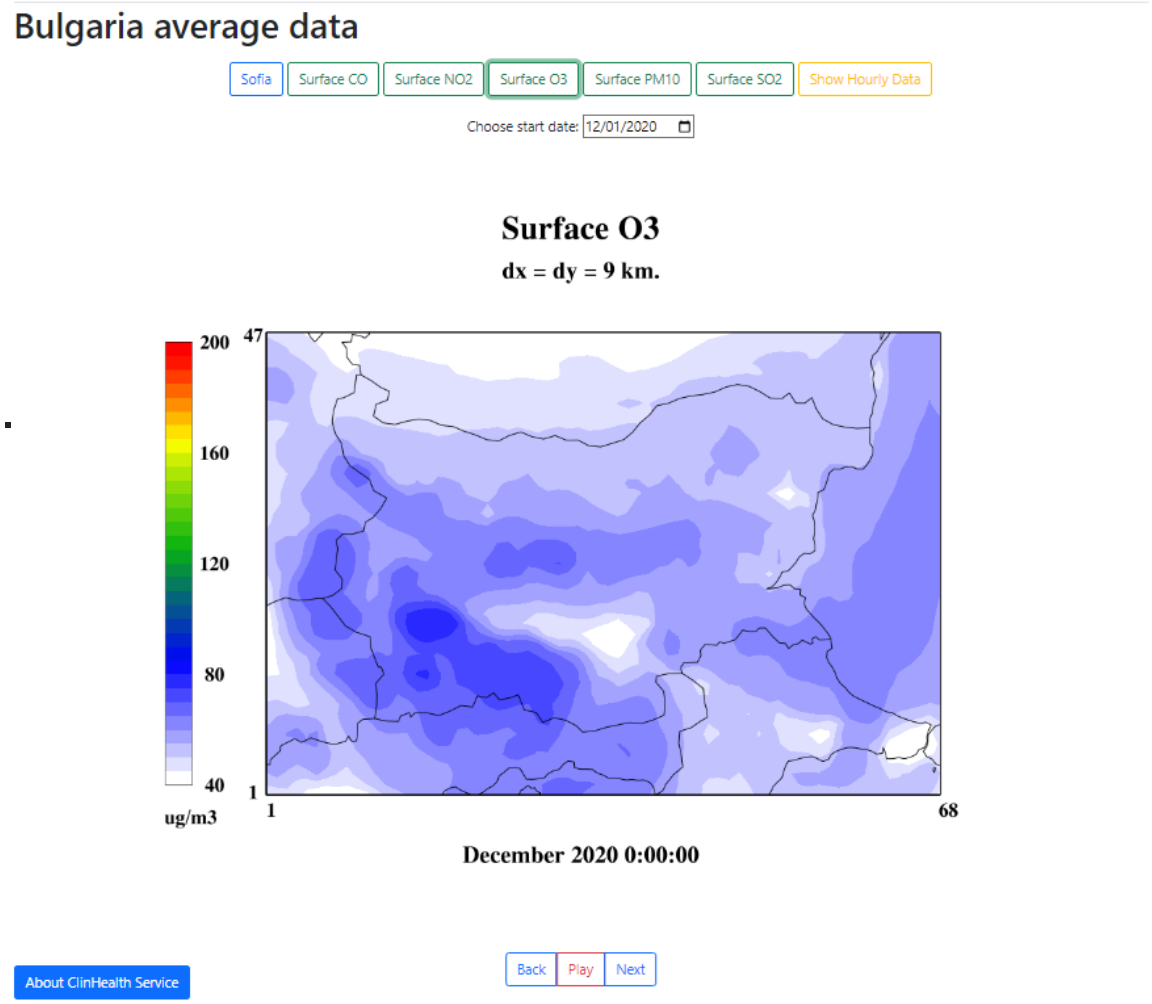


NI4OS Data Discovery Service



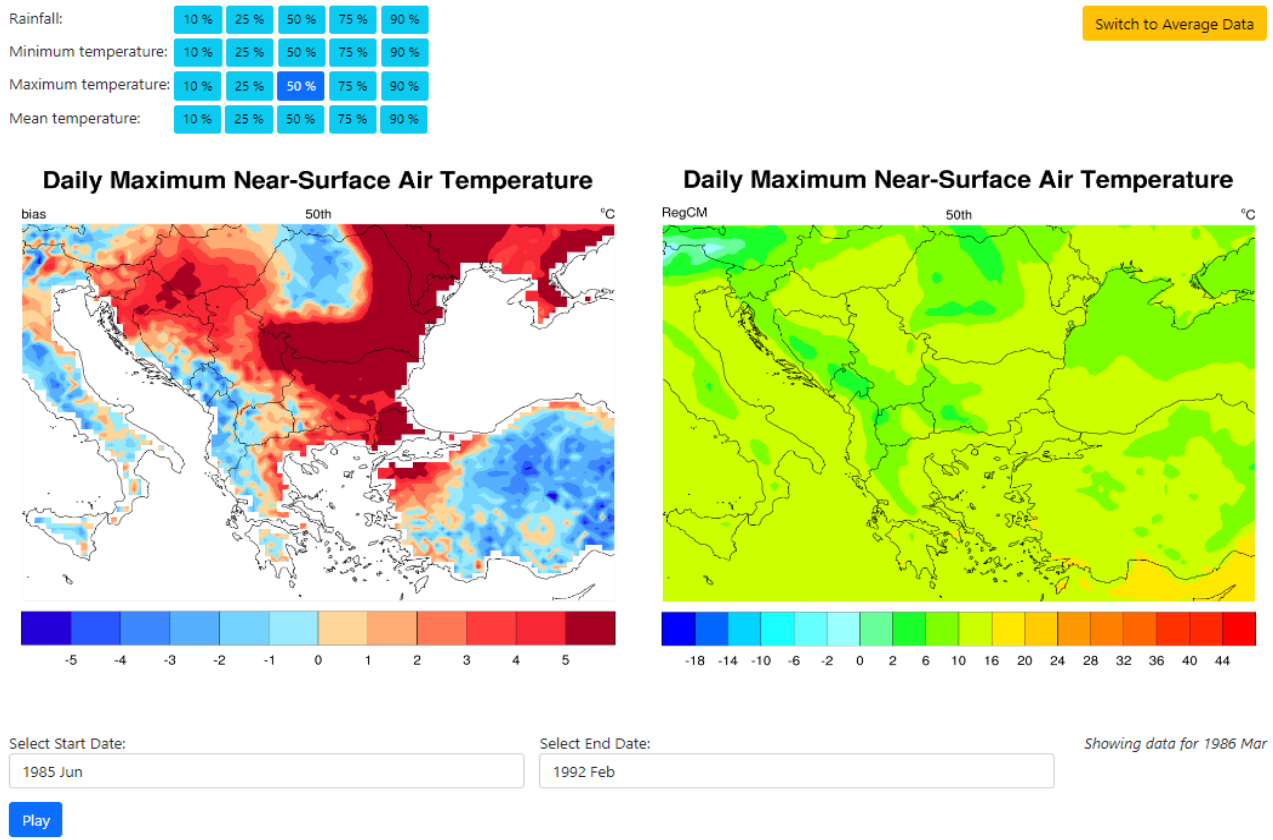
ClInHealth thematic service

- ClInHealth предоставя изчерпателни данни за индекси и метрики, които определят количествено въздействието на атмосферни параметрите и характеристиките върху качеството на живот и здравните рискове за населението.
- Услугата генерира надеждни, изчерпателни и детайлни изследвания за влиянието на параметрите и характеристиките на ниските атмосферни условия върху качеството на живот и рисковете за здравето на населението у нас.
- Разработена от НИГГГ-БАН



ClimCoSt thematic service

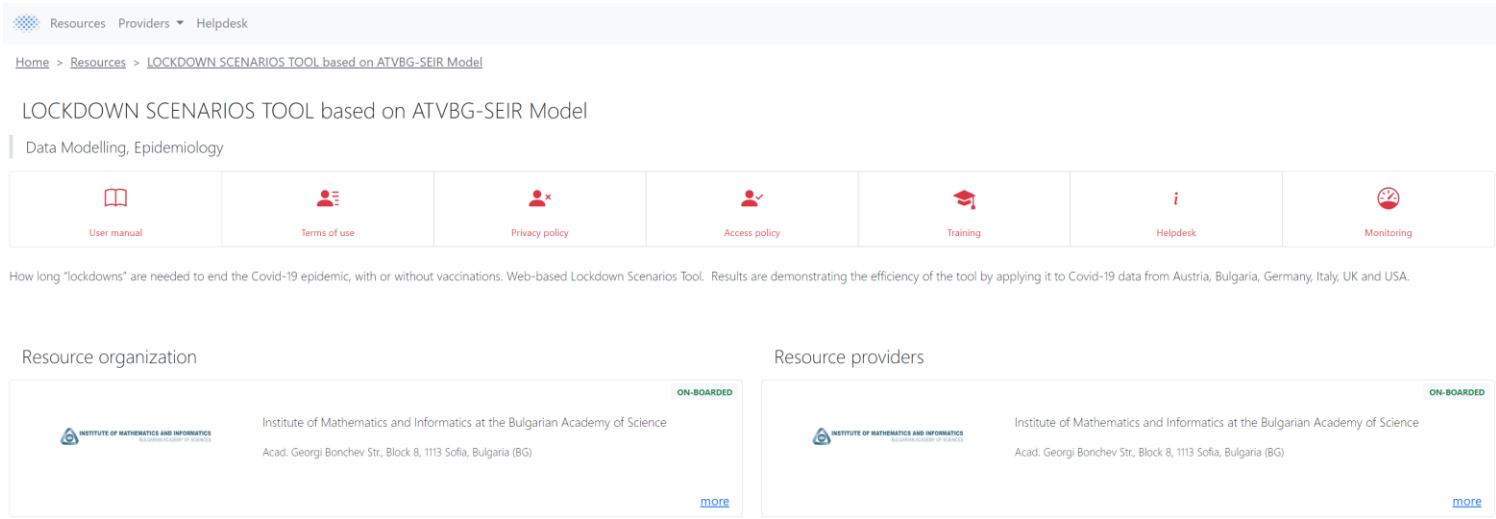
- ClimCoSt предоставя изчерпателни и надеждни компютърни симулации на промените в климата в регионален/местен мащаб и оценка на тяхното въздействие върху екосистемите и качеството на живот.
- Услугата произвежда надеждни, изчерпателни и подробни оценки на възможни регионални/местни промени в климата и техните последствия за различни сценарии на глобална промяна.
- Разработена от НИГГГ-БАН



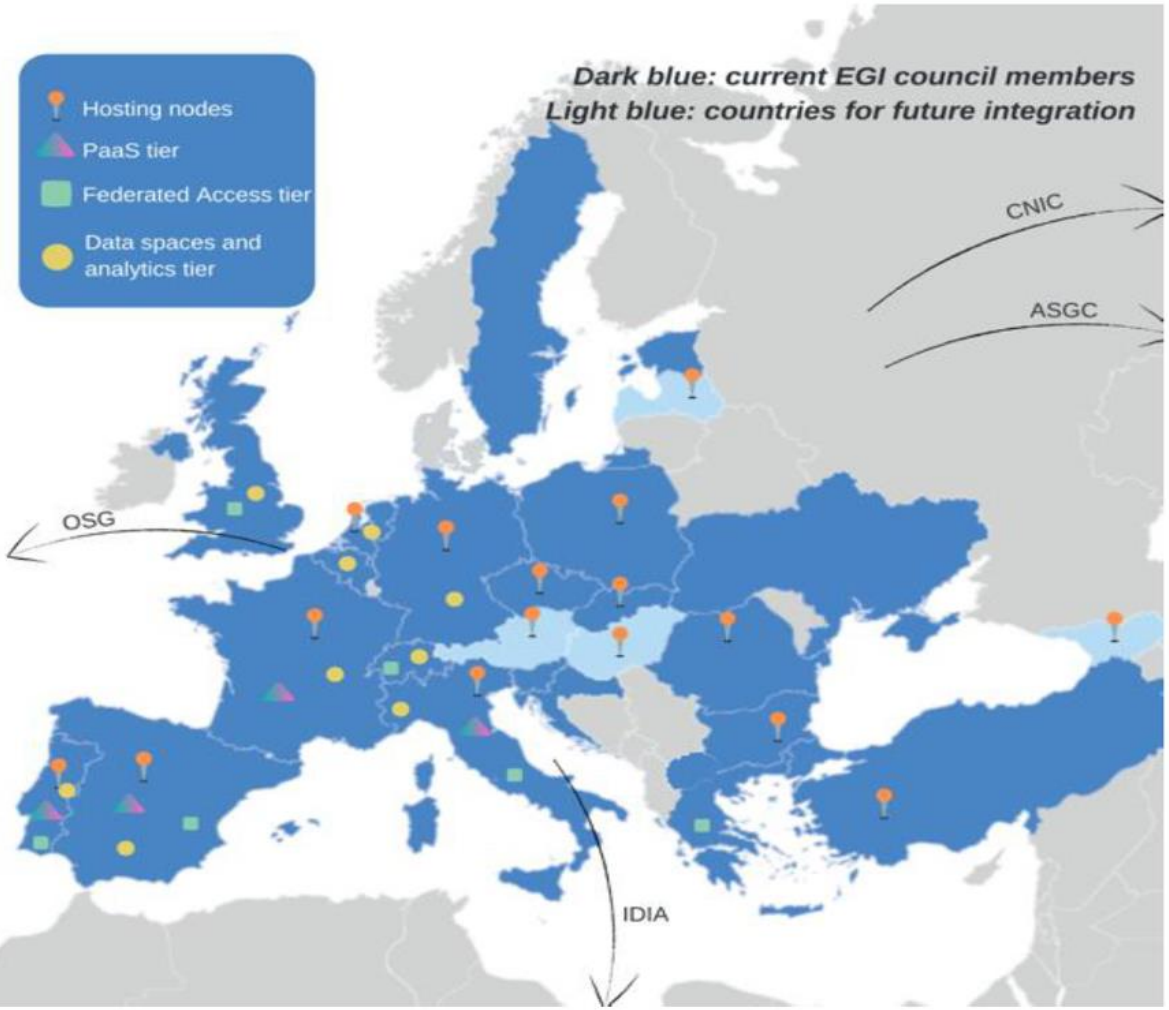
Services from IMI

- Lockdown Scenarios tool based on ATVBG-SEIR Model
  - How long “lockdowns” are needed to end the Covid-19 epidemic, with or without vaccinations. Results are demonstrating the efficiency of the tool by applying it to Covid-19 data from Austria, Bulgaria, Germany, Italy, UK and USA.
  - Repository - Bulgarian Digital Mathematics Library (BulDML) at IMI-BAS

http://sci-gems.math.bas.bg/



Project Overview



EGI Advanced Computing for EOSC
Grant agreement ID: 101017567

Budget

- Total budget: € 12,009,988
- EC budget: € 8,000,000

Consortium

- Coordinator - Stichting EGI
- 33 Partners, 23 third parties

Effort

- 1472 PMs, 48 FTEs
- **49% Virtual Access** (35 services, 38 providers)

Duration

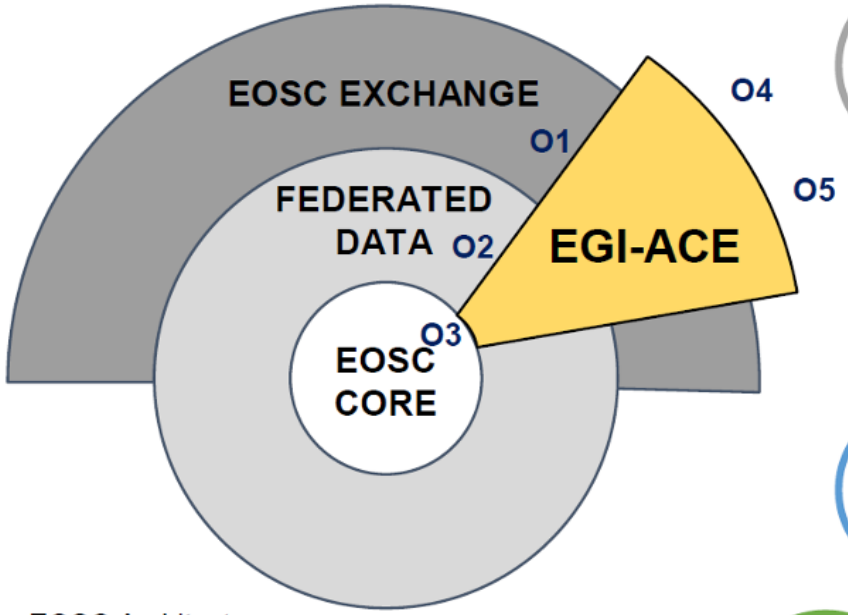
- Jan 2021 - June 2023 (30 months)

EGI-ACE Mission

Implement the **Compute Platform of the EOSC** and contribute to the **EOSC Data Commons** by delivering integrated computing, platforms, data spaces and tools as an integrated solution that is **aligned with** major European cloud federation projects and HPC initiatives.

Внедряване на компютърната платформа за EOSC и допринасяне за общите (FAIR) данни на EOSC, като предоставя интегрирани изчисления, платформи, услуги за данни и инструменти като интегрирано решение, което е в съответствие с европейските проекти за облачна ферерация и HPC инициативи.

Project Objectives



EOSC Architecture:
Solutions for a sustainable EOSC
(report from the EOSC Sustainability WG)

O1 Deliver the European Open Science Cloud Compute Platform and expand the supply-side

O2 Contribute to the implementation of the EU Data Strategy and the EOSC Data Commons to support the Green Deal, Health and Fundamental Research

O3 Integrate the EOSC Compute Platform with the EOSC Portal and the EOSC Core

O4 Contribute to the realization of a global Open Science Cloud

O5 Expand the demand-side of EOSC across sectors and disciplines

Federated Infrastructure Services

Distributed compute and storage facilities deliver CPU, GPU and Storage

- 27 Cloud providers: **15** funded with Virtual Access, 23 support EGI-ACE use cases
- 200+ HTC providers: **1** funded with Virtual Access, 58 support EGI-ACE use cases
- 4 pilot level HPC centres (BG, TR, PT, ES)

Cloud Compute

High-Throughput Compute

HPC

HPC Integration handbook:
https://zenodo.org/record/6396471

Task 7.3 - HPC integration in EGI-ACE

***Objective**: Provide interoperability guidelines for HPC systems with the EOSC Compute Platform delivered by EGI-ACE*

Explore the usage and integration of HPC guided by 4 scientific pilot use cases with combined cloud and HPC needs, focusing on the areas of:

1. Access federation: Federated Authentication and Authorization
2. Application federation: Portable execution of container-based workloads
3. Data federation: Data transfers between systems
4. Operation federation: Presence in EOSC Portal, A/R monitoring, Usage accounting, Resource allocation, CRM…

HPC as a Service

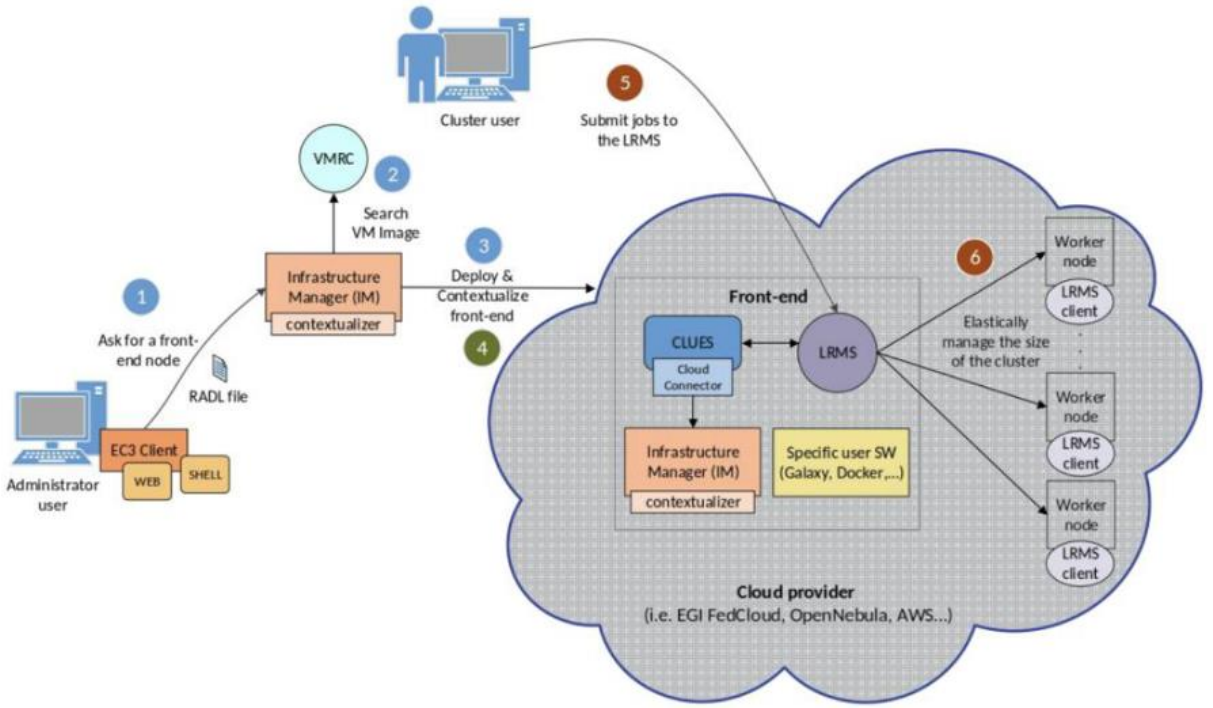
Use existing cloud APIs to create virtual infrastructures with HPC Capabilities

- PCI Passthrough for specialised hardware like GPU and infiniband
- Tools developed for proper configuration of devices at nodes

Deploy elastic clusters with EC3

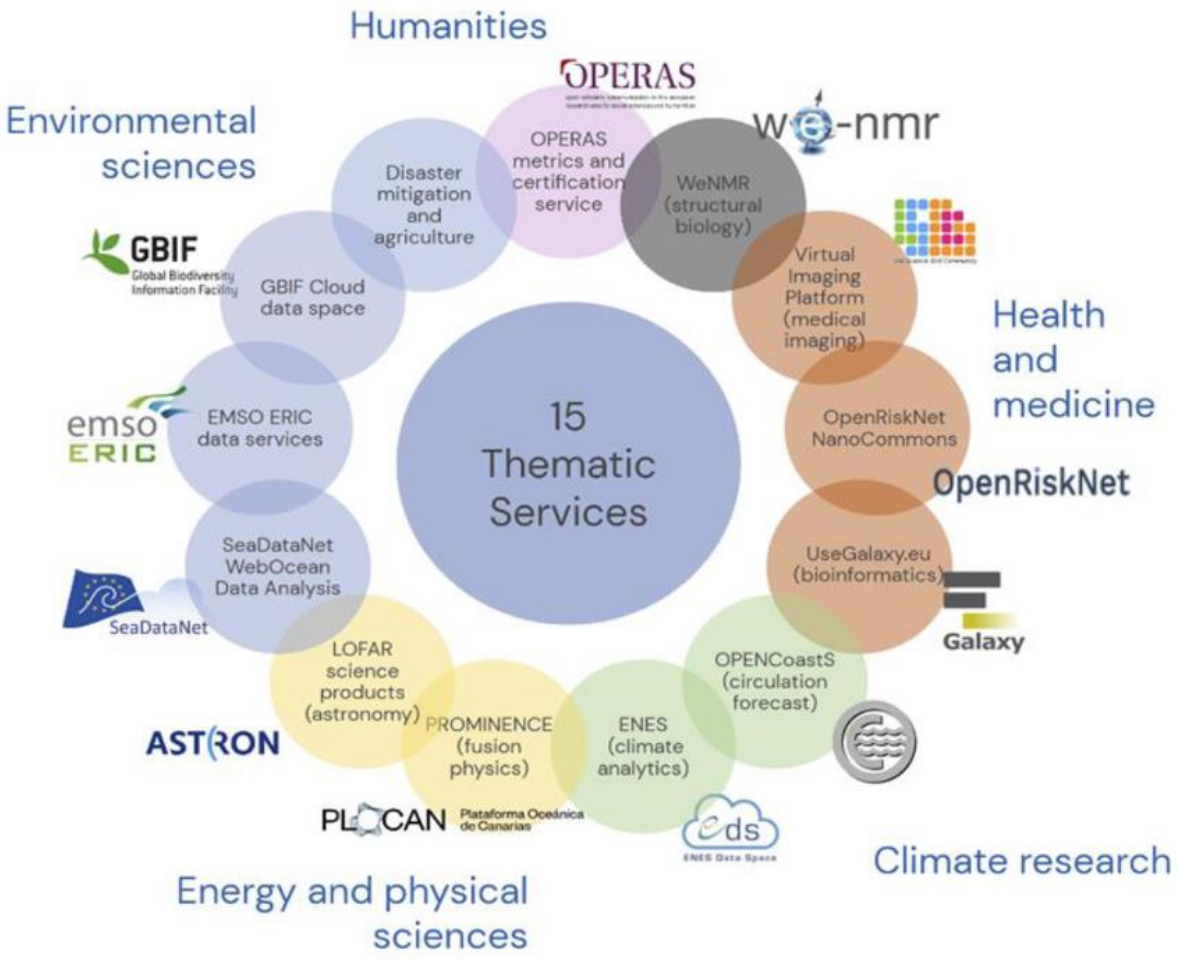
- SLURM + shared filesystem
- Automatic elasticity of worker nodes based on load (e.g. number of pending jobs)

Ideal for testing & development, training environments

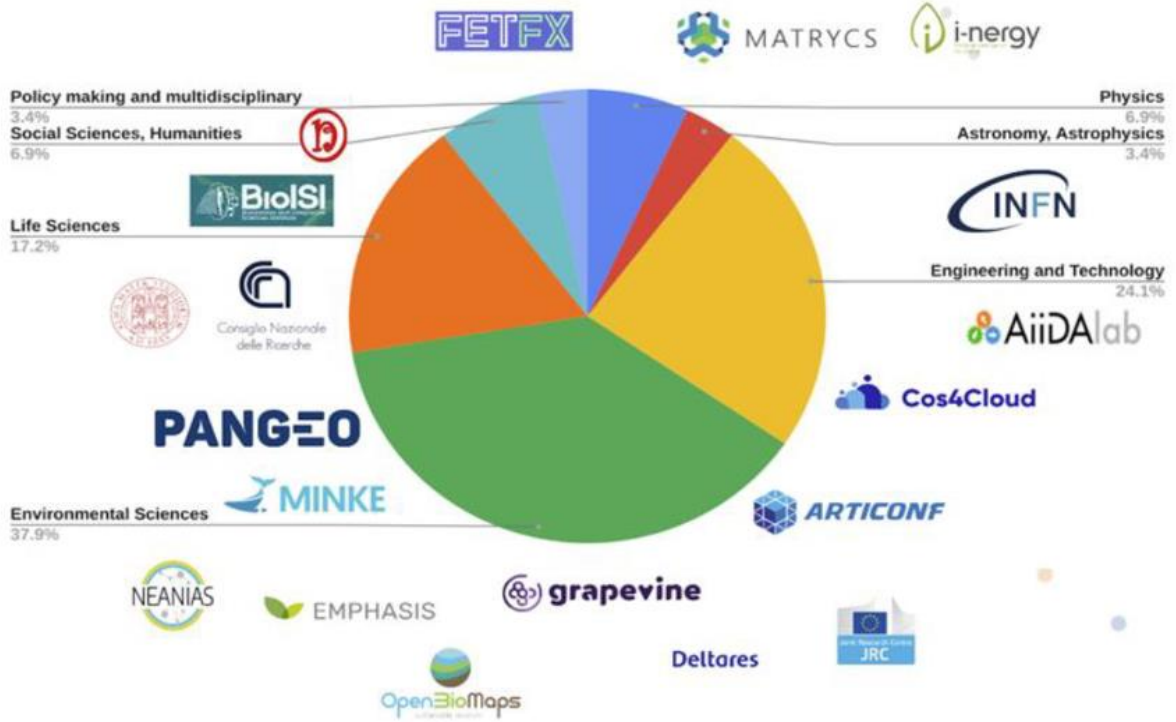


EC3 https://servproject.i3m.upv.es/ec3/

Thematic applications and application services



In the consortium



External users

EGI-ACE: Main Activities and Achievements

- Service delivery in EOSC:
  - **35** services from the consortium
  - **8** services from external providers - empowered by our services
- Integration of Thematic Services:
  - **15 Thematic Services** (VREs, Data Spaces)
- Number of users of EGI-ACE services:
  - **76,000** on Thematic Services
  - **1,300** on the Platform and Infrastructure services

Our vision for a ‘Collaborative Compute Continuum’

International research infrastructures and projects

eli · EISCAT 3D · SKA SQUARE KILOMETRE ARRAY · CLARIN · EPOS EUROPEANPLATEOBSERVINGSYSTEM · European XFEL · ess EUROPEAN SPALLATION SOURCE · E-RIHS EUROPEAN RESEARCH INFRASTRUCTURE FOR HERITAGE SCIENCE

Service Level Agreement

eosc

Resource brokering
and **access support**
Shepherds and Competence Centres

EGI-ACE

Technical federation
Identity portability + Data portability + Application portability

Operation Level Agreement

e.g:

EGI · EuroHPC Joint Undertaking · EOSC Future

National and international compute infrastructures

Aligned science and compute priorities

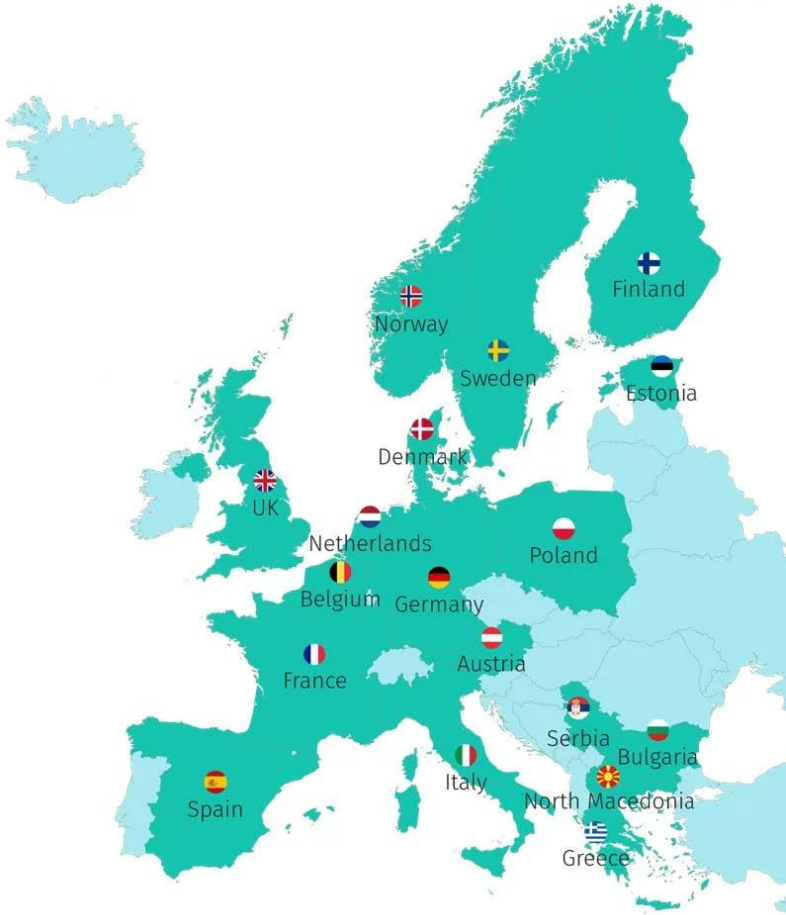
Project administrative summary

Skills 4 eosc
Skills for the European Open Science Commons

Supporting eosc
Funded by the European Union

Skills4EOSC has received funding from the European Union's Horizon Europe research and innovation Programme under Grant Agreement No. 101058527.

- Skills4EOSC, Grant agreement ID: 10158527, HE EC
- **Budget:** EC funding: €6 476 658
- **Consortium:**
  - 44 **Participants**, 18 **Countries** ("**Key doers**" in Open Science in their Country/Region/Domain)
  - 2 ESFRI Research Infrastructures
  - GARR (Italy) is the coordinator
- **Effort**: 761 PMs, ≈ 63.5 FTEs
- **Duration**: Sept 2022 – Aug 2025 (36 months)



WP1 - Project Management

MAPPING&METHODOLOGY.....UPSKILLING.....EXPLOITATIO

WP2 - OS career profiles, skillsets and material - landscaping, certification and QA

- **Mapping skills Vs profiles**
- **Methodology for FAIR material+lifecycle**
- **Schemes for the certification/accreditation of acquired competences**
- **co-creation and monitoring**

WP4 Curricula and career paths

- Academic paths (undergraduate, postgraduate, PHD, postdoc specialization)
- Structured training paths for data professionals

WP3 OS training for evidence-based policy &PA

- paths for civil servants, policy makers, and to empower researchers to communicate with them

WP5 Thematic Training for RIs professionals and communities

- RI professionals
- Infrastructure professionals
- Research communities: SSH, Solid Hearth, Climate change, Museums
- Legal & Ethics professionals

WP6 Peer Networks

- Peer Networks for professionals
- Thematic Peer Networks

ACADEMIC PATHS ....

PROFESSIONAL TRAINING ...

INFORMAL LEARNING

WP8 SND Synergies, Engagement comms advocacy

- promoting Outputs
- Furthering activities at the national/regional level
- gaining support
- creating sustainability for national initiatives

WP7: Competence centres and user support network

coordination and harmonisation - platforms & tools - exchange of competences - sustainability

Curricula and Learning paths for open science

WP4 Goal

Building curricula and learning paths for *Open Science ready Institutions*.

- Undergraduate students and PhDs
- Data stewards and data professionals
  - Data librarian and curators
  - Legal and ethical experts.

Objectives of WP4

Design harmonised **curricula and learning paths** for **OS professionals**, to ensure alignment, uniformity, quality and recognition of the acquired competences across Europe and beyond.

Define "OS essentials" to include in undergraduate and PhD courses and support professionals

Foster an **OS ecosystem** where researchers, public servants, and data stewards align curricula, training, practices and needs to make Open Science happen

Deliver **TTT (train-the-trainers) courses** for staff in competence centres and beyond

Tasks

- T4.1 Training curriculum for data stewards
- T4.2 Learning paths for data professionals
- T4.3 OS essentials at undergraduate level
- T4.4 OS ready PhD curricula
- T4.5 Integrating ELSI in curricula and learning paths for OS ready institutions

WP8: Synergies, stakeholder engagement, advocacy, and communications

Objectives

a) Engage with key stakeholders, including funding agencies, policymakers, and civil servants and implement co-creation and feedback strategy with the OS community

b) Promote the uptake of curricula, methodologies, QA & certification frameworks

c) Liaise and establish synergies with relevant EOSC-related initiativies & projects

d) Create synergies with national/regional/EU programmes relevant for OS to support longer-term sustainability and recognition of career profiles and QA & certification schemes

e) Liaise with the EOSC governance and contribute to achieve the EOSC Partnership goals

f) Commmunicate the project objectives and disseminate its key outputs

Tasks

T8.1 Stakeholder engagement

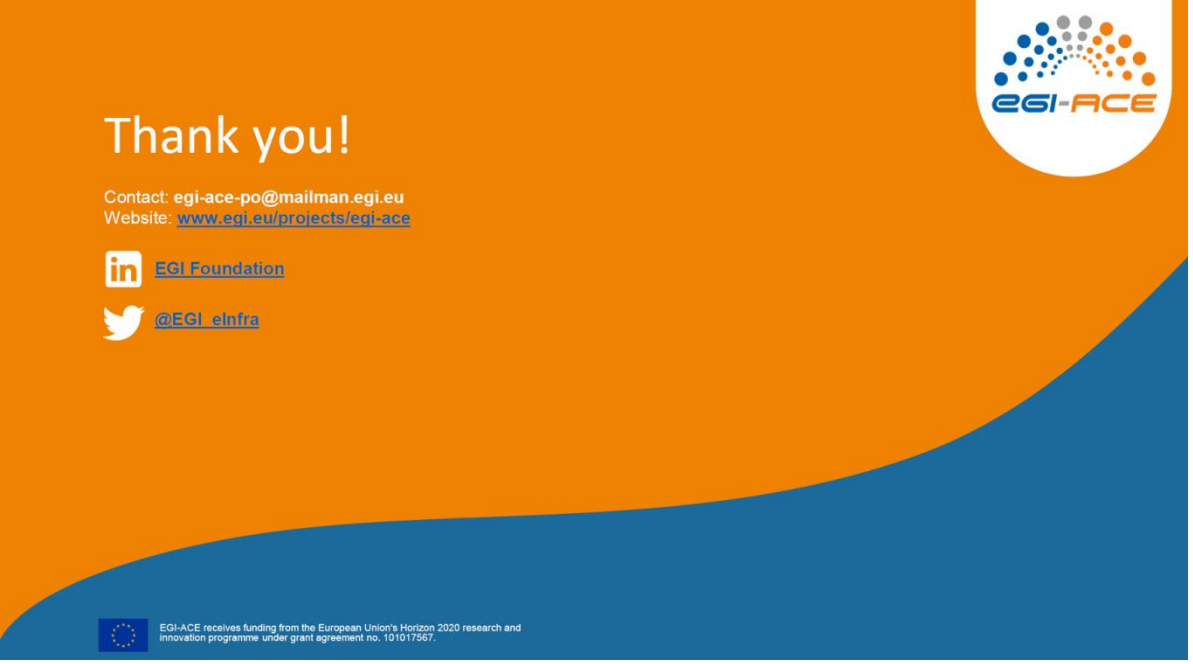
T8.2 Synergies with EOSC-relevant projects & initiatives

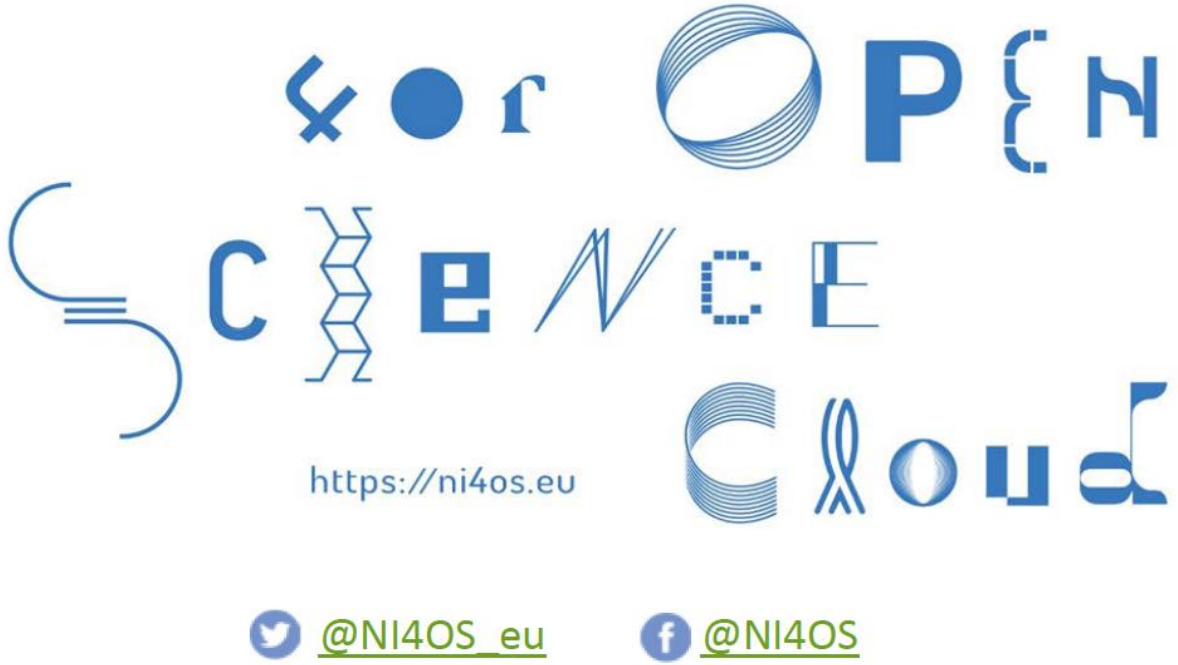
T8.3 Enabling synergies with national, regional and EC programmes and funding streams

T8.4 Liaison with the EOSC Partnership

T8.5 Advocacy kit for reaching out to funders and policy makers

T8.6 Communications and outreach





QUESTIONS ?

https://www.skills4eosc.eu/

https://twitter.com/Skills4Eosc