

# C-SCALE

EOSC Marketplace ask me anything  
webinar

Nikos Triantafyllis GRNET (ntriantafyl@grnet.gr)



with



The EOSC Future, C-SCALE, DICE, EGI-ACE, OpenAIRE-Nexus and Reliance projects are funded by the European Union Horizon Programme calls INFRAEOSC-03-2020 and INFRAEOSC-07-2020.





# High Performance Computing (HPC)

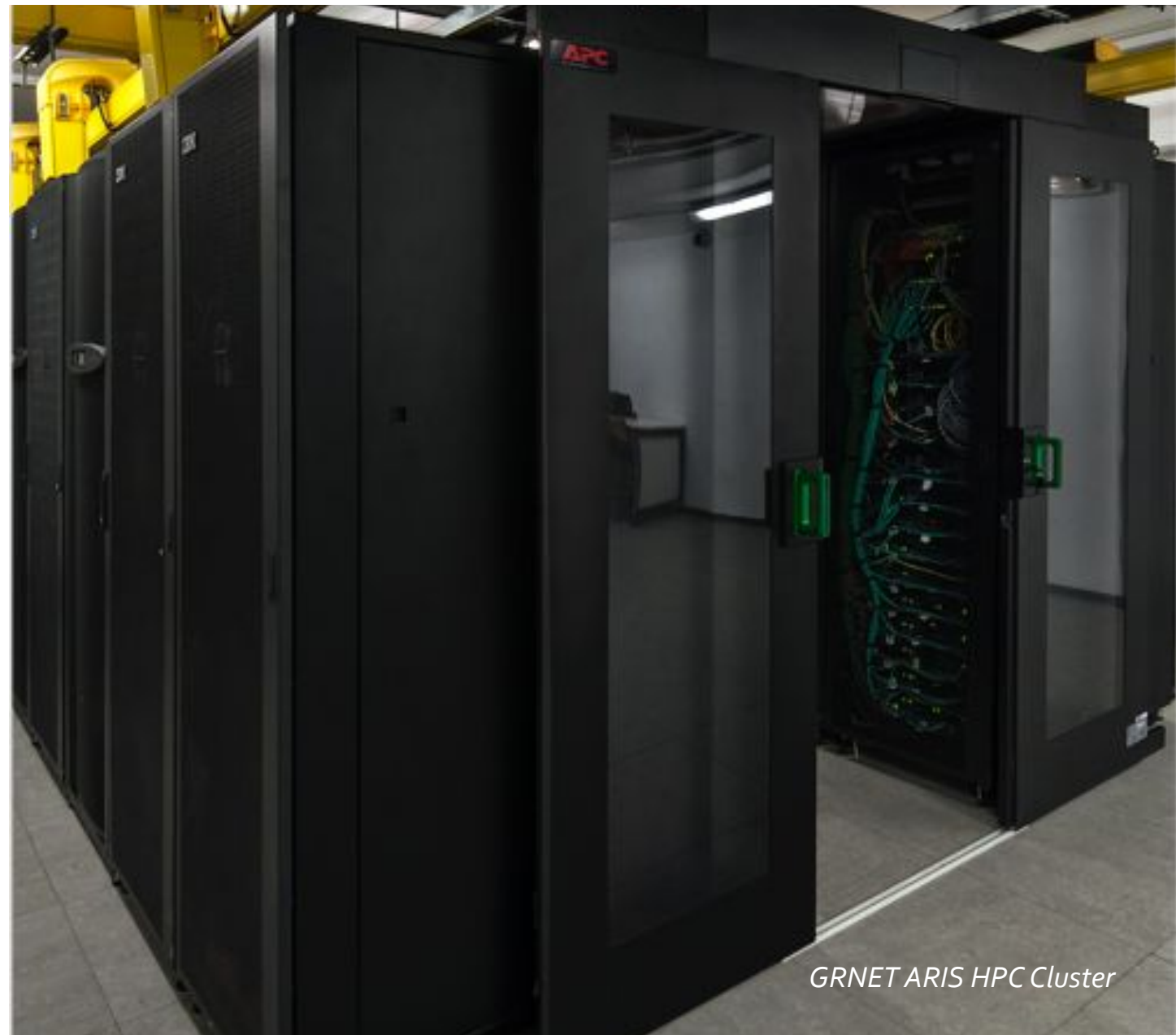
Determination, demands and infrastructures





# High Performance Computing (HPC)

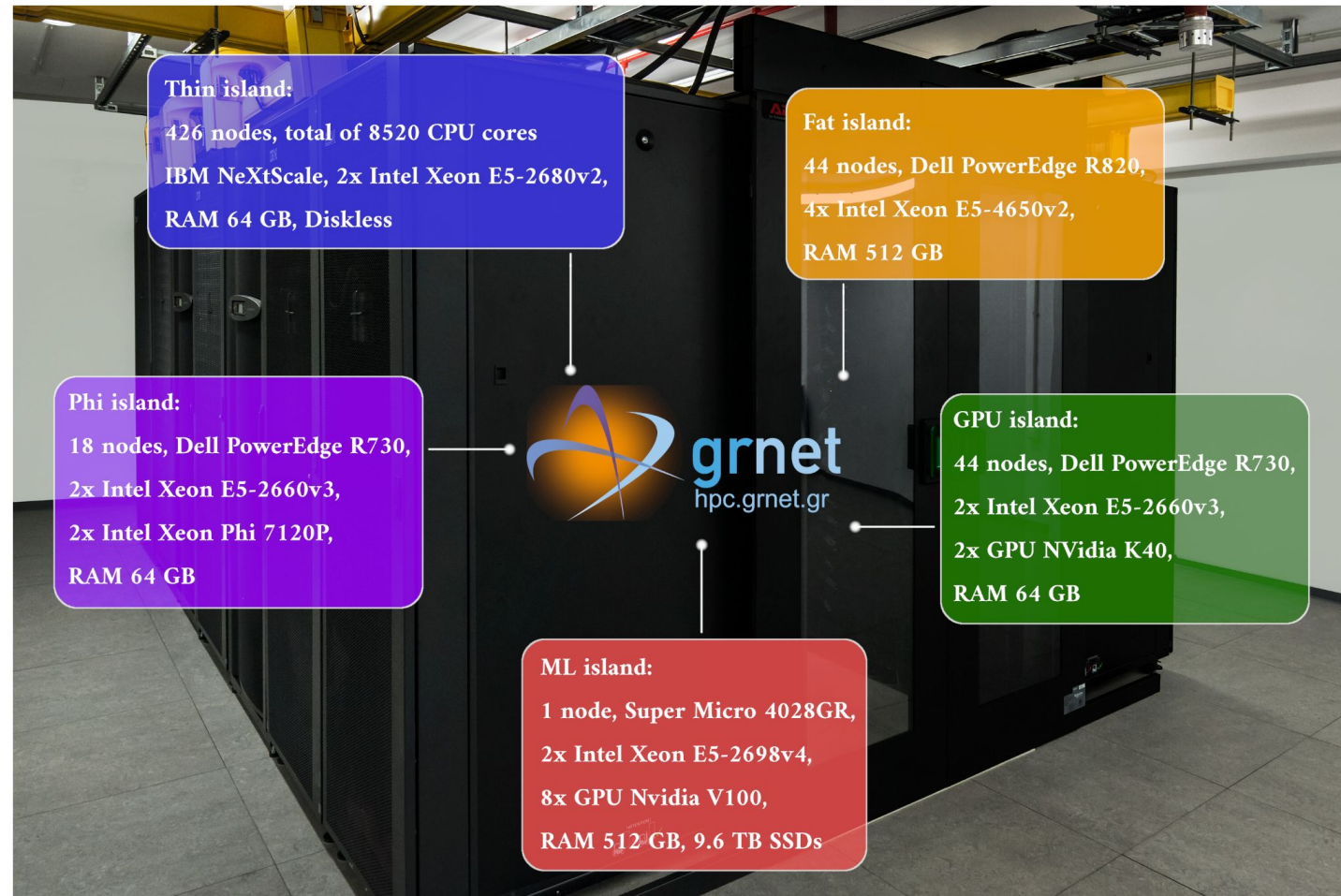
- High-Performance Computing (HPC) is the ability to process data and perform sophisticated calculations at high speeds
- An HPC cluster consists of hundreds or thousands of compute servers, so-called nodes. The nodes in each cluster work in parallel with each other, boosting processing speed to deliver high-performance computing
- HPC solves large problems in science, engineering, or business, that are too complex for the desktop. It might take hours, days, weeks, months, years but if you use an HPC Cluster, it might only take minutes, hours, days, or weeks



GRNET ARIS HPC Cluster

# GRNET HPC infrastructure

- Codename: ARIS
- **533** compute nodes organized in **5** partitions/islands (node groups)
- Processing Capability: 535 TFlops
- File System: 2PB IBM GPFS
- Intercon. Network: Infiniband 56 Gbps
- Resource Manager: Slurm v. 16.05.11
- More info: <https://hpc.grnet.gr/en>





# Copernicus – eoSC AnaLytics Engine (C-SCALE)

Enabling Copernicus Big Data Analytics through EOSC







# C-SCALE Partners



Deltares



with





# C-SCALE Vision

- Larger areas need to be analysed in more detail in less time
- VM/laptop workflows do not easily scale and require interaction
- C-SCALE serves European researchers, institutions and initiatives by making Copernicus data, tools, resources and services easier to discover, access and share
- Copernicus is the European Union's Earth observation programme, looking at our planet and its environment to benefit all European citizens. It offers information services that draw from satellite Earth Observation and in-situ (non-space) data.
- Achieved by software deployment across infrastructures





# C-SCALE Compute Federation

## Distributed Infrastructure:

- Flexible, with support for Cloud, Container and HTC/HPC resources
- Common authentication and authorisation
- Following EOSC guidelines
- Common software repository to host user applications (*in progress*)

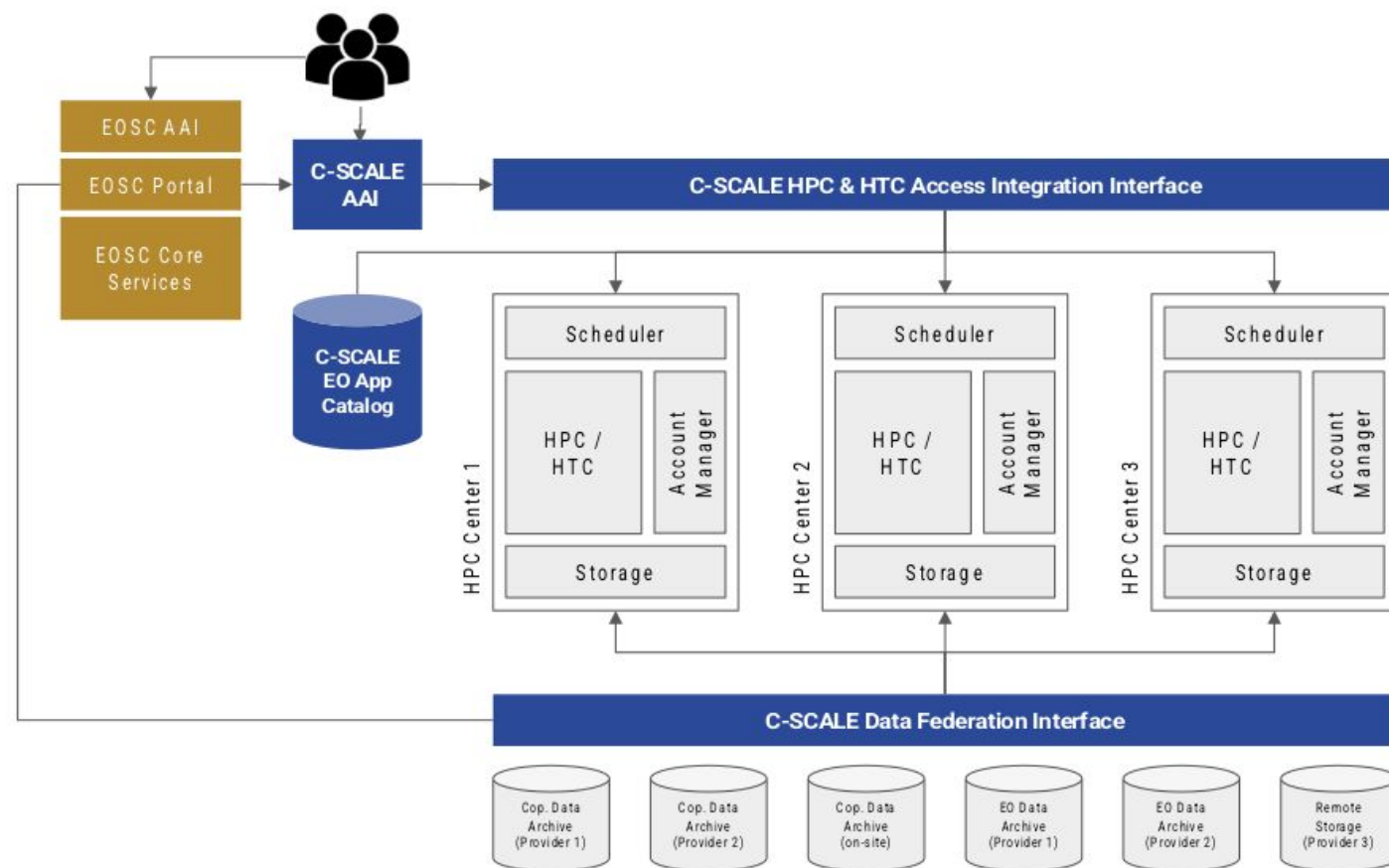
## Currently, 8 providers delivering:

- 12 PB months of storage
- 18 million Cloud CPU hours
- 3.1 million HPC/HTC CPU hours
- 6,000 GPU hours

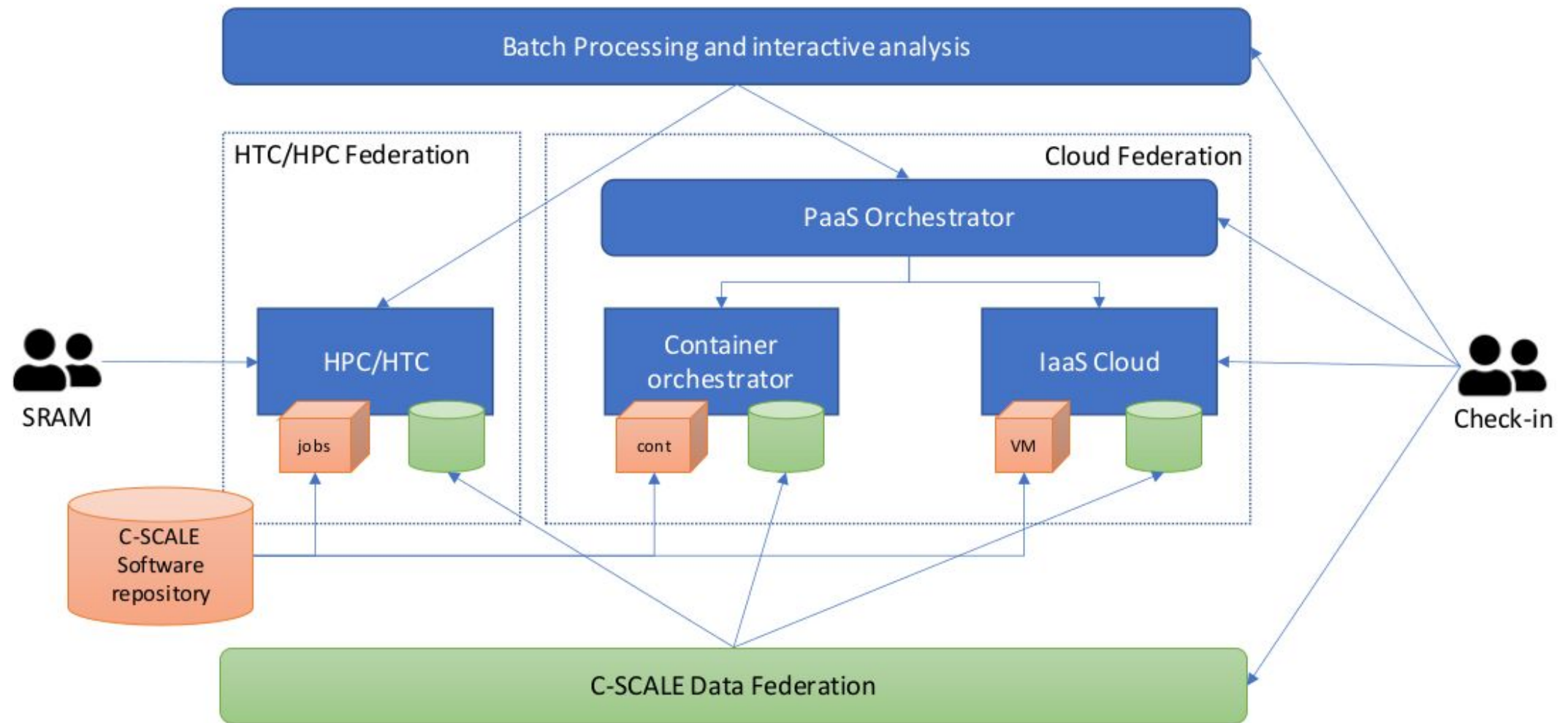


# C-SCALE HPC Federation

- Access through a unified system, that is: SRAM
- <https://sram.surf.nl>
- Providers, collaborations or use cases, and members are registered and associated with each other, respectively



# C-SCALE Compute Federation Schema





# C-SCALE Objectives

- C-SCALE is an open federation in and for EOSC
- EOSC key element since promotes federative/uniform approach
- New providers and users are welcome
- The C-SCALE project will enhance EOSC Portal with pan-European federated data and computing infrastructure services for Copernicus





# C-SCALE integration in EOSC

The C-SCALE project will enhance EOSC Portal



# Integration Objectives

- This open federation will integrate cross-/inter- disciplinary EOSC services, ensuring interoperability between distributed data catalogues, computational tools and infrastructure
- In doing so, the federation will increase the service offer of the EOSC Portal providing state-of-the-art research enabling services to its users.
- It will also provide an open, well-documented framework for integrating new service providers and application developers.



**EUROPEAN OPEN  
SCIENCE CLOUD**



**C-SCALE**



# C-SCALE services in the EOSC Portal (soon)



## Access

Access to a large C-SCALE EO data archive.



## Integration

C-SCALE compute services integrated with the EO Data archive.



## Analytic tools

Set of analytics platforms and tools that can be deployed on top of the C-SCALE EO data archive and compute services.



with







# C-SCALE Data

- C-SCALE will make the unique data resources and body of knowledge of the Copernicus community accessible in a more user-friendly way to new audiences and user communities through the EOSC portal
- It will deliver a modular, open, and robust federation for data discovery, processing and exploitation of Copernicus and, in general, EO Data



**Access**

Access to a large C-SCALE EO data archive.



# C-SCALE Services

- Mainly, divided in two domains:
- Cloud interface: access to Cloud resources of the federation as IaaS and container platforms (Kubernetes) with federated orchestration for the deployment of applications and platforms across providers in a seamless way
- HPC and HTC interface: lightweight, federated and uniform access-integration layer to HPC and HTC systems



**Integration**

C-SCALE compute services integrated with the EO Data archive.



# C-SCALE Analytic Tools

- By collaboratively building on the competences of pan-European e-Infrastructures and existing project initiatives e.g. "Copernicus Data and Information Services" (DIAS), C-SCALE will federate European digital capabilities and lay the foundation for a European open source Big (Copernicus) Data Analytics platform



## Analytic tools

Set of analytics platforms and tools that can be deployed on top of the C-SCALE EO data archive and compute services.

# Integration Timeline

- The C-SCALE project will enhance EOSC Portal with pan-European federated data and computing infrastructure services and analytic tools for Copernicus
- Integration with EOSC is ongoing (e.g., marketplace registration) **end of summer of 2022**
- More info: <https://c-scale.eu>
- Contact: [info@c-scale.eu](mailto:info@c-scale.eu)



**EUROPEAN OPEN  
SCIENCE CLOUD**



**C-SCALE**

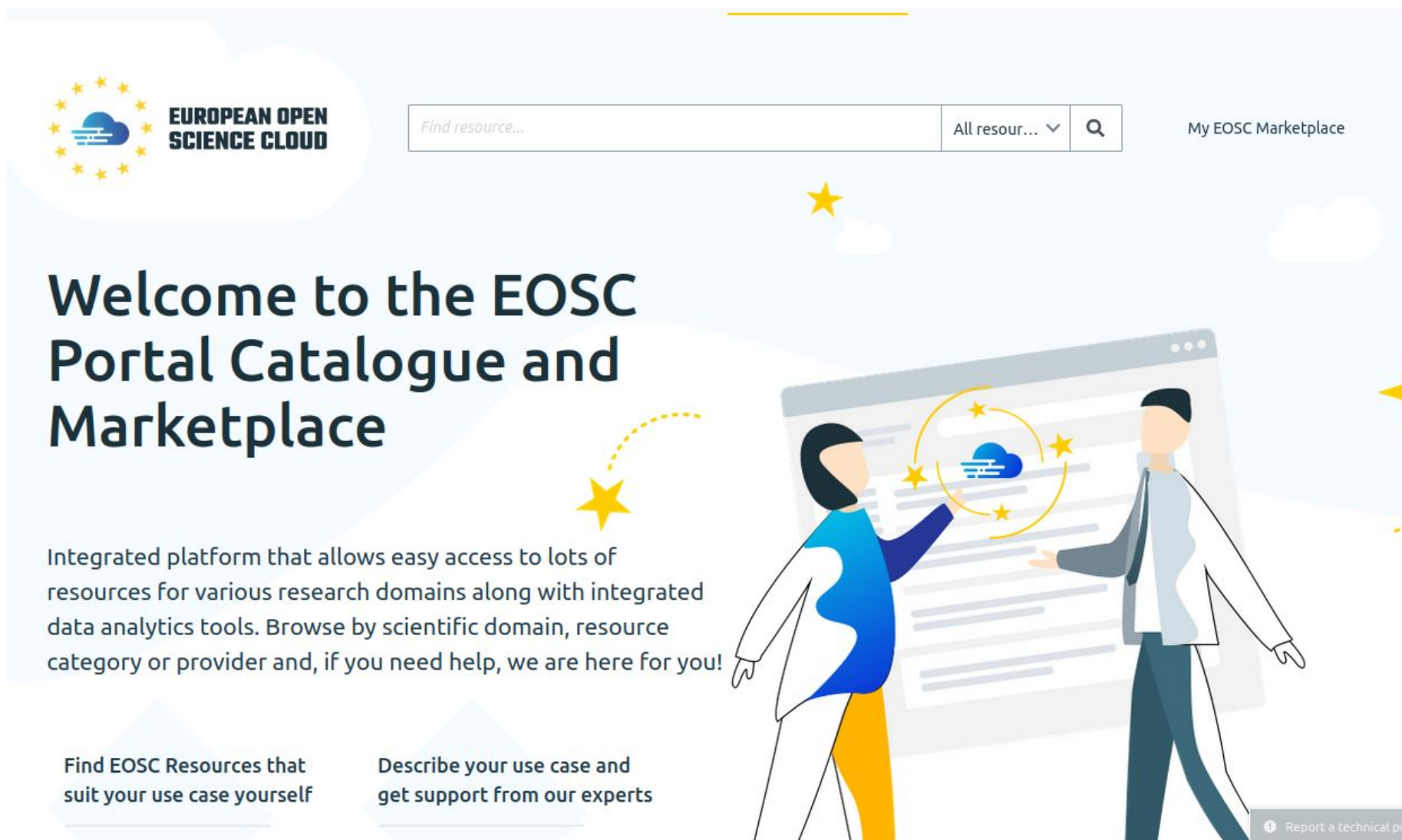


# EOSC Marketplace

EOSC Portal Catalogue and Marketplace



# EOSC Marketplace - <https://marketplace.eosc-portal.eu>



The screenshot shows the homepage of the EOSC Marketplace. At the top left is the European Open Science Cloud logo. To its right is a search bar with the placeholder text "Find resource..." and a dropdown menu labeled "All resour...". Further right is a link to "My EOSC Marketplace". The main heading reads "Welcome to the EOSC Portal Catalogue and Marketplace". Below this, a paragraph states: "Integrated platform that allows easy access to lots of resources for various research domains along with integrated data analytics tools. Browse by scientific domain, resource category or provider and, if you need help, we are here for you!". To the right of this text is an illustration of two people interacting with a large screen displaying a cloud icon and stars. At the bottom, there are two call-to-action boxes: "Find EOSC Resources that suit your use case yourself" and "Describe your use case and get support from our experts". A small link "Report a technical problem" is visible in the bottom right corner of the illustration area.

**EUROPEAN OPEN SCIENCE CLOUD**

Find resource... All resour... Q My EOSC Marketplace

## Welcome to the EOSC Portal Catalogue and Marketplace

Integrated platform that allows easy access to lots of resources for various research domains along with integrated data analytics tools. Browse by scientific domain, resource category or provider and, if you need help, we are here for you!

Find EOSC Resources that suit your use case yourself

Describe your use case and get support from our experts

Report a technical problem



with





# EOSC Marketplace - GRNET HPC Resource



All resour... ▾



My EOSC Marketplace

🏠 > Resources > Access physical & infrastructures > Compute > Job Execution > ARIS



## ARIS

GRNET High Performance Computing Services

Organisation: **National Infrastructures for Research and Technology**



(0.0 / 5) 0 reviews



Add to comparison



Add to favourites

Access the resource



ORDER REQUIRED

→ [Webpage](#)

→ [Helpdesk e-mail](#)

→ [Manual](#)

[Ask a question about this resource?](#)

ABOUT

DETAILS

REVIEWS (0)

GRNET (National Infrastructures for Research and Technology) provides high performance computing resources to the Greek and international scientific and research communities in order to conduct scientific research. It is a typical HPC system.

All compute nodes are used through SLURM resources/workload manager, they are not directly accessible by end user and they haven't internet access. All compute jobs run through SLURM. Access to the system is allowed only via SSH from specific IPs/networks to login nodes from which all data management/transfers, job submission etc. are performed. Only local LDAP authentication is supported.

Authorization to use each partition, run limits, budget, accounting etc. are handled by SLURM. System has total 2 PB (raw) shared storage (gpfs) with usable, after raid etc. capacity of 1.4 PB splitted in three partitions with tuning for different types of storage usage.

It supports large number of applications, optimized for each partition hardware. Software is organized via environment modules

### SCIENTIFIC CATEGORISATION



Generic

• Generic

- Generic

### CATEGORISATION

Report a tech



with



# See you next time!

Thank you :)



with



The EOSC Future, C-SCALE, DICE, EGI-ACE, OpenAIRE-Nexus and Reliance projects are funded by the European Union Horizon Programme calls INFRAEOSC-03-2020 and INFRAEOSC-07-2020.

