D5.3 Initial collection of training material

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Deliverable Abstract

The document outlines the initial training plan that will be delivered during the project and will provide a first set of training contents about the C-SCALE services. It discusses the target audiences, creates the structure of the training plan with an initial outline of training material and gives information on how the access to the material will be organised.

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List of Acronyms

Acronym	Description
AMB	Activity Management Board
C-SCALE	Copernicus – eoSC AnaLytics Engine
EAP	Early Adopter Programme
EC	European Commission
EO	Earth Observation
EOSC	European Open Science Cloud
FAIR	Findability, Accessibility, Interoperability, Reusability
HPC	High-Performance Computing
HTC	High-Throughput Computing
WP	Work Package

Executive summary

The C-SCALE (Copernicus – eoSC AnaLytics Engine) project aims to federate existing European Earth Observation (EO) service providers, cloud resources and computing centres to empower the European EO research community to more easily discover, access, process, analyse and share Copernicus data, tools, resources and services. The C-SCALE data and compute federation will ensure interoperability between distributed data catalogues, computational tooling and infrastructure, and will thereby increase the service offer of the EOSC Portal providing state-of-the-art research enabling services to its users.

This deliverable reports on the initial collection of training material and plan of the C-SCALE Project. After an introduction to the scope of the C-SCALE training is given in Section 1, Section 2 provides some background information on the types of the target audiences and their main learning objectives. Section 3 sets the main goals for creating a knowledge base and a specific learning process for C-SCALE by giving insights on the planned training topics per audience type. In this initial stage, it is intended to give a general picture of the results, not limited to these goals and extensible with more details in the final version of training plan. Section 4 discusses the ways that the C-SCALE training material will be made available to the target audiences and the available channels. Finally, Section 5 provides the conclusions and the future work.

1 Introduction

The development of the C-SCALE services has been, both conceptually and in practise, directly linked to the user co-design and testing. Service providers and users of the project collaborate closely on developing a meaningful data and compute federation by deploying use cases that will implement their workflow on the federated infrastructure. Furthermore, C-SCALE aims to onboard additional use cases through its Open Call to further test and challenge the federation. The provision of dedicated user support and training is, thus, of high importance. At the same time, another key objective of the project is to onboard new service providers, to extend the federation and create larger impact. Therefore, training material for providers is also required and foreseen in the project.

The project plans to deliver dedicated training material and organise training events to support its users become proficient in the use of the C-SCALE services, provide additional, on-demand support to ensure efficient and effective service delivery and user satisfaction, and increase awareness of Copernicus-related EOSC services to broaden the user community. More specifically, the aim of C-SCALE training is to provide high quality instructions, guidance and useful information on how to access and work with the C-SCALE data and compute federation as well as with analytic tools that will be offered on top of it. In addition, C-SCALE aims at onboarding further data and infrastructure providers to broaden the federation and thus the service offering. Therefore, training material for supporting our existing but also new service providers is also foreseen. Finally, as part of the project's outreach and engagement activities, high-level material on the mission and the impact of the project will be made available through the project's channels. The training audience is, therefore, expected to range from technical to non-technical attendants, and stakeholders.

This document outlines the initial training plan that will be delivered during the project and provides information on the first set of training contents about the C-SCALE services. Its scope is to build the structure of the training plan with an initial outline of training material. The final version will include the valuable contribution of the users' experience, the feedback from the C-SCALE User Forum and any request from co-design activity of the solution relevant to training materials.

It should be noted that the present deliverable presents the initial training plan and collection of material. However, although it is not foreseen to officially submit to the EC an updated deliverable on this topic, the project is committed to constantly create and collect new material as well as evolve and improve the existing material. The documentation will stay accessible to the public via the C-SCALE User Forum (e.g. https://github.com/c-scale-community/documentation) for the entire duration of the projects and our target audiences will be constantly informed about new material and events through the project's channels.

C-SCALE services in EOSC Marketplace

The C-SCALE services will be onboarded and made available to the end-users through the EOSC Marketplace (Figure 1) according to their maturity and the FAIR principles. Along with the

availability of the services in the EOSC Portal, dedicated training and support will be provided to the users.

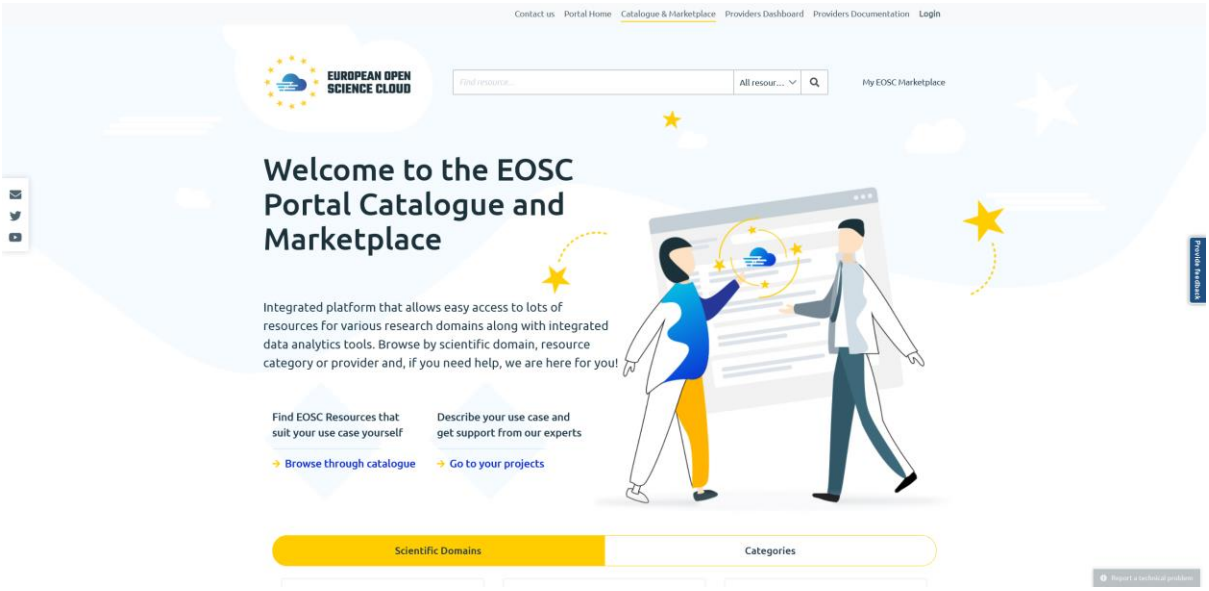

Figure 1: EOSC Catalogue and Marketplace (https://marketplace.eosc-portal.eu/)

C-SCALE Community and User Forum

The C-SCALE Community is a place for researchers, end-users, institutions and initiatives, in short for anyone with an interest in Copernicus data, tools, resources and services. It is supported by the C-SCALE project and operated by the C-SCALE partners. The C-SCALE User Forum, hosted in GitHub (https://github.com/c-scale-community/discussions) was created to enable the communication between the different target groups but also within them. It is a platform where everyone can discuss technical issues, ask questions, collaborate, share ideas and engage in the community.

2 Training target audience

The C-SCALE training material and the training events that will be organised during the project will be targeted to three main types of audience: *service providers, researchers and developers (end users)* and *peer initiatives*. Depending on its activities, each type of audience has different learning goals, the main objectives are presented in Table 1.

Table 1: Target audiences and their main learning goals

Target audience type	Main learning goals
Service providers	Learn how to join their services to the C-SCALE federation.
Researchers and developers (end users)	Learn how to benefit from the C-SCALE federation to perform EO projects.
Peer initiatives	Understand what the benefits and the added value of the C-SCALE project are.

In the next months, and with the help of various events at which we will have the chance to meet new research communities, we will evaluate the work done to confirm that representative communities were engaged and that they received the proper information by means of one of their representatives.

Public events, such as ESA events, EGI Conference and more, will be the opportunities to get in touch with new communities, which we will welcome as important providers of new input for the learning material. Consequently, we will assess the communication channels and the access to training and information C-SCALE related.

3 Training plan

The C-SCALE training activities are expected to start in October 2021 and go on until the project finishes. The training plan and material will be updated continuously during the lifecycle of the project to ensure that it captures all the user requests and the improvements needed to offer a full thematic coverage of the opportunities, procedures and services of C-SCALE.

3.1 Training topics

The Consortium has identified a number of crucial training topics per target audience.

For service providers:

- *How to commission EO input data*. Service providers are not always aware of the location of EO input data that needs to be made available for end users. The goal is to create recipes to make the data available for each use case.
- *How to join the C-SCALE federation, including the onboarding of IaaS/PaaS providers into the C-SCALE federation.* In order to streamline operations, management and exploitation of all services in C-SCALE, service providers need to join the federation. We want to put together the relevant material for service providers so the federation process is as smooth as possible.
- *How to deploy openEO*[1]. openEO consists of the back-end and the front-end. "openEO" alone refers to the back-end only. However, "openEO Platform" aggregates both the back-end and the front-end (User Interface). Providing access to openEO and openEO Platform across service providers in C-SCALE is a requirement of the project. However, its deployment is not trivial and therefore training material will be offered to support service providers.

For researchers and developers (end users):

- *Get Started with C-SCALE resources for end users (orientation deck)*. Since users will be interacting with a newly federated infrastructure, we will provide training material to show how to find, request access and effectively work with the compute and storage resources of the C-SCALE federation. This orientation deck will provide guidance on where to find the relevant training material.
- *How to get access to the C-SCALE/EOSC services*. As we create and publish new C-SCALE/EOSC services, we will create the accompanying documentation to guide end users on how to access and request them.
- *How to access and process EO input data*. We will create a document to detail how EO input data is made available to end users across the C-SCALE data federation, and how to efficiently search and process it.
- *How to work with openEO Platform*. We want to complement the official openEO Platform documentation with the practicalities related to the deployment in the C-SCALE federation to offer a good user experience when working with the Platform.

[1] https://openeo.cloud/ and https://openeo.org/

- *How to use the compute resources*. The compute resources available in the C-SCALE federation will be naturally heterogeneous provided that each site will have a tailored infrastructure. The aim here is to make as easy as possible the portability of use cases across different service providers. Moreover, C-SCALE offers access to both Cloud and HPC/HTC systems and therefore specific training will be provided for each service:
    - *Create virtual infrastructure in the cloud*. We will create specific training material on how to deploy virtual machines using the Cloud providers in C-SCALE.
    - *Run jobs in HTC/HPC systems*. We will guide the users on how to efficiently submit computational jobs for the HTC/HPC systems made available in the C-SCALE federation.
- *How to install software tools in user space*. Apart from the software available at each service provider, end users may want to install additional software to carry out their analyses. We will put together a collection of material to help with this task.
- *Dissemination and exploitation of use case results*. Training material will be provided to end users so they can share and re-use each other's results following FAIR principles.

Generic topics for peer initiatives:

- *openEO Platform*. It represents the most important properties for a future-oriented platform on EO: simplicity, efficiency and availability.
- *High level (non-technical) information on the mission and vision of C-SCALE (for stakeholders, funding agencies etc.)*. It will explain the concept of easily accessible Copernicus Data, resources and services.
- *Pitch material on the social impact of EO and EOSC*. It will provide a brief description on how the EO research contributes to the mitigation of major societal issues, a representative example of which is climate change, and the role of EOSC as a facilitator for the research communities.
- *Background on EO and Copernicus*. Information related to the Earth Observation mission and activities as the most important monitor of the planet status, performed with the increasing amount of data and tools in the Copernicus Program. Copernicus is the EU's Earth observation programme – Europe's Eyes on Earth. The domain that each Copernicus Service addresses (marine, land and atmosphere monitoring, emergency response, security and climate change) can serve many areas. Copernicus Program will reach the full potentiality supporting the most pressing challenges today, such as fighting climate change, helping to stimulate technological innovation, and providing socio-economic benefits to citizens.

The training topics listed above are subject to change between two different phases in the C-SCALE project: 1) pre-federation phase, and 2) post-federation phase.

For example, the training material about "How to use compute resources" will change after all services have been federated. In the first pre-federation phase end users follow the existing procedures on each of the providers, which differ from one to another. Once the federation has completed the way in which the end users request, access and exploit compute resources in C-SCALE will be homogenised, and therefore the training material on "How to use compute resources" will be updated to reflect it. In addition to this initial list of topics, further training needs will be collected throughout the coming year in the C-SCALE Community.

For the collection of training material, the collaboration between all INFRAEOSC-07 projects as well as with EOSC Future will have a key role. The goal of these collaborations is to identify the ways that each of the participating projects can offer their expertise to the other projects. In this sense, depending on the topic, some of the training material might be generated and shared by one of the other projects. This will also help the projects to have non-overlapping material and utilise the project resources in a more efficient and meaningful way.

3.2 Training schedule

The available training will be delivered according to the schedule shown in Table 2.

Table 2: Training schedule

Available Training	Target Audience (U=users, P=providers, I=peer initiatives)	Available after
Pre-federation phase		
Get Started with C-SCALE	U	Dec 2021
Commission EO input data	P	Dec 2021
Access and process EO input data	U	Apr 2022
Deploy openEO Platform	P	Apr 2022
Work with openEO Platform	U	Dec 2021
Use the compute resources	U	Oct 2021
Install software tools in user space	U	Dec 2021
Post-federation phase		
Access to the C-SCALE/EOSC services	U	Jun 2022
Access EO input data on the C-SCALE data federation	U	Jun 2022
Use the C-SCALE Compute federation	U	Jun 2022
Join the C-SCALE federation	P	Jun 2022
Dissemination and exploitation of use case results	U	Apr 2023
General topics for external stakeholders		
openEO Platform	I	Oct 2021
Mission and vision of C-SCALE (for stakeholders, funding agencies etc.)	I	Dec 2021
Pitch material on the social impact of EO and EOSC	I	Dec 2021
Background on EO and Copernicus Program	I	Dec 2021

The goal is to offer tailored training material to each target group, adapted to the timeline of the project. Initially, we will focus on the training material for the external stakeholders and the pre-

federation phase of the infrastructure. Later, we will work on the refinement of the training material in the transition to the post-federation phase.

3.3 Existing training material

The collection of the training material will be an ongoing process during the entire runtime of the project and the responsible work package will aim to collect all necessary documentation in time for the different target audiences to be able to use it.

At the time of writing this document, the training material that is already collected includes the following documentation:

- How can providers join the federation, by EGI
- How to use the cloud computing for end users, by INCD
- How to use the HPC/HTC computing, by SURF
- How to create a Virtual Machine, by GRNET
- EO related background information and training, by ESA
- Mission and vision of C-SCALE, by C-SCALE
- Documentation on openEO Platform, by openeo.org and openeo.cloud

This material still needs to be added to the access point on GitHub.

4 Training channels and access

The C-SCALE website (https://c-scale.eu/) will serve as the main access point for all training material as it is the most visible webspace through the project dissemination and outreach activities. A new dedicated page will be presenting all available material and provide links to the actual files along with the following information as shown in the form below:

Table 3: Form of training catalogue on the C-SCALE website

Available Training	Target Role/Group	Duration	Training material	Source/ Collaboration	C-SCALE	EOSC	Notes
...	(non-technical)	...	Link	...	...	...	...
...	(technical)	...	...	...	...	...	...

At the same time, the GitHub organisation for the C-SCALE Community – or User Forum - will be the main hosting point for all files (see Figure 2). All technical and non-technical documentation will be available in the designated page: https://github.com/c-scale-community/documentation.

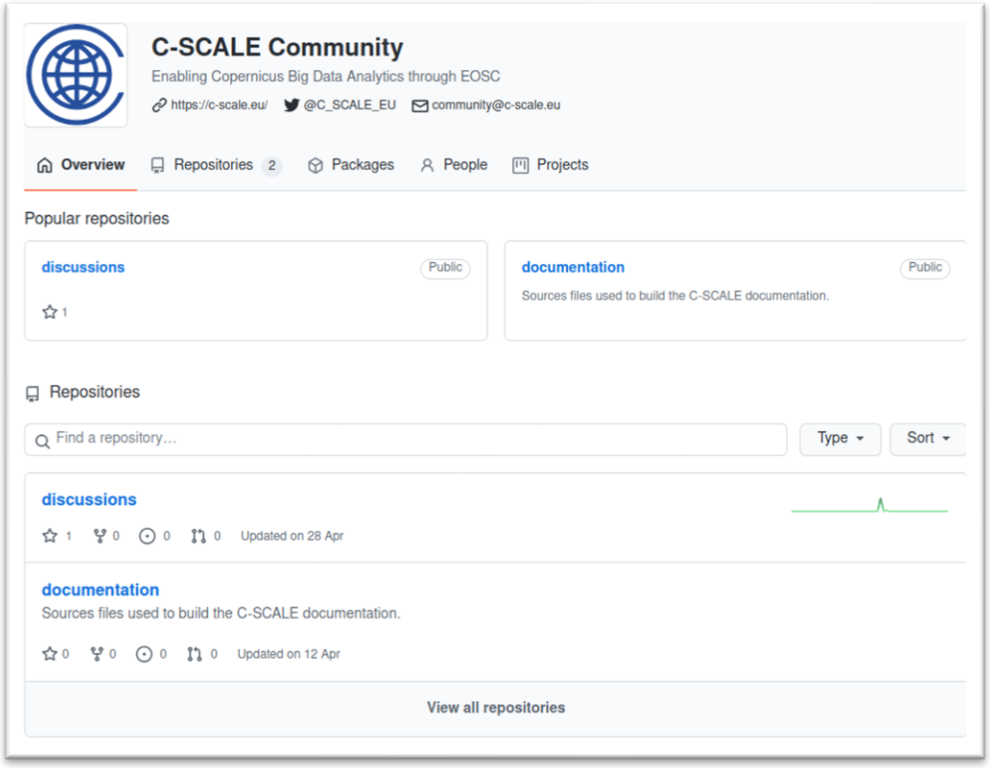

Figure 2: GitHub organization used for the C-SCALE Community (https://github.com/c-scale-community)

A User Forum was created to coordinate and provide feedback to the providers on the functional design and usability of the C-SCALE data and compute federation and drive the integration activities. It consists of the representatives of the service providers and the use cases and aims to include external advisors from international and national organisations invested in Copernicus as well. The

set of communities involved in the User Forum will grow during the project, through the Early Adopter Programme (EAP) and the engagement activities of the project.

When new material is available, all target audiences will be informed through the project channels. Apart from the project website (https://c-scale.eu/), C-SCALE maintains a Twitter account (@C_SCALE_EU). In addition, all project partners use their communication channels, i.e. company website, Twitter and LinkedIn, to spread the work on project related news.

Finally, the project aims to organise at least two webinars, which will provide live training to the participants, but they will also be recorded and stored in the aforementioned location. The topics of the webinars are yet to be decided in coordination with the other INFRAEOSC-07 projects and EOSC Future.

5 Conclusions and future work

The training plan will be updated and the training material consolidated and improved, according to the developments, new use cases and new users requirements.

Under the WP5, all the dissemination and exploitation activities will ensure that a proper information will be offered, included but not limited to the easy access to the training and documentation.

On top of the GitHub Organization for C-SCALE, that offers interactive features, the training and service documentation will be published on the C-SCALE project website and on the EOSC Portal[2], where final services will be offered with the possibility to reuse the C-SCALE results after the end of the project.

[2] https://eosc-portal.eu/about-eosc-portal