



EO SC-Synergy: Integrating Capacities & Building Capabilities

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Implementing EOSC at national level

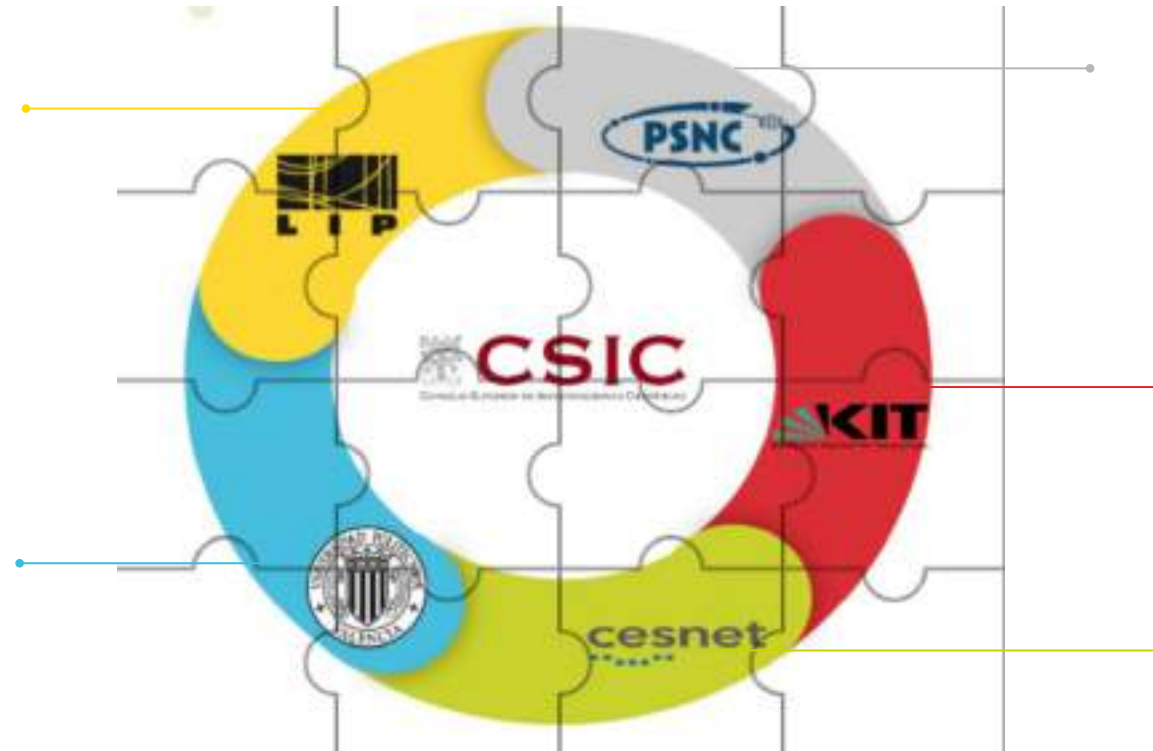


Promoting EOSC High Quality Services

Software quality as a service, FAIRness evaluation and quality certification badges.

Thematic Services Integration

10 thematic services addressing 4 scientific areas (Earth Observation, Environment, Biomedicine and Astrophysics).



Skills development

Environment for tutorials with a dedicated MOOC platform, courses methodology and a Hackaton as a service platform.

Capacity Expansion at the Infrastructure level

Integration of services and resources from the RIs of the consortium partners.

Alignment at the Policy Level

Collaboration with regional projects on landscaping activities, gap analysis and contribution to EOSC policies.

Project partners



EOSC-synergy coordination structure is based on IBERGRID:
www.ibergrid.eu



Project management and legal coordination resides on CSIC (Spanish coordinator of IBERGRID)

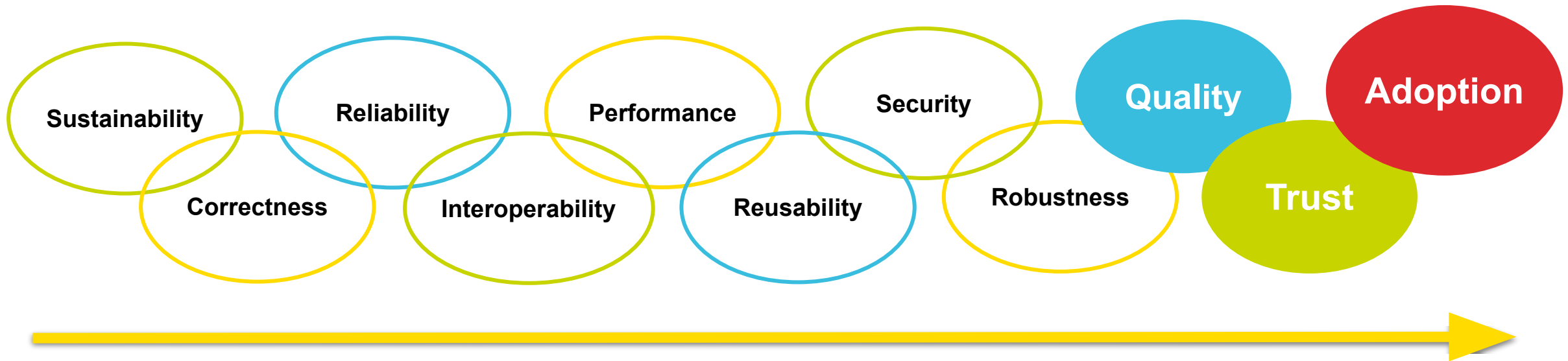


Spain, Portugal, UK, Czech Republic, Germany, Slovakia, Poland and the Netherlands

Fostering Service Integration and Adoption



Quality based approach for service integration to promote EOSC adoption



Virtuous cycle



Improved Software Quality

1-Developers/Integrators

Increase software quality
Adhere to software development best practices

2-Providers/Operators

Increase service quality
Adhere to service delivery best practices

Increasing Adoption

Increased Usage

Improved Services Quality

3-Users/Researchers

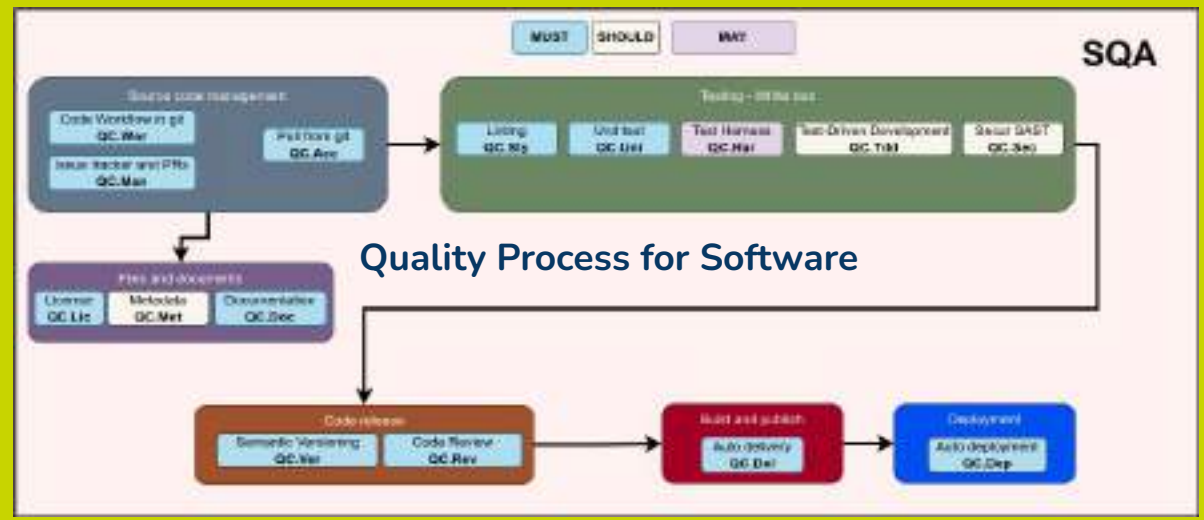
More aware of EOSC services quality
Build trust and increase adoption

SQAaaS Platform

A set of Common Software Quality Assurance Baseline Criteria for Research Projects

A set of Common Service Quality Assurance Baseline Criteria for Research Projects

Quality Baselines Good Practices



Software Classification			
Quality Criteria	Quality Badges		
	Gold	Silver	Bronze
QC.Acc	Gold	Silver	Bronze
QC.Lic	Gold	Silver	Bronze
QC.Sty	Gold	Silver	Bronze
QC.Met	Gold	Silver	Bronze
QC.Uni	Gold	Silver	Bronze
QC.Doc	Gold	Silver	Bronze
QC.Sec	Gold	Silver	Bronze
QC.Wor	Gold	Silver	Bronze
QC.Ver	Gold	Silver	Bronze
QC.Man	Gold	Silver	Bronze
QC.Del	Gold	Silver	Bronze

Mapping of QC to Badges

SQAaaS Platform leverages CI/CD & DevOps

Source Code Repository



The screenshot shows the SQAaaS platform interface with a 'Quality criteria define the CI/CD pipeline work' section and a 'Your pipeline has been successfully created' message.



Badges to Reward Quality



Tools for FAIR assessment



FAIR EVA

- Assess FAIR compliance of research data
- Implements the RDA indicators
- Modular architecture supporting multiple types of data repositories

Integration with the SQAaaS

- FAIR validation in Quality Assurance
- Supporting assessment tools in CI/CD pipelines (FAIR EVA and F-UJI)
- Support for FAIR badging



https://github.com/EOSC-synergy/FAIR_eva

Thematic Services in Earth Observation

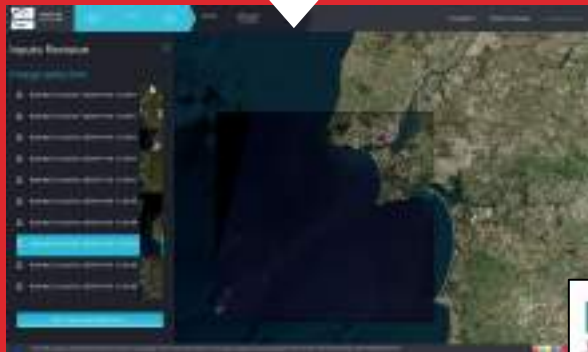


WORSICA



Water Monitoring Sentinel Cloud Platform

A service for the detection of water using satellites, Unmanned Aerial Vehicles & in-situ data. WORSICA can be used for coastline detection, inland water bodies detection and water leaks detection on irrigation networks.



SAPS



Surface Energy Balance Automated Processing Service

Used to estimate Evapotranspiration and other environmental data that can be applied, for example, on water management and the analysis of the evolution of forest masses and crops.



GCore

indra

Acquisition, cataloguing and processing EOS data

G-Core is a production-ready technology used as a service at ESA's and national programs that provides a Data Manager for spatial and non-spatial purposes and a framework for third-party processors.



Thematic Services in Biomedicine & Astrophysics



SCIPION

CryoEM data processing for Structural Biology

ScipionCloud service will allow users from Instruct to deploy a dynamic cluster in the cloud to keep processing the data acquired at the facility.



EIRENE



OpenEBench

ELIXIR benchmarking and technical monitoring platform

Used to evaluate bioinformatics tools, OpenEBench is an observatory for SW quality based on the automated monitoring of FAIR for research software metrics and indicators.



LAGO

Latin American Giant cosmic ray Observatory

LAGO is a cosmic ray observatory made of a network of water-Cherenkov detectors (WCD) spanning over different altitudes and latitudes making research on High Energy Physics, Space weather, etc.



Thematic Services in Environment



UMSA

Untargeted Mass-Spectrometry Analysis

UMSA aims at processing data to correlating the whole spectra with other data to work with more complex hypotheses on the impact of environment in human health.



MSWSS

Water Supply Systems modeling and analysis

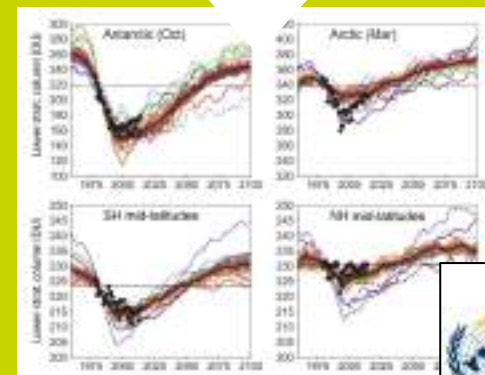
MSWSS integrates the analysis and simulation of toxics in drinking water supply networks to allow operators and researchers to analyse hazardous events.



O3AS

Ozone Analysis Service

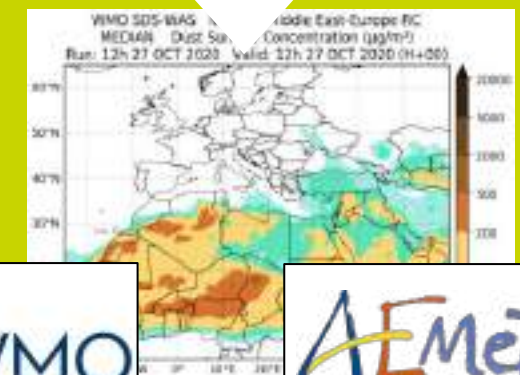
The O3AS service shall provide an invaluable tool to extract O₃ trends from large climate prediction model data to produce figures of stratospheric ozone trends.



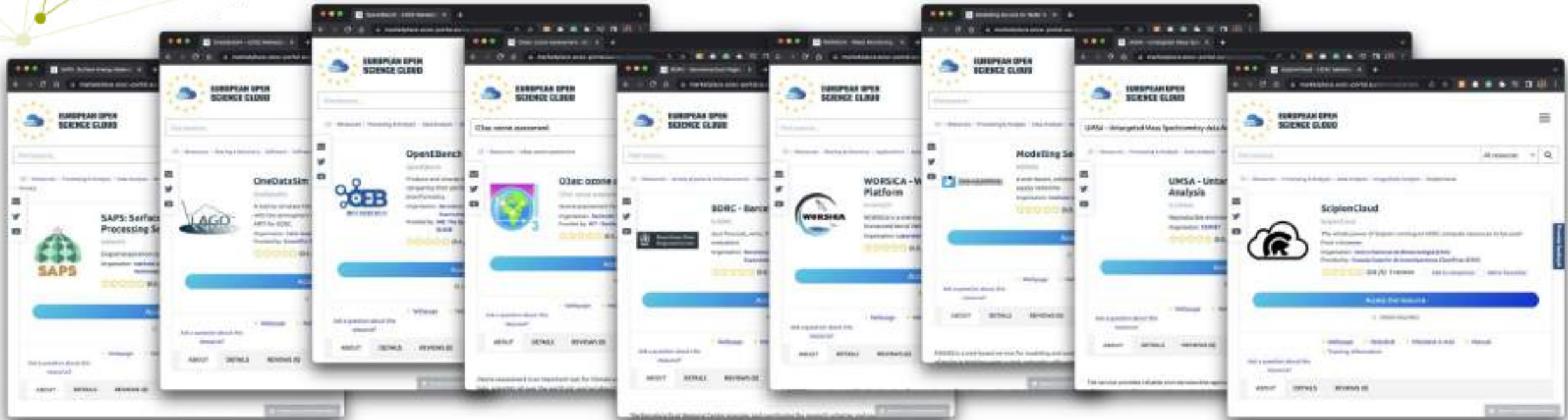
SDS-WAS

A Service related to the mineral dust forecast

SDS-WAS aims to support institutional entities to warn about possible dust events and to foster the study of dust-related phenomena.

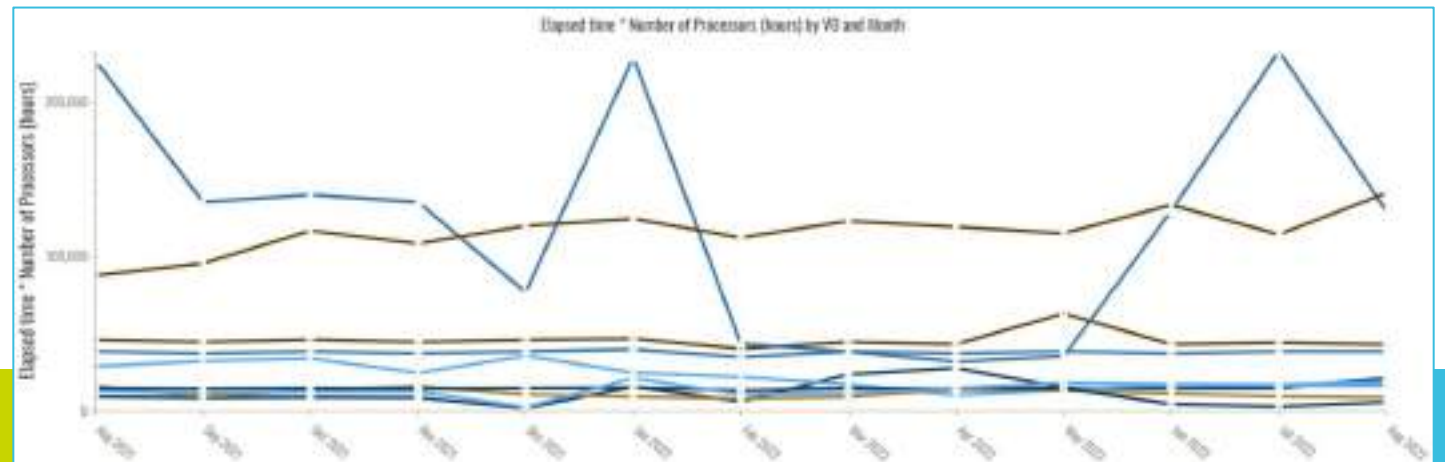


Increasing users and usage







Over last year:

- More than 4.7 Million CPU core hours
- More than 3.400 VMs
- 90 registered users in VO



Infrastructure for thematic services



	WORSICA	G-Core	SAPS	Scipion	LAGO	SDS-WAS	UMSA	MSWSS	O3AS	OpenE Bench
 AAI	EGI Check in	Kerberos LDAP & CAS User/pwd	EGI Check in	EGI Check in	eduTEAMS+ EGI Check in	B2ACCESS	EGI Check in +Life Science AAI	EGI Check in	EGI Check in	Life Science AAI
 Workload Manager	ArcCE, Batch (SLURM)	GCore+ K8s	K8s	Batch (SLURM)	Batch (SLURM)	Batch (SLURM)	Batch (SLURM) in IM/EC3 (in Galaxy)	Batch (SLURM) in EC3 (in Galaxy)	Cluster batch (SLURM) & K8s	GA4GH WES/TES stack + NextFlow
 Resource Manager	IM (TOSCA)	IM / EC3	IM / EC3	IM / EC3	Local clusters & IM+EC3	EC3	IM / EC3	IM / EC3	IM	one
 Data Storage	Nextcloud, Dataverse	ElasticSearch for the catalogue	Open Stack Swift	Local + S3	EGI Data-Hub ONEDATA	B2HANDLE /B2SAFE	Local + S3	Local + ONEDATA	WebDAV	Local + B2SHARE

Integrate computing and storage infrastructure



EOSC-SYNERGY Handbook

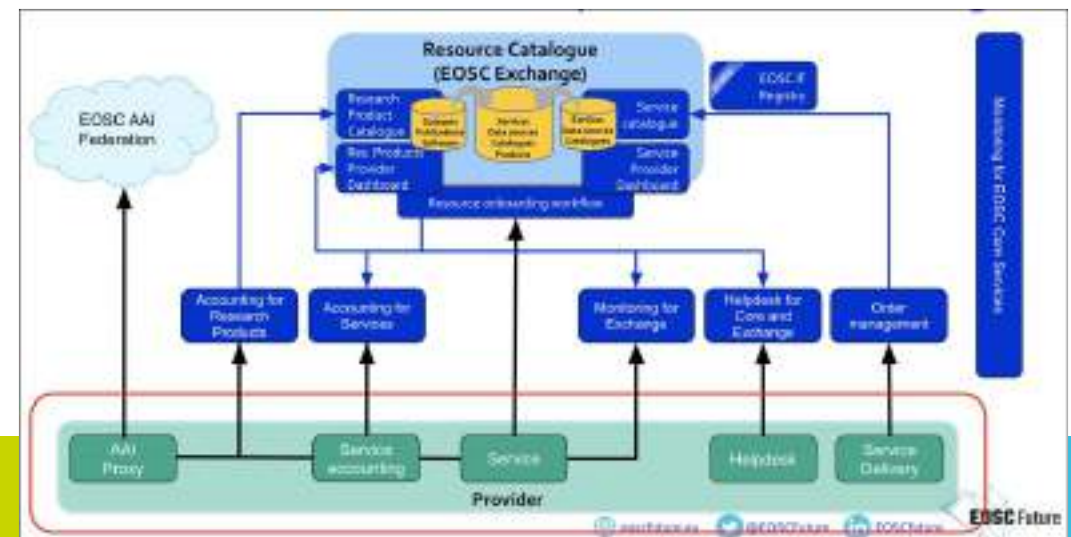
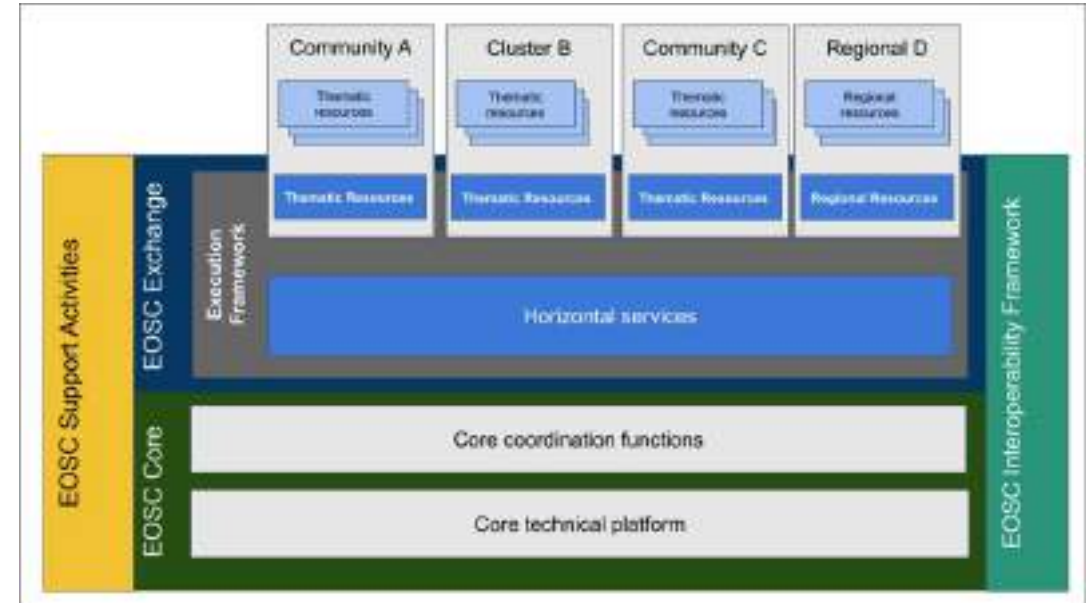
<https://handbook.eosc-synergy.eu/>

EOSC-SYNERGY – Handbook

This handbook is targeted at multiple different audiences. Different sections are targeted at different groups. We suggest a prioritised list to read for the different target audiences.

- **Management of Computer Centres:**
 - Introduction
 - Architecture of EOSC
 - Resource Integration
- **Users of the cloud:**
 - Introduction
 - Thematic Services
 - EOSC Synergy Services and tools
- **System Administrators:**
 - Resource Integration
 - Thematic Services
 - Architecture of EOSC

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Policy related activities



Recommendations for the alignment of national policies related to EOSC.

Aimed at policy makers, EOSC Bodies, research funders, research performing organisations

<https://www.eosc-synergy.eu/policy-harmonization/>



Expanding training and education capabilities through an innovative online platform



Guidance for creating good quality tutorials

- Best practices and training related materials

Set of EOSC ecosystem tutorials and training materials

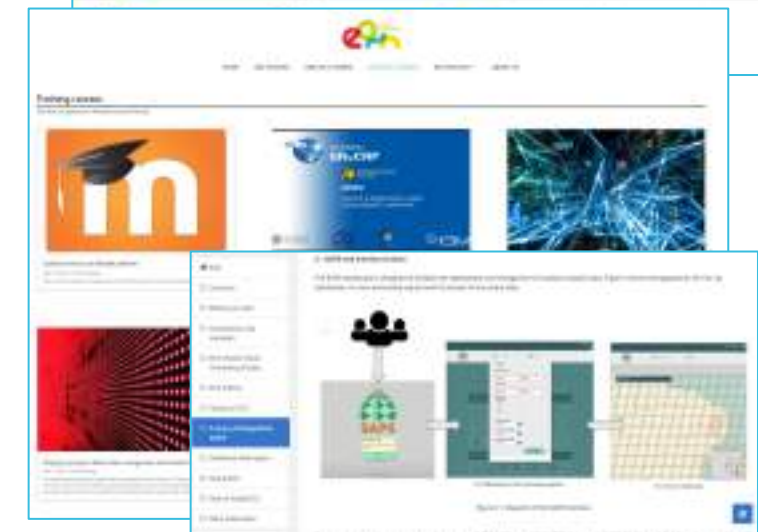
- Basic tutorials on EOSC
- Advanced tutorials regarding the EOSC-Synergy tools
- Domain specific tutorials regarding thematic services

Learn@Synergy and HaaS platforms

- Online platform for content creation/hosting of training material
- Service for running hackathons

Interaction with national education programmes

- Courses developed to be suitable for education programmes
- Had 10 different practical use cases of using the EOSC-Synergy platform or training materials during the activities of those institutions' educational processes in different countries.



Learn@Synergy platform

An innovative online platform focussing on open tools

Modular set of tools for preparing and conducting tutorials

<https://learn.eosc-synergy.eu/>

- **MOOC:** customised Moodle
- **Videoconference:** based on eduMEET
- **Interactive computing:** based on Jupyter Notebook
- **Shared drive:** based on NextCloud
- **Infrastructure Manager** to create virtual machines and training accounts
- **Training material catalogue**
- **Hackathon-as-a-service** to facilitate the organisation of hackathons on the EOSC infrastructure and accessible through the EOSC Portal



Results



FAIR Framework Framework for validating EOSC FAIR data requirements. It provides Automated deployment of data repositories and fairness verification. One of the key components is the FAIR evaluator "FAIR EVA" FAIR EVA [...]	JuPL The Jenkins Pipeline Library (JuPL) is a library to build and execute automated software quality verification pipelines using the Jenkins CI system. A new implementation of the INDIGO-DC Jenkins Pipeline Library by [...]	SQAaaS Platform A Software and Services Quality Assessment (SQAA) for on-demand automated software verification, offered through the EOSC portal. The SQAaaS aims at contributing to the realization of the Open Science principles [...]	Haas The EOSC-Synergy Hackathon as a Service is a new approach to offer Infrastructure as a Service support for the execution of Hecatom [...]	EOSC Training Platform Our training platform is a set of tools, including procedures and best practices for the creation and conduction EOSC related training courses. It facilitates cloud related courses providing tools for [...]	QZAS The QZAS service provides an available tool to assist scientists in visualizing ozone (O3) time series from extensive climate prediction models and calculating and visualizing dates for the recovery [...]	Handbook on EOSC infrastructure integration How to make your infrastructure EOSC-aware [...]
Badge Scheme The Quality Badge Scheme for software, services and FAIR data is a method to reward adherence to quality best practices for software and services. The badges are defined to motivate [...]	Services Quality Baseline A set of quality baseline criteria for services based on best practices aiming at improving services quality. The key benefits are: Access and assure the quality and maturity of services [...]	Software Quality Baseline A set of quality baseline criteria for software based on good practices aiming at improving software quality. The purpose of this result is enhancing the visibility, accessibility and distribution of [...]	MSWSS MSWSS is a service for modeling and analysis of Water Supply Systems which integrates the analysis of losses in drinking water supply networks with water distribution network simulation. MSWSS website [...]	UMSA UMSA is an integrated mass-spectrometry analysis service from RECETOX (Research Centre for Toxic Copounds) in the Environment of Masaryk University in the Czech Republic. The service is evolving to a [...]	SDS-WAS SDS-WAS (Sustainable Design, Research, Center from January 2022) is a service that aims at improving capabilities for more reliable sand and dust storm (SDS) forecasts. It supports institutional entities [...]	
LAGO The LAGO (Latin American Giant Observatory) Project is an extended astrophysics observatory at a global scale operated by the LAGO Collaboration, a free-centralized and distributed collaborative network of more [...]	OpenEBench Used to evaluate Life Sciences research software, OpenEBench is an observatory for software quality based on the automated monitoring of FAIR for research software metrics and indicators. The OpenEBench platform [...]	SCIPION Scipion is an application framework developed as a collaboration between three institutions including the retract Image Processing Center (I2PC) in Madrid to help the Structural Biology community to process Cryo [...]	EAPE EAPE (EAS Automated Processing Service) is a service to estimate Evapotranspiration (ET) and other environmental data that can be applied, for example, to water management and the analysis of the [...]	G-CORE G-CORE is a production-ready technology used as a service at ESA's first national program led by INdRI for the acquisition, storage, cataloguing and processing data from several Earth Observing [...]	WorSiCs European-wide service for the detection of the coastline changes, coastal inundation areas and island waterbodies, water detection [...]	

www.eosc-synergy.eu

