

European Weather Cloud - Introduction

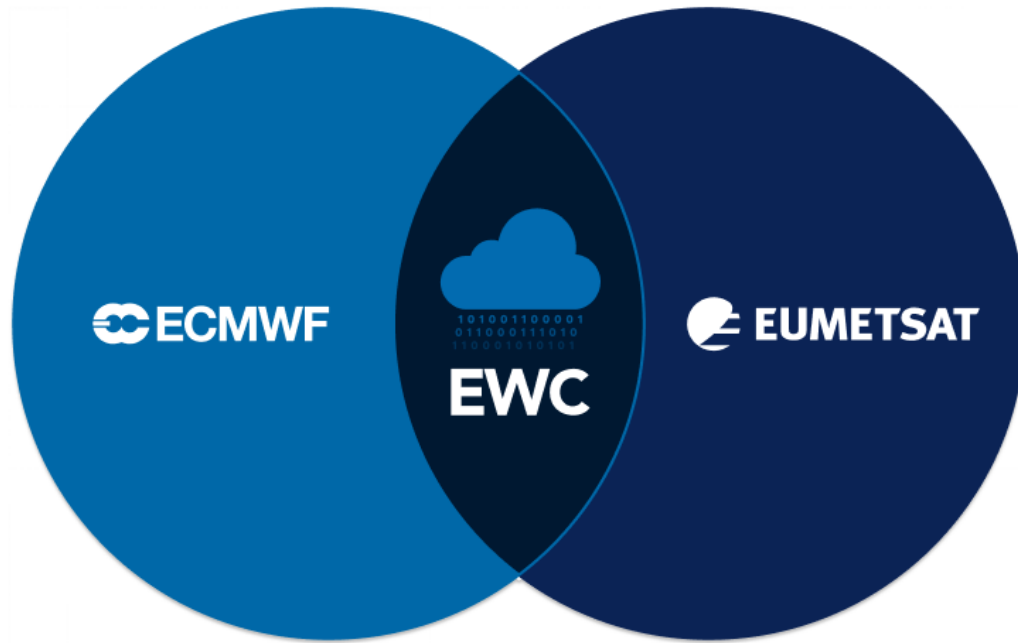
Online training course
13 October 2025

Samuel Langlois (ECMWF)

Our mission statement

“The European Weather Cloud is the *cloud-based collaboration platform* for *meteorological application development and operations* in Europe and enables the digital transformation of the European Meteorological Infrastructure. The European Weather Cloud is dedicated to support the National Hydro-meteorological Services of the Member States of both ECMWF and EUMETSAT in fulfilling their *official duties* to protect life and property from impending meteorological hazards.”

"a community cloud"



What's in it for you?



Community for sharing and collaboration

The European Weather Cloud is a hub for the meteorological community with the aim to bring its users together in a common environment to collaborate and share resources.



Data access

The platform offers optimised access to the data repositories of ECMWF and EUMETSAT.



Computing and storage

Data proximate cloud computing facilities and storage solutions are provided to boost research, development and operational activities close to ECMWF and EUMETSAT data.



Tools and services

Tools and services are available for the users for the flexible management and orchestration of the cloud resources.



Training and Support

Support services and training resources tailored for the meteorological community guide the user to effectively use the different capabilities of the cloud platform.



Flexible

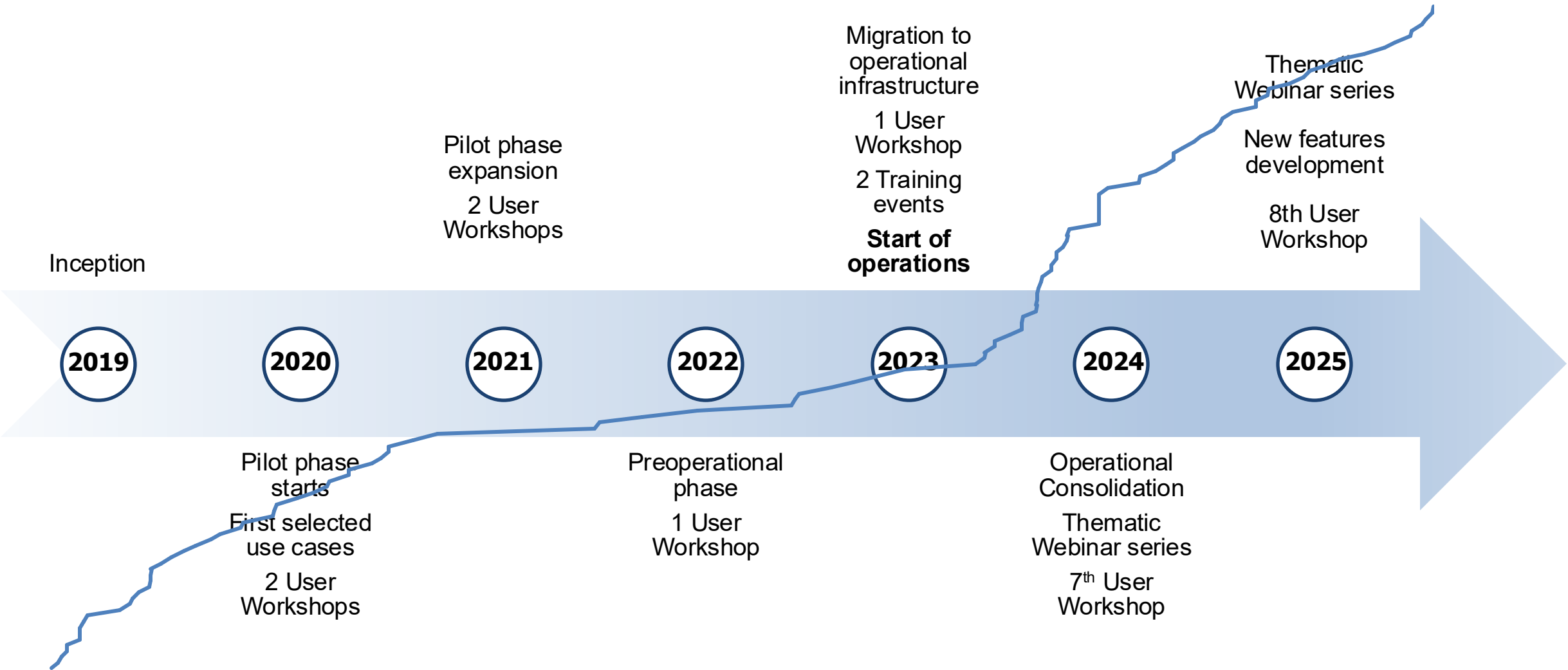
The platform provides users with a possibility to fully and easily tailor the environment for their use case.



**EUROPEAN
WEATHER CLOUD**



Our Journey



**EUROPEAN
WEATHER CLOUD**



A growing community

200
tenancies
in total



20
new
tenancies
in 2025



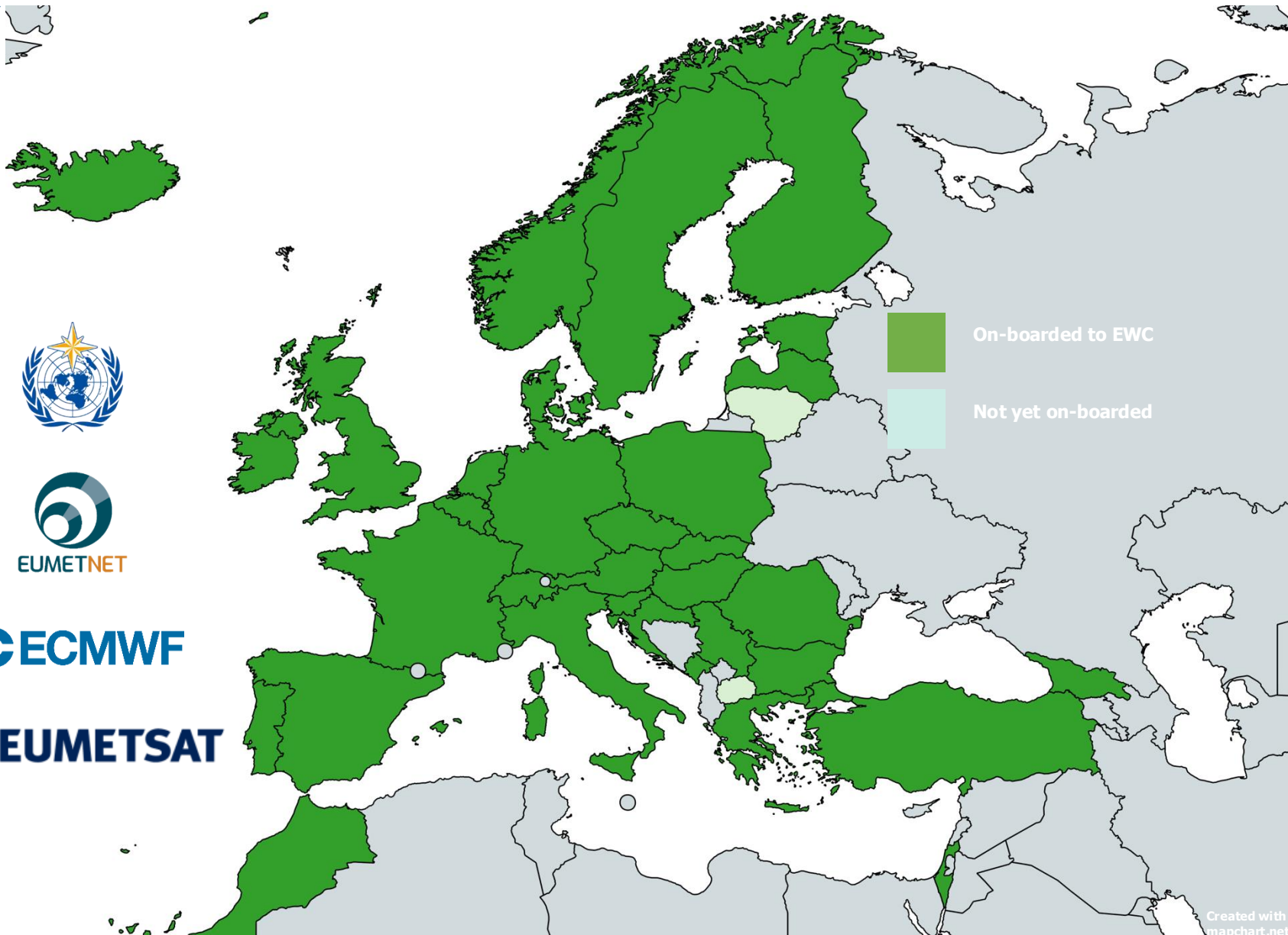
13 active
R&D
projects



9
active
special
projects



**EUROPEAN
WEATHER CLOUD**



Who is it for?

Member and Cooperating States

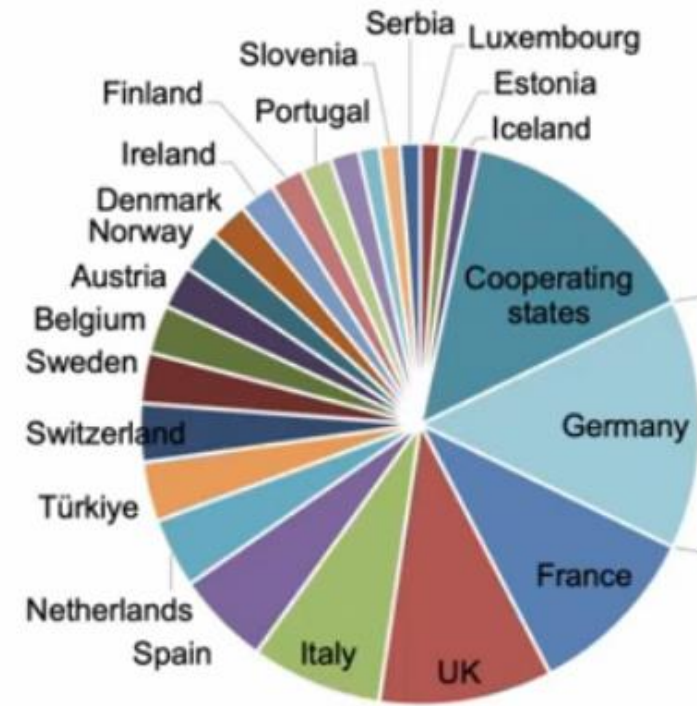
Research & Development

ECMWF Special Projects
EUMETSAT annual R&D calls

European Meteorological Infrastructure

EUMETNET

Internal use at ECMWF and EUMETSAT



ECMWF Special Projects

Experiments or investigations of a scientific or technical nature, undertaken by one or more Member States*, likely to be of interest to the general scientific community

* or Co-operating States, for the EWC

Getting your own tenancy

Member or Cooperating state

1. Find your Authorizing Officer (CompRep)
2. Create a ticket on our Support Portal, with:
 - A name for the tenant: xx-orga-project
 - A tenant administrator
 - A rough budget
3. Profit!

Special Project

1. Apply on our web site, before the 30th June ("late request" possible)
2. Wait for the decision
3. Profit!

How does it compare to...

	Public clouds (AWS, Azure, ...)	European Weather Cloud	HPC
Available services	Hundreds!	VMs, Storage, Network	Batch, Storage
Proximity to data	✗	✓	✓
Software flexibility	✓	✓	✗
Public hosting	✓	✓	✗
Cost	💰	0	0

Operational infrastructure



Cores	5936
Memory	47.5 TB
Storage	5.9 PB usable
GPUs	371 VGPUs (10 GB partitioning)

- Hosted externally with 10 Gbps link to EUM
- Sizing may increase in coming years, based on demand



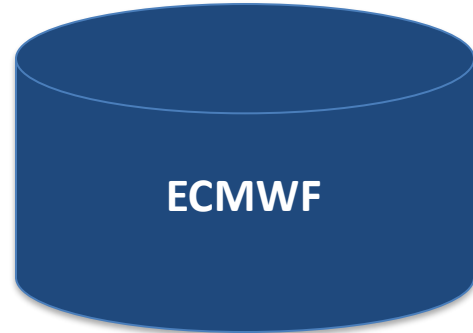
Cores	5632
Memory	53 TB
Storage	4.2 PB usable
GPUs	32 x A100 80 GB

- Co-located with HPC and DHS, in Bologna DC
- 2 Production clouds - one on each computer hall
 - CCI1
 - CCI2



Data Access from EWC

Combined set of “pull” and “push” data access services:



Meteorological Archival and Retrieval System (MARS)

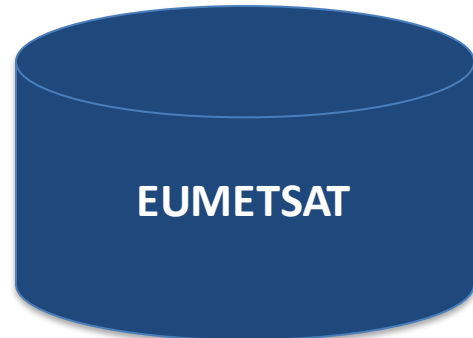
- ECMWF Petabytes-scale data archive providing APIs for data discovery and retrieval

ECMWF Production Data Store (ECPDS)

- Data dissemination service for customised data delivery

Copernicus Climate and Atmosphere Data Stores (CDS/ADS)

- Copernicus Climate Change (C3S) and Atmospheric Monitoring (CAMS) services data



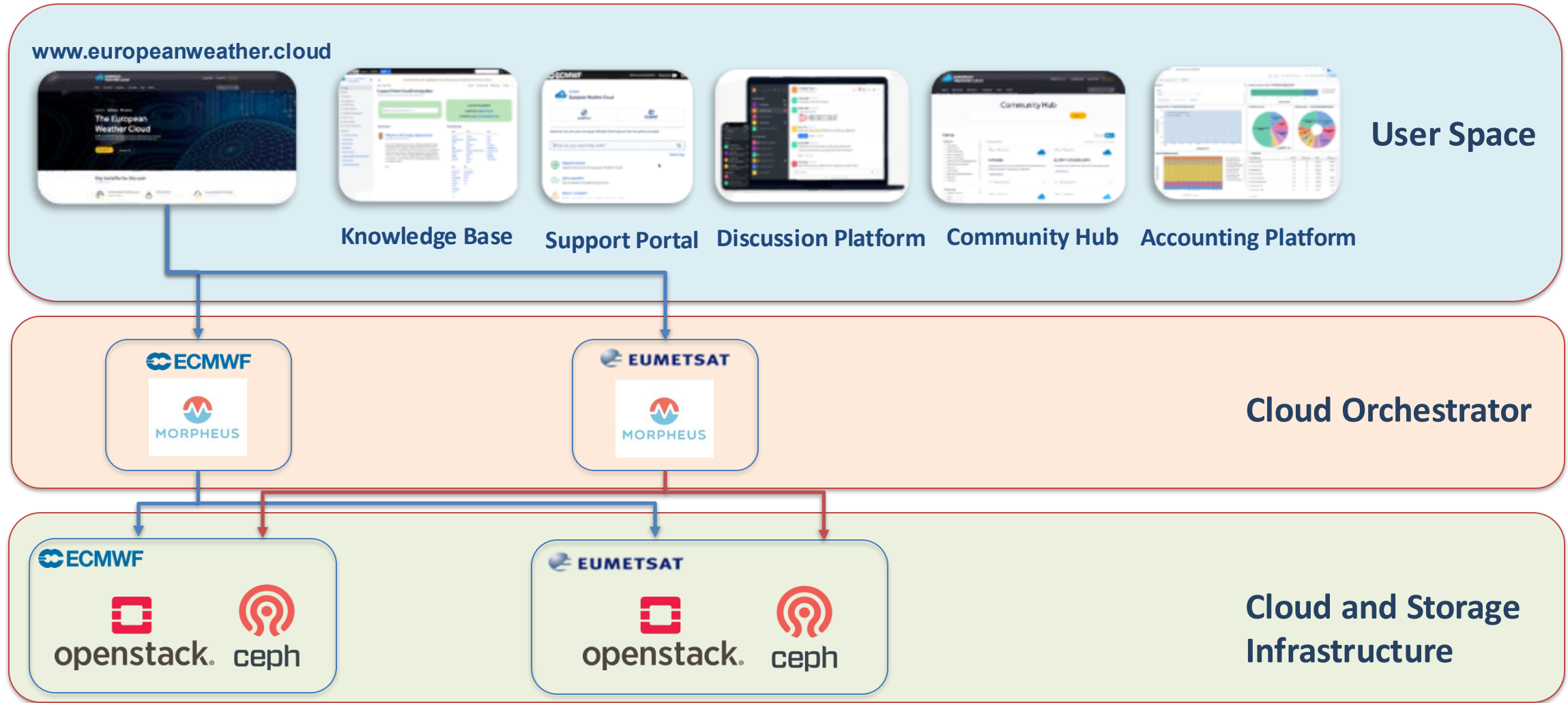
EUMETSAT Data Store & Data Tailor

- Access to all EUMETSAT meteorological, climate and ocean data through a suite of APIs, and incorporating data tailoring capability

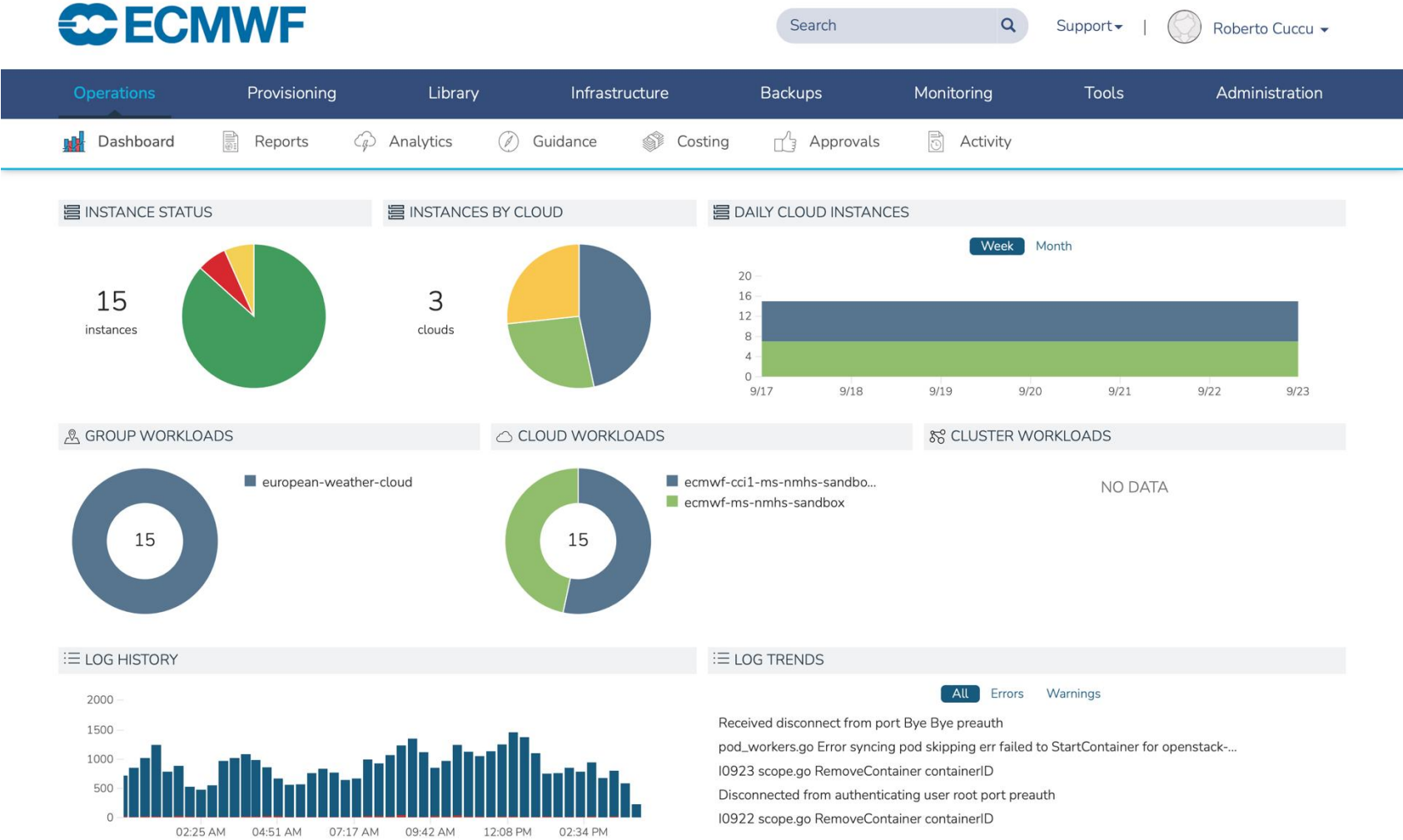
EUMETCast Terrestrial

- Near-real time data delivery via terrestrial network

High Level Design



Morpheus



INSTANCE STATUS

15 instances

INSTANCES BY CLOUD

3 clouds

DAILY CLOUD INSTANCES

Week Month

GROUP WORKLOADS

15

CLOUD WORKLOADS

15

CLUSTER WORKLOADS

NO DATA

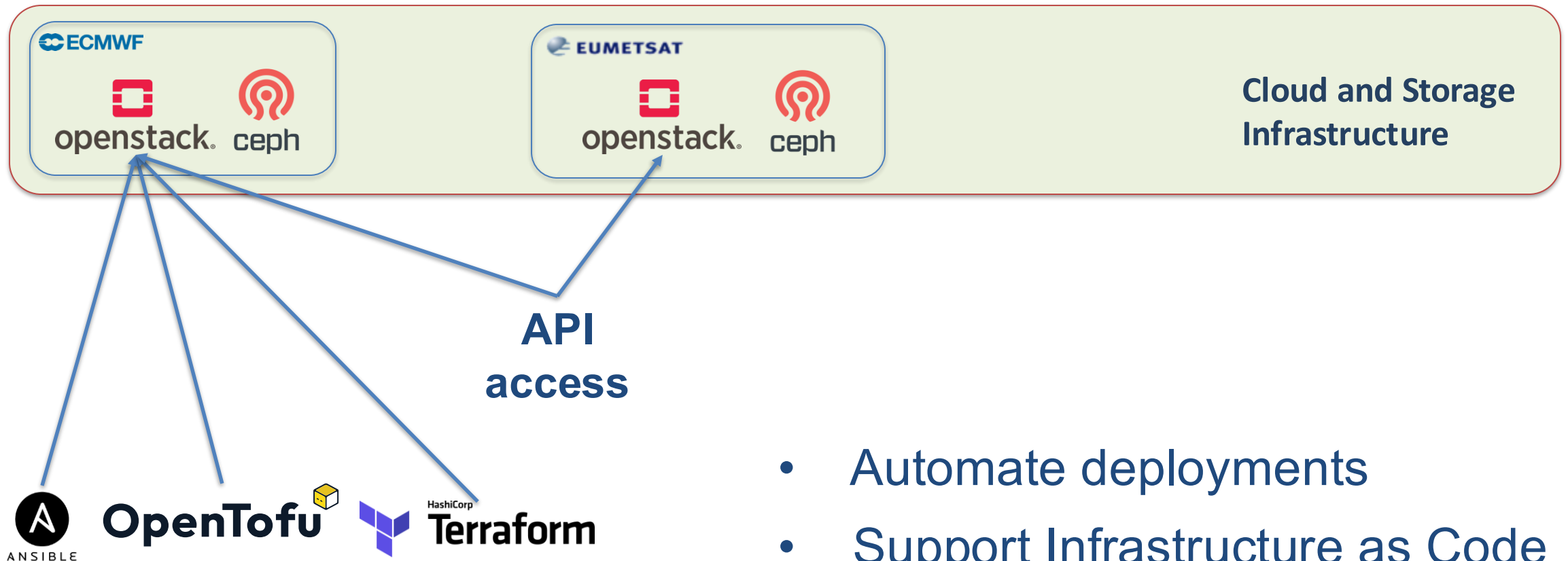
LOG HISTORY

LOG TRENDS

All Errors Warnings

Received disconnect from port Bye Bye preauth
pod_workers.go Error syncing pod skipping err failed to StartContainer for openstack-...
i0923 scope.go RemoveContainer containerID
Disconnected from authenticating user root port preauth
i0922 scope.go RemoveContainer containerID

OpenStack access



- Automate deployments
- Support Infrastructure as Code
- Improve synergies with other infras

S3 Object Storage

- Computer data storage architecture designed to handle large amounts of unstructured data
- Data is stored as **objects** within resources called **buckets**
- **Benefits:** high scalability, flat structure, resilience, access protocol
- Access via the **S3 RESTful API** is compatible with the basic data access model of the Amazon Simple Storage Service (S3) which runs over HTTPS


S3 Object Storage - Access

Morpheus GUI

STORAGE

Buckets File Shares Volumes Data Stores Servers

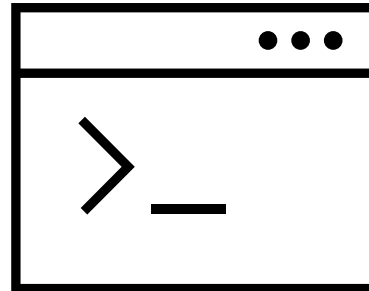
BUCKETS

Search 

NAME	PROVIDER TYPE	BUCKET NAME
bucket_post	S3	postupdate
cci1-os	S3	vmbackup
Cloudy Bucket	S3	cloudybucket
Demo	S3	demo

Command Line Tools

- s3cmd
- rclone
- awscli



Python Libraries (boto3)



```
# Initialize the S3 client
s3 = boto3.client(
    's3',
    endpoint_url=S3_ENDPOINT_URL,
    config=Config(
        signature_version=UNSIGNED
    ))
```

Knowledge Base

ECMWF

Spaces

Search

Log in

European Weather Cloud Knowledge Base

Pages

Blog

SPACE SHORTCUTS

ECMWF Portal

EUMETSAT Portal

Accounting Dashboards

Morpheus Documentation

Raise an issue

How-to articles

Troubleshooting articles

PAGE TREE

Terms and Conditions for the Us

EWC service definition

Getting access to EWC

EWC Accounting Dashboard

EWC Discussion Platform

EWC Service Status page

Getting started

EWC Compute

EWC DNS

EWC Storage

EWC Data access

EWC Security guidelines

EUMETSAT - EWC Identity and A

EWC Training and Tutorials

EWC Community Hub

EWC Community Templates

Space tools

Pages

European Weather Cloud Knowledge Base

Created by Unknown User (uscs), last modified by Uroosa Farooq on Sept 11, 2025

Search this documentation for ...

Recent news

Using the EWC Community Hub webinar - Registration is open!

Xavier Abellan posted on Oct 09, 2025

The European Weather Cloud (EWC) teams at ECMWF and EUMETSAT are pleased to invite you to the third thematic EWC webinar of 2025 <https://events.ecmwf.int/event/506/>. These recurring thematic webinars are aimed at all users of the EWC service, provided by EUMETSAT and ECMWF, which is available to all ECMWF and EUMETSAT Member and Co-operating States. Our primary objective is to provide guidance to users on how to effectively use the different capabilities of the EWC....

events

European Weather Cloud users meet in Bologna for 8th workshop

Xavier Abellan posted on Oct 02, 2025

https://events.ecmwf.int/event/479/attachments/3048/5516/EWC-WS_Group%20photo.jpg
The 8th European Weather Cloud (EWC) User Workshop <https://events.ecmwf.int/event/479/> was held on 18 September in Bologna, hosted by ECMWF as part of its 50th anniversary celebrations. The workshop brought together users, developers, and service providers to share experiences and learn from each other....

news

Can't find the answer?

Login to the Support Portal

or email us at support@europeanweather.cloud

Browse by topic

A

access

active-directory

admin

api

apps

authentication

avatar

aviso

B-C

backup

backups

basics

blueprint

bucket

ceph

change

command-line

communityhub

containers

D

data

data-access

data_access

definitions

disk

dissemination

E-H

email

eumetcast

european-weather-cloud

events

ewc

ewc-community-hub

ewcloud

glossary

gpu

grib

how-to

howto

I-M

identity

keys

kubernetes

legal

login

machine-learning

mars

monitoring

morpheus

morpheus-cli

morpheus-web

N

network

networks

news

nfs

notifications

nvidia

O-Q

object-storage

on-boarding

openstack

opera

owned-single-by-sydc

owned-single-by-syo

owned-single-by-usrc

owned-single-by-usxa

password

portal

provisioning

python

R

radar

reconfigure

remote

retrieval

roles

S-T

U-Z

EUROPEAN
WEATHER CLOUD

Support Portal

<https://support.europeanweather.cloud/>

Search

Support

Demo User

Operations

Provisioning

Library

Infrastructure

Back

Administration

Dashboard

Reports

Costing

Approvals

KNOWLEDGE BASE - EUROPEAN WEATHER CLOUD

SUPPORT PORTAL - EUROPEAN WEATHER CLOUD

ECMWF SERVICE STATUS

FAVORITES

INSTANCE

TYPE

ADDRESS

my-new-vm

Rocky

136.156.132.135

INSTANCE STATUS

INSTANCES BY CLOUD

DAILY CLOUD INSTANCES

1 instances

1 clouds

Week

Month

9/19

9/20

9/21

9/22

9/23

9/24

9/25

Add announcement

Requests 8

ECMWF

EUMETSAT

Welcome! You can raise a European Weather Cloud request from the options provided.

What do you need help with?

Search

Search help

General question

Get assistance for general questions.

Request access

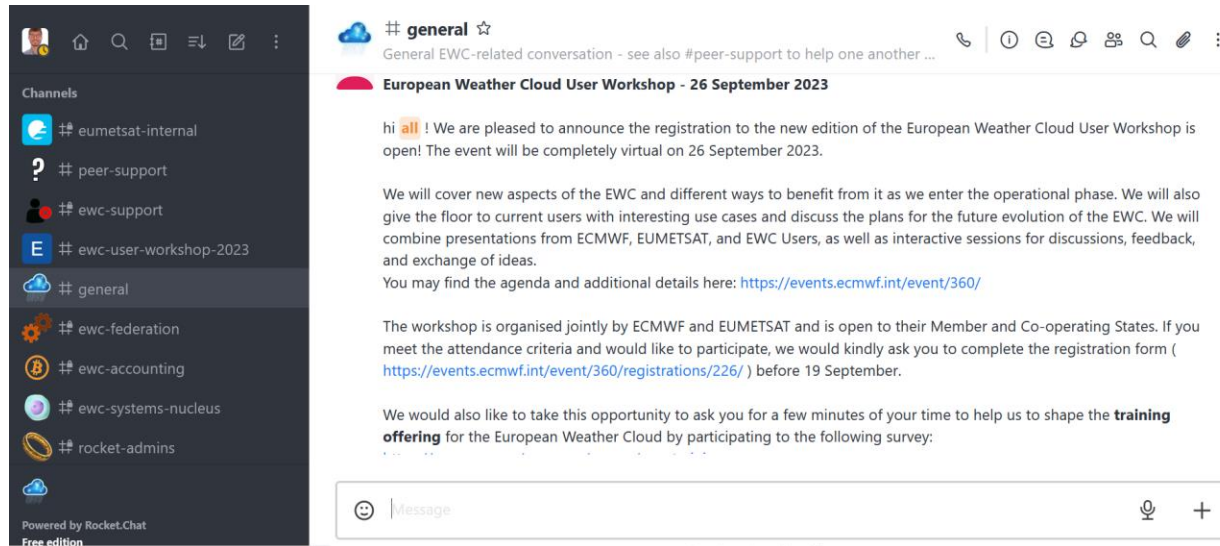
Request access to the European Weather Cloud

Report a problem

Report a problem in the European Weather Cloud

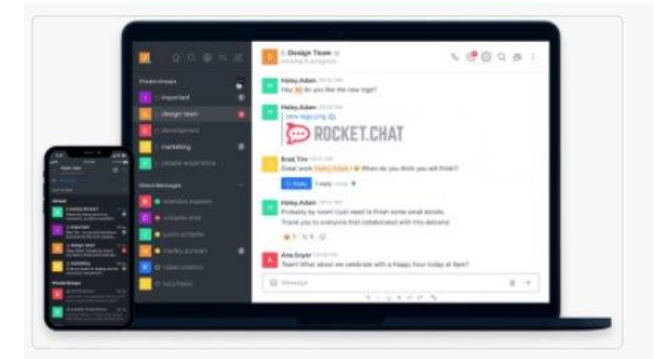
Powered by Jira Service Management

EWC Discussion Platform: Rocket.Chat



Installation

- Web based
- Desktop App
- Mobile

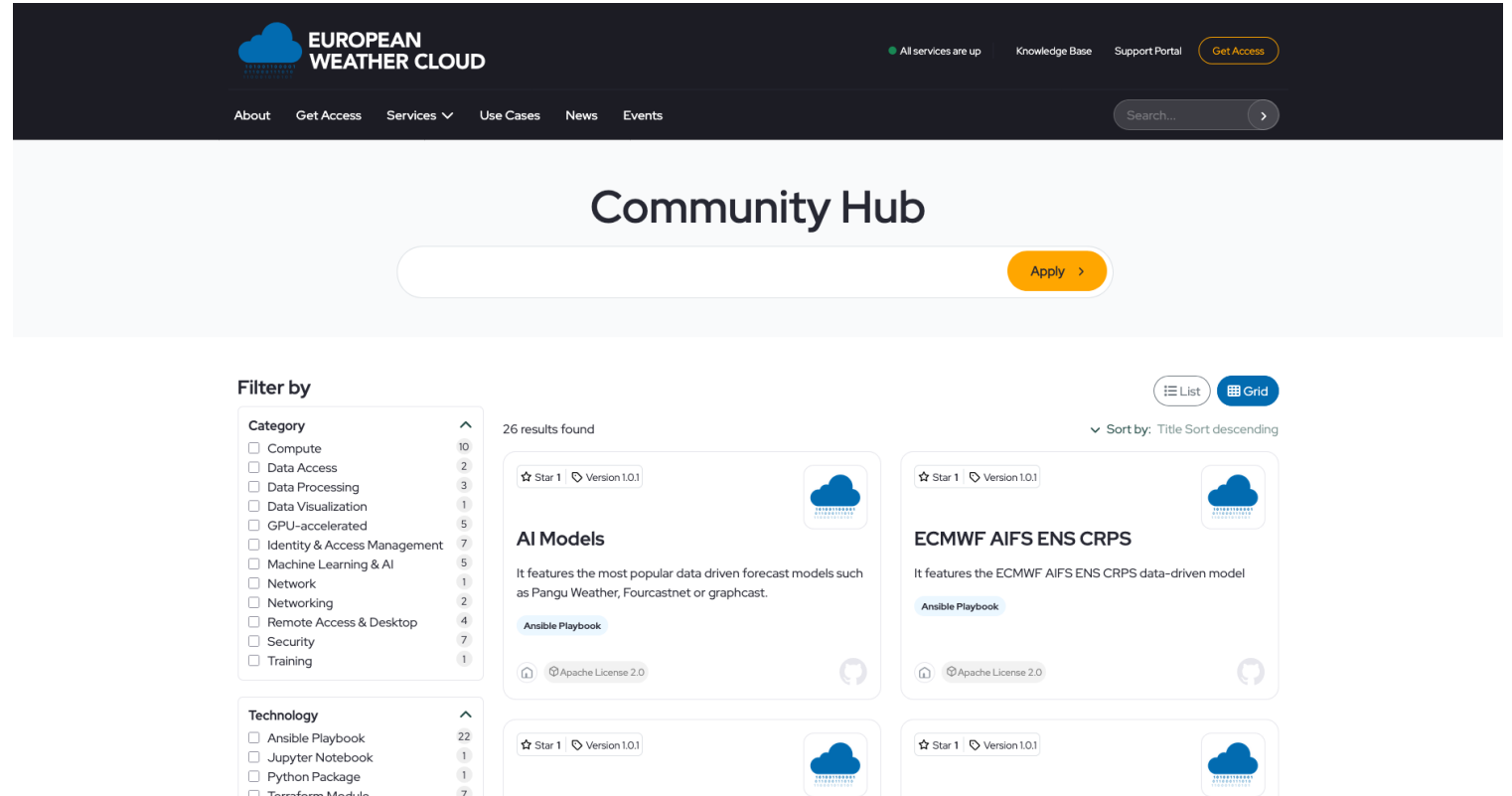


How do I join?

Member and Cooperating States users can self-register (based on email domain) on:
<https://chat.europeanweather.cloud>

EWC Community Hub

- Centralised platform where EWC users can exchange components, such as:
 - Ansible playbooks
 - Jupyter notebooks
 - Terraform modules
 - Python packages
 - Examples
 - ...



EWC Accounting

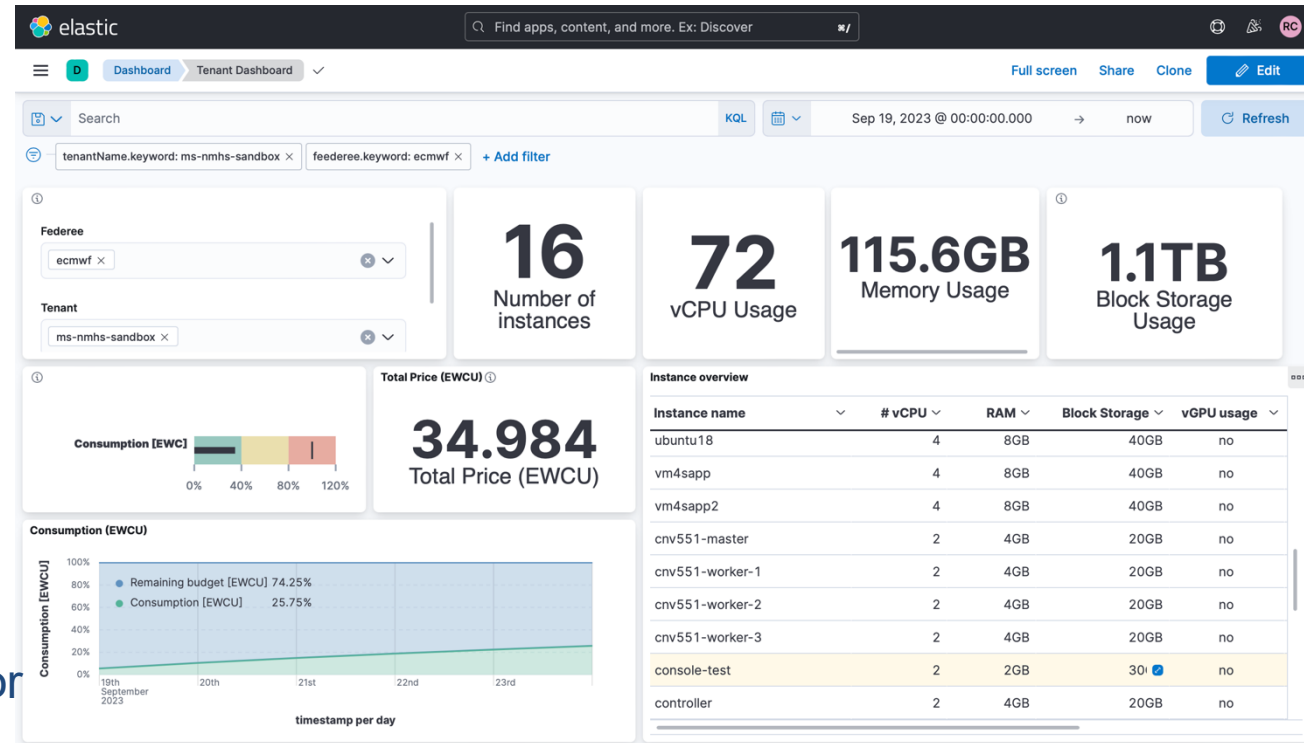
The **Accounting dashboard** provides a cross-cloud overview of the resource usage of the tenancies.

A web GUI provides metrics, time series, graphs, and dashboards displaying the accounting information.

Accounted resources include:

- Virtual Machines
 - vCPU
 - Memory
 - Local Disks
- Object Storage (S3)
- vGPU usage

A **CBU (Cloud Billing Unit)** is the virtual currency for the accounting of the consumed cloud resources.



Usage context examples

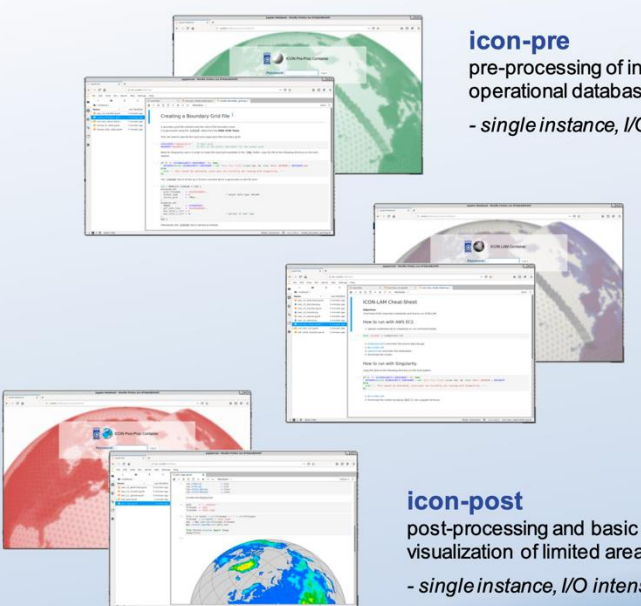
- Pre-operational / Operational usage
- Backup infrastructure
- Cloud “bursting” / elasticity
- Application development and testing support
- Systems architecture setup / testing
- Research / scientific activities
- Training activities
- Collaboration environments

Emergency response

- In March 2020, a magnitude 5.3 earthquake hit Croatia Meteorological Service
- A backup was created on the EWC, in a few days



Training

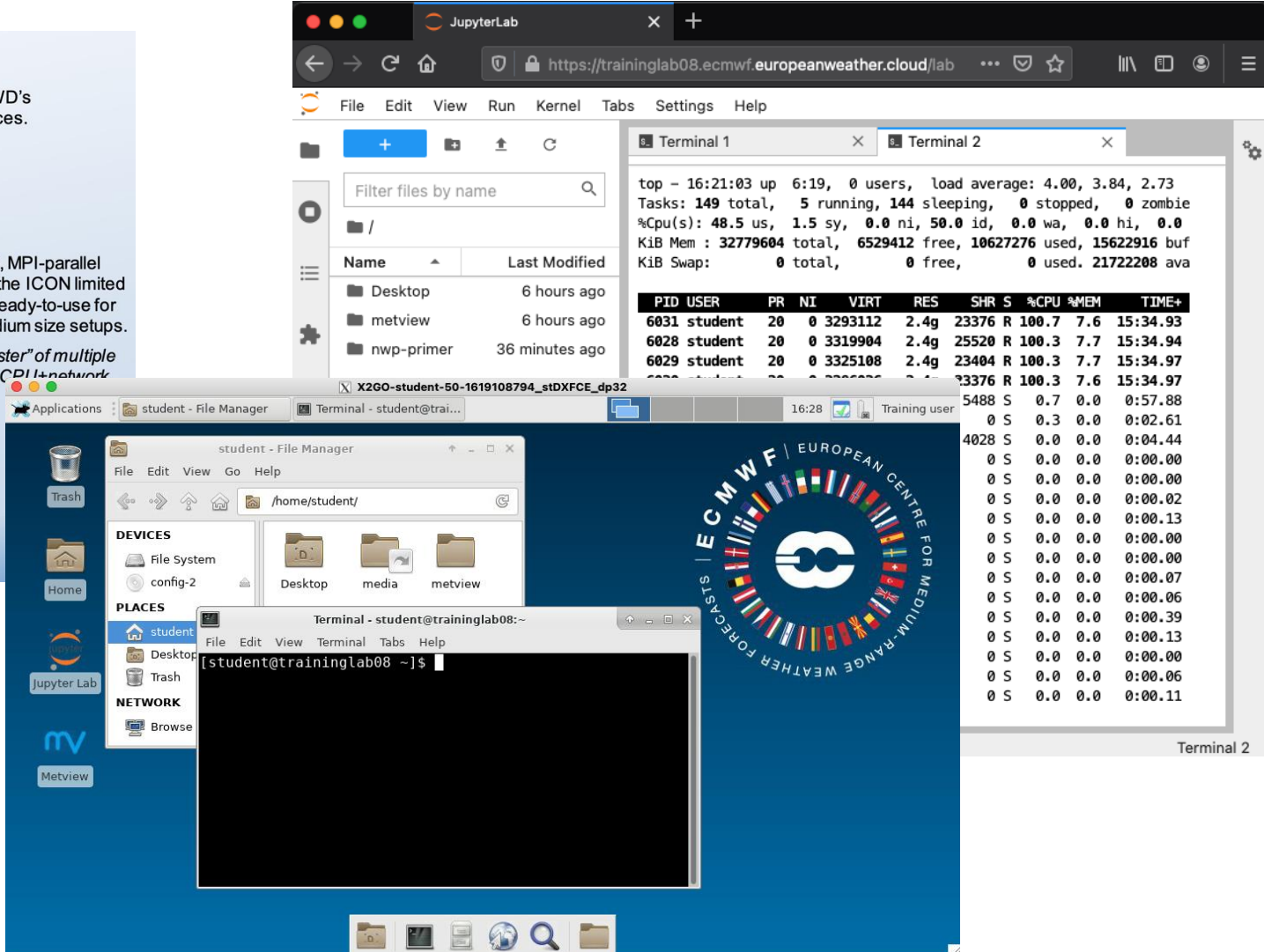


icon-pre
pre-processing of input data from DWD's operational database and other sources.
- single instance, I/O intensive

icon-lam
self-contained, MPI-parallel executable of the ICON limited area model. Ready-to-use for small and medium size setups.
- "virtual cluster" of multiple instances, CPU+network intensive

icon-post
post-processing and basic visualization of limited area ICON runs.
- single instance, I/O intensive

- ICON Lab by DWD
- ECMWF NWP Training labs
- EUMETSAT Training infrastructure



JupyterLab interface showing system statistics and a file manager.

Terminal 1 output:

```
top - 16:21:03 up 6:19, 0 users, load average: 4.00, 3.84, 2.73
Tasks: 149 total, 5 running, 144 sleeping, 0 stopped, 0 zombie
%Cpu(s): 48.5 us, 1.5 sy, 0.0 ni, 50.0 id, 0.0 wa, 0.0 hi, 0.0
KiB Mem : 32779604 total, 6529412 free, 10627276 used, 15622916 buf
KiB Swap: 0 total, 0 free, 0 used. 21722208 ava
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+
6031	student	20	0	3293112	2.4g	23376	R	100.7	7.6	15:34.93
6028	student	20	0	3319904	2.4g	25520	R	100.3	7.7	15:34.94
6029	student	20	0	3325108	2.4g	23404	R	100.3	7.7	15:34.97
6030	student	20	0	3325108	2.4g	23376	R	100.3	7.6	15:34.97
5488	S	0	0	0	0	0	S	0.7	0.0	0:57.88
4028	S	0	0	0	0	0	S	0.3	0.0	0:02.61
0	S	0	0	0	0	0	S	0.0	0.0	0:00.00
0	S	0	0	0	0	0	S	0.0	0.0	0:00.00
0	S	0	0	0	0	0	S	0.0	0.0	0:00.02
0	S	0	0	0	0	0	S	0.0	0.0	0:00.13
0	S	0	0	0	0	0	S	0.0	0.0	0:00.00
0	S	0	0	0	0	0	S	0.0	0.0	0:00.00
0	S	0	0	0	0	0	S	0.0	0.0	0:00.07
0	S	0	0	0	0	0	S	0.0	0.0	0:00.06
0	S	0	0	0	0	0	S	0.0	0.0	0:00.39
0	S	0	0	0	0	0	S	0.0	0.0	0:00.13
0	S	0	0	0	0	0	S	0.0	0.0	0:00.00
0	S	0	0	0	0	0	S	0.0	0.0	0:00.06
0	S	0	0	0	0	0	S	0.0	0.0	0:00.11

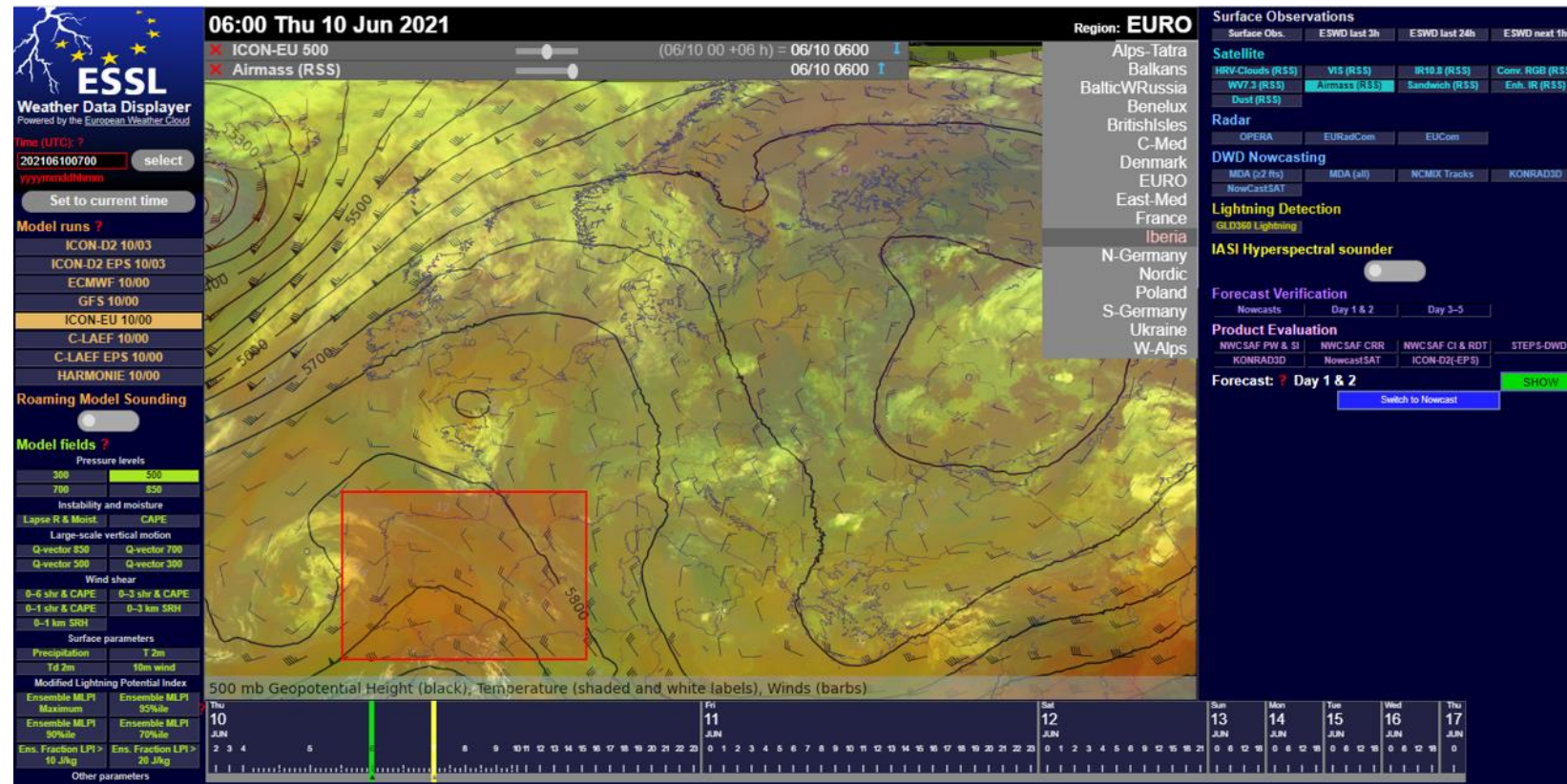
Terminal 2 output:

```
top - 16:21:03 up 6:19, 0 users, load average: 4.00, 3.84, 2.73
Tasks: 149 total, 5 running, 144 sleeping, 0 stopped, 0 zombie
%Cpu(s): 48.5 us, 1.5 sy, 0.0 ni, 50.0 id, 0.0 wa, 0.0 hi, 0.0
KiB Mem : 32779604 total, 6529412 free, 10627276 used, 15622916 buf
KiB Swap: 0 total, 0 free, 0 used. 21722208 ava
```

File Manager showing /home/student/ directory with Desktop, media, and metview folders.

Data & visualisation services

- European Severe Storm Lab – Weather Data Displayer

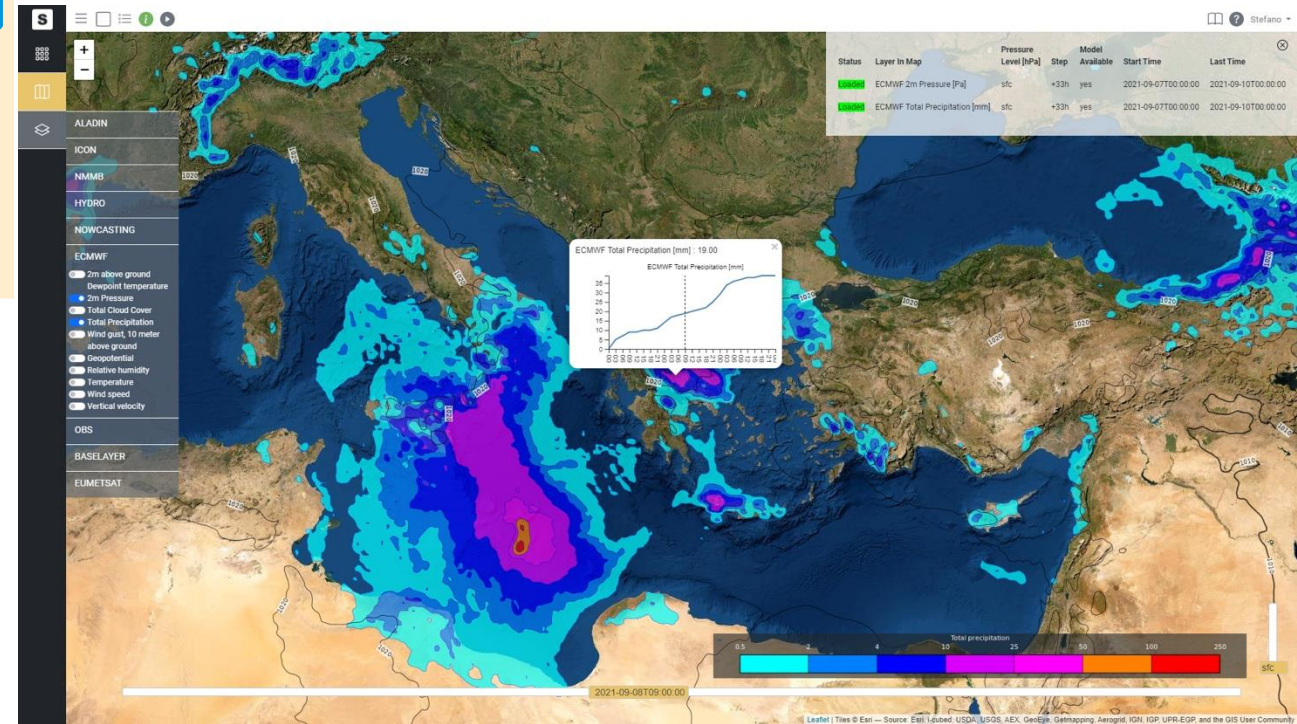
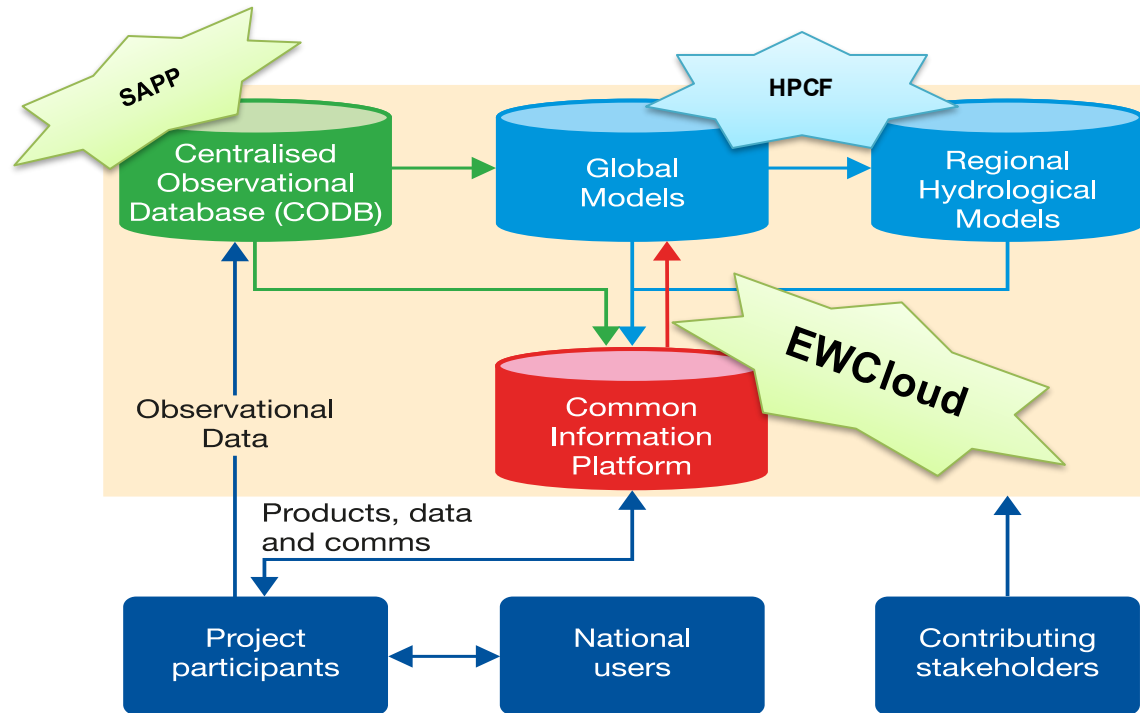


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International collaboration projects

- South-East European Multi-Hazard Early Warning Advisory System (SEE-MHEWS-A)





1 0 1 0 0 1 1 0 0 0 0 1
0 1 1 0 0 0 1 1 1 0 1 0
1 1 0 0 0 1 0 1 0 1 0 1

Demo!



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1 0 1 0 0 1 1 0 0 0 0 1
0 1 1 0 0 0 1 1 1 0 1 0
1 1 0 0 0 1 0 1 0 1 0 1

Questions?



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