

The Copernicus Climate | Atmosphere Data Stores



Climate Change

Angel LOPEZ ALOS, ECMWF

angel.alos@ecmwf.int

Weather and climate in the cloud
Workshop

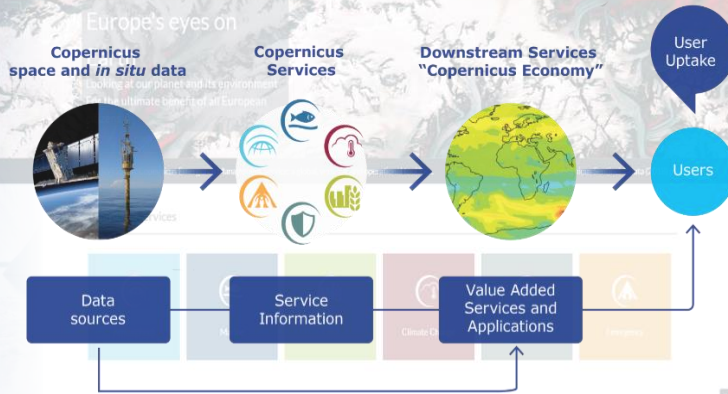




Climate
Change

Copernicus

<https://www.copernicus.eu/en>



Copernicus is the **European Union's** Earth Observation Programme.

Combines **satellite** observations and **in-situ** measurements.

Services transform this raw data into **value-added** geo-information products.

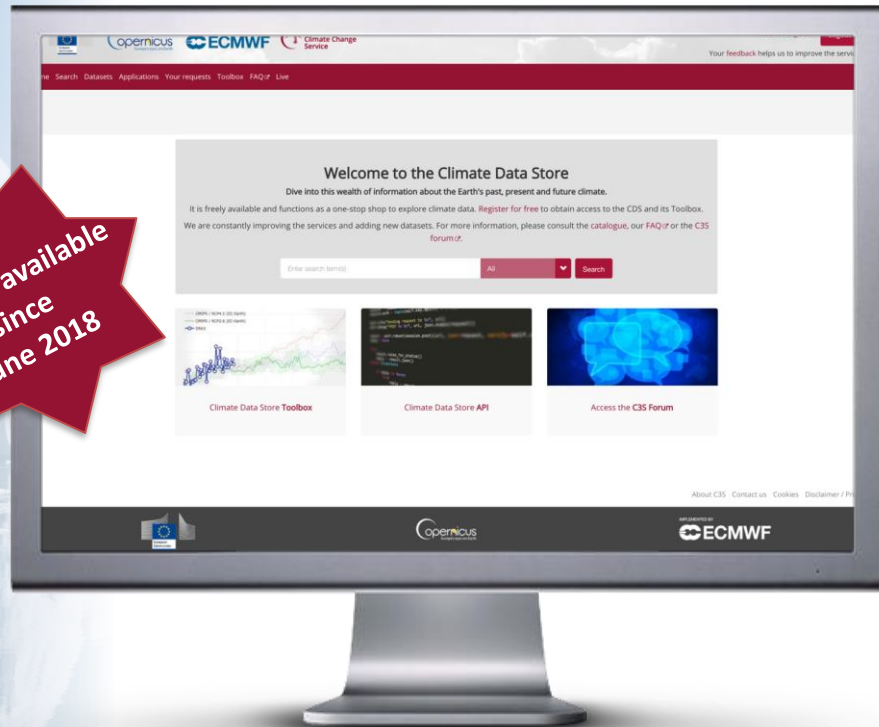
ECMWF entrusted to implement **Climate Change (C3S)** and **Atmosphere Monitoring (CAMS)** services.



Climate
Change

Climate Data Store

Publicly available
since
June 2018



<https://climate.copernicus.eu>

<https://cds.climate.copernicus.eu>

The **Climate Data Store (CDS)**, is an online **open** and **free** service supporting the implementation of **Climate Change Service (C3S)**.

Distributed system providing improved access to a **wide range of climate datasets** and **applications** via a **searchable catalogue**.

Toolbox allows users to **build** their own applications, maps and graphs.

Evaluation and Quality Control (EQC) for catalogued products



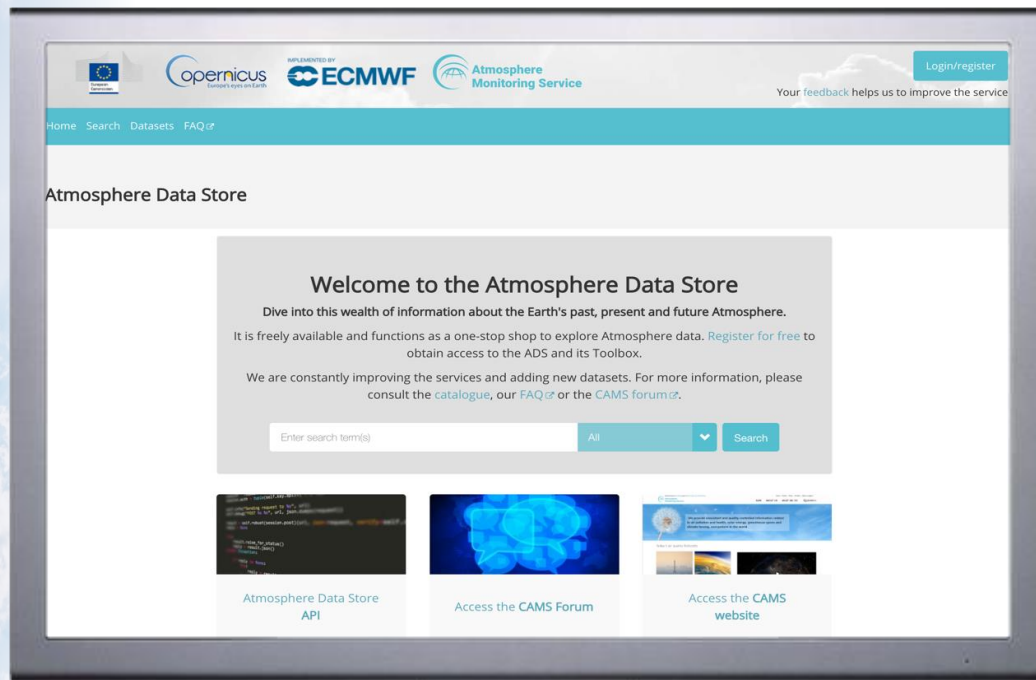
Europe's eyes on Earth





Atmosphere
Monitoring

Atmosphere Data Store



<https://atmosphere.copernicus.eu>

<https://ads.atmosphere.copernicus.eu>

The **Atmosphere Data Store (ADS)** is replacing the CAMS Catalogue as the main point of access to **CAMS data**

It uses the **CDS technology and infrastructure**



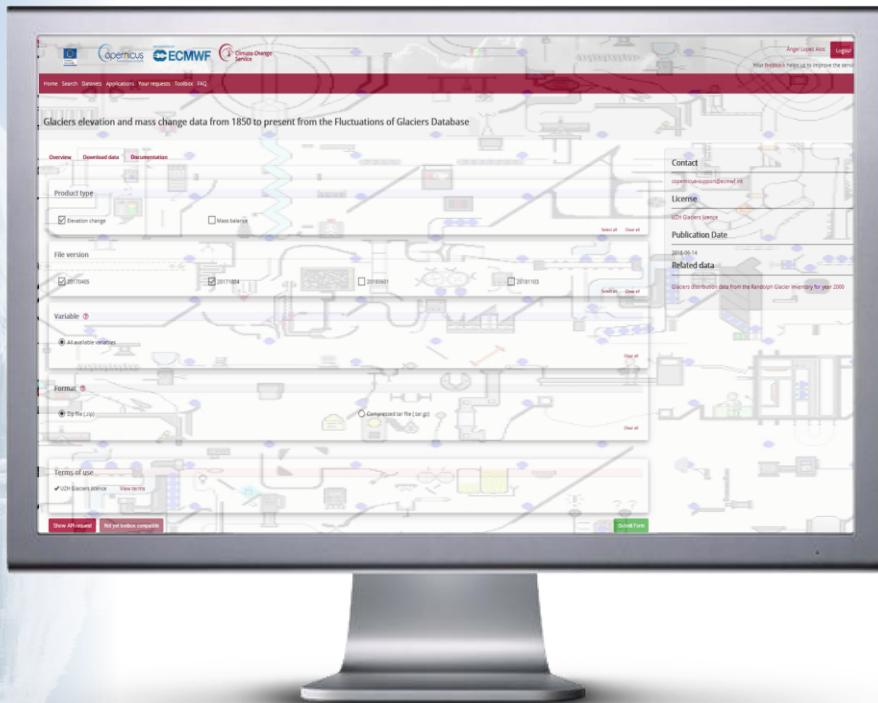
Europe's eyes on Earth





Climate
Change

CDS - ADS



<https://cds.climate.copernicus.eu/live>

CDS/ADS catalogues and
functionalities continuously evolving.

DevOps team to operate and improve
the system.

User support team to help users with
issues and **questions**.

On-Premises Private Cloud.

Driven goals: Diversity, Interoperability,
Scalability, Simplicity, Consistency,
Traceability, Reliability.



Europe's eyes on Earth





Climate
Change

CDS concept in a nutshell

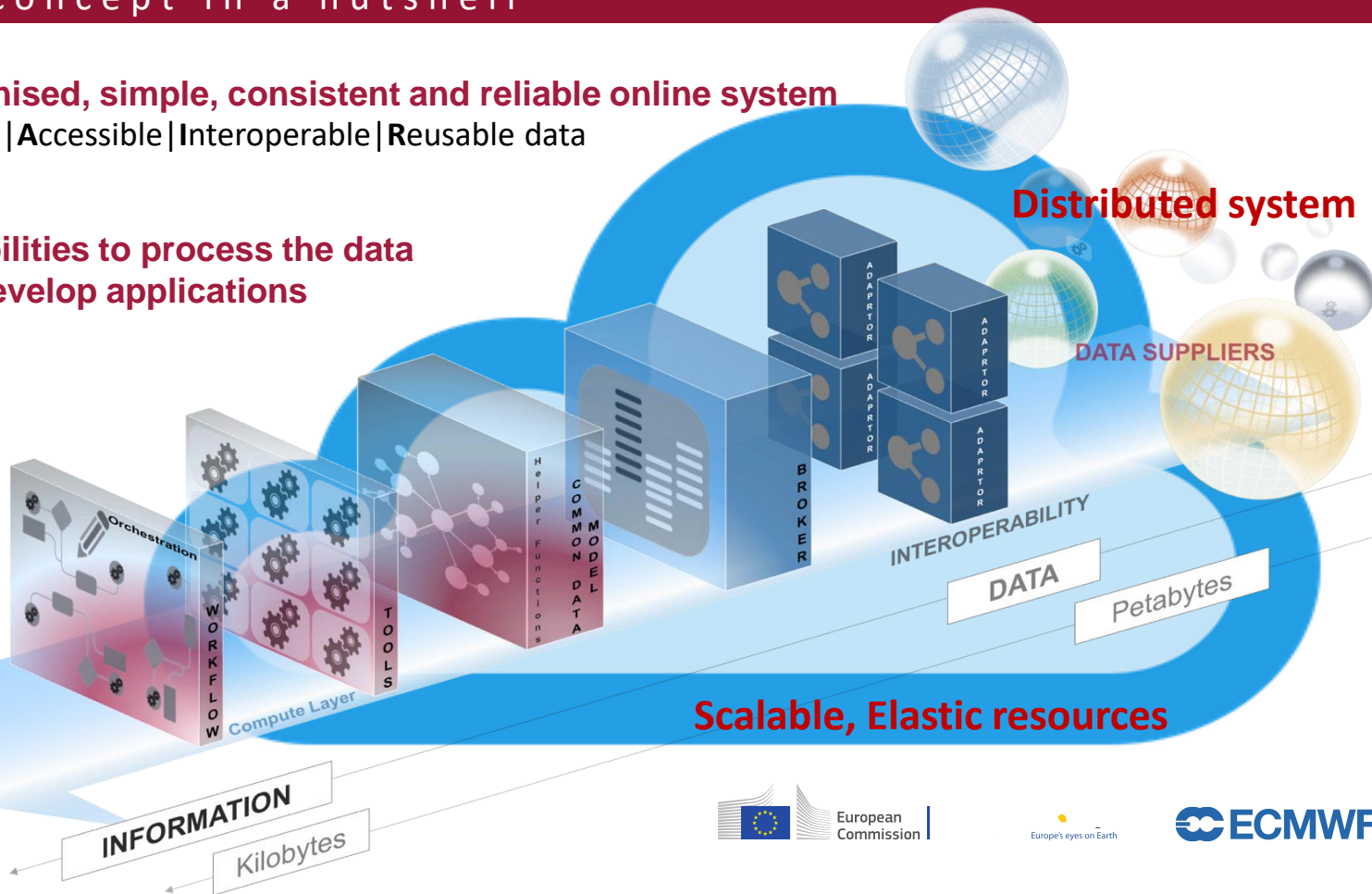
Harmonised, simple, consistent and reliable online system

Findable | Accessible | Interoperable | Reusable data

**Capabilities to process the data
and develop applications**

Distributed system

DATA SUPPLIERS

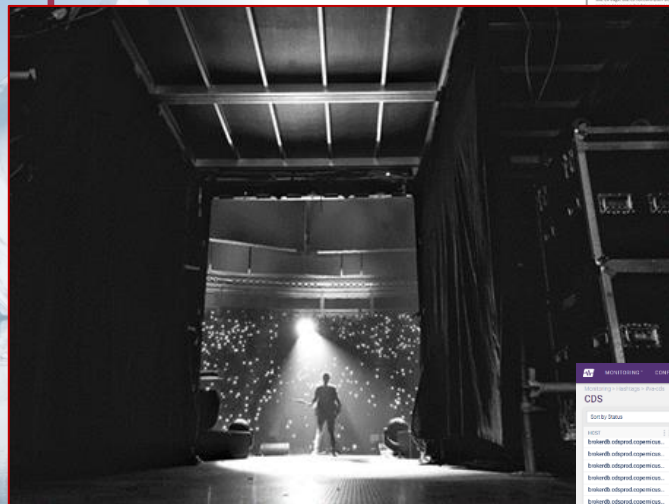




Climate
Change

CDS Duality

**simple, consistent,
harmonized,
Intuitive, informative
interfaces**



Robust, reliable Backend

QoS | Interoperable | Scalable |
Automatized | Monitored

In-house Cloud Infrastructure

Elasticit | Scalable | Monitored

Overview - Metadata

API

Applications

CSW

EQC Information

Toolbox editor

Python based
workflows

Download forms

Documentation

CDS Live

Operational monitoring
(Opsview)

Automatic deployment
(Puppet)

Statistics and reporting
(Splunk)

Cloud Infrastructure
monitoring and management
(Horizon, Grafana)



Climate
Change

CDS Live

Climate Data Store - Live

Statistics Queue Limits Priorities ↺

EQC Performance Indicators



NEWS FEED

Tweets by @ECMWFCDs



C3S CDS IT
@ECMWFCDs
#CDSOperation #CDS #ClimateDataStore
#AtmosphereDataStore Please be informed
that System Session on Wednesday 16th
December between 17-21h (UTC) has been
successfully completed. Sorry about
inconveniences.



Dec 16, 2020



C3S CDS IT
@ECMWFCDs
#CDSOperation #CDS #ClimateDataStore
#AtmosphereDataStore Please be informed
that Wednesday 16th December between 17-
21h (UTC) all access to CDS will be closed
for maintenance including API.



Dec 10, 2020



C3S CDS IT
@ECMWFCDs
#CDSOperation #CDS #ClimateDataStore
#ADS #AtmosphereDataStore Please be
informed that system session planned for
Thursday 3th December between 17-21h
(UTC) has been cancelled due to technical
issues and it will need to be rescheduled.



Dec 3, 2020



C3S CDS IT
@ECMWFCDs
#CDSOperation Scheduled
the #CDS #ClimateDataStore
#AtmosphereDataStore &
at development environments,
unavailable for around 3 hours
GMT. Our websites should be



C3S CDS IT
@ECMWFCDs
#CDSOperation due to an in

Registered users

70.611

Running users

177

Queued users

17

Running requests

262

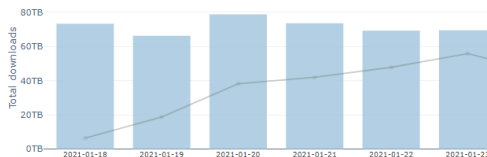
Queued requests

662

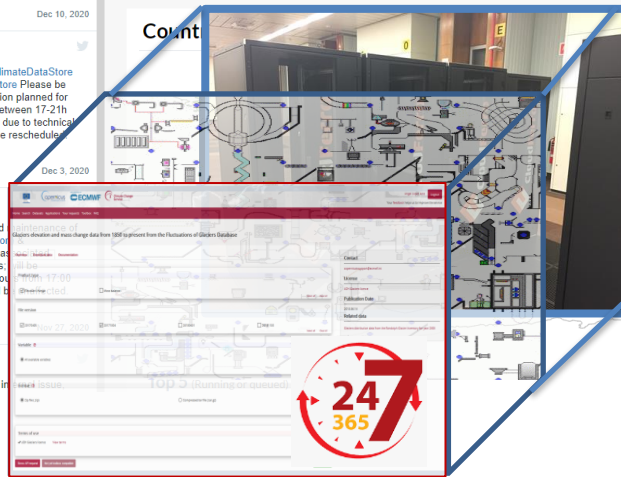
At

09:34

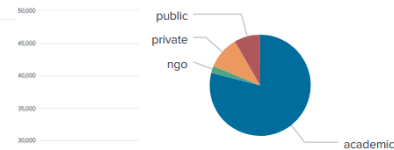
Daily downloads In Terabytes



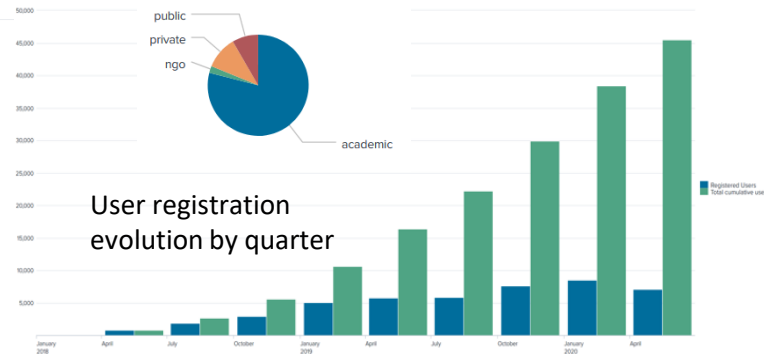
Count



- **70611** registered users
 - **+/- 90** new users
 - **1200** active users
- **600k/day** requests
- **80 Tb/day** delivered
- **Catalogue updates (88 datasets, 21 apps)**
- **250** visits to public apps.



User registration
evolution by quarter



European
Commission

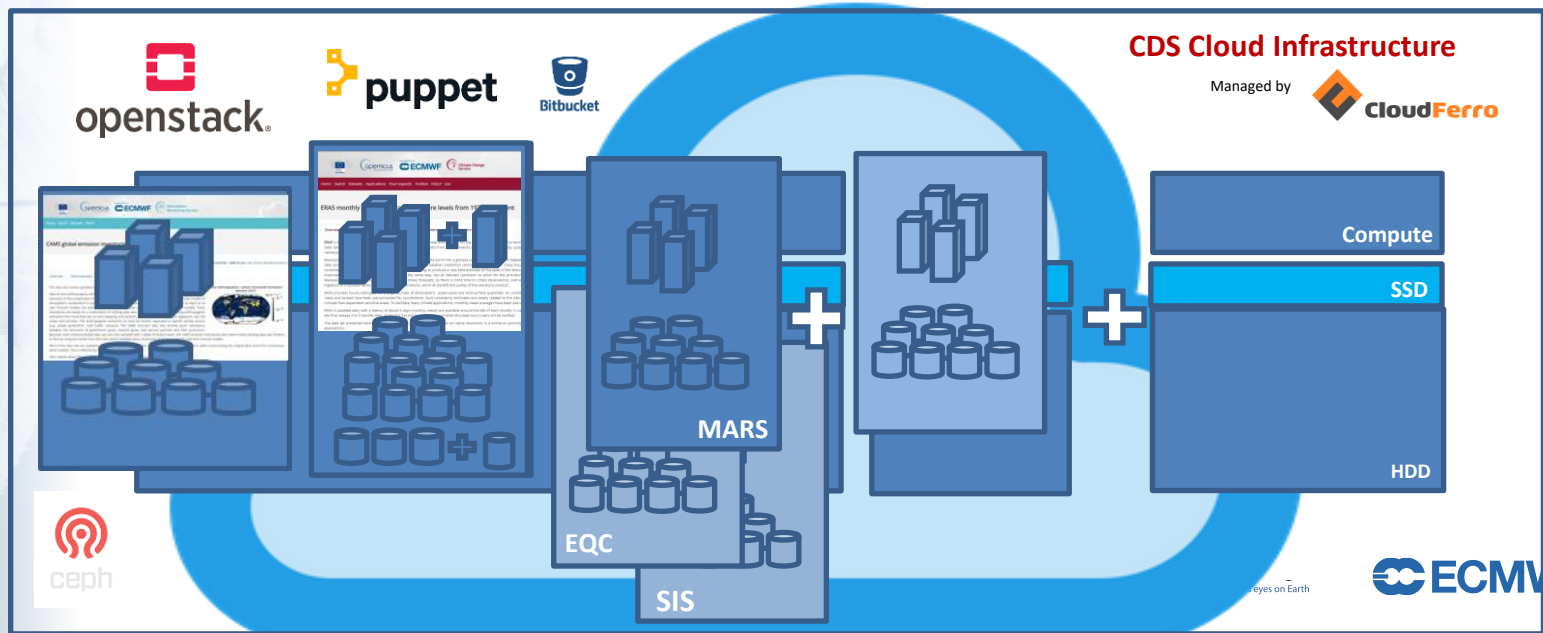
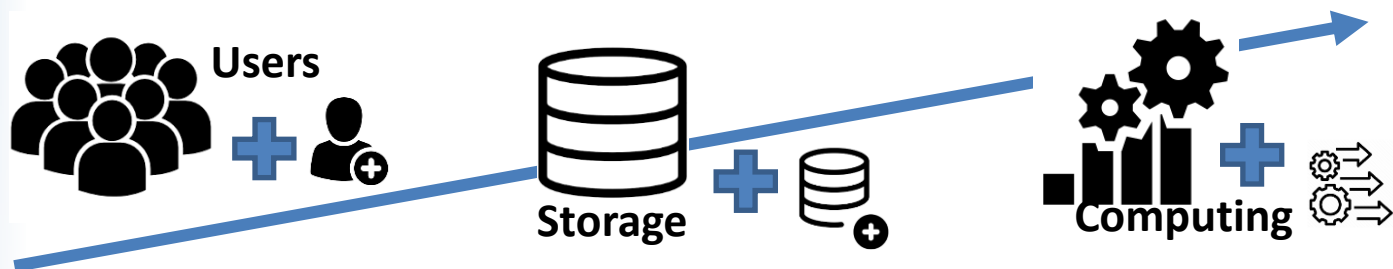
Europe's eyes on Earth





Climate
Change

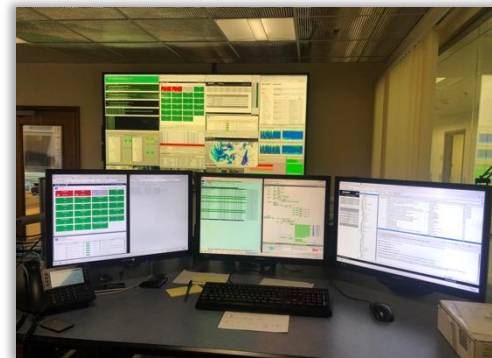
CDS Cloud Elasticity was key for success





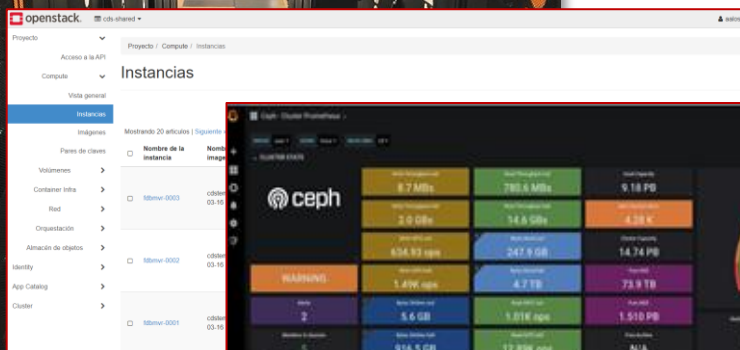
Climate
Change

In-house Cloud infrastructure



On-Premises Private Cloud

72+ nodes, 4000+ CPUs, 13TB RAM
3.9 PB usable (of which 380TB SSD)



**Monitoring
Capacity building
backups**

European
Commission

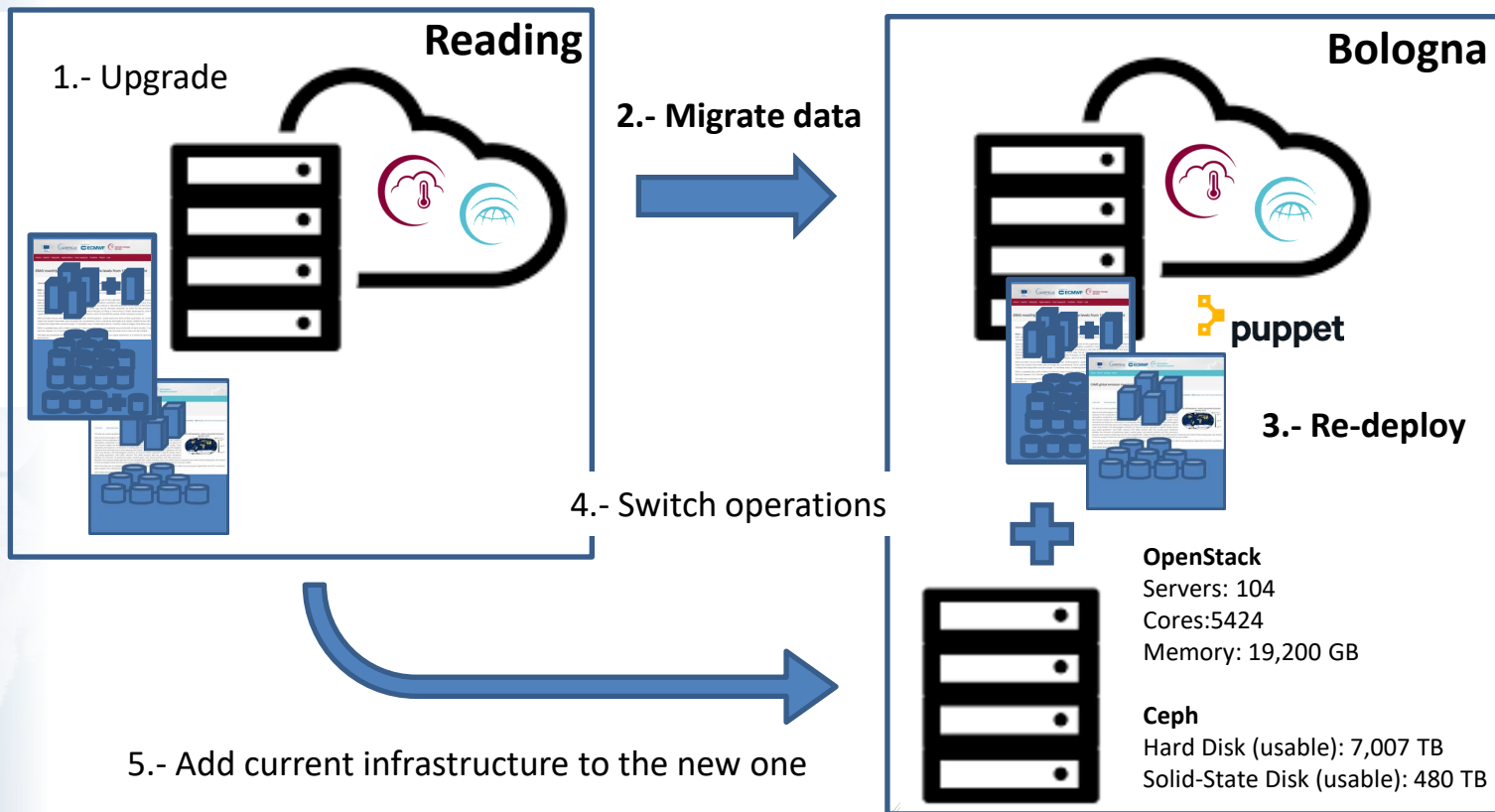
Europe's eyes on Earth

ECMWF



Climate
Change

CDS Migration to Bologna (on going)

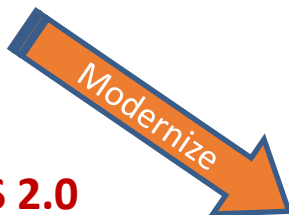
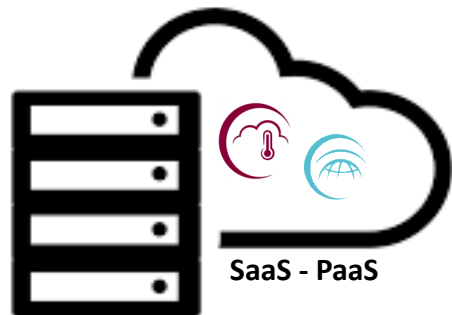




Climate
Change

Copernicus 2.0

CDS



CDS 2.0

Enhanced continuity

More datasets
More applications
More tools
More efficient

...

Offline Toolbox



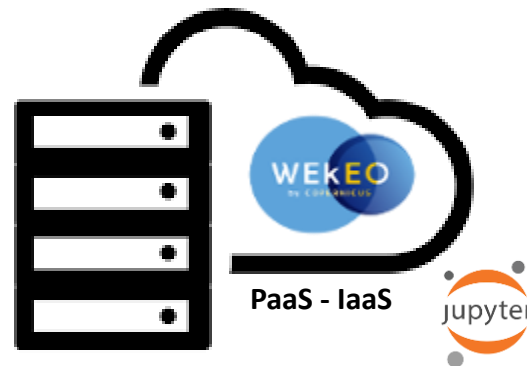
kubernetes



jupyter



Catalogue (CSW)
Data
Toolbox



EUMETSAT, ECMWF and MERCATOR Océan
Data Information Access Service (DIAS)
Provide fast and easy online access to
Copernicus data and products.

<https://www.wekeo.eu/>



Climate
Change

Thank you

<https://cds.climate.copernicus.eu>

<https://ads.climate.copernicus.eu>

<https://wekeo.eu>

