The Copernicus **C**limate|**A**tmosphere **D**ata **S**tores

Climate Change

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Weather and climate in the cloud
Workshop

Copernicus Europe's eyes on Earth | European Commission | ECMWF

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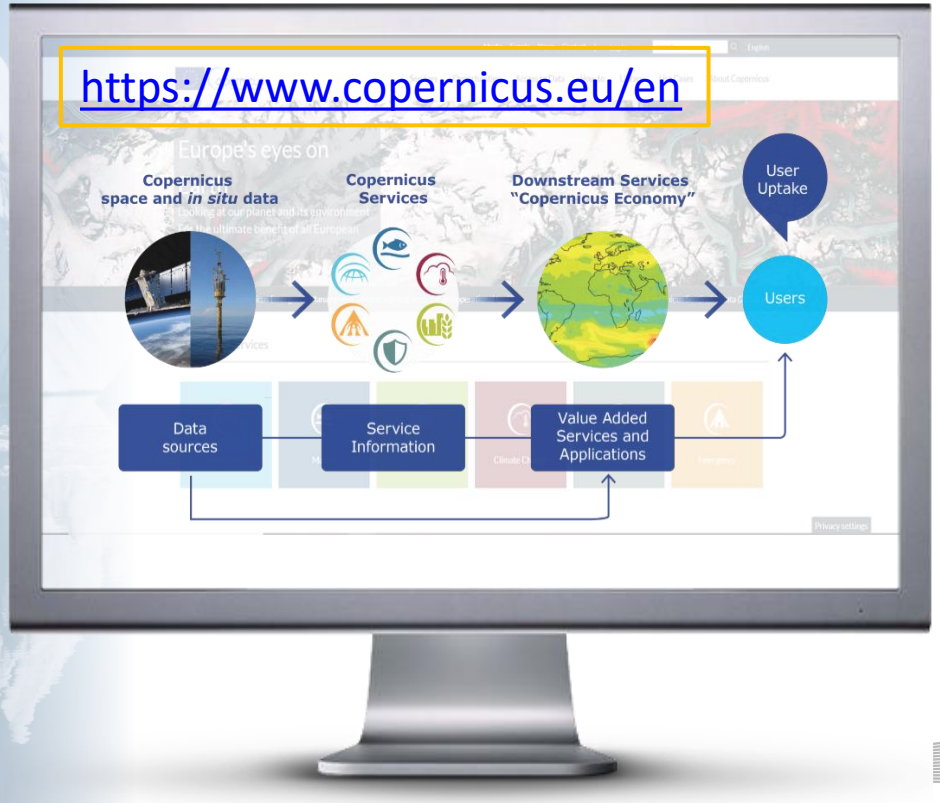

Copernicus is the **European Union's Earth Observation Programme**.

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.

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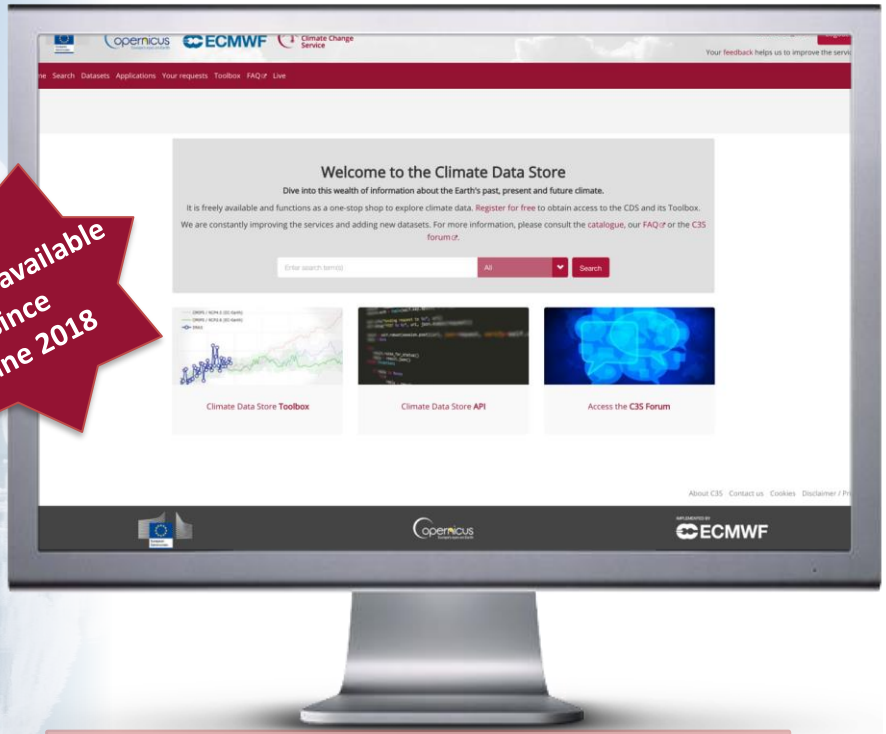
Climate Data Store

Climate Change



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

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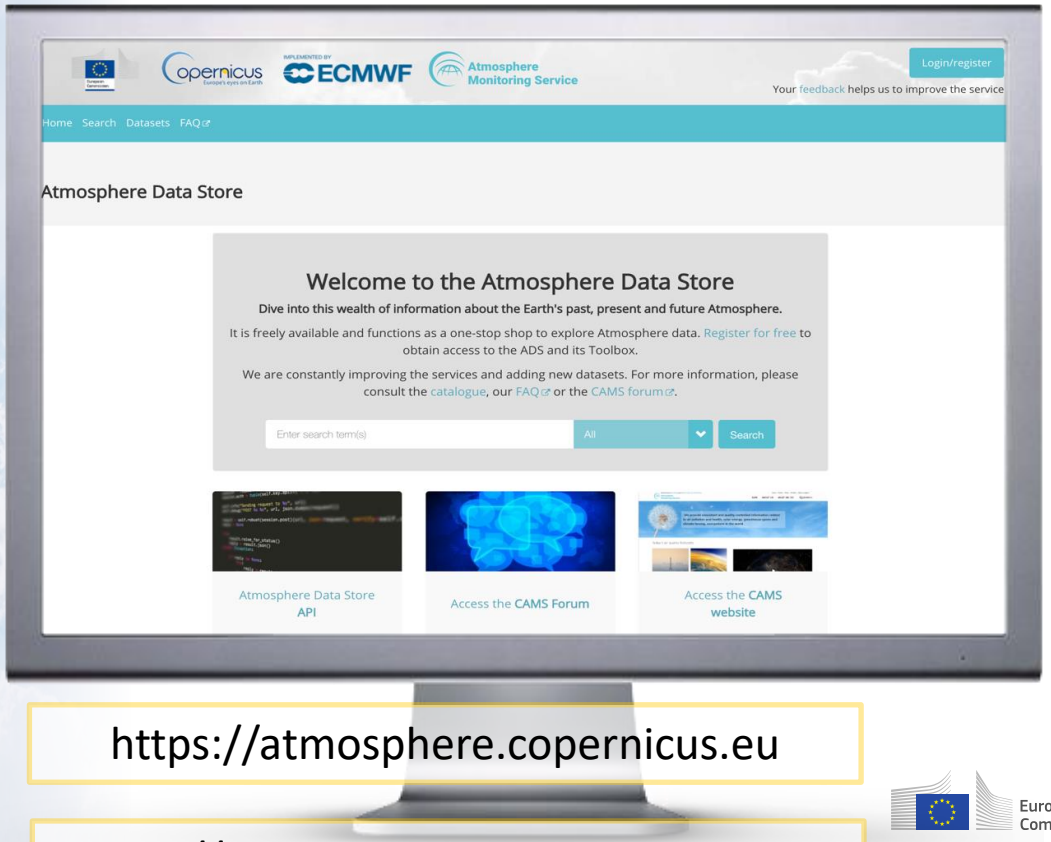
Atmosphere Data Store

Atmosphere Monitoring



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**

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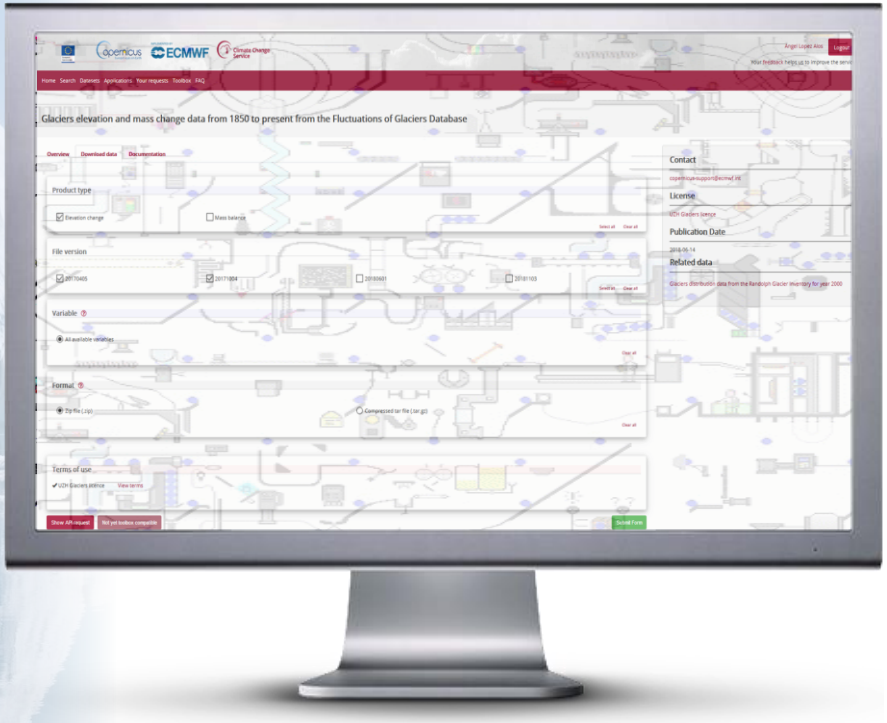
CDS - ADS



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.

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

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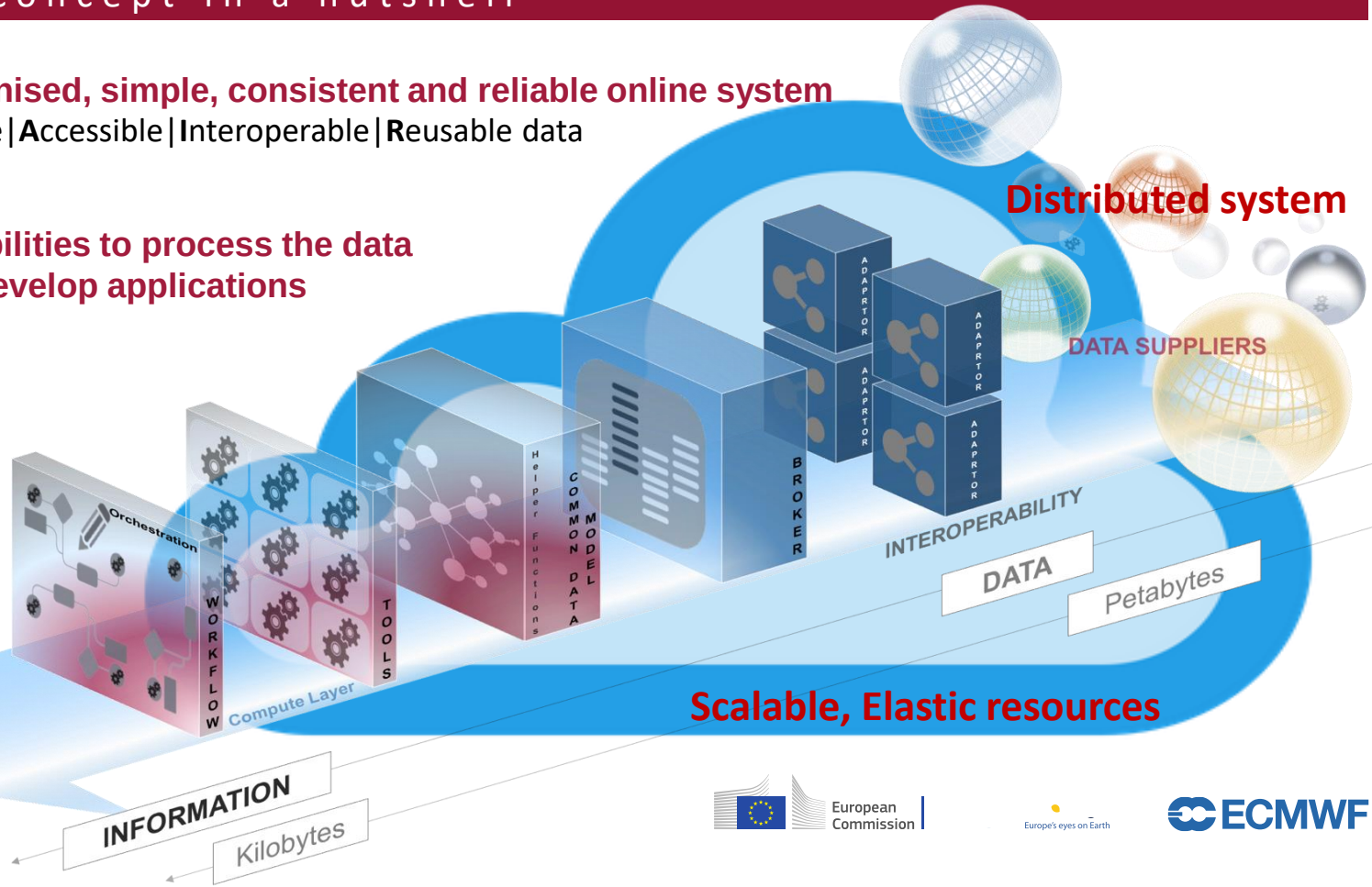
CDS concept in a nutshell

Harmonised, simple, consistent and reliable online system

Findable | **A**ccessible | **I**nteroperable | **R**eusable data

Capabilities to process the data and develop applications



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CDS Duality

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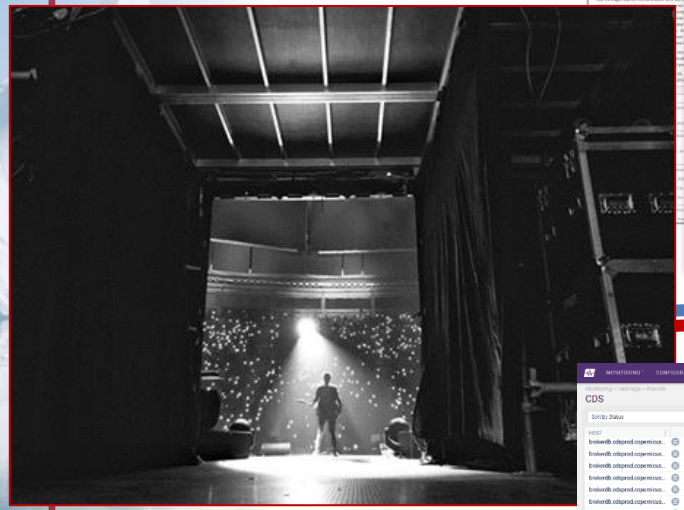
simple, consistent, harmonized, Intuitive, informative interfaces



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)

Robust, reliable Backend

QoS | Interoperable | Scalable | Automatized | Monitored

In-house Cloud Infrastructure

Elasticit | Scalable | Monitored

CDS Live

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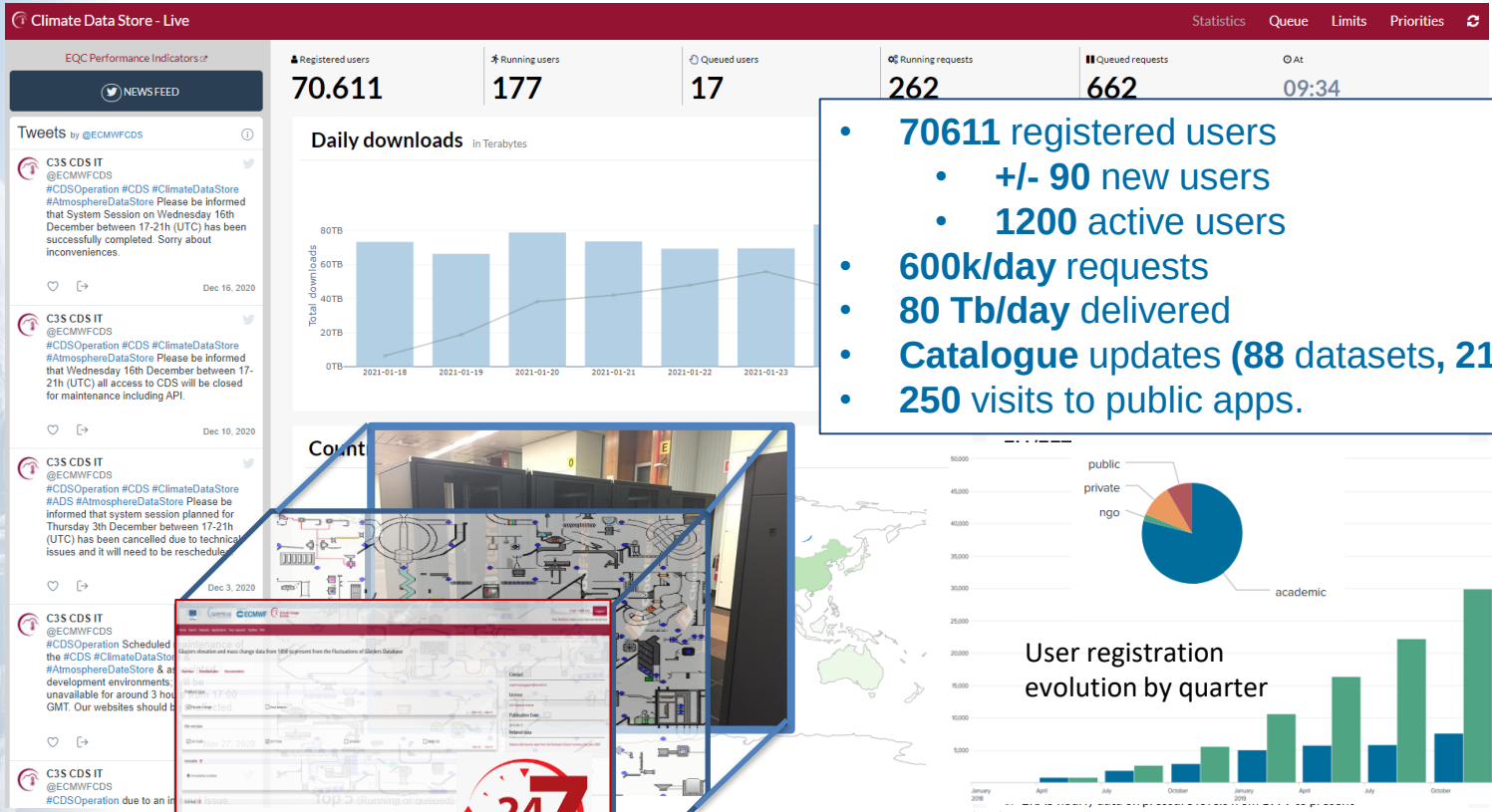

- **70611** registered users
  - **+/- 90** new users
  - **1200** active users
- **600k/day** requests
- **80 Tb/day** delivered
- **Catalogue** updates **(88** datasets**, 21** apps**)**
- **250** visits to public apps.

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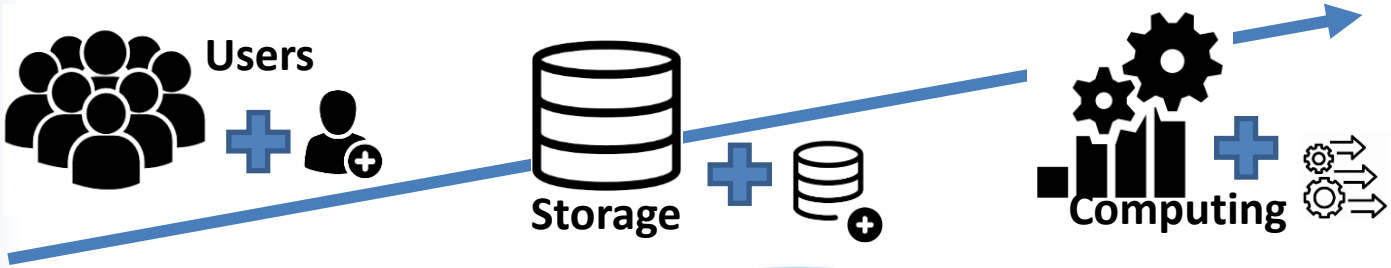
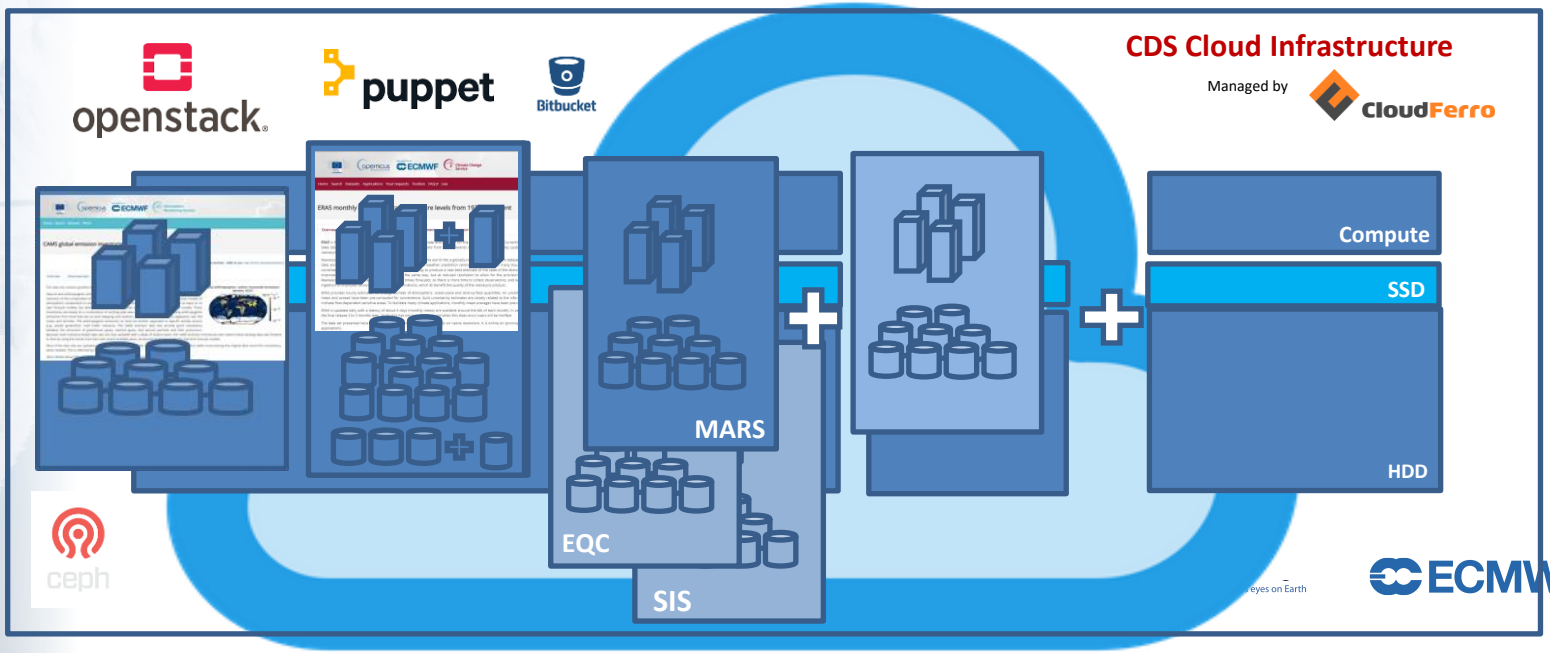
CDS Cloud Elasticity was key for success





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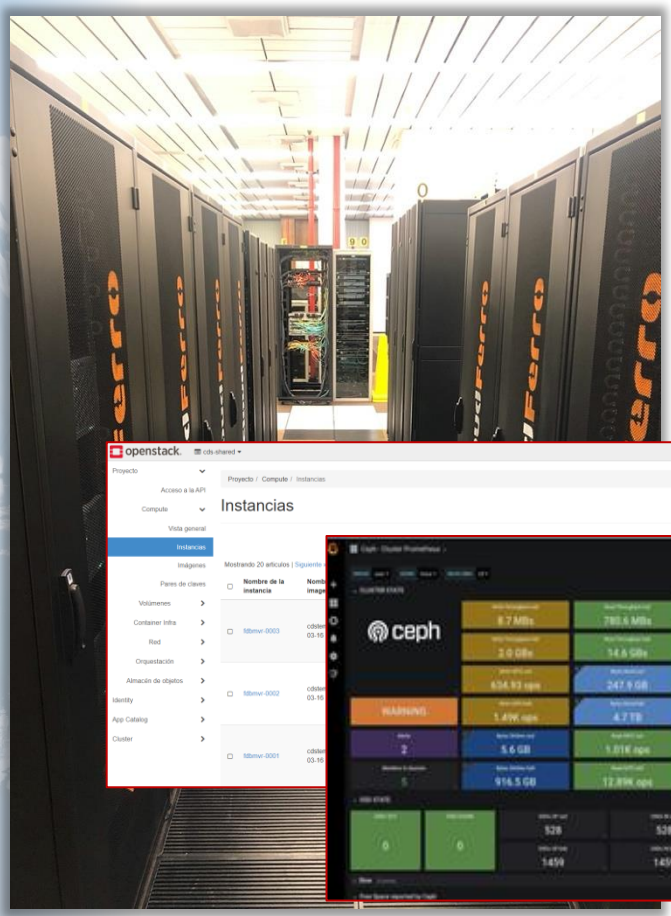
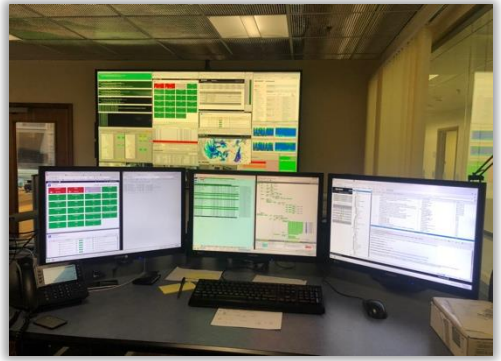
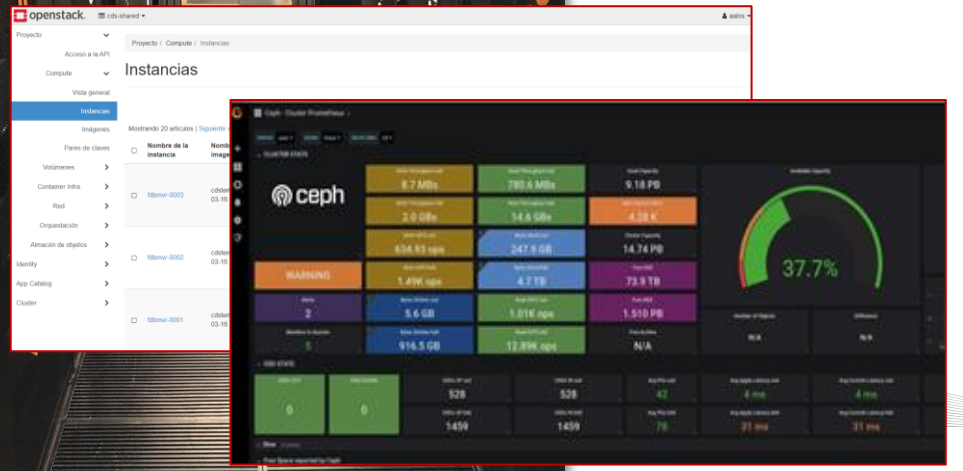
In-house Cloud infrastructure







On-Premises Private Cloud

72+ nodes, 4000+ CPUs, 13TB RAM

3.9 PB usable (of which 380TB SSD)

Monitoring

Capacity building

backups

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CDS Migration to Bologna (on going)

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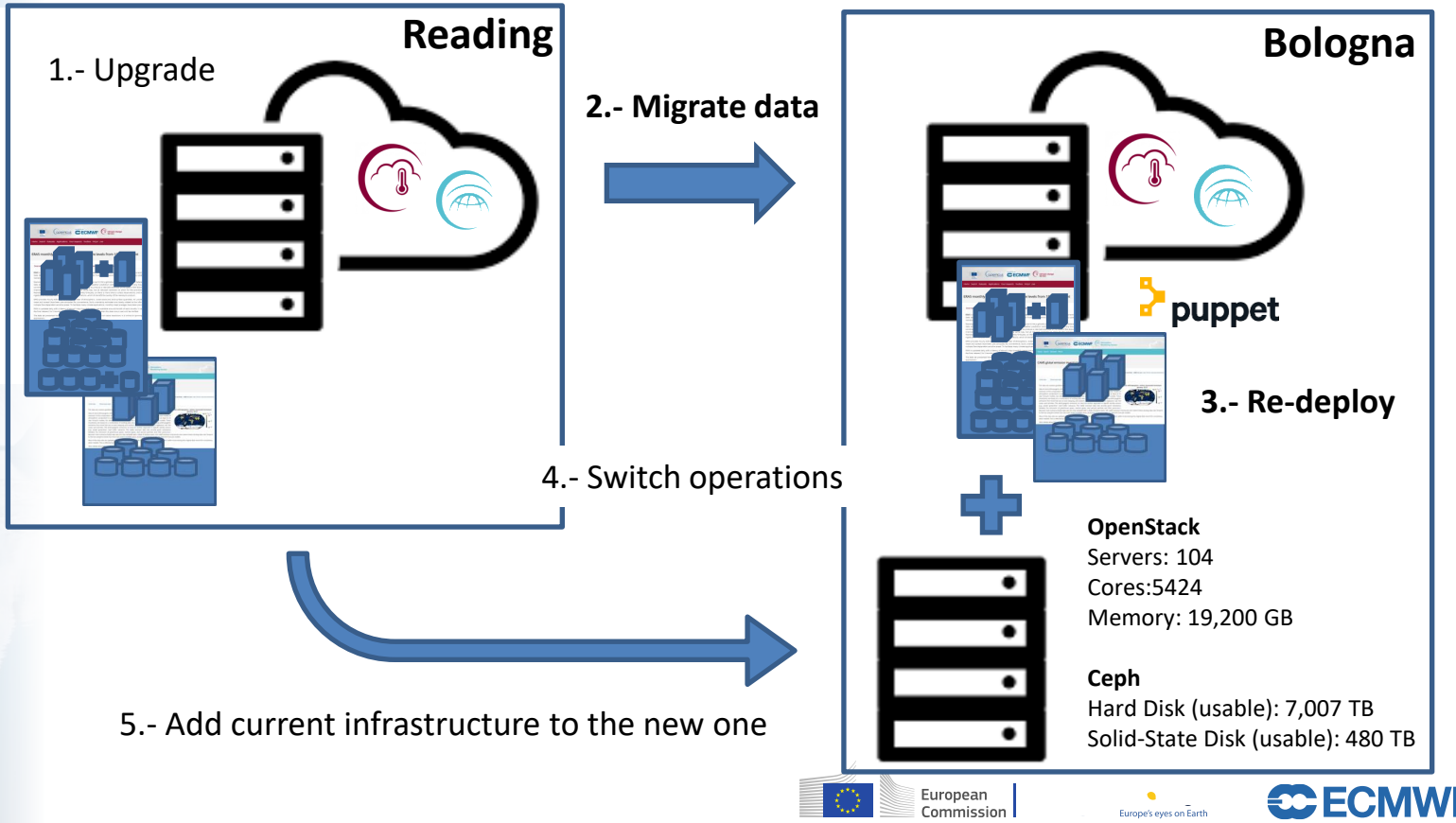

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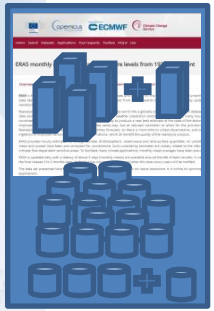
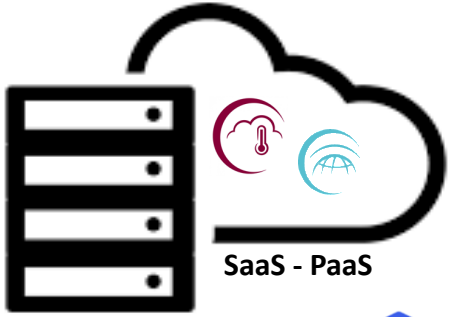
Copernicus 2.0

CDS





SaaS - PaaS

kubernetes

jupyter

Modernize

CDS 2.0

Enhanced continuity

More datasets
More applications
More tools
More efficient
...

Offline Toolbox

Strengthen Synergies

Catalogue (CSW)
Data
Toolbox

PaaS - IaaS

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/

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Thank you

https://cds.climate.copernicus.eu

https://ads.climate.copernicus.eu

https://wekeo.eu

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