

From CDS to DSS, a decade of Data Stores



PROGRAMME OF
THE EUROPEAN UNION



On behalf of all those that conceived, designed, implemented, contributed and supported the Data Stores
Data Stores Team, Production Section, Forecast and Service Department, ECMWF

Data Stores in a nutshell

Underlying **infrastructure supporting the implementation of Copernicus Services at ECMWF** on behalf of the European Commission making use of the **wealth of experience in operating data provision services for about 40 years.**

Robust and reliable backend that expose **simple and harmonized interfaces** that serve direct users and power federated platforms .

Innovation, evolution and adaptation driven by user requirements on their journey to seamlessly discover, retrieve, process and visualize a wide range of distributed and heterogenous datasets.

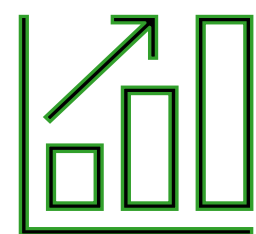
Simplification, harmonization and automatization are key.

Data Store Instances:

- **C3S - Climate Data Store (CDS).**
- **CAMS – Atmosphere Data Store (ADS)**
- **CEMS – Early Warning Data Store (EWDS)**
- **ECMWF – Data Store (ECDS) - Expected (Q1-2026).**

Hosted on **ECMWF In-house Cloud (CCI)** together with EWC benefiting from collocation.

Data Stores in numbers



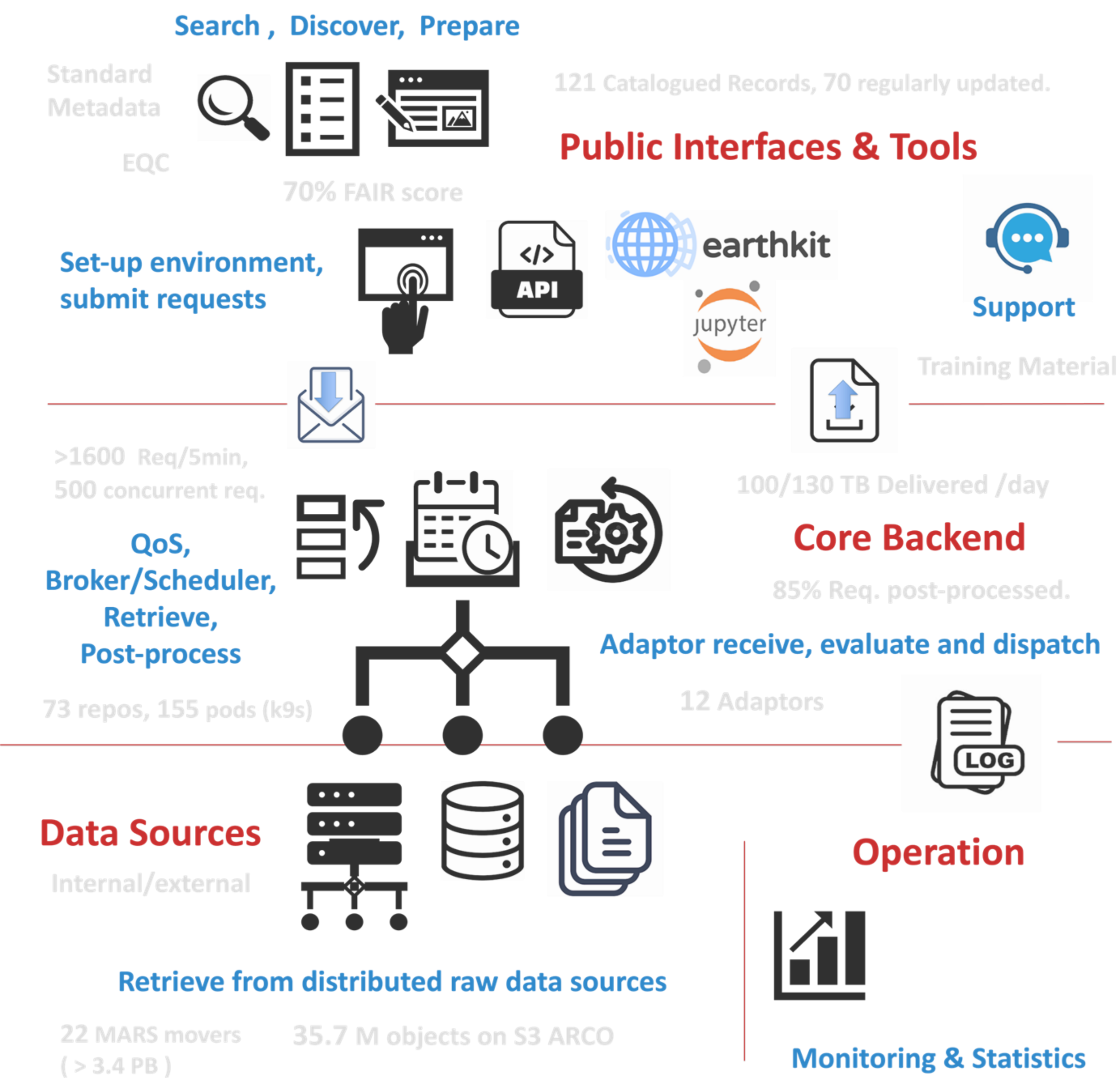
- **> 200k Registered Users**, around **5k active on daily basis.**
- **> 550k Requests/day** of which **>80% post-processed** and **>95% from MARS** originated data.
- **175 Catalogued records**, **19 on ARCO** versions (Zarr). **>75%** regularly updated (some daily)
- **88% FAIR Score** (Findability, Accessibility, Interoperability, Reusability)
- Incremental trends in all operational stats and KPIs.
- **24/7** Open, used and monitored.

Milestones on Data Stores history

- **2014** Copernicus workshop at **ECMWF**. Gathering of requirements.
- **2016/2018** Development, implementation and public opening.
- **2019** EMS Technology Achievement Award
- **2012 / 2022** Migration to Bologna Data Centre
- **2022 / 2024** Software Modernization and hosting on **ECMWF** Common Cloud Infrastructure (CCI)
- **2016 / Onwards** – Towards Federation and new challenges.



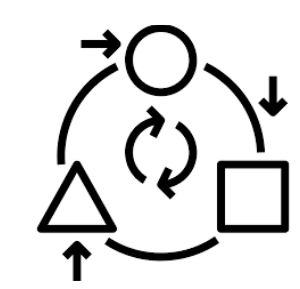
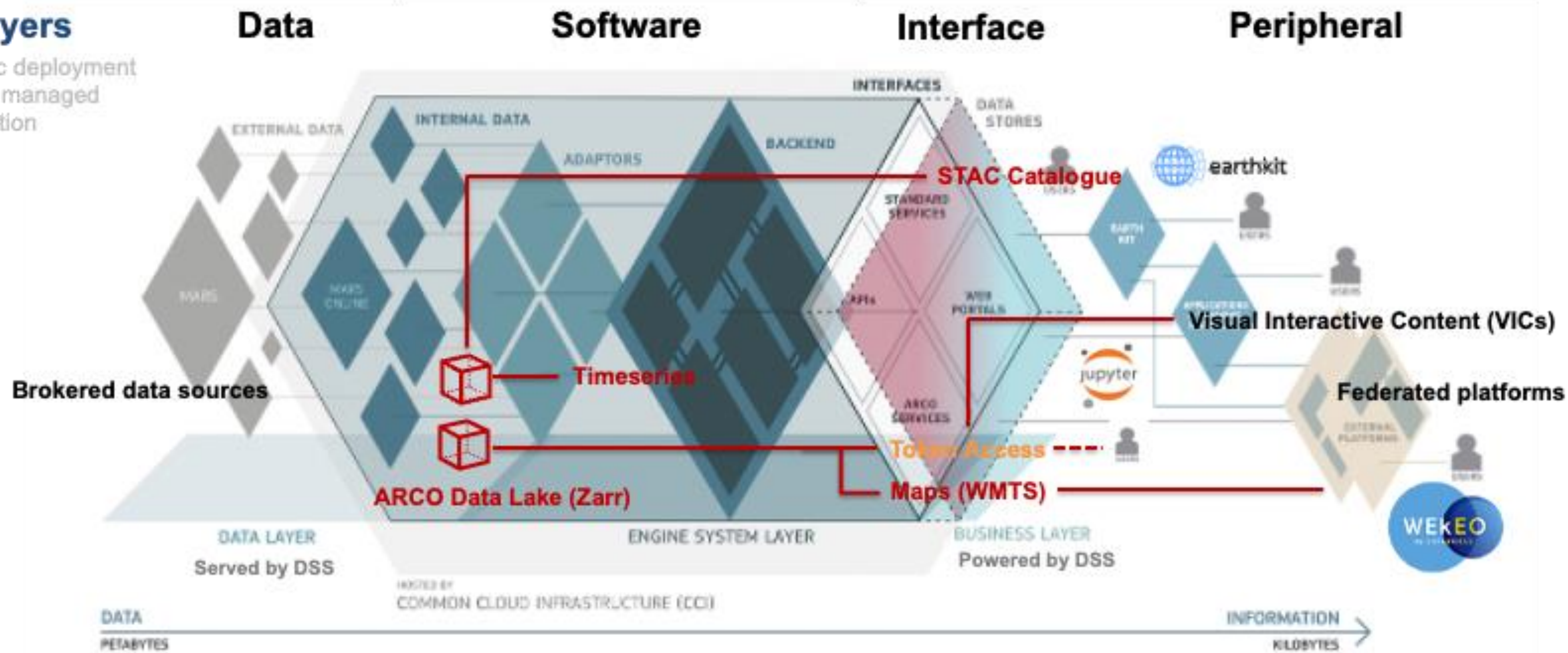
The journey of a data request



Multi-layer Infrastructure

DSS Layers

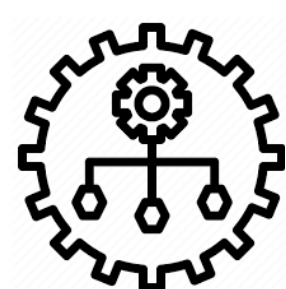
- Automatic deployment
- Centrally managed configuration



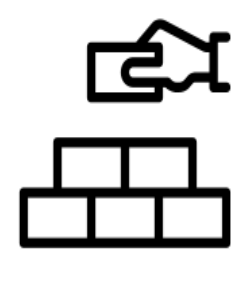
Adaptation
Across all layers



Trusted
Data and Services



Collocation
Data & Computing



Powered by
Foundations for Federation