



Blue-Cloud VRE

The platform for developing & operating your research products

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Funded by
the European Union

Architecture

System of Systems

Blue-Cloud VRE is built with dedicated services leveraging on existing e-infrastructures and marine infrastructures, EOSC resources and services

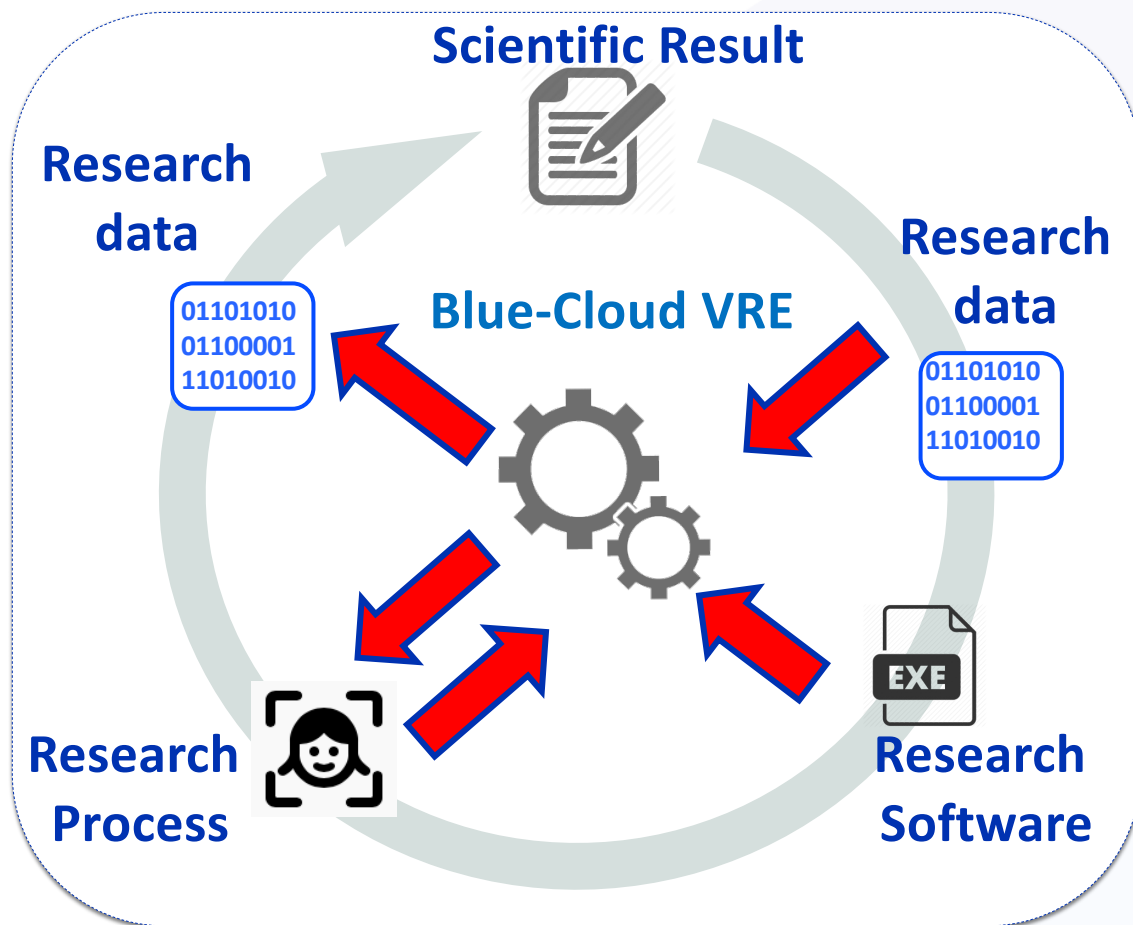
Extensible

Blue-Cloud VRE integrates services and resources resulting from existing marine initiatives

Open

Blue-Cloud VRE promotes open science and practices

A SoS to support and promote Open Science



Enable

- Repeat, Reproduce, Reuse, Evaluate
- Active collaboration
- Effective sharing
- Provenance and attribution

Adopt

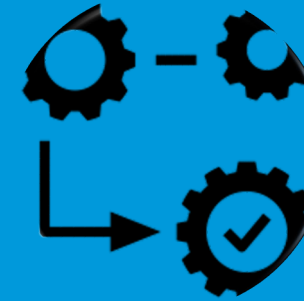
- As-a-service approach
- Standards
- Economy-of-scale to reduce operational costs



One place to
discover and
access













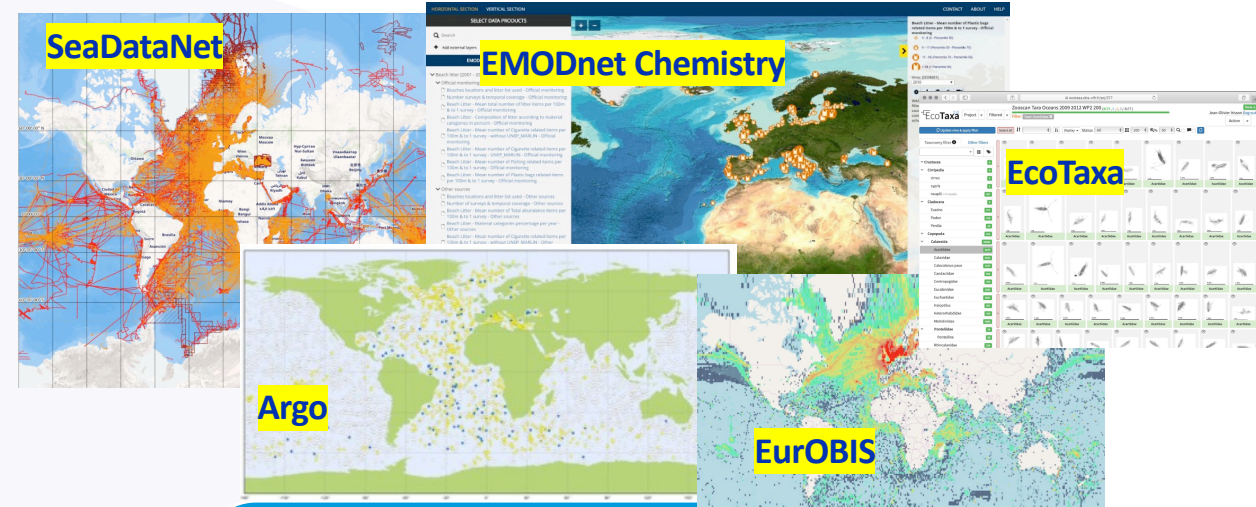
One place to
store, share, and
preserve



One place to
execute analysis
and processes



| Blue Data Infrastructure | Types of data sets | Logo and link |
|---|--|---|
| SeaDataNet CDI service | Marine physics, bathymetry, chemistry, geology, geophysics, and biology observation data sets |  |
| EMODnet Chemistry data products | Marine chemistry data collections and interpolated map products |  |
| EurOBIS - EMODnet Biology | Marine biogeographic data collections with taxonomy and distribution |  |
| Euro-Argo and Argo GDAC | Ocean physics and marine biogeochemistry observation data from Argo floats |  |
| ELIXIR- European Nucleotide Archive (ENA) | Nucleotide sequencing data and information on marine species |  |
| EcoTaxa | Taxonomic annotation data of images on planktonic biodiversity |  |
| SeaDataNet data products | Aggregated marine data collections and climatologies, such as for Temperature & Salinity |  |
| ICOS-Marine | Long-term oceanic observations of carbon uptake and fluxes for understanding the global carbon cycle |  |
| SOCAT - Surface Ocean CO2 Atlas | SOCAT version 2020 with quality-controlled surface ocean fCO2 measurements from 1957 to 2020 |  |
| EMODnet Bathymetry | EMODnet Bathymetry World Base Layer is used as base map in the interface |  |

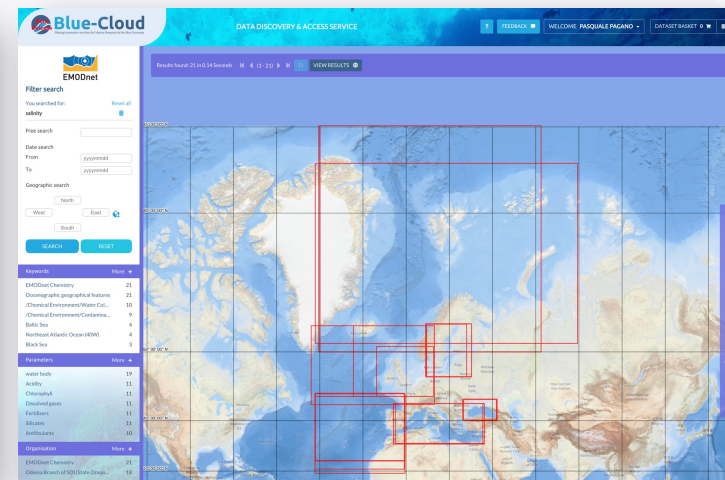


The first step enables users to identify interesting data collections, with free search, geographic and temporal criteria



The second step enables users to drill down per interesting BDI to get more specific data sets at granule level, using again free search, geographic and temporal criteria

| Blue Data infrastructure | Level 2 Search | Level 1 Results (22/01/21) | Level 1 Total | Last update |
|---------------------------|----------------|----------------------------|---------------|-------------|
| Ecolux | Level 2 Search | 10 | 10 | 2022-01-17 |
| ELIXIR-ENA | Level 2 Search | 32 | 32 | 2022-01-17 |
| EMODnet Chemistry | Level 2 Search | 207 | 207 | 2022-01-02 |
| EuroArgo - Argo | Level 2 Search | 16556 | 16556 | 2021-11-21 |
| EurOBIS - EMODnet Biology | Level 2 Search | 927 | 927 | 2022-01-17 |
| ICOS data portal | Level 2 Search | 180 | 180 | 2022-01-17 |
| SeaDataNet | Level 2 Search | 849 | 849 | 2022-01-02 |
| SeaDataNet-products | Level 2 Search | 49 | 49 | 2022-01-17 |
| Socat | Level 2 Search | 6471 | 6471 | 2022-01-10 |



Complete your order

Search for more | Empty basket | Submit order

Results found: 516 | (1-500) | 500 | 516 | Export

| # | Order # | BDI | Dataname | Source | Dataname | ID |
|-------|---------|---|--|--------|------------------|-----------------------------|
| 22987 | 426 | SeaDataCloud Black Sea Temperature and Salinity Climatology V2 | North Sea - Eutrophication and Acidity aggregated datasets 1921/2020 v2021 | | | |
| 22986 | 426 | Black Sea gridded climatology decades - for cold intermediate content at 1/8° | Arctic Ocean - Contaminants aggregated datasets 1974/2015 v2018 | | | |
| 22985 | 426 | Mediterranean Sea - Temperature and salinity Historical Data Collection SeaDataCloud V1 | Baltic Sea - Contaminants aggregated datasets 1974/2018 v2021 | | | |
| 22984 | 426 | Baltic Sea - Temperature and salinity observation collection V2 | | IT | 02-11-2021 16:20 | Downloaded 13-12-2021 16:05 |
| 22983 | 425 | A011185h.baz | RNODC_Bottle_11185_13 | IT | 02-11-2021 16:20 | Downloaded 13-12-2021 16:05 |
| 22982 | 425 | RNODC_Bottle_10855 | RNODC_Bottle_10855_18 | IT | 02-11-2021 16:20 | Downloaded 13-12-2021 16:05 |
| 22981 | 424 | RNODC_Bottle_10855 | RNODC_Bottle_10855_1 | IT | 02-11-2021 16:19 | Downloaded 13-12-2021 16:05 |
| 17835 | 417 | EurOBIS Asteroida distribution data from: Deep-sea fauna of European seas - an annotated species check-list of benthic invertebrates living deeper than 2000 m in the seas bordering Europe | | IT | 27-10-2021 11:03 | Downloaded 02-12-2021 15:57 |

Compose and submit shopping request at the granule level

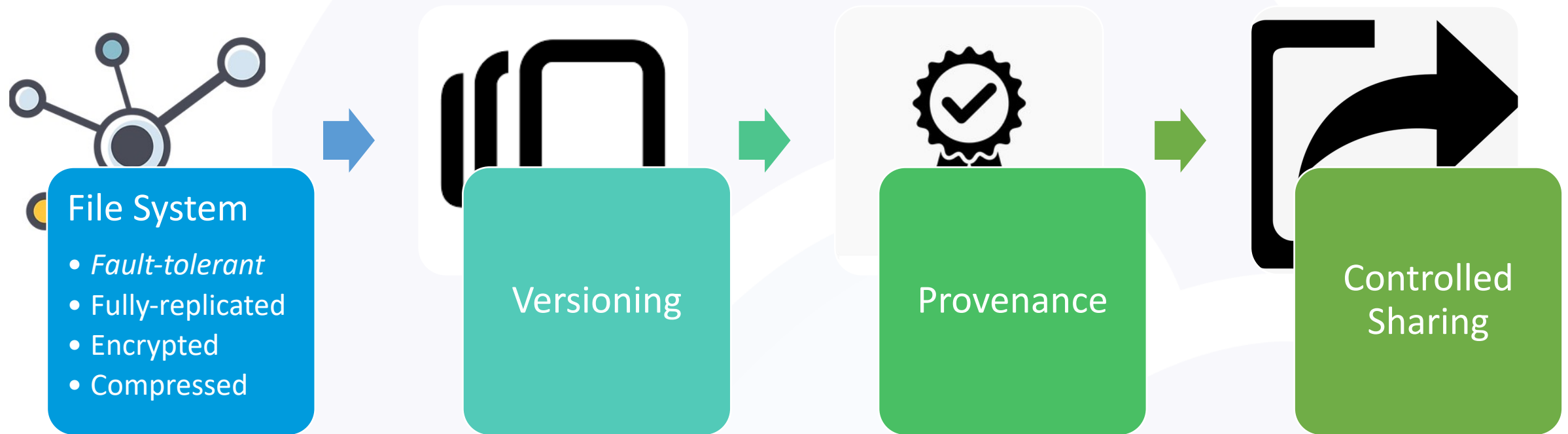


Retrieve the datasets by downloading from the Dashboard



Push datasets to the Blue-Cloud VRE Data Pool

- Common **workspace** and **dataspace** to easily exploit technologies and services not designed to work together



Workspace

Pros

Fault-tolerant

Replicated
Distributed

Compressed

Cons

High Latency

Slower

Dataspace

Pros

Large Volume
(1TB)

Faster

Low Latency

Cons

Single Site

Linked only to
JupyterHub

Volatile

Pros

Faster

Single Site

Low Latency

Cons

Deleted after
24 hours

Accessible only
via URIs

- interactive notebooks via JupyterHub and community-specific applications delivered as a Docker container extend the Analytics framework



Development and integration environment for R, Python, and other supported software languages

START

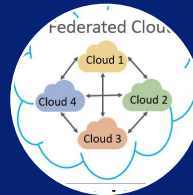
- it is powered by a cluster of DataMiner servers, each with 16 cores and 32 GB RAM.
- It is powered by a cluster of RStudio servers, each with 16 cores and 32 GB RAM.
- It is powered by JupyterHub with a maximum of 8 cores and 32 GB RAM per notebook. Jupyterl



- To **expand** and **further develop** the functionalities of the Blue-Cloud VRE by federating more analytical services and more e-infrastructures
- To stimulate further **uptake and utilisation** of the Blue-Cloud VRE services and capabilities for developing Virtual Labs by Blue Data Infrastructures
- To **ensure long-term EOSC integration**, alignment and growth of the EU digital ecosystem required to support research of Oceans, seas, coastal & inland waters via sustained mechanisms for community dialogue



Active-Passive Cross-site replication
Distributed processing across sites

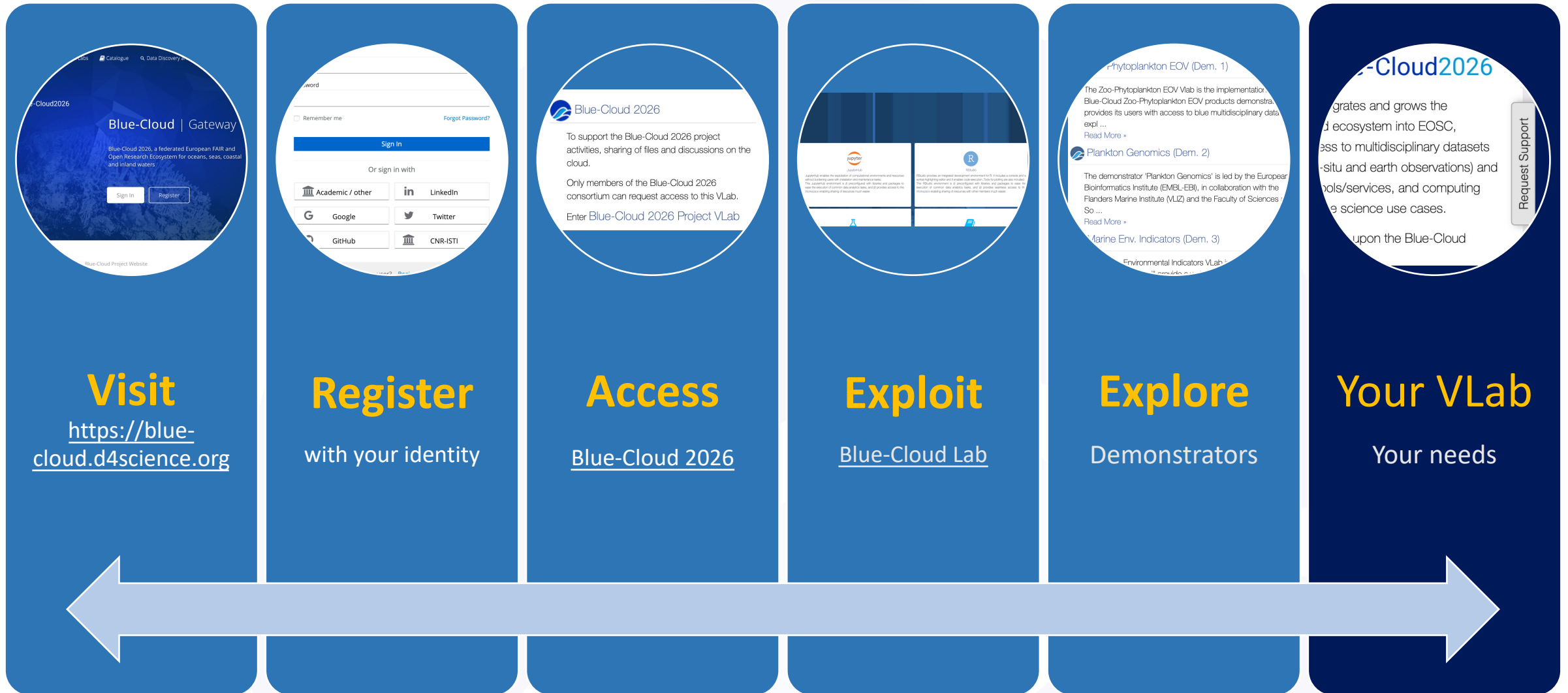


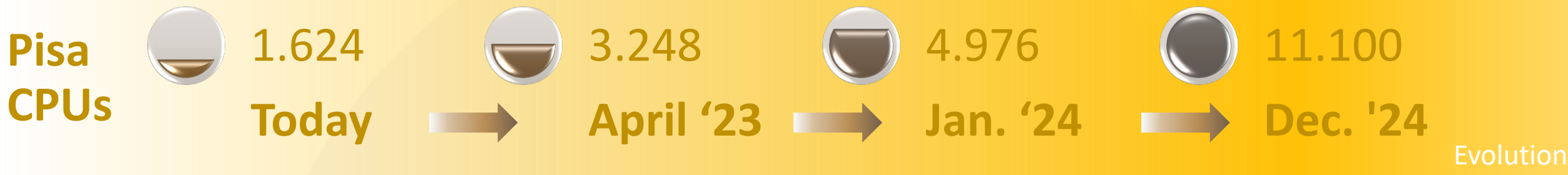
Expansion by empowering the
federation with EGI, WEkEO, EUDAT,
JERICO-CORE



Integration of services delivered by
EGI-ACE, iMagine,
and FAIR-EASE





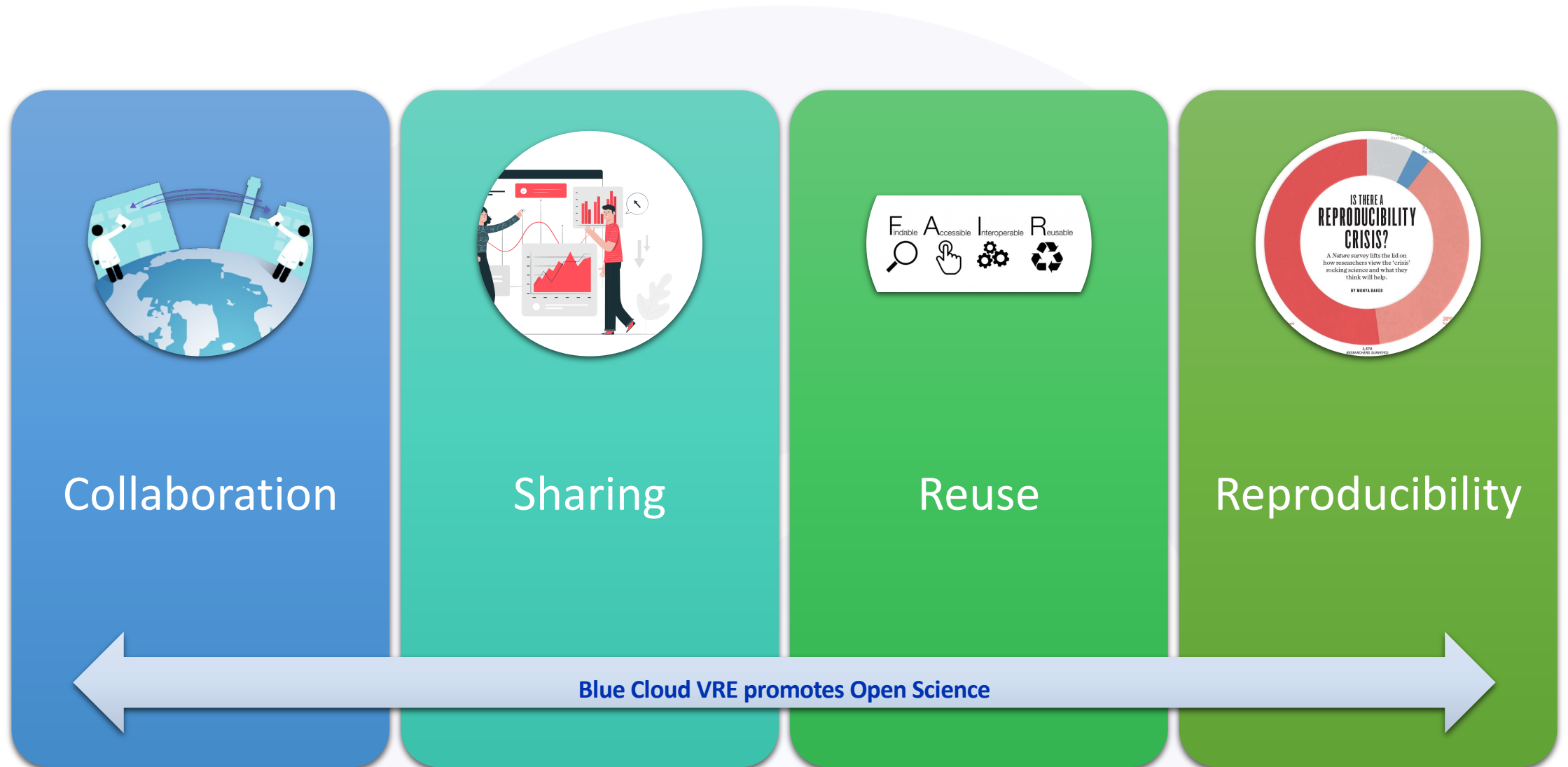


D4Science is a federated digital infrastructure promoting Open Science

- 4 sites (1 Pisa, 3 @ GARR)
- 3590 CPUs core
- 13 TB RAM
- 600 TB Storage

D4Science is owned and managed by CNR
It supports ESFRI RIs, national and European projects, national and international initiatives

*Computing and storage resources and IT support are granted for **2 additional years** after the end of the project*



eosc | Blue-Cloud2026



blue-cloud.org



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