

VRE Info day:
Blue-Cloud VRE Open Science services
for building, hosting and operating
Virtual Labs

Massimiliano Assante, PhD

ISTI - CNR

 <https://orcid.org/0000-0002-3761-1492>

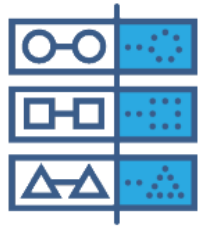
 Follow @maxassante



Funded by
the European Union



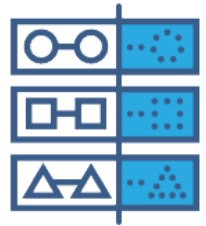
- **Blue-Cloud Data Discovery & Access service**, federating key European data management infrastructures, to facilitate users in finding and retrieving multi-disciplinary datasets from multiple repositories



- **Blue-Cloud Virtual Research Environment platform** to provide a range of services and to facilitate orchestration of computing and analytical services for constructing, hosting and operating Virtual Labs for specific applications



- **Blue-Cloud Virtual Labs**, configured with specific analytical workflows to serve as **Demonstrators**, which can be adopted and adapted for other inputs and analyses

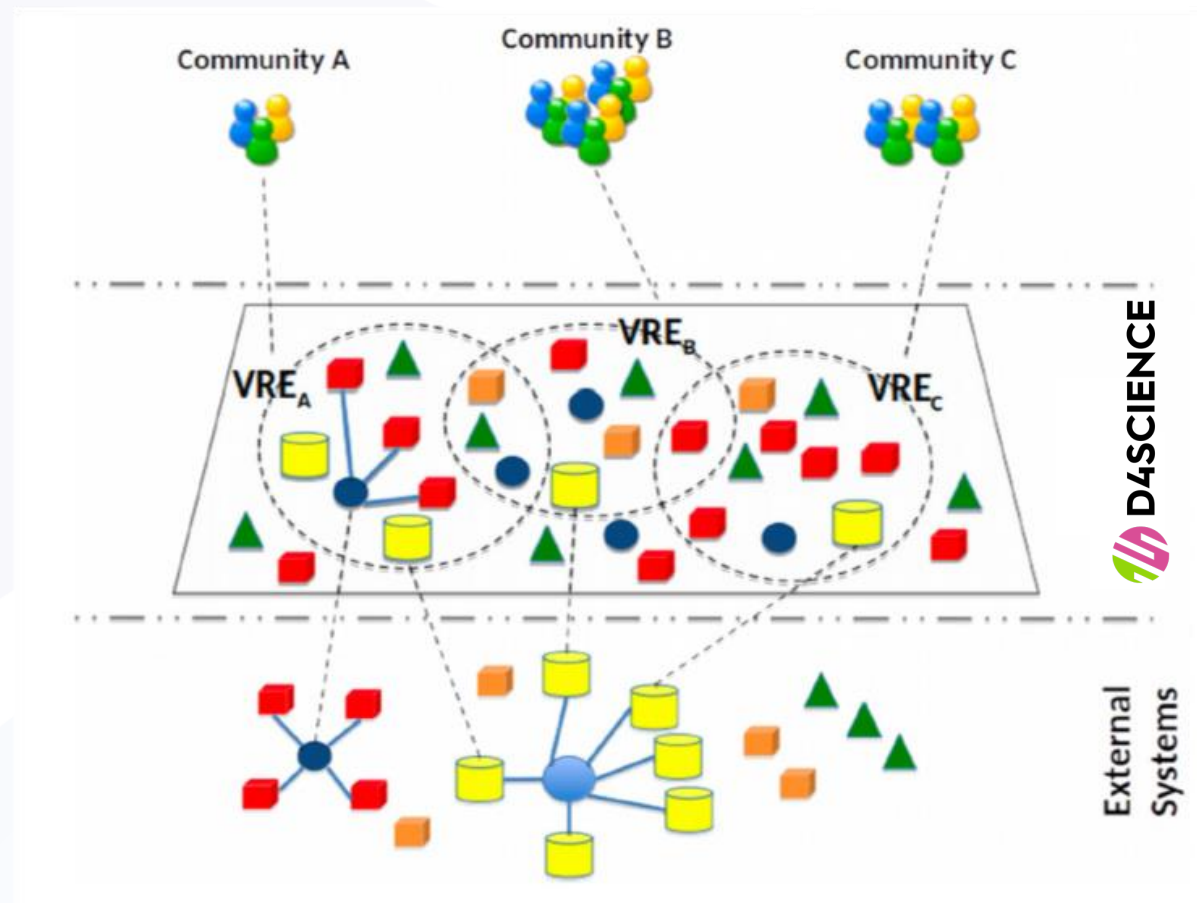


- **Blue-Cloud Data Discovery & Access service**, federating key European data management infrastructures, to facilitate users in finding and retrieving multi-disciplinary datasets from multiple repositories
- **Blue-Cloud Virtual Research Environment platform** to provide a range of services and to facilitate orchestration of computing and analytical services for constructing, hosting and operating Virtual Labs for specific applications
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D4SCIENCE promotes Open Science practices through the operation of a Data Infrastructure service

- leverage **external systems** (e.g. data, storage services, computational resources, cloud computing infrastructures)
- by exposing them as a **common unified space of resources**
- to serve **diverse community of researchers**
- via the **provision of tailored services and sharing tools**
- made accessible through a flexible, web-based and on-demand environments called **Virtual Labs**



System of Systems

D4Science is built with dedicated services leveraging on existing e-infrastructures and other domain-specific infrastructures, EOSC resources and services

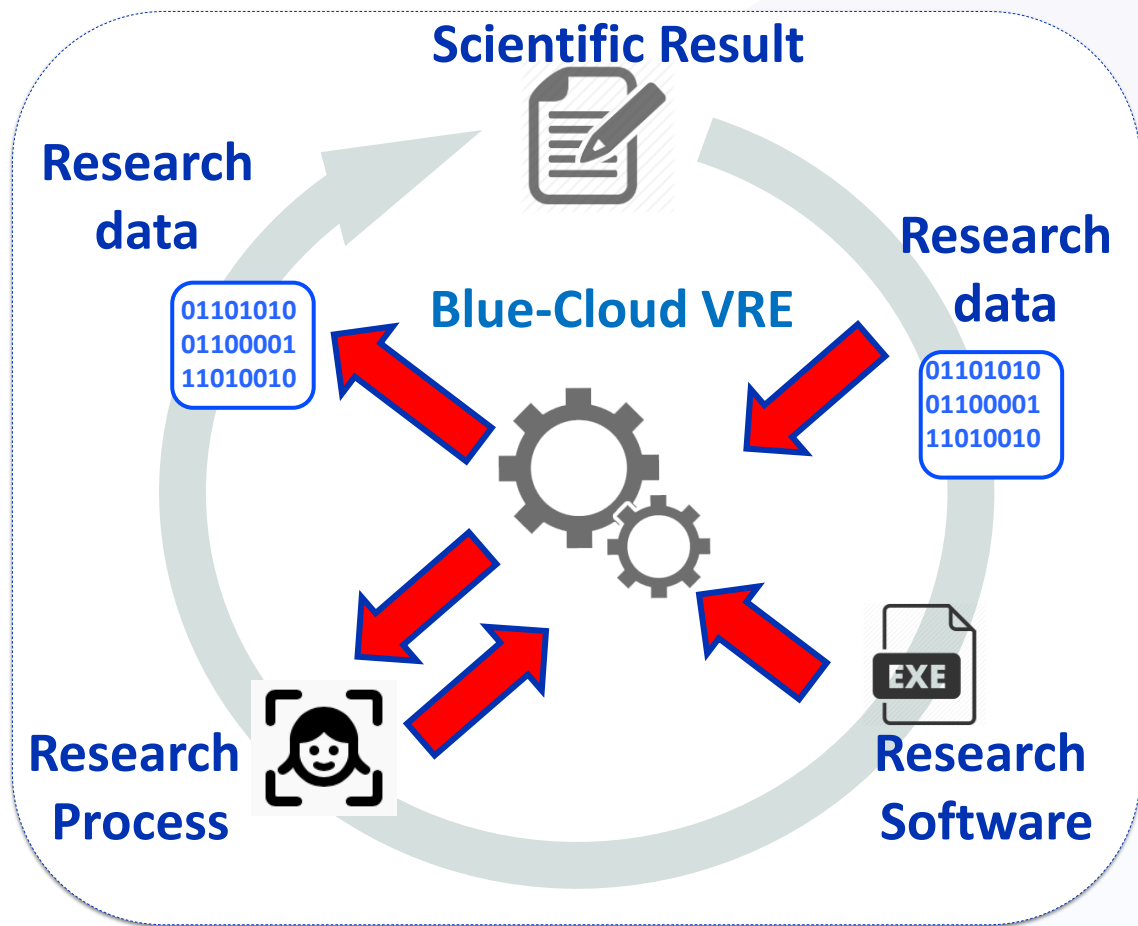
Extensible

integrates services and resources resulting from existing initiatives

Open

promotes OpenScience and OS practices

A SoS to support and promote Open Science practices for Data Driven Science

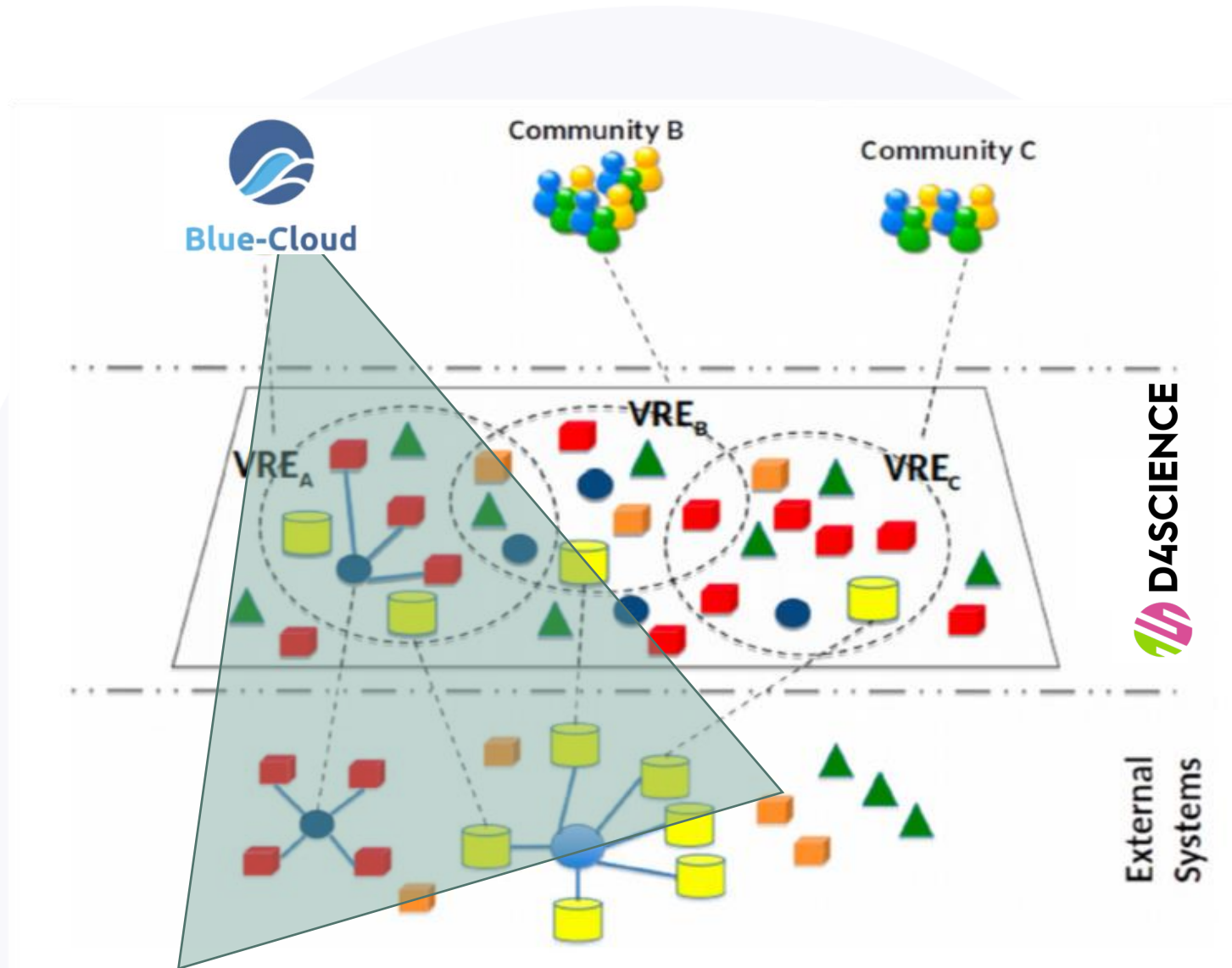


Enable

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

Adopt

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



<https://blue-cloud.d4science.org>

Blue-Cloud Gateway

Catalogue

Deliverable (23)

Service (16)

Dataset (5)

Provider (2)

Method (1)

Virtual Labs (Views)

VLab 1

...

VLab 5

Project Vlab(s)

Synergies, events VLabs

D4SCIENCE

Analytics Computing Framework

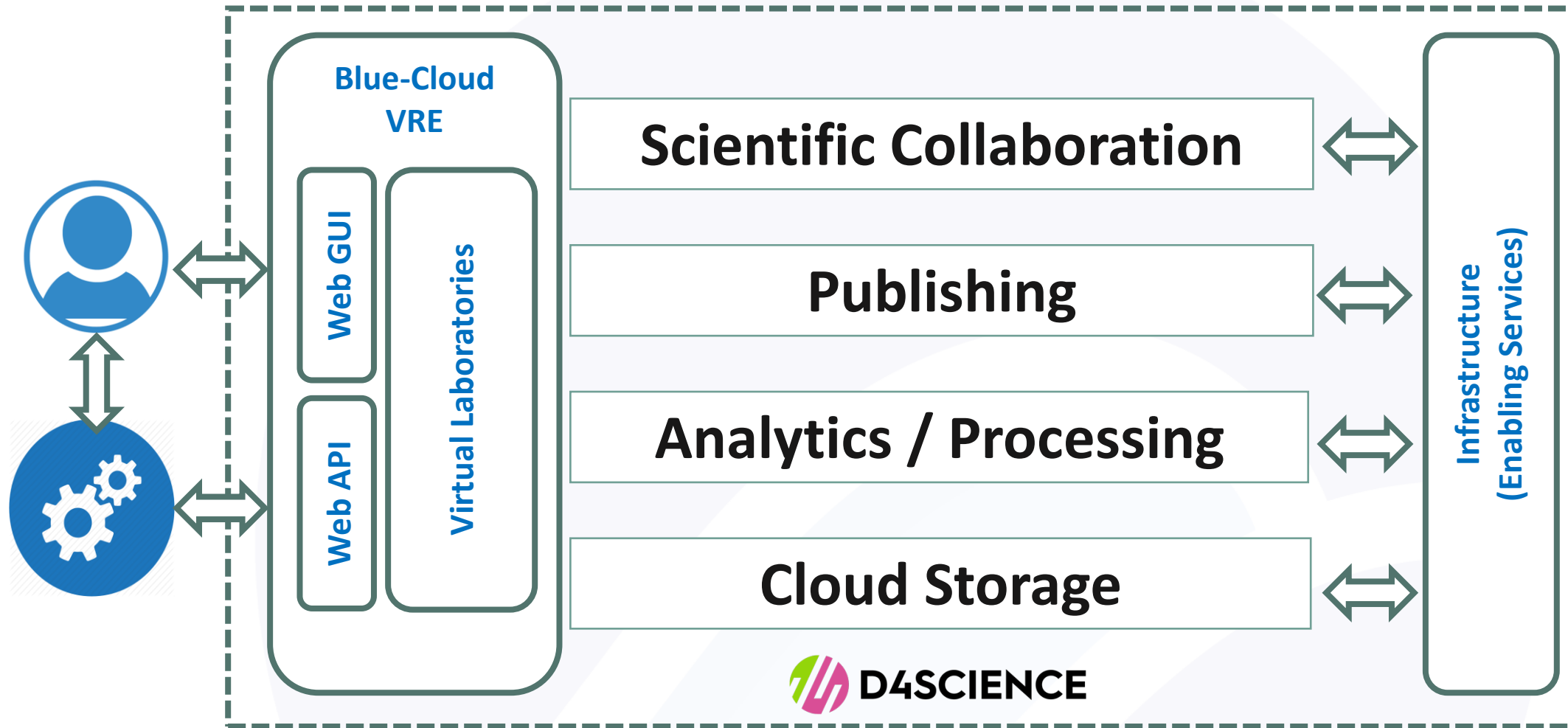
IAM

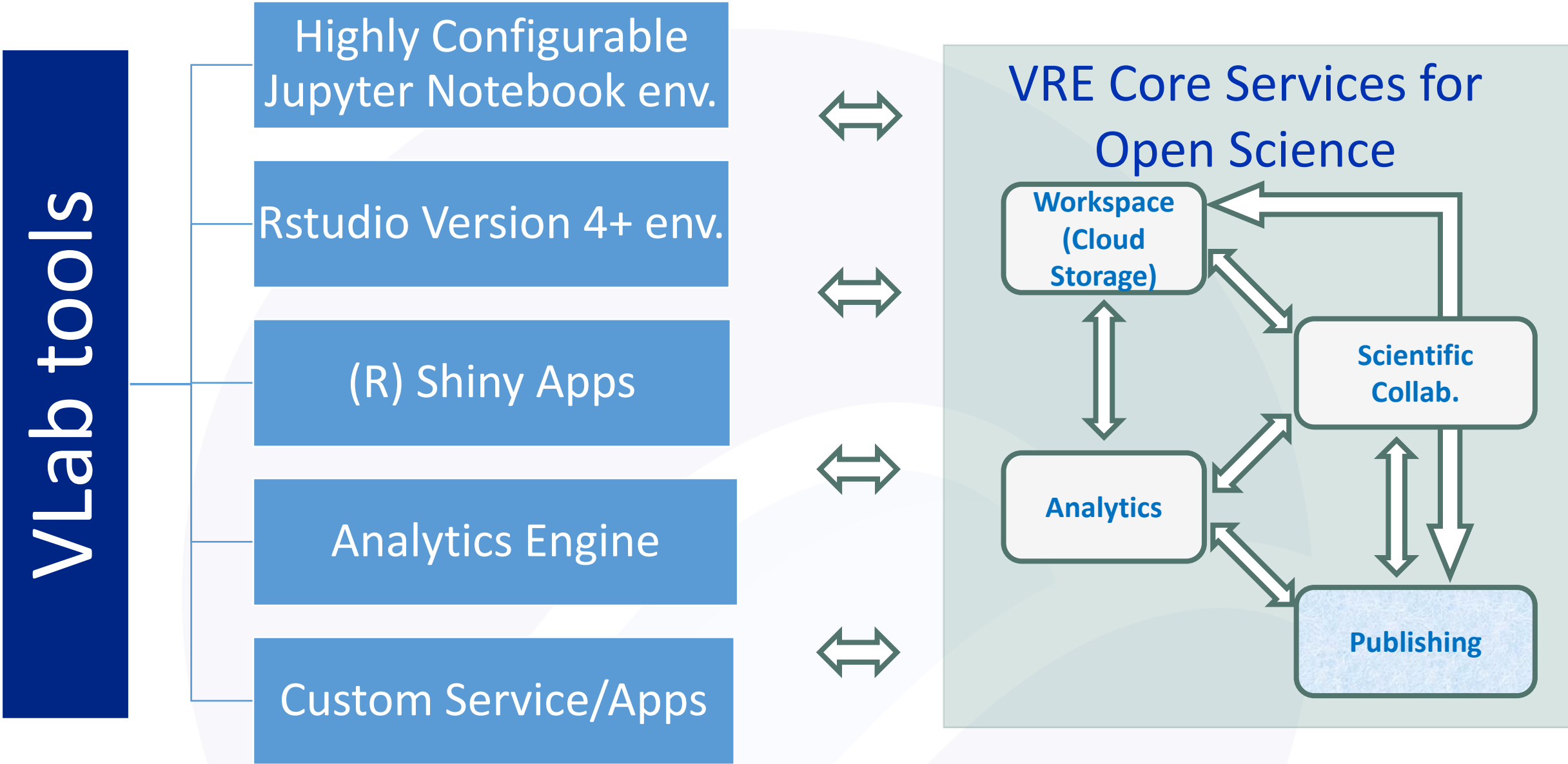
Storage Engine

IS, RM

Blue-Cloud VRE Core Services

Blue-Cloud VRE Federated Resources



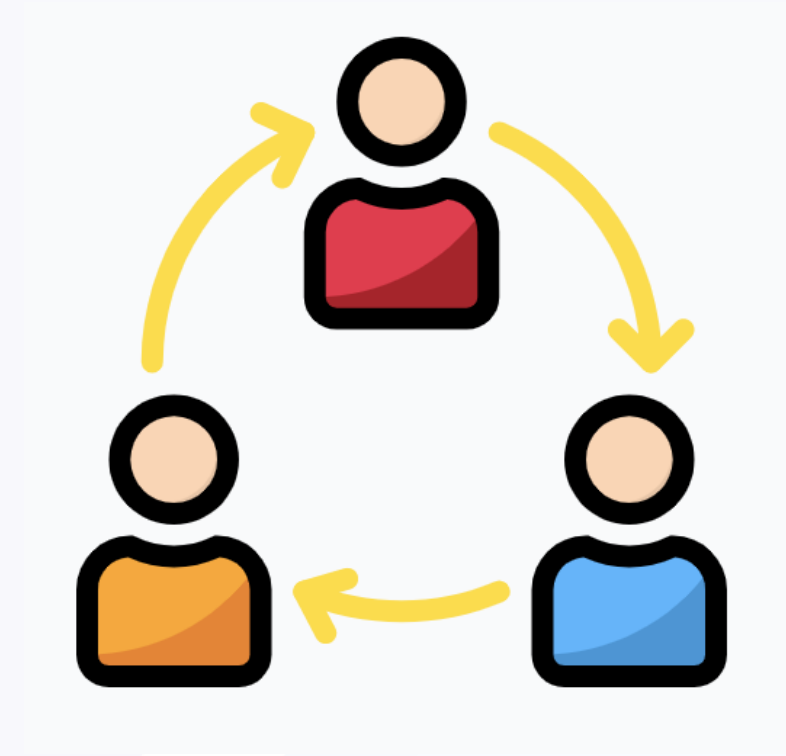


Scientific collaborations can be defined as interactions taking place within a social context among two or more scientists that *facilitates the sharing of meaning and completion of tasks* with respect to a mutually shared, superordinate goal.

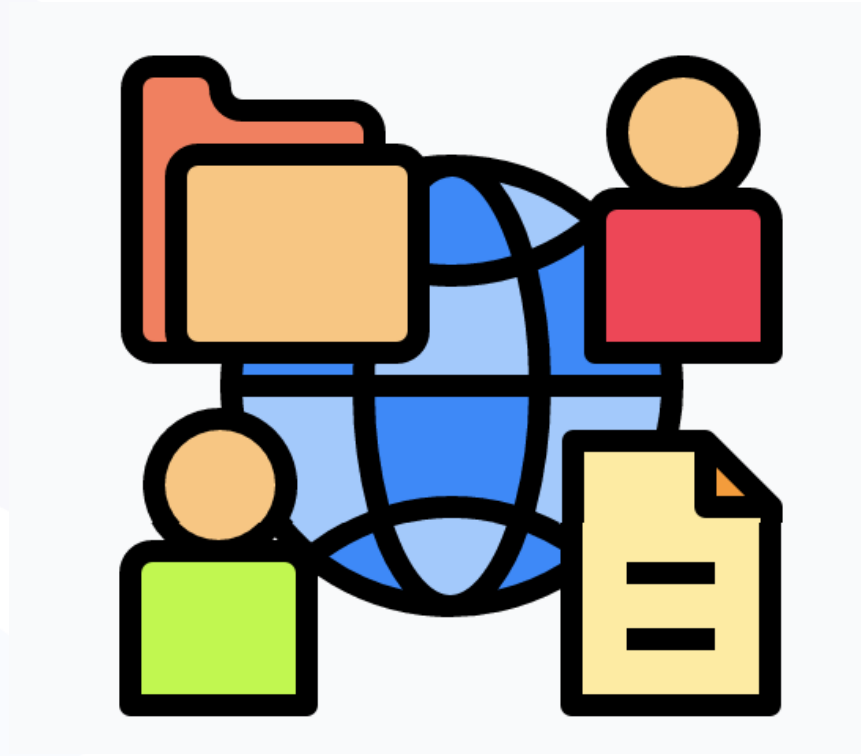
Blue-Cloud2026 promotes technologies enabling the **sharing of datasets and software methods/algorithms**



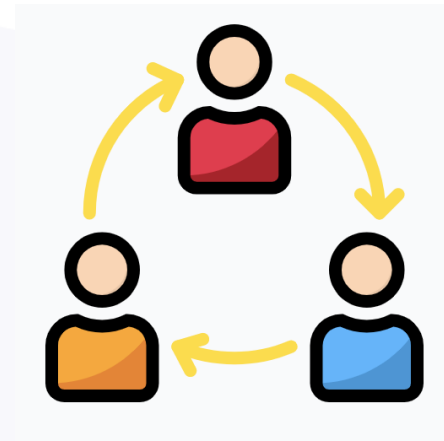
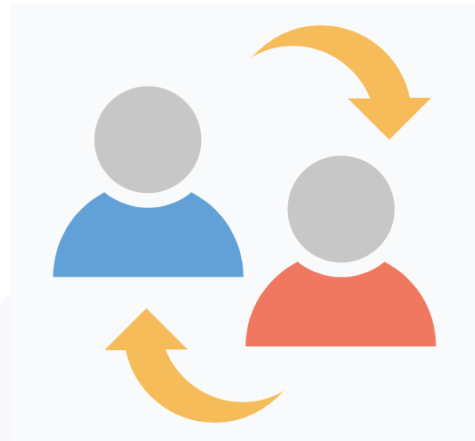
Selective Sharing



Controlled Sharing



Publishing



Blue-Cloud promotes technologies enabling the
sharing of datasets and methods

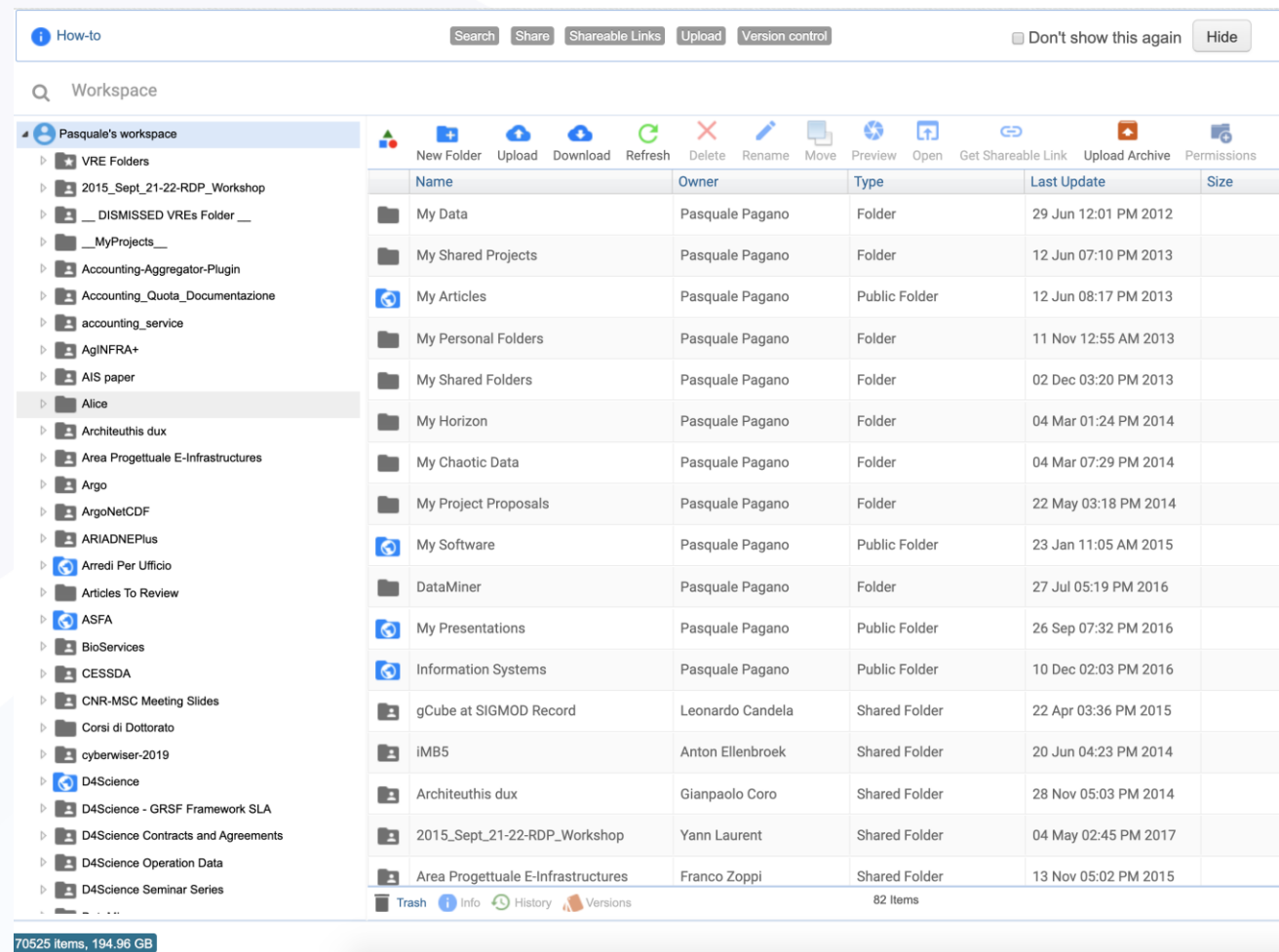
WORKSPACE

Resembles a **typical file system**

with **files organised in folders,**

yet it supports

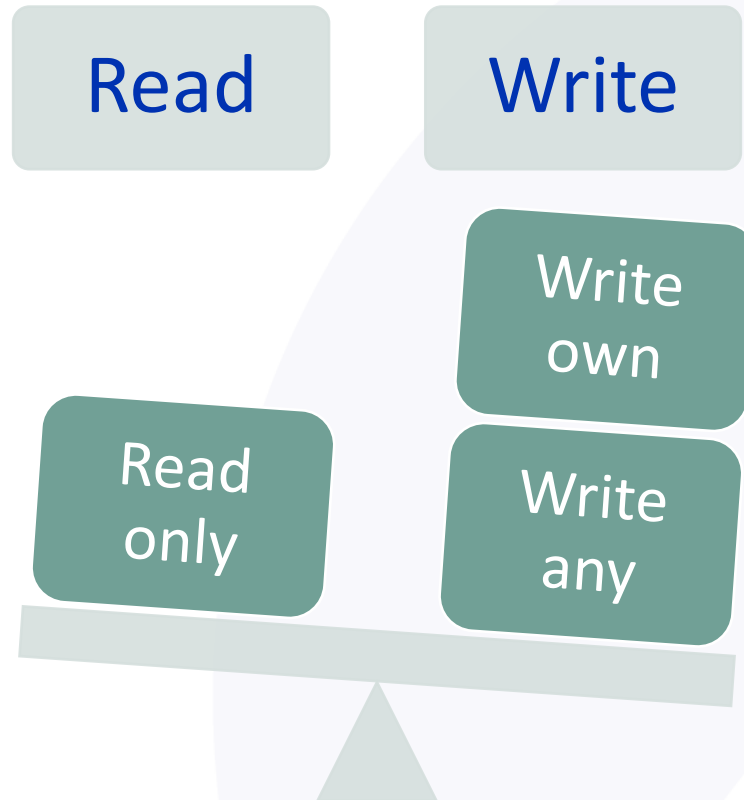
**files, datasets, software methods,
workflows, maps, ...**







Shared folder permissions



Shared folder policies:

- **Write Own:** users can only update/delete their own files
- **Write Any:** any user can update/delete any file
- **Read Only:** users can read any file but cannot update/delete

- Shared folder owner can
 - do anything;
 - nominate administrators to delete mngt. rights

- Subfolders
 - inherit parent permissions;
 - permissions can be restricted, not the opposite

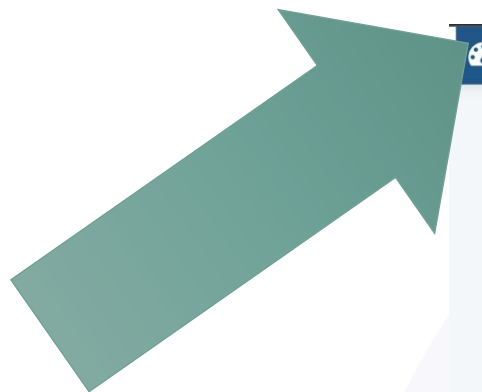
<https://blue-cloud.d4science.org>



[Terms of Use](#) [Cookies Policy](#) [Privacy Policy](#) [Blue-Cloud Project Website](#)

 Blue-Cloud 2026 has received funding from the European Union's Horizon Europe programme call HORIZON-INFRA-2022-EOSC-01, Project ID 101094227. Blue-Cloud has received funding from the European Union's Horizon programme call BG-07-2019-2020, topic: [A] 2019 -

<https://blue-cloud.d4science.org>



Blue-Cloud

Go to 20 Andrea Rossi

Piloting Innovative Services for Marine Research and the Blue Economy

Statistics

ACTIVITY GOT SPACE USED

0 1 0 1.36%

PROFILE STRENGTH

51%

Data Discovery and Access service

Federated discovery and access to data sets and data products for external users in stand-alone mode. The Blue-Cloud data sets are managed in the blue data infrastructures that are connected to this service.

[Visit the service](#)

VLabs for supporting Blue-Cl...

restricted

To support the Blue-Cloud2026 project activities and discussions. Workspace: for sharing files and folders on the cloud Soci ...

[Read More >](#)

restricted

To support the Blue-Cloud project activities and discussions. It is equipped with the following

News feed

Show sorted by: newest Post ▼

Francesco Palermo

December 15 2022, 4:20 PM · MarineEnvironmentalIndicators

Dear All,

We are glad to inform you that the MEI Generator application has been updated to the version v2.3.4-dev.

With this new version, support for multiple methods has been introduced. Here is the list of the currently available methods:

- "Ocean Climate" (updated to the new version)
- "Ocean Pattern" (New)
- "Storm Severity Index" (New)

The MEI generator will be able to ask for each method the needed parameters, which include also the datasources.

We welcome you to contact us for any questions or feedback related to the user experience.

Thanks a lot!

Cheers,
Francesco

Reply - Like 4

Massimiliano DRUDI

October 17 2022, 1:21 PM · MarineEnvironmentalIndicators

Did you know Blue-Cloud was featured on WEKEO website for its contribution to the development of open science platforms for the marine research ?

-- link: <https://web-wekeo-jxr6u17jq-labelia-team.vercel.app/use-cases/blue-cloud>

Open Virtual Labs

open

Where scientists can contribute, find, try, and use Blue-Cloud methods as integrated in the infrastructure by scientists across multiple disciplines. Using the VRE user interfac ...

[Read More >](#)

open

This VLab hosts examples of suitable habitat maps produced for today and 2050 in new areas for more than 11,000 species and provides models and workflows to combine environmental data with species observations in their habi ...

[Read More >](#)

Demonstrators

open

The Zoo-Phytoplankton EOVI Vlab is the implementation of the Blue-Cloud Zoo-Phytoplankton EOVI products demonstrator. It provides its users with access to blue multidisciplinary data for exploring the methodology and data use ...

[Read More >](#)

open

Right click on any folder to share

Version Id	Created	Current Version
1.0	Mon Feb 13 18:08:27 GMT+100 2023	No
1.1	Mon Feb 13 18:11:10 GMT+100 2023	No
1.2	Tue Feb 14 08:45:18 GMT+100 2023	Yes

Click on History to see the activities

Description	Operation	User	Date
Operation: Created (1 Item)			
Blue-Cloud2026 - WP5 - KoM Feb 2023.pptx created by Massimiliano Assante	Created	Massimiliano Assante	Mon Feb 13 18:08:27 GMT+100 ...
Operation: Read (14 Items)			
Blue-Cloud2026 - WP5 - KoM Feb 2023.pptx v.1.1 read by Jan Willem Noteboom	Read	Jan Willem Noteboom	Tue Feb 14 08:08:52 GMT+100 ...
Blue-Cloud2026 - WP5 - KoM Feb 2023.pptx v.1.2 read by Federico Drago	Read	Federico Drago	Tue Feb 14 08:52:21 GMT+100 ...
Blue-Cloud2026 - WP5 - KoM Feb 2023.pptx v.1.2 read by Leonardo Candela	Read	Leonardo Candela	Tue Feb 14 09:32:41 GMT+100 ...

Click on Versions to see and access the different versions

Workspace

Pros

Cons

Fault-tolerant

Replicated Distributed

Compressed

High Latency

Slower

Dataspace

Pros

Cons

Large Volume (1TB)

Faster

Low Latency

Single Site

Linked only to JupyterHub

Volatile

Pros

Cons

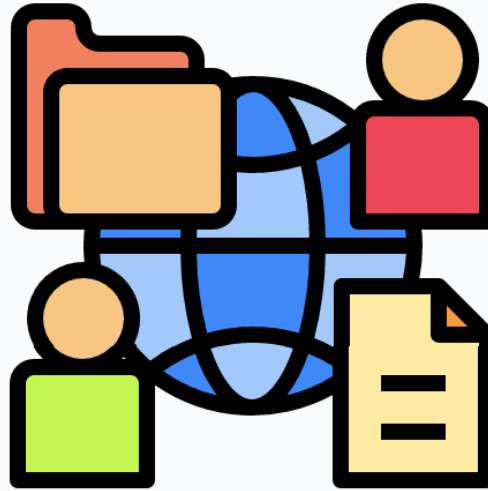
Faster

Single Site

Low Latency

Deleted after 24 hours

Accessible only via URIs



Blue-Cloud promotes technologies enabling the sharing of datasets and methods

PUBLISHING

Resembles a catalogue of artefacts with **search and browse**

Every published item in the catalogue is characterised by:

a **type**, which highlights its features

an **open ended set of metadata**

optional **resource(s)** representing the actual payload of the item.

Blue-Cloud Catalogue statistics

47
items

6
virtual labs

11
groups

5
types

Browse by Virtual Labs



Blue-Cloud (26)



Zoo-Phytoplankton
EOVI (7)



Marine
Environmental
Indicators (6)



PlanktonGenomics (3)



Blue-Cloud Lab (3)

[See All Virtual Labs](#)

Browse by Types



Deliverable (23)



Service (16)



Dataset (5)



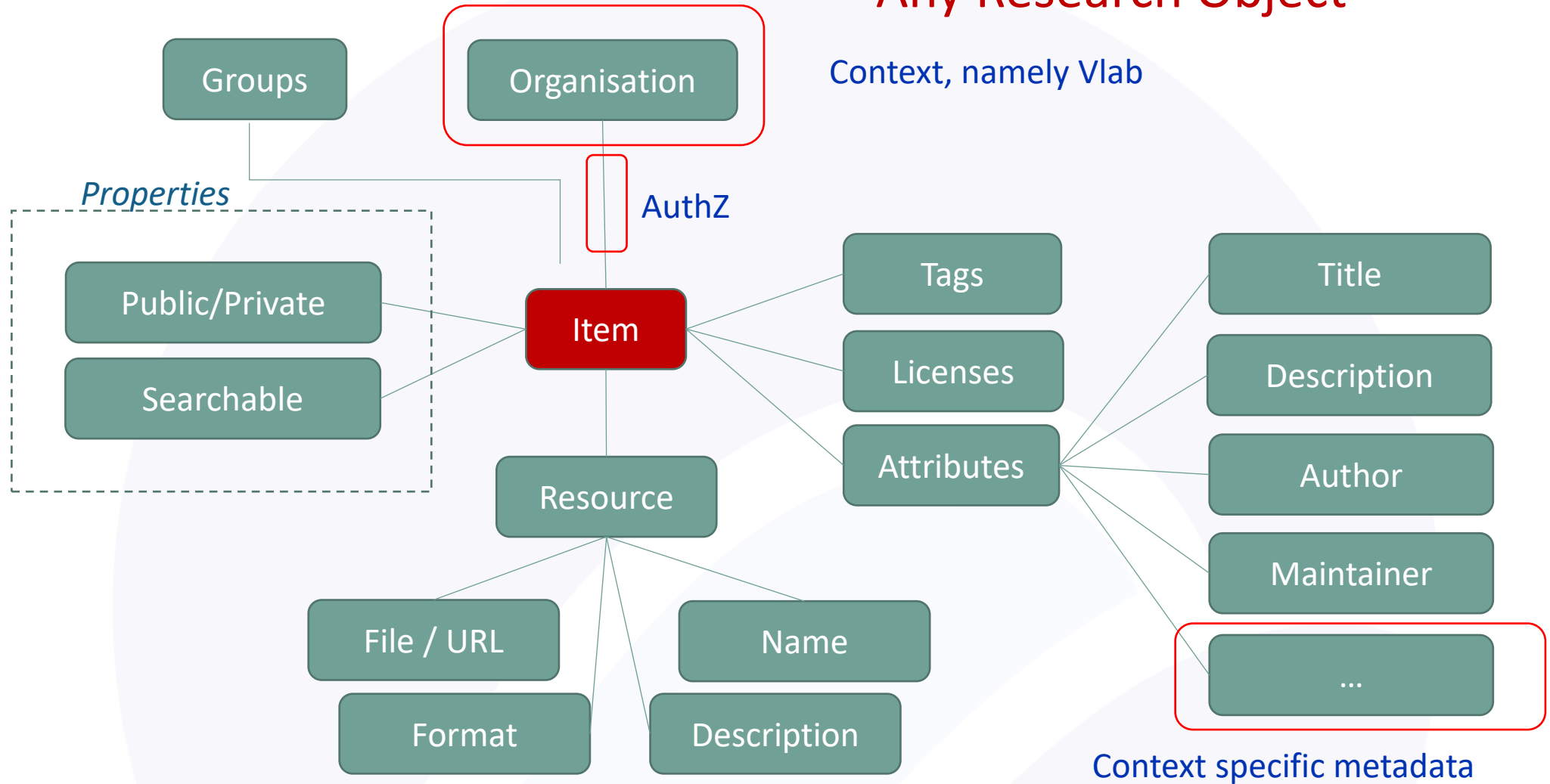
Provider (2)



Method (1)

[See All Types](#)

Any Research Object



Organization

Title & Description

Tags

Resources (item payloads)

License

PURL QR-Code

Item URL

Metadata

Item URL
<http://data.d4science.org/ctlg/d4science.research-infrastructures.eu/sarda-sarda3>

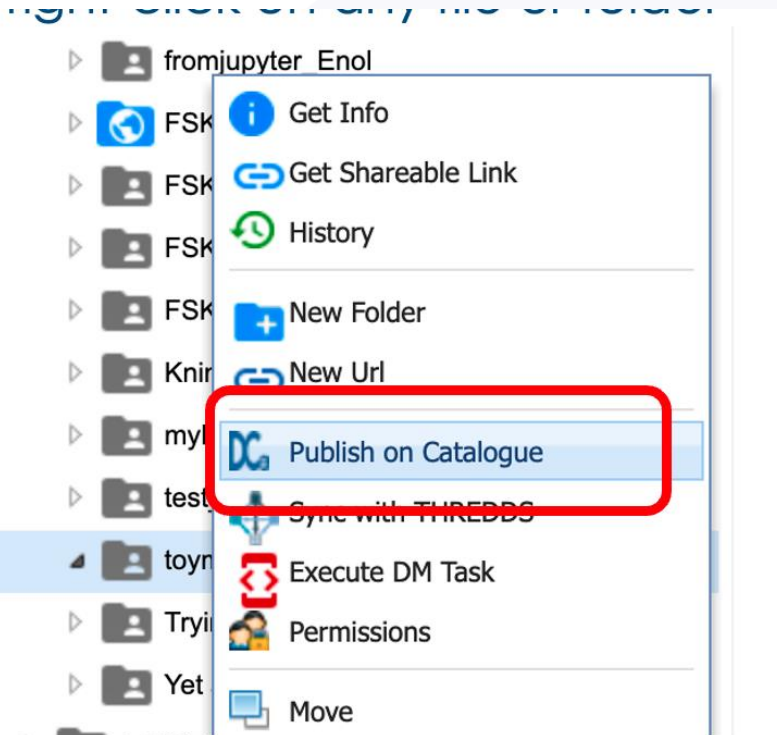
Geonetwork Links

Field	Value
GN_Metadata_Show	http://geonetwork.d4science.org/geonetwork/srv/en/metadata.show?uuid=b9bd0ef9-76f9-4fb9-8f98-1c36557bc5f8
GN_Metadata_Source	http://geonetwork.d4science.org/geonetwork/srv/en/xml.metadata.get?uuid=b9bd0ef9-76f9-4fb9-8f98-1c36557bc5f8
GN_URL	http://geonetwork.d4science.org/geonetwork

Additional Info

Field	Value				
access_constraints	[]				
bbox-east-long	180.0				
bbox-north-lat	90.0				
bbox-south-lat	-90.0				
bbox-west-long	-180.0				
contact-email	info@i-marine.eu				
coupled-resource					
dataset-reference-date	<table border="1"> <thead> <tr> <th>type</th> <th>creation</th> </tr> </thead> <tbody> <tr> <td>value</td> <td>2013-04-12T01:13:51.731+02:00</td> </tr> </tbody> </table>	type	creation	value	2013-04-12T01:13:51.731+02:00
type	creation				
value	2013-04-12T01:13:51.731+02:00				
frequency-of-update	asNeeded				
graphic-preview-file					

right-click on any file or folder



Select organization, typology and compile metadata

A screenshot of the 'Publish Item' form. The fields are: Visibility: Restricted; Publish in: ORION Knowledge Hub (selected), DEMETER, EcoEvo; Version: ; * Author: Candela Leonardo; * Author Email: leonardo.candela@isti.cnr.it; Maintainer: Candela Leonardo; Maintainer Email: leonardo.candela@isti.cnr.it; Types: none. At the bottom are 'Continue' and 'Reset' buttons.

Select resources

A screenshot of the 'Publish Item' form showing resource selection. On the left, a list of resources includes 'toyDoseResponse.fskx', 'toyExposure.fskx', and 'toyGeneric.fskx'. On the right is an empty selection area. Navigation arrows (>>, >, <, <<) are between the two panels. At the bottom are 'Continue' and 'Go Back' buttons.



The screenshot displays the Zenodo integration interface. At the top, a navigation bar includes 'Home', 'Share Link', 'Upload to Zenodo' (highlighted with a red box), and 'Publish Item'. Below this, a card shows the item title 'CROP_SIMULATION_FOR_FIELD_V1_ID_43a9f471 9f95 4e6f bb75 360ebaded77d' and a 'Manage' button. A modal window titled 'Upload to Zenodo' is open, containing a text box with instructions: 'By using this process you are transferring selected catalogue item content to the Zenodo Repository (link). This will create a new item in Zenodo and a link of the Zenodo item will be added to the catalogue item.' Below the text box, a sidebar on the left has 'The Item' and 'Files' options, with 'Files' highlighted by a red box. The main area of the modal is a form for 'Item Information' with fields for Title, Description, Keywords, Upload type, Access right, License, and Creator. A second, smaller modal window is also visible, showing a 'Select the file/s to upload to Zenodo' section with two file entries, each with a 'Publish' toggle set to 'OFF'.

specify metadata and file to deposit

Blue-Cloud services, regularly registered in the Blue-Cloud Catalogue, will also be made accessible through the EOSC marketplace.

Welcome to the Blue-Cloud Catalogue!
 Here you will find data, products, and resources of interest for the Blue-Cloud community. In particular, the Catalogue features datasets and products resulting from the Blue-Cloud Virtual Laboratories and the methods used to generate them. Every Catalogue item is accompanied by rich descriptions capturing general attributes to enhance FAIRness:

- title and creator(s)
- accessibility properties
- technical properties, e.g. size and format
- legal and ethical attributes, e.g. whether containing personal data
- intellectual properties, e.g. licences

Browse the Blue-Cloud Catalogue now!

Items Search
 Insert keywords here

Blue-Cloud Catalogue statistics
 47 items, 6 virtual labs, 11 groups

Browse by Virtual Labs

- Blue-Cloud Project (26)
- Zoo-Phytoplankton EOVS (7)
- Marine Environmental Indicators (6)
- PlanktonGenomics (3)
- Blue-Cloud Lab (3)
- Fisheries Atlas (2)

Browse by Types

- Deliverable (23)
- Service (16)
- Dataset (5)
- Provider (2)
- Method (1)

Browse by Groups



EUROPEAN OPEN SCIENCE CLOUD

Search in catalogs: Scientific discipline: 01 natural sciences x

28813 search results in All catalogs

Filters

- Research step**
 - Discover Research Outputs (288)
 - Access Training Material (0)
 - Process and Analyse (0)
 - Manage Research Data (0)
 - Access Computing and Storage Resources (0)
- Virtual service**
 - no (0)
 - yes (0)
- Type of product**
 - publication (2)
 - software (10)
 - dataset (9)
 - other (0)
 - service (0)
 - training (0)
 - data source (0)
- Access right**
 - Open access (25509)
 - Closed (3118)
 - Restricted (153)
 - Embargo (33)
 - Order required (0)
 - Other (0)
- Scientific discipline**
 - 01 natural sciences (28813)
 - 02 engineering and technology (0)

28813 search results in All catalogs

Rosemary beetle *Chrysolina americana*: A new invasive leaf beetle (Coleoptera: Chrysomelidae: Chrysomelinae) in Israel

Open access | 29 July 2016 | Type: publication | 108 Downloads | 289 Views

Author names: Friedman Ariel-Leib-Leonid
 DOI: 10.5281/zenodo.59017

Keio 3D K-OMEGA-SST

Software
 Open Access
 English
Author names: Minh Doan Shinnosuke Ohi

fireworks v1.1.9

Software
 Open Access
 Not Specified
Author names: Anubhav Jain Shyue Ping Ong Xiaohu Qiu Bharat Medasani jakirkham C Petretto Dan Gunter William Scullin Patrick Huck zulissi Ixb lord Mathew Joseph Montoya Henrik Rusche Donny Winston
 DOI: 10.5281/zenodo.3354

Keio 2D Spalart-Allmaras

Software
 Open Access
 Not Specified
Author names: Minh Doan Shinnosuke Ohi

Wavelength Conversion via Refractive Index Tuning of A Hexagonal Photonic Crystal Cavity

Open access | 20 April 2017 | Type: publication | 8 Downloads | 21 Views

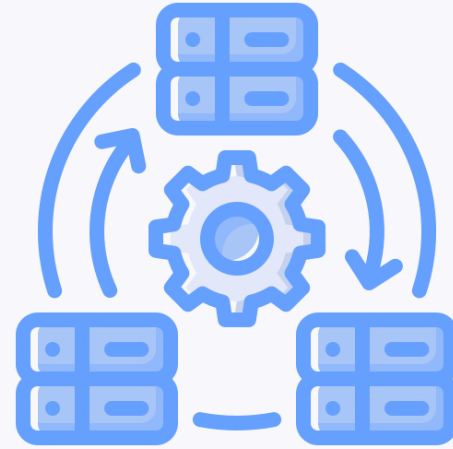
Author names: Md Abu Jubair
 DOI: 10.5281/zenodo.556269

two-dimensional photonic crystal, hexagonal cavity, refractive index tuning, wavelength conversion

Photonic crystals are consisting of a periodic dielectric medium that can affect the electromagnetic wave propagation by creating allowed and forbidden electronic energy bands. Bands of wavelengths which are not allowed are called photonic band gaps. An...




Tracking Magnetic Variability From High-Resolution Unpolarised Spectra

Open access | 01 August 2016 | Type: publication | 98 Downloads | 60 Views




ANALYTICS COMPUTING FRAMEWORK

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

 <p>JupyterHub</p> <p>JupyterHub enables the exploitation of computational environments and resources without burdening users with installation and maintenance tasks. This JupyterHub environment is (i) preconfigured with libraries and packages to ease the execution of common data analytics tasks, and (ii) provides access to the Workspace enabling sharing of resources with other members much easier.</p>	 <p>RStudio</p> <p>RStudio provides an integrated development environment for R. It includes a console and a syntax-highlighting editor and it enables code execution. Tools for plotting are also included. This RStudio environment is (i) preconfigured with libraries and packages to ease the execution of common data analytics tasks, and (ii) provides seamless access to the Workspace enabling sharing of resources with other members much easier.</p>
 <p>Analytics Engine</p> <p>Analytics Engine (DataMiner) permits the execution of an array of analytics methods by transparently relying on distributed computing infrastructure. Executions can run either on multi-core machines or on different computational platforms, such as D4Science and other different private and commercial Cloud providers. New software can be integrated by using the dedicated Software Importer (SAI).</p>	 <p>Catalogue</p> <p>Catalogue contains a list of dataset and products produced by the Blue-Cloud Virtual Laboratories and the methods used to generate such products. All the Catalogue items are accompanied with rich descriptions capturing general attributes, e.g. title and creator(s); accessibility properties; technical properties, e.g. size and format; legal and ethical attributes, e.g. whether containing personal data; intellectual properties, e.g. licences.</p>

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



- 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. Jupyterf



PlanktonGenomics Administration Result Overview **JupyterHub** RStudio Analytics Engine Catalogue Members

jupyterhub Home Token Services

Server

- R Env XL - 16 Cores / 64G RAM**
The R Env new notebook servers inc libraries preinstalled for R
- R Env Large (New version) - 8 Core**
The R Env new notebook servers inc libraries preinstalled for R

File Edit View Run Kernel Tabs Settings Help

CREATE_MONTHLY_FIELD!× readme_Notebook1.2.ipynb Python 3

Phytoplankton_EOV workspace WEKEO-HDA-UI.ipynb

Notebook 1.2. allows for the creation of protein functional clusters from Fasta files derived from Metagenomic or Metatranscriptomic sequencing. These clusters contain annotated as well as unknown sequences and can then be passed on to Notebook 2.

Files for input:

Data available from: Tara Oceans Eukaryotic Genomes (the "SMAGs") <https://www.genoscope.cns.fr/tara/> Peptides Fasta Sequences 713 manually curated SMAGs (Single amplified genomes and metagenome assembled genomes) Peptide file containing 10207435 proteins

```
[ ]: %%bash
grep -c ">" SMAGs_v1_concat.faa
```

Use Prodigal to detect genes and translate them to amino acids. (needs to be installed on server)

```
[ ]: %%bash
for file in TARA*; do prodigal -i "$file" -o "$file.coords.gbk" -a "$file.protein.faa" -d "$file.nucl.faa" ; done
```

Create a protein database adapted to diamond (simplifying Fasta Header)

```
[ ]: %%bash
cat *.protein.faa >> Euk_prot.faa
cut -d " " -f 1 Euk_prot.faa > Euk_prot_shorthead.faa
cat Euk_prot_shorthead.faa SMAGs_v1_concat.faa > EukMAGS_SMAGs_prot_concat.faa
```

Create diamond db for all (diamond needs to be installed on server)

```
[ ]: diamond makedb --in EukMAGS_SMAGs_prot_concat.faa -d EukMAGS_SMAGs_prot_db
```

The screenshot shows the RStudio interface with the following components:

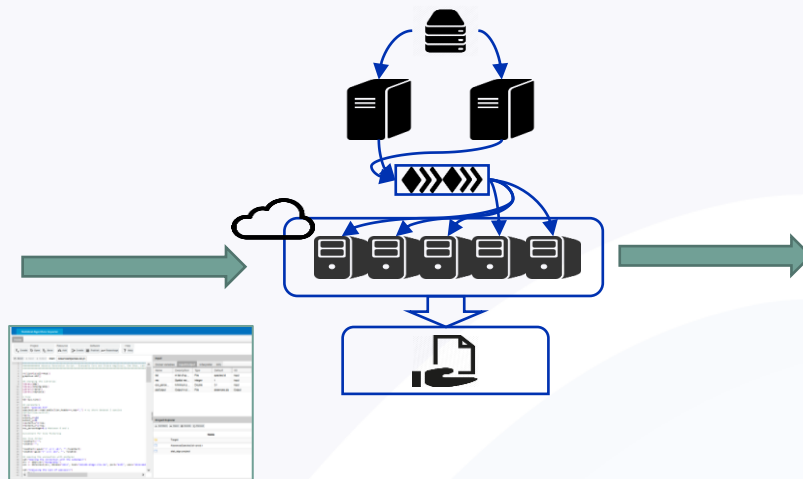
- Console (Terminal):** Displays the R startup sequence, including package loading (RPostgreSQL, grDevices, graphics, stats) and a welcome message for user 'massimiliano.assante'. It provides instructions on how to manage packages and workspace files.
- Environment:** Shows 'Global Environment' which is currently empty. A large green arrow points from this area towards the Files pane.
- Files:** Shows a file explorer for the 'workspace' directory. It contains a list of files and folders with their sizes and modification dates.

Name	Size	Modified
bipartite example file.csv	21.1 KB	May 19, 2020, 11:05 AM
Blue-Cloud Data Pool		
Calling WPS.ipynb	13.6 KB	Jun 13, 2022, 10:07 AM
D4Science Operation Data		
Dashboard Visualization Folder		
Data Publication Survey		
DataMiner		
DCF-GTA-massimiliano.assante		
DCF-RDB-WECAFC-massimiliano.assante		
DCF-SHINY-massimiliano.assante		
Devops Docs		
Dlib Team		
empty nb.ipynb	1.2 KB	Jun 13, 2022, 10:09 AM
EOSC Workshop 14-15 Sept Pisa		
EOSCsecretariat.eu		
EU Projects		
FAO-Infoods-ufish		
Links to Send		

Script/SW

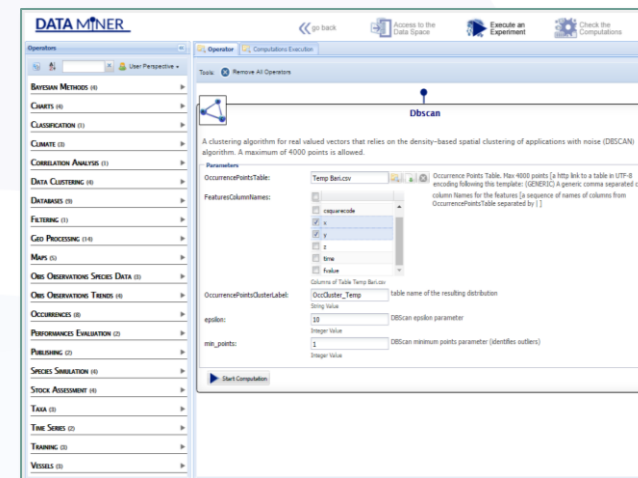


Automatic
Integration Process



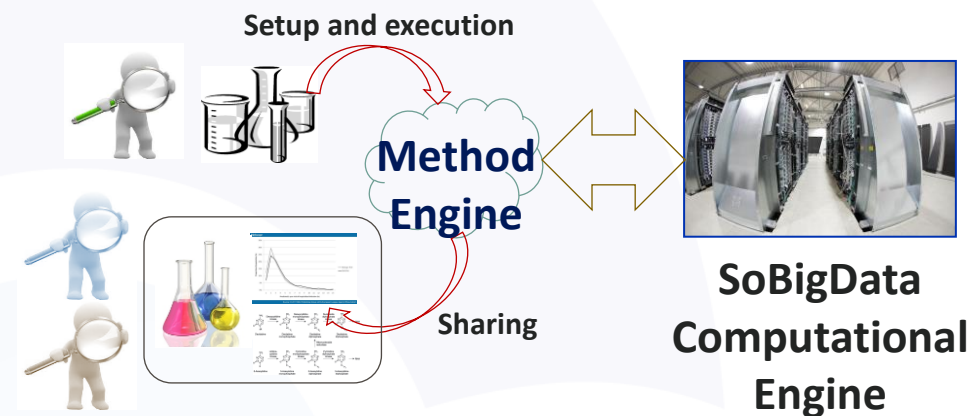
**SOFTWARE
IMPORTER**

Resulting Web UI and
Web Service



**ANALYTICS
ENGINE**

- Helps scientists in performing **in-silico experiments**
- Supplies “*precooked*” methods **as-a-Service**
- Performs calculations in a **seamless way** to the users
- **Share** input, **results**, and **parameters** with colleagues by means of VREs



The execution can be repeated with or without the same input parameters

Dataminer go back Access to the Data Space Execute an Experiment Check the Computations Help

List of Computations SIMPLE_SORT_WORDS_ID_6272f52d-a79f-4121-a16c-8cc260922ad9

Computation Report of **SIMPLE_SORT_WORDS_ID_6272f52d-a79f-4121-a16c-8cc260922ad9**

Output Result

LogFile: Show Download
 result: Show Download

Input Parameters

filename: Show Download
 usertoken: 4bc2dc31-1122-4e20-b406-87bd7679f9cfc-843339462

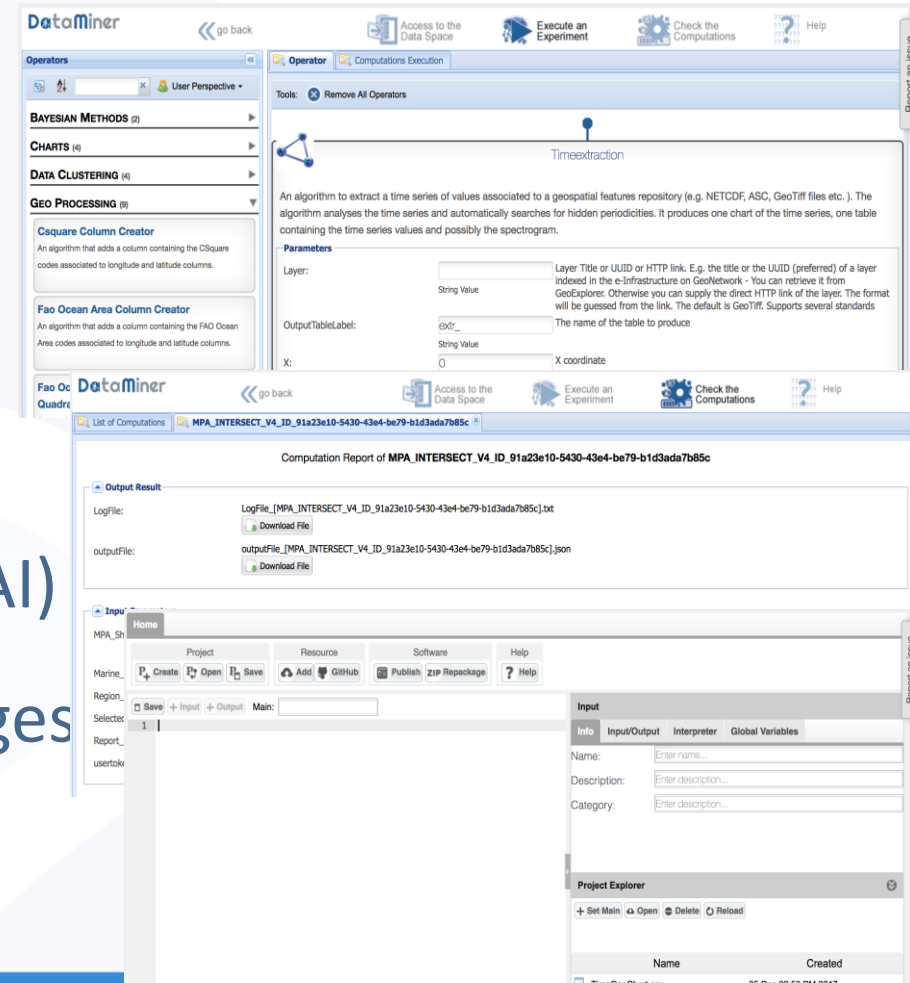
Computation Details

Start Date: 16/03/2023 16:17:38
 End Date: 16/03/2023 16:17:45
 Status: completed
 VRE: /d4science.research-infrastructures.eu/D4OS/Blue-CloudLab

Operator Details

Operator Name: SIMPLE_SORT_WORDS

- User-friendly data analytics platform
- Per-method GUI and HTTPs access by WPS Standard
- Provenance management (PROV-O)
- Method integration support via dedicated tool (SAI) with extensibility WRT supported method languages

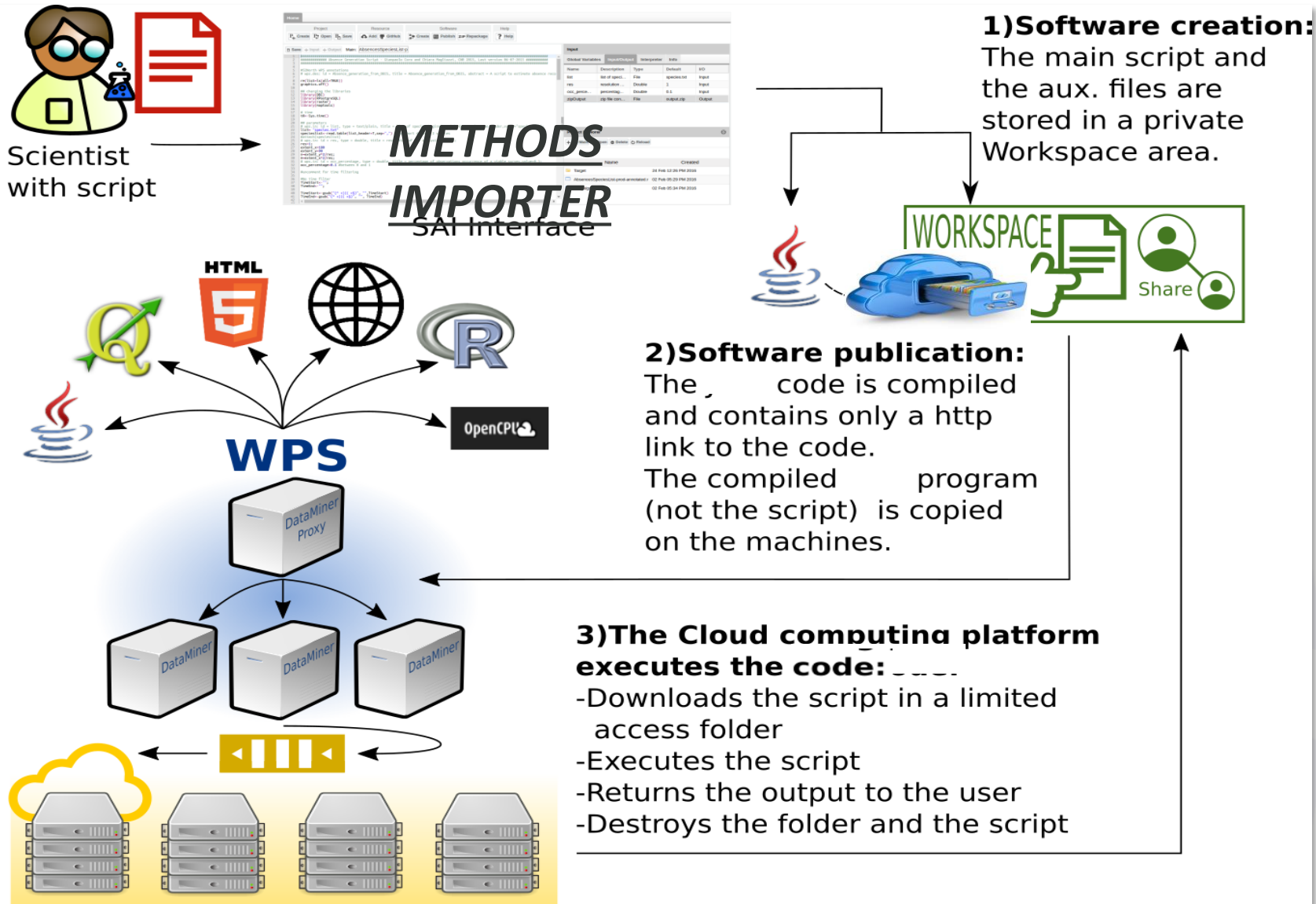


“Provenance is information about entities, activities, and people involved in producing a piece of data or thing, which can be used to form assessments about its quality, reliability or trustworthiness.”

The PROV Ontology (PROV-O) expresses the PROV Data Model using the OWL2 Web Ontology Language (OWL2).

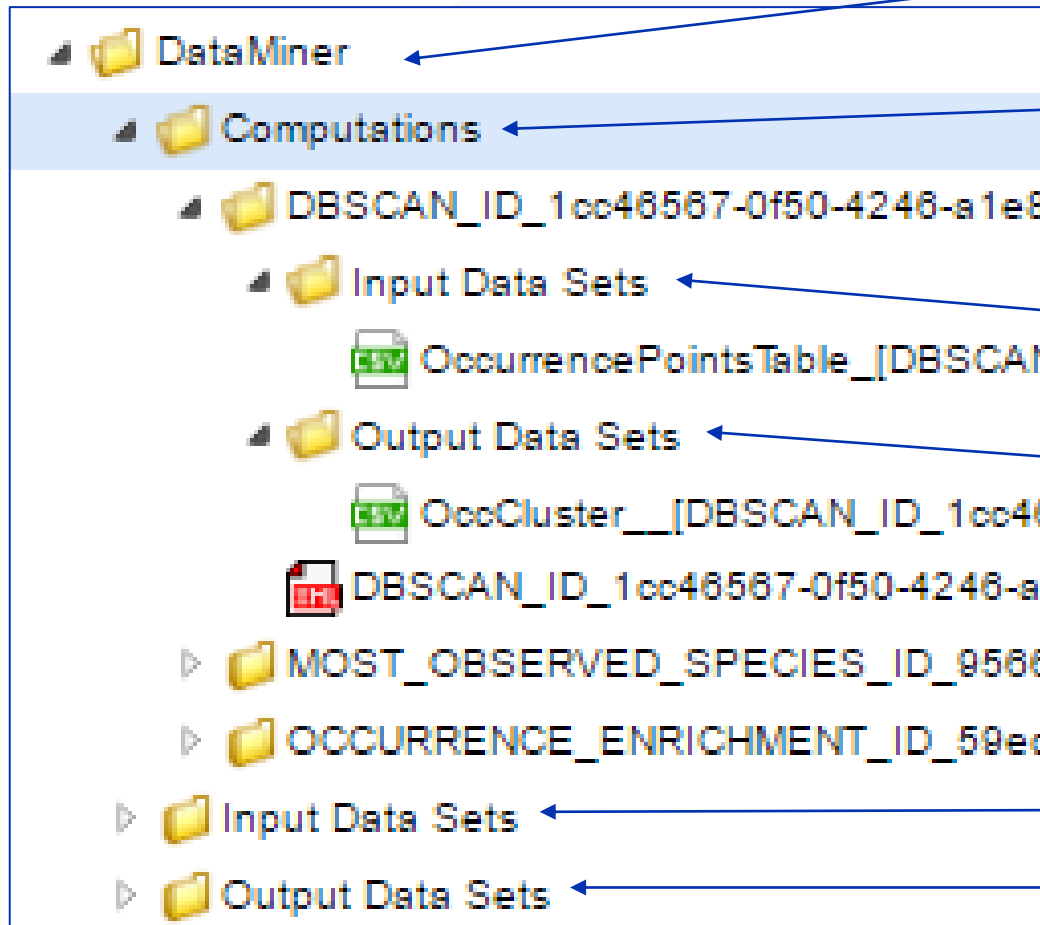
It provides a set of classes, properties, and restrictions that can be used to represent and interchange provenance information generated in different systems and under different contexts.

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    <prov:softwareAgent prov:id="d4s:dataminer.d4science.org"/>
    <prov:person prov:id="d4s:gianpaolo.coro"/>
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    </prov:entity>
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Neural Network using an online Back-Propagation
procedure and returns the training error and a binary file containing the trained network<
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```





User's Workspace



Dataminer folder

Overall computations folder

Computation

Comp. Input data

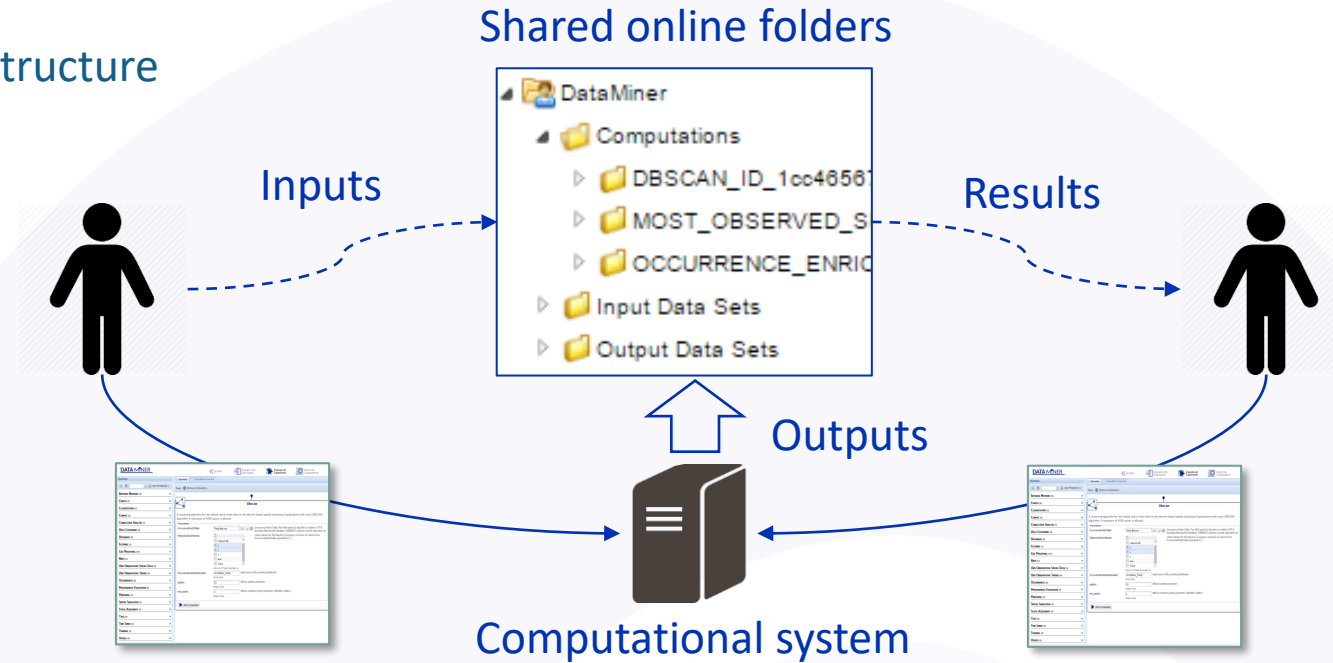
Comp. Output data

Provenance info

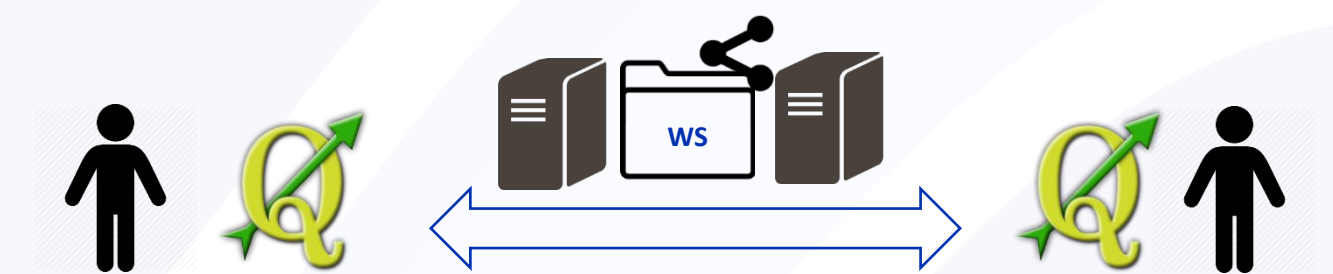
Overall Input Data

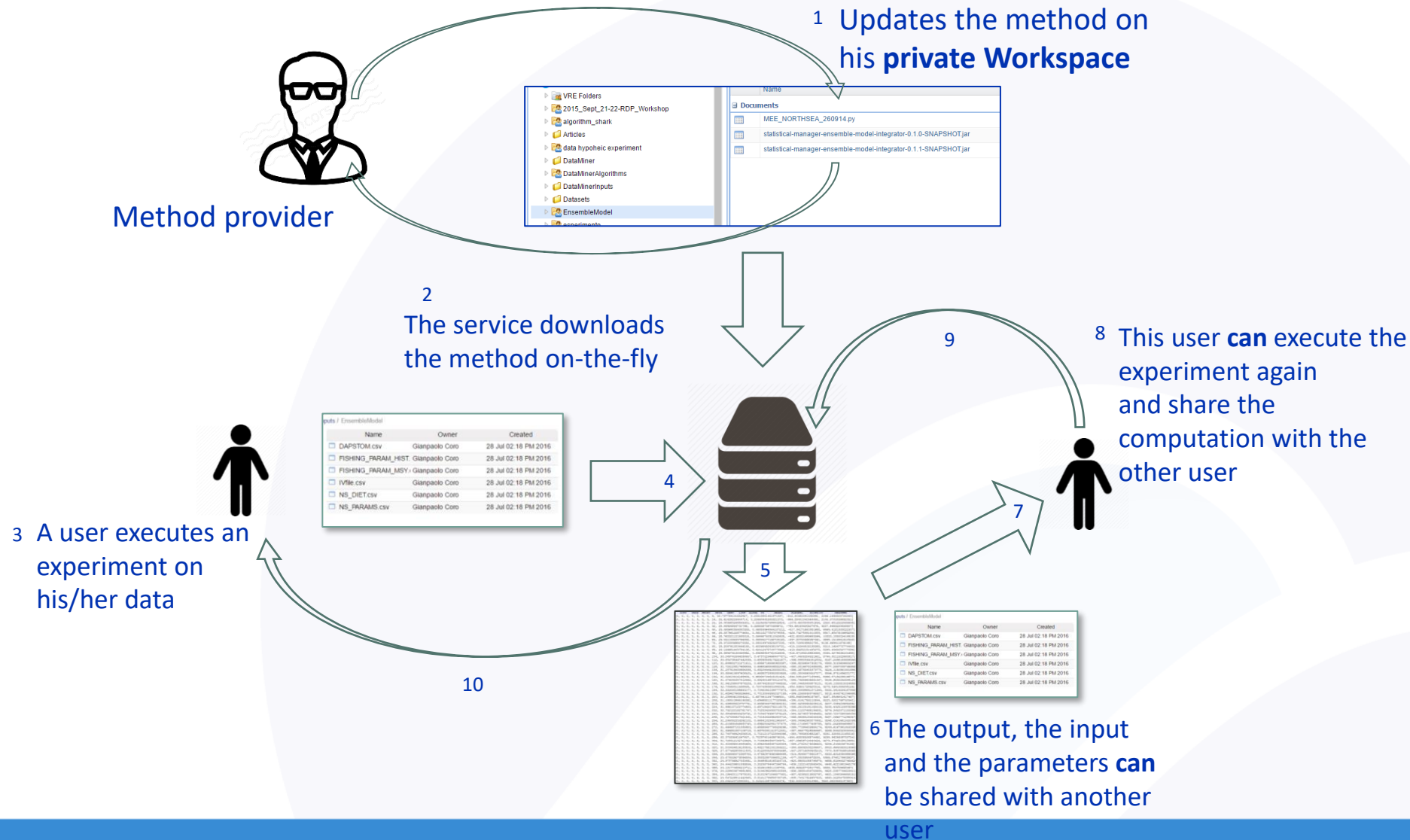
Overall Output Data

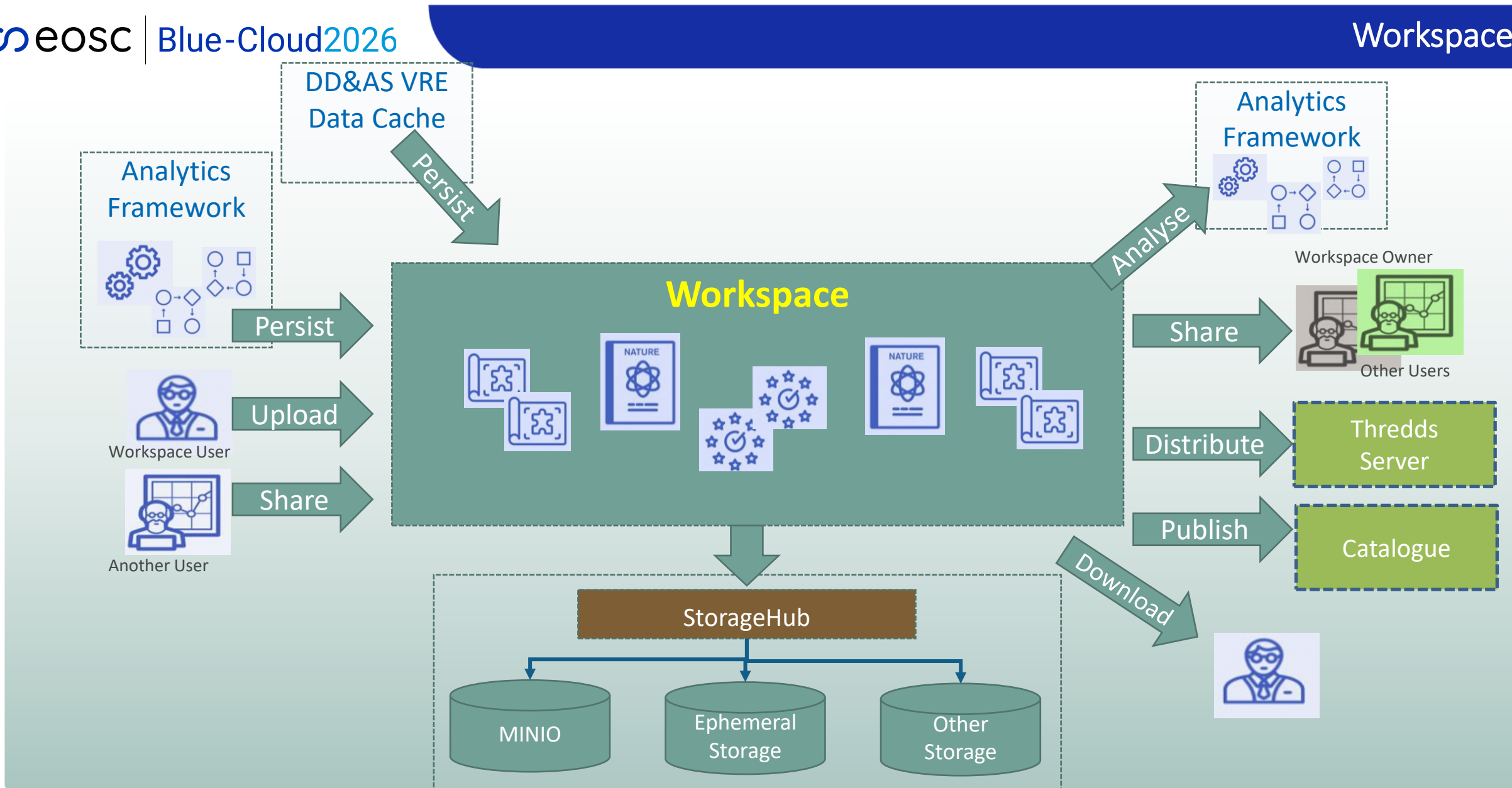
In the e-Infrastructure



Through third party software

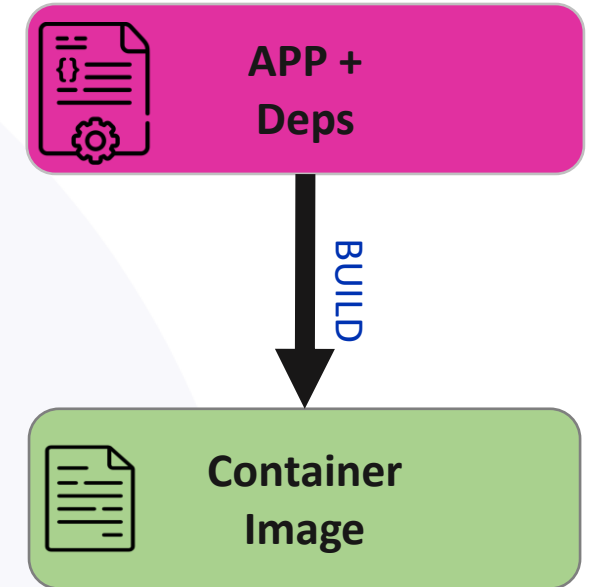




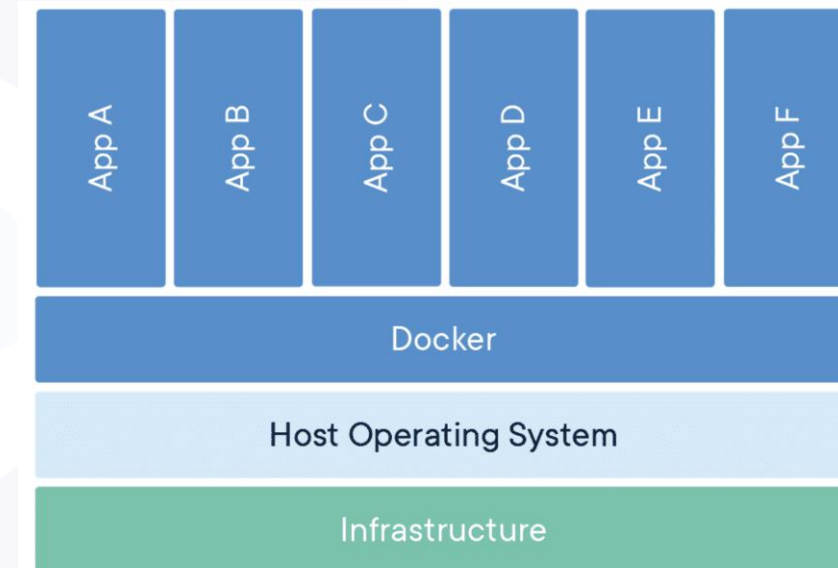


What if I have my own web application?

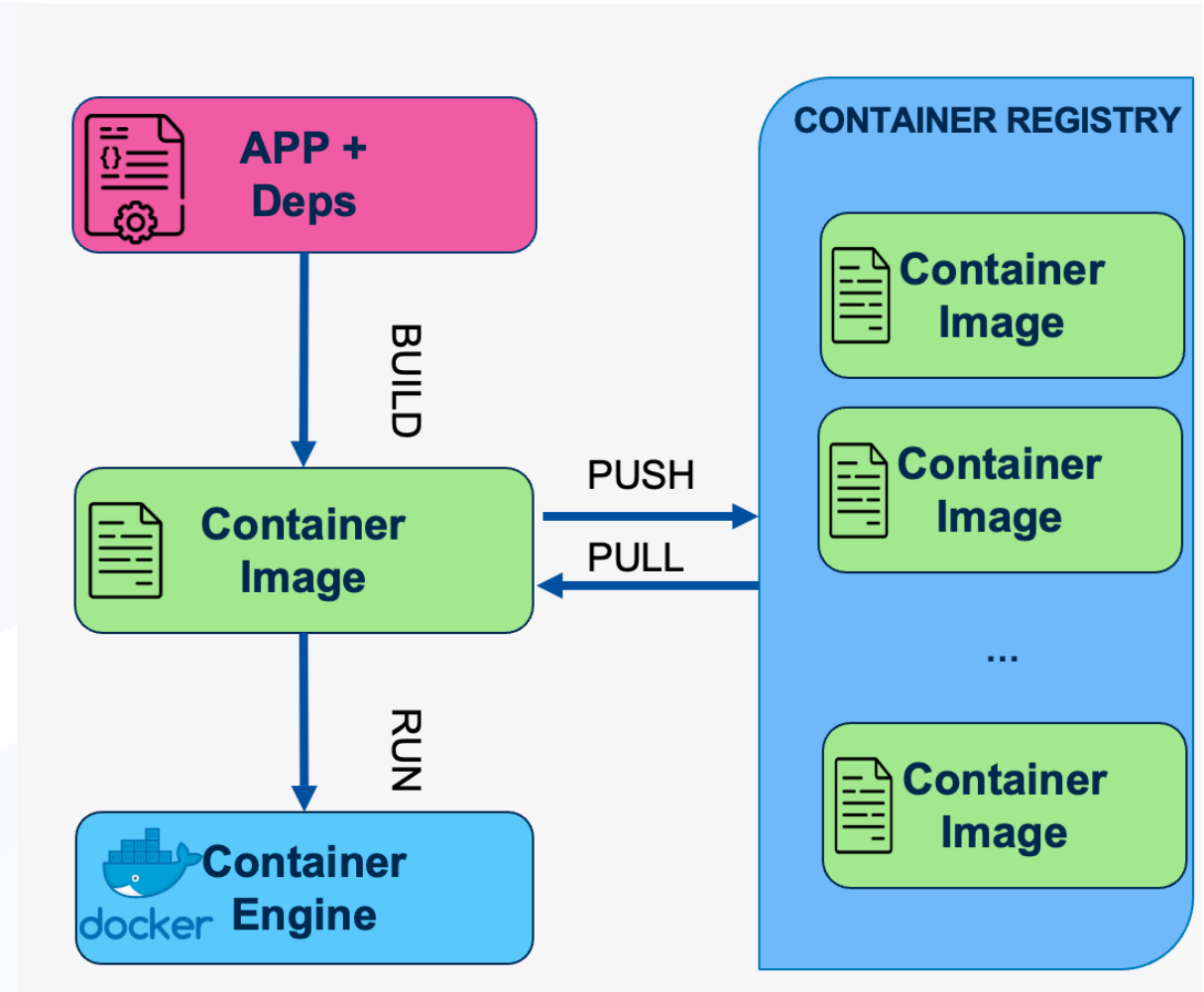
- Containerized applications are applications that run in isolated runtime environments called *containers*
- *containers* encapsulate an application with all its dependencies, including system libraries, binaries, and configuration files.
- Container images include (in a file) everything a container needs to run—the container engine such as Docker



- Container engines refer to the software components that enable the host OS to act as a container host
- A container engine accepts user commands to build, start, and manage containers through client tools (including CLI-based or graphical tools)
- *Blue-Cloud2026 uses Docker as Container Engine*



- Container images can be shared with others via a public or private container registry
- Blue-Cloud uses Docker hub* as Registry



To delegate to Blue-Cloud VRE not only the hosting

- Authentication & Authorization
- User Roles Mgmt.
- Auditing / Accounting
- Metrics / Monitoring



Grafana



Prometheus



Blue-Cloud VRE Identity and Access Management (IAM) Service

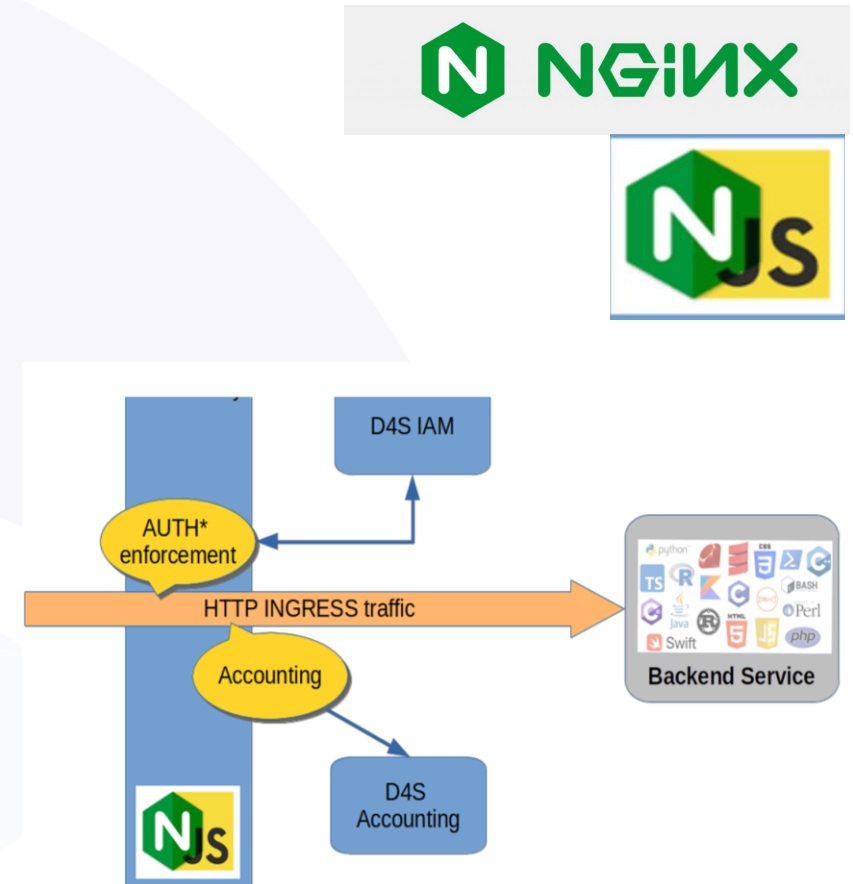
- Single-Sign On & Identity Brokering and Social Login
- *Integration via Standard Protocols*, support for OpenID Connect, OAuth 2.0, and SAML.

A screenshot of the Blue-Cloud login page. At the top left is the "Blue-Cloud" logo and at the top right is the "D4SCIENCE" logo with a language dropdown set to "English". The main heading is "Sign in to your account". Below this are two input fields for "Username or email" and "Password". There is a "Remember me" checkbox and a "Forgot Password?" link. A prominent blue "Sign In" button is centered. Below the button, it says "Or sign in with" followed by four social login options: "Academic / other", "LinkedIn", "Google", and "Twitter".

- Blue-Cloud uses D4Science Smart Proxy Tech.

NGINX based SmartProxy (nginx + js)

- Sending Auditing/Accounting information to the infrastructure Service
- Can be extended with few lines of JavaScript code to support specific needs (e.g. HTTP header extraction, parsing and adaption of custom tokens)
- Also employed in authentication and authorization enforcement



- *Prometheus* is an open-source system monitoring and alerting toolkit
 - a multi-dimensional data model with time series data identified by metric name and key/value pairs
 - time series collection happens via a pull model over HTTP;
 - PromQL, a flexible query language to leverage this dimensionality;
- The multiple modes of graphing and dashboarding has been exploited by adopting *Grafana*, which allow us to query, visualise, alert on and understand Prometheus data on metrics.

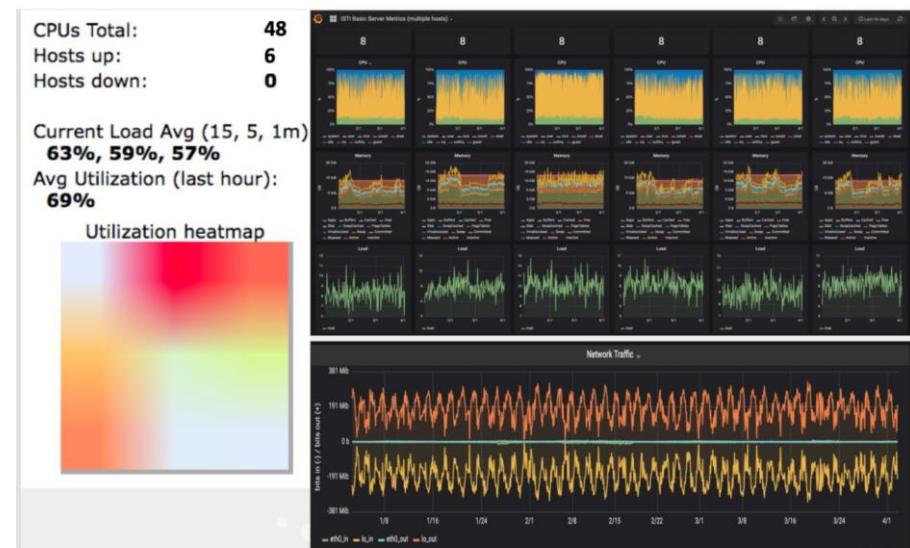
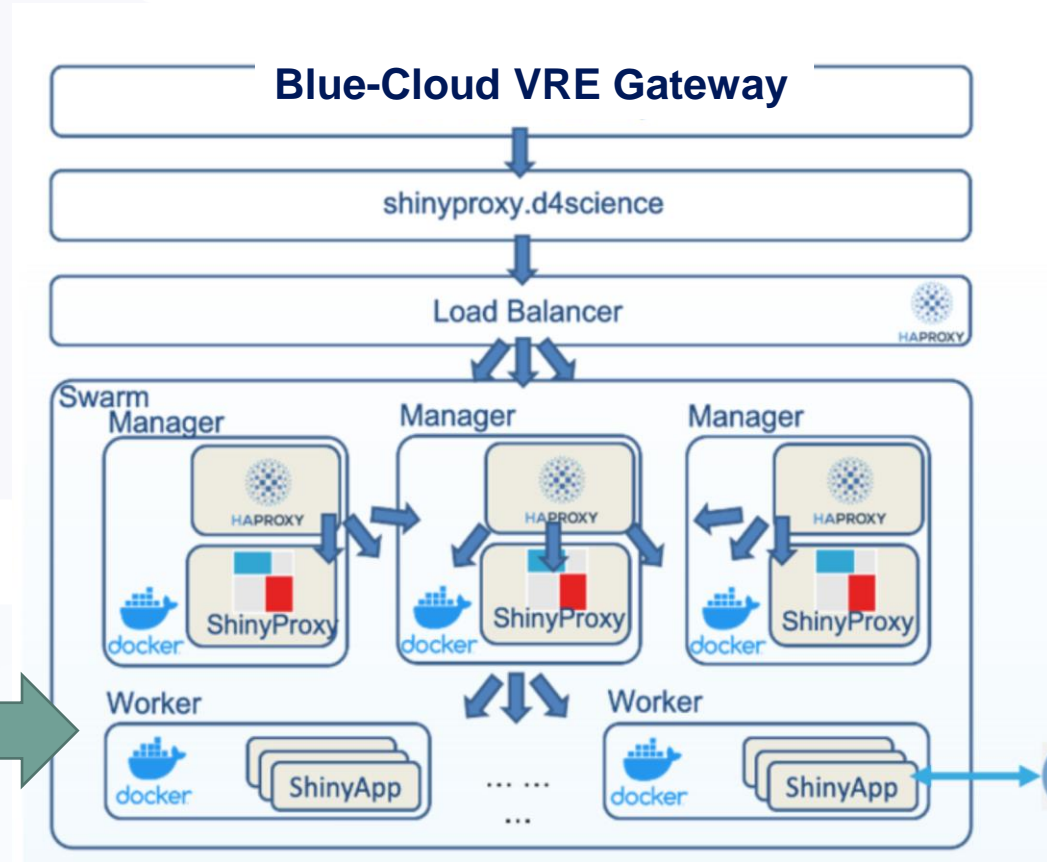
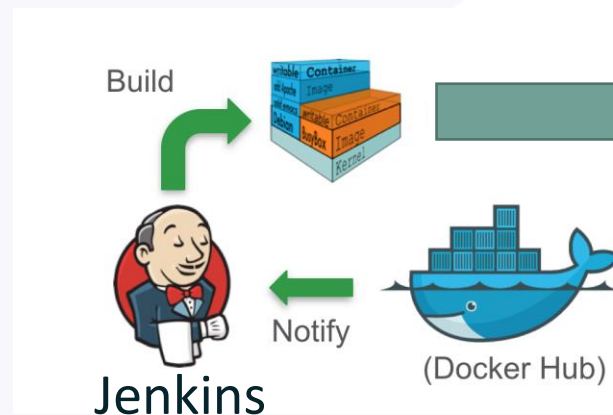
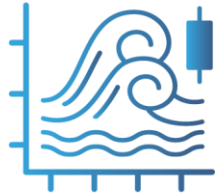


Figure 12 Prometheus Aggregated View via Grafana for the Auditing Cluster

Automated Deployment processes

- It can be a public app available in Docker Hub or any other public container registry.
- The image name and the run command are the only requirements.

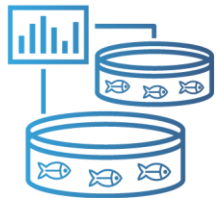




Marine Environmental Indicators



Zoo & Phytoplankton EO products



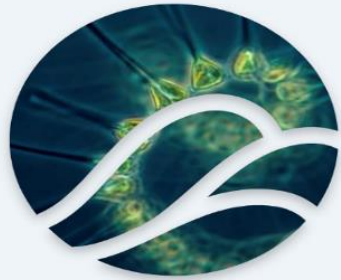
Aquaculture Monitor



Fish a matter of scales



Plankton Genomics



Biodiversity
Zoo and Phytoplankton EOV
products



Genomics
Plankton Genomics



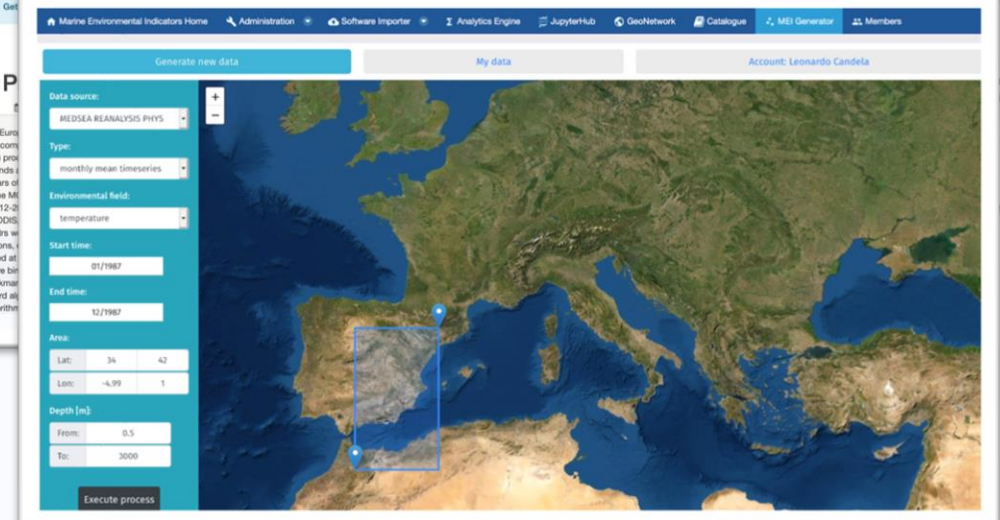
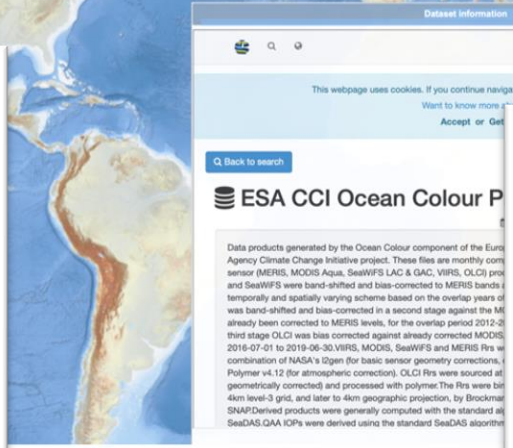
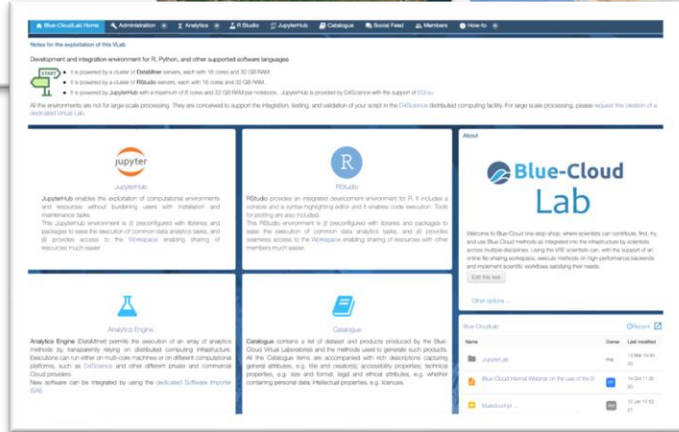
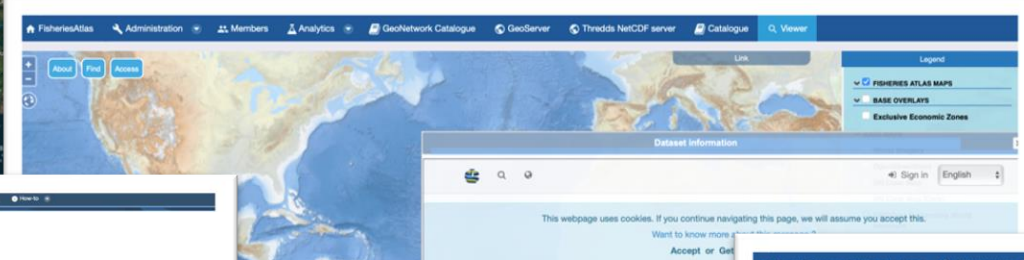
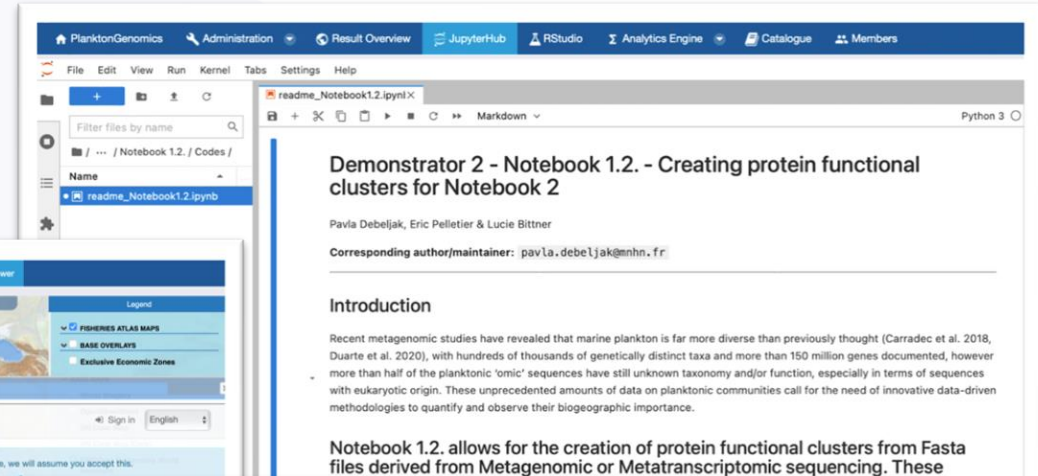
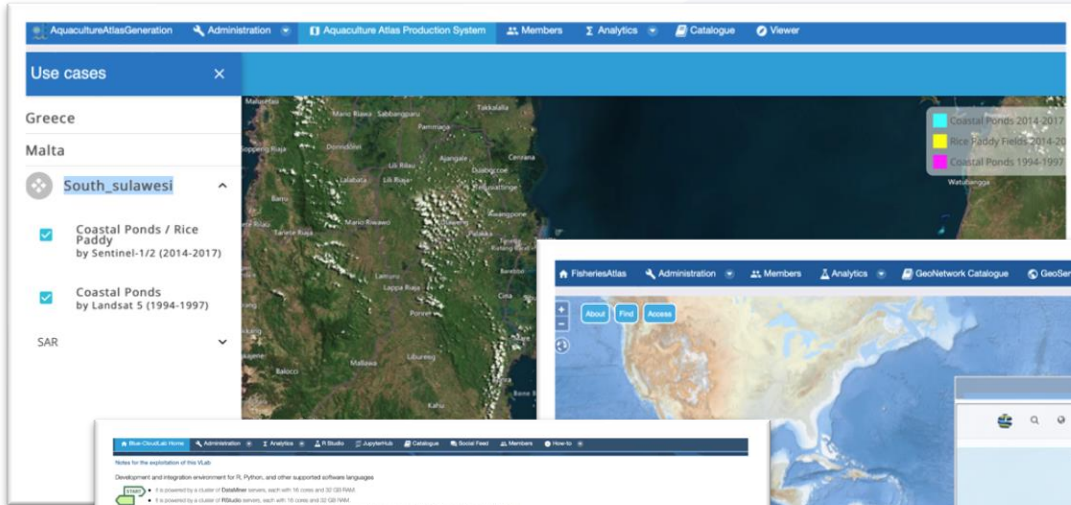
Environment
Marine Environmental
Indicators



Fisheries
Global Record of Stocks and
Fisheries



Aquaculture
Aquaculture Monitor



<https://blue-cloud.d4science.org>

<https://blue-cloud.d4science.org/web/marineenvironmentalindicators>



Marine Environmental Indicators

The VLab provides support to analyse the quality of the marine environment, and inform decision makers about the good environmental status in a changing climate.

Partners:



Data sources through Blue-Cloud:

Copernicus Marine Service, Copernicus Climate Service, EuroARGO, EMODnet

Main target users:

Environmental protection agencies and international stakeholders involved in environment management

Services introduction:

The VLab offers a web user interface and several scientific-based algorithms, that can be used to obtain environmental indicators and added-value data applying big data analysis and machine learning methods on multi-source data sets.

UN SDGs addressed



THANK YOU

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