



**Data Analysis made easy with the ENES Climate Analytics Service (ECAS)**

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SC1.22**

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**Dissemination level: Public**



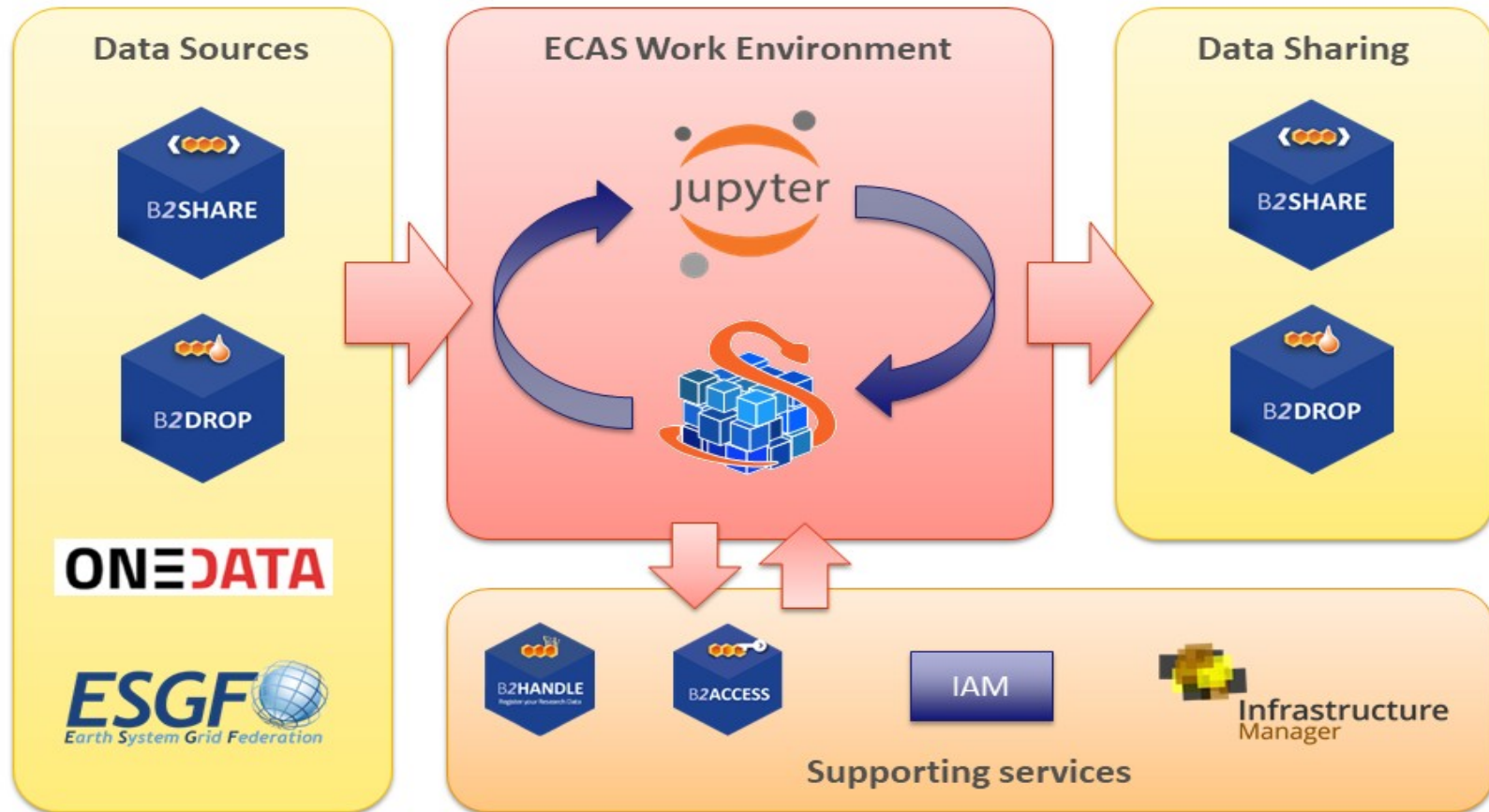
- Training materials
  - <https://github.com/ECAS-Lab/ecas-training>
- ECASLab / JupyterHUB
  - **ECASLab @ DKRZ** <https://ecaslab.dkrz.de>
  - **ECASLab @ CMCC** <https://ecaslab.cmcc.it>
- Ophidia framework documentation
  - <http://ophidia.cmcc.it/documentation/users/index.html>

- ECAS is part of the **EOSC-HUB** service catalogue
  - ECAS enables scientific end-users to perform data analysis experiments
- Server-based
  - Computation @ **CMCC** or **DKRZ**
  - Avoid data transfer (download)
  - Improved reusability of data and workflows (FAIR approach)
- ECAS supports different Auth\* providers
  - Local and external AAI providers supported (LDAP, B2ACCESS, EGI Check In)
  - Additional AAI providers can be integrated (e.g. INDIGO IAM)

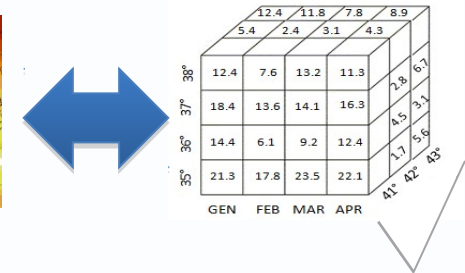
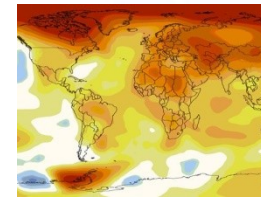
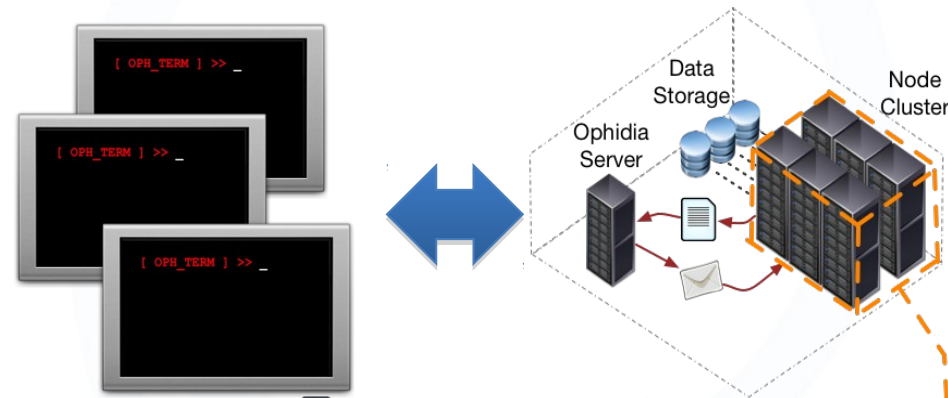


- ECAS provides data access via ESGF
- Coordinated Regional Climate Downscaling Experiment
  - ~ 100 Tbyte Cordex
- Coupled Model Intercomparison Project 5
  - ~ 1.2 Pbyte CMIP5 Data
- Coupled Model Intercomparison Project 6
  - ~ 250 Tbyte CMIP6 Data from the 1PByte published
- Other Data pools can be mounted on demand
  - MPI Grand ensemble (**MPI - GE**)
  - data collection exposed in the Federated Data Archive (e.g. through **OneData**)

## Service architecture and interfaces



- The Ophidia framework addresses big data challenges for eScience
  - support for declarative, parallel, server-side data analysis exploiting parallel computing techniques
  - end-to-end mechanisms to support complex experiments and large processing workflows on scientific multi-dimensional datacubes
- Ophidia supports both **batch & interactive** data analytics
  - More than 50 datacube-oriented **operators** are available, including: data reduction and subsetting, data intercomparison, metadata and provenance management, time series analysis with array-based primitives
  - A wide set of (low-level) array-based primitives (over 100) to perform, e.g. data summarization, algebraic expressions, predicates evaluation, statistical analysis
  - Support for complex workflows and Python applications execution

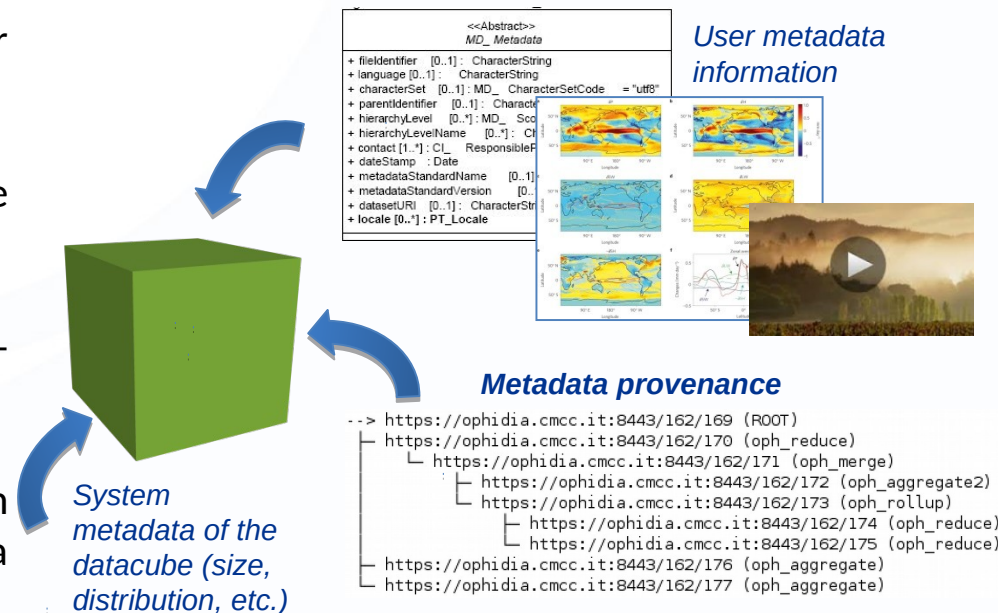


**Oph\_Term:** a terminal-like commands interpreter serving as a client for the Ophidia framework

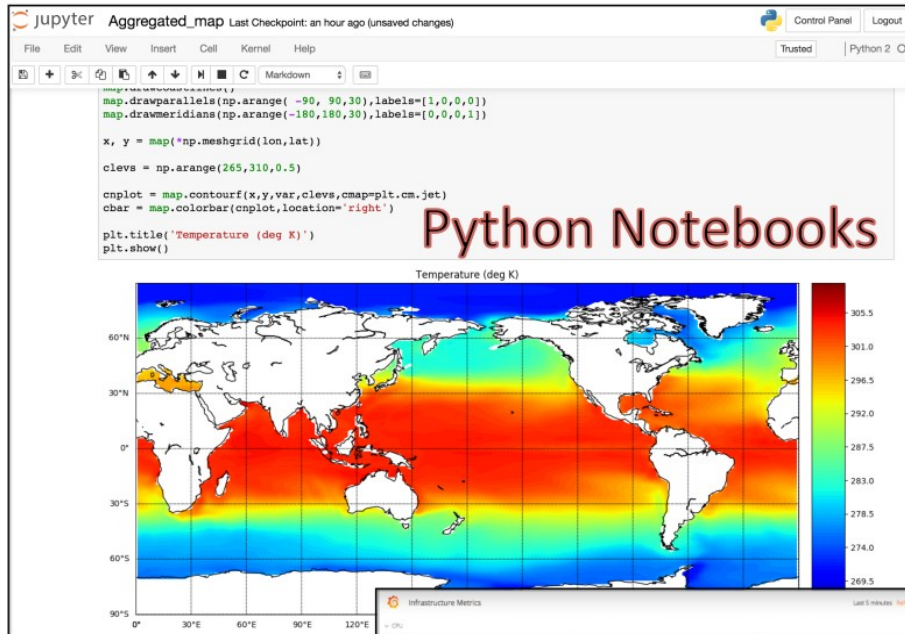
**PyOphidia:** a Python interface for datacube management & analytics with Ophidia

**Ophidia framework:** declarative, parallel server-side processing

Through **oph\_term/PyOphidia** the user run ("send") commands ("operators") to the Ophidia framework to manipulate datasets ("datacubes")







## ECAS Terminal

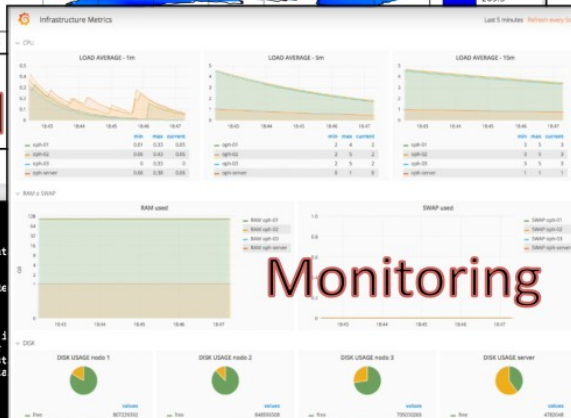
```
Warning: There is no session to resume
Resuming last session...
Getting list of Ophidia operators XML files from "ht
rators.xml"... Done.
Downloading necessary files... Done.
Remote XML files: 67 - Downloaded XML files: 67 - Re

Oph Term - the Ophidia shell, version 1.0.0
Copyright (C) 2012-2017 CMCC Foundation - www.cmcc.it
This program comes with ABSOLUTELY NO WARRANTY; for
This is free software, and you are welcome to redist
under certain conditions; type 'conditions' for deta

Welcome to Oph_Term !

Use the power of the Ophidia framework right from yo
If you are going to use Oph_Term for the first time and need something
to get you started, just try entering "help"

[OPH_TERM] >>> oph_list
```



### Quick Start


OphidiaLab provides two different ways to get access to its scientific eco-system: JupyterHub and Ophidia client.

Jupyter supports interactive data science and scientific computing. OphidiaLab includes a JupyterHub installation and, thanks to the Jupyter Notebooks, scientists can create and share documents that contain live code, equations, visualizations and explanatory text.

The JupyterHub interface is available [here](#).\*

After you login, open "Quick Start.ipynb" notebook available under the *quickstart/* folder in your home to get started with OphidiaLab environment capabilities.

\*Please note that for security reasons, the access to our JupyterHub instance is restricted to authorised users only and needs an additional step after the registration process.



### QuickStart

The Ophidia Terminal is a robust, comprehensive, and user-friendly Ophidia client, developed with characteristics similar to the bash shell present in almost all Unix-like environments. Please have a look at the online available documentation to learn more about the basic functionalities of the [Ophidia terminal](#) as well as some [advanced features](#) useful for more skilled users.

Two short guides ([basic](#), [advanced](#)) in pdf format are also available.

Several examples of real-world usage of the terminal are also available on the Ophidia website tutorial section. The latest client RPM for CentOS7 is available [here](#). The related DEB package can be downloaded from [here](#).

Once installed you can simply run:

```
/usr/local/ophidia/oph-terminal/bin/oph_term -H
ophidiab.cmcc.it -u <username> -p <password> -P 11732
```

Source: Sandro Fiore



# Thank you for your attention!

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*Questions?*

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