

EODASHBOARDHACKATHON.ORG

Dashboard Technical Background and Integration Guide

June 23-29, 2021

This guide is intended for participants of the Earth Observation (EO) Dashboard Hackathon. The instructions contained in this document require users to be signed up and registered for this specific event at <u>eodashboardhackathon.org</u>.

Please note that some of the images used in this guide are samples from previous hackathons and are not exact replicas of the platform that will be used for the EO Dashboard Hackathon.

For more information:

If you have questions that are not addressed in this guide or in the other guides located on <u>eodashboardhackathon.org/about</u>, contact the organizing team at <u>info@eodashboardhackathon.org</u>.

For technical assistance with any of the content in this document, email <u>web@eodashboardhackathon.org</u> with a specific description of your problem.

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Introduction

To be eligible for some of the Global Awards, your team will need to show that your project can be successfully integrated into the <u>Earth Observing Dashboard</u>. All of the Global Winners will have the opportunity to be integrated into the live Dashboard and continuously updated. This document provides background information on the Dashboard and with the technical details you need to ensure that your project can be successfully integrated into it. <u>Read carefully!</u>

The guide contains the following sections:

- Dashboard Technical Background
- How to register to the EuroDataCube (EDC)
- Tutorial Jupyter Notebooks in the EuroDataCube (EDC)
- Upscaling and integration

Please see the *Data Resources Guide* for an overview of the data available to you for the hackathon. Please see the *Project Submission Guide* for instructions on how to complete your project submission page on the website. All of the guides are located on <u>eodashboardhackathon.org/about</u>.

If you have any questions regarding your EuroDataCube workspace at any time, contact <<u>eo-dashboard-hackathon@eurodatacube.com</u>>.

Dashboard Technical Background

<u>https://eodashboard.org</u> is the Tri-Agency Earth Observing (EO) Dashboard hosted by NASA, ESA, and JAXA. The software powering the Dashboard is implemented, maintained, and operated by the Euro Data Cube (EDC) consortium (<u>https://eurodatacube.com</u>).

The Dashboard is a vue app as described at <u>https://github.com/eurodatacube/eodash/tree/staging/app</u>. The source code of the Dashboard is released under the permissive Open Source MIT license and publicly available at <u>https://github.com/eurodatacube/eodash</u>. Thus, feel free to run the Dashboard locally and propose any specific feature needed for your project via a pull request.

Indicator data is stored either in an EDC service called geoDB

(<u>https://eurodatacube.com/marketplace/services/edc_geodb</u>) or as CSV directly in the Git repository at <u>https://github.com/eurodatacube/eodash/tree/staging/app/public/data/trilateral</u>. At this location you can also find the indicator stories and associated images.



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For performance optimizations, most of the indicator data is cached as static JSON files and also stored directly in Git at https://github.com/eurodatacube/eodash/tree/staging/app/public/data/internal. The vue app is built using GitHub actions (see files in https://github.com/eurodatacube/eodash/tree/staging/app/public/data/internal. The https://github.com/eurodatacube/eodash/tree/staging/.github/workflows). These actions also deploy

https://github.com/eurodatacube/eodash/tree/staging/.github/workflows). These actions also deploy the Dashboard by uploading the vue app as well as the JSON files to AWS s3 from where they are served as static files via CloudFront CDN.

An indicator may retrieve additional data at runtime based on user input. For example the Air Quality - TROPOMI: NO2 indicator <u>https://eodashboard.org/?poi=W1-N1</u> allows the user to draw an area of interest on the map and show statistical NO2 for the user-drawn area of interest over time. Please feel free to propose other ways to extend your project indicator, for example using geoDB or other EDC services to provide more insights to users.

In order to store the indicator data in geoDB or as CSV, it has to be constantly generated. One way to process big volumes of satellite data to derive an indicator such as the Air Quality time series which computes a spatial average of bi-weekly tropospheric nitrogen dioxide (NO2) concentrations over a city area (e.g., over Rome https://eodashboard.org/?poi=IT01-N1) is to use EDC services.

Please register at <u>https://eurodatacube.com/participate?event=eo-dashboard-hackathon</u> to receive your personal EDC workspace including a hosted JupyterLab to run your Python notebooks.

There are several tutorial notebooks provided detailing how to use the EDC services like geoDB or Sentinel Hub. Feel free to also explore all the notebooks shared on the EDC marketplace (<u>https://eurodatacube.com/marketplace</u>) and propose yours for inclusion via your EDC dashboard (<u>https://eurodatacube.com/dashboard</u>).



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How to Register to the EDC

The registration process for the EuroDataCube is illustrated here: How to Register to EDC.





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After registering, follow the steps illustrated below to <u>get started with the EDC</u> and reach the resources and tutorials for the hackathon.



Tutorial Jupyter Notebooks in the EuroDataCube

There are some tutorials provided in the form of Jupyter notebooks describing how to use the provided EDC resources. You can access these tutorials from your JupyterLab workspace in the EDC.

You may want to start from the Notebook called README.ipynb accessible from the Launcher, as shown in the above video.

The following tutorial notebooks below are available. When in the JupyterLab workspace, please use the "Execute Notebook" button as illustrated in the video above at the top left to copy a notebook into your workspace for interactive execution:

- How to access data from each agency from the processing API
- How to use xcube
- How to use the processing API
- How to combine mobility data from Google and data from geodb
- How to use geodb



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- How to use the statistical API
- How to pull in data from OpenStreetMap

Integration Steps for Project Submission

If your project is a Global Winner and selected for integration into the Dashboard, you will receive support from the ESA development team.

When completing your project page on <u>eodashboardhackathon.org</u>, you must describe how your solution could be integrated into the Earth Observing Dashboard and include links to source code and documentation, if applicable. (Please see the *Project Submission Guide* on <u>eodashboardhackathon.org/about</u> to review the requirements.) You should indicate what is needed for your solution to be ready for integration (e.g., more tests at larger scale, or automation).

If you think your contribution is ready for integration, please take this additional step: right-click on your directory in the EDC and select "EDC: Submit Directory for EO Hackathon" (see the figure below).





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Please note: This step is not required to qualify for judging or awards; however, this will notify the EDC technical team that your contribution is ready for revision for potential integration. This also does not constitute your submission for the hackathon. You should follow the *Project Submission Guide* to make sure your submission is complete.

More details are provided in the Readme notebook in the EuroDataCube workspace.

The upscaling and integration of your solution in the Dashboard includes parametrizing your indicator notebook and running it in a headless manner

(<u>https://eurodatacube.com/documentation/headless-notebook-execution</u>) on a regular basis to generate new data and extend the CSV or geoDB table.

Happy Hacking!