



WEKEO
by COPERNICUS

WEKEO THE COPERNICUS DIAS SERVICE

Presentation to TERRATEC 2020

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Implemented by





1

WHAT IS WEKEO

EUMETSAT, ECMWF and MERCATOR OCEAN have joined their experience and skills to build up **WEkEO** in a **stepwise approach**, **minimizing the risks**, **capitalizing on user feedback**, and **strongly involving the industry** through procurement.



Implemented by



1

WEkEO Industrial Support

ThalesAlenia
a Thales / Leonardo company
Space

the SERVER LABS
the IT architects

space-tec
PARTNERS

CloudFerro

Atos

orange

CLS

ES
GROUP

TERRAUE

TELESPAZIO
a LEONARDO and THALES company

SINERGISE

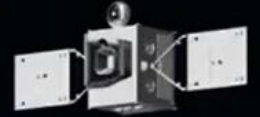
MEEQ

B-Open
solutions

gmv
INNOVATING SOLUTIONS

expri^{via}

FULL, FREE AND OPEN
ACCESS TO DATA



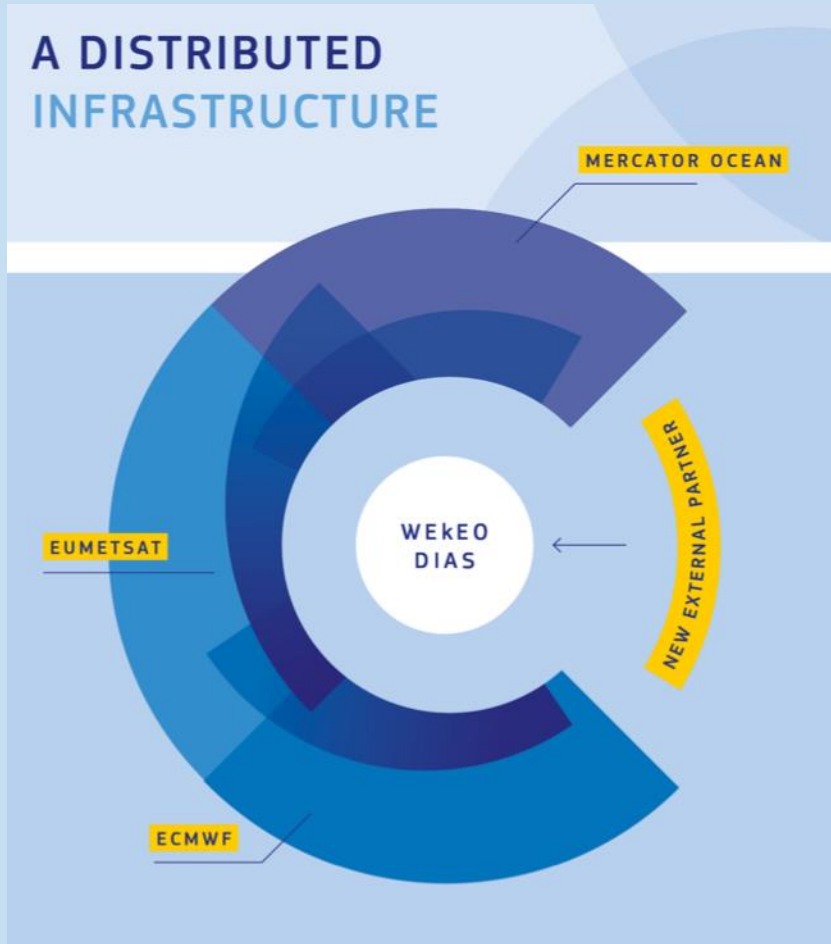
-  ATMOSPHERE MONITORING
-  MARINE ENVIRONMENT MONITORING
-  LAND MONITORING
-  CLIMATE CHANGE
-  EMERGENCY MANAGEMENT
-  SECURITY

 **opernicus**
Europe's eyes on Earth

1

A DISTRIBUTED INFRASTRUCTURE

A DISTRIBUTED INFRASTRUCTURE



Most up-to-date data
Relaying on Copernicus organisation

Potential to continually grow and expand

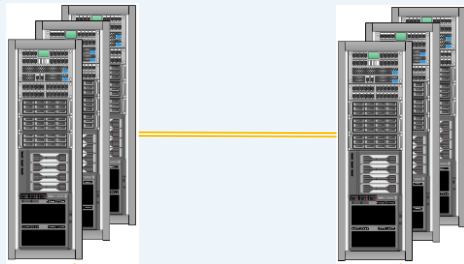


What is WEkEO

WEkEO Partners

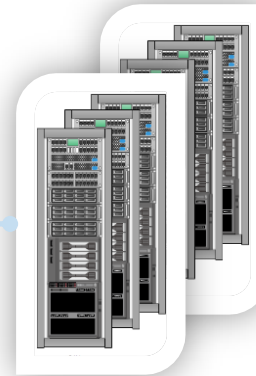
EUMETSAT (D)

MERCATOR Océan (P)



ECMWF (UK)

Hybrid Cloud

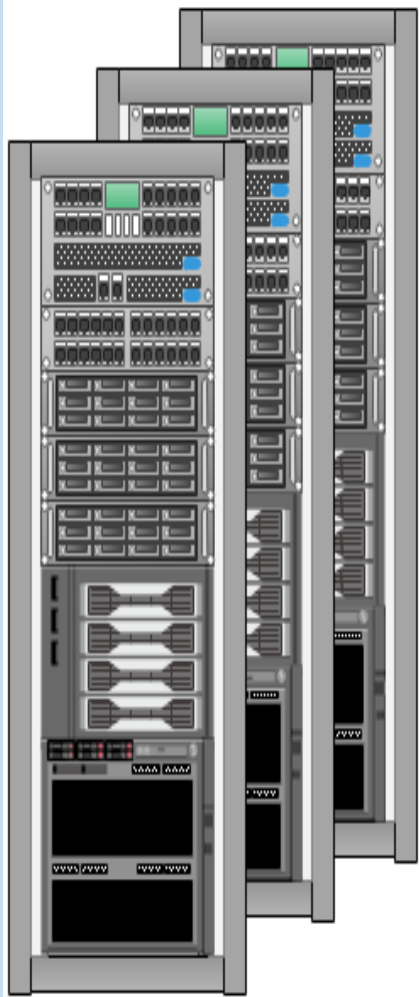


Elastic cloud (P)

WEkEO language:

- Each partner has one DPI on premise (DPI: Distributed Partner Infrastructure)
- The three partners is called WEkEO partners
- Elastic cloud is provided by a Public cloud called elastic cloud
- Wekeo partners + elastic cloud forms the hybrid cloud

Features in WEkEO plateforms



Deployed on Mercator DPI

Common to all DPIs

Front Office

Discovery &
View data

Hosted
processing

Development
tools

Information
page

Helpdesk

PaaS

Security	Forum	WPS Server	Service & Data registry	VMs Catalogue	Data broker	Marketplace	...	Monitoring
WIKI	Serv.Desk	JupyterHub	Data accessUI	WMS Server	Data adaptors	Mail server		Billing

Container orchestration

IaaS

Hypervisor

Cloud Broker (VMs orchestration)

SaaS

Block storage

Object storage

File system storage

Applications example



Maritime

- OIL AND GAS
 - Cargo transport
 - Oil tanker
 - Offshore Platform
 - Oil Leaks
- FISH MONITORING
 - Illegal fishes
 - Fish regulation
- SHIP/CARGO MONITORING
 - Detect illegal movements
 - Boat regulation
- SEA ICE PATROL
 - Monitor the melting ice



Land Administration

- MAPPING
 - City Mapping
 - Regional Mapping
 - National Mapping
 - Cadasters Mapping
- Bridge



Natural resources

- SURFACE MINING
 - Monitor trucks movements
- OIL AND GAZ
 - Truck/Cargo transport
 - Pipelines
 - Oil Leaks



Agriculture & Environment

- PARCEL MANAGEMENT
 - Agriculture Parcel
 - Cereals monitoring
 - Crops monitoring
- LIVESTOCK, OLIVE TREES
 - Livestock
 - Tree agriculture
- Forestry
 - Cropping
- DEFORESTATION



Natural disasters

- SEISMS
- FLOODS
- VOLCANIC ERUPTIONS
- TSUNAMI
- FIRE
- AIR CRASH
- RESCUE MANAGEMENT



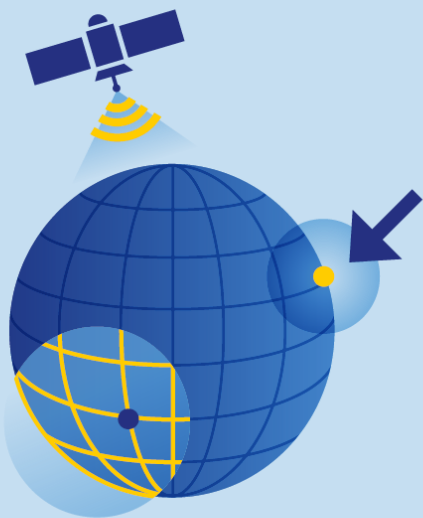
2

WHAT CAN YOU
DO WITH WEKEO

2

WEKEO ADDED VALUES

COPERNICUS DATA



VIRTUAL ENVIRONMENT & TOOLS



USER SUPPORT



What can you do with WEKEO?



INTERACT WITH
USER SUPPORT



USER SUPPORT

Benefit from skilled technical and
customer support



Service Desk's email:
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SEARCH FOR DATA



SEARCH
FOR DATA



DOWNLOAD



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DATA



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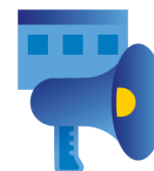


Transform
Copernicus Data

COMPUTE
AND
TRANSFORM
DATA



PROMOTE



PROMOTE FOR YOUR
BUSINESS AND
SERVICE ON WEKEO
MARKETPLACE

2

WEkEO V1 Website

WEkEO
EU Copernicus DIAS reference service for environmental data and virtual processing environments

Sign in [Sign Up](#)

Services [Catalog](#) [free](#) [Applications](#) [registered](#) Communities News Documentation Support

Search DIAS


Meet WEkEO in one minute


EUMETSAT, ECMWF and MERCATOR OCEAN are building WEkEO together. Take a tour with a one minute video !


TOURISM


TRANSPORT

ENERGY


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3

WEKEO
STEP BY STEP

3A

REGISTER



INTERACT WITH
USER SUPPORT



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SEARCH
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DATA



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3A

REGISTER

There are 2 types of registration at WEkEO:

FREE	FROM 66 €/MONTH
Essential	Advanced
✓ Discover datasets	✓ Discover datasets
✓ Download	✓ Download
✓ Jupyter Notebooks	✓ Jupyter Notebooks
✓ Support	✓ Support
✗ Virtual Machines	✓ Virtual Machines * See options below
✗ Processing tools	✓ Processing tools
✗ Free networking (in and out)	✓ Free networking (in and out)
Register	Register

3B

GETTING STARTED

FREE INTERACT WITH USER SUPPORT



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REGISTER



SEARCH FOR DATA



SEARCH DATA



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COMPUTE AND TRANSFORM DATA



PROMOTE

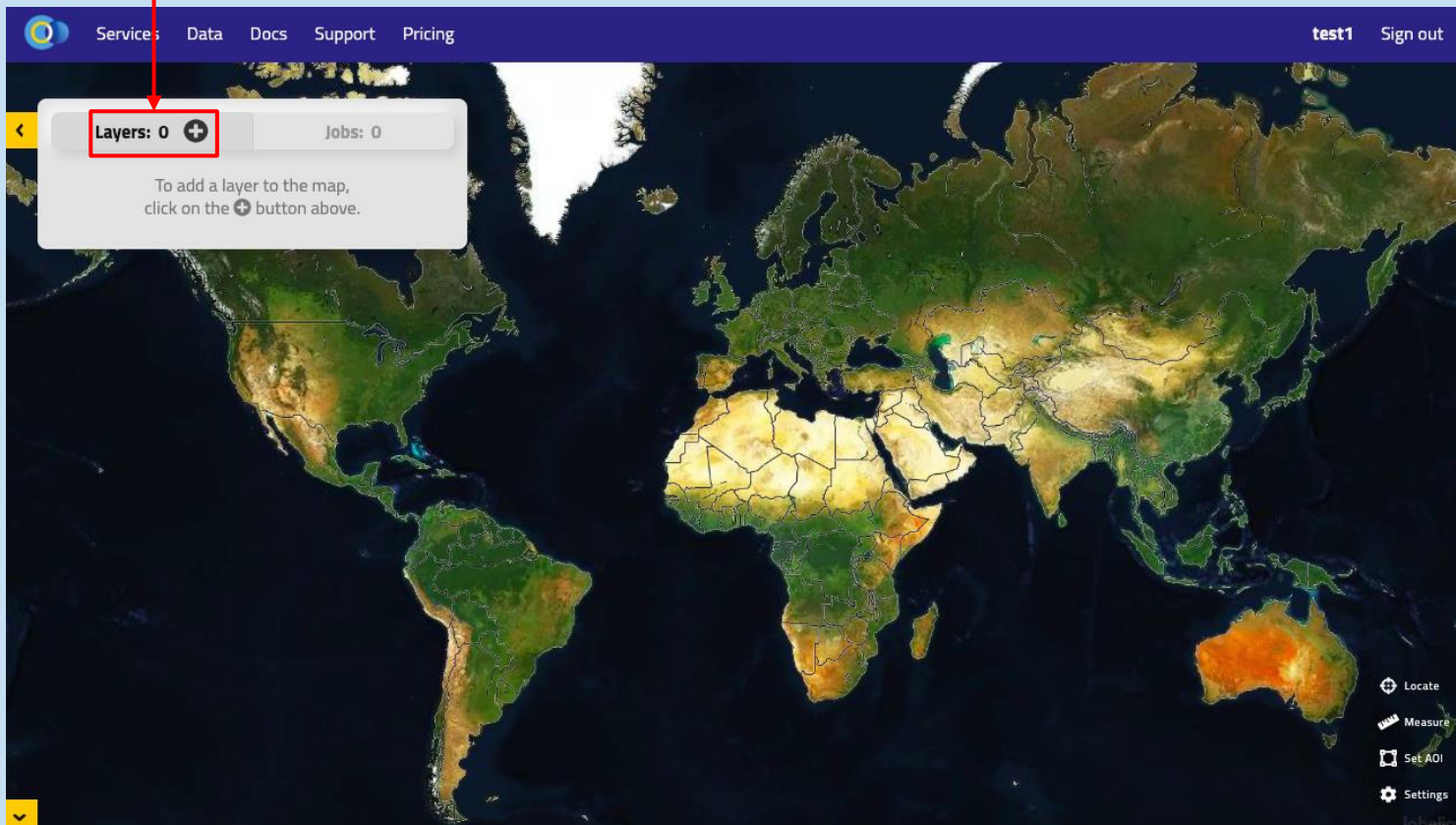


PROMOTE FOR YOUR BUSINESS AND SERVICE ON WEKEO MARKETPLACE

3B

SEARCH FOR DATA

Add a layer to search for datasets



3B

SEARCH FOR DATA

Free-text search

Filters for an extended search

The screenshot displays a web application interface with a dark blue header containing navigation links: Services, Data, Docs, Support, and Pricing. A 'Layers: 0' indicator is visible on the left. The main content area features a 'Catalogue' panel with a search bar and filter options. The search bar is labeled 'FREE-TEXT SEARCH' and contains the placeholder text 'Free-text'. Below the search bar, there are filter categories: 'FAVOURITES' (0), 'COPERNICUS SERVICE' (expanded to 'CMEMS (Marine)' with 3 items), 'AREA' (expanded to 'Mediterranean Sea' with 3 items), 'TIME' (expanded to 'Past' with 3 items), 'TAGS' (expanded to 'Marine' with 3 items and 'Sea surface temperature' with 3 items), 'ORIGINATING CENTRE' (expanded to 'Other Restrictions' with 3 items), and 'DATA POLICY' (expanded to 'Other Restrictions' with 3 items). To the right of the filters, the 'Datasets' section shows three search results, each with a map thumbnail, a title, a description, and buttons for 'Details' and 'Add to map...'. The first dataset is 'Mediterranean Sea - High Resolution and Ultra High Resolution L35 Sea Surface Temperature' (8 items). The second is 'Mediterranean Sea High Resolution and Ultra High Resolution Sea Surface Temperature Analysis' (6 items). The third is 'Mediterranean Sea - High Resolution L4 Sea Surface Temperature Reprocessed' (2 items). Red boxes and arrows highlight the search bar and the filter categories, corresponding to the text labels on the left.

3B

SEARCH FOR DATA

The screenshot shows a web application interface with a dark blue header containing navigation links: Services, Data, Docs, Support, and Pricing. A 'Layers: 0' indicator is visible on the left. A 'Catalogue' modal window is open, displaying search filters and a list of three datasets. The filters include a free-text search bar, favourites, Copernicus Service (CMEMS Marine), Area (Mediterranean Sea), Time (Past), Tags (Marine, Sea surface temperature), Originating Centre, and Data Policy (Other Restrictions). The datasets list includes:

- Mediterranean Sea - High Resolution and Ultra High Resolution L35 Sea Surface Temperature** (8 datasets): Description: For the Mediterranean Sea - The CNR MED L35 data consist of supercollated (merged-multisensor) SST data remapped over the Mediterranean Sea at high (1/16°) and Ultra High (0.01°) spatial... Buttons: Details, Add to map...
- Mediterranean Sea High Resolution and Ultra High Resolution Sea Surface Temperature Analysis** (6 datasets): Description: For the Mediterranean Sea - The CNR MED Sea Surface Temperature provides daily gap-free maps (L4) at high (HR 0.0625°) and ultra-high (UHR 0.01°) spatial resolution over the Mediterranean Se... Buttons: Details, Add to map...
- Mediterranean Sea - High Resolution L4 Sea Surface Temperature Reprocessed** (2 datasets): Description: For the Mediterranean Sea - CNR has reprocessed Pathfinder V5.3 (PFV53) AVHRR data covering the 1981-2014 period and combined them with a bias-corrected version of the CMEMS NRT L4 data up... Buttons: Details, Add to map...

The third dataset entry is highlighted with a red rectangular border.

3B

SEARCH FOR DATA

Services Data Docs Support Pricing

Layers: 0

Mediterranean Sea - High Resolution L4 Sea Surface Temperature Reprocessed

Abstract

For the Mediterranean Sea - CNR has reprocessed Pathfinder V5.3 (PFV53) AVHRR data covering the 1981-2014 period and combined them with a bias-corrected version of the CMEMS NRT L4 data up to 2017 to provide a full time series of consistent daily gap-free maps (L4) at the original PFV53 resolution (0.0417° x 0.0417°). The data are interpolated through an Optimal Interpolation algorithm. REP L4 were interpolated on the original Pathfinder grid (at 0.0417° x 0.0417° spatial resolution) and are representative of night SST values (00:00 UTC). References: Pisano A. et al. The new Mediterranean optimally interpolated pathfinder AVHRR SST Dataset (1982–2012) doi:10.1016/j.rse.2016.01.019. Buongiorno Nardelli B. et al. 2013: High and Ultra-High resolution processing of satellite Sea Surface Temperature data over Southern European Seas in the framework of MyOcean project, Rem. Sens. Env., 129, 1–16, doi:10.1016/j.rse.2012.10.012.

Classification

Dataset ID	EO:MO:DAT:SST_MED_SST_L4_REP_OBSERVATIONS_010_021
Published	Mercator Océan, 26 August 2012
Copernicus service	CMEMS (Marine)
Area	Mediterranean Sea
Time	Past
Tags	Marine · Sea surface temperature

Resources

JSON metadata

Contacts

Originator Mercator Océan [servicedesk.cmems@mercator-ocean.eu](mailto: servicedesk.cmems@mercator-ocean.eu)

Raw metadata

Temporal extent 1 November 1981 to 31 December 2016

Lat extent 30.25° to 46°

Lon extent -18.12° to 36.25°

Add to map...

Temporal and spatial information

Dataset description

Dataset ID

3C

DOWNLOAD DATA

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SEARCH FOR DATA



SEARCH DATA



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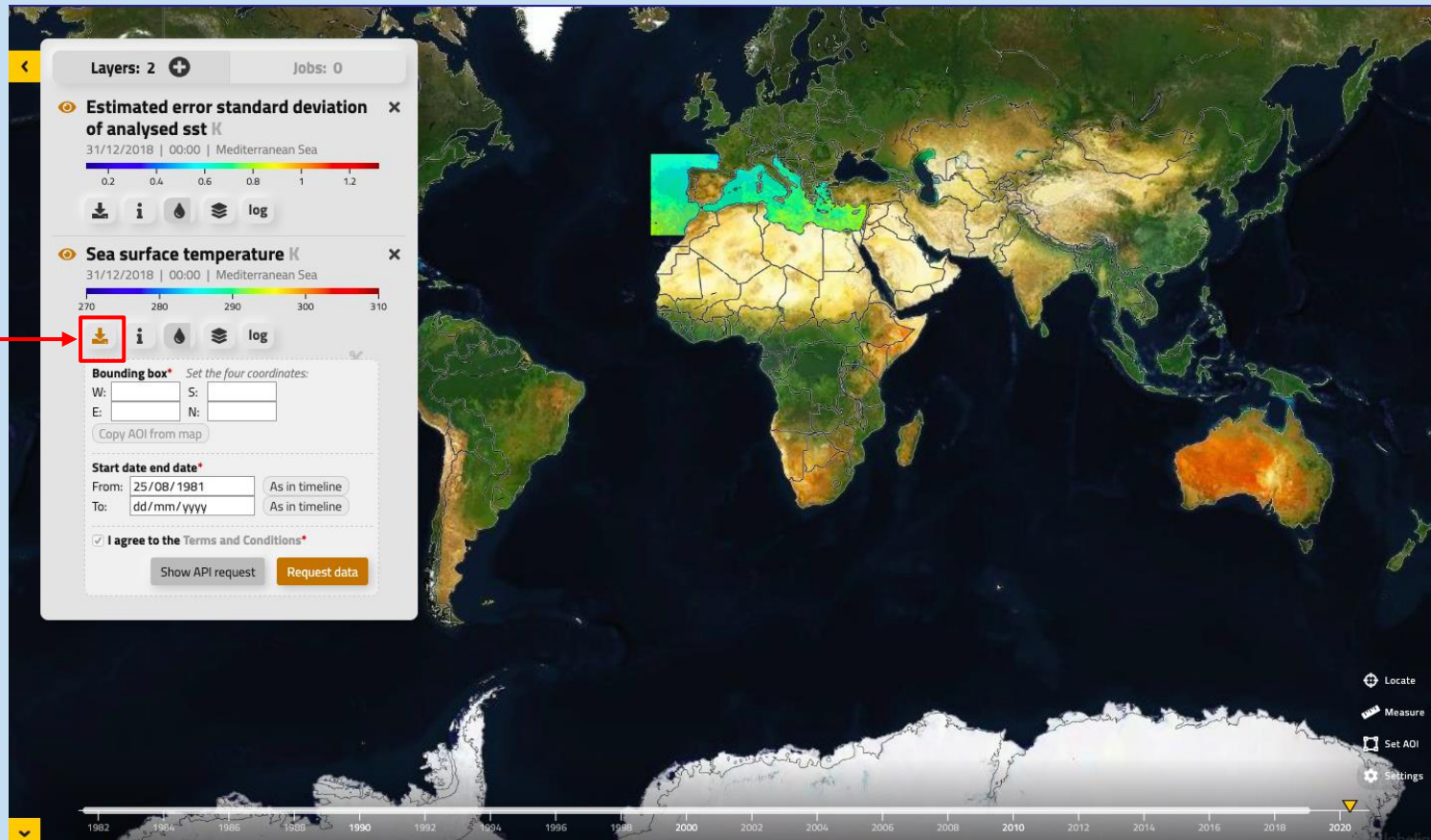


PROMOTE



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Click this button to select the parameters of your interest

3C

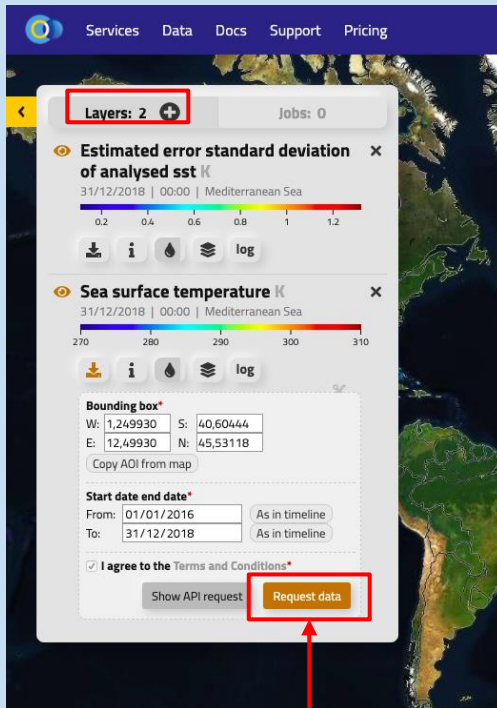
DOWNLOAD DATA

Spatial parameters

Temporal information

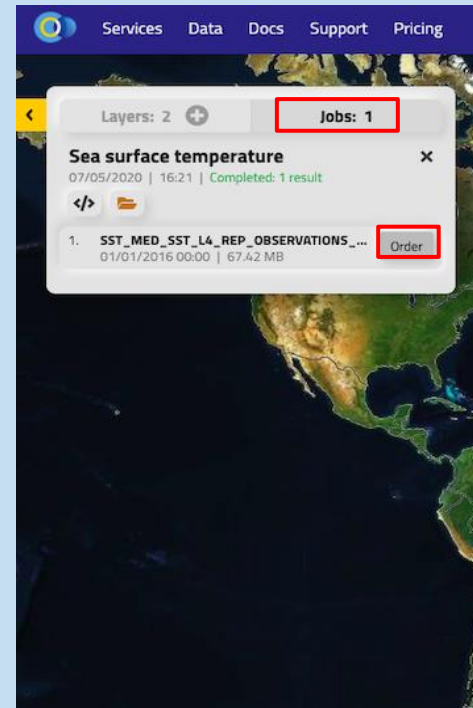
The screenshot displays a web application interface for downloading data. The main view is a world map with a red bounding box highlighting the Mediterranean Sea region. A sidebar on the left contains configuration options for two data layers: 'Estimated error standard deviation of analysed sst K' and 'Sea surface temperature K'. The sidebar includes fields for 'Bounding box' (W: 1,249930, S: 40,60444, E: 12,49930, N: 45,53118) and 'Start date end date' (From: 01/01/2016, To: 31/12/2018). A timeline at the bottom shows years from 1982 to 2020. The top navigation bar includes 'Services', 'Data', 'Docs', 'Support', 'Pricing', 'test1', and 'Sign out'.

DOWNLOAD DATA



The screenshot shows a web interface with a navigation bar (Services, Data, Docs, Support, Pricing) and a map background. A panel on the left contains two data layers: 'Estimated error standard deviation of analysed sst' and 'Sea surface temperature'. The 'Layers: 2' indicator is highlighted with a red box. Below the layers, there are input fields for 'Bounding box' (W: 12,49930, S: 40,60444, E: 12,49930, N: 45,53118) and 'Start date end date' (From: 01/01/2016, To: 31/12/2018). A red box highlights the 'Request data' button at the bottom right of the panel.

Click this button to download the selected data



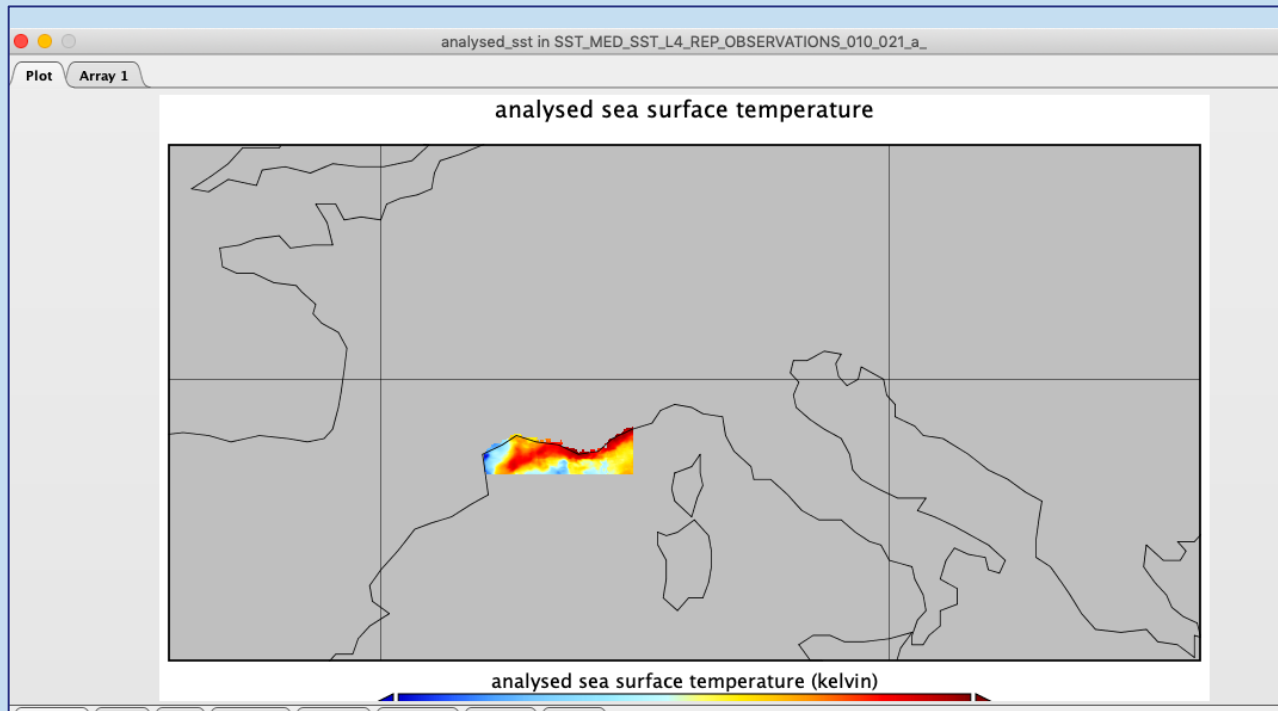
The screenshot shows the same web interface, but the 'Jobs: 1' indicator is highlighted with a red box. The panel now displays 'Sea surface temperature' with a completion status of 'Completed: 1 result'. Below this, a list item shows 'SST_MED_SST_L4_REP_OBSERVATIONS_...' with a file size of 67.42 MB. A red box highlights the 'Order' button next to the list item.

Click *order* to download the data files locally in your computer

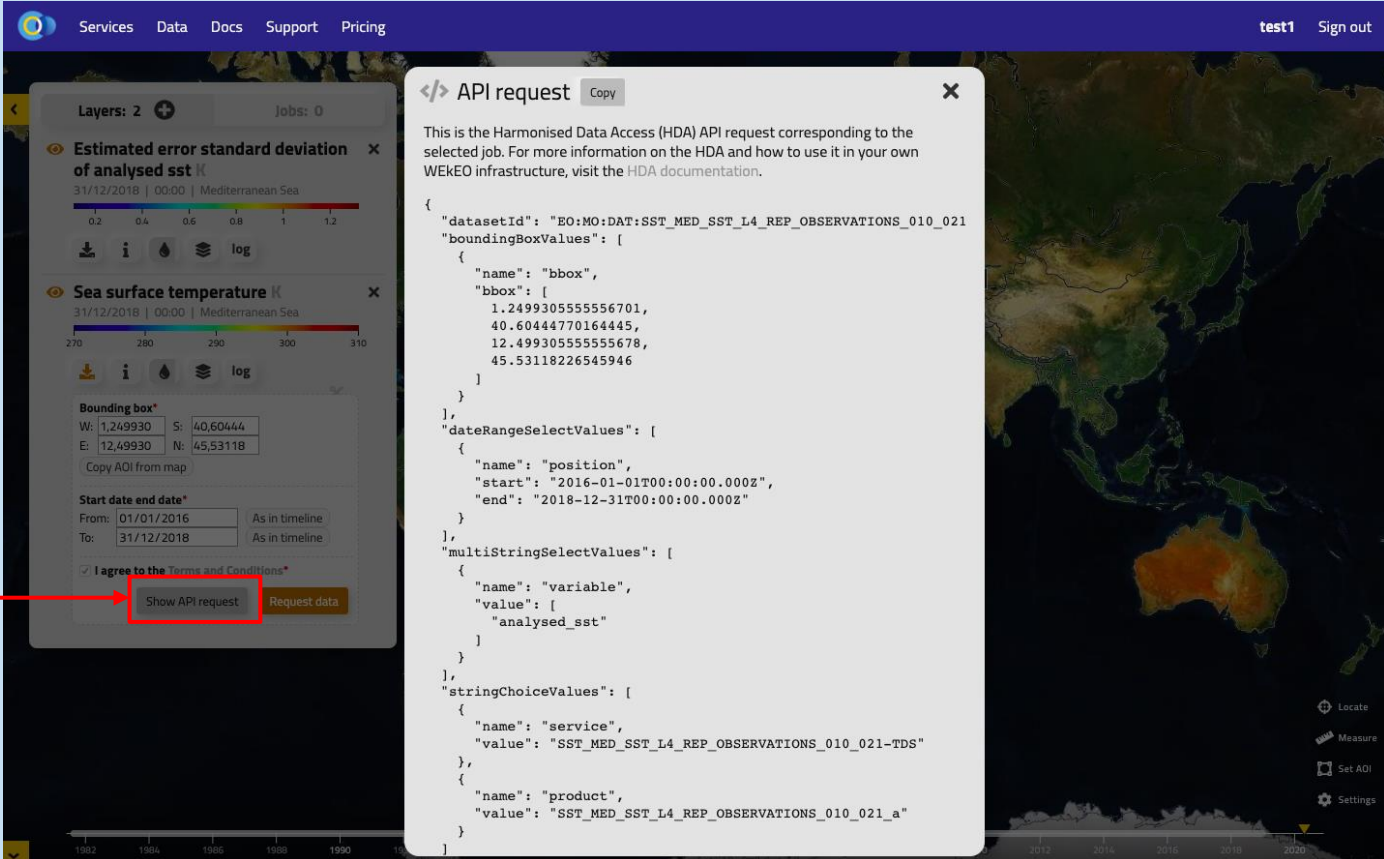
3C

DOWNLOAD DATA

To visualize downloaded data you might need to use additional software (to unzip folders) or GIS software (Panoply, QGIS...)



SHOW API REQUEST



The screenshot shows a web application interface with a purple header bar containing navigation links: Services, Data, Docs, Support, Pricing. The user is logged in as 'test1' and can sign out. The main content area displays two layers: 'Estimated error standard deviation of analysed sst' and 'Sea surface temperature'. A bounding box is defined with coordinates W: 1,249930, S: 40,60444, E: 12,49930, N: 45,53118. The start date is 01/01/2016 and the end date is 31/12/2018. A red box highlights the 'Show API request' button. An 'API request' dialog box is open, showing the following JSON request:

```
{  
  "datasetId": "EO:MO:DAT:SST_MED_SST_L4_REP_OBSERVATIONS_010_021"  
  "boundingBoxValues": [  
    {  
      "name": "bbox",  
      "bbox": [  
        1.2499305555556701,  
        40.6044770164445,  
        12.499305555555678,  
        45.53118226545946  
      ]  
    }  
  ],  
  "dateRangeSelectValues": [  
    {  
      "name": "position",  
      "start": "2016-01-01T00:00:00.000Z",  
      "end": "2018-12-31T00:00:00.000Z"  
    }  
  ],  
  "multiStringSelectValues": [  
    {  
      "name": "variable",  
      "value": [  
        "analysed_sst"  
      ]  
    }  
  ],  
  "stringChoiceValues": [  
    {  
      "name": "service",  
      "value": "SST_MED_SST_L4_REP_OBSERVATIONS_010_021-TDS"  
    },  
    {  
      "name": "product",  
      "value": "SST_MED_SST_L4_REP_OBSERVATIONS_010_021_a"  
    }  
  ]  
}
```

Click this button to copy the code that can be used in Jupyter Hub and/or in Virtual Machines

3D

COMPUTE AND TRANSFORM DATA

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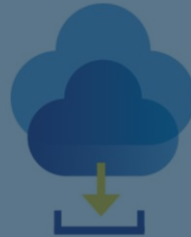
SEARCH FOR DATA



SEARCH DATA



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Jupyter Hub

Dashboard - Wekeo x JupyterLab x +

← → ↻ 🔒 jupyterhub-wekeo.apps.eumetsat.dpi.wekeo.eu/user/johndoe/lab?

File Edit View Run Kernel Tabs Settings Help

+

+

+

+

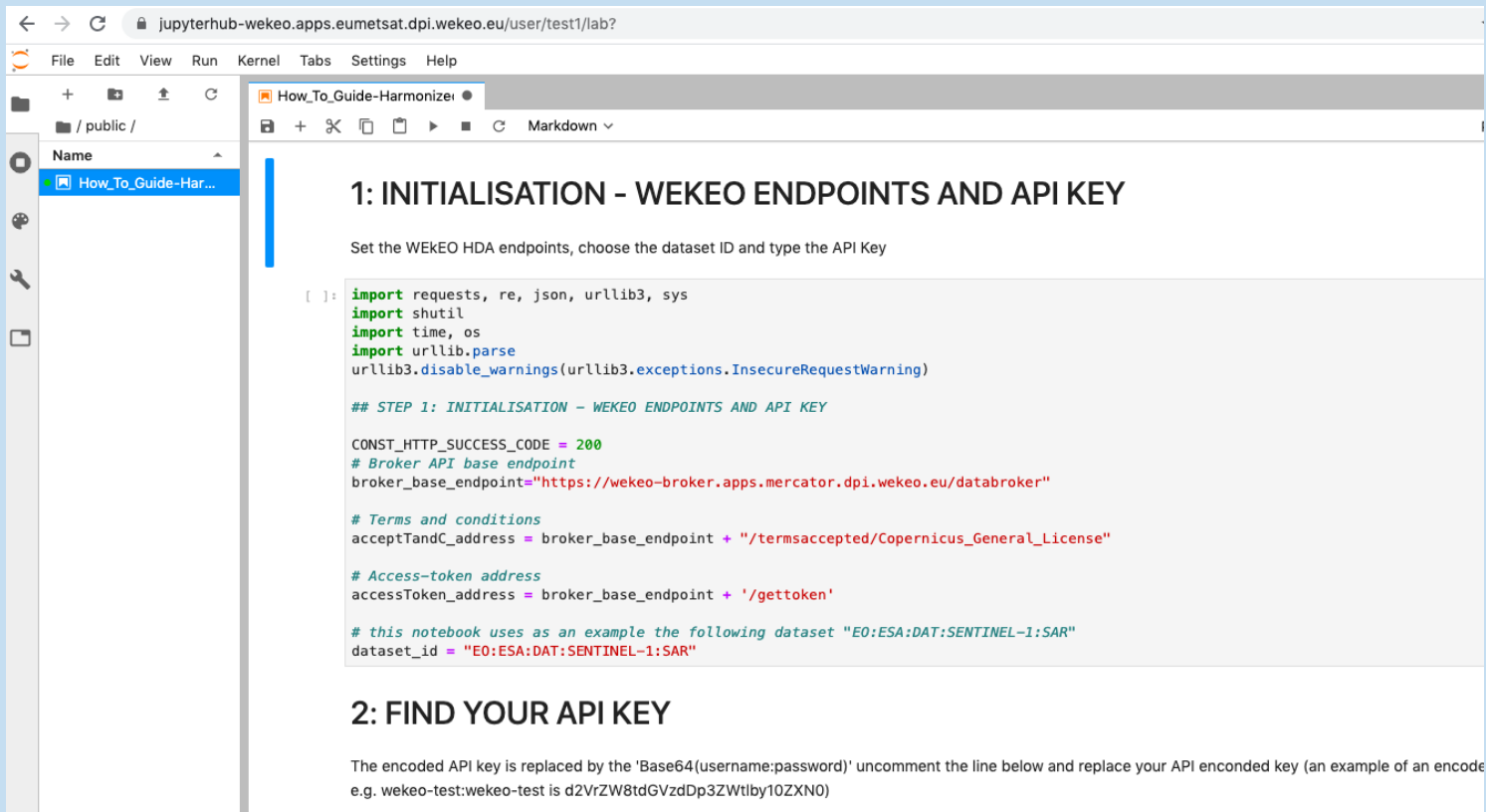
Terminal 2 x

jovyan@jupyter-johndoe:/home/johndoe\$

Name	Last Modified
public	2 months ago
work	seconds ago

Jupyter Hub

There is step-by-step example guide available



The screenshot displays a Jupyter Notebook interface in a web browser. The browser address bar shows the URL: `jupyterhub-wekeo.apps.eumetsat.dpi.wekeo.eu/user/test1/lab?`. The notebook interface includes a menu bar (File, Edit, View, Run, Kernel, Tabs, Settings, Help) and a file browser on the left showing a directory structure with a file named `How_To_Guide-Har...`. The main content area shows a Python code cell with the following code:

```
[ ]: import requests, re, json, urllib3, sys
import shutil
import time, os
import urllib.parse
urllib3.disable_warnings(urllib3.exceptions.InsecureRequestWarning)

## STEP 1: INITIALISATION - WEKEO ENDPOINTS AND API KEY

CONST_HTTP_SUCCESS_CODE = 200
# Broker API base endpoint
broker_base_endpoint="https://wekeo-broker.apps.mercator.dpi.wekeo.eu/databroker"

# Terms and conditions
acceptTandC_address = broker_base_endpoint + "/termsaccepted/Copernicus_General_License"

# Access-token address
accessToken_address = broker_base_endpoint + '/gettoken'

# this notebook uses as an example the following dataset "EO:ESA:DAT:SENTINEL-1:SAR"
dataset_id = "EO:ESA:DAT:SENTINEL-1:SAR"
```

Below the code cell, the notebook displays two sections:

1: INITIALISATION - WEKEO ENDPOINTS AND API KEY

Set the WEKEO HDA endpoints, choose the dataset ID and type the API Key

2: FIND YOUR API KEY

The encoded API key is replaced by the 'Base64(username:password)' uncomment the line below and replace your API encoded key (an example of an encode e.g. wekeo-test:wekeo-test is d2VrZW8tdGVzdDp3ZWtlby10ZXN0)

CLOUD RESOURCES OFFER

Cloud-based hosted processing

There are different prices for the virtual processing environments

	D-light	Dev.	XS	S	M	L
vCPUs	2	4	4	8	16	128
RAM	16 GB	32 GB	32 GB	64 GB	512 GB	4 TB
Block storage	500 GB	1 TB	500 GB	2 TB	4 TB	64 TB
File storage	500 GB	500 GB	500 GB	1 TB	10 TB	40 TB
Object storage	500 GB	1 TB	1 TB	4 TB	40 TB	320 TB
Public IPs	1	1	1	1	3	5
Load balancer	-	1	-	1	3	5
GPUs	-*	-*	-	-	1	2
Trial period	5 mo*	3 mo*	3 mo	1 mo	-	-
	124.68 €/mo	195.90 €/mo	175.20 €/mo	465.68 €/mo	3,304.72 €/mo	
	-	-	-	-	-	Contact us
	792.96 €/yr (66.08 €/mo)	1,311.60 €/yr (109.30 €/mo)	1,086.96 €/yr (90.58 €/mo)	3,428.88 €/yr (285.74 €/mo)	23,550.00 €/yr (1,962.50 €/mo)	

* GPU can be added to *Dev.* and *D-Light*; in this case, the free trial period is reduced to 1 month. Please contact us for more information.

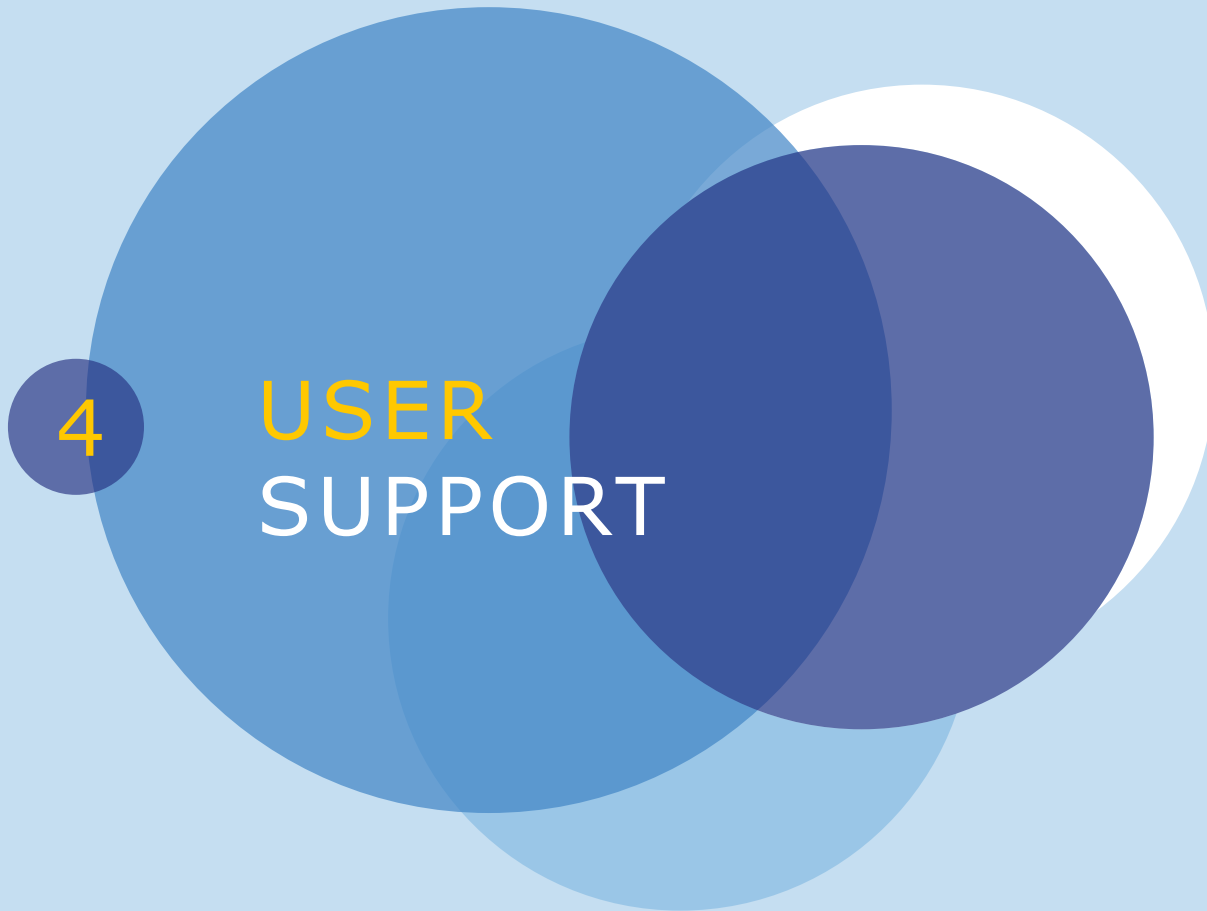
VIRTUAL MACHINES (VM)

VMs in the WEkEO cloud infrastructure can be accessed through the dashboard or by using SSH access

The screenshot displays the WEkEO cloud dashboard with the following components:

- Navigation Bar:** Operations, Provisioning (active), Infrastructure, Backups, Logs, Monitoring, Administration.
- Sub-Menu:** Instances, Apps, Blueprints, Automation, Virtual Images, Migrations.
- Summary Cards:**
 - INSTANCE COUNT:** 2
 - INSTANCE STATUS:** Running: 2, Stopped: 0
 - MAX CPU:** 0%
 - STORAGE:** 0%
 - MEMORY:** 0%
- INSTANCES Table:**

Instance Name	SSH	Version	Virtual Machines	Group	Clouds	Status	Health	MAX CPU	MEMORY	STORAGE
VM_Test1	SSH: 10.0.0.16:22	Version: 18.04	Virtual Machines: 1	Group: dias-mo-tgroup	Clouds: dias-mo_wekeo_Mercator	▶	?	0	0	0
VM_Test2	SSH: 185.213.72.77:22	Version: 7.5	Virtual Machines: 1	Group: dias-mo-tgroup	Clouds: dias-mo_wekeo_Mercator	▶	?	0	0	0



4

USER
SUPPORT

7

USER SUPPORT



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4

USER SUPPORT



CONTACT USER SUPPORT and benefit from WEkEO's user assistance that capitalizes on EUMETSAT, ECMWF and Mercator-Océan's recognized experience on Copernicus and Earth Observation services.



Send a message through the **WEB FORM**



Send an **E-MAIL** to support@wekeo.eu

First name

Last name

Your email

Phone number

Your message



5

JOIN US!

5

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wekeo.eu



@WEkEO_dias



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*This is a new service.
Please provide us
with feedback at
support@wekeo.eu*