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EUROPEAN WEATHER CLOUD







EWC Community and Platform Services

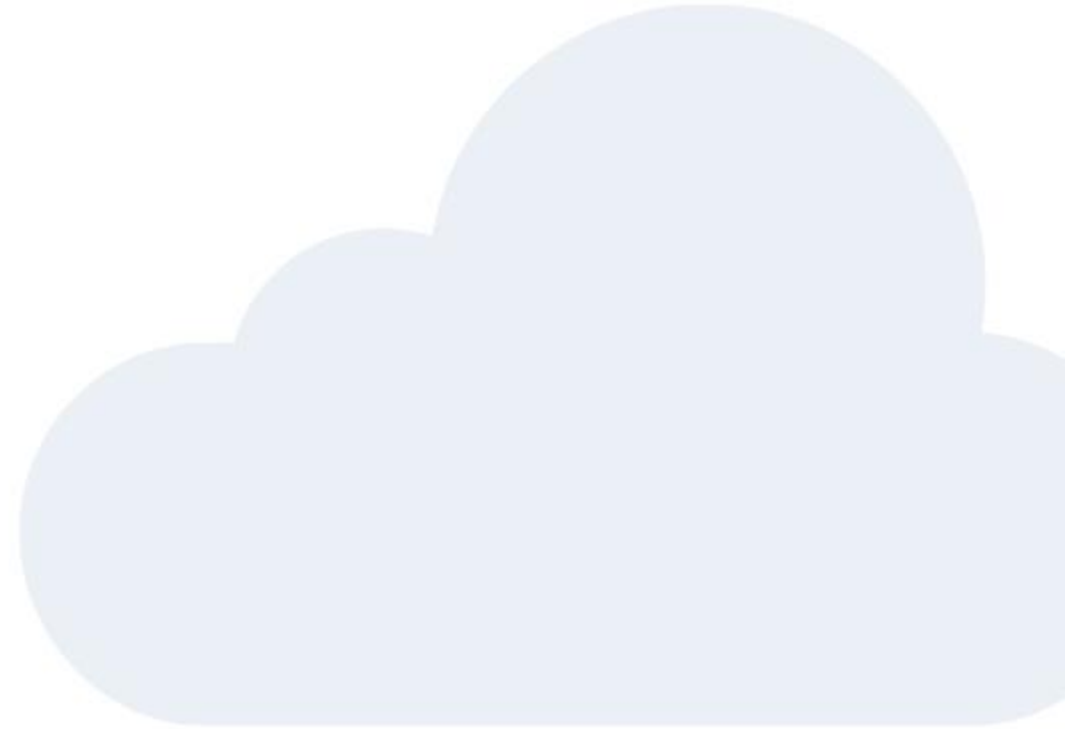
EWC User Workshop

13th November 2024

Francesco Murdaca (EUMETSAT), on behalf of the EWC Team

Outline

-  Morpheus – Cloud Management Platform
-  Knowledge Base and Support Portal
-  EWC Website
-  Accounting Tool
-  Discussion Platform
-  Feature Roadmap and Software Marketplace



Morpheus – Cloud Management Platform

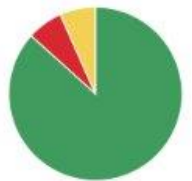
[Support](#) Roberto Cuccu

Operations Provisioning Library Infrastructure Backups Monitoring Tools Administration

Dashboard Reports Analytics Guidance Costing Approvals Activity

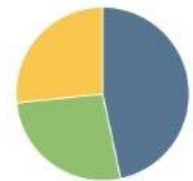
INSTANCE STATUS

15 instances



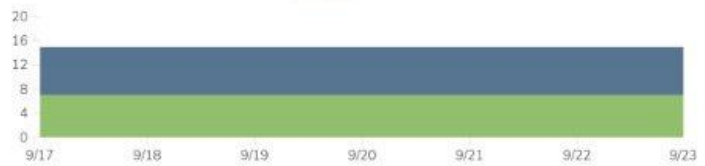
INSTANCES BY CLOUD

3 clouds



DAILY CLOUD INSTANCES

Week Month



GROUP WORKLOADS

15



■ european-weather-cloud

CLOUD WORKLOADS

15



■ ecmwf-cci1-ms-nmhs-sandbo...
■ ecmwf-ms-nmhs-sandbox

NO DATA

CLUSTER WORKLOADS

LOG HISTORY



LOG TRENDS

ALL Errors Warnings

Received disconnect from port Bye Bye preauth
pod_workers.go Error syncing pod skipping err failed to StartContainer for openstack-...
i0923 scope.go RemoveContainer containerID
Disconnected from authenticating user root port preauth
i0922 scope.go RemoveContainer containerID

Morpheus is a cloud management platform able to control multiple cloud infrastructure.

Each project with access to the European Weather Cloud is called a **Tenant**.

Each partner in the EWC makes available their infrastructure to the users which is seen as a **Cloud** in Morpheus.

One **Tenant** can have access to multiple **clouds** (e.g. one on EUMETSAT side and one on ECMWF side), managed by the same **Morpheus**

Virtual Machine Provisioning

Provisioning-> Instances -> +ADD

1

The dashboard shows the 'Instances' section with a navigation menu at the top. Below the menu, there are several metrics: 'INSTANCE COUNT' (1), 'INSTANCE STATUS' (Running: 1, Stopped: 0), 'MAX CPU' (0%), 'STORAGE' (4%), and 'MEMORY' (10%). At the bottom, there is a table with columns for NAME, SUMMARY, LOCATION, and STATS. A '+ ADD' button is highlighted with a red box.

2

Instance Type selection

The 'CREATE INSTANCE' dialog box is shown with a red border. It has tabs for 'GROUP', 'CONFIGURE', 'AUTOMATION', and 'REVIEW'. Below the tabs, there is a search bar and a 'TECHNOLOGY' dropdown. Two instance types are listed: 'ROCKY' and 'UBUNTU'. The 'ROCKY' entry includes a description: 'Rocky Linux is an open-source enterprise operating system designed to be compatible with Red Hat Enterprise Linux. It is under intensive development by the community. https://rockylinux.org'. The 'UBUNTU' entry includes a description: 'Ubuntu is an open source software operating system that runs from the desktop, to the cloud, to all your internet connected things. https://ubuntu.com/'.

The 'CREATE INSTANCE' dialog box is shown with a red border. It has tabs for 'AUTOMATION' and 'REVIEW'. Below the tabs, there are several configuration options: 'VERSION' (8.8), 'LAYOUT' (rocky-8.8-generic), 'PLAN' (2cpu-4gbmem-30gbdisk), 'RESOURCE POOL' (cc1-ewcloud-ms-nmhs-sandbox), 'VOLUMES' (30 GB, 100 GB), 'NETWORKS' (private-cc1-ewcloud-ms-nmhs-san, DHCP), 'AVAILABILITY ZONE' (nova), 'SECURITY GROUP' (ssh-https), 'SERVER GROUP (AFFINITY)' (Select), and 'FLOATING IP' (external-internet).

Instance configuration options:

- Layout
- Plan
- Volumes
- Networks (public and/or private)
- Security Group
- Floating IP

3

4

The dashboard shows the 'Instances' section with a navigation menu at the top. Below the menu, there are several metrics: 'INSTANCE COUNT' (1), 'INSTANCE STATUS' (Running: 1, Stopped: 0), 'MAX CPU' (0%), 'STORAGE' (4%), and 'MEMORY' (9%). At the bottom, there is a table with columns for NAME, SUMMARY, LOCATION, and STATS. A new instance 'my-new-vm' is highlighted with a red box. The instance details are: Name: my-new-vm, Test; IP addr: 136.156.132.135; Version: 8.8; Virtual Machines: 1; Group: european-weather-cloud; Clouds: ecwmf-cc1-ms-nmhs-sandbox. The instance has icons for STATUS, HEALTH, MAX CPU, MEMORY, and STORAGE.

Tasks and Workflows and Integrations

Library-> Automation-> Workflows and Tasks

Tasks

Workflows

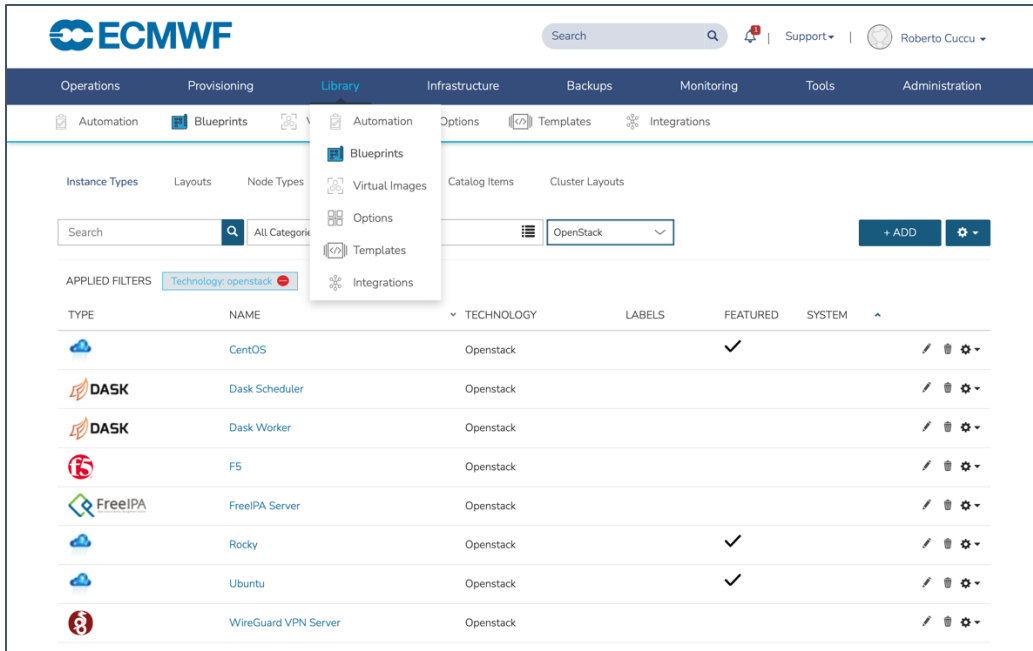
Library-> Integrations



Automation Integrations can be added to enable the use of configuration management tools, e.g. Ansible

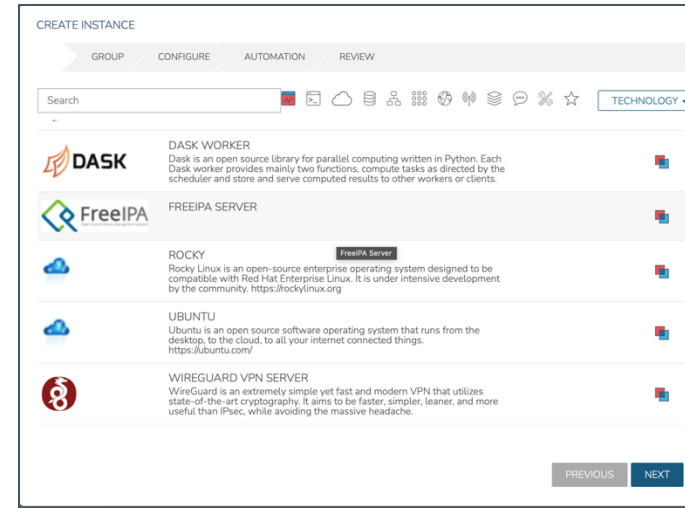
Blueprints, Instance Types

Library-> Blueprint



The screenshot shows the ECMWF Library interface. The 'Library' tab is active, and a dropdown menu is open over the 'Blueprints' option. The main content area displays a table of Instance Types with columns for Type, Name, Technology, Labels, Featured, and System.

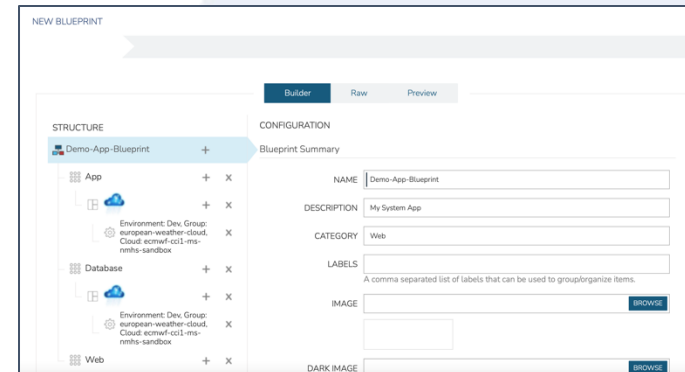
TYPE	NAME	TECHNOLOGY	LABELS	FEATURED	SYSTEM
	CentOS	Openstack		✓	
	Dask Scheduler	Openstack			
	Dask Worker	Openstack			
	F5	Openstack			
	FreeIPA Server	Openstack			
	Rocky	Openstack		✓	
	Ubuntu	Openstack		✓	
	WireGuard VPN Server	Openstack			

The screenshot shows the 'CREATE INSTANCE' interface with tabs for GROUP, CONFIGURE, AUTOMATION, and REVIEW. A search bar is at the top. Below, several Instance Types are listed with their descriptions and icons.

- DASK WORKER**: Dask is an open source library for parallel computing written in Python. Each Dask worker provides mainly two functions: compute tasks as directed by the scheduler and store and serve computed results to other workers or clients.
- FREEIPA SERVER**
- ROCKY**: Rocky Linux is an open source enterprise operating system designed to be compatible with Red Hat Enterprise Linux. It is under intensive development by the community. <https://rockylinux.org>
- UBUNTU**: Ubuntu is an open source software operating system that runs from the desktop, to the cloud, to all your internet connected things. <https://ubuntu.com/>
- WIREGUARD VPN SERVER**: WireGuard is an extremely simple yet fast and modern VPN that utilizes state-of-the-art cryptography. It aims to be faster, simpler, leaner, and more useful than IPsec, while avoiding the massive headache.

Instance Types and Layouts



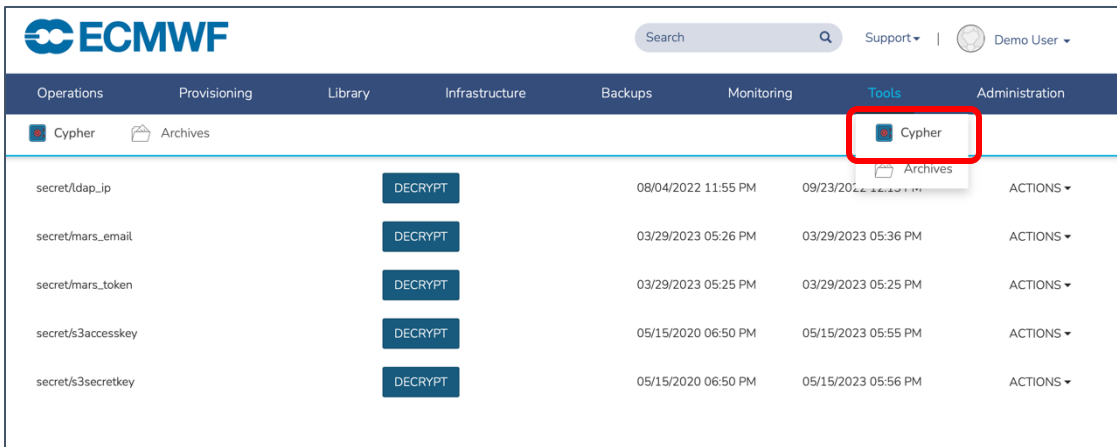
The screenshot shows the 'NEW BLUEPRINT' interface with tabs for Builder, Raw, and Preview. The 'STRUCTURE' panel on the left shows a tree view of the blueprint components: App, Environment, Database, and Web. The 'CONFIGURATION' panel on the right shows the 'Blueprint Summary' with fields for Name, Description, Category, Labels, Image, and Dark Image.

App Blueprints

Blueprints feature together with automation tools allow the setup of reproducible application environment for their flexible on-demand deployment.

Cypher – Secret Management

Tools -> Cypher



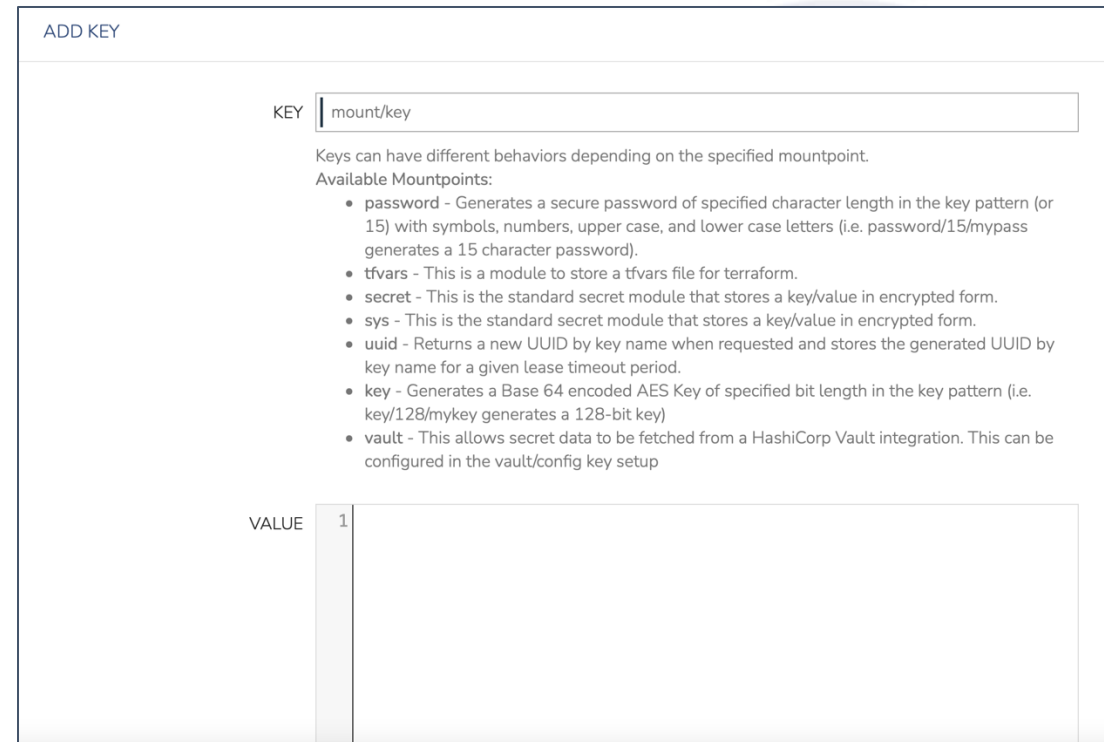
The screenshot shows the ECMWF Tools page. The 'Tools' menu item is highlighted in a red box. Below it, a list of secrets is displayed with columns for name, actions, creation time, and last update time. Each row has a 'DECRYPT' button and an 'ACTIONS' dropdown menu.

secret	Actions	Created	Updated
secret/ldap_ip	DECRYPT	08/04/2022 11:55 PM	09/23/2023 05:26 PM
secret/mars_email	DECRYPT	03/29/2023 05:26 PM	03/29/2023 05:36 PM
secret/mars_token	DECRYPT	03/29/2023 05:25 PM	03/29/2023 05:25 PM
secret/s3accesskey	DECRYPT	05/15/2020 06:50 PM	05/15/2023 05:55 PM
secret/s3secretkey	DECRYPT	05/15/2020 06:50 PM	05/15/2023 05:56 PM

Morpheus Cypher is a built-in functionality to store sensitive information, e.g. to store secrets like passwords or API keys.

The feature is integrated with the Automation tools and it is possible to access stored secrets programmatically e.g. via shell scripts or Ansible tasks.

Stored secrets can be revoked either manually or automatically after a timeout.



The screenshot shows the 'ADD KEY' form. The 'KEY' field contains 'mount/key'. Below the form, there is a list of available mountpoints with their descriptions.

KEY:

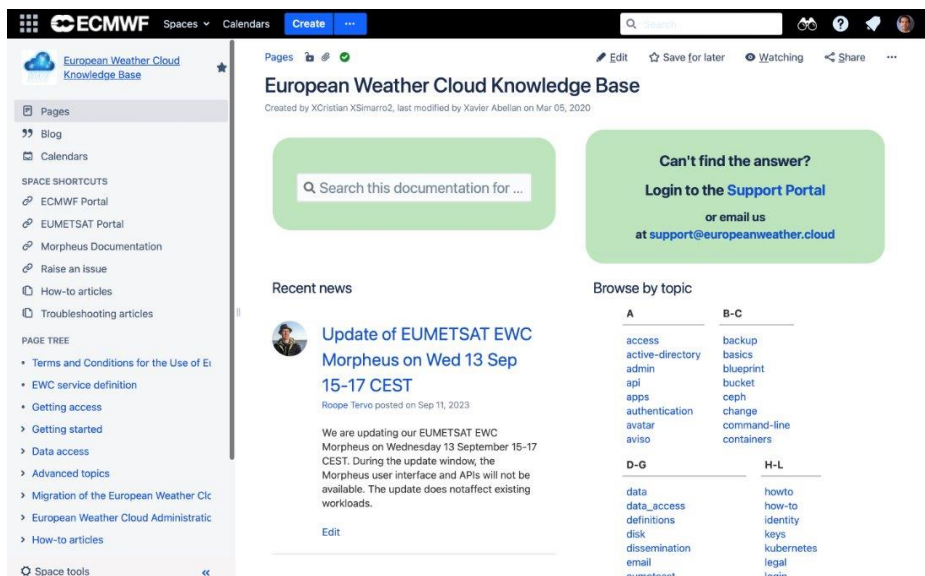
Keys can have different behaviors depending on the specified mountpoint.

Available Mountpoints:

- password - Generates a secure password of specified character length in the key pattern (or 15) with symbols, numbers, upper case, and lower case letters (i.e. password/15/mypass generates a 15 character password).
- tfvars - This is a module to store a tfvars file for terraform.
- secret - This is the standard secret module that stores a key/value in encrypted form.
- sys - This is the standard secret module that stores a key/value in encrypted form.
- uuid - Returns a new UUID by key name when requested and stores the generated UUID by key name for a given lease timeout period.
- key - Generates a Base 64 encoded AES Key of specified bit length in the key pattern (i.e. key/128/mykey generates a 128-bit key)
- vault - This allows secret data to be fetched from a HashiCorp Vault integration. This can be configured in the vault/config key setup

VALUE:

1	<input type="text"/>
---	----------------------



The screenshot shows the Confluence interface for the European Weather Cloud Knowledge Base. The page title is "European Weather Cloud Knowledge Base" and it was created by XChristian XSimarro2. A search bar is prominently displayed with the text "Search this documentation for...". Below the search bar, there is a call to action: "Can't find the answer? Login to the Support Portal or email us at support@europeanweather.cloud". The page also features a "Recent news" section with an article titled "Update of EUMETSAT EWC Morpheus on Wed 13 Sep 15-17 CEST" and a "Browse by topic" section with a grid of links categorized by letters A through L.

<https://confluence.ecmwf.int/x/6J83Cg>



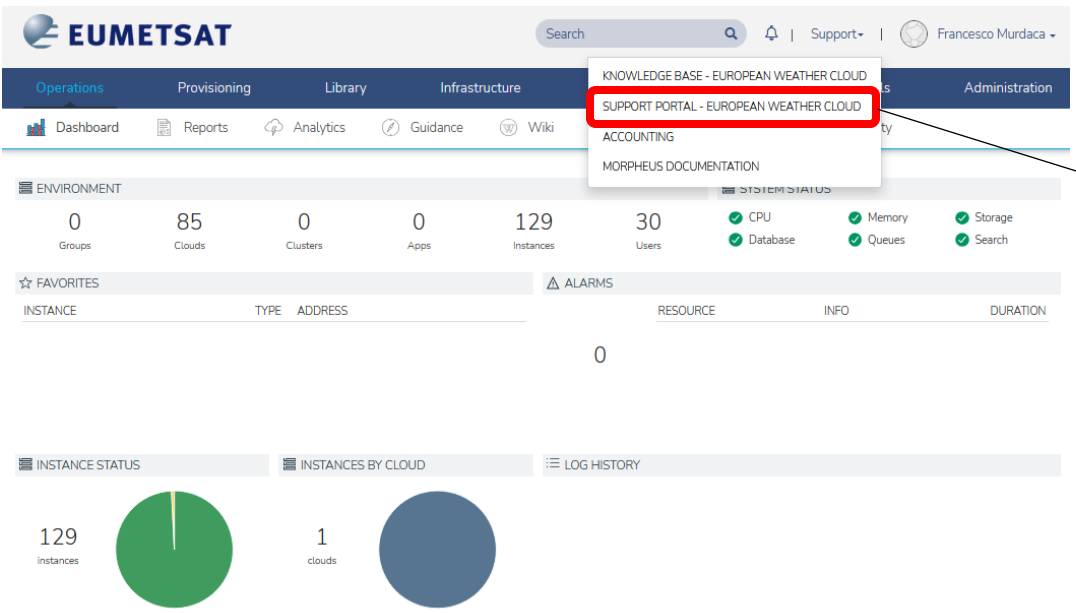
KB Content

- Terms and Conditions
- Getting access
- Getting started
- Compute
- Data access
- Storage
- How-to articles
- Troubleshooting articles
- Discussion platform
- Training and Templates
- EWC Templates

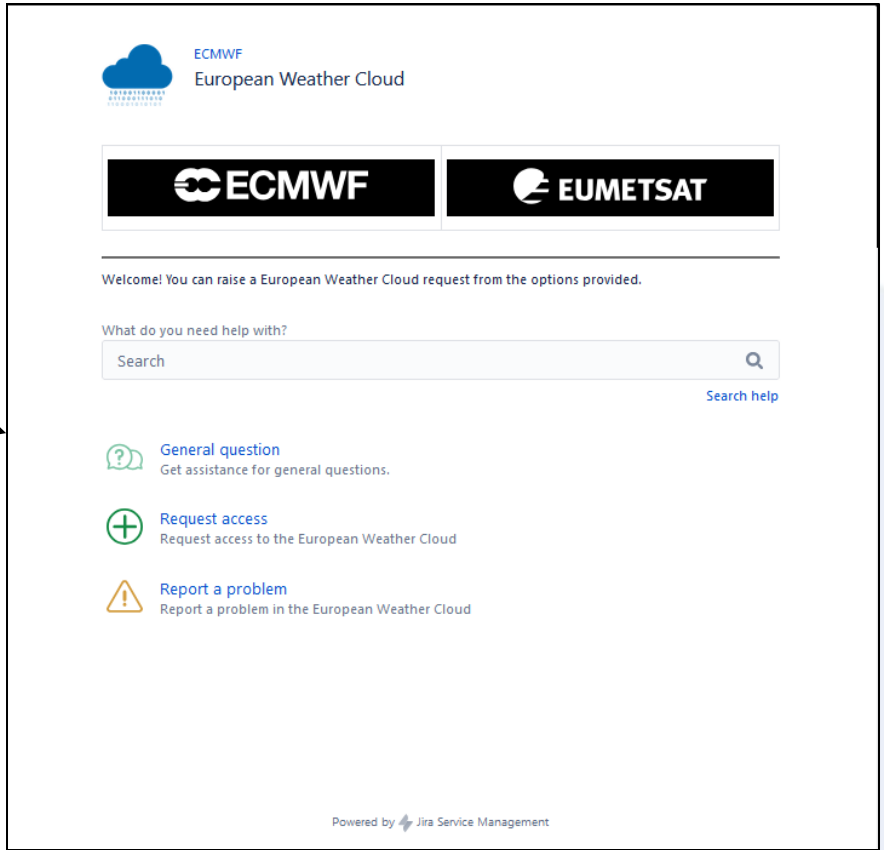


Blog Posts

Support Portal



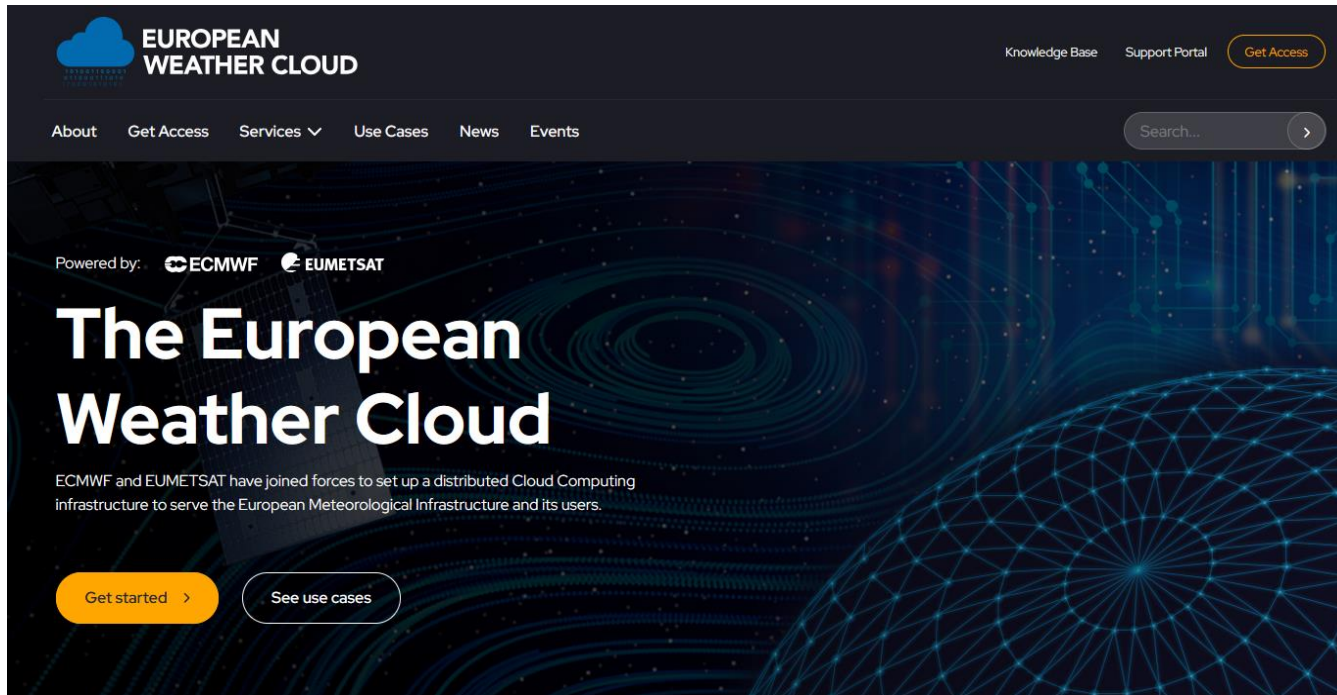
The screenshot shows the EUMETSAT dashboard interface. At the top, there is a navigation bar with 'EUMETSAT' on the left and a search bar, notification bell, 'Support+', and user profile 'Francesco Murdaca' on the right. Below this is a secondary navigation bar with tabs for 'Operations', 'Provisioning', 'Library', 'Infrastructure', and 'Administration'. A dropdown menu is open under 'Infrastructure', with 'SUPPORT PORTAL - EUROPEAN WEATHER CLOUD' highlighted in a red box. Other items in the dropdown include 'KNOWLEDGE BASE - EUROPEAN WEATHER CLOUD', 'ACCOUNTING', and 'MORPHEUS DOCUMENTATION'. The main dashboard area displays various metrics: 0 Groups, 85 Clouds, 0 Clusters, 0 Apps, 129 Instances, and 30 Users. System status indicators for CPU, Memory, Storage, Database, Queues, and Search are all shown as green checkmarks. There are also sections for 'FAVORITES', 'ALARMS', and 'INSTANCE STATUS'.



The screenshot shows the support portal interface. At the top, it features the 'ECMWF' and 'EUMETSAT' logos. Below the logos is a welcome message: 'Welcome! You can raise a European Weather Cloud request from the options provided.' There is a search bar with the placeholder text 'What do you need help with?' and a 'Search help' button. Three main categories are listed with icons: 'General question' (question mark icon), 'Request access' (plus icon), and 'Report a problem' (warning triangle icon). At the bottom, it says 'Powered by Jira Service Management'.

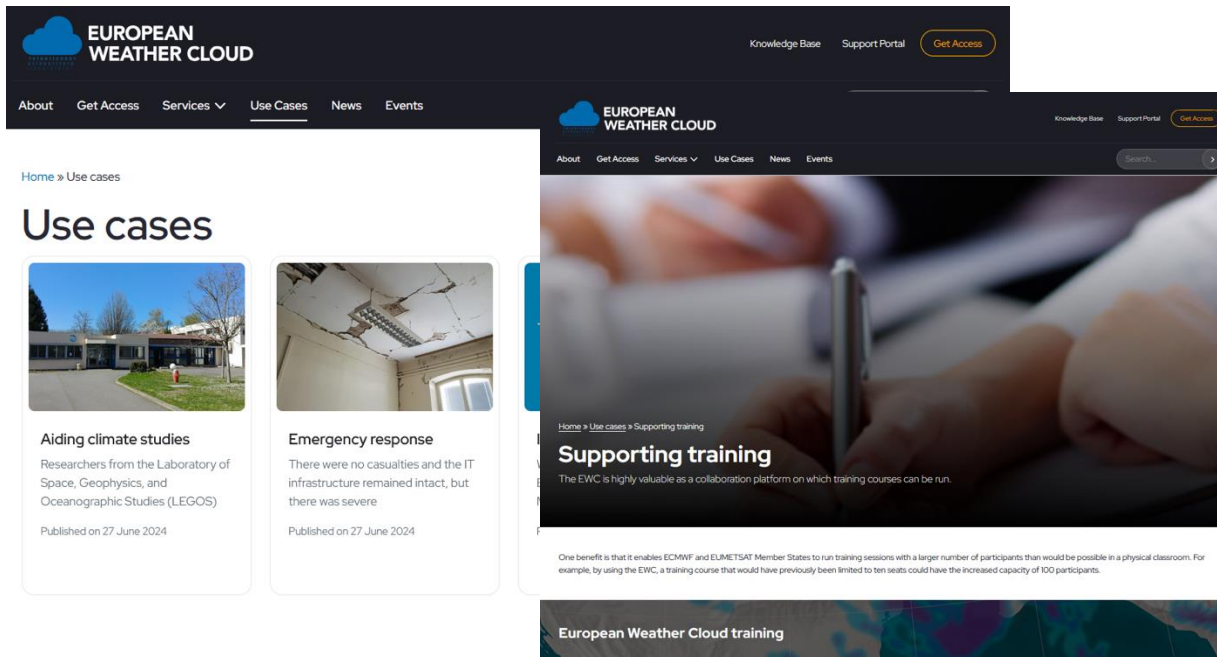
<https://support.europeanweather.cloud/>





- **New design**
- **Better Description of the services**
- **Use Cases**
- **News and Events**
- **Service status dashboard *COMING SOON***

EWC Website – Contribute with your Use Case



You can **publish your EWC use case on the EWC website.**

Inputs needed:

- Title
- Organizations involved
- Description about the use case
- Picture (if any)

Contact us by email, user portal or in rocketchat if you would like to contribute with your use case!

EWC Accounting

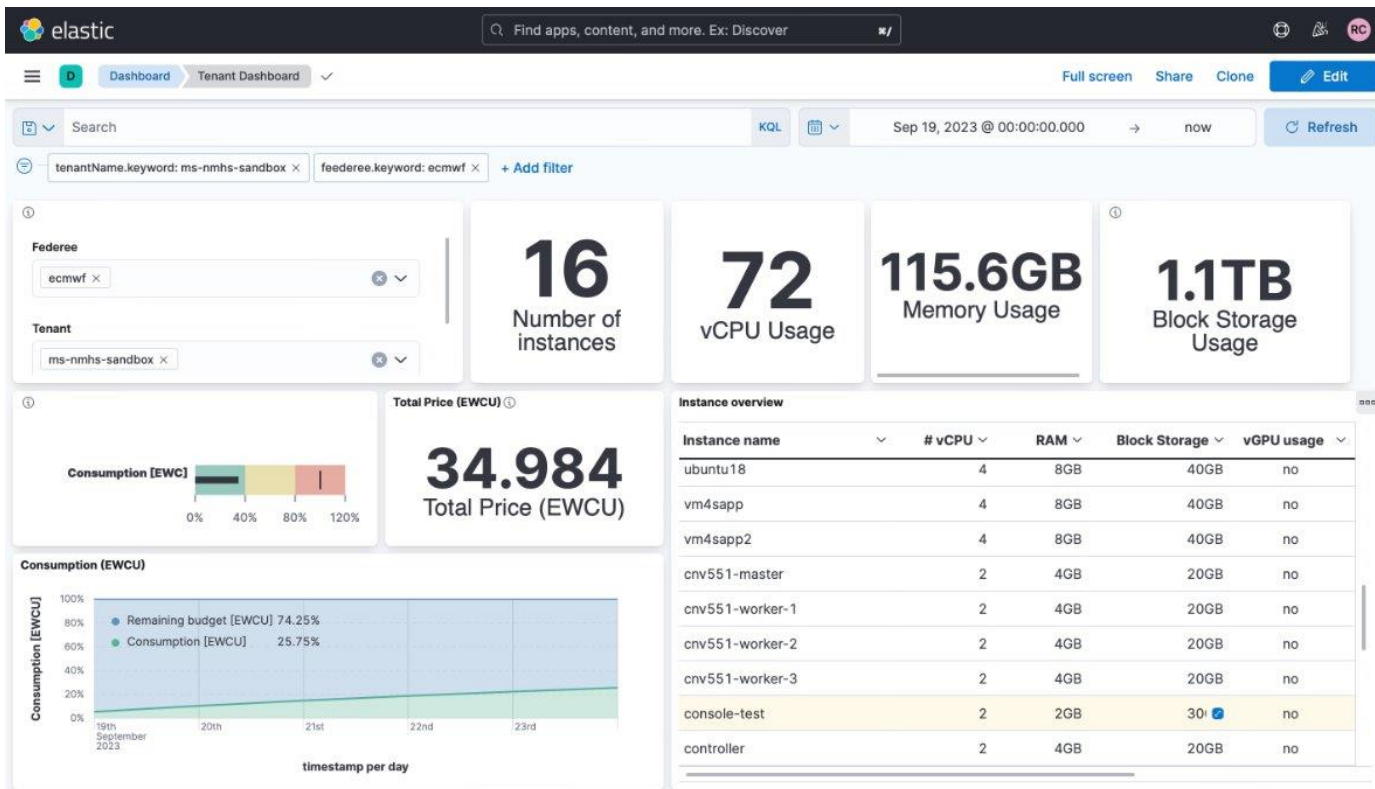
The **Accounting service** provides a cross-cloud overview of resource usage of the tenancies.

A web GUI provides metrics, time series, graphs, and dashboards displaying the accounting information.

Accounted resources include:

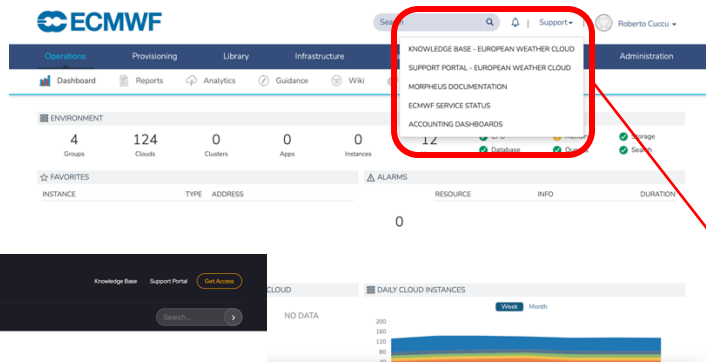
- **Virtual Machines** (CPU, RAM)
- **Storage**
 - Block Storage (volumes attached to the VM)
 - Object Storage (S3 buckets)
 - Shared File System (extra volume shared with multiple VMs)
- **GPU usage** (set of VM configuration including GPU card)

A **Cloud Billing Unit (CBU)** is adopted as virtual currency for the accounting of the consumed cloud resources.

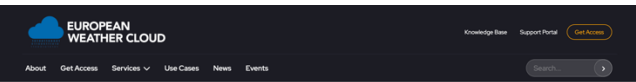


Dashboard	Description
Computing Representative Dashboard	providing overview of the annual budget and consumption
Tenant Dashboard	providing more detailed information on the usage

EWC Accounting – How to access it?



 <https://accounting.europeanweather.cloud>



Accounting Dashboard

In order to ensure a fair share of resources for all EWC users while keeping usage as flexible as possible, the EWC implements an accounting of the cloud resources usage to keep track of the consumption against the provided allocations.

The cloud resources allocations are granted **free of actual charge for the ECMWF and EUMETSAT Member and Co-operating States**, however the accounting is needed to keep track of the usage according to the respective share.

Each type of deployed resource is accounted **hourly** based and deduced from an annual budget expressed in a **virtual cloud billing unit "EWCU"**. In addition, each type of resource has a **quota** defining **hard limit** which can't be exceeded at any point of time.

The accounting dashboard portal allows the users to see how much budget is left and to analyze the consumption along with the quotas.

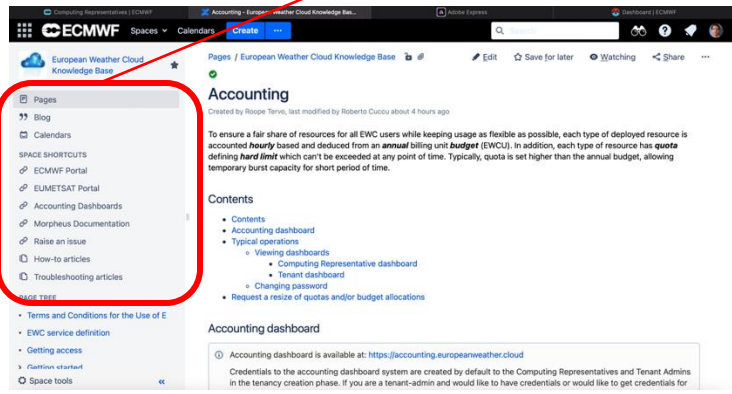
Two main dashboards are available:

- 1) **Computing Representative dashboard**, providing overview of the annual budget and consumption.
- 2) **Tenant dashboard**, providing more detailed information on the usage.

Both dashboards are available to the registered users, while the Computing Representatives can see all resources within their tenancies.



[Access the Accounting Dashboard >](#)

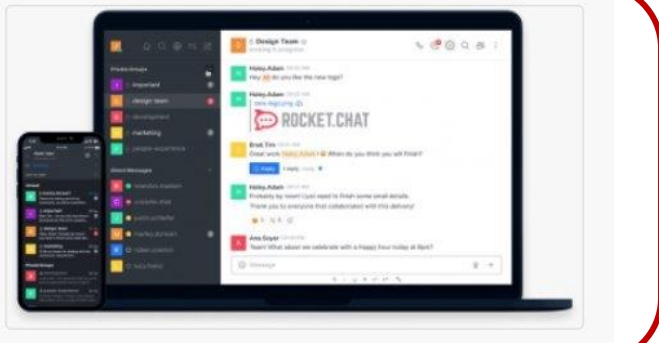


Accounting Dashboards link can be found on the EWC website, in the Morpheus portal support menu or in the EWC Knowledge Base side bar.

EWC Discussion Platform

Installation

- Web based
- Desktop App
- Mobile



Rocketchat

Customizable communication platform hosted on EWC

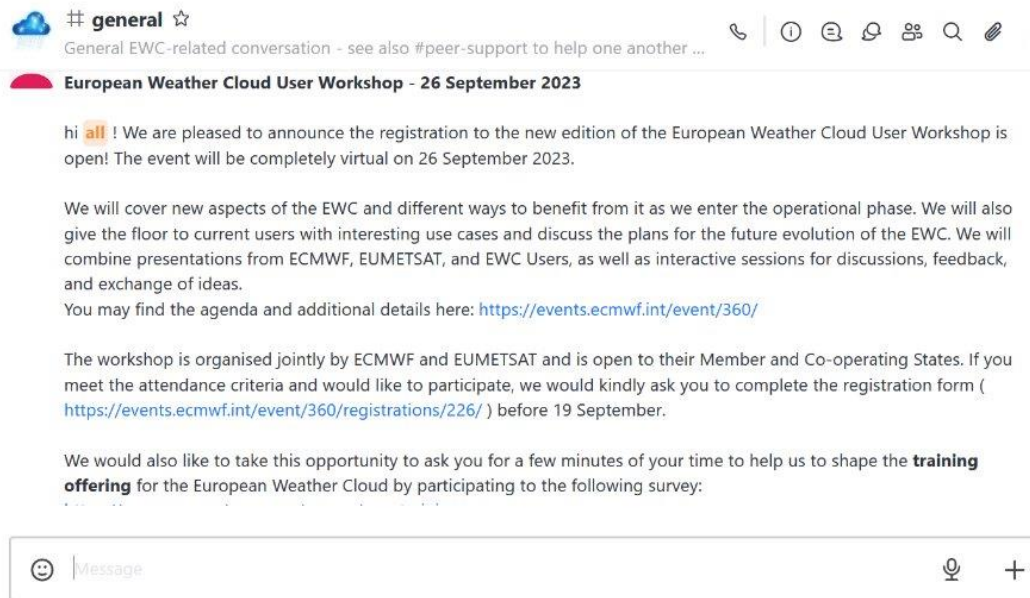
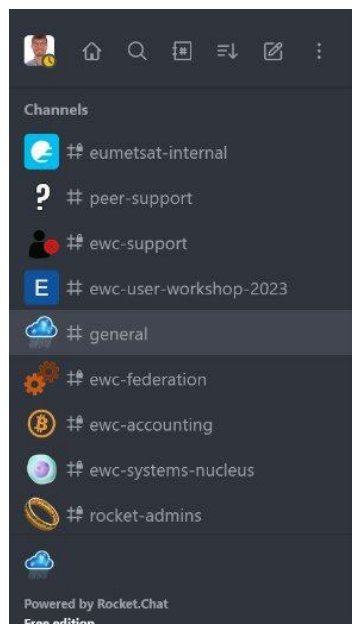
Secure and compliant to standards (e.g. E2E encryption, GDPR)

Open Source

Unlimited history of discussion

Not an official support tool!! -> JIRA ticket or support email

It's a pilot -> review process in place



How do I join?

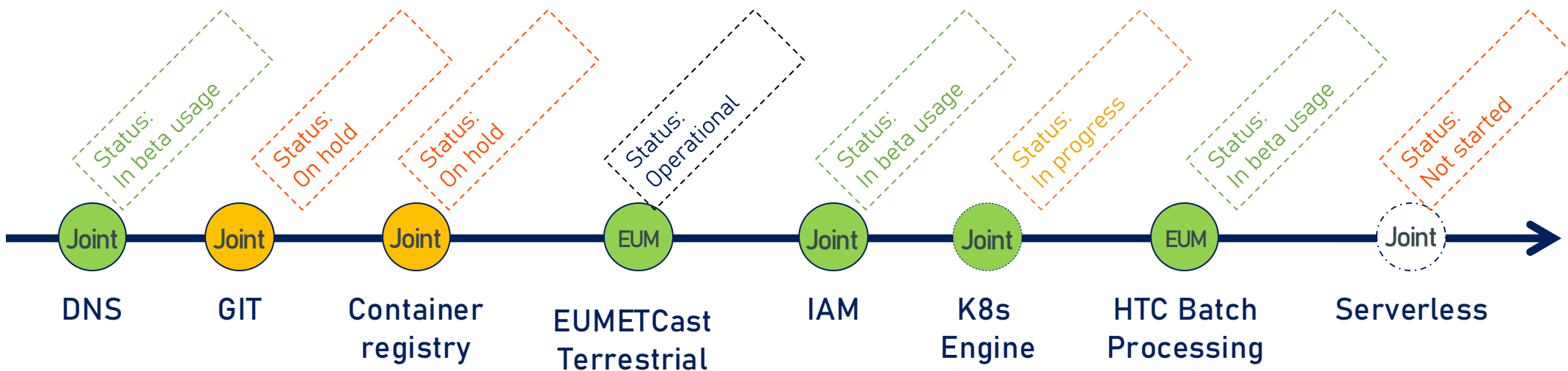
All Member States developers can self-register (based on email domain): <https://chat.europeanweather.cloud>

External users can't self-register but can be invited. They need to be accepted by admins.

What channels are featured?	What Can I do here?
#general	<ul style="list-style-type: none"> • Learn about any news, updates from EWC community • Share interesting article/topics for the community • Discuss tools/solution you are using that could benefit the community
#peer-support	#community-support channel , if you are encountering issues with any tools or need recommendations on some technology or solution, you can ask the community
#random	#off-topic channel to share pictures, meme, anything to chill with the community

EWC Feature Roadmap

- Currently, the service mainly IaaS meaning that users can deploy VMs and additional infrastructure resources
- We are updating the EWC to contain more centrally managed platform and software services
- All services are first released as beta versions and later either operationalized or terminated based on their usefulness and feasibility
- The roadmap is open for updates and reprioritization, based on the user needs



EWC Marketplace

EWC marketplace aims to enable EWC tenants to share and reuse their assets (including e.g. software, ML models, infrastructure as a code, and examples) with each other

Contributions and application support based on the community contributions:

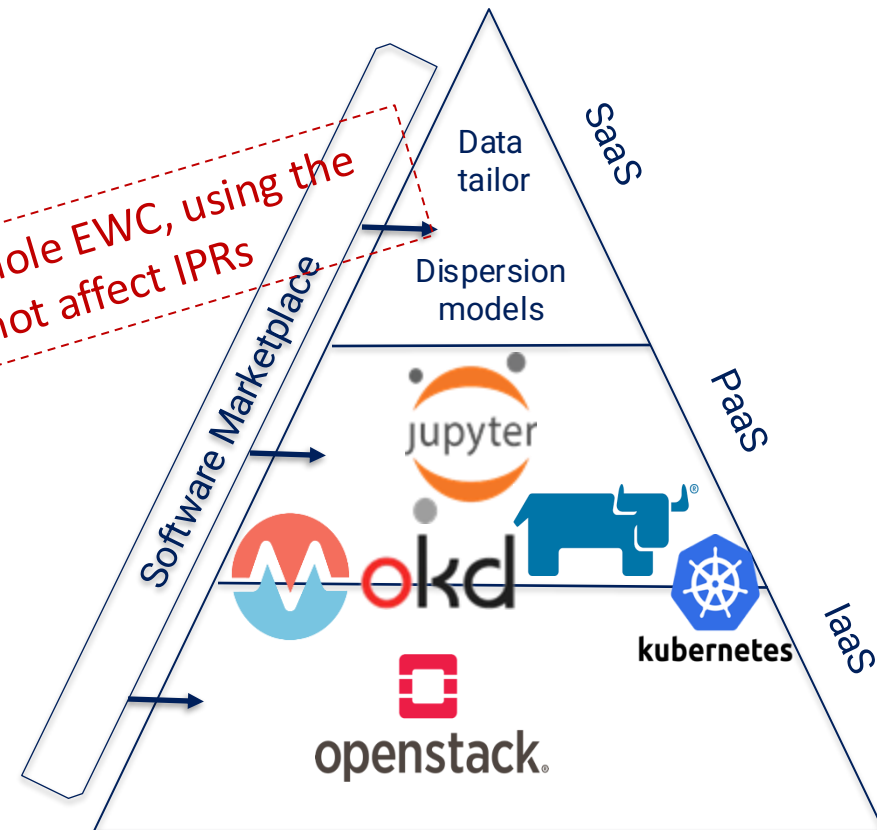
EWC-specific support for creating and maintaining assets to be provided

Envisaged to contain one primary GIT repository and several auxiliary channels to distribute the content:

GIT Repositories (hosted and others) / Container registries / VM images;



As with the whole EWC, using the service does not affect IPRs



Examples of possible marketplace offering:

- Web Map Service on ECMWF and EUMETSAT data
- PyTroll satellite image production
- Nowcasting model templates
- Notebook environment on ML data analytics on archive or forecast data

Contacts and references



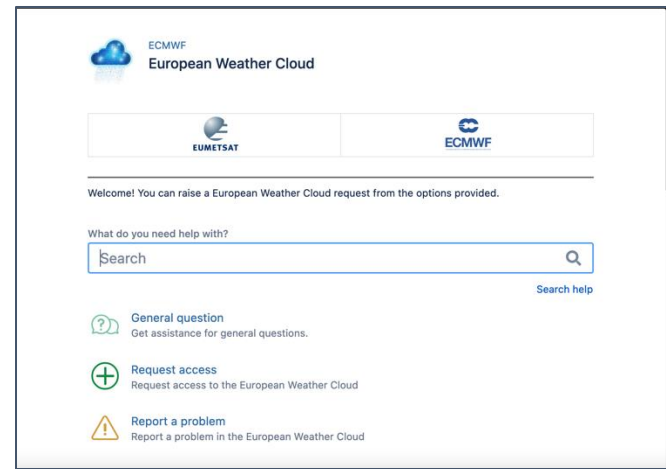
<https://europeanweather.cloud>



<https://support.europeanweather.cloud>



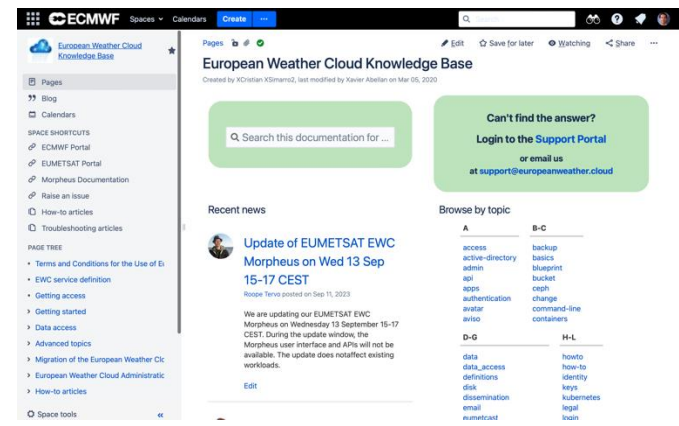
[Support Portal](https://support.europeanweather.cloud)



<https://chat.europeanweather.cloud>



[Knowledge Base](https://knowledge.europeanweather.cloud)





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EUROPEAN WEATHER CLOUD

Thank you for your attention!