Operational
European Weather Cloud
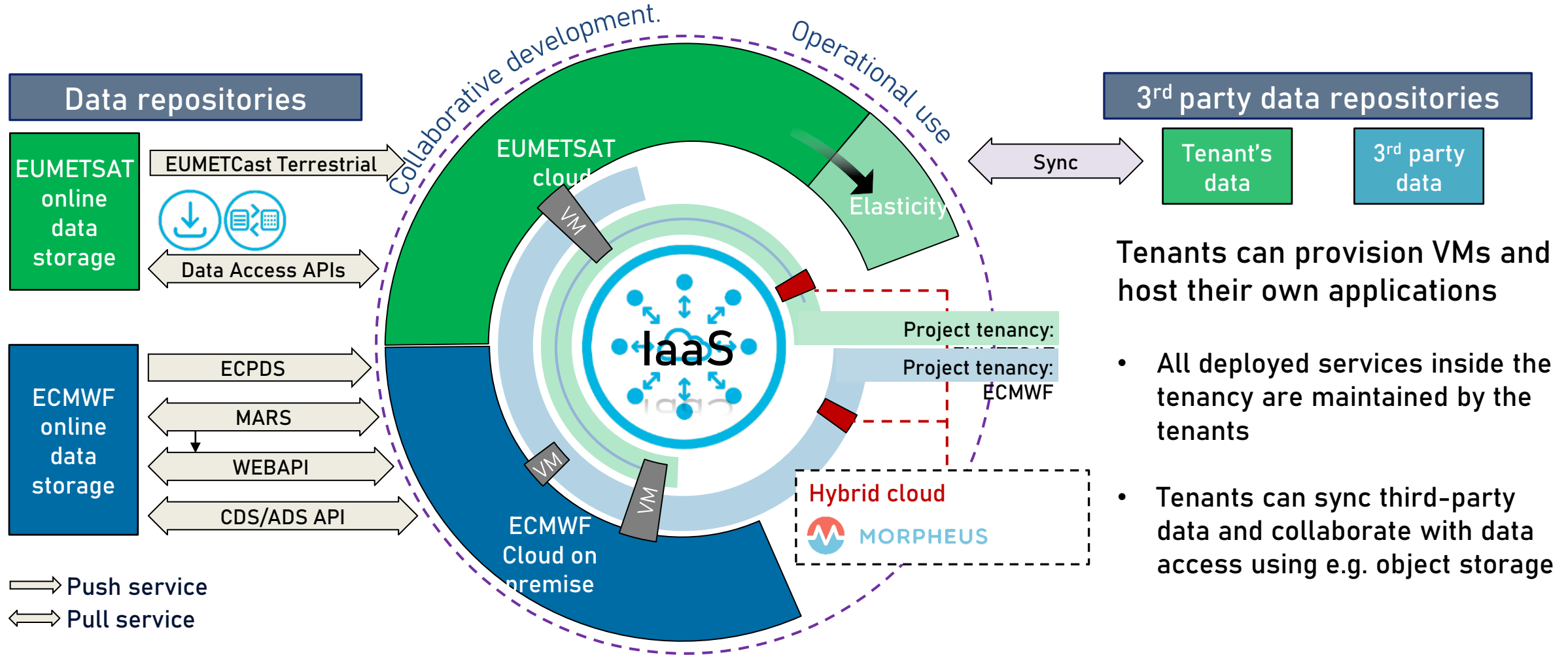## *What does it mean for user?*

Roope Tervo
on behalf of the whole EWC Team

European Weather Cloud User Workshop
26 September 2023

EUROPEAN WEATHER CLOUD
CLOUD COMPUTING-BASED INFRASTRUCTURE, FOCUSED
ON THE NEEDS OF THE METEOROLOGICAL COMMUNITY

ECMWF EUMETSAT

EWC provides users with data-proximate resources as a Infrastructure-as-a-Service

Data repositories

EUMETSAT online data storage
- EUMETCast Terrestrial
- Data Access APIs

ECMWF online data storage
- ECPDS
- MARS
- WEBAPI
- CDS/ADS API

⇒ Push service
⇔ Pull service

Collaborative development.

Operational use

EUMETSAT cloud

Elasticity

IaaS

VM

ECMWF Cloud on premise

Project tenancy: EUMETSAT
Project tenancy: ECMWF

Hybrid cloud
MORPHEUS

Sync

3rd party data repositories

Tenant's data

3rd party data

Tenants can provision VMs and host their own applications

- All deployed services inside the tenancy are maintained by the tenants

- Tenants can sync third-party data and collaborate with data access using e.g. object storage

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ECMWF   EUMETSAT

EUMETSAT starts operations with 240 CRUs

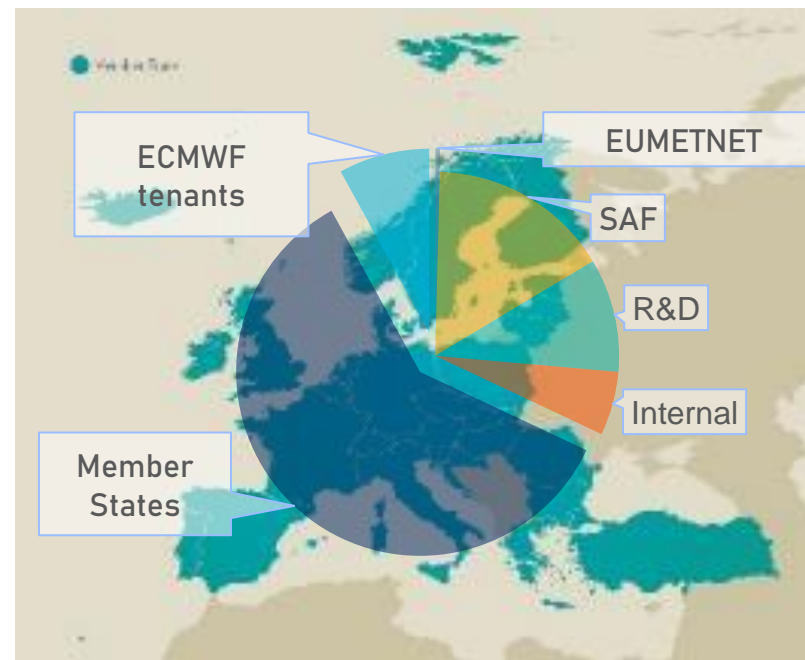|	
CPU	3830
RAM	30.7 TB
Block Storage	960 TB
S3	1.92 PB
SFS	960 TB
vGPU*	240

The actual sizing will be based on the actual usage within the limits of Member States allocation and sizing of different usage categories

The operational phase is to be started with 10Gbps dedicated network link based on the experiences gained from WEkEO

- Link capacity is to be evaluated each year and increased if necessary. Remarkable evolution is envisaged in 2025 due to both increased amount of usage and data.

Allocation	CRUs identified in initial sizing	Start of operations
Member States basic allocation	75	75
Member States pro-rata allocation	75	75
Support to ECMWF EWC users/tenants	44	10
SAFs	64	40
Research (indicative, 25-100 CRUs)	25	25
Other EUM internal usage	45	14
Optional EUMETNET usage/ additional community relevant data and services	2 expected	1
Totals	**328**	**240**

1 CRU = 16 cores; 128GB RAM; 1 GPU; storage: 4TB block, 8TB object, 4TB filestore

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ECMWF   EUMETSAT

ECMWF Operational infrastructure

- New Cloud Infrastructure ready in ECMWF's Bologna Home

  - Collocated with other key ECMWF Computing and Data Services

  - Migration almost complete

  - Shutdown of the pilot-phase infrastructure soon

- 2 Production clouds – one on each computer hall

  - Based on Openstack and Ceph

Cores	5632
Memory	53 TB
Storage	2.1 PB usable
GPUs	32 x A100 80 GB

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ECMWF **EUMETSAT**

Member State total allocation is a sum of both EUMETSAT and ECMWF allocations

EUMETSAT

Member state	Total (CRUs)	vCPU	RAM (GB)	Storage (TB)	vGPU
Austria	4	64	512	64	4
Belgium	4	64	512	64	4
Bulgaria	3	48	384	48	3
Croatia	3	48	384	48	3
Czech Republic	3	48	384	48	3
Denmark	4	64	512	64	4
Estonia	3	48	384	48	3
Finland	4	64	512	64	4
France	13	208	1664	208	13
Germany	17	272	2176	272	17
Greece	3	48	384	48	3
Hungary	3	48	384	48	3
Iceland	3	48	384	48	3
Ireland	4	64	512	64	4
Italy	10	160	1280	160	10
Latvia	3	48	384	48	3
Lithuania	3	48	384	48	3
Luxembourg	3	48	384	48	3
Netherlands	6	96	768	96	6
Norway	4	64	512	64	4
Poland	4	64	512	64	4
Portugal	3	48	384	48	3
Romania	3	48	384	48	3
Slovakia	3	48	384	48	3
Slovenia	3	48	384	48	3
Spain	8	128	1024	128	8
Sweden	5	80	640	80	5
Switzerland	5	80	640	80	5
Turkey	6	96	768	96	6
United Kingdom	13	208	1664	208	13
R&D projects	25	400	3200	400	25
SAF Basic allocation	2	32	256	32	2
SAF Specific allocation	6	96	768	96	6

ECMWF

Country	vCPU	Memory [GB]	Storage [TB]	vGPU
Austria	93	880	68	5
Belgium	105	992	76	6
Croatia	45	428	33	3
Denmark	83	781	60	5
Estonia	41	392	30	2
Finland	72	678	52	4
France	387	3663	282	22
Germany	533	5043	388	30
Greece	65	613	47	4
Iceland	41	385	30	2
Ireland	73	694	53	4
Italy	298	2815	217	17
Luxembourg	43	411	32	2
Netherlands	148	1404	108	8
Norway	93	877	67	5
Portugal	66	628	48	4
Serbia	44	412	32	2
Slovenia	44	419	32	3
Spain	211	1994	153	12
Sweden	109	1034	80	6
Switzerland	127	1204	93	7
Türkiye	149	1412	109	8
United Kingdom	390	3691	284	22
Bulgaria	42	395	30	2
Czech Republic	52	488	38	3
Georgia	39	369	28	2
Hungary	47	444	34	3
Israel	60	568	44	3
Latvia	40	378	29	2
Lithuania	41	388	30	2
Montenegro	38	362	28	2
Morocco	45	425	33	3
North Macedonia	39	366	28	2
Romania	52	489	38	3
Slovak Republic	44	418	32	3
Special Projects	422	3994	307	24

Member State shares will be managed by the Computing Representatives

Tenancy sizes may vary from 38 vCPUs to 533 vCPU depending on the tenant and configuration

Tenants can use their yearly allocation flexibly

Overall available resources

Quota set to CF OpenStack tenancy
Hard limit, cannot be exceeded at any point of time

Annual credits set for a tenancy
Limit for the whole year. Might cover for example 560 640 CPU hours and corresponding amount other resources.

Actual use at some particular moment

Tenant 1   Tenant 2   Tenant 3   Tenant 4
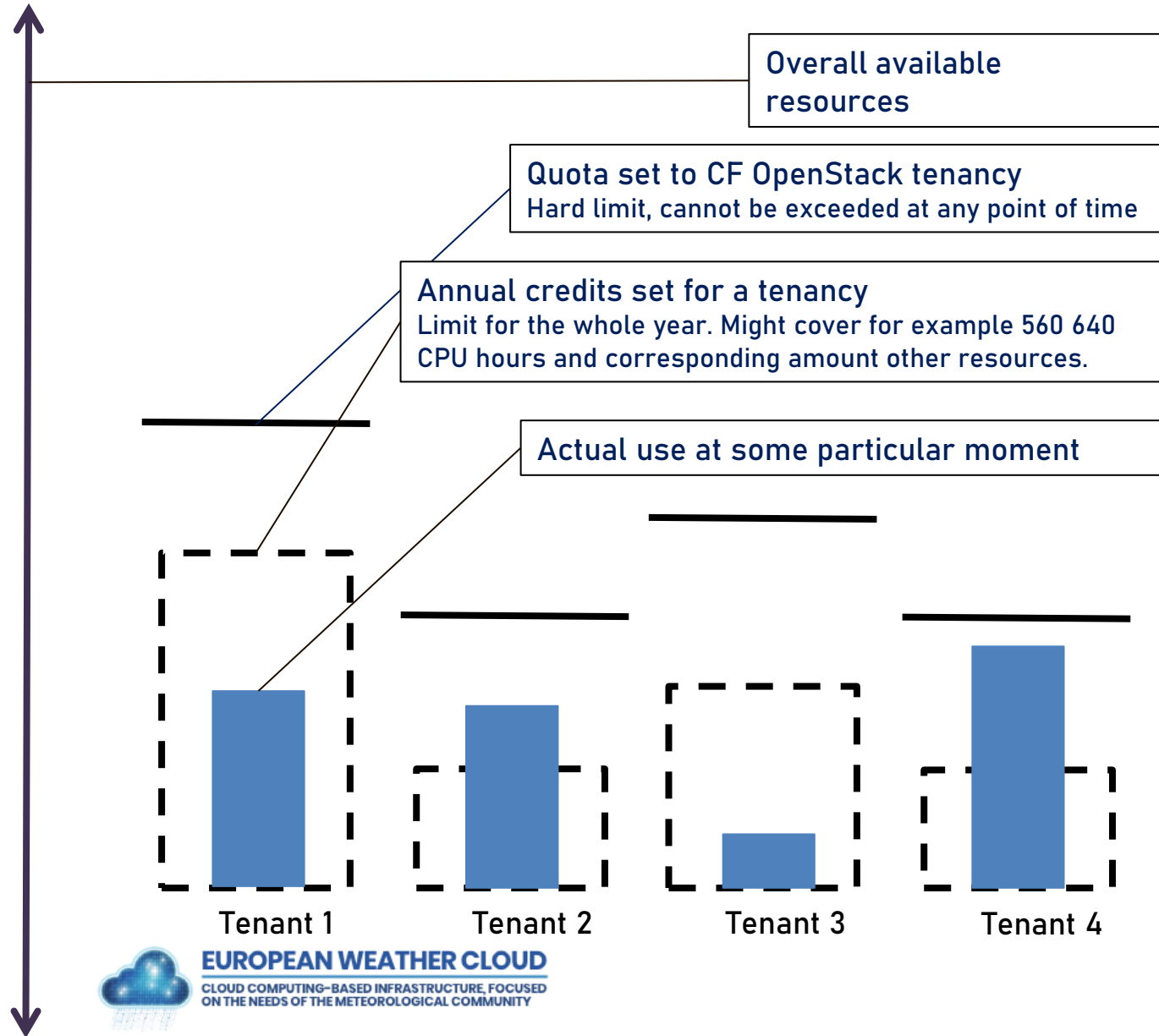
- Tenants will have yearly budgets of credits and resource quota based on their allocation:
  - Allocating any type of resources will consume credits
- This will allow tenants to use their yearly allocation in shorter period

- Member States can share their credits to several tenants and combine them with other Member States

- EWC support team will monitor and control the usage so that overall limit is not exceeded
  - In case of many tenants will use burst capacity at the same time, action might be needed.

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ECMWF   EUMETSAT

Expected availability

The expected service levels are **objectives**. *All data, applications, content and information to which the EWC Services provide access is made available 'as is'.*

See <u>EWC Service definition</u> and <u>Terms and Conditions</u> in our Knowledge base for more details

Time to first response

1 day on business hours	Lead time to respond to the ticket and start the task

Time to resolution plan of service request

8 business days	Time to assessment and to the resolution plan of the service request including support requests and service change requests

Lead time to on-board

8 business days	Lead time to onboard an approved new user counted from the approval by the Computing Representative / R&D project and Special Project acceptance

Expected availability of deployments and reachability of the VM/service

99%	The availability of the deployed resources including the whole virtual environment explained above. This availability also includes the reachability of the VM/service from the Internet.

Availability of Cloud Management Services

99%	The EWC tools such as the provisioning portal, metering and accounting services.

ECMWF   **EUMETSAT**
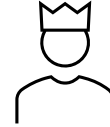
Roles and definitions

Authorizing Officer

The designated representative of ECMWF, EUMETSAT and Member and Co-operating States of EUMETSAT and ECMWF who authorizes access to the EWC Services.
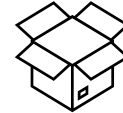
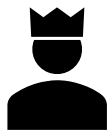Authorizing officer may act as tenant admin or delegate the task.

Tenancy Owner

A user who administers one or several tenancies available on the EWC in accordance with an agreement with the Authorizing Officer.

Tenancy User

A user authorized by a Tenancy Owner or another existing Tenancy User to use one or more identified Tenancies on the EWC. A Tenancy User may generate Tenancy - based Services for End-Users

Tenancy

An isolated environment offering services on the EWC and administered by a Tenancy Owner authorized by the Authorizing Officer.
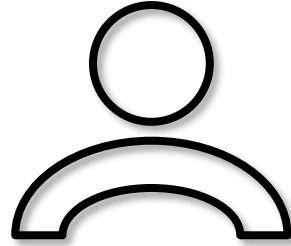
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ECMWF   EUMETSAT

Shared responsibility model

Cloud provider

- Infrastructure
- Provides secure by default initial setup
- Provide support
- Can interrupt the service if legally required to
- May monitor traffic
- NO access to VMs

Tenant

- Application security
- OS level updates
- Access control to VMs
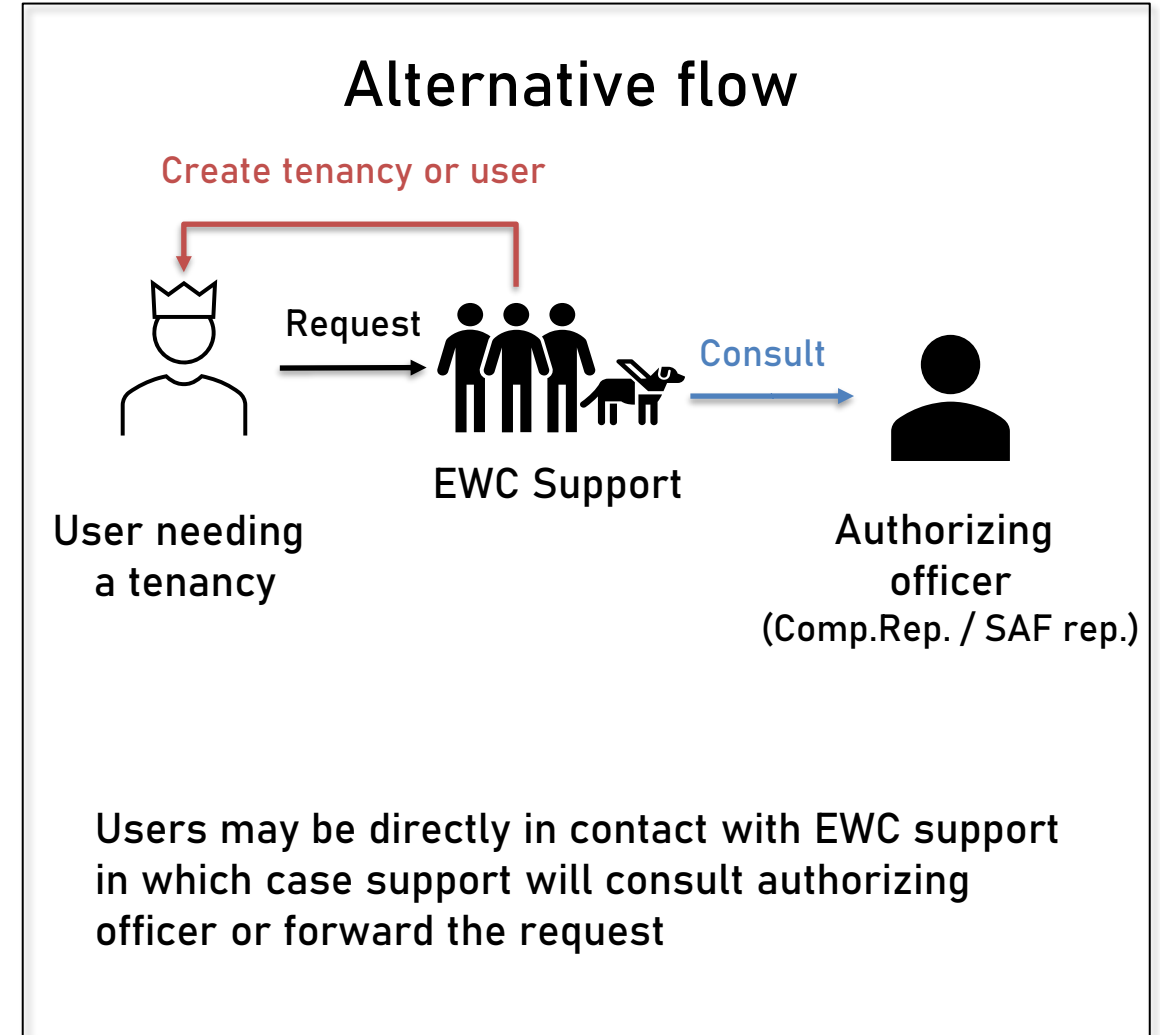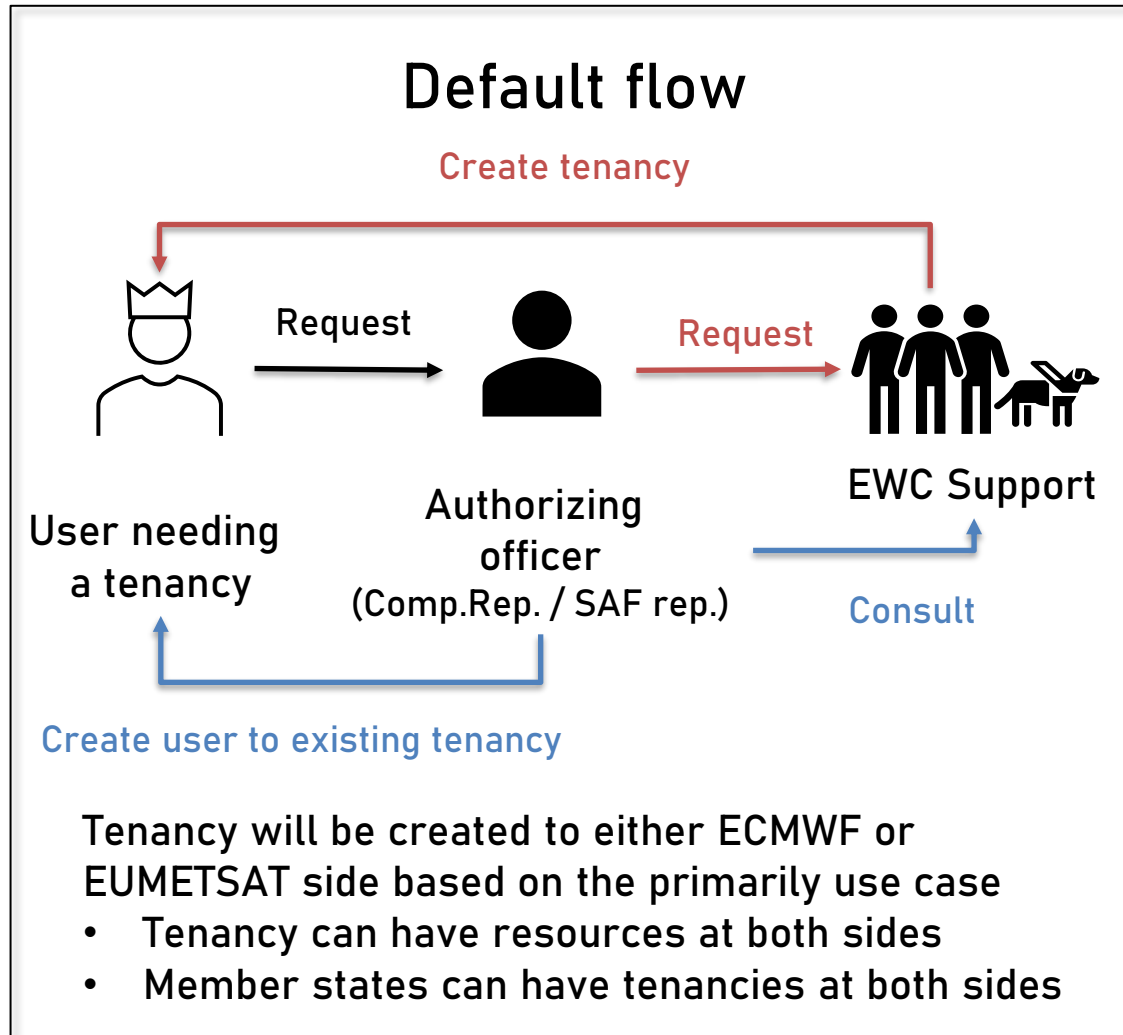- Network security
- Data protection
- …

Authorizing officer will authorize users

Authorizing officer may act as tenant admin or delegate the task.

⚠ Using EWC implies the acceptance of Terms and Conditions

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ECMWF   EUMETSAT

Getting a tenancy workflow

Default flow

Create tenancy

Request — Request

Consult

User needing a tenancy

Authorizing officer
(Comp.Rep. / SAF rep.)

EWC Support

Create user to existing tenancy

Tenancy will be created to either ECMWF or EUMETSAT side based on the primarily use case
- Tenancy can have resources at both sides
- Member states can have tenancies at both sides

Alternative flow

Create tenancy or user

Request

Consult

User needing a tenancy

EWC Support

Authorizing officer
(Comp.Rep. / SAF rep.)

Users may be directly in contact with EWC support in which case support will consult authorizing officer or forward the request

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ECMWF EUMETSAT

EUMETSAT R&D Call and ECMWF Special projects

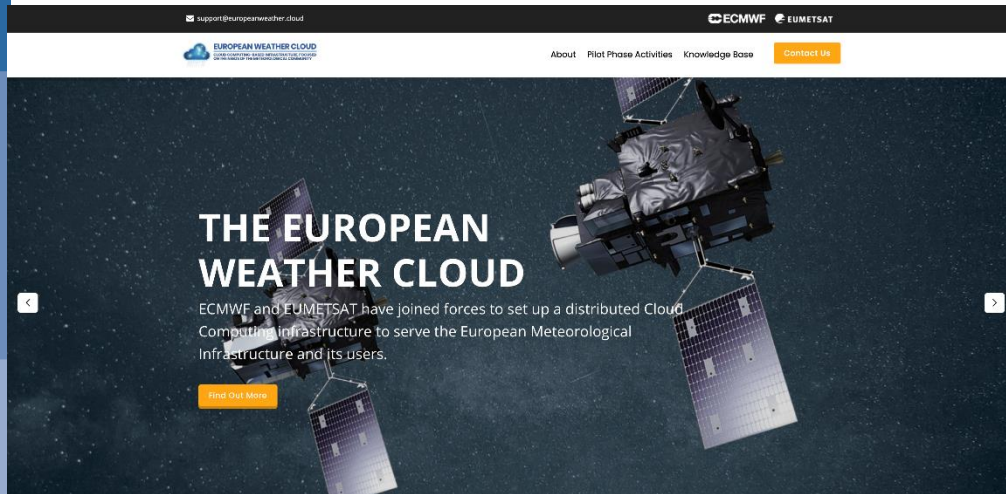Annual EUMETSAT Research & Development call closes each year on 30 June

- Objectives on improving, development and using products in applications and using the cloud infrastructure (more details here)

- Eligible for application for resources are Member States' public institutions, i.e., public services and academia

- Fast-track projects available anytime of the year for small projects
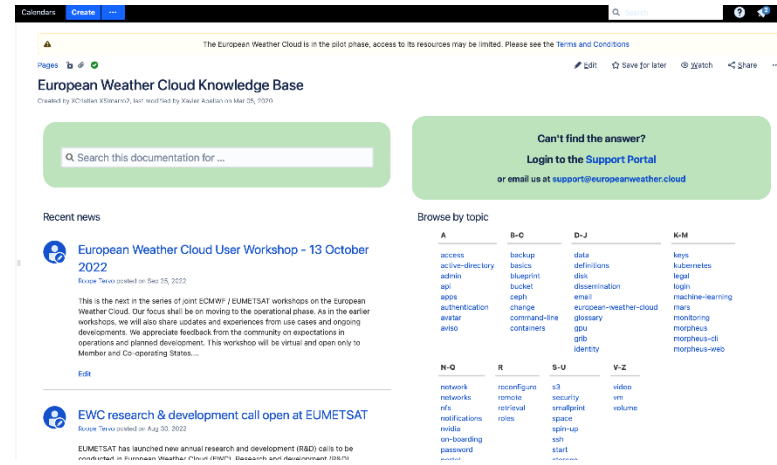
ECMWF Special projects can also include EWC resources in their application, closes each year on 30 June

- The scope includes experiments or investigations of a scientific or technical nature, undertaken by one or more Member States, likely to be of interest to the general scientific community

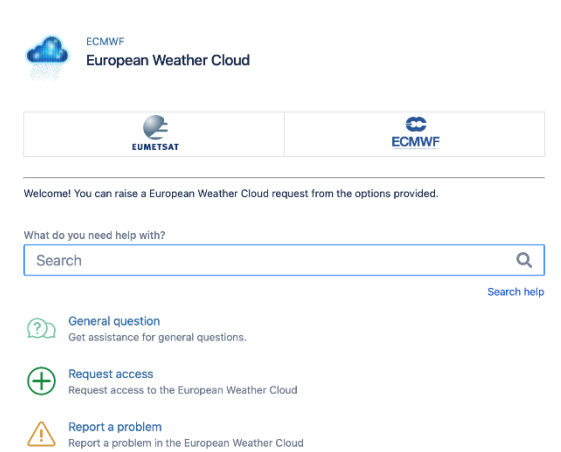- "Late request" possible after deadline

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More information

https://www.europeanweather.cloud

Knowledge Base

User Support

https://chat.europeanweather.cloud

Questions?