SAO

SENTINEL ALPINE OBSERVATORY

ACCESS USER MANUAL

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DRAFT VERSION: 1.0

EURAC research

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1) Overview

Sentinel Alpine Observatory (SAO) is an initiative of the EURAC Institute for Applied Remote Sensing to foster ESA Sentinel based remote sensing applications for mountains and for the European Alps.

The resources at EURAC have been sized on the specific needs of the research on mountain environment, and both resources and Data (mainly Sentinel related, as well as MODIS, NPP, Landsat and in-situ and UAV) can be accessed with the help of two main components:

- Earth Observation – Environmental Data Archive
- Cloud Computing Services (Platform as a Service – PaaS)

Resources are accessible on the PaaS SAO platform via the *Spatial Data Infrastructure (SDI) Data catalogue, the Open Nebula Sunstone* self-service Computing Cluster portal, the *LoginApp* server and the *DMI (Data Management Interface)* server.

Earth Observation - Environmental Data Archive

EURAC EO and Environmental Archive is defined relying on a Software Defined Storage (SDS) based on CephFS, and has a RAW Capacity of 1,25 PB.

The Data are discoverable through a CSW compliant GeoNetwork catalogue and accessibility is granted according with specific and capillary policies.

http://sdi.eurac.edu/

Data Structure:

Base Data archive (MODIS, NPP, Landsat, SENTINEL-1, SENTINEL-2)

EURAC Product / SAO related added value products (SNOW, RGB, METEO)

COMPUTE_NFS/Project is a private NFS3 repository which can be used to store results. The Project name $PROJECT is assigned along with the Login credentials:

```
projectdata.eurac.edu:/srv/compute/PROCESSING/DOMAINS/$PROJECT/
```

SDI Data catalogue (GeoNetwork)

The catalogue can be used to search for data registered inside the EURAC SDI

URL: sdi.eurac.edu

User: $your_username

Pwd: (sent separately)

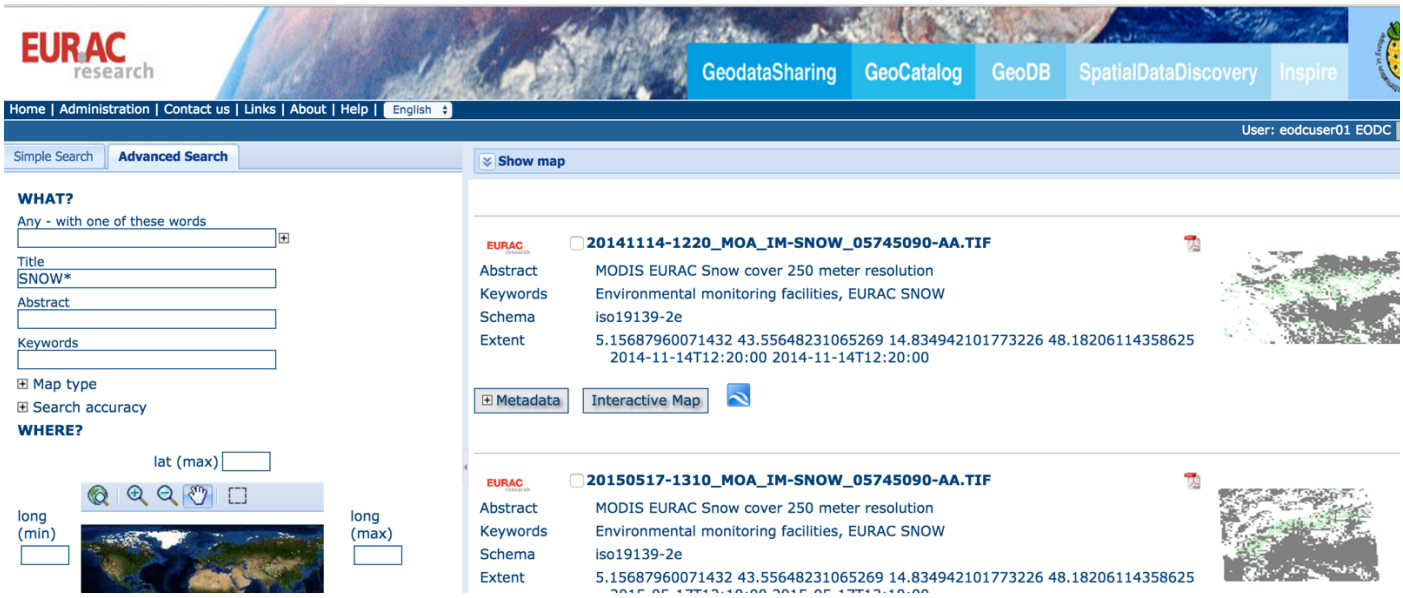


Fig. 2.1 EURAC SDI Catalog “Advanced Search” search example using “Title”

See APPENDIX 1.1 for short Catalog Documentation

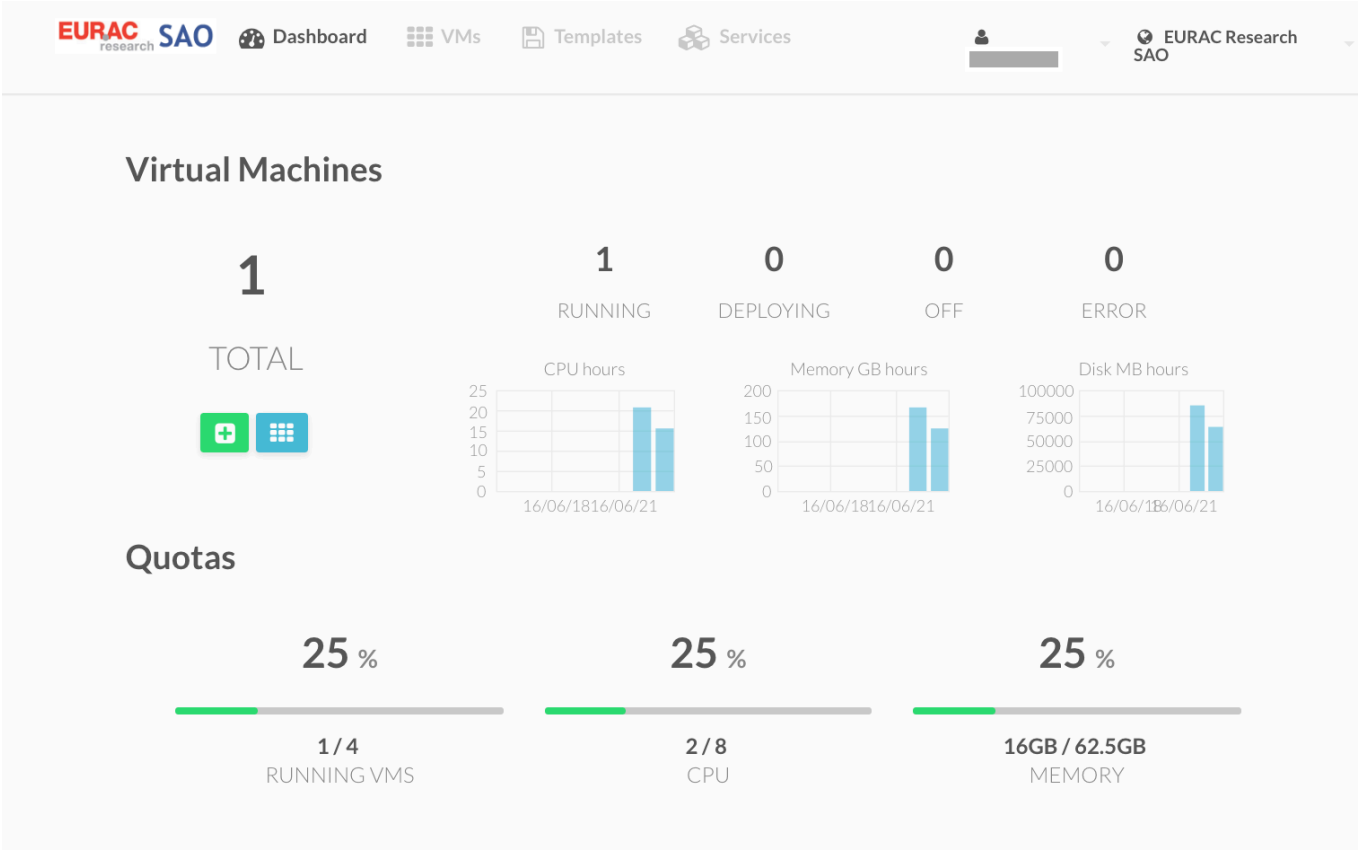
Cloud Computing Services (PaaS):

Computing Resources for processing Data available at EURAC are accessible via the Open Nebula Sunstone self-service portal.

Sunstone self-service portal (for Admin users)

The self-provisioning portal, allows to allocate resources and assign them to Virtual Machines.

Sunstone portal at EURAC:



See APPENDIX 2.1 for more screenshots

URL: http://saocompute.eurac.edu/opn_sunstone/

User: $your_username

Pwd: (sent separately)

Quota: Typically 4 CPU (8 vCPU), 32 GB RAM, 100 GB NFS, CentOS 7.1 template

Note: Do not forget ending slash / in URL . Only Admins should access this service.

NOTE: EURAC Internal Users should access the following URL instead:

URL: http://rseopn01.eurac.edu:9869/login (VNC Viewer in VM works only here!!)

Once the resources are allocated through the Sunstone portal. The running VM's are accessible from the LoginApp with root@IP (no password required)

LoginApp

This server allows the external users to access allocated SAO resources. From here all created VMs are accessible with root@IP without password.

For security and network isolation issues there are two LoginApp's:

- For EURAC internal users (**rseloginapp01.eurac.edu**)
- For external users **(saocompute.eurac.edu**).

host: saocompute.eurac.edu OR 10.8.244.23

protocol: ssh

User: $your_username

Pwd: (sent separately)

Note: External LoginApp accessible only for defined public IP's 193.170.203.0/24

DMI (Data Management Interface)

The Data Management Interface allows to mount provided sections of Base Data via SSHFS protocol.

host: abz01dmi.eurac.edu

protocol: sshfs

User: $your_username@eurac.edu

Pwd: (sent separately)

Data-Path: `/mnt/CEPH_BASEDATA/Base_Data/SATELLITE/SENTINEL/`

2) Meta Data and Data Access

Metadata can be searched using the EURAC SDI catalogue at

http://sdi.eurac.edu/

or using the **CSW** protocol with other client applications.

Data can be searched *by keywords, title, abstract, spatial extend and time frame*.
On request Metadata can be generated automatically when products are produced.
Also custom fields can be added to the metadata if required (ex. Cloud %, etc.)

NOTE: Keep in mind that the filename of a data entry is reported in the *Title*.
Therefor it's possible to make a fine grained query on the data by knowing the file naming convention. Here some examples:

Data naming conventions:

Product	**Naming convention**	**Title field search pattern example**
EURAC		
EURAC_RGB_P	EURAC_RGB_P.ALPS.H.2014.1216.1033.TIF	EURAC_RGB_P.ALPS.*
EURAC_SNOW_P	20140611-1155_MOA_IM-SNOW_05745090-AA.TIF	20140611*
EURAC_METEO_P	EURAC_METEO_P.ALPS.2015.0225.1039.DAYTIME.TIF	EURAC_METEO_P.ALPS.*
MODIS		
MCD15	MCD15A3.A2003053.H18V04.005.2007278163122.hdf	MCD15A3*

MOD021KM	…	
….	…	
…	…	

Metadata will contain the path or OGC service to where data is located, under the TAG *"Online Resource"*

If the "Online Resource" is a file path, Data can be accessed via the **DMI** (Data Management Interface) server using the SSHFS protocol with the Eurac Domain User gst_rseeodc01

2.1) Base Data

BaseData is organized in a hierarchical folder structure.

```
/mnt/CEPH_BASEDATA/Base_Data/

GIS  GROUND  METEO  SATELLITE  UAV

/mnt/CEPH_BASEDATA/Base_Data/SATELLITE/

ALOS   ASTER    BLUEMARBLE  ENVISAT  LANDSAT  MODIS  NPP    RADARSAT
SENTINEL  TERRASAR   WORLDVIEW2
AMSRE  AVNIR-2  COSMO       IRS-6    MERIS    MSG    PRISM  RAPIDEYE  SPOT
```

In order to access BaseData sections from the allocated VMs, a user needs a valid EURAC Active Directory account to login on the DMI server, ex. *$your_user@eurac.edu*

The user may than mount via SSHFS, the BaseData sub folders where he has access to: **example**:

```
sshfs  -o allow_other $your_user@abz01dmi.eurac.edu:
/mnt/CEPH_BASEDATA/Base_Data/SATELLITE/SENTINEL/SENTINEL-1/ /mnt/Sentinel/
```

3) Storage

A dedicated COMPUTE_NFS storage is available for storing output data.

Note: for writing data faster during processing, you should consider in first place the local drive(s), or available volatile RAM discs for storing processing data.

All created VM's have read-write NFS access to a defined computing share (ex. **$PROJECT**) which can be mounted with NFS3 protocol

NFS Storage rw (2.9 TB)

add mount point to /etc/fstab

projectdata.eurac.edu:/srv/compute/PROCESSING/DOMAINS/**$PROJECT** /mnt/your mount_point nfs tcp,rw,soft,intr,rdirplus,rsize=1048576,wsize=1048576,retrans=512,timeo=14 0 0

4) Guidelines

Data Access:

The access to data is regulated by Users and Groups.

AD User $your_user@eurac.edu belongs to a specific group ‘Sentiel Alpine Observatory’

Data Protection:

Sunstone:

Please consider the sunstone access should be used only for Administrative tasks, and should not be shared with scientific users

EURAC Data/Product List:

Raw
L1
L2
L3

Data Access Policy:

Raw and L1 L2 and L3 produced by EURAC are protected by read-only rights,

Capacità di archiviazione risultati/prodootti

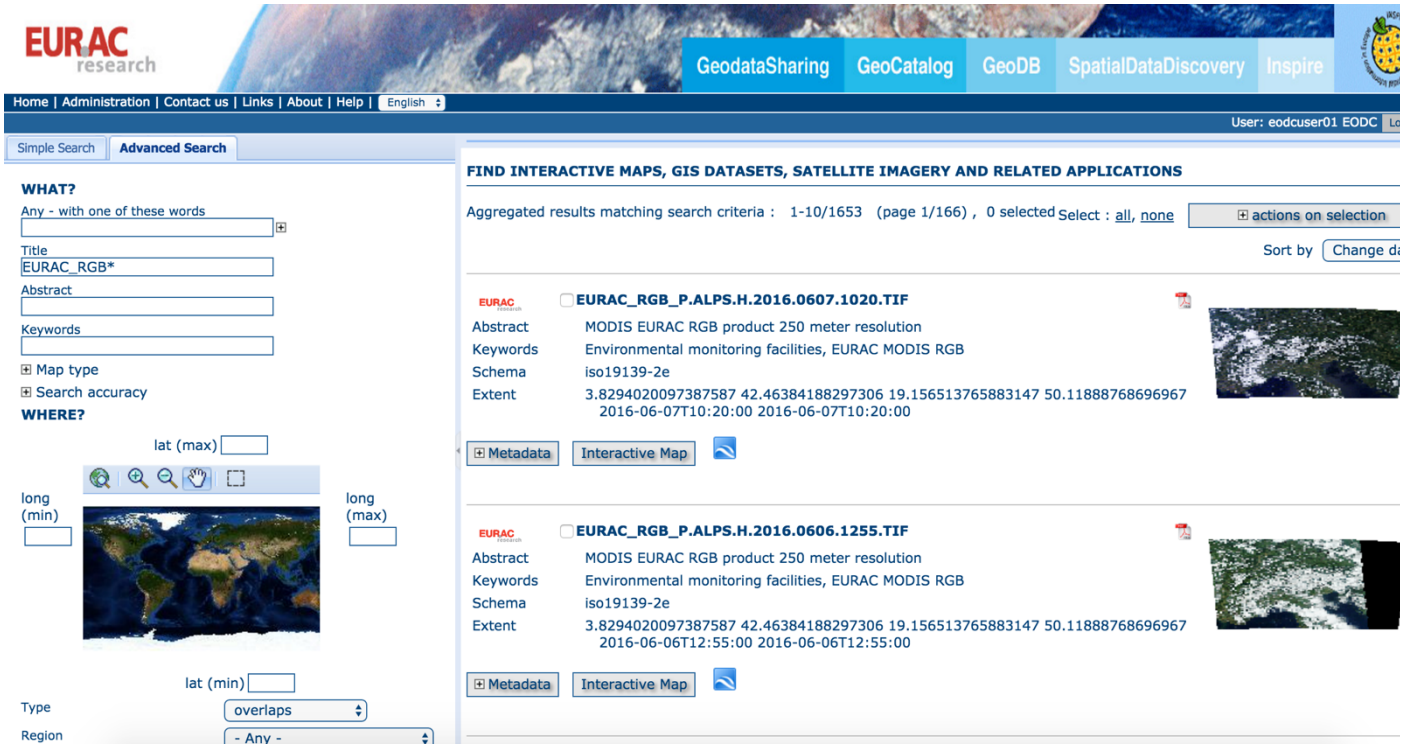
Modalita do acesso ai risultati:

5) Security

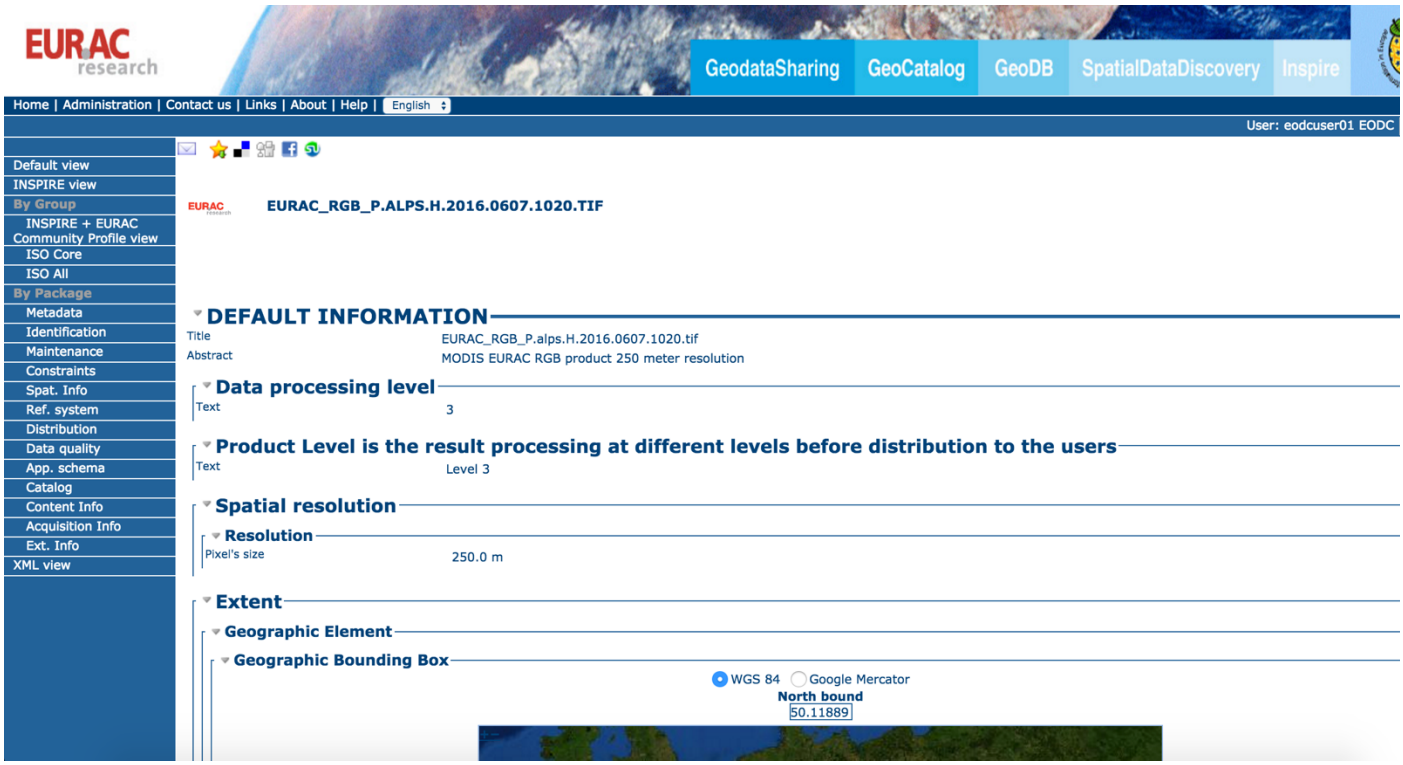
IMPORTANT: Please keep the provided credentials secretly.

6) APPENDIX 1.1

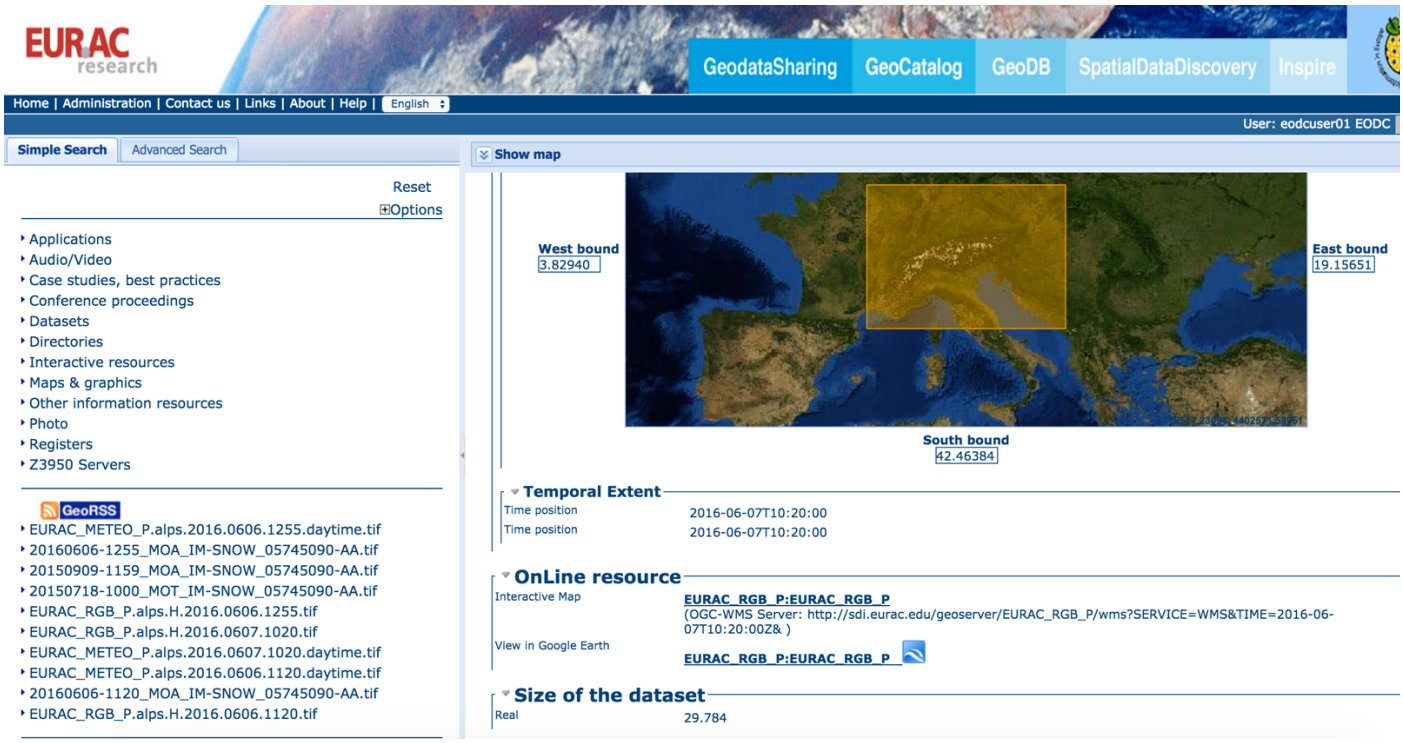
Advanced Search Dialog example query



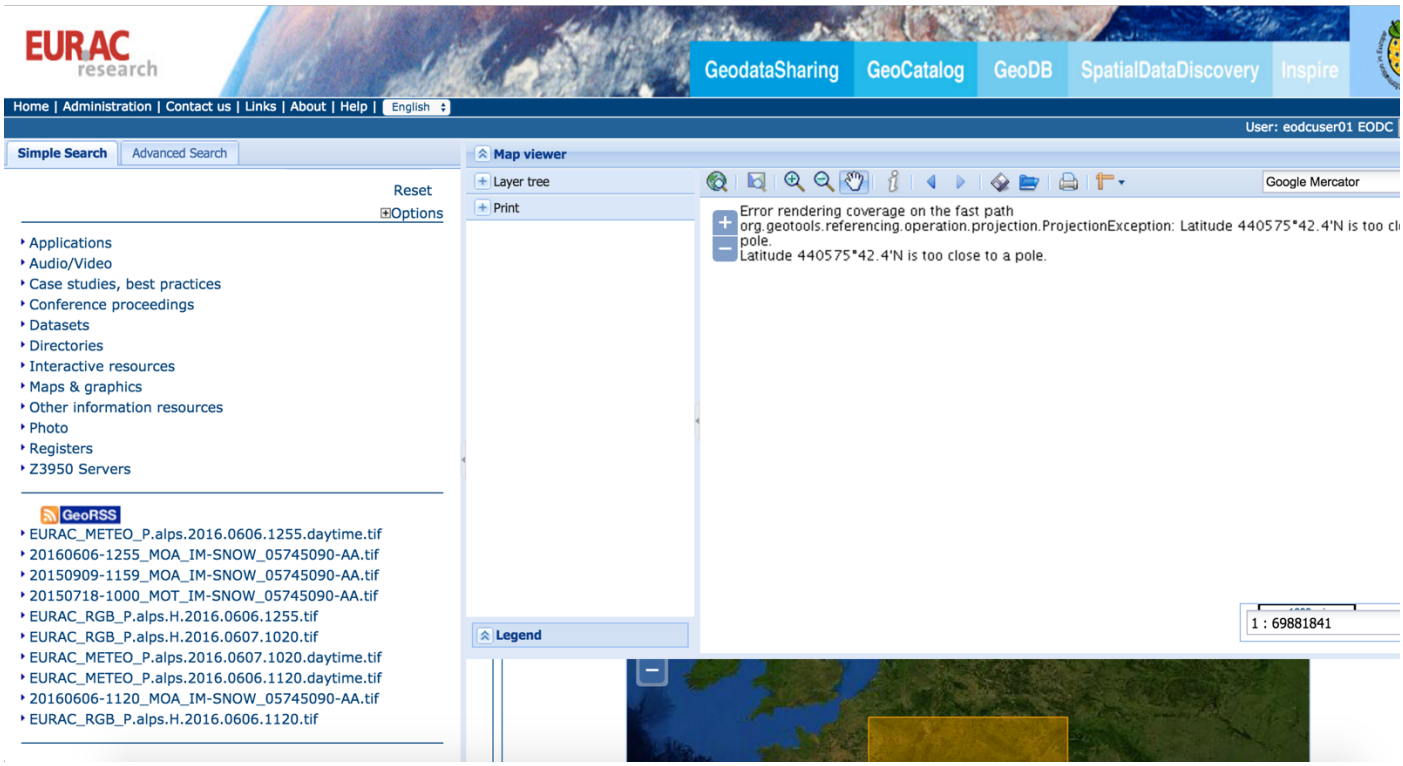
Metadata Result Detail



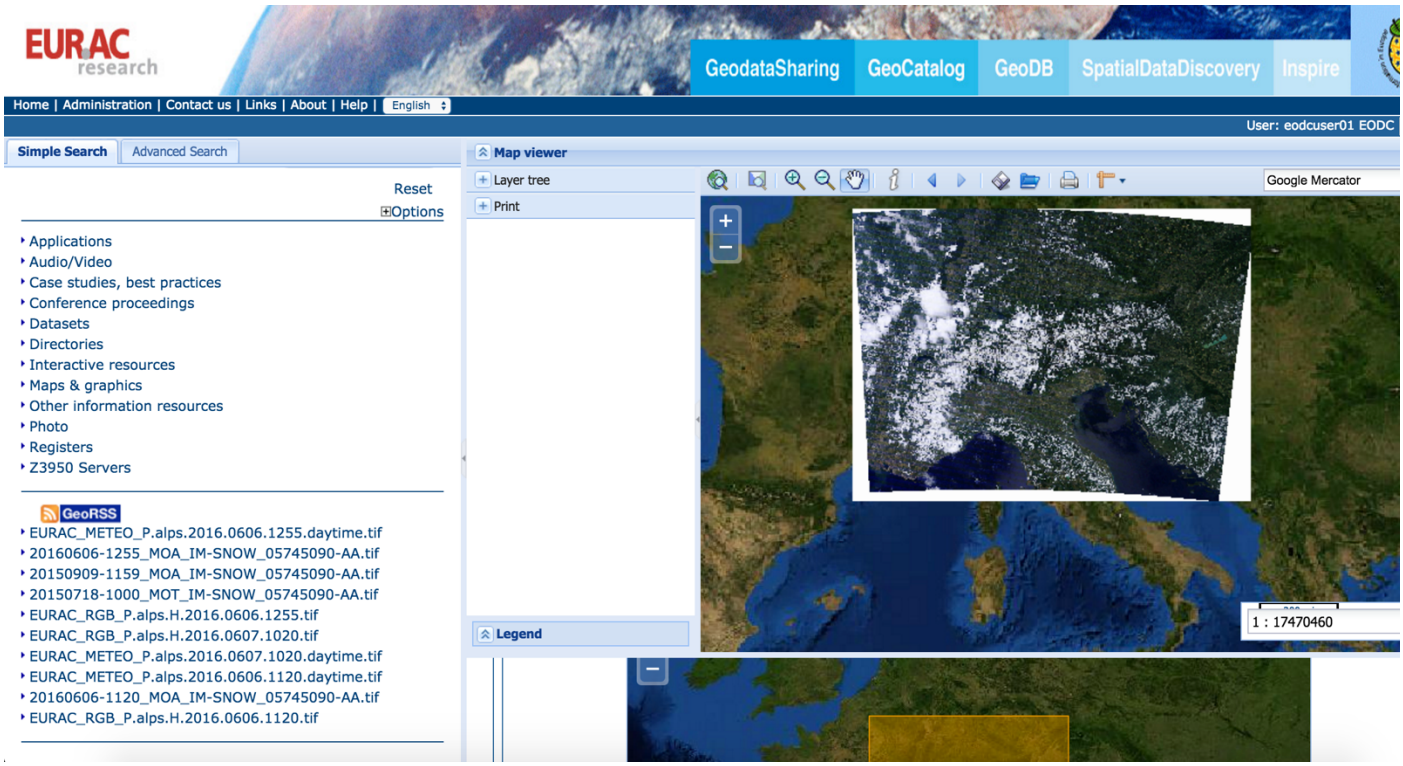
Data extend and “Online Resource”



IFF by clicking the “Online Resource” link you encounter this Error, please ZOOM IN the map, you should see the preview then



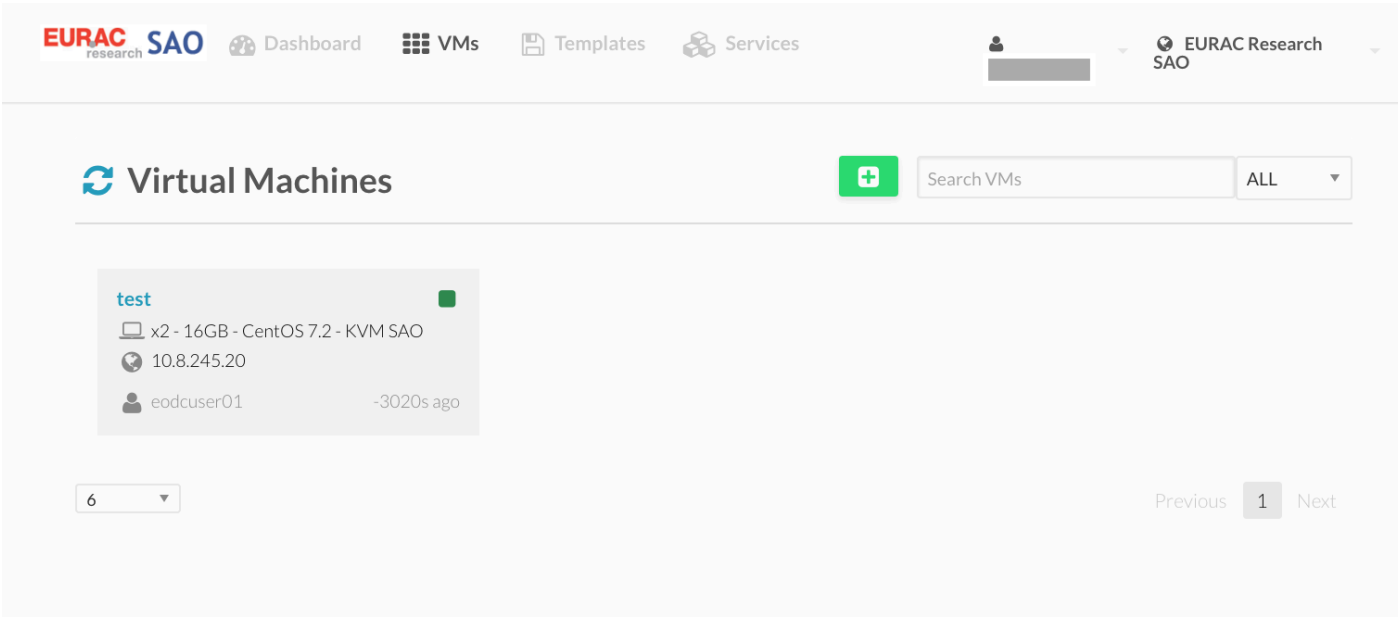
Data preview on Map via OCG services



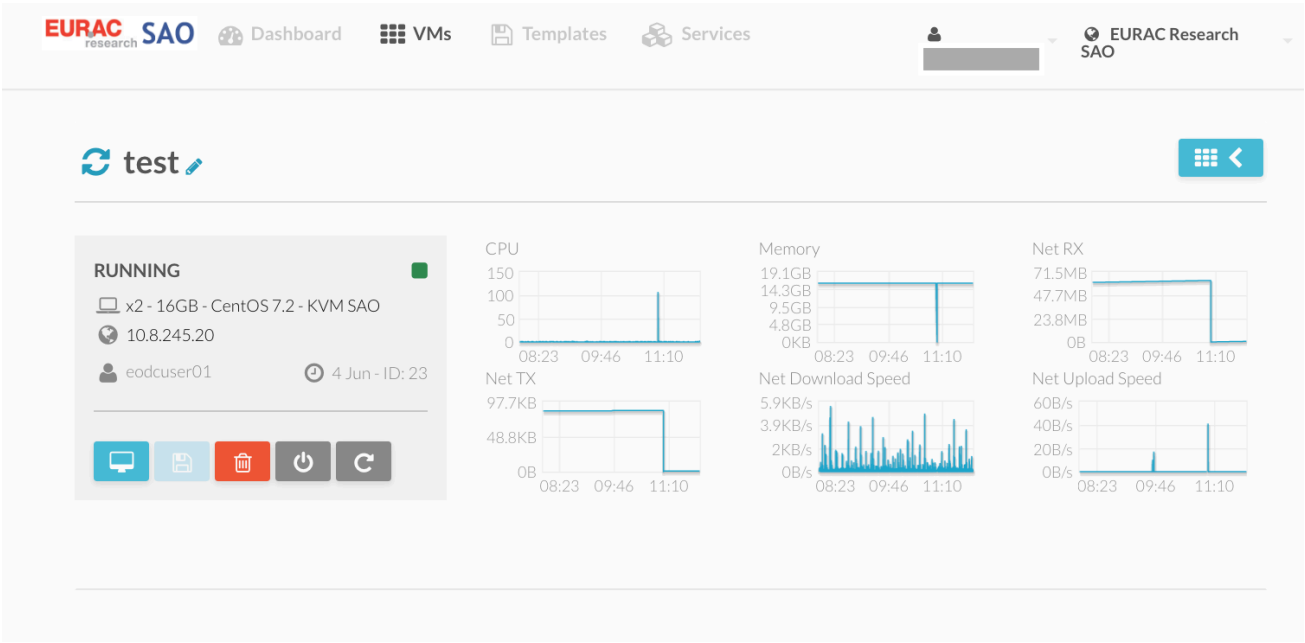
7) APPENDIX 2.1

SunStone Portal

Virtual Machine View



VM View Detail



Sunstone web enabled VNC Viewer