



This project has received funding from the European Union's Horizon2020-SPACE-2019 innovation action programme under grant agreement No 870373 - SnapEarth



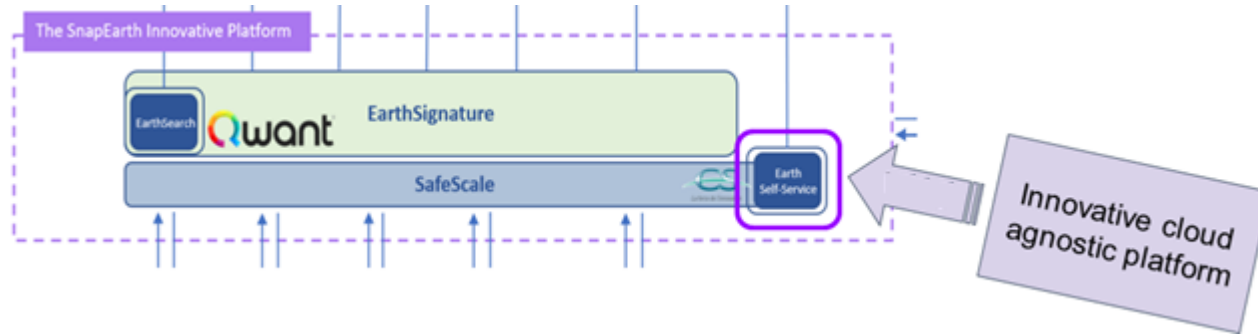
EarthSelf service

The AI and EO-ready Cloud agnostic and highly scalable environments for service development and exploitation

www.snapearth.eu

CS GROUP France
CS GROUP Romania

What is EarthSelf ?



EarthSelf Service is the proposed service enabling any service providers and the 4 SnapEarth Pilot projects to create new value-added services by offering them:

- ✓ The ability to deploy AI and EO-ready Cloud agnostic and highly scalable environments thanks to **SafeScale** solution
- ✓ To exploit the results of the **EarthSignature** database
- ✓ Additional services, as: dedicated web portal for hardware resource reservation, cloud comparator service, helpdesk portal and support, etc.

EarthSelf use case (the need)



- › A service provider wants to develop a new service or exploit an existing one. For that, he wants to benefit from cloud technologies to:
 - avoid expensive infrastructure Investments;
 - optimise its costs throughout its product lifecycle;
 - be able to face significant traffic ramp up.
- › But he is not familiar with Cloud technologies, Cloud offers, Cloud architecture, Cybersecurity etc. and has neither time nor money to dig in,
- › And he is scared of an asymmetrical relationship between the big Cloud providers and its company (vendor lock-in, IP grabbing etc.).

- › Independent comparison of Cloud providers for cost optimisation and time saving;
- › Deployment of cloud development/production environments with:
 - ✓ No vendor-lock-in (the environments are cloud agnostic);
 - ✓ Guaranteed service-level agreement;
 - ✓ Built-in infrastructure monitoring;
 - ✓ Built-in Secure user environments;
 - ✓ IT and EO thematic helpdesk.



Cloud/Data providers comparator



Infrastructure management



Network & Service securing

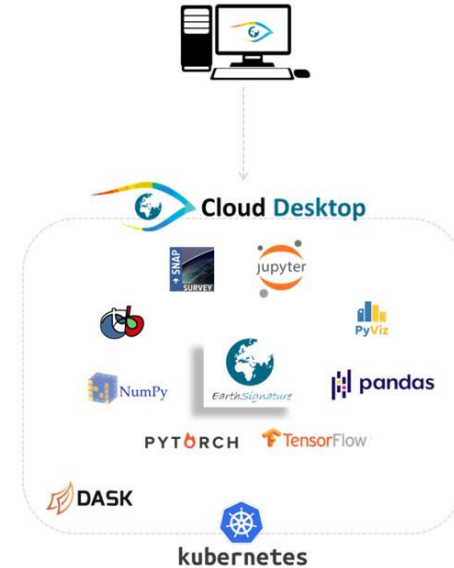


Multi-Cloud

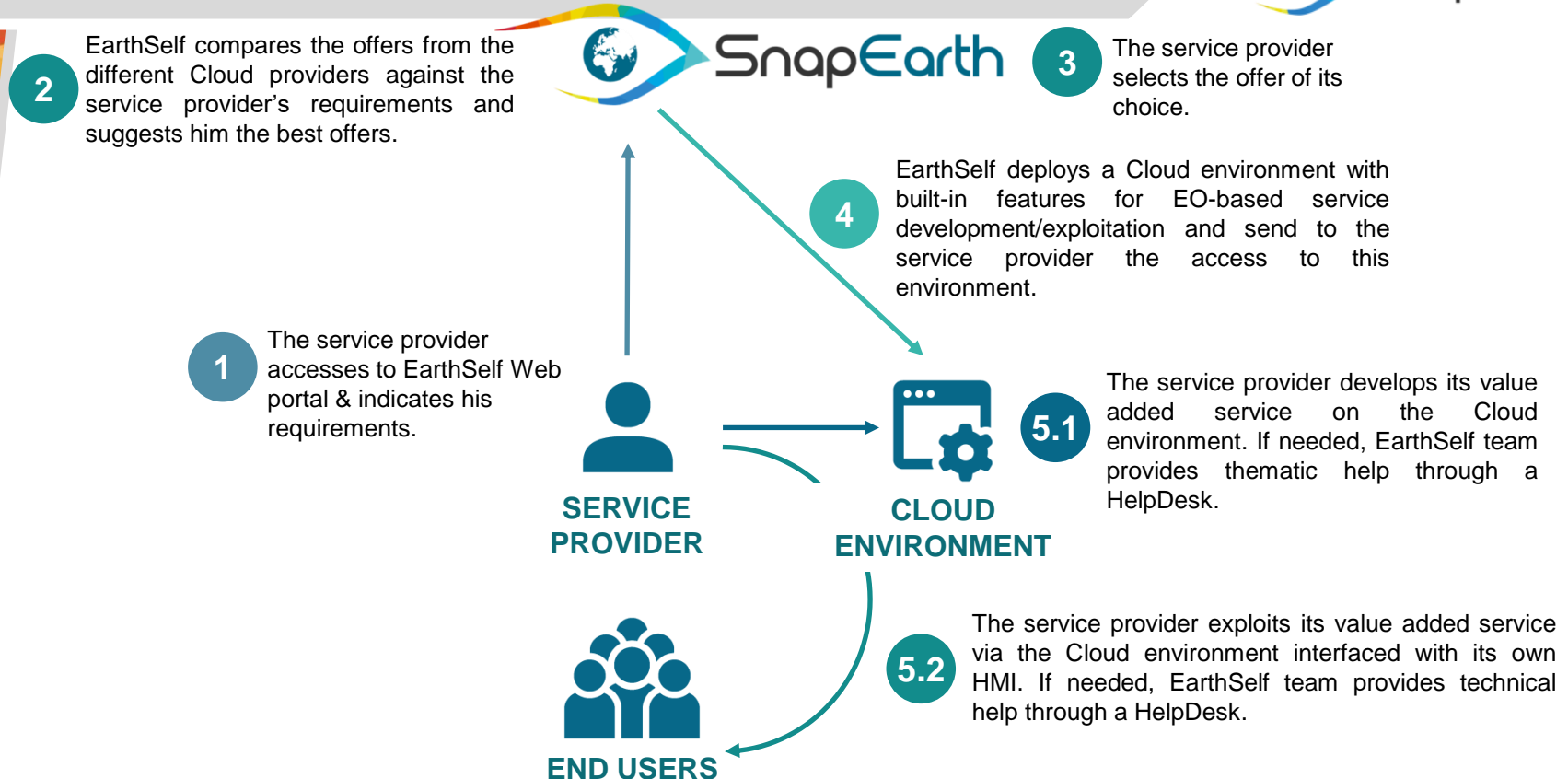
Cloud Desktop

SnapEarth offers optional Cloud Desktop service (if agreements) to provide users with a graphical environment:

- ✓ A Jupiter desktop to integrate several ready to use tools, such as EO image processing libraries
- ✓ Scientific data visualization to make data visualizations easier to use, learn and more powerful
- ✓ Datamining features for automatically searching large stores of data to discover patterns and trends that go beyond simple analysis
- ✓ Distributed computing with dask, for parallel and distributed computing
- ✓ More automatized deployment on cloud.
- ✓ AI / machine learning tools
- ✓ Human helpdesk with a support with qualified teams to help to build up European EO cloud projects

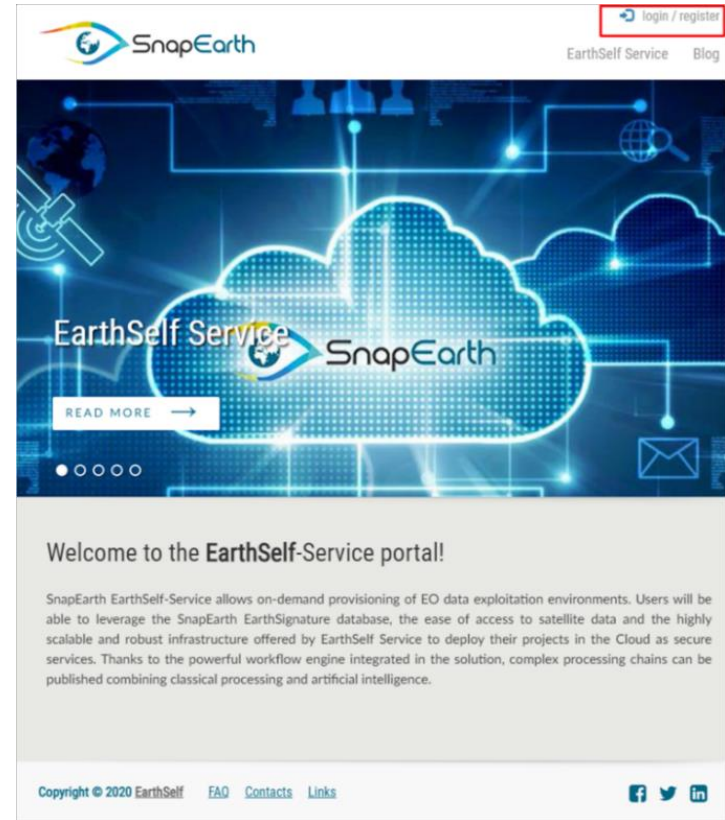


EarthSelf workflow



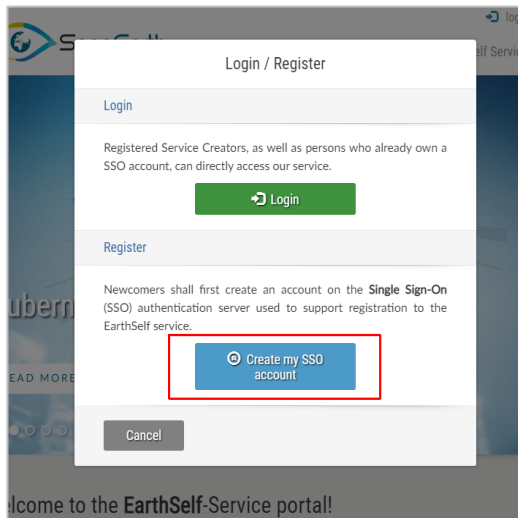
What is EarthSelf Portal ?

- Is an online system that Service Providers can use to manage their own EO value-added services using personal accounts.
- Enables them to submit customized requests based on their needs and to gain access to necessary information concerning cluster accessibility.



Accessing the EarthSelf Portal

EarthSelf Portal is a restricted area, the user must first register for an SSO account and then subscribe to EarthSelf services.



Login / Register

Login

Registered Service Creators, as well as persons who already own a SSO account, can directly access our service.

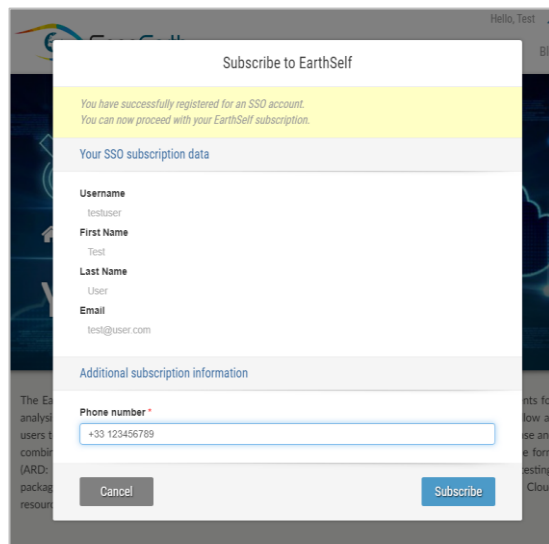
[Login](#)

Register

Newcomers shall first create an account on the **Single Sign-On (SSO)** authentication server used to support registration to the EarthSelf service.

[Create my SSO account](#)

[Cancel](#)



Subscribe to EarthSelf

You have successfully registered for an SSO account.
You can now proceed with your EarthSelf subscription.

[Your SSO subscription data](#)

Username
testuser

First Name
Test

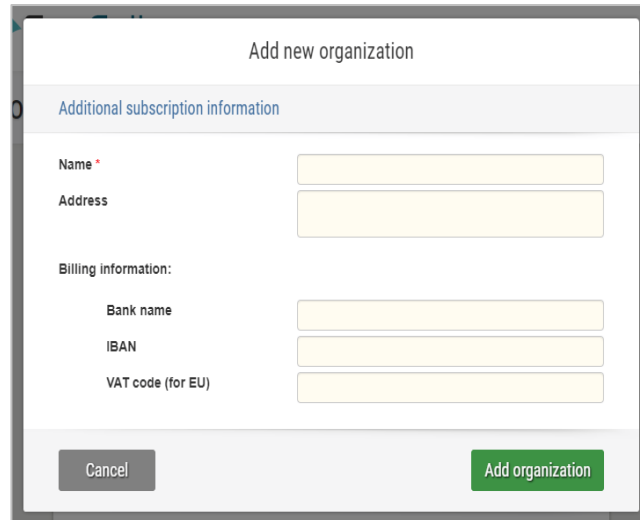
Last Name
User

Email
test@user.com

[Additional subscription information](#)

Phone number *
+33 123456789

[Cancel](#) [Subscribe](#)



Add new organization

[Additional subscription information](#)

Name *

Address

Billing information:

Bank name

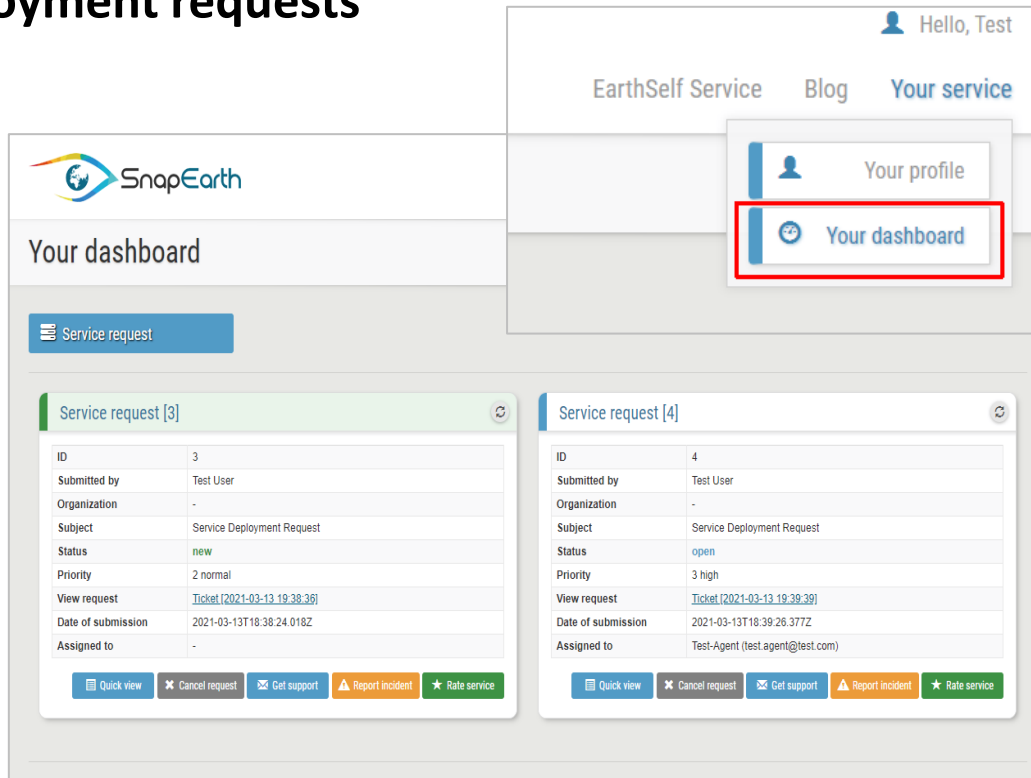
IBAN

VAT code (for EU)

[Cancel](#) [Add organization](#)

Service deployment requests

- Authenticated users have access to their service environment through “Your dashboard” portal section.
- Users can then manage their requests, get information about their status, request additional information or raise an issue if necessary.



The screenshot displays the EarthSelf service environment dashboard. At the top, the SnapEarth logo is visible. The user is logged in as 'Hello, Test'. The navigation bar includes links for 'EarthSelf Service', 'Blog', and 'Your service'. A dropdown menu for 'Your service' shows 'Your profile' and 'Your dashboard', with 'Your dashboard' highlighted by a red box. Below the navigation bar, the 'Your dashboard' section features a 'Service request' button. Two service request cards are displayed:

Service request [3]

ID	3
Submitted by	Test User
Organization	-
Subject	Service Deployment Request
Status	new
Priority	2 normal
View request	Ticket [2021-03-13 19:38:36]
Date of submission	2021-03-13T18:38:24.018Z
Assigned to	-

Actions: [Quick view](#) [Cancel request](#) [Get support](#) [Report incident](#) [Rate service](#)

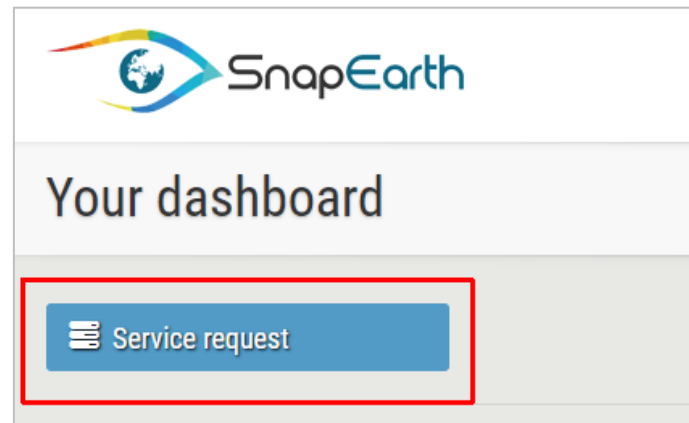
Service request [4]

ID	4
Submitted by	Test User
Organization	-
Subject	Service Deployment Request
Status	open
Priority	3 high
View request	Ticket [2021-03-13 19:39:39]
Date of submission	2021-03-13T18:39:26.377Z
Assigned to	Test-Agent (test.agent@test.com)

Actions: [Quick view](#) [Cancel request](#) [Get support](#) [Report incident](#) [Rate service](#)

Request a new service deployment

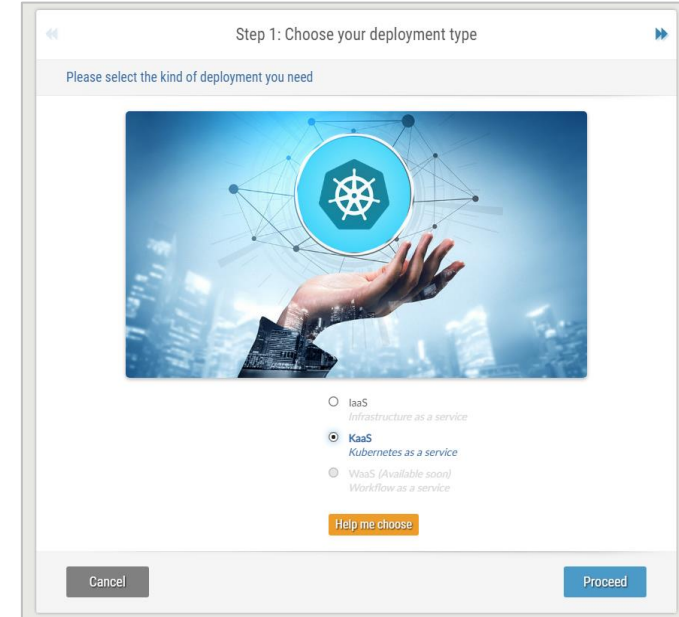
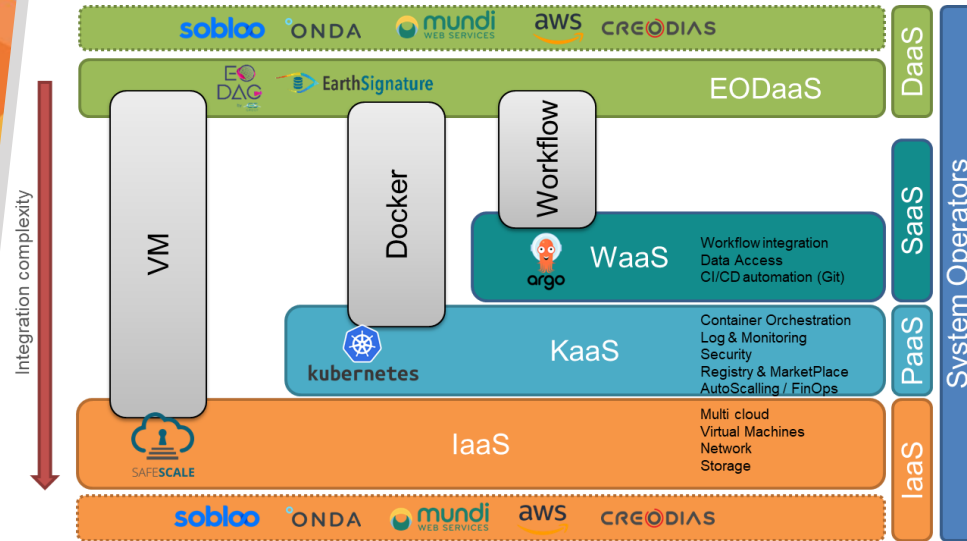
- User can access the Service Deployment Request and is guided through several steps:
 1. Choose the deployment type
 2. Set up your deployment type
 3. EO data information
 4. Customize search
 5. Select provider and machine configurations
 6. Review and submit the service deployment request



Managing EarthSelf service environment

1. Choose the deployment type

- User should choose the type of deployment: Infrastructure as service “IaaS” (Virtual Machines), or Kubernetes as a service “KaaS” (Docker), or Workflow as service “WaaS” (Workflow) ?

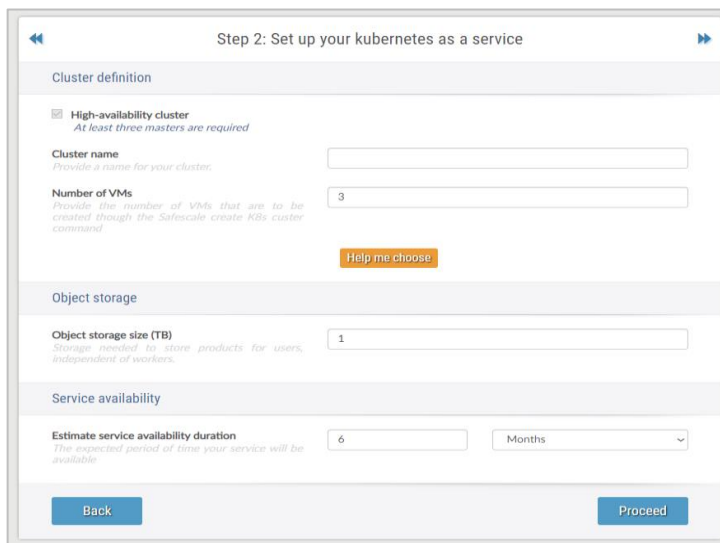


EarthSelf deployment type selection

Note: the WaaS option is not yet available for the moment

2. Set up your deployment type

- User can choose one of these two options (IaaS and KaaS) and be redirected to set up process according to the selected deployment type.



Step 2: Set up your kubernetes as a service

Cluster definition

☒ High-availability cluster
At least three masters are required

Cluster name
Provide a name for your cluster

Number of VMs
Provide the number of VMs that are to be created through the Safescale create K8s cluster command

Help me choose

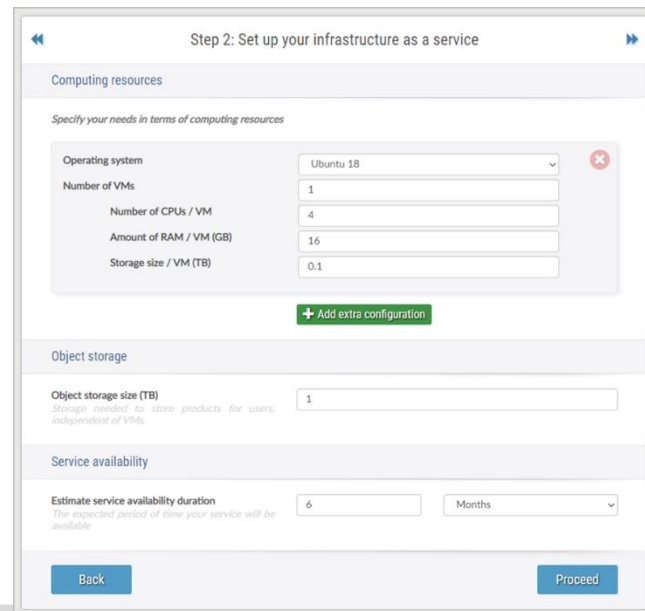
Object storage

Object storage size (TB)
Storage needed to store products for users, independent of workers

Service availability

Estimate service availability duration
The expected period of time your service will be available

Back Proceed



Step 2: Set up your infrastructure as a service

Computing resources

Specify your needs in terms of computing resources

Operating system: Ubuntu 18

Number of VMs: 1

Number of CPUs / VM: 4

Amount of RAM / VM (GB): 16

Storage size / VM (TB): 0.1

+ Add extra configuration

Object storage

Object storage size (TB)
Storage needed to store products for users, independent of VMs

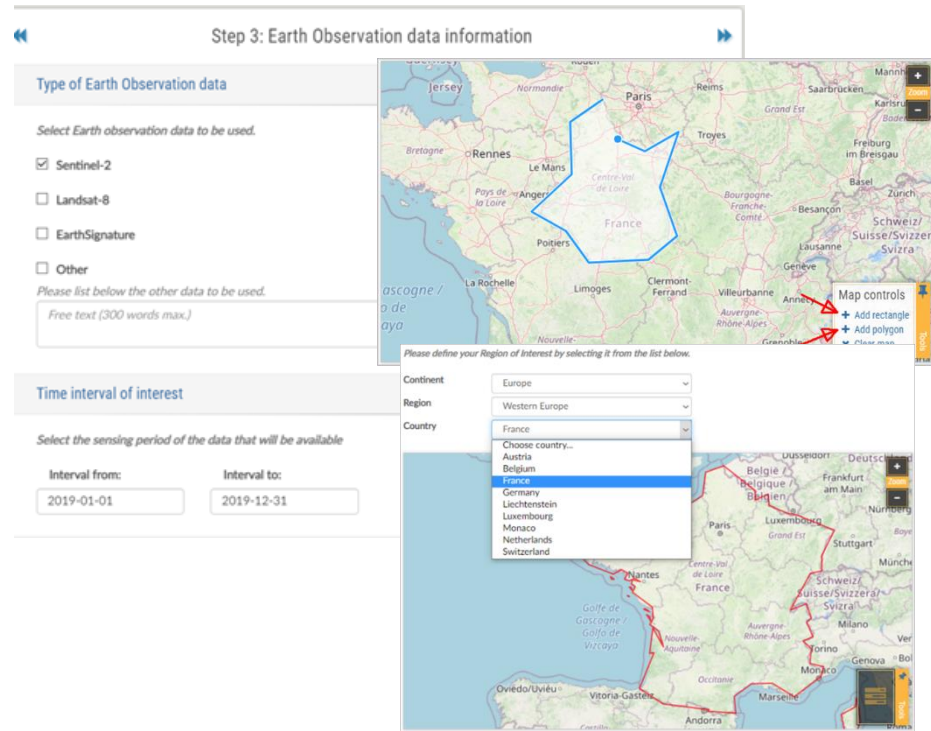
Service availability

Estimate service availability duration
The expected period of time your service will be available

Back Proceed

3. EO data information

- User must provide information about:
 - **EO data to be used:** can select:
 - ☐ Sentinel-2
 - ☐ Landsat-8
 - ☐ EarthSignature database
 - **Time interval of interest:** can provide an interval of time defining the sensing period of the data that will be available.
 - **Region of interest:** can define the region of interest for the EO data, using an interactive map



Step 3: Earth Observation data information

Type of Earth Observation data

Select Earth observation data to be used.

- ☒ Sentinel-2
- ☐ Landsat-8
- ☐ EarthSignature
- ☐ Other

Please list below the other data to be used.

Free text (300 words max.)

Time interval of interest

Select the sensing period of the data that will be available

Interval from: 2019-01-01 Interval to: 2019-12-31

Please define your Region of interest by selecting it from the list below.

Continent: Europe

Region: Western Europe

Country: France

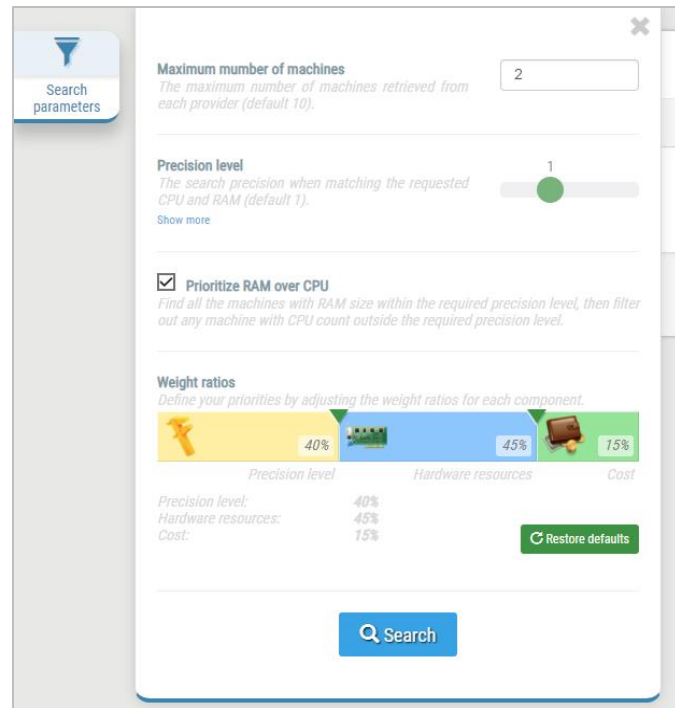
Choose country...

- Austria
- Belgium
- France
- Germany
- Liechtenstein
- Luxembourg
- Monaco
- Netherlands
- Switzerland

4. Customize search

- User can configure the Suggest Engine search algorithm and select a provider from the returned list

The Suggest Engine is an algorithm that searches for virtual machines from several cloud providers, machines that satisfy the configuration requirements defined by the user.



The screenshot shows a 'Search parameters' dialog box with the following settings:

- Maximum number of machines:** 2 (The maximum number of machines retrieved from each provider (default 10)).
- Precision level:** 1 (The search precision when matching the requested CPU and RAM (default 1)). A 'Show more' link is present.
- ☒ **Prioritize RAM over CPU:** Find all the machines with RAM size within the required precision level, then filter out any machine with CPU count outside the required precision level.
- Weight ratios:** Define your priorities by adjusting the weight ratios for each component.
 - Precision level:** 40% (represented by a wrench icon)
 - Hardware resources:** 45% (represented by a server rack icon)
 - Cost:** 15% (represented by a wallet icon)

Below the weight ratios, a summary table is displayed:

Precision level:	40%
Hardware resources:	45%
Cost:	15%

A 'Restore defaults' button is located at the bottom right of the weight ratios section. A 'Search' button is at the bottom of the dialog box.

Managing EarthSelf service environment

5. Select provider and machine configurations (1/3)

The Suggest Engine results are grouped in two categories:

- Cloud providers
- Virtual machines

Each provider in the returned list is depicted as a container which functions as a shopping cart

Step 4: Providers and costs estimation

Search results

	OS	CPU	RAM	Storage	Cost
configuration_1 x 1	Ubuntu 18	x 4	16 GB	102 GB	Estimated price / VM
CREODIAS	Ubuntu 18	x 4	16 GB	64.00 GB HDDR 38.00 GB HDD	Flavor (vCPU) € 538.80 Storage € 15.12 Total: € 547.92
CREODIAS	Ubuntu 18	x 4	16 GB	64.00 GB HDDR 38.00 GB HDD	Flavor (vCPU) € 672.36 Storage € 15.12 Total: € 681.48
OVH	Ubuntu 18.04	x 4	15 GB	100.00 GB SSD 2.00 GB HDD	Flavor (vCPU) € 252.00 Storage € 10.47 Total: € 252.47
OVH	Ubuntu 18.04	x 4	15 GB	100.00 GB SSD 2.00 GB HDD	Flavor (vCPU) € 372.00 Storage € 10.47 Total: € 372.47
mundi	Ubuntu 18.04	x 4	16 GB	102.00 GB SATA	Flavor (vCPU) € 877.51 Storage € 28.15 Total: € 905.66
mundi	Ubuntu 18.04	x 4	16 GB	102.00 GB SATA	Flavor (vCPU) € 877.51 Storage € 28.15 Total: € 905.66
configuration_2 x 3	Centos 7	x 16	64 GB	512 GB	Estimated price / VM
CREODIAS	CentOS 7	x 16	64 GB	256.00 GB HDDR 256.00 GB HDD	Flavor (vCPU) € 2,689.44 Storage € 61.44 Total: € 2,750.88
OVH	Centos 7	x 16	60 GB	400.00 GB SSD 112.00 GB HDD	Flavor (vCPU) € 990.00 Storage € 26.21 Total: € 1,016.21

CREODIAS
€ 0

OVH
€ 0

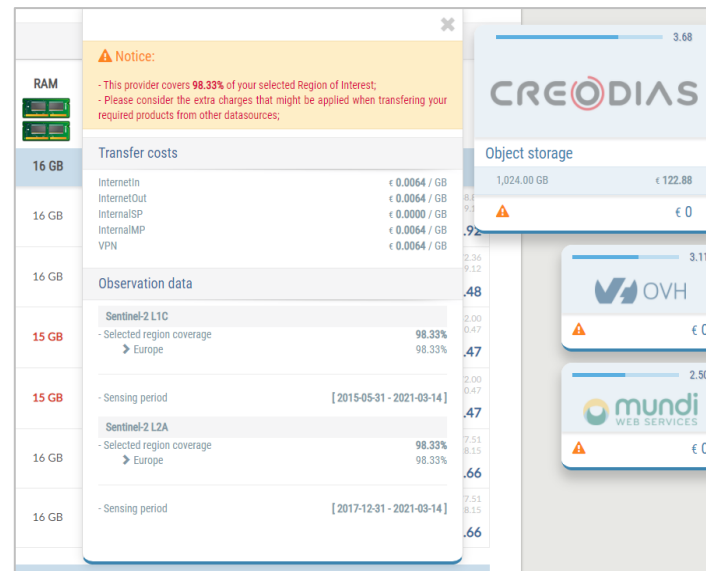
mundi
€ 0

5. Select provider and machine configurations (2/3)

i. Cloud providers

- The provider details panel displays information related to EO data request:
 - ✓ Region coverage, sensing period requirement not being satisfied or extra costs due to certain provider limitations.
 - ✓ Transfer costs.

The user must take into consideration these extra costs, which are not reflected in the final estimation cost for the request.



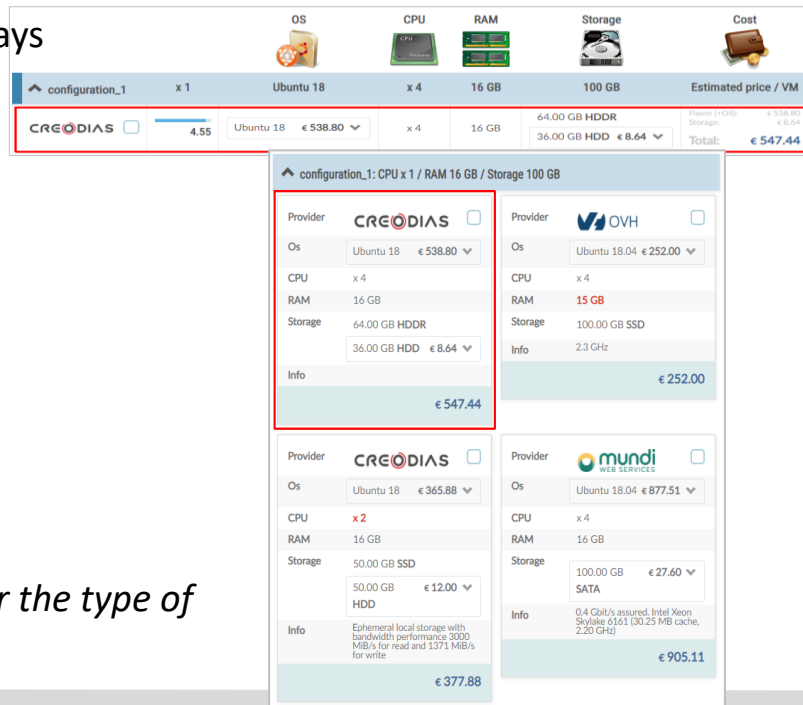
The screenshot displays a configuration panel for a cloud provider. It includes a 'Notice' section with a warning icon and text: '- This provider covers 98.33% of your selected Region of Interest; - Please consider the extra charges that might be applied when transferring your required products from other datasources;'. Below this, there are sections for 'Transfer costs' and 'Observation data'. The 'Transfer costs' section lists various services and their costs per GB: Internetin (€ 0.0064 / GB), InternetOut (€ 0.0064 / GB), InternalSP (€ 0.0000 / GB), InternalMP (€ 0.0064 / GB), and VPN (€ 0.0064 / GB). The 'Observation data' section shows details for Sentinel-2 L1C and Sentinel-2 L2A, including region coverage (98.33% for Europe) and sensing periods ([2015-05-31 - 2021-03-14] and [2017-12-31 - 2021-03-14]). On the right side, there are panels for 'Object storage' (CREODIAS) and 'Web services' (OVH and mundi WEB SERVICES), each showing a warning icon and a cost of € 0.

5. Select provider and machine configurations (3/3)

ii. Virtual machines

- Virtual machines can be displayed in two different ways
- Each row/card provides information about:
 - ✓ Cloud provider logo/name;
 - ✓ Suggest Engine score;
 - ✓ Operating system;
 - ✓ CPUs count;
 - ✓ Additional hardware information;
 - ✓ Amount of RAM;
 - ✓ Storage;
 - ✓ Estimated cost for selection;

If necessary, the user can change the operating system or the type of extra storage



The screenshot displays a configuration interface for virtual machines. At the top, there are icons for OS, CPU, RAM, Storage, and Cost. Below these, a table shows the configuration for 'configuration_1' (x 1) with Ubuntu 18, x 4 CPUs, 16 GB RAM, and 100 GB Storage. The estimated price per VM is € 547.44. A red box highlights the 'CREODIAS' provider configuration, which includes Ubuntu 18, x 4 CPUs, 16 GB RAM, 64.00 GB HDD, and 36.00 GB HDD for a total cost of € 547.44. Below this, two other configurations are shown: one for 'OVH' (Ubuntu 18.04, x 4 CPUs, 15 GB RAM, 100.00 GB SSD, 2.3 GHz, € 252.00) and one for 'mundi' (Ubuntu 18.04, x 4 CPUs, 16 GB RAM, 100.00 GB SATA, 0.4 GB/s assumed, Intel Xeon Skylake 6161 (30.25 MB cache, 2.20 GHz), € 905.11).

Configuration	OS	CPU	RAM	Storage	Estimated price / VM
configuration_1	Ubuntu 18	x 4	16 GB	100 GB	€ 547.44
configuration_1: CPU x 1 / RAM 16 GB / Storage 100 GB	Ubuntu 18	x 4	16 GB	64.00 GB HDD, 36.00 GB HDD	€ 547.44
configuration_1: CPU x 1 / RAM 16 GB / Storage 100 GB	Ubuntu 18.04	x 4	15 GB	100.00 GB SSD, 2.3 GHz	€ 252.00
configuration_1: CPU x 1 / RAM 16 GB / Storage 100 GB	Ubuntu 18.04	x 4	16 GB	100.00 GB SATA, 0.4 GB/s assumed, Intel Xeon Skylake 6161 (30.25 MB cache, 2.20 GHz)	€ 905.11

6. Review and submit the request form

- If the user is satisfied with the selection, he/she can move to the last step, reviewing and submitting the request, after the agreement with the Terms and conditions

Summary information on your service request

This is a collection of information that you have selected.

Deployment setup request

Deployment type
Selected deployment: **IaaS**

Computing resources
Configuration 1: **1 x [4 CPUs, 16 GB RAM, 0.0977 TB storage], Ubuntu 18**
Configuration 2: **3 x [16 CPUs, 64 GB RAM, 0.5 TB storage], Ubuntu 18**

Object storage
Object storage size: **1 TB**

Service availability
Estimate service availability duration: **6 months**

Earth Observation data information

Type of Earth Observation data
Sentinel-2: **Yes**
Landsat-8: **No**
EarthSignature: **No**
Other: **-**

Sensing period
From: **2019-01-01**
To: **2019-12-31**

Region of interest
Selected region: **France**

Provider selection

Provider	Count	OS	CPU	RAM	Storage	Estimated Cost [EUR]
CreoDIAS	x 1	SuSE 12	x4	16 GB	64.00 GB HDDR 36.00 GB SSD	582.48
CreoDIAS	x 3	Ubuntu 18	x16	64 GB	256.00 GB HDDR 256.00 GB HDD	8,252.64
CreoDIAS		Object storage			1.00 TB	122.88
TOTAL						8,958.00

☒ I have read and agree to the Terms and conditions.

[Back and edit](#) [Submit the request](#)

Follow the service request (1/2)

- Following the link provided in each card on the dashboard, the user can inspect each request status and the responses from helpdesk service.

Service request [4]

ID	4
Submitted by	Test User
Organization	-
Subject	Service Deployment Request
Status	open
Priority	3 high
View request	Ticket [2021-03-13 19:39:39]
Date of submission	2021-03-13T18:39:26.377Z
Assigned to	User Agent (user.agent@test.com)

Quick viewCancel requestGet supportReport incidentRate service

Managing EarthSelf service environment



Follow the service request (2/2)

- The service request page is similar to the summary information page on the request form.
- Any help provided by the helpdesk service is displayed at the bottom of the page.

Summary information on your service request

This is a collection of information that you have selected.

Deployment setup request

Deployment type Selected deployment	KaaS
Your cluster definition High-availability cluster	Yes
Cluster name	ESDCluster
Number of workers	3
Object storage Object storage size	1 TB
Service availability Estimate service availability duration	6 months

Earth Observation data information

Type of Earth Observation data Sentinel-2	Yes
Landuse-8	Yes
Earthsignature	No
Other	-
Sensing period From	2019-01-01
To	2019-12-31
Region of interest Selected region	User custom selection

Provider selection

Provider	Count	OS	CPU	RAM	Storage	Estimated Cost
mundi	x 3	Ubuntu 18.04	x 4	16 GB	102.40 GB SATA	€ 2,717.31
mundi	Object storage				1 TB	€ 133.94
TOTAL						€ 2,851.25

Close

Support

User Agent wrote [2021-03-13T18:41:23.223Z]:

Your request has been processed.
Further information will be provided once the cluster creation has been completed.

Various links for EarthSelf



- EarthSelf web portal public link will be available soon:
<https://snapearth.csgroup.space>
- The user manual of EarthSelf service “D4.2 EarthSelf Service Portal V1”:
<https://snapearth.eu/resources/deliverables>
- EarthSelf Video:
https://www.youtube.com/watch?v=tiwNm8qZvio&feature=emb_title

- Project website: <https://snapearth.eu/>
- EarthSelf website: <https://snapearth.csgroup.space>
- Newsletter: <https://snapearth.eu/resources/newsletters>
- Social Media:
 - Facebook: <https://www.facebook.com/SnapEarth-101390444737532/>
 - Twitter: https://twitter.com/Snap_Earth
 - LinkedIn: <https://www.linkedin.com/showcase/snapearth/>
- General questions: contact@snapearth.eu
- Specific solutions:
 - EarthSelf CS GROUP France team: yasmine.boulfani@csgroup.eu & sebastien.besombes@csgroup.eu
 - EarthSelf CS GROUP Romania team: nicu.stancioi@c-s.ro & kraftek@c-s.ro & cosmin.udroiu@c-s.ro



Co-financed by the Connecting Europe
Facility of the European Union



Thank you

www.snapearth.eu



ORTA DOĞU TEKNİK ÜNİVERSİTESİ
MIDDLE EAST TECHNICAL UNIVERSITY

absiskey
INNOVATION SPIRIT

isardSAT[®]



CERTH
CENTRE FOR
RESEARCH & TECHNOLOGY
HELLAS



CS
GROUP

CS
ROMANIA