

OSCAR

A Virtual Research Environment (VRE) for
event-driven data-processing applications



[↗ oscar.grycap.net](https://oscar.grycap.net)

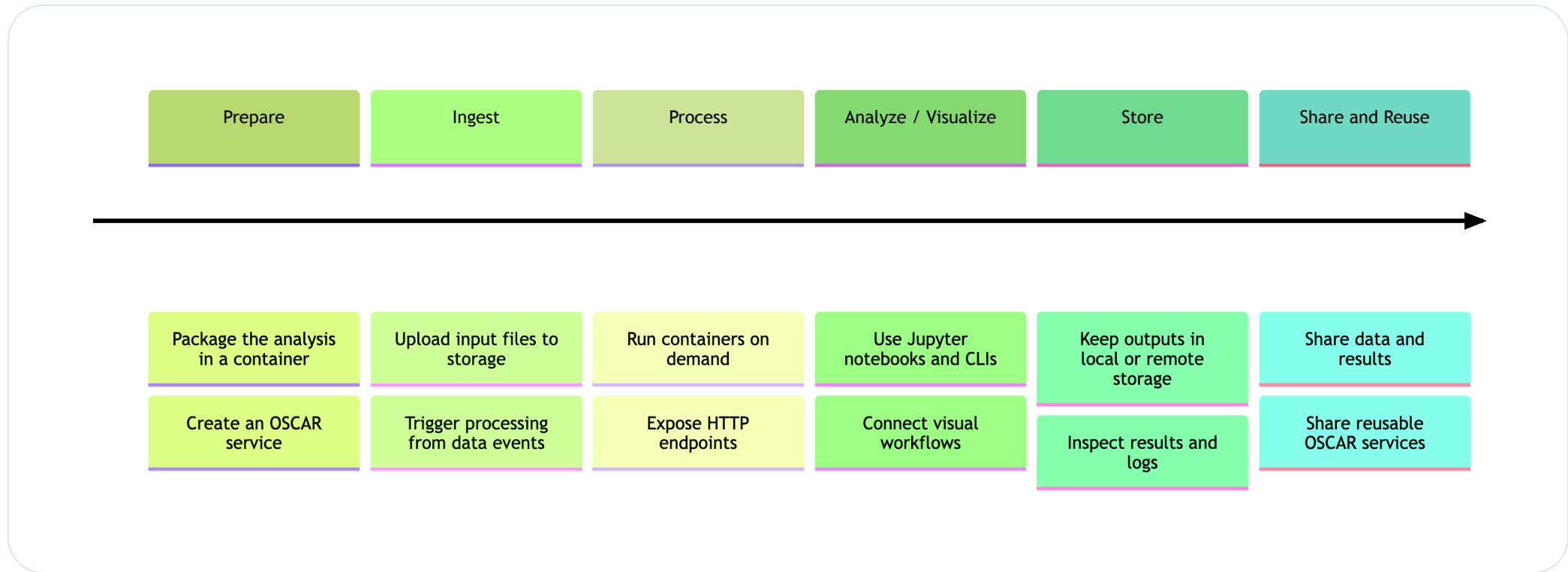
What OSCAR gives you

- A simple way to run container-based data-processing applications
- Event-driven execution from file uploads
- HTTP endpoints for scalable interactive use cases
- Deployment of user-facing services for data processing (e.g. Jupyter Notebooks)
- A multi-tenant platform that handles the execution details for you

Key idea:

Bring your container and your logic, then let OSCAR run it on demand

OSCAR in the data lifecycle



OSCAR helps connect the practical steps around a data-processing application.

Why consider OSCAR?

Without OSCAR

Build triggers, queues, scaling, and endpoints yourself

Scripts tied to a VM, notebook, or machine

Repeating the same task becomes manual work

Sharing a workflow with others takes extra setup

With OSCAR

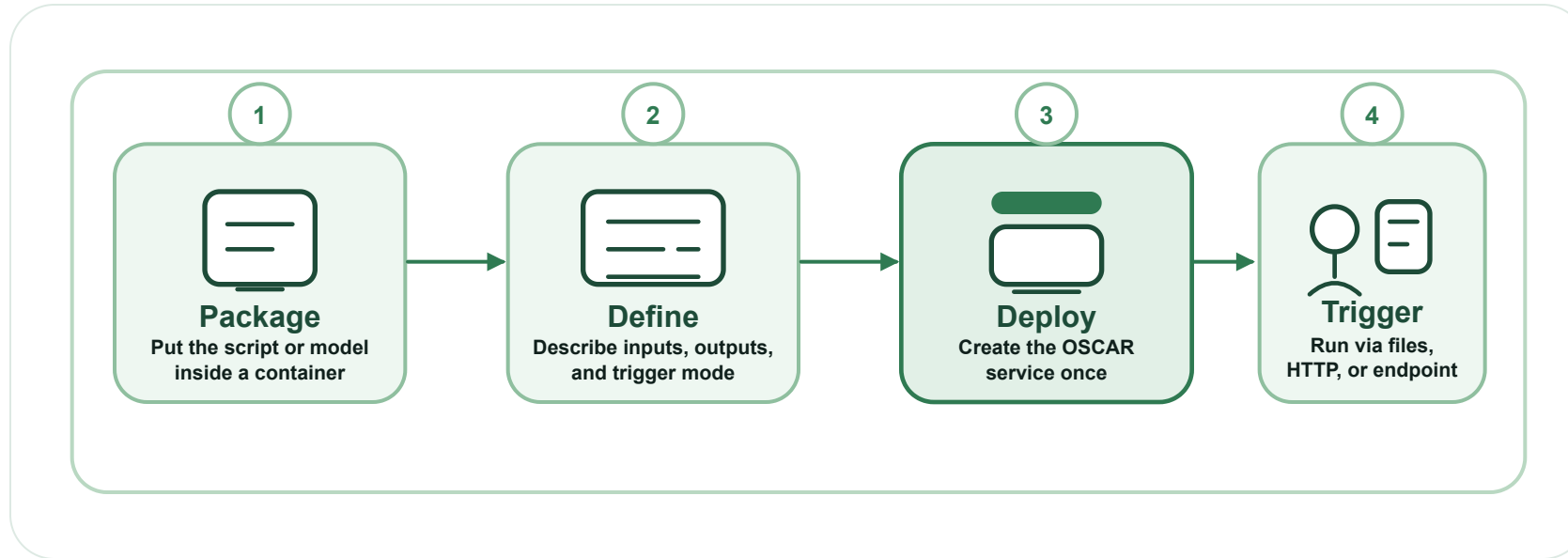
Let the platform handle triggering, execution, scaling, and routing

Turn the same logic into a reusable service

Process many inputs automatically and in parallel

Expose the same service through files, HTTP, or a public endpoint

From script to service



The same tool can then be reused by you or by others without rebuilding the service.

Result:

A data-processing tool becomes a service others can run on demand

When OSCAR fits well

Good fit

Many independent files to process

Tools already packaged in containers

APIs that should scale on demand

Interactive user-facing services such as notebooks

Less ideal

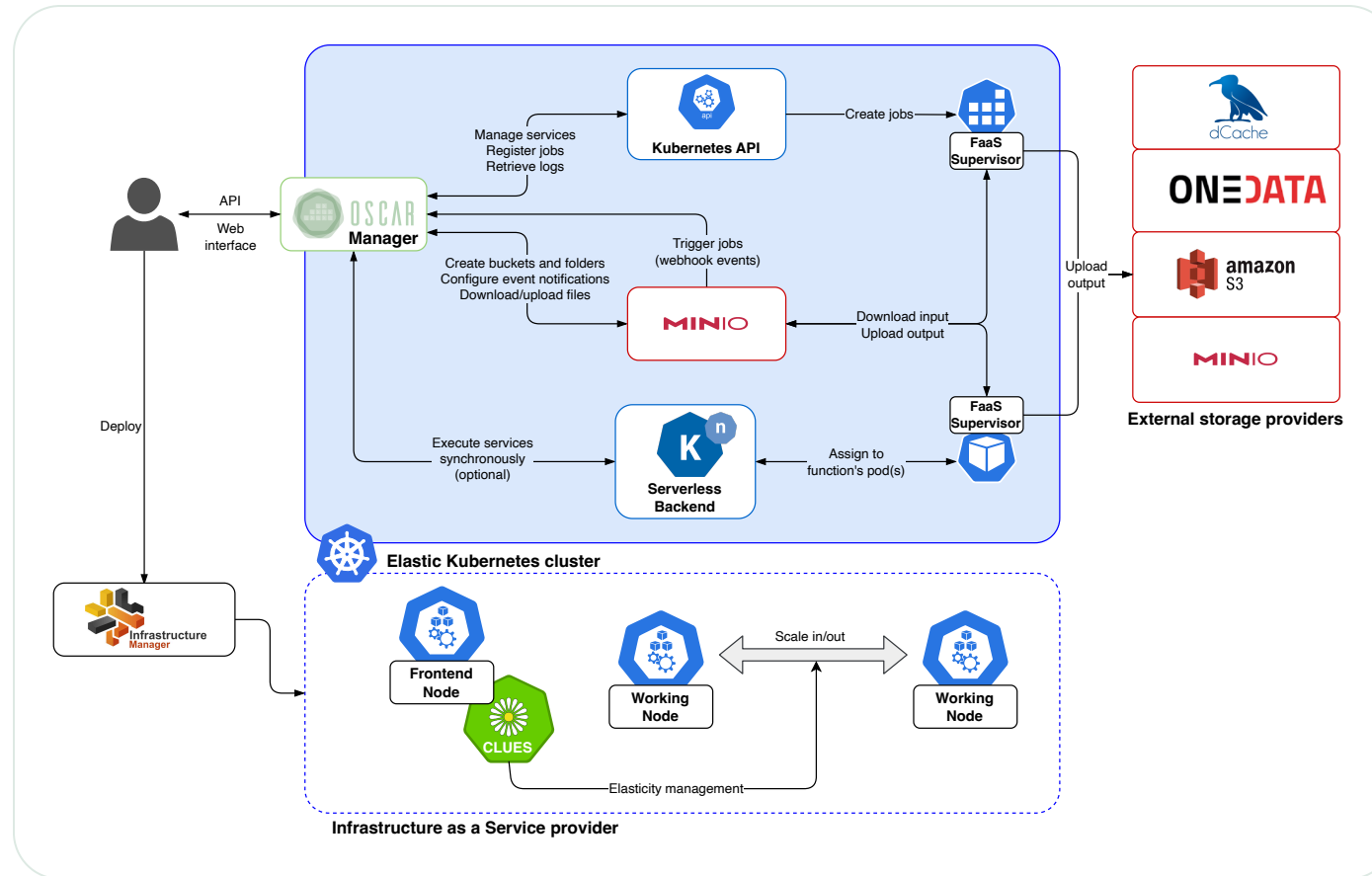
One tightly coupled long-running application

Workloads with jobs that require interconnection

Complex systems with many always-on internal dependencies

Cases where event-driven or service-based execution is not needed

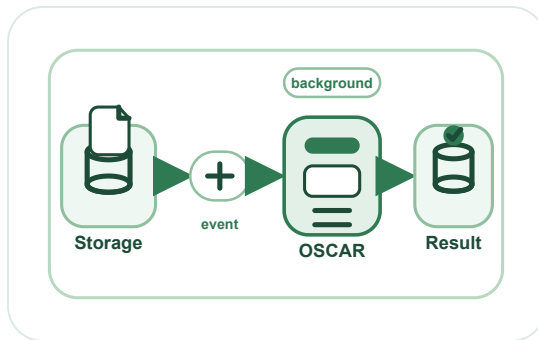
OSCAR architecture



Connects storage, events, containers and results in one platform.

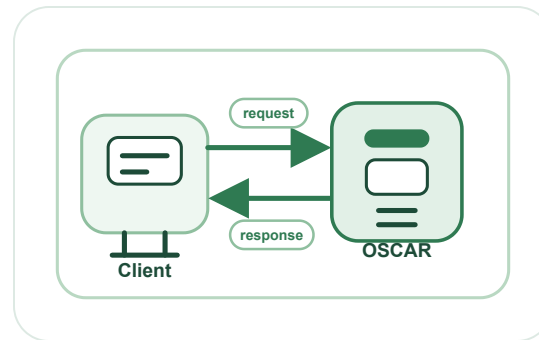
Three ways to offer a service

Async



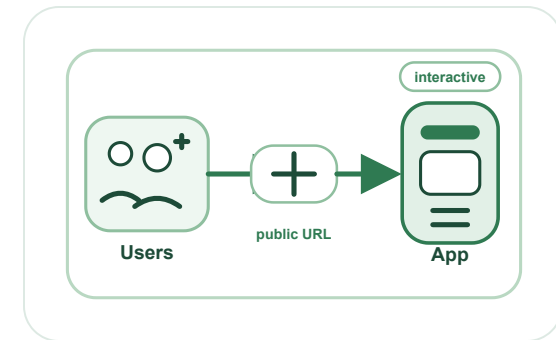
Upload files to storage and let OSCAR react to each event in the background.

Sync



Send an HTTP request and receive the result back in the same call.

Exposed



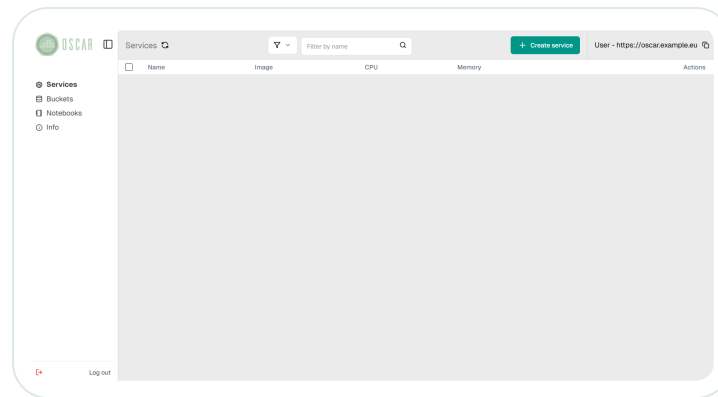
Publish a public endpoint for interactive tools such as notebooks or web apps.

Main benefits

- **Less infrastructure work:** focus on the application, not the cluster
- **Container-friendly:** reuse software packaged in Docker images
- **Scales with demand:** from occasional jobs to larger workloads
- **Multiple ways to interact:** Dashboard, API and CLI
- **Open source:** transparent, portable and adaptable

Multiple interfaces

Dashboard



CLI



API

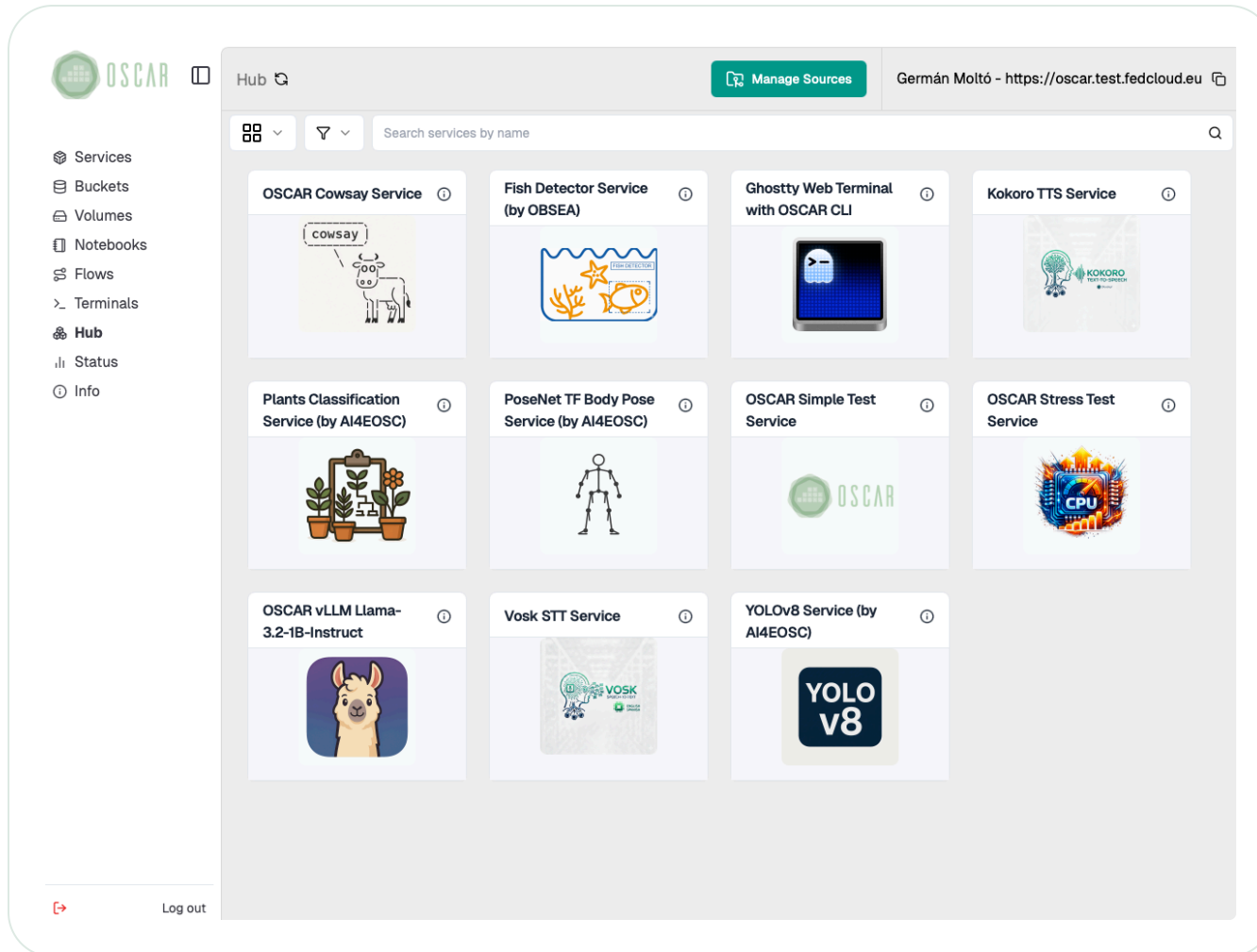


Explore services, inputs, outputs, and logs

Automate and reproduce deployments

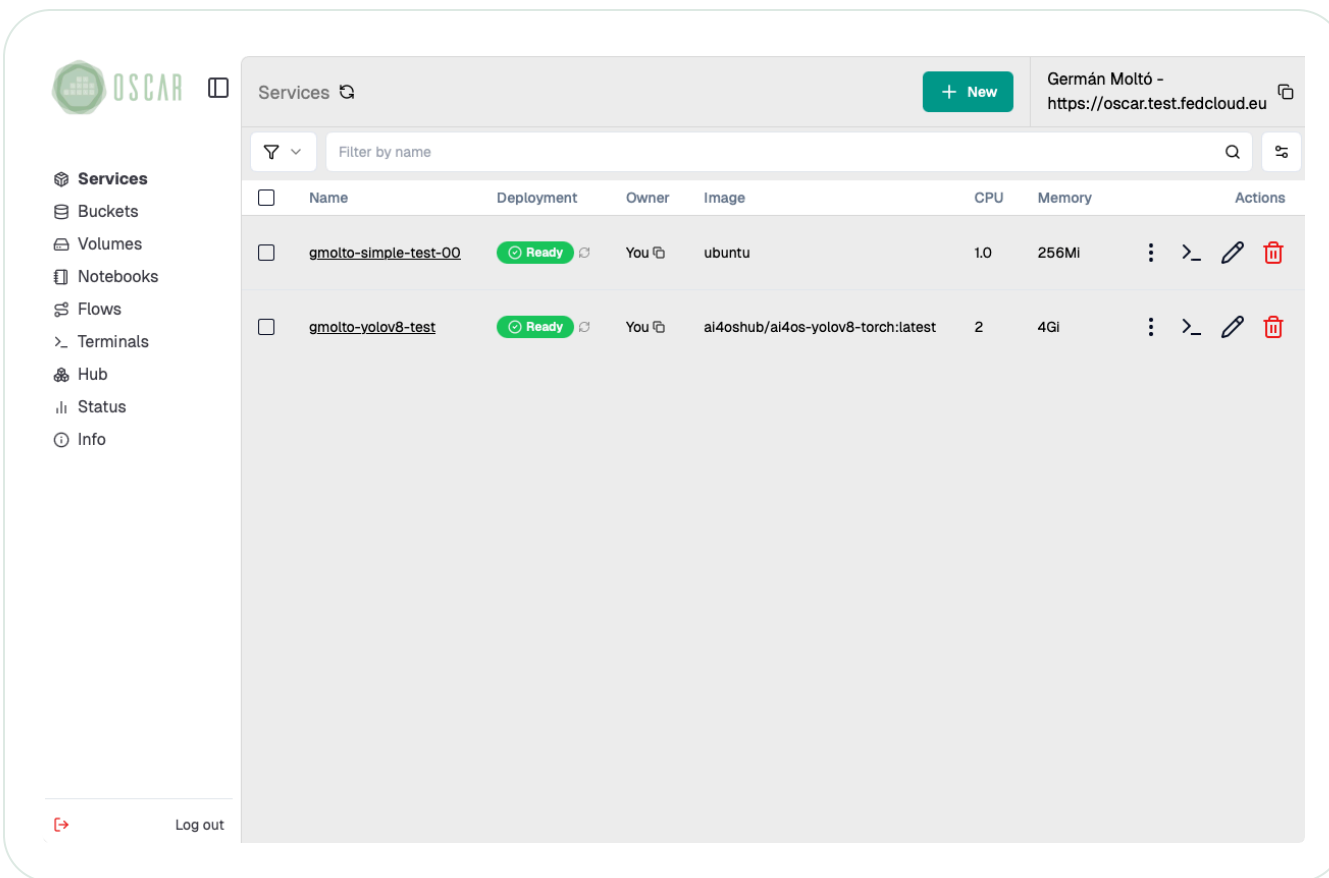
Integrate OSCAR from your applications

OSCAR Hub



- Discover reusable OSCAR service examples
- Start from existing service definitions (RO-CRATE + FDL)
- Share working patterns for data-processing applications

Deploy a service from the Dashboard



The screenshot shows the OSCAR dashboard interface. On the left is a navigation sidebar with options: Services, Buckets, Volumes, Notebooks, Flows, Terminals, Hub, Status, and Info. The main content area is titled 'Services' and includes a '+ New' button, a search bar, and a table of services. The table has columns for Name, Deployment, Owner, Image, CPU, Memory, and Actions. Two services are listed: 'gmolto-simple-test-00' and 'gmolto-yolov8-test', both with a 'Ready' status. At the bottom left, there is a 'Log out' button.

Name	Deployment	Owner	Image	CPU	Memory	Actions
gmolto-simple-test-00	Ready	You	ubuntu	1.0	256Mi	[More] [Terminal] [Edit] [Delete]
gmolto-yolov8-test	Ready	You	ai4oshub/ai4os-yolov8-torch:latest	2	4Gi	[More] [Terminal] [Edit] [Delete]

- See the services available in the cluster
- Open service details from the Dashboard
- Confirm endpoints and runtime status before execution

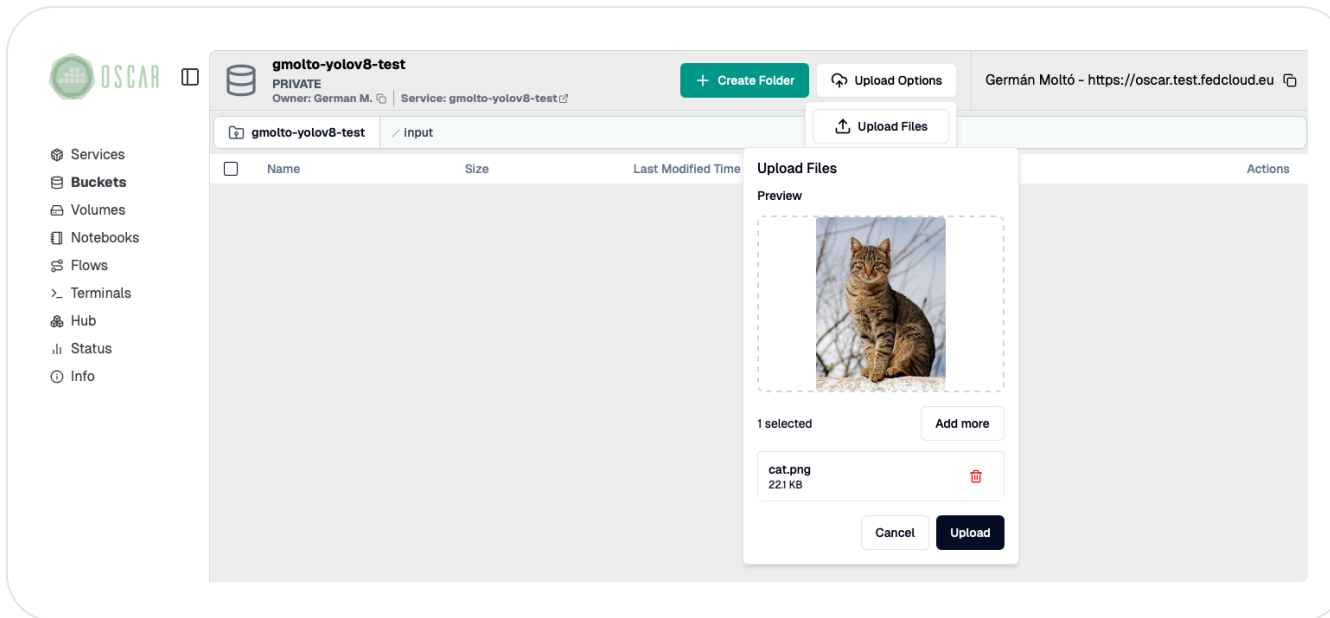
Browse service storage

The screenshot shows the OSCAR interface for managing buckets. The sidebar on the left contains navigation links: Services, Buckets, Volumes, Notebooks, Flows, Terminals, Hub, Status, and Info. The main content area is titled 'Buckets' and includes a '+ New' button and a user profile for 'Germán Moltó'. Below this is a search bar and a table of buckets.

<input type="checkbox"/>	Name	Owner	Service	Visibility	Actions
<input type="checkbox"/>	cowsay-secrets	62bb1b40398f73778b66f344d282242debb8ee3ebb106717a123ca213162926@egi.eu		PUBLIC	
<input type="checkbox"/>	cpublic	62bb1b40398f73778b66f344d282242debb8ee3ebb106717a123ca213162926@egi.eu		RESTRICTED	
<input type="checkbox"/>	dog-breed	62bb1b40398f73778b66f344d282242debb8ee3ebb106717a123ca213162926@egi.eu		PUBLIC	
<input type="checkbox"/>	gmolto-bucket-00	You	juno-vizedi-vkbfjvfx	PRIVATE	
<input type="checkbox"/>	gmolto-simple-test-00	You	gmolto-simple-test-00	PRIVATE	
<input type="checkbox"/>	gmolto-yolov8-test	You	gmolto-yolov8-test	PRIVATE	
<input type="checkbox"/>	imagemagick	62bb1b40398f73778b66f344d282242debb8ee3ebb106717a123ca213162926@egi.eu		PUBLIC	
<input type="checkbox"/>	inference	62bb1b40398f73778b66f344d282242debb8ee3ebb106717a123ca213162926@egi.eu		PUBLIC	

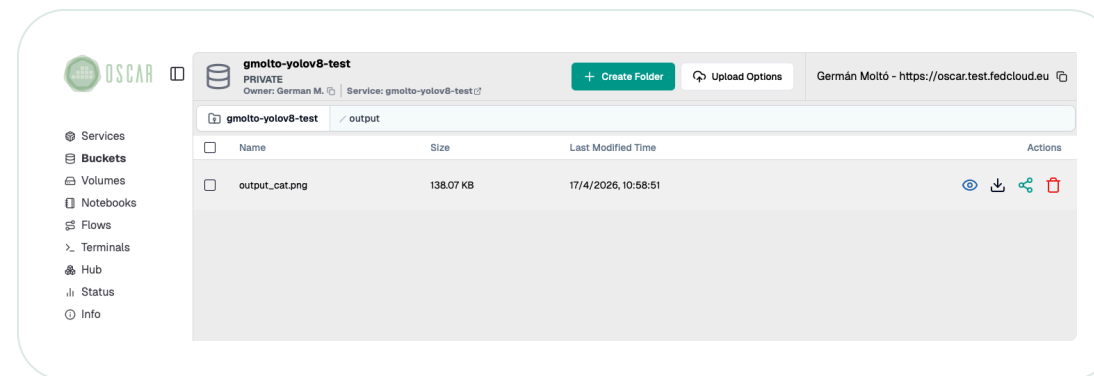
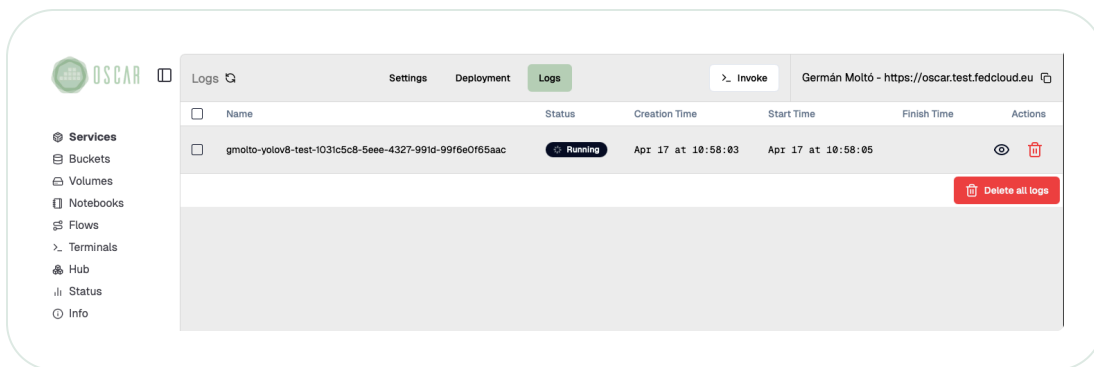
- Open the buckets associated with the service
- Check where inputs and outputs are stored
- Keep the data view close to the execution view

Upload input data



- Select the input bucket linked to the service
- Upload one or more files from the browser
- Let storage events trigger processing automatically

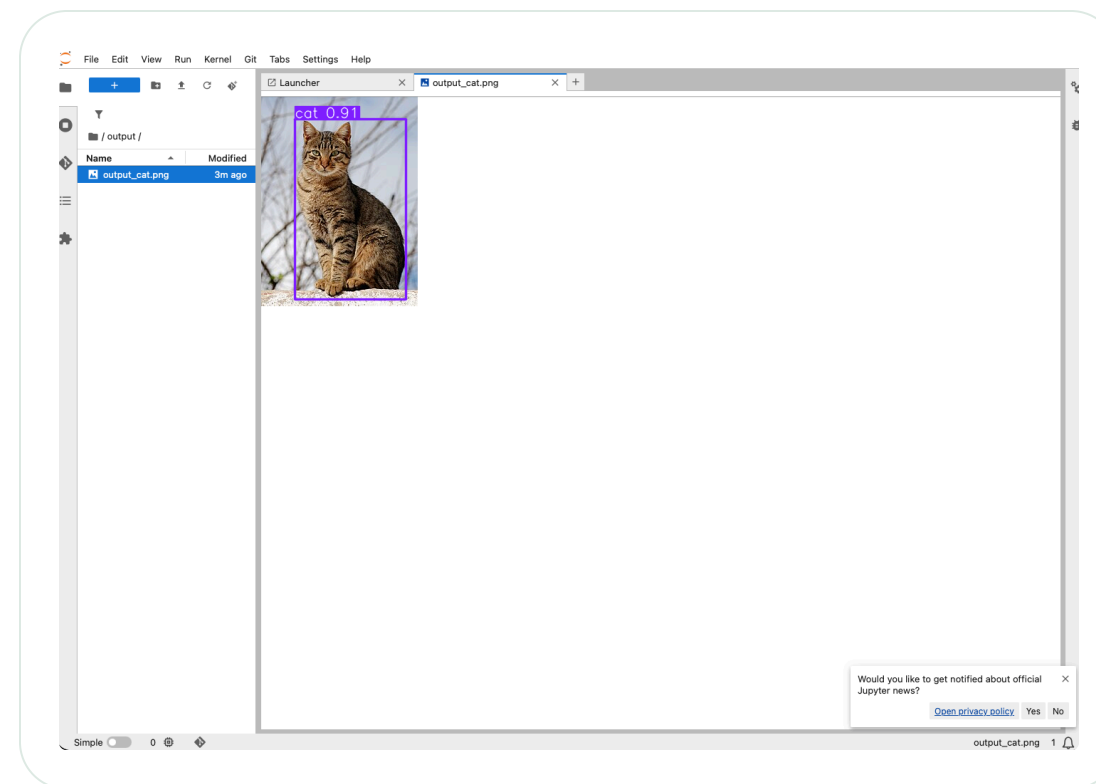
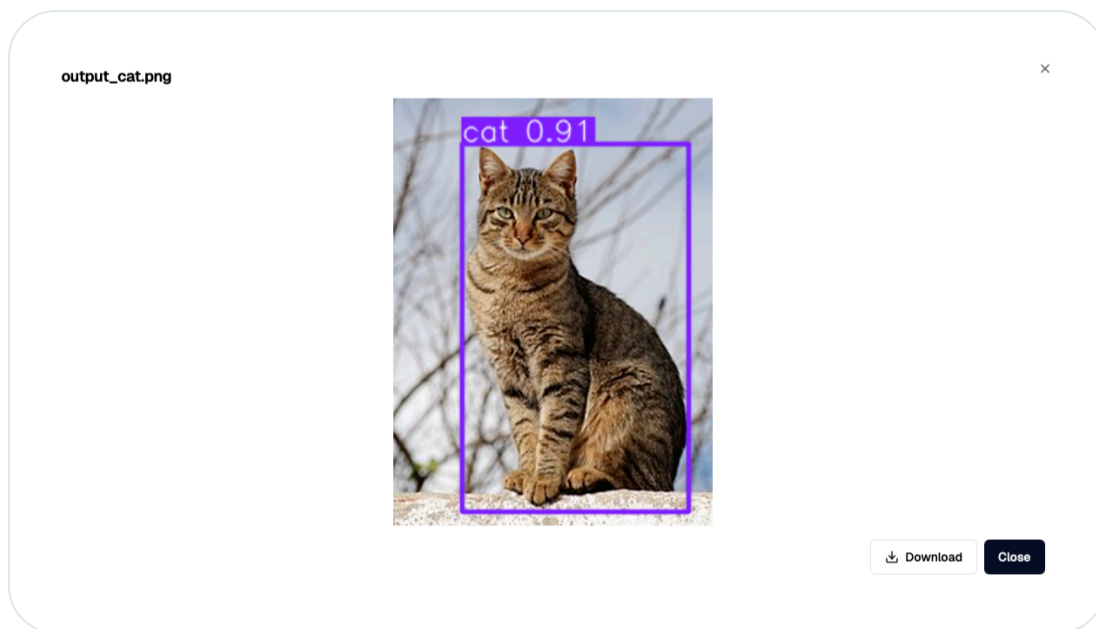
Inspect execution and generated files



- Check the job logs for the service run
- Debug failed runs without leaving the Dashboard

- Confirm the files produced by the execution
- Move from runtime diagnostics to generated results

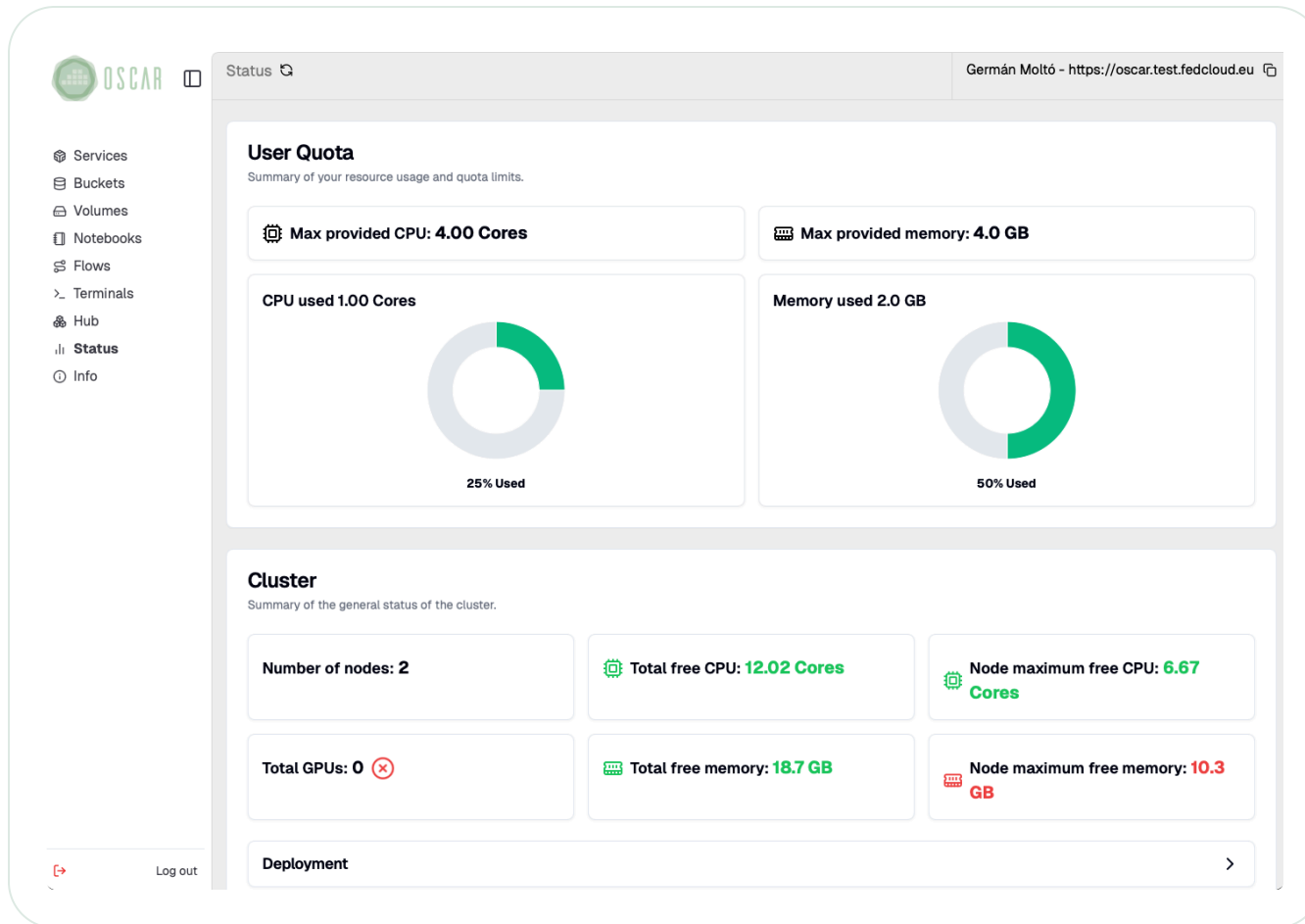
Collect results and continue in a notebook



- Browse the output bucket after execution
- Keep inputs and outputs organized

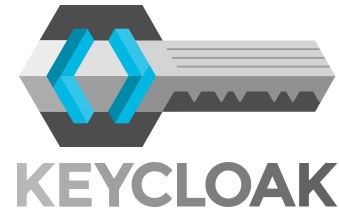
- Continue analysis and visualization in Jupyter

Track cluster status and resource quotas



- OSCAR is multi-tenant, integrated with OIDC.
- Check the CPU, memory, and storage available to the user
- Understand current usage before deploying new services

OSCAR integrations with other software

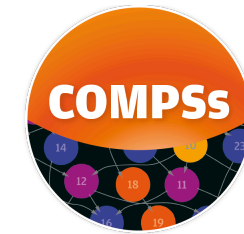
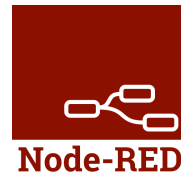


OIDC / IAM in EGI

OIDC / IAM

HPC offloading

Confidential computing



Interactive notebooks

Automation flows

Data management

Workflow parallelism

Used in Horizon Europe projects:

 | DATA COMMONS

eosc-data-commons.eu

 AI IN SECURE PRIVACY-PRESERVING
COMPUTING CONTINUUM

ai-sprint-project.eu

AI4 |  eosc

ai4eosc.eu


interTwin

intertwin.eu


iMagine

imagine-ai.eu

 |  ARENA

eosc-arena.eu



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