

# How to access and use the PaaS Orchestrator Service in the EOSC Marketplace

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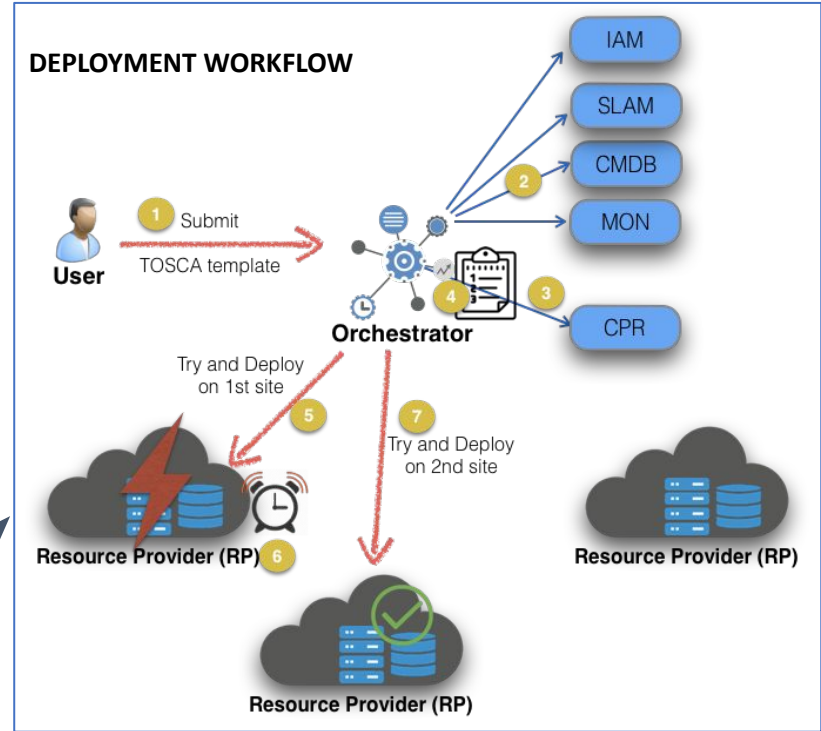
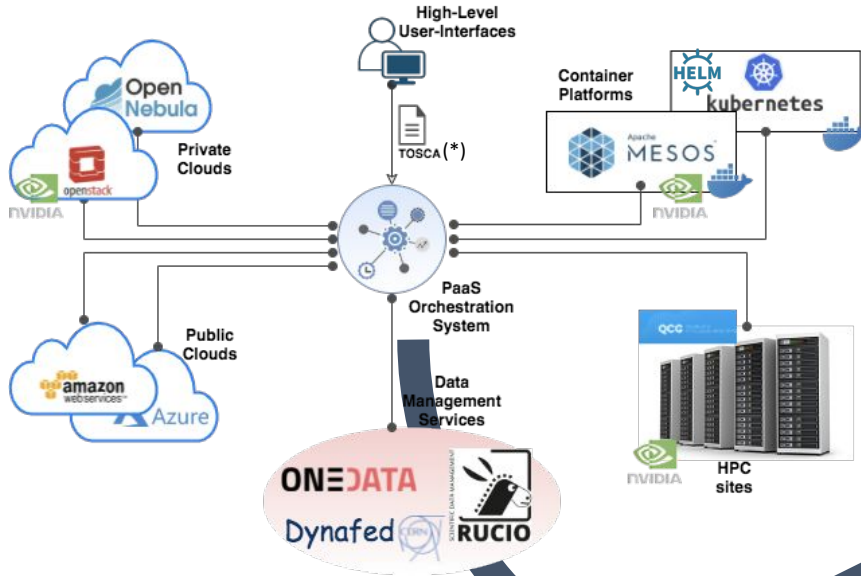


# The INDIGO PaaS

- ❑ The INDIGO PaaS allows to coordinate the provisioning of virtualized compute and storage resources on different Cloud Management Frameworks (like OpenStack, OpenNebula, AWS, etc.) and the deployment of dockerized services and jobs on Mesos clusters and Kubernetes clusters.
- ❑ The development started during the European H2020 project INDIGO-DataCloud and continued during the following projects DEEP-Hybrid DataCloud, eXtreme-DataCloud and EOSC-Hub
  - Evolving the functionalities to **TRL8**
  - Ensuring the scalability and performance of the developed solutions
  - Providing relevant contributions to the **European Open Science Cloud**

# INDIGO PaaS Orchestration System

## High-level architecture



(\*) Topology and Orchestration Specification for Cloud Applications Ref: [TOSCA Simple Profile in YAML, Version 1.1](#)

The Orchestrator interacts with the provider services through:

- the [Infrastructure Manager](#) for deploying complex and customized virtual infrastructures on multiple IaaS Cloud backends (Openstack, AWS, etc.)
- direct APIs for deploying dockerized workloads on container platforms or submitting HPC jobs

# Foundations and key enablers

- ❑ Develop and integrate **open-source** and **open standard-based** components to ensure portability and interoperability
- ❑ Adopt a **modular micro-service** architecture
- ❑ Use **Infrastructure as Code** (IaC), DevOps and **containers** to reduce manual processes and increase flexibility and portability across environments
- ❑ Leverage **federated Authentication and Authorization** technologies based on **OpenID-Connect** (supporting also legacy AAI solutions) like INDIGO-IAM and EGI Check-in
- ❑ Enable flexible **service composition** and re-use

# INDIGO PaaS - Main features

- ❑ **Enabling the federation of distributed and heterogeneous compute environments: clouds, docker orchestration platforms, HPC systems**
  - Further integrations can be easily included implementing new plugins (adapters)
- ❑ **Smart scheduling → Automatic selection of the provider**
  - First level based on the deployment type (cloud, Mesos, Kubernetes, HPC)
  - Second level based on SLAs and compute/storage requirements vs provider capabilities
    - Support for specialized hardware (GPU, Infiniband)
    - Data location
  - Best provider selection based on:
    - Resource quotas (SLA)
    - Monitoring data
  - Automatic retry of failed deployments
- ❑ **Support for hybrid deployments and network orchestration**
- ❑ **Client interfaces for advanced users (REST APIs, CLI, python bindings) and end-users (web dashboard - no skills required)**

# Current exploitation and usage

Several on-going projects rely on the INDIGO PaaS as federation and orchestration tool: e.g. EGI-ACE, C-SCALE, IoTwins

It will be further extended in the new projects: InterTwin and AI4EOSC

It is also used for production services like

- **Laniakea@ReCaS**, the service that allows to perform the automatic deployment of virtual Galaxy environments for life science (Elixir-Italy)
- **DODAS (Dynamic On Demand Analysis Service)**, a service for generating an on-demand container-based HTCondor cluster
- The **INFN Cloud Infrastructure** is exploiting the INDIGO PaaS capabilities for federating the resources provided by the two large data centers of CNAF and Bari, and other satellite sites.

A large, red, rectangular stamp with a distressed, ink-like texture is centered on the page. The word 'DEMO' is written in a bold, serif font within the stamp's border.

# Don't miss...

## Posters:

- EGI-ACE webODV - Online extraction, analysis and visualization of SeaDataNet and Argo data
- Exploring reference data through existing computing services for the bioinformatics community : an EOSC-Pillar use-case

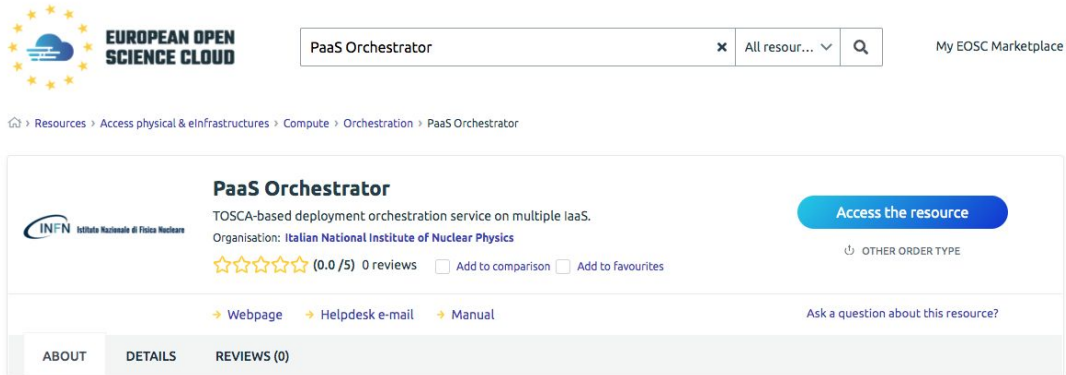
## Training session:

How to deploy ready-to-use BigData Platform on top of the EOSC Compute Platform - the DODAS solution (23 Sep 2022, 09:30)



# Thank you for your attention!

<https://marketplace.eosc-portal.eu/services/paaS-orchestrator>



The screenshot shows the EOSC Marketplace interface. At the top left is the 'EUROPEAN OPEN SCIENCE CLOUD' logo. A search bar contains 'PaaS Orchestrator'. The breadcrumb trail reads: 'Resources > Access physical & infrastructures > Compute > Orchestration > PaaS Orchestrator'. The main content area features the 'PaaS Orchestrator' card, which includes the INFN logo, a description: 'TOSCA-based deployment orchestration service on multiple IaaS.', the organization 'Italian National Institute of Nuclear Physics', a rating of '(0.0/5) 0 reviews', and buttons for 'Add to comparison' and 'Add to favourites'. A prominent blue button says 'Access the resource'. Below this are links for 'Webpage', 'Helpdesk e-mail', and 'Manual', along with a link to 'Ask a question about this resource?'. At the bottom, a navigation bar shows 'ABOUT', 'DETAILS', and 'REVIEWS (0)'.



For more information and technical support  
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