Open Nebula

ONEnextgen

Unlocking the Hybrid Cloud

An Open Source Approach

FOSDEM – 02/02/2025

OpenNebula.io

~$ whoami

CARD_ID @vickmp

Victor Palma

Cloud Engineer

vpalma@opennebula.io

Open Nebula

📍 Madrid (Spain)

A Quick Overview of the Current Hybrid Cloud Scenario

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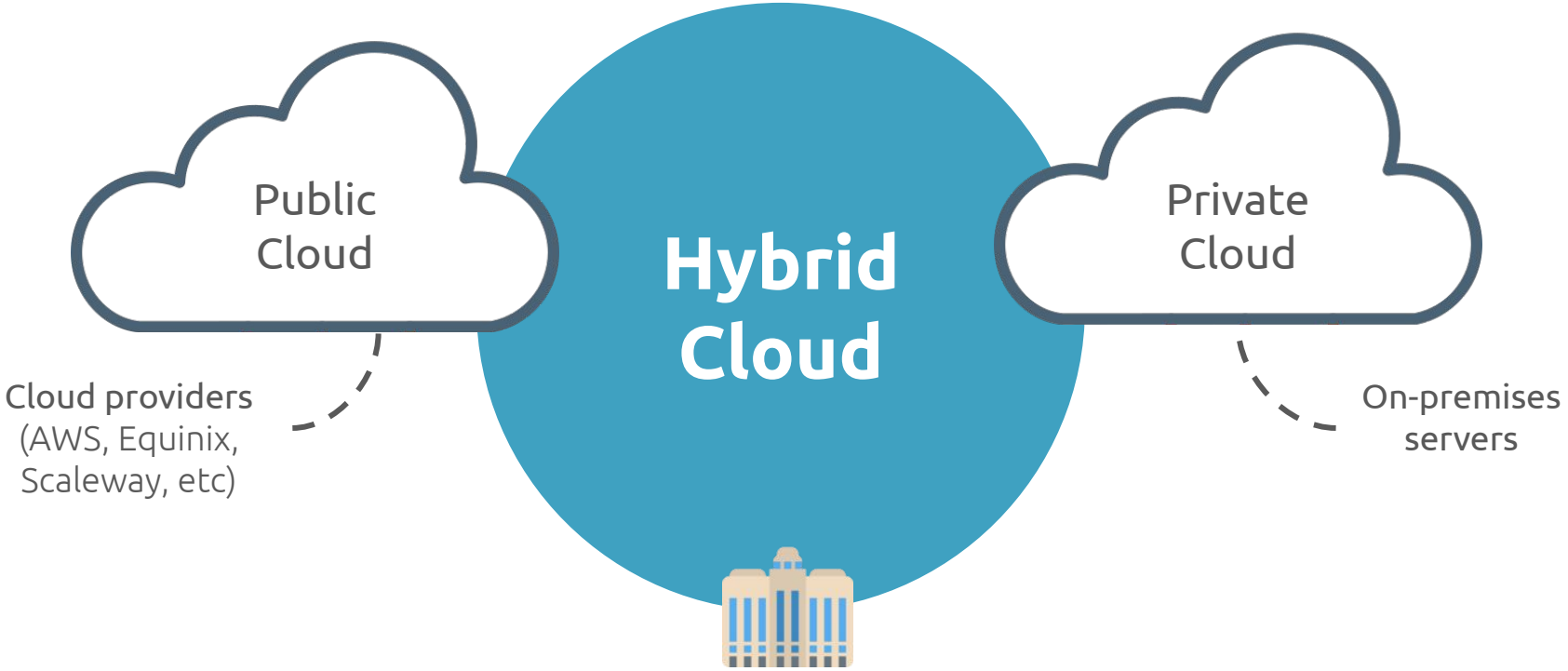
What's the Hybrid Cloud?

Bridging On-Premises and Public Infrastructure for Optimal Performance



The Relevance of the Hybrid Cloud

Why is the hybrid cloud so relevant in our current context?

📌 Flexibility & Scalability

Adapt to changing workloads by combining on-premises and public cloud resources

⚡ Disaster Recovery

Ensure HA with Hybrid DR strategies, allowing quick failover to the cloud in case of disruptions

🔒 Security & Compliance

Maintain control over sensitive data to meet regulatory requirements

💰 Cost Optimization

Reduce IT expenses by keeping predictable workloads in the private cloud while leveraging public cloud for on-demand

🌍 Edge Computing

Process data closer to the source for real-time applications, enhancing performance for IoT, AI, 5G connectivity or games

Challenges of the Hybrid Cloud

What makes managing a hybrid cloud environment so challenging?

⚙️ Complexity in Management

Managing multiple environments requires specialized skills, robust orchestration, and automation to ensure seamless operations

🔗 Integration & Interoperability

Ensuring compatibility between legacy systems, cloud-native applications, and multiple cloud providers can be challenging.

💰 Cost & Resource Management

Uncontrolled resource usage can lead to unexpected expenses, requiring careful cost tracking and optimization strategies

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Introducing a Technology Stack for Hybrid Cloud:

An Open Source Approach 🔎

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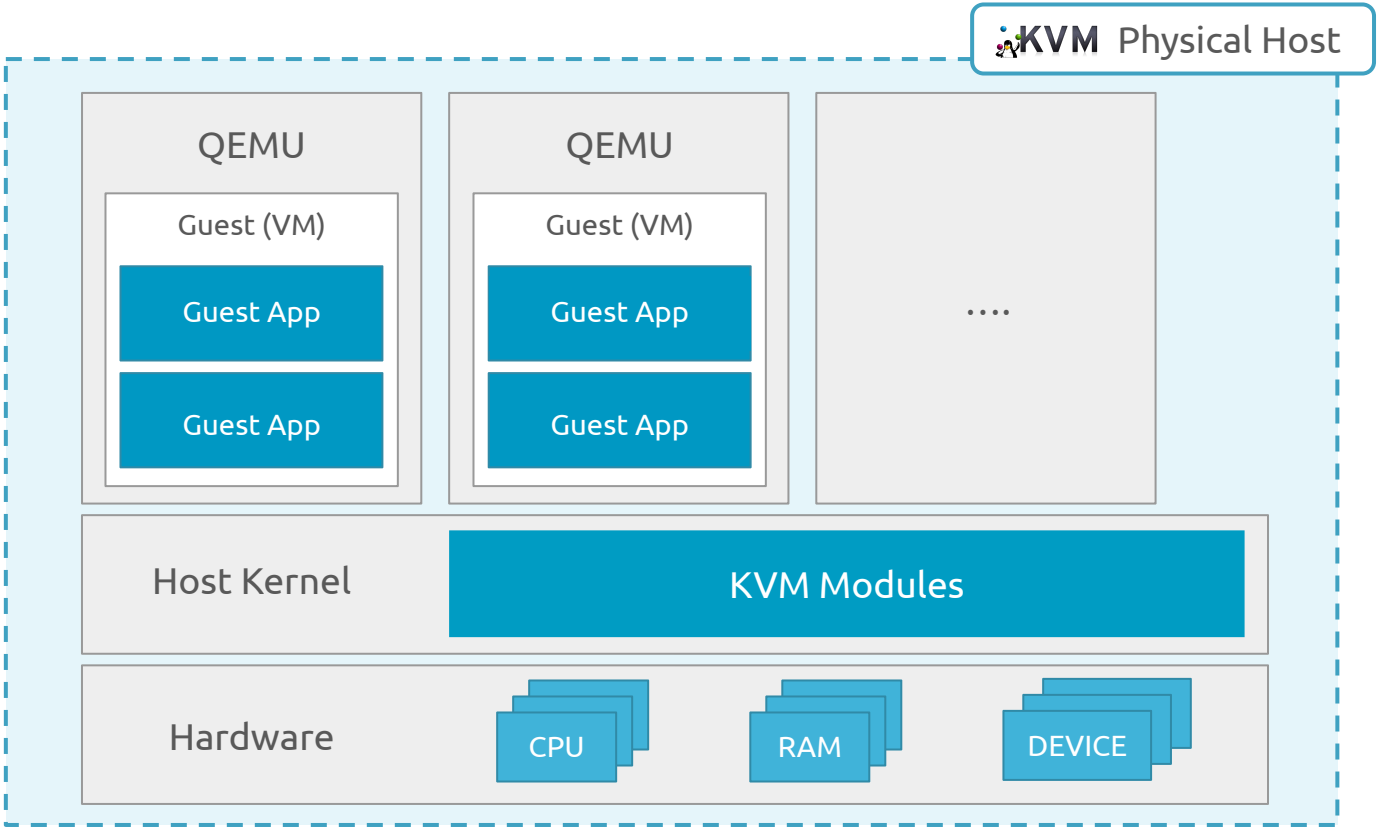
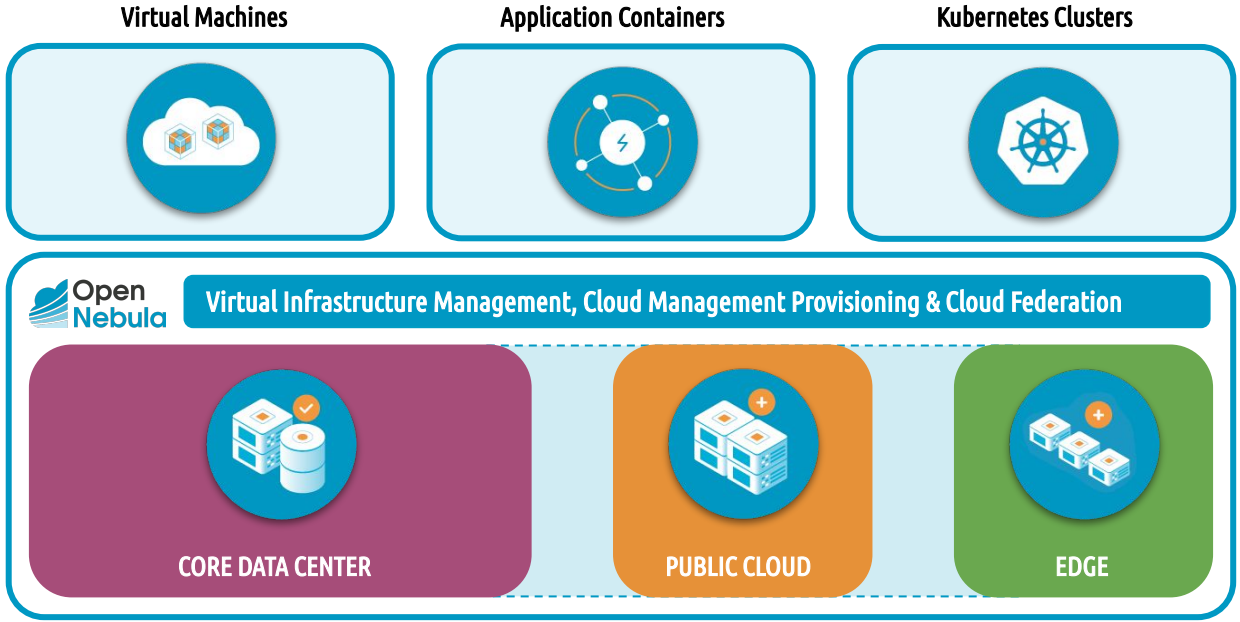
KVM as Hypervisor

Utilizing KVM for Efficient and Scalable Hybrid Cloud Virtualization



OpenNebula Capabilities

The Open Source Cloud & Edge Platform bringing real freedom to your Enterprise Cloud 🚀



- ✓ Avoids “Vendor Lock-in”
- ✓ Minimizes complexity
- ✓ Reduces resource consumption
- ✓ Slashes operating costs

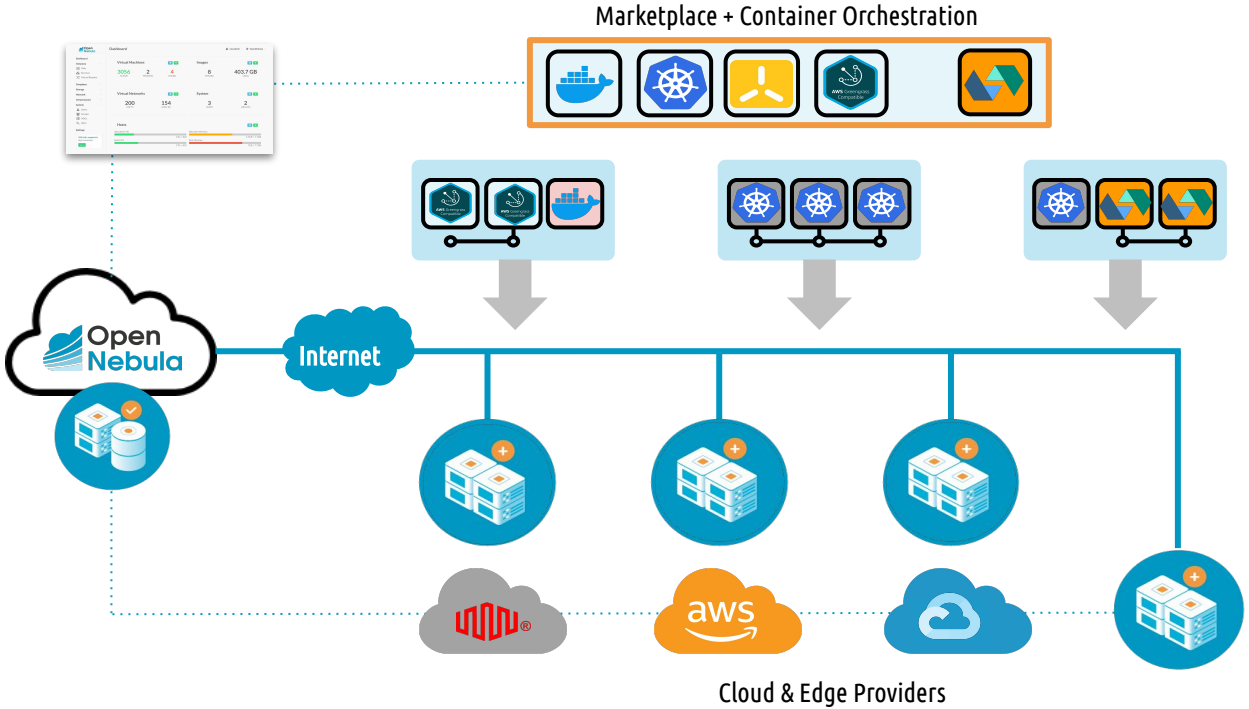
OpenNebula as Multi-Cloud Orchestrator

Single control panel to avoid vendor lock-in, reduce costs, and ensure workload portability

1. **Any Application**
   VMs, multi-VM services, **containers**, and **k8s clusters** on a shared environment

2. **Uniform Management**
   Homogeneous layer for user and workload management and operation

3. **Any Infrastructure**
   Automatic provision of resources from **cloud providers**



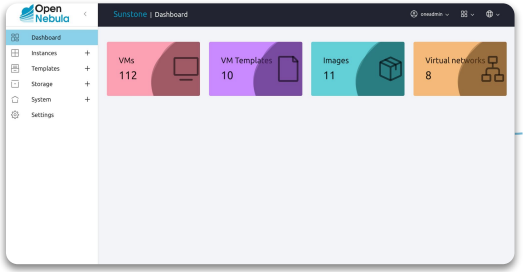
https://opennebula.io/multi-cloud/

OneForm as Multi-Cloud Key Technology

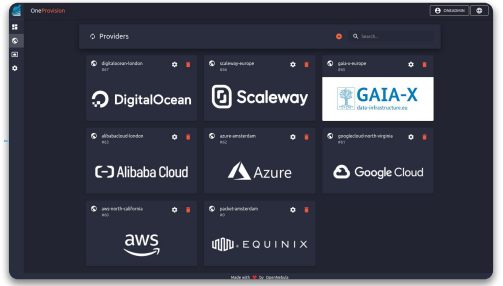
Using OpenNebula Formation Capabilities to Expand Your OpenNebula Hybrid Cloud 🚀

Open Nebula + OneForm

One platform to rule them all 🚀



Cloud-Edge Deployment in an Instant ⚡



Cloud-Edge Deployment

Automated Resources Deployment

HashiCorp Terraform

ANSIBLE

Automated Host Configuration

OneForm is able to deploy a full **multi-cloud infrastructure** in under 15 minutes!

OneForm as Key tool for the Hybrid Cloud Management ☁️

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An Introduction to OneForm

Build and Deploy Your Hybrid Cloud in Less Than 15 Minutes

OneForm is a new tool that allows you to **automatically deploy** and **configure** new Clusters in the Public cloud into your OpenNebula cloud.

OneForm enables us to expand our cloud by seamlessly adding dynamically all the essential components for daily operations:

- Clusters
- Hosts
- Networks
- Datastores
- Virtual Routers
- VMs & Multi-VMs applications

All seamlessly supported by OpenNebula multi-tenancy capabilities from a single portal.

OneForm concepts

Build and Deploy Your Hybrid Cloud in Less Than 15 Minutes

WHERE?

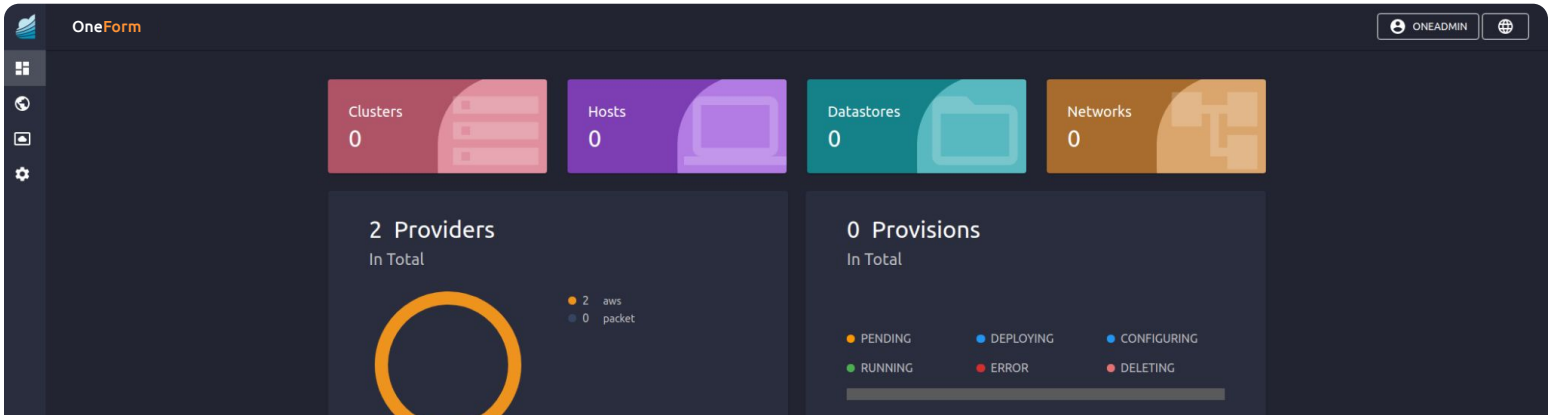
Provider

It represents a Cloud where resources (Hosts, Networks or Storage) are allocated to implement a Provision.

WHAT?

Provision

It represents the physical resources deployed in a given provider (e.g. a specific hosts in AWS)

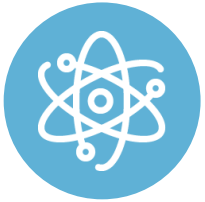


OneForm features

Build and Deploy Your Hybrid Cloud in Less Than 15 Minutes

Template System

Enables automation and definition of cloud providers and provisions

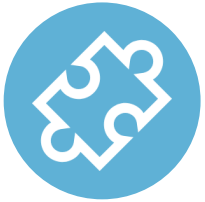


Lifecycle Management

Supports updates and automatic scaling based on predefined rules

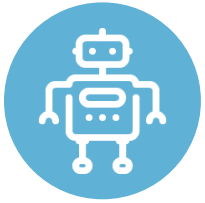
Multi-Provider Support

Allows registration of multiple cloud providers



Extensible & Customizable

Allows cloud administrators to create their own custom cloud providers in OneForm



Automated Cluster Deployment

Automates cluster configuration in OpenNebula

API & Automations

Provides an API that enables the creation of custom automation workflows.

OneForm as Multi-Cloud Key Technology

Using OpenNebula Formation Capabilities to Expand Your OpenNebula Hybrid Cloud 🚀

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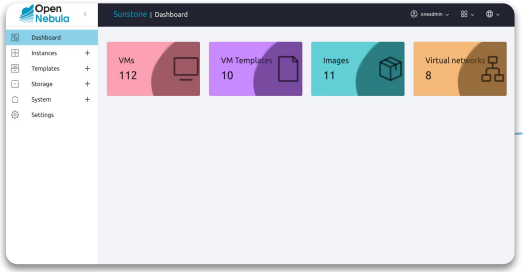

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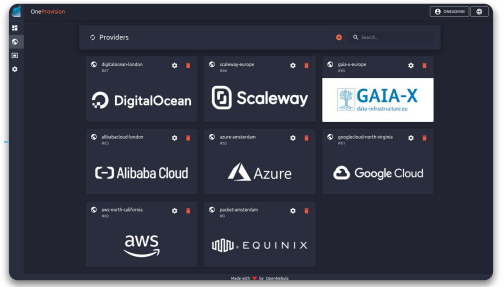

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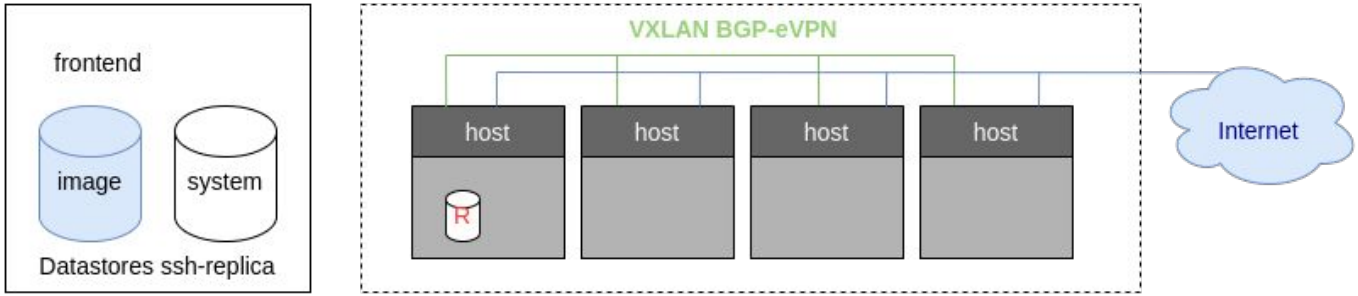
OneForm from an Infrastructure Perspective

Build and Deploy Your Hybrid Cloud in Less Than 15 Minutes

OpenNebula point of view

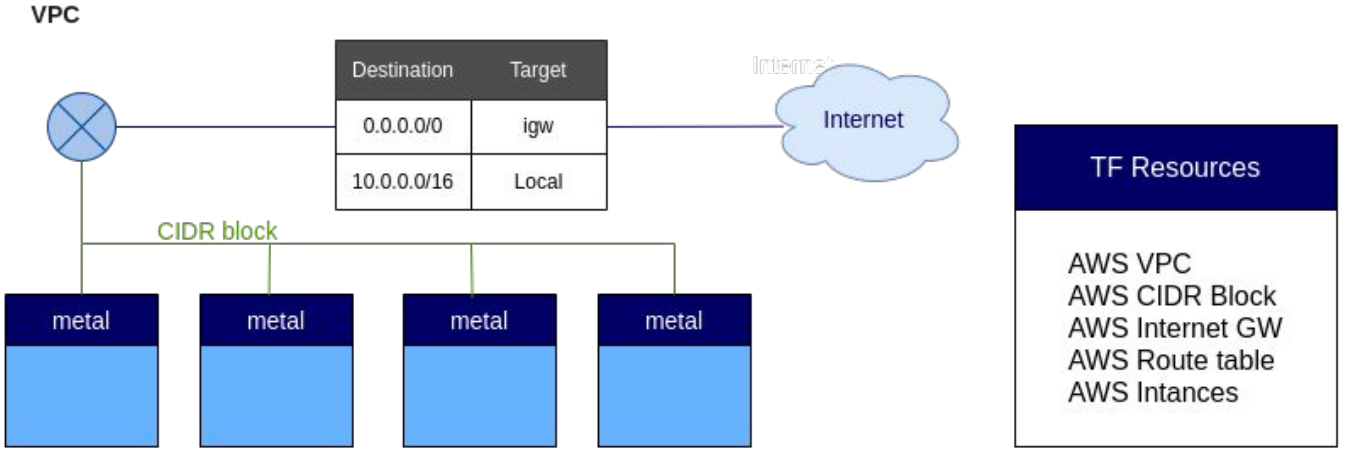


OpenNebula View

AWS View

Provider point of view

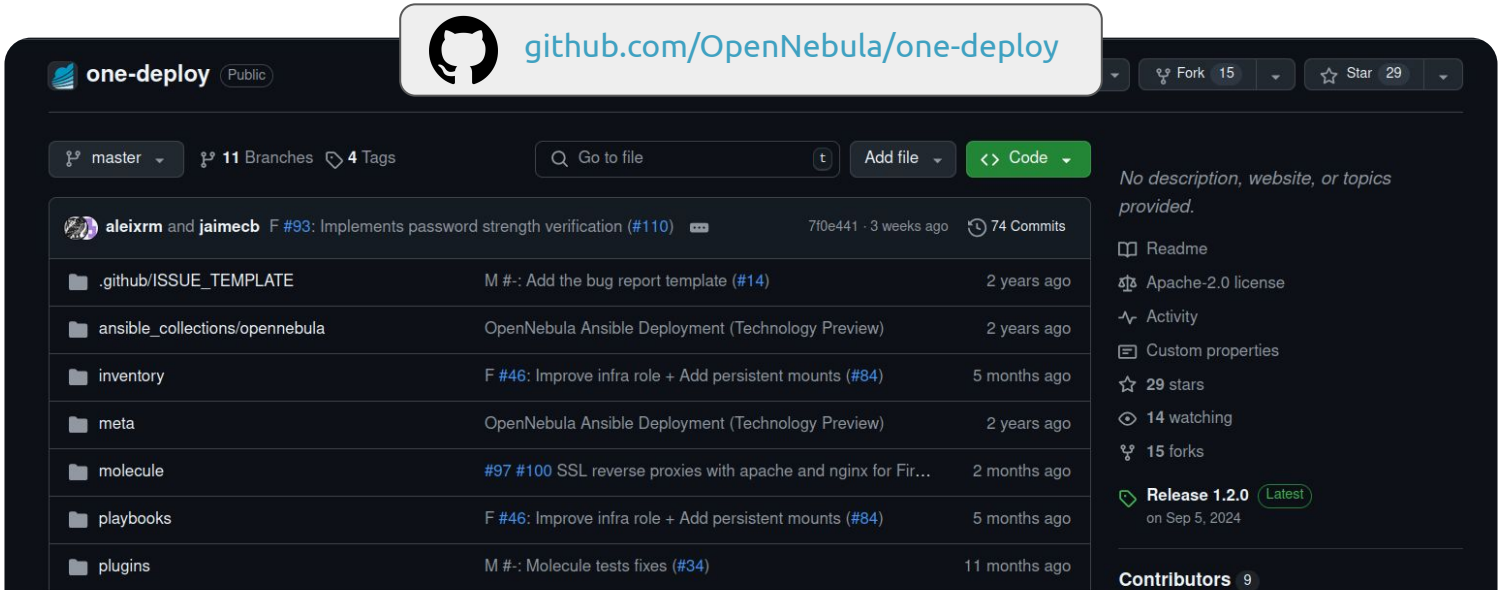
(AWS example)



OneForm Hosts Configuration

Build and Deploy Your Hybrid Cloud in Less Than 15 Minutes

OneForm leverages the power of **OneDeploy** — an OpenNebula tool based on Ansible Playbooks designed for seamless configuration. With its incredible flexibility, it empowers users to fully customize their OpenNebula instances to fit any scenario.



OneForm Uses Cases

Build and Deploy Your Hybrid Cloud in Less Than 15 Minutes

🚀 Automated Edge Cluster Provisioning

Seamlessly integrates with OpenNebula to deploy edge applications, such as 5G networks, with full automation

☁️ Multi-Cloud Distributed Applications

Enables the provisioning of applications across multiple cloud providers, ensuring scalability and flexibility

🔗 Hybrid Cloud Expansion

Extends on-premises private clouds by provisioning hybrid cloud infrastructures, unlocking new capabilities and resource elasticity

Show Time! 🚀

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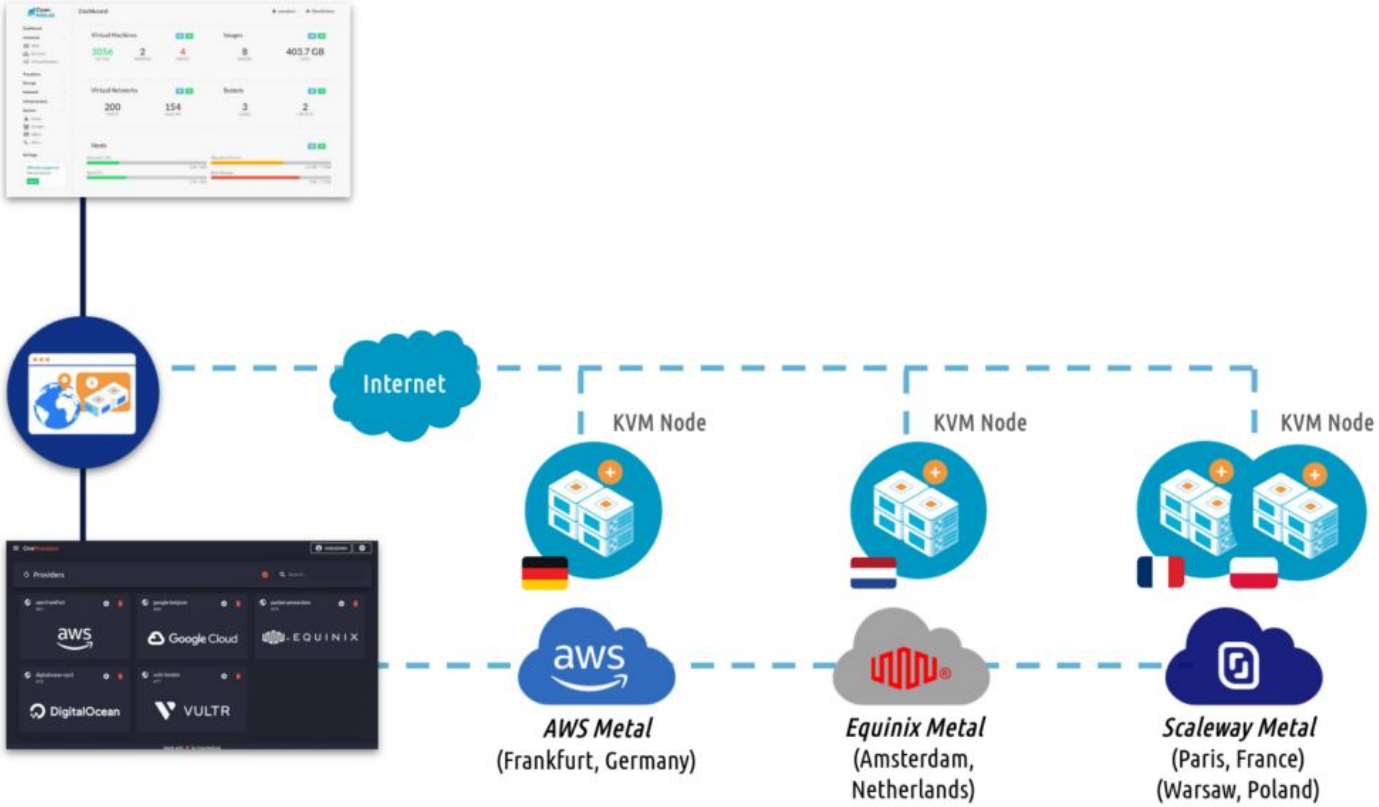
A Distributed Object Store Application

An Overview of the Architecture and Functionality in Action



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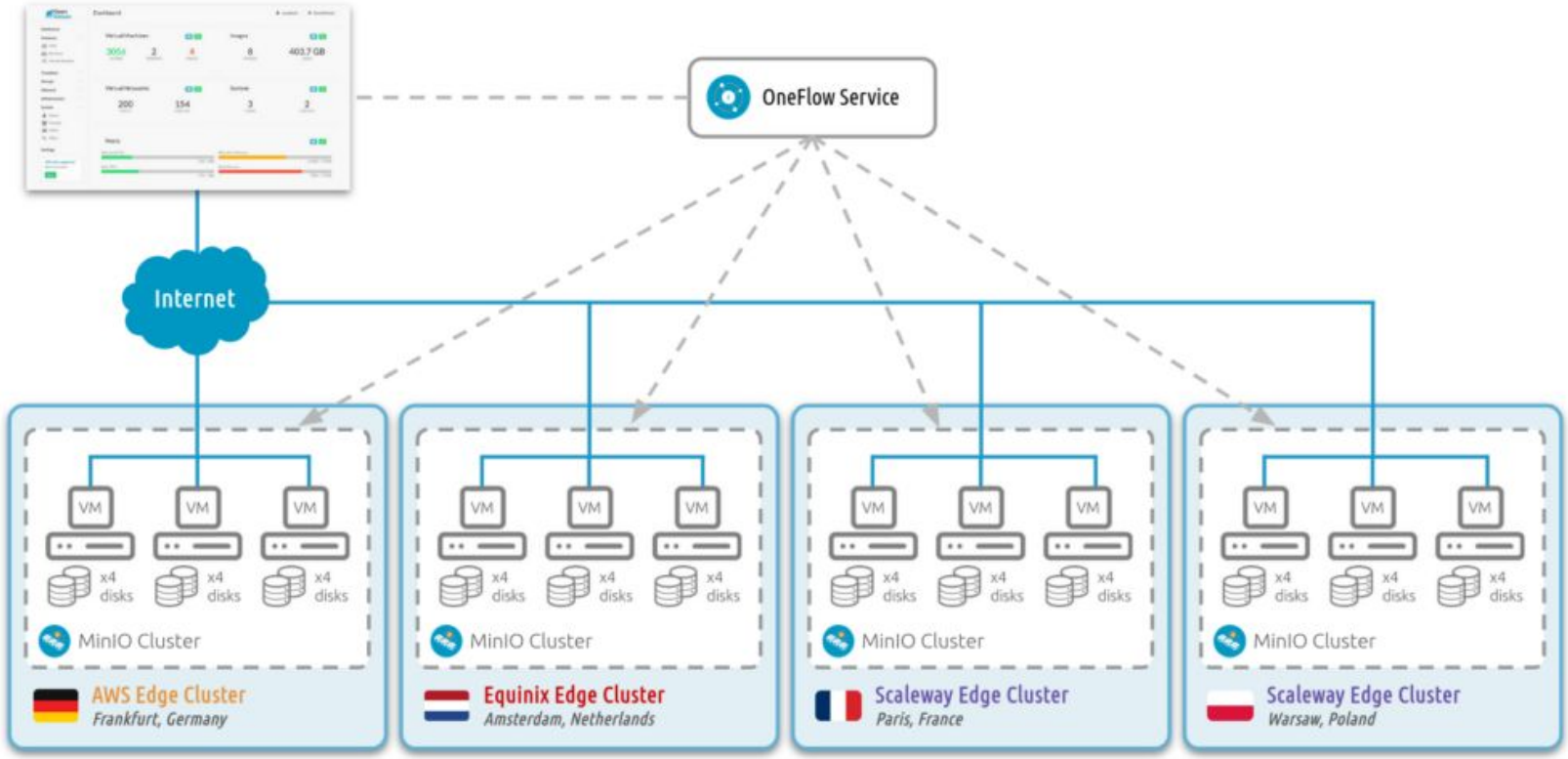

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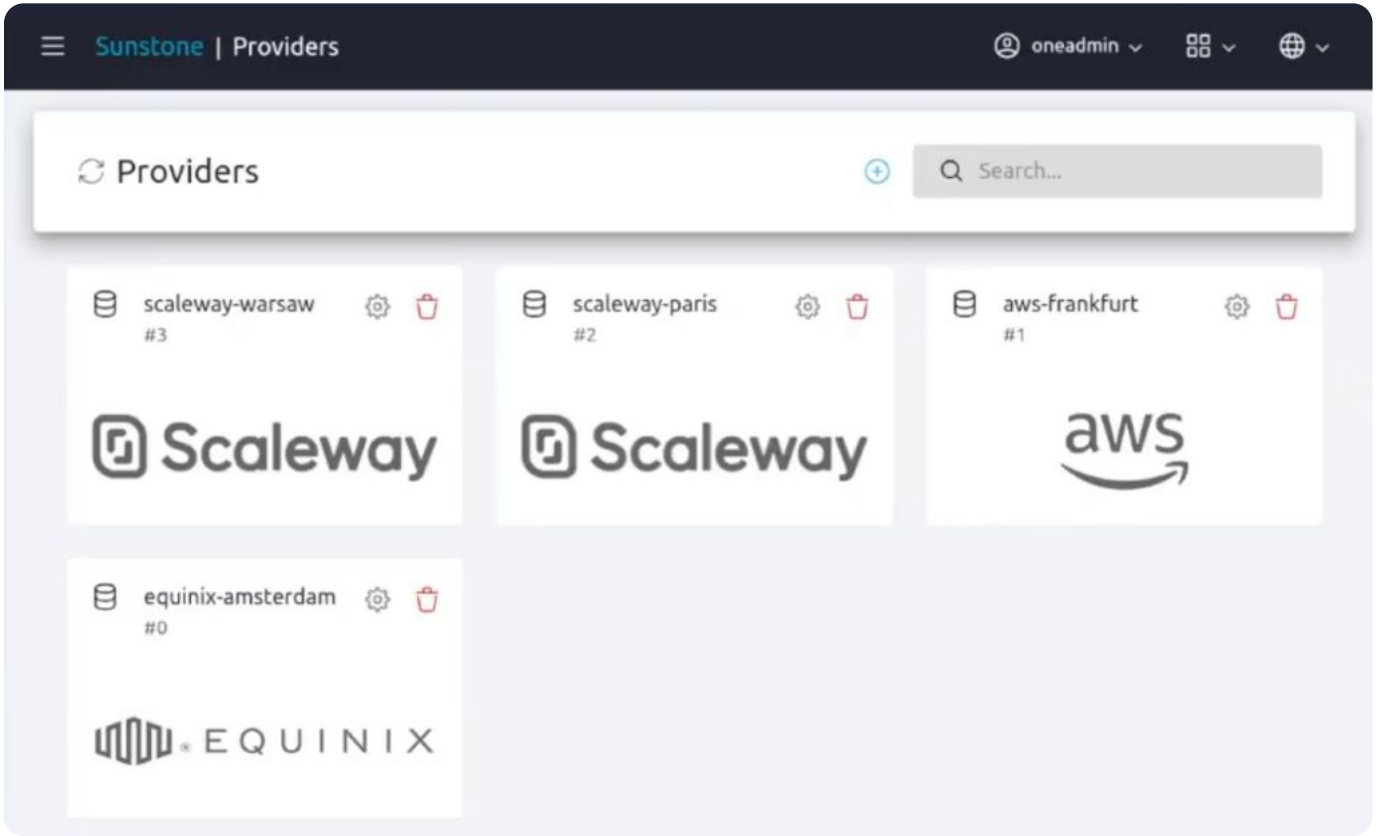

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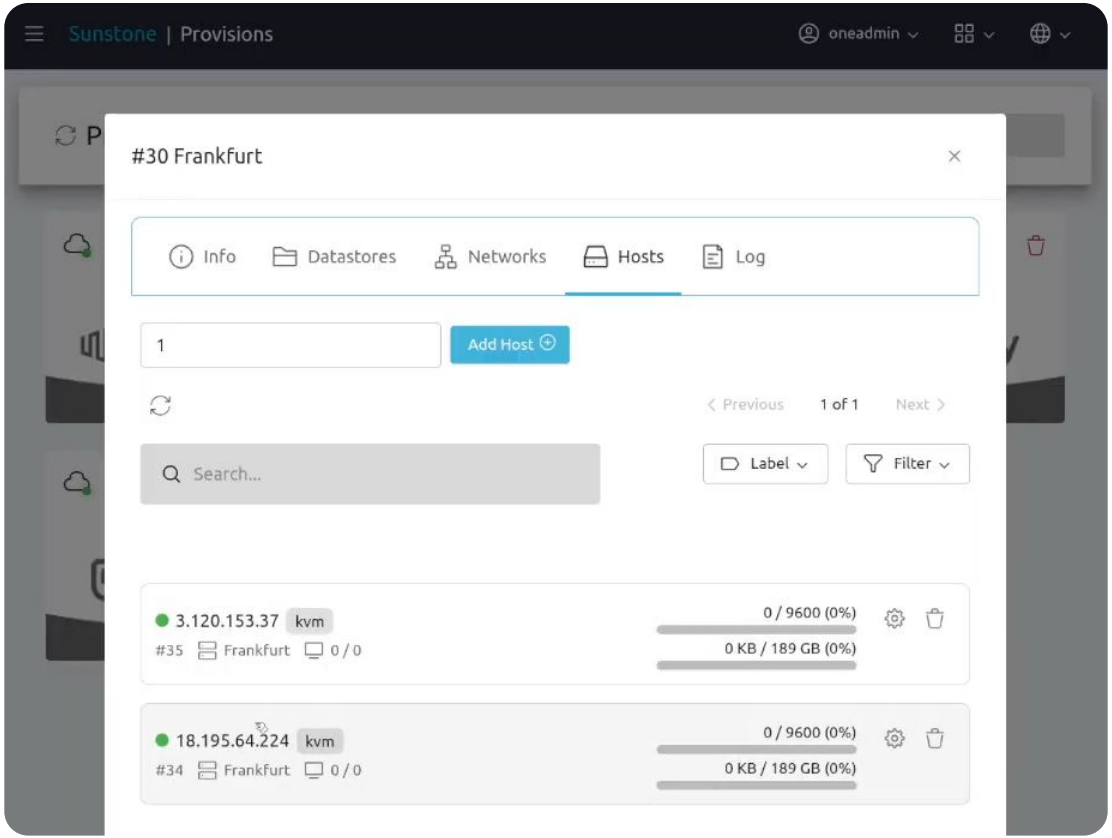

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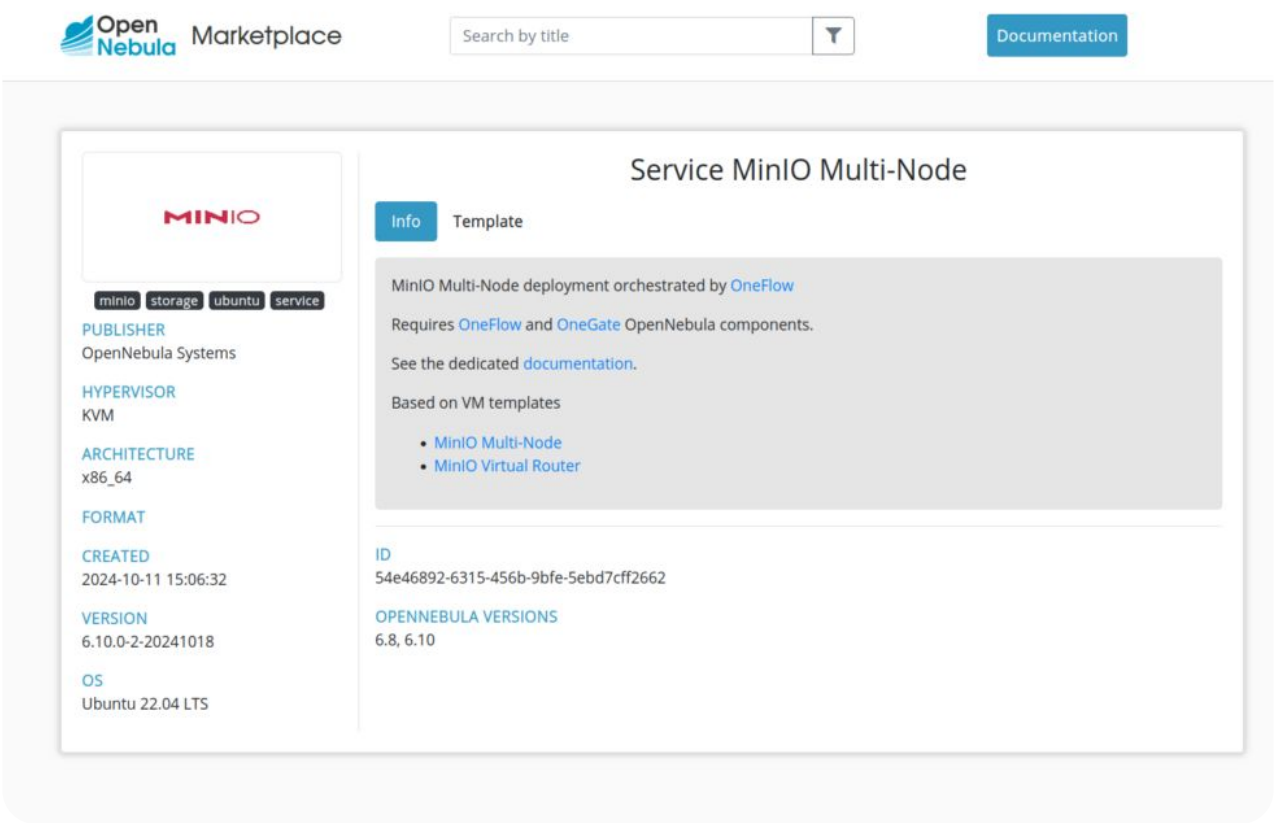

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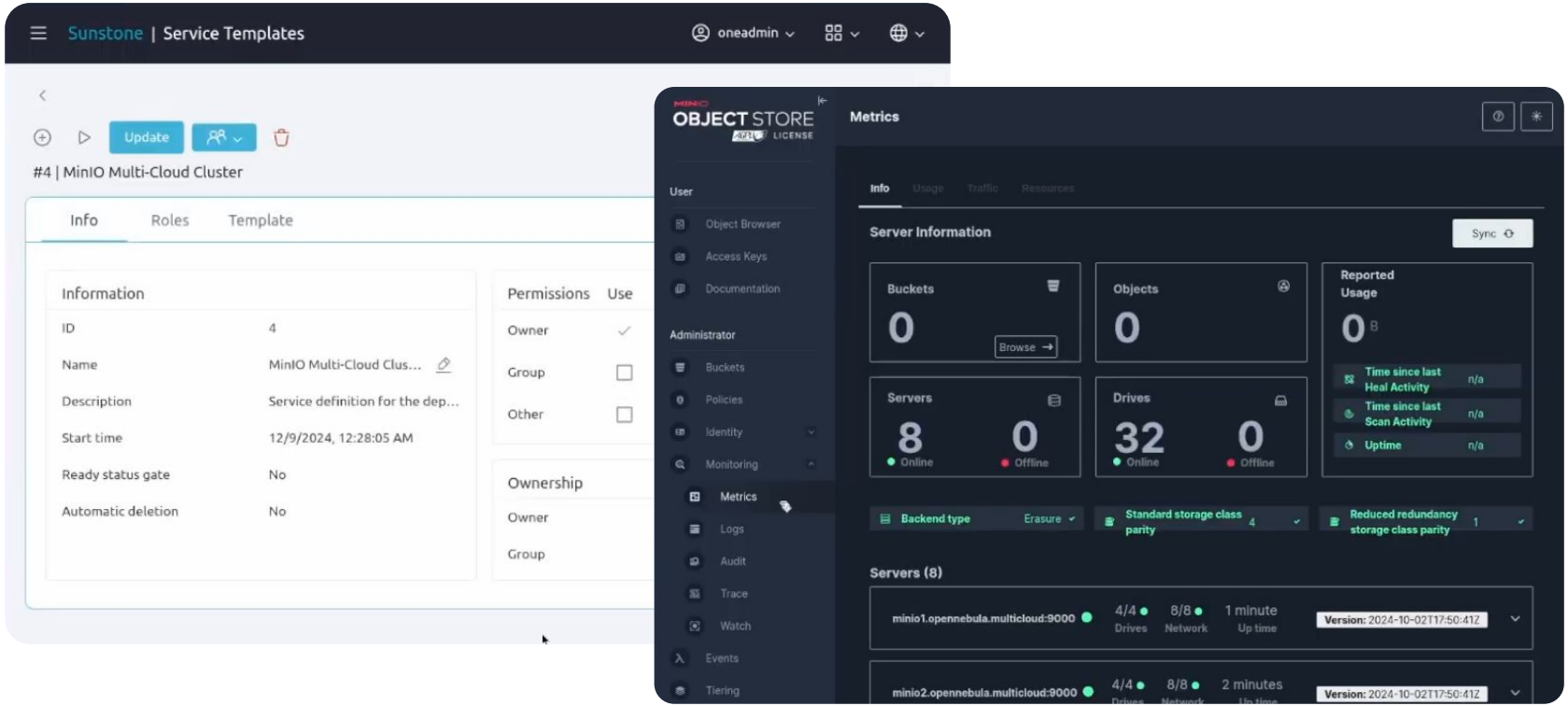

Closing Thoughts and Next Steps 🏃

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Next Steps & Challenges

Future Directions and Key Challenges Ahead

📢 Launch with OpenNebula 7.0

OneForm will be officially introduced alongside OpenNebula 7.0.

🔄 Replacing OneProvision

OneForm will take over from the existing OneProvision, incorporating a lot of enhancements and new features

🛠️ Continuous Development

We will keep expanding OneForm with new capabilities, including the ability to provision OpenNebula resources directly from OneForm

🌍 Broader Cloud Ecosystem Integration

Future updates will enhance compatibility with more cloud providers, making hybrid and multi-cloud deployments even more seamless

⚡ Optimized Performance & Automation

Ongoing improvements will focus on reducing provisioning times (even more!), increasing automation, and enhancing user experience

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IPCEI-CIS

Next-Generation European Platform for the Datacenter-Cloud-Edge Continuum

Initiative supported by the Spanish Ministry for Digital Transformation and Civil Service through the **ONEnextgen Project: Next-Generation European Platform for the Datacenter-Cloud-Edge Continuum** (UNICO IPCEI-2023-003) and co-funded by the European Union's NextGenerationEU instrument through the Recovery and Resilience Facility (RRF).

Financiado por la Unión Europea NextGenerationEU

Plan de Recuperación, Transformación y Resiliencia

GOBIERNO DE ESPAÑA · MINISTERIO PARA LA TRANSFORMACIÓN DIGITAL Y DE LA FUNCIÓN PÚBLICA · SECRETARÍA DE ESTADO DE TELECOMUNICACIONES E INFRAESTRUCTURAS DIGITALES

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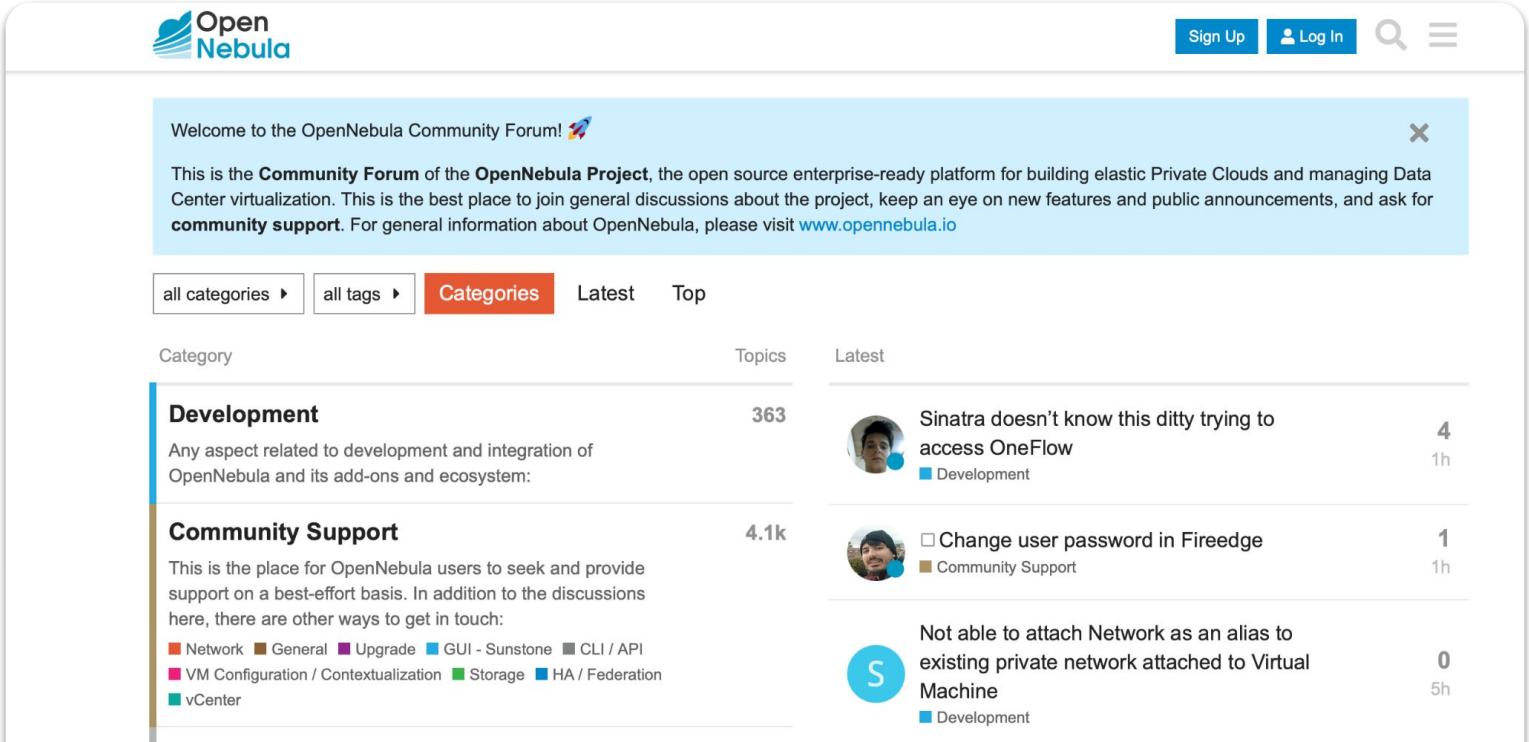
OpenNebula Community Forum

Join the OpenNebula Community where Exploration and Collaboration Unite! 🚀

🔗 forum.opennebula.io



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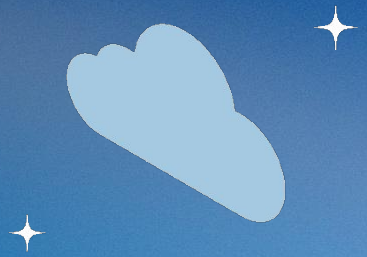

contact@opennebula.io

+34 91 297 9741 / +1 781 238 6643

OpenNebula Systems Headquarters

EMEA

La Finca Business Park, Building 13
28223 Pozuelo de Alarcón, Madrid
Spain

USA

1500 District Avenue
Burlington, MA 01803
USA

OpenNebula Labs

Czech Republic

Cyrilská 7 – Impact Hub Brno
602 00 Brno
Czech Republic

Belgium

Brussels Manhattan Center, 5th Floor
Avenue du Boulevard 21, Brussels 1210
Belgium