



Serverless Computing with OpenNebula

Running containers as **Firecracker microVMs** at the Edge



About Me



Christian González

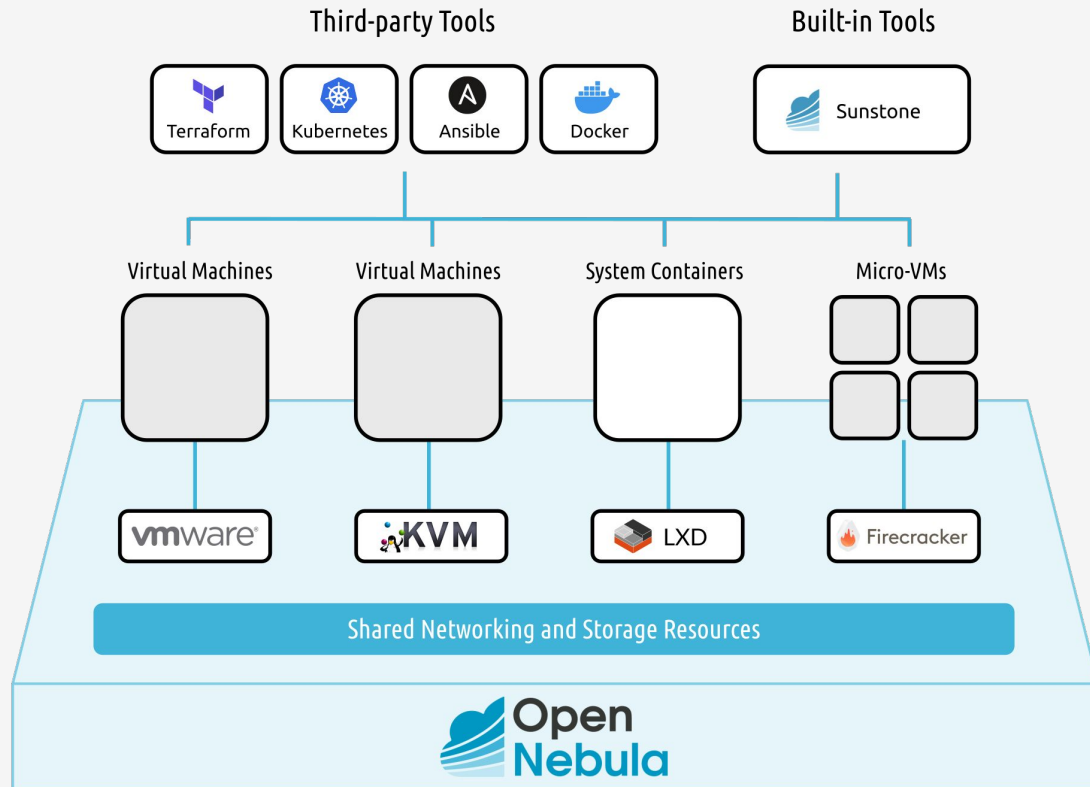
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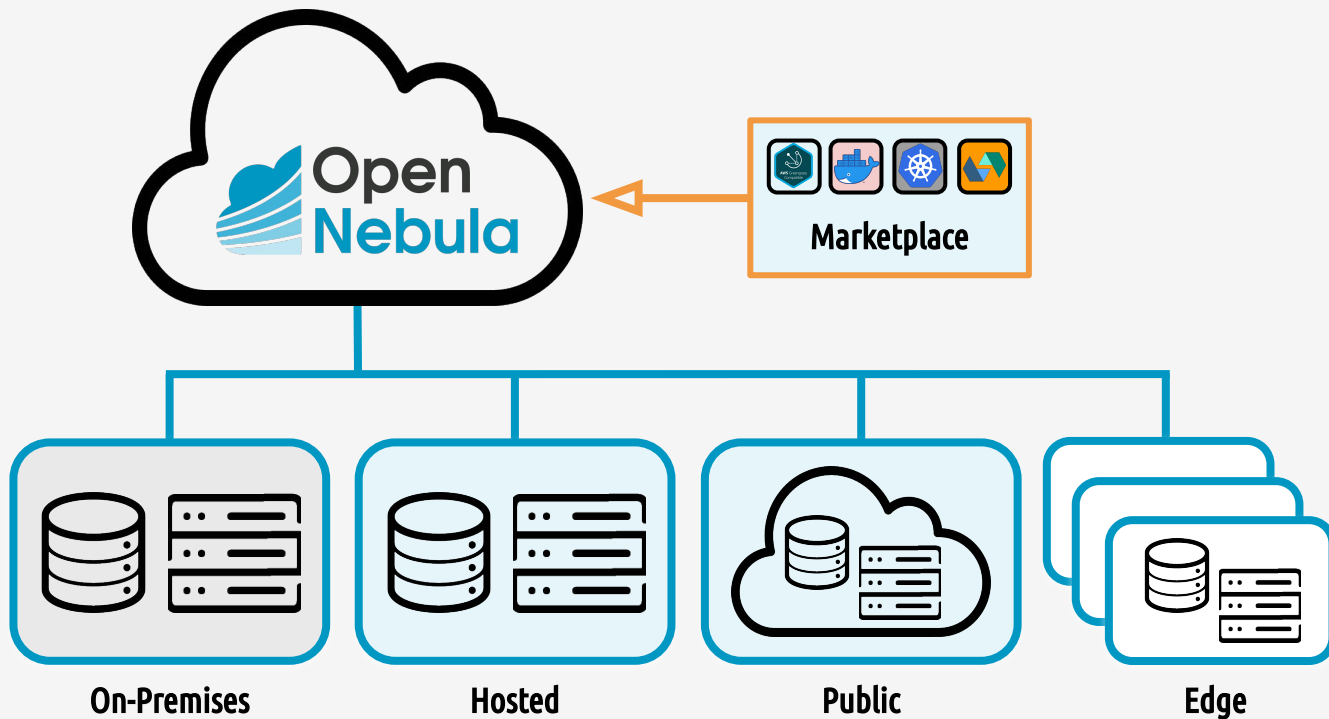
What is OpenNebula?

The open source Cloud Management Platform developed for the Enterprise 🚀



How is OpenNebula Being Used?

Say *hello* to our new True Hybrid Cloud Architecture



<https://opennebula.io/true-hybrid>

The OpenNebula Way

Getting the most out of Public Cloud & Bare-Metal Providers at the Edge

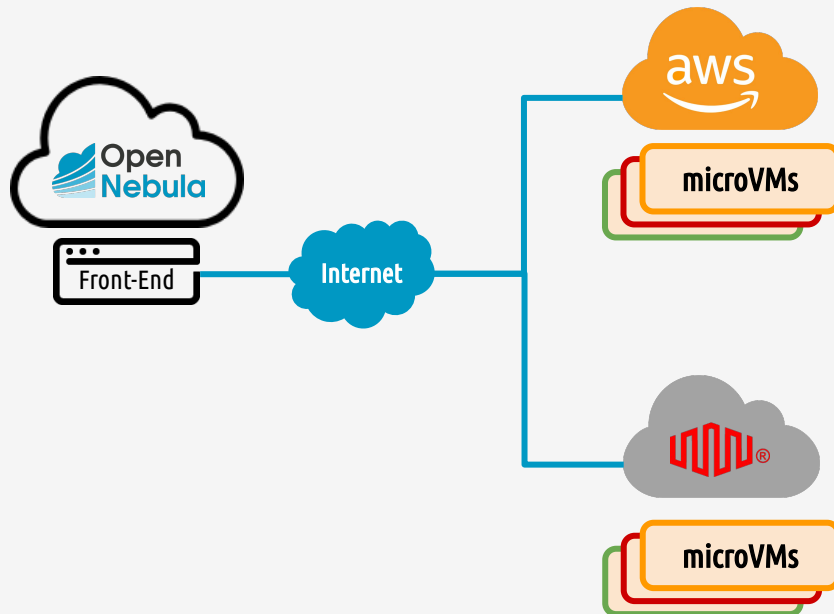
Edge

Easy and quickly cloud provision on the edge with main **bare metal** cloud **providers**.

+

Serverless

Fast and secure serverless load execution with
Firecracker **microVMs** based on **Docker images**.





ONEedge.io

This work has received funding from the European Union's
Horizon 2020 research and innovation programme under
grant agreement ONEedge 880412

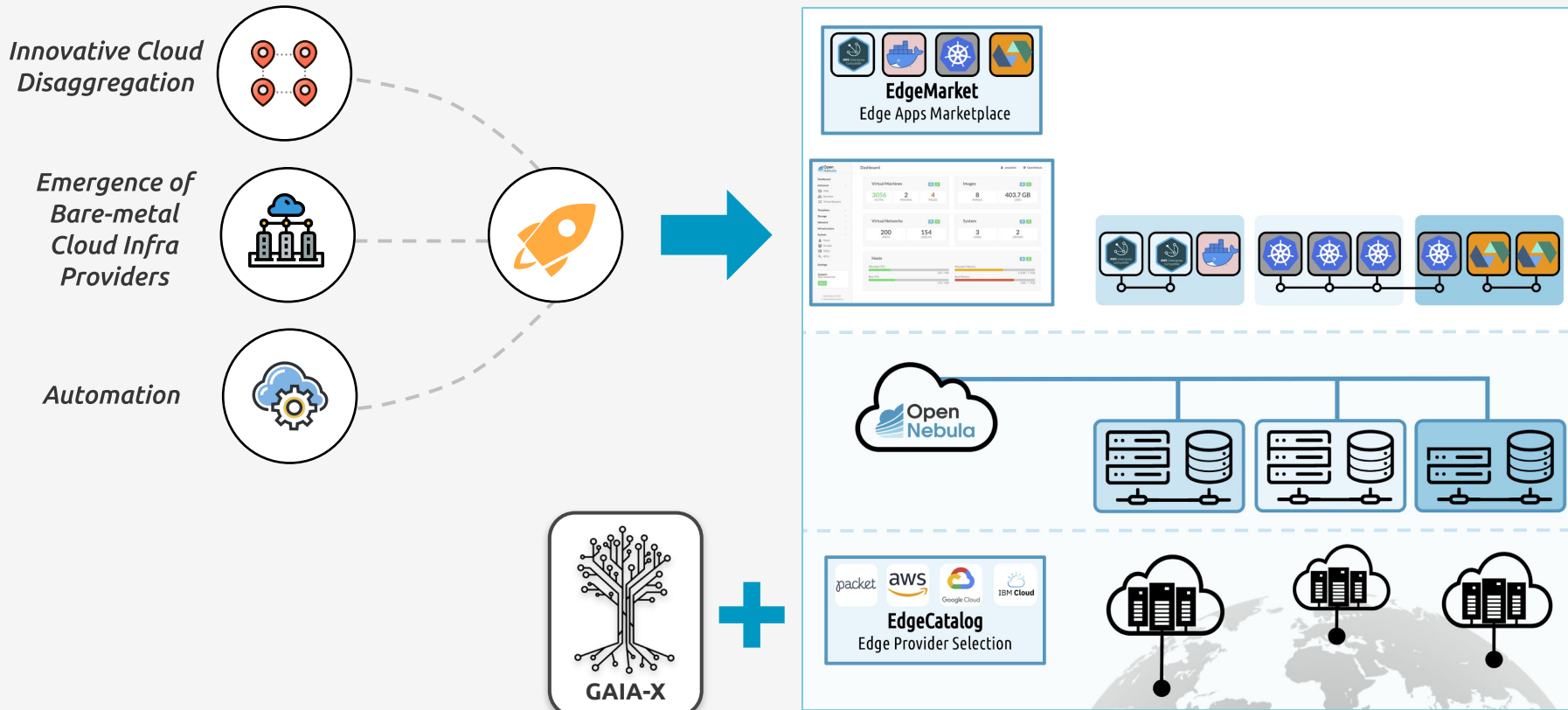
Next Generation Edge Cloud Platform

Build & Manage an On-Demand Edge Cloud
Using Resources from Bare-Metal Providers



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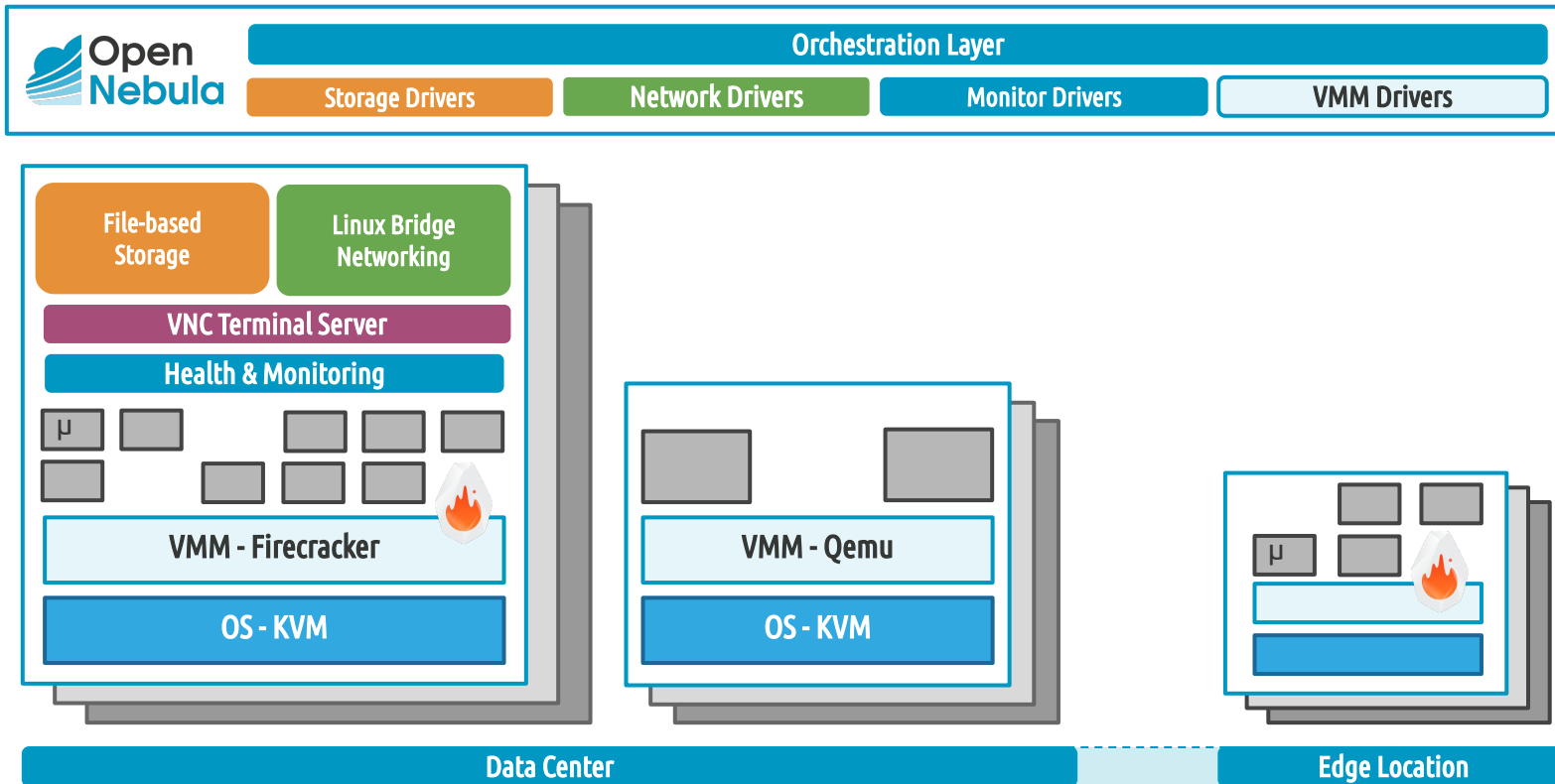
Expanding Open Source Cloud Computing to the Edge





AWS Firecracker

Secure and Fast MicroVMs for Container Orchestration





Secure and Fast MicroVMs for Container Orchestration



Open Nebula

Dashboard

Instances

Templates

Storage

Datstores

Images

Files

MarketPlaces

Apps

Network

Infrastructure

System

Settings

Officially supported

Not connected

Sign in

Apps

oneadmin

OpenNebula

+

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Search

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	ID	Name	Owner	Group	Size	State	Registration Time	Marketplace	Zone
🗑	208	jobber	oneadmin	oneadmin	2GB	READY	24/04/2020 00:00:00	DockerHub	0
🗑	207	sapmachine	oneadmin	oneadmin	2GB	READY	24/04/2020 00:00:00	DockerHub	0
🗑	206	scratch	oneadmin	oneadmin	2GB	READY	25/06/2013 00:00:00	DockerHub	0
🗑	205	alt	oneadmin	oneadmin	2GB	READY	18/04/2020 00:00:00	DockerHub	0
🗑	204	friendica	oneadmin	oneadmin	2GB	READY	07/05/2020 00:00:00	DockerHub	0
🗑	203	hipache	oneadmin	oneadmin	2GB	READY	01/06/2016 00:00:00	DockerHub	0
🗑	202	clefos	oneadmin	oneadmin	2GB	READY	11/05/2020 00:00:00	DockerHub	0
🗑	201	sl	oneadmin	oneadmin	2GB	READY	20/04/2020 00:00:00	DockerHub	0
🗑	200	euleros	oneadmin	oneadmin	2GB	READY	10/05/2019 00:00:00	DockerHub	0
🗑	199	caddy	oneadmin	oneadmin	2GB	READY	06/05/2020 00:00:00	DockerHub	0

10

Showing 1 to 10 of 233 entries

Previous

1

2

3

4

5

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24

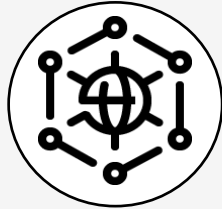
Next

233 TOTAL

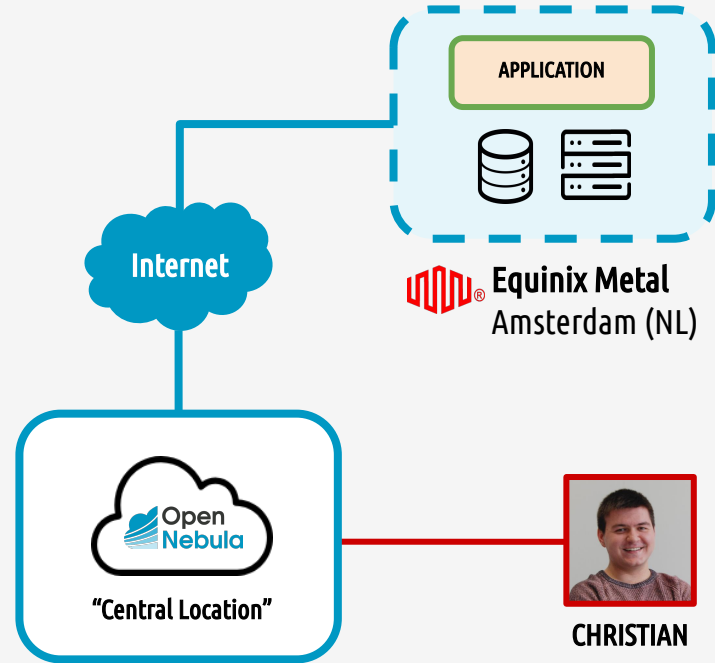
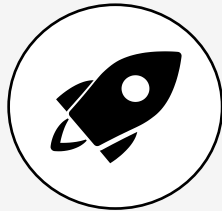
Today's Demo

A View From the Eagle's Eye

Provision Edge Resources



Deploy Serverless Load



Provisioning Edge Resources

At the Edge

01

YAML

Define provision

Define the infrastructure
to be allocated and the
virtual resources

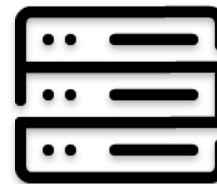
02



Validate provision

Validate YAML file

03



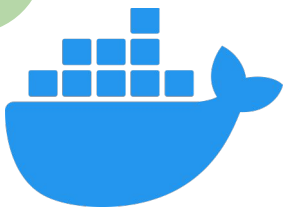
Provision resources

Run the provision to
allocate every resource
defined in the YAML file

Deploying Serverless Loads

Run Any Application, Anywhere

01

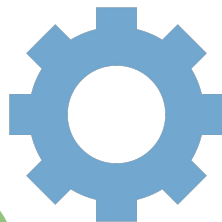


Step1

Import an official image
from Docker Hub

Provision
YAML

02



Step2

Customize your
microVM template

03



Step3

Run it wherever and
whenever you need!

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Future Improvements in OpenNebula 6.0



Improve UX for application deployment.



Make it easier to incorporate new infrastructure providers.



Add user-friendly WebUI for provisioning tool.



Quick deployment of lightweight K8s clusters at the Edge.



K3S

MicroK8s

Low-latency Gaming

Fully automated deployment of gaming servers on
17 edge locations in 25 minutes



<https://opennebula.org/opennebula-a-lightning-fast-video-gaming-edge-use-case-2/>

OTT & Live Broadcasting

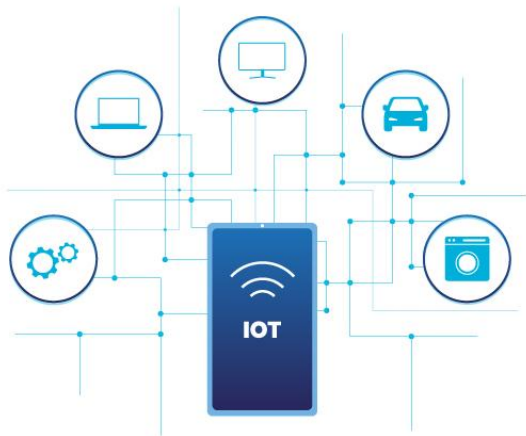
Build live and on-demand video workflows on a
geo-distributed cloud to meet latency,
bandwidth and regulatory requirements



<https://opennebula.io/an-elastic-private-cloud-open-nebulas-solution-for-media-services/>

Internet of Things

Leverage the IoT features of “AWS IoT Greengrass” to create a distributed Greengrass Edge Cloud



<https://opennebula.io/automatic-deployment-of-aws-iot-greengrass-at-the-edge/>

Telecom Edge Cloud

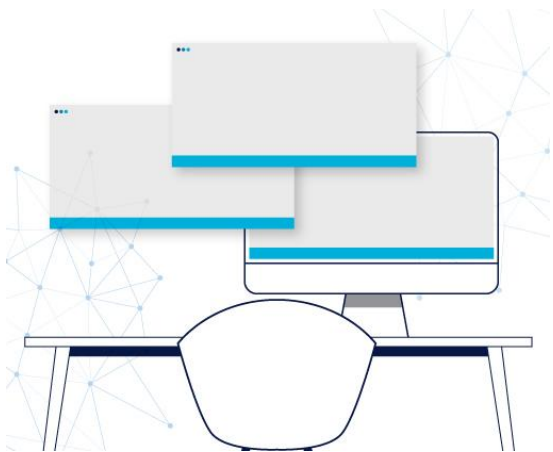
OneEdge as a core component of edge computing
CORD (Central Office Re-architected as a Data center)



<https://www.telefonica.com/documents/737979/144981357/whitepaper-telefonica-opa-mec-feb-2019.pdf>

Desktop Virtualization

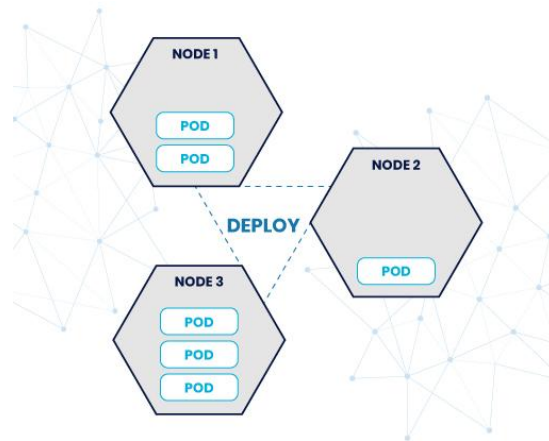
Deploy a pay-as-you-go VDI solution that is compliant with local data protection regulations



<https://opennebula.io/opennebula-for-vdi-at-the-edge/>

Kubernetes Deployment

Configure and manage multiple Kubernetes clusters on the edge for the orchestration of containers



<https://opennebula.io/using-opennebula-and-kubernetes-to-deploy-multiplayer-game-servers-on-the-edge/>

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Give it a try!



Get Started with OpenNebula
for Edge Computing with miniONE

SCREENCAST



A Practical Introduction to
OpenNebula on the Edge with Docker

ARTICLE



Accelerate Edge Cloud Computing
with OpenNebula

WHITE PAPER



miniONE

Install a single-node LXD/KVM/FC Cloud

minione.opennebula.io



OpenNebula 5.12

Try “Firework”, our latest release!

opennebula.io/firework



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