

# OpenNebula, 10 years after

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Pôle de Compétences Logiciels Libres

OpenNebulaCon 2022

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# Pôle de Compétences Logiciels Libres

FOSS and agility in french Minister of National Education

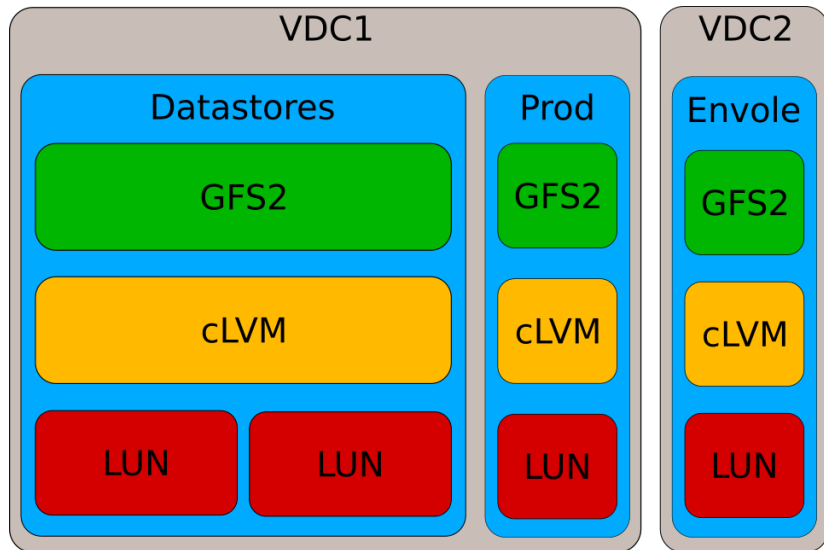
- Original mission  $\Rightarrow$  EOLE GNU/Linux meta-distribution
- CeCILL / GPL / EUPL-1.2 software licensing
- Agile consulting for other development teams

Where were we?

Back in **OpenNebulaConf 2016**

# Storage on SAN

the corosync/pacemaker/cLVM/GFS2 sandwich



# Storage on SAN

Everybody has a gun and too many want to use it

corosync/pacemaker can be challenging

Hot/cold storage  $\Rightarrow$  I/Os not striped on all LUNs

Happy start day

 We started our first cluster in 2012 

More than 880 000 virtual machines

# New hyper-converged infrastructure



# Distributed file system LizardFS

OpenNebula / LizardFS

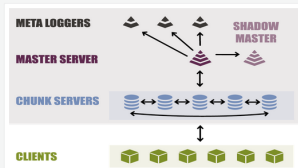
Last 15 minutes

Server All Master localhost ChunkServer All Goal All Storage interface storage

Info



LizardFS is a distributed, scalable, fault-tolerant and highly available file system. It allows users to combine disk space located on many servers into a single name space which is visible on Unix-like and Windows systems in the same way as other file systems. LizardFS makes files secure by keeping all the data in many replicas spread over available servers.



General Cluster Info

Chunk Server Ready Count

5

Chunks AVA Safe Goal:All

179629

Chunks AVA Unsafe Goal:All

0

Chunks AVA state Lost Goal:All

0

Usage

69.3%

Total

36.4 TiB

MetadataServer (4 panels)

ChunkServers (5 panels)

Cluster (7 panels)

Network (4 panels)

Disks (9 panels)



# Distributed file system LizardFS

OpenNebula / LizardFS

Last 15 minutes

## ChunkServers

Chunk Distribution

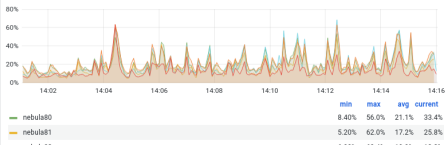


ChunkServer	count	percentage
ChunkServer:10.120.1.80:9422	112 K	19.9%
ChunkServer:10.120.1.81:9422	110 K	19.7%
ChunkServer:10.120.1.82:9422	113 K	20.1%
ChunkServer:10.120.1.83:9422	110 K	19.7%
ChunkServer:10.120.1.84:9422	116 K	20.6%

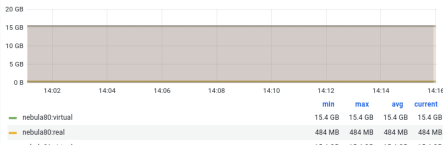
## ChunkServers

A set of chunkservers which store the data. Each file is divided into blocks called chunks (each up to 64 MiB) which are stored on the chunkservers.

Chunkserver CPU



Chunkserver Memory



## ChunkServers

server	version	errors	chunks	total_space	used_space
10.120.1.84:9422	3.12.0	10	116 K	7.3 TiB	5.0 TiB
10.120.1.83:9422	3.12.0	68	110 K	7.3 TiB	5.0 TiB
10.120.1.82:9422	3.12.0	9	113 K	7.3 TiB	5.0 TiB
10.120.1.81:9422	3.12.0	75	110 K	7.3 TiB	5.1 TiB
10.120.1.80:9422	3.12.0	62	112 K	7.3 TiB	5.1 TiB

# Distributed file system LizardFS

future migration?

Excluded from **Debian** since Bullseye

Staled **upstream**

# Custom tooling required

give them out, all of them

Public tooling repository

Only a single tool publish yet `-\_(ツ)_/`

## Crafting appliances

- a template to speed creation and ease common changes
- a Gitlab runner
- a K3s cluster

Could we organise a community?

An OpenNebula **plugin for Packer**?

## Docker for dev has limits

- Want modify/reload workflow → use of volumes
- `docker-compose` → far from prod environment

**k3d** VM as an easy and quick Kubernetes lab

# Integrate CI with Kubernetes

work to be done

- Per developer Kubernetes service
- Automatic deployment in developer environment on Git push

# As infrastructure

for our actual users

- 179 actual OpenNebula deployed by our users
- Easy deployment of Helm on current infrastructures

# As infrastructure

for new setup

Kubernetes distribution based on OpenNebula



# Webography

- Talk at OpenNulaConf 2016  
<http://eole.ac-dijon.fr/presentations/2016-10-OpenNebulaConf/Building-a-GNU-Linux-distribution-with-DevOps-in-mind.pdf>
- LizardFS at Debian <https://tracker.debian.org/pkg/lizardfs>
- LizardFS upstream <https://github.com/lizardfs/lizardfs>
- Our tooling repository  
<https://gitlab.mim-libre.fr/EOLE/opennebula/opennebula-sysadmin-tools>
- Appliance template  
<https://gitlab.mim-libre.fr/EOLE/opennebula/opennebula-apps-template>
- Gitlab runner appliance  
<https://gitlab.mim-libre.fr/EOLE/opennebula/gitlab-runner-app>
- K3S appliance  
<https://gitlab.mim-libre.fr/EOLE/opennebula/k3s-cluster-app>
- Packer plugins <https://www.packer.io/plugins>

# Thanks

Many thanks to the FOSS community for all the great software. So few things would exist without them.

This talk was realised with the help of the following libre software:

- Composition system  $\LaTeX$  **TeX Live**
- The most powerful text editor available today **GNU/Emacs**
- The **Awesome** window manager
- The Universal Operating System **Debian GNU/Linux**



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