Sylva project

Taking on CaaS and CNF integration fragmentation challenges

June 2024

A fundamental step to Telco Cloud & Edge homogenization and sustainability

Every cloud has a SYLVA lining

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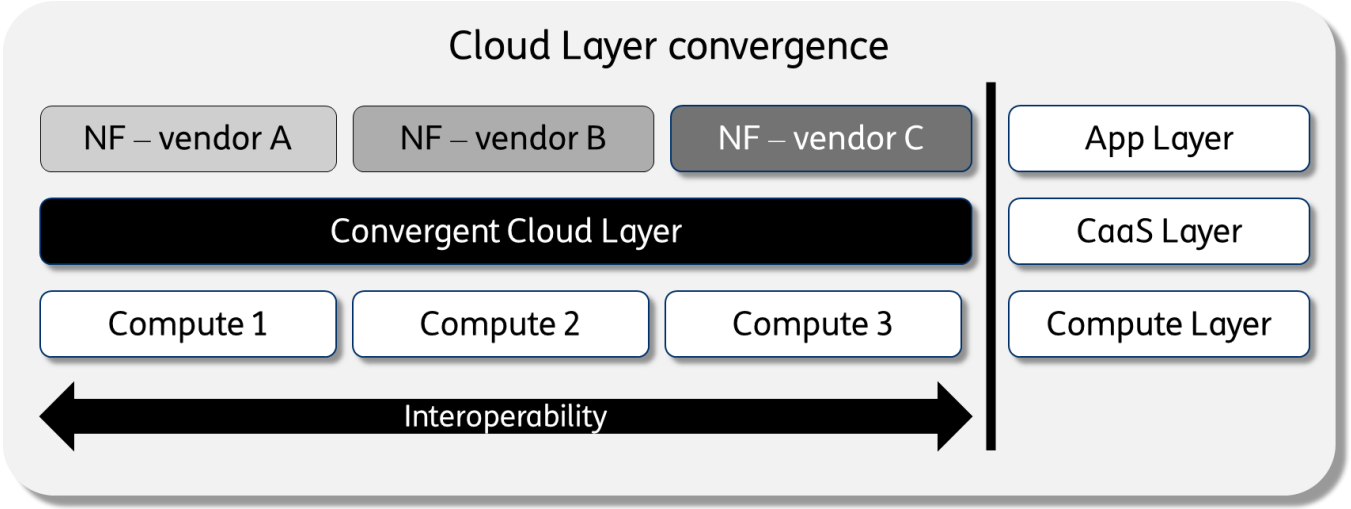
Convergence opportunity

Both **vendors and operators** are interested in a **convergence** on the Cloud Layer, that could guarantee interoperability and simplify drastically the operations.



? The question is **WHO** will provide this Convergent Cloud Layer, and what impact it will have on costs, industrial dependency, sovereignty, etc

Why Sylva?

Mission statement

The main carriers in Europe, together with network function providers, launched in Nov 2022 the **Sylva** project to address Telco and Edge use cases

The project objectives are:

- To release a cloud software framework tailored for telco and edge requirements that address the technical challenges of the industry layer of this ecosystem
- To develop a reference implementation of the cloud software framework and create a validation program for such implementations

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Our approach

The five technical pillars

Network Performance to answer to CNF requirements and performance

Telco features : SR-IOV, DPDK, Low latency, Specific CNI

CaaS on BareMetal

Distributed cloud

BM Automation : Declarative approach & Gitops to manage thousands of heterogenous nodes

MultiK8S : Optimized lifecycle Management of many K8S Clusters in DC

Best in Class Security Design

Answer Telco grade requirements

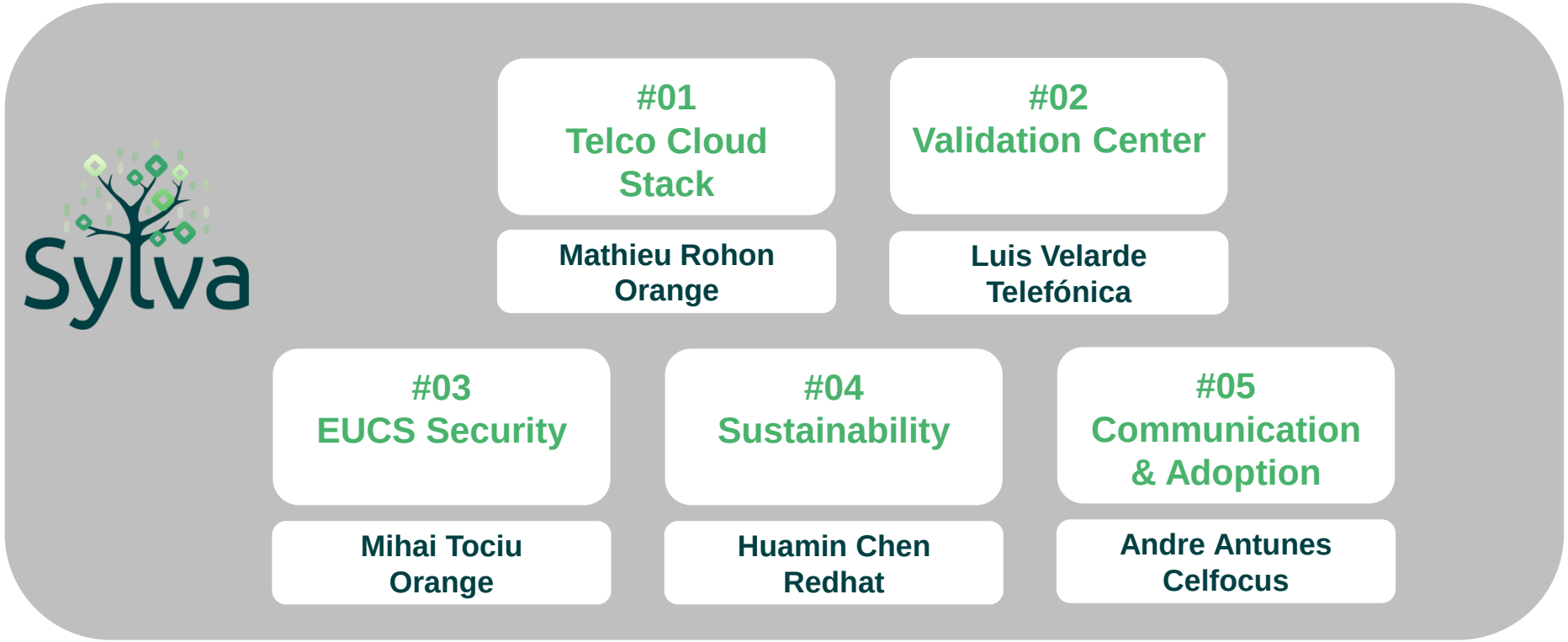
Open source and standardized API

Support multi-Vendor CNF & boost market adoption

Sustainability

Measure & Optimize to limit Energy Consumption & manufacturing CO2 Emission

Summary of workgroups under Sylva TSC

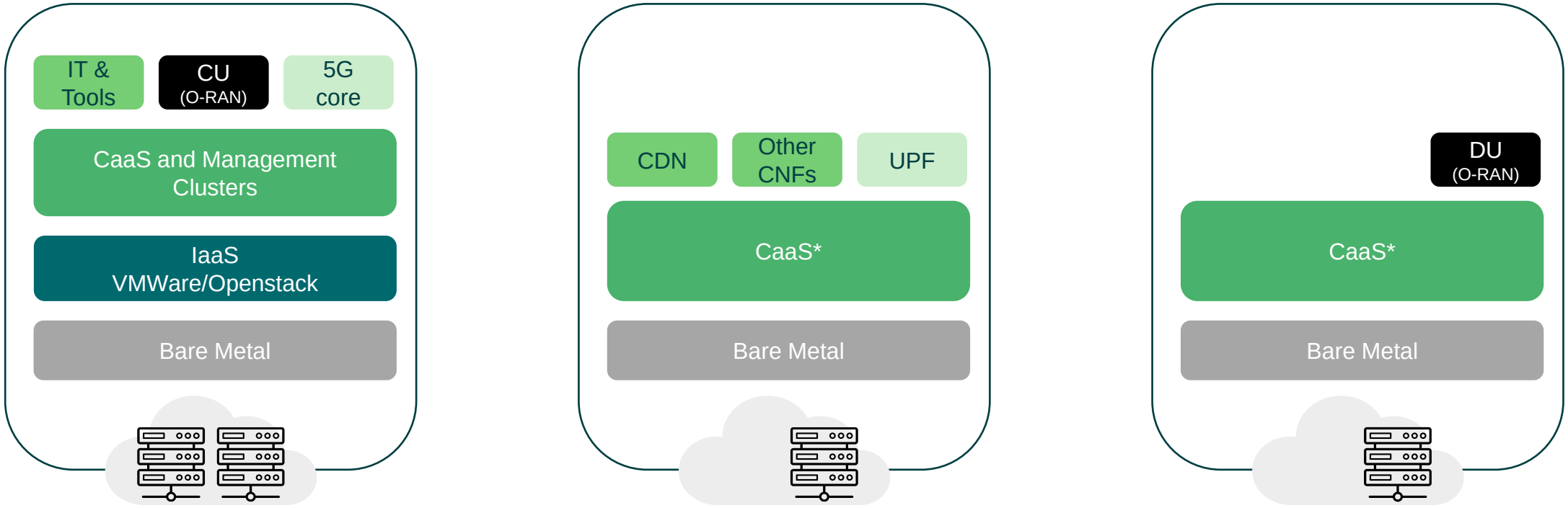


Sylva Co-Chairman : Carlo Cavazzoni (TIM) & Guillaume Nevicato (Orange)

What we deliver

Sylva architecture

To address such use case as 5GCore, Distributed UPF, CDN or Open RAN,
Sylva will provide an architecture able to manage from Central to far edge site

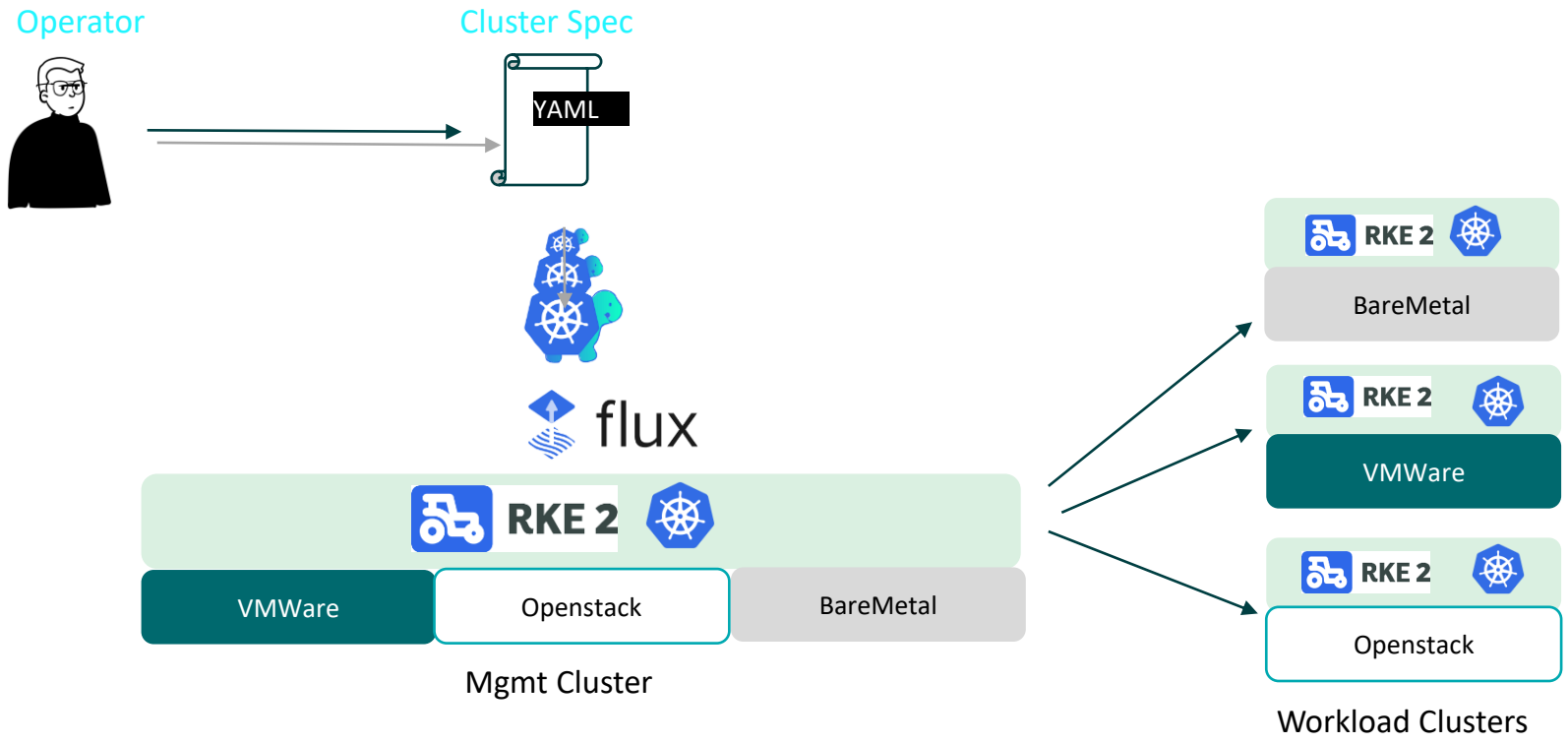


Central site | Edge site 1 | Edge site 2

*this is an example on how SYLVA could be deployed in a multi cluster environment

What we deliver

Architecture



Info

from Imperative to **Declarative management of Kubernetes Clusters** based on **ClusterAPI** and **FluxCD**
No **kubernetes distros** lock-in (RK2E and vanilla K8S currently)
No **IaaS hypervisor** lockin (Bare-Metal, Openstack, VMWare, …)

Sylva adoption

Validation Program

Validation Center Platforms	Telefónica 1➔2	orange x3	TIM 0➔1	Datacenter and dedicated teams to support the validation process

	6WIND	ORACLE	NOKIA	Ericsson	Hewlett Packard Enterprise	HUAWEI	ZTE	Others
NF Validated Vertical integration with limited functional and performance test	VSR	5G PCF 5G SIG	5G Distrib UPF 5G EMS/UDM	5G SIG	5G SDM	5G SDM	5G SDM	CASA SDM
NF Backlog			5G Core (tbc)	NEF (tbc)		5G Core (tbc)	5G Core (tbc)	AI-Fogsphere CDN Varnish

Backlog :
https://gitlab.com/sylva-projects/validation_center/-/blob/main/CNF%20Validation%20Backlog.md

2024 Sylva Roadmap

Draft that will be validated to next TSC

	Feb V1	March V1.1	Sept 1.2	Dec 1.3
Use cases requirements	**Optimized Operations** **5GCore**	**Nephio**	**DU-ORAN** **Infra Test coverage**	**Federation CAMARA Edge WG** **Enhanced connectivity** **Edge App** **NF Tooling**
Cloud Features	**Kubernetes : V1.27** **OS** : Add OpenSuse Leap **Prod Readiness :** Documentation, installation process, values definition **Security :** **Security as Supply Chain** first step in authenticity & integrity of the artifact, OS & Kubernetes Hardening	Tentative K8S 1.28 User management **Prod Readiness :** **Cloud Stack Upgrade Test & proc** **Doc** enhancement on Monitoring, user Management, upgrade **Nephio Integration demo** **Security :** External PKI integration	**K8S Distro : 1.29** **Improve CI results and coverage** **OS :** *Explore Immutable OS*, RT OS for RAN PTP Client **Offloading** DU Acceleration Card **Security** NF Security Redlines with WG02/03 Node FW Cert Manager *Explore GUI to simplify K8S provisioning* *Explore Host Based Routing* *Exploration on Tenant Isolation* *Explore OKD (Openshift) Pilot with CAPI*	*additional K8S distro* **NF Tooling Zone Design :** list of selected components **Hybrid Cloud Hyperscaler integrated in the Cluster Manager** **MultiCluster application : distributed application (service mesh or other)** **Storage :** NAS and new Cloud native solution ***Network Automation Exploration Explore*** *L2&L3 Network Automation (BGP & VLAN)* **CO2 emission Monitoring with WG04** Tenant Isolation first Implementation

Standard bodies and Open-Source ecosystem

Sylva growing Adoption

Active Contributors

ORACLE
HUAWEI
DELL
Lenovo
NEARBY COMPUTING
HPE
casa systems
intel
UBiqube
ZTE
CELFOCUS
TIM
GitLab

General Sponsors

NOKIA
6WIND
Red Hat
EQUINIX
CANONICAL
Open Nebula

Premier Sponsors

orange
vodafone
Telefónica
SUSE

Cochairs : Carlo Cavazzoni **TIM** & Guillaume Nevicato **Orange**

Followers

- Telus
- Free
- NTT
- BT
- AWS
- NVIDIA
- Mavenir
- Juniper
- Viavi
- SRS
- Airbus
- Thales
- Cap Gemini

NF Vendors; IT HW, SW & Integrators; Telco Operators

Sylva achievements & Challenges

Achievements

- ✓ **Open-Source Project launched** in Nov 2022
- ✓ **Directed Fund Creation** in Sept 2023 with 12 sponsors
- ✓ **Production grade** telco cloud stack on VM/BM with Acceleration. 3 Major Releases / y
- ✓ **4 validation center platforms** Up&Running. 10 Network Functions Onboarded
- ✓ **25 companies contributing** to the project

Ahead of us

- ✓ Address new use Cases : Open-RAN, Edge, IT & Network Convergence
- ✓ Onboard New Telecom Operators , IT Editor and integrators

#ManageManyK8S #Security #Performance #ConvergentStack

More info ?

Info

- Introduction Website : https://sylvaproject.org/
- Gitlab https://gitlab.com/sylva-projects
- Slack Channel : https://join.slack.com/t/sylva-projects/shared_invite/zt-22qh2hv90-veKs9yH_tO7u7hHGc6Hvrg

Thank you

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