XGVela Cross Community Collaboration

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XGVela | Collaboration Overview
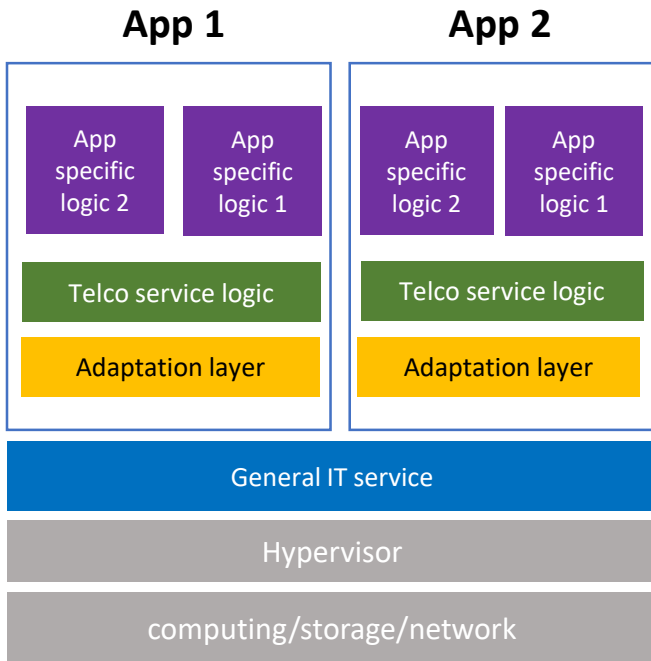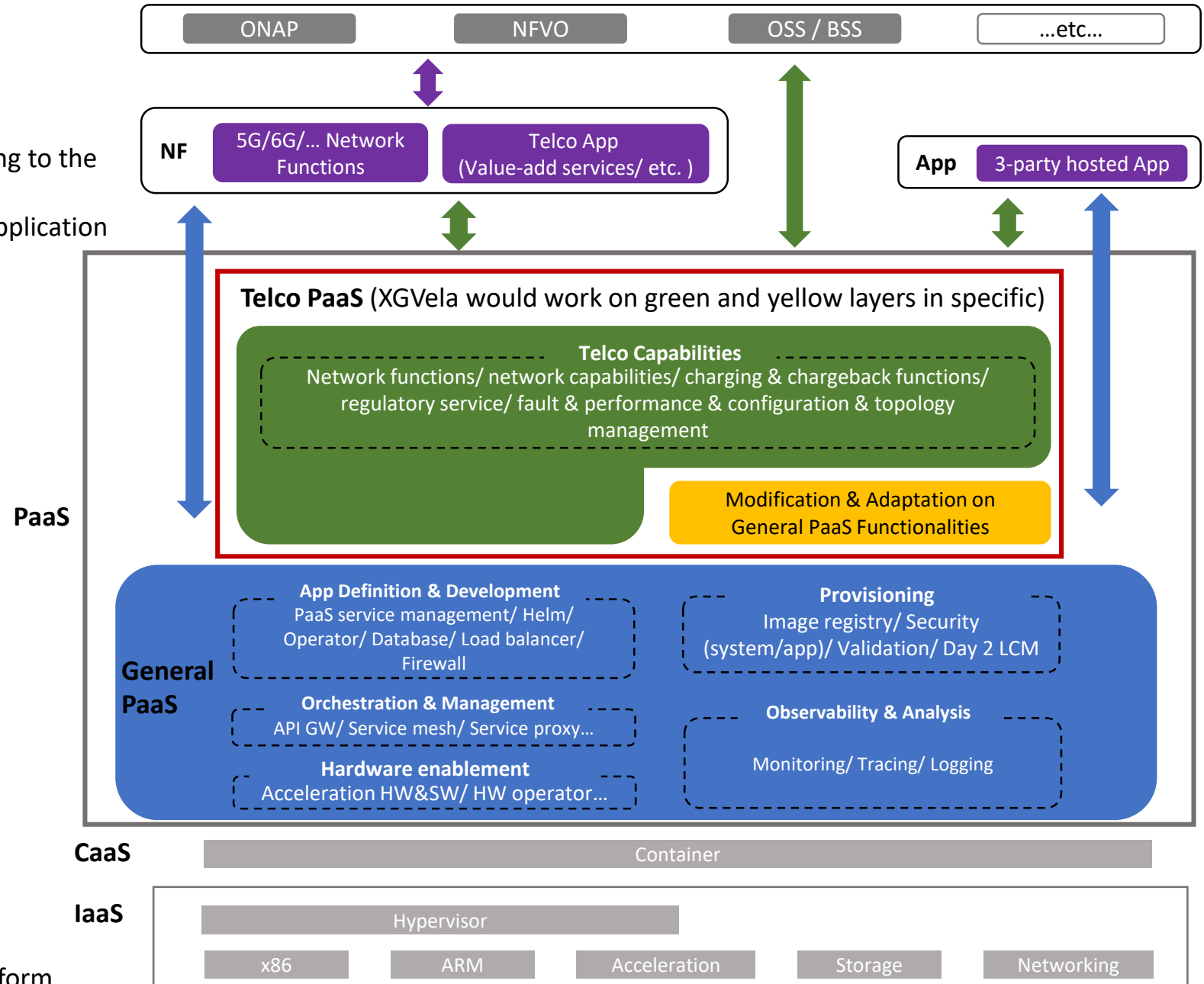
XGVela | Architecture

1. Application tailoring:

- The NFs / applications are further decomposed according to the microservices architecture
- Strip away the parts that have nothing to do with the application itself

App 1	App 2

App 1

App specific logic 2	App specific logic 1
Telco service logic	
Adaptation layer	

App 2

App specific logic 2	App specific logic 1
Telco service logic	
Adaptation layer	

General IT service

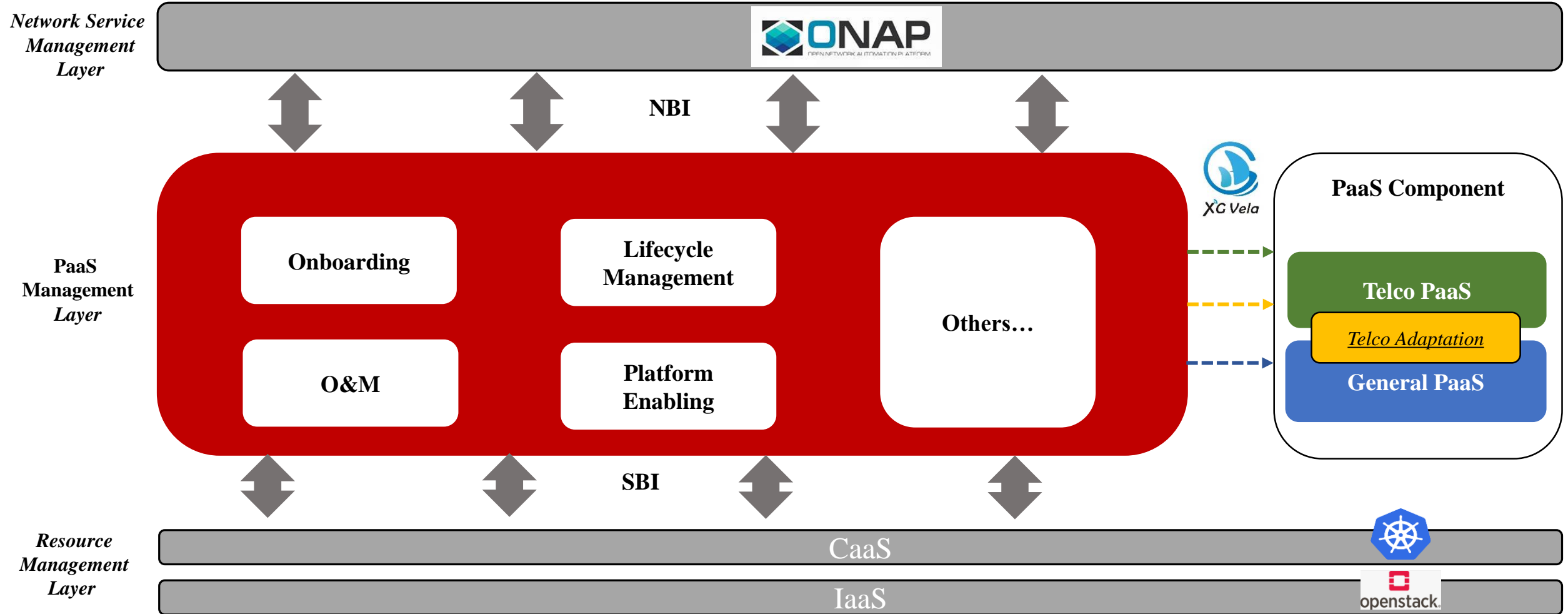Hypervisor

computing/storage/network

2. Platform addition:

- Support the coexistence of multiple resource forms
- Based on network element software architecture, the implementation of the general service rely on the platform
- Provides unified capabilities through API

ONAP	NFVO	OSS / BSS	...etc...

NF

5G/6G/… Network Functions	Telco App (Value-add services/ etc.)

App | 3-party hosted App

PaaS

Telco PaaS (XGVela would work on green and yellow layers in specific)

Telco Capabilities
Network functions/ network capabilities/ charging & chargeback functions/ regulatory service/ fault & performance & configuration & topology management

Modification & Adaptation on General PaaS Functionalities

General PaaS

App Definition & Development
PaaS service management/ Helm/ Operator/ Database/ Load balancer/ Firewall

Provisioning
Image registry/ Security (system/app)/ Validation/ Day 2 LCM

Orchestration & Management
API GW/ Service mesh/ Service proxy...

Observability & Analysis
Monitoring/ Tracing/ Logging

Hardware enablement
Acceleration HW&SW/ HW operator...

CaaS | Container

IaaS

Hypervisor

x86	ARM	Acceleration	Storage	Networking

XGVela | Collaboration with ONAP | PaaS Management

Network Service Management Layer

ONAP

NBI

PaaS Management Layer

XG Vela

PaaS Component

Onboarding

Lifecycle Management

Others…

O&M

Platform Enabling

Telco PaaS

Telco Adaptation

General PaaS

SBI

Resource Management Layer

CaaS

IaaS

openstack

Onboarding
- Insert external PaaS component
- Render PaaS component inventory

Lifecycle Management
- Instructed by NBI and work with resource layer by SBI
- Store PaaS component alive status

O&M
- PaaS component status monitoring(response time, session connection number, etc),Telemetry
- PaaS component performance assurance and operate by customized policy

Platform enabling
- Enable CaaS platform capabilities for multiple scenarios of NFV cloud(Core cloud, edge cloud, etc)

XGVela | Collaboration with ONAP | ONAP Orchestration
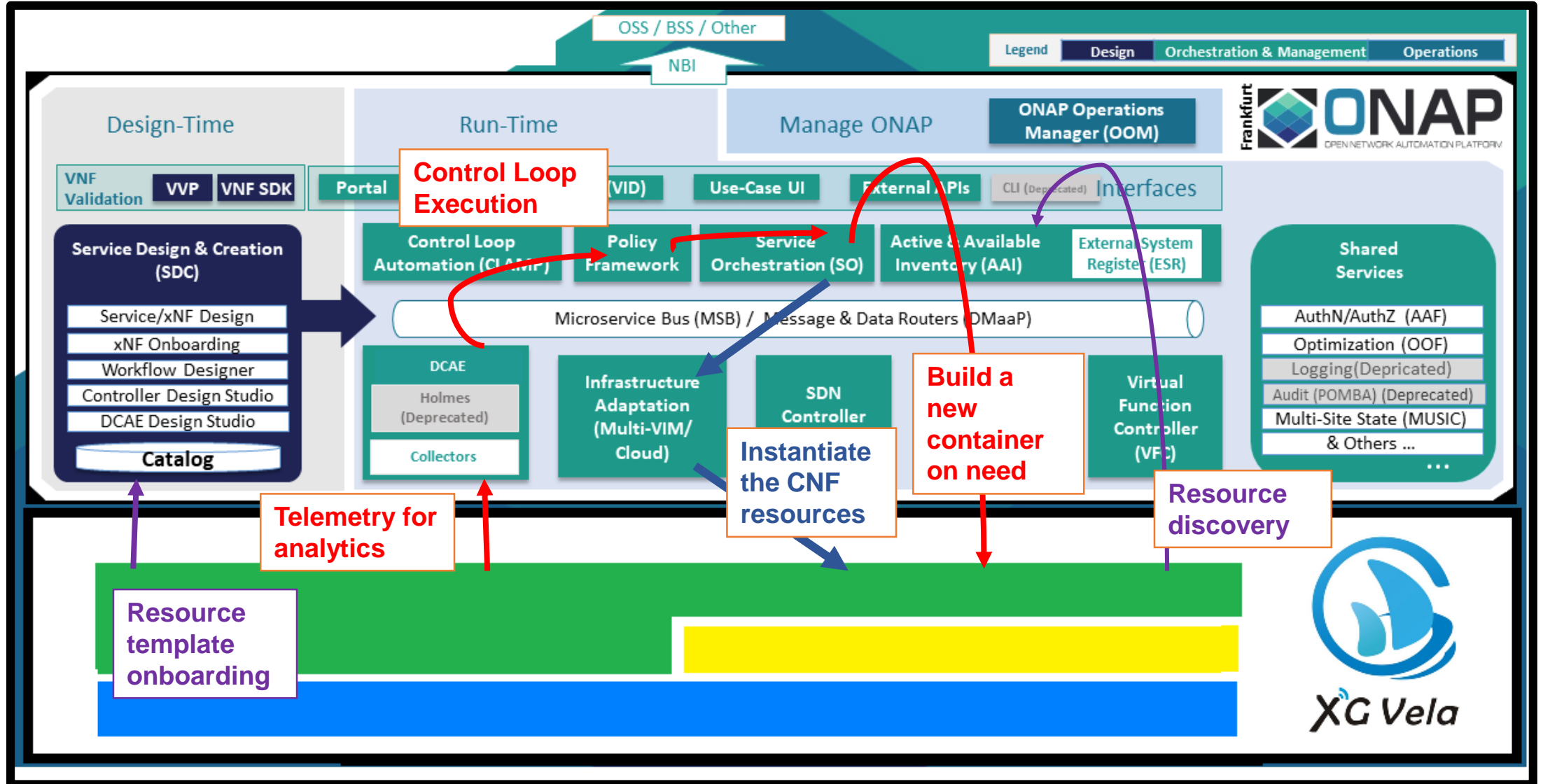
XGVela | Collaboration with ETSI
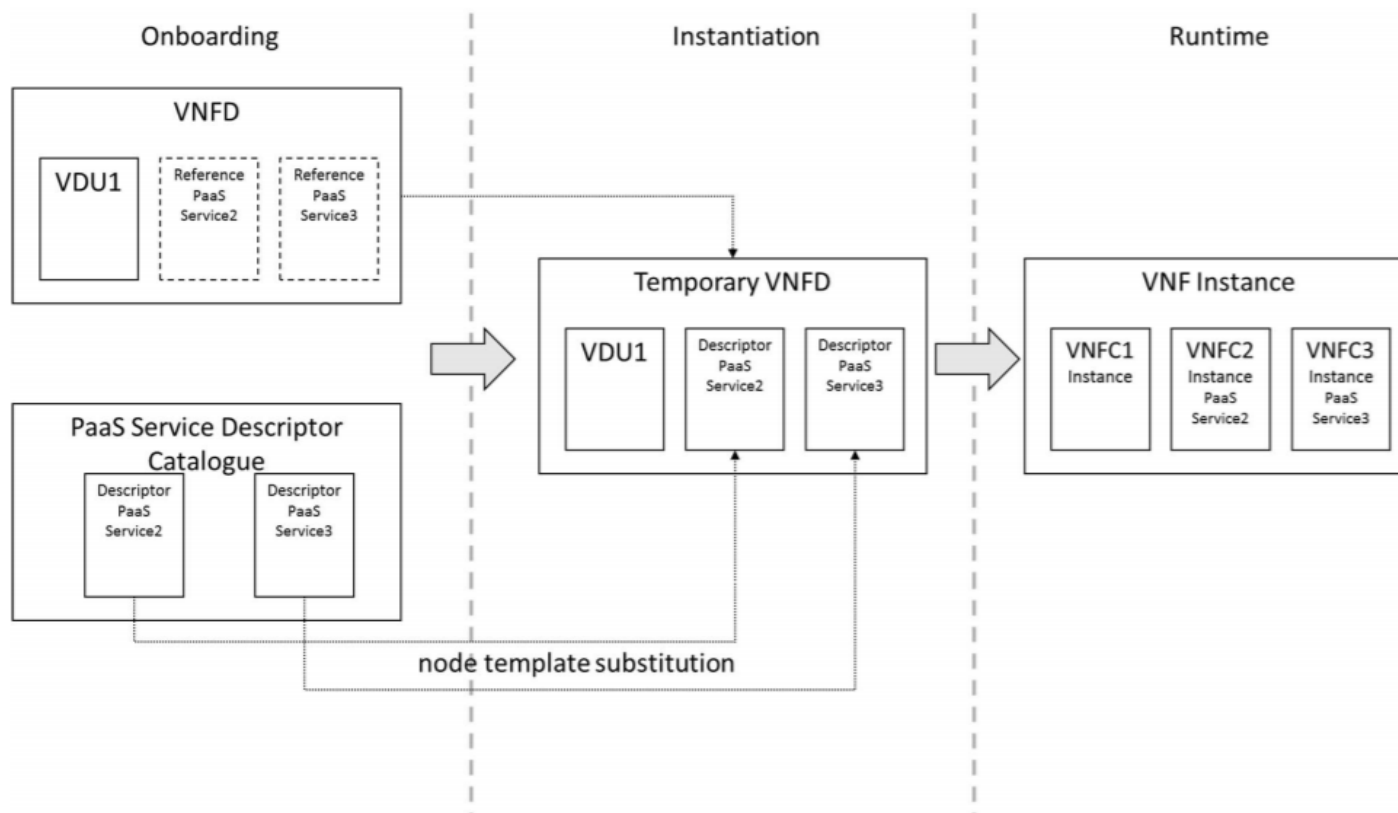
XGVela might be a good fit for the CNF bases orchestration scenarios that ETSi defines and is currently working upon.

In particular IFA029 (NFV-IFA029v030301p) Enhancements of the NFV architecture towards "Cloud-native" and "PaaS

There a lot of usecases defined in the specification (with no particular architectural definition) to defined the MANO and PaaS interactions.

The vision to the enhance the 5G based usecases for better service management.

The focus the will be SOL004 and SOL007.

XGVela | Collaboration with CNCF
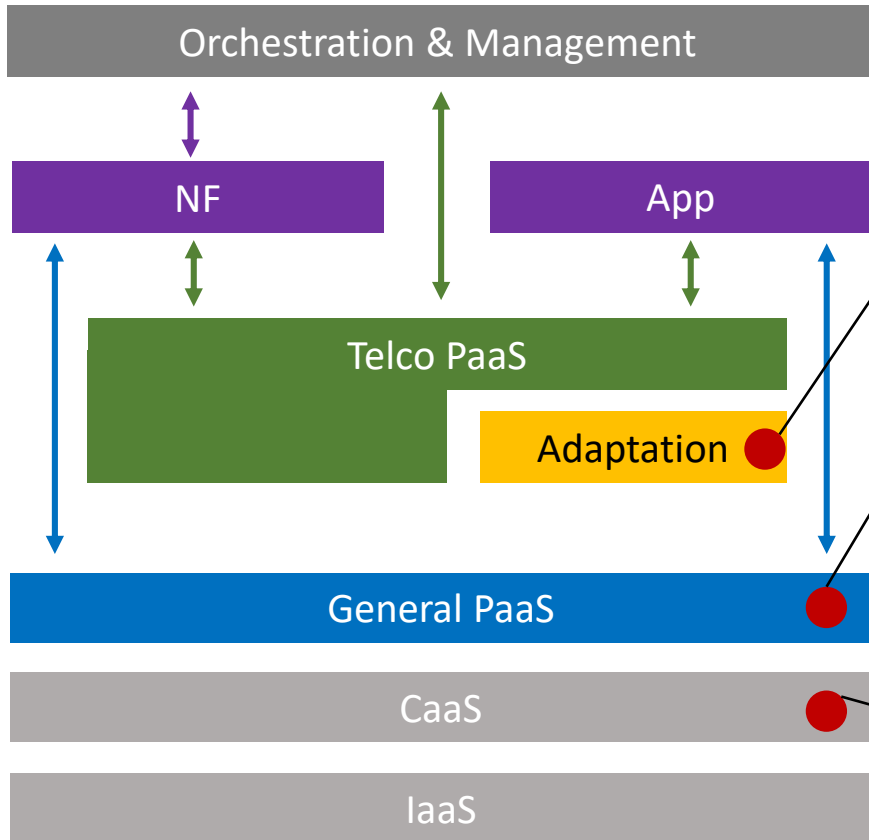
— **Adapt & enhance to meet telco requirements**
- Protocol enhancement on general PaaS (diameter, SNMP alarm…)
- Platform enablement (FPGA, GPU & Smart NICs for K8S schedulers…)
- Data model enhancement follow telco management system rules

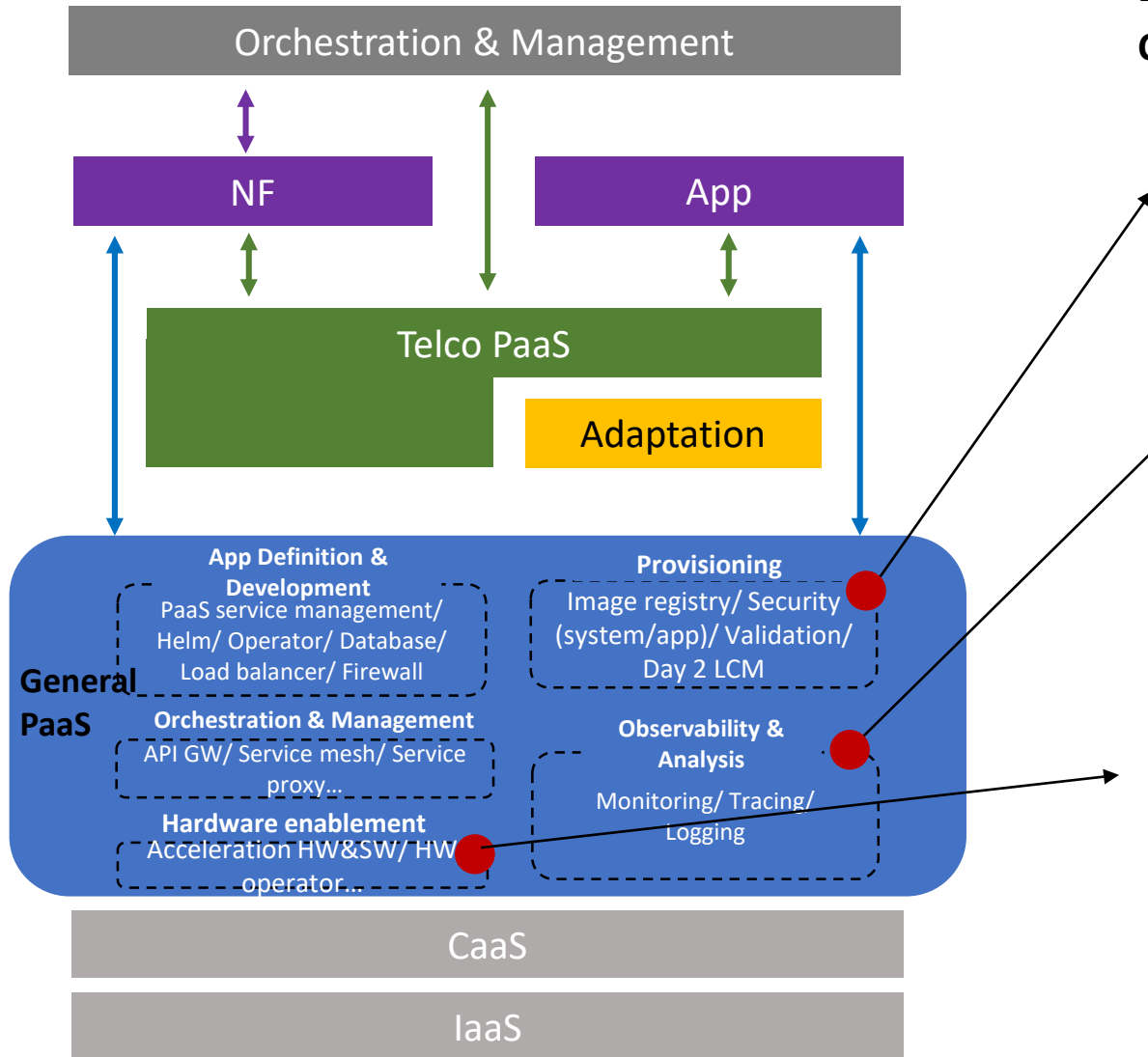— **Choose necessary general PaaS functionalities**

| Service LCM | Service proxy | Tracing | Logging |
| Messaging | Service Discovery | Database | Monitoring |

— **Provide container environment**
- container storage, container network, container runtime, …

XGVela | Collaboration with CNCF

— **Some examples for General PaaS functionalities implemented with CNCF projects**

◆ **Configuration update online**
  – Update NF/APP or PaaS components configuration without POD restart
  – Play and plug as add-ons for Kubernetes

◆ **Observability & Analysis**
  – Monitoring NF/APP by Prometheus: Telco required metrics with defined exporters
  – Logging by telco analysis way with EFK tools

◆ **Telco requirement for container resource**
  – Multiple network plane/different acceleration HW/…
  – Different scenarios requirement support enable different abstract functionalities
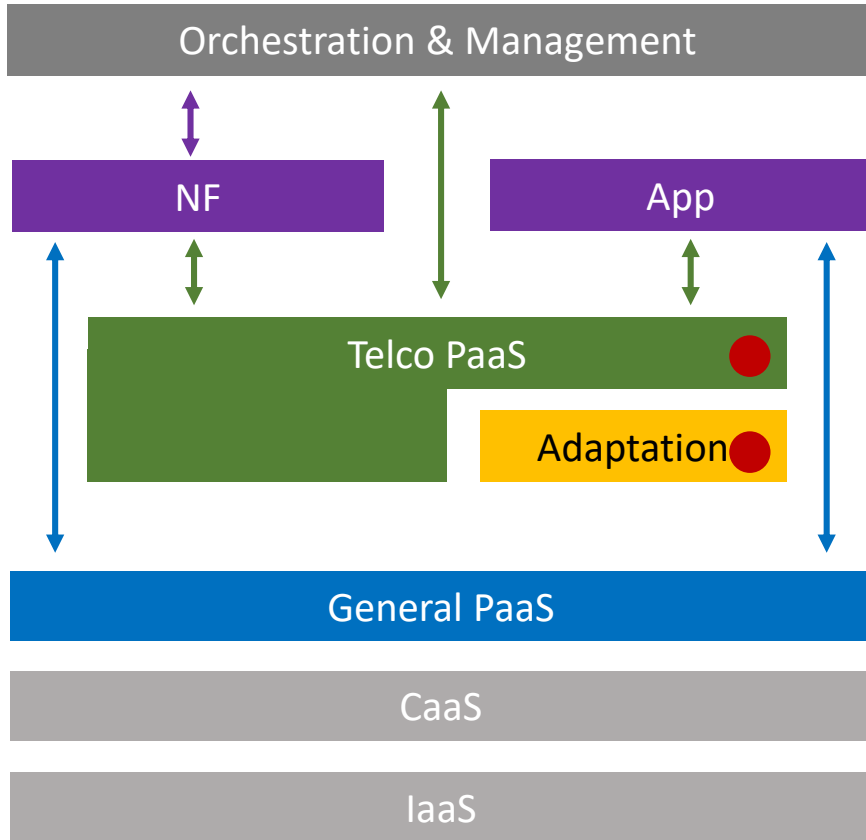
XGVela | Collaboration with Akraino

Upstream projects:
IaaS: Openstack
Provision: Ansible, KubeSpray
CaaS: Docker

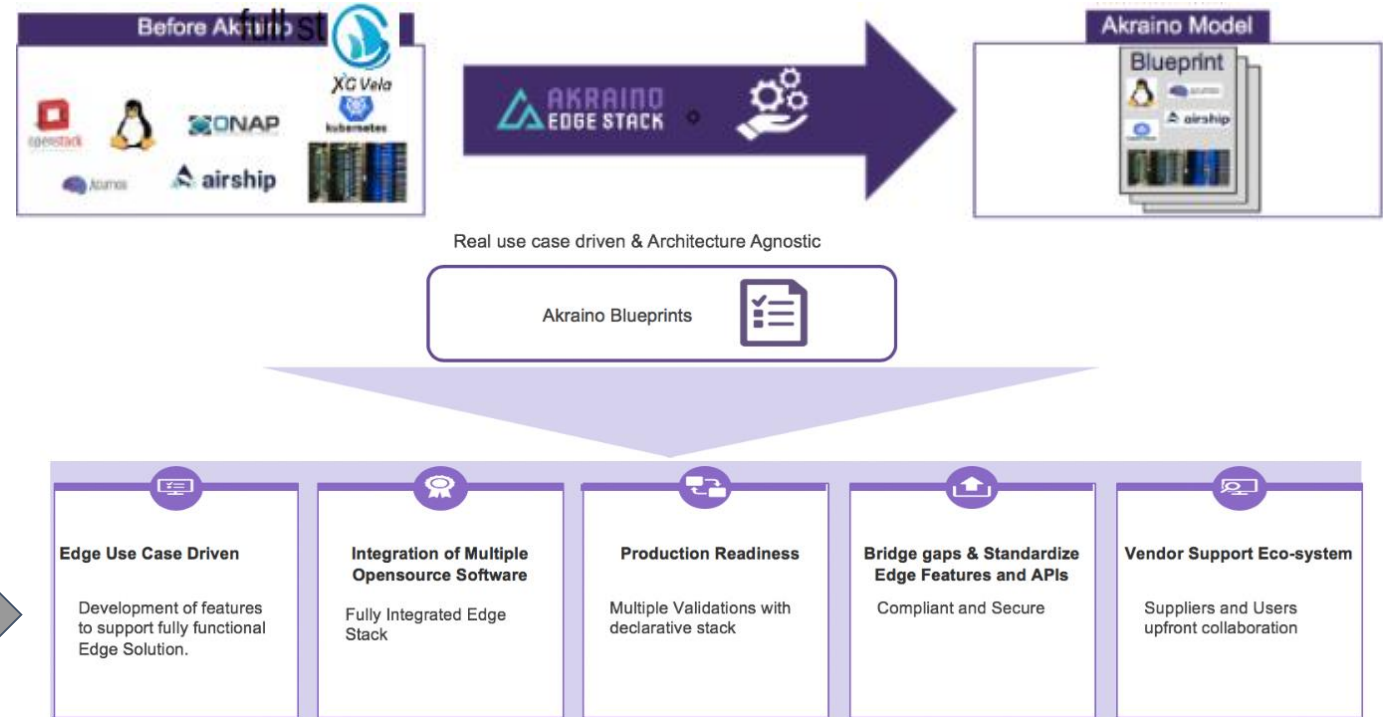GPaaS: CNCF, K8s
Telco PaaS: XGVela
NF O&M: ONAP
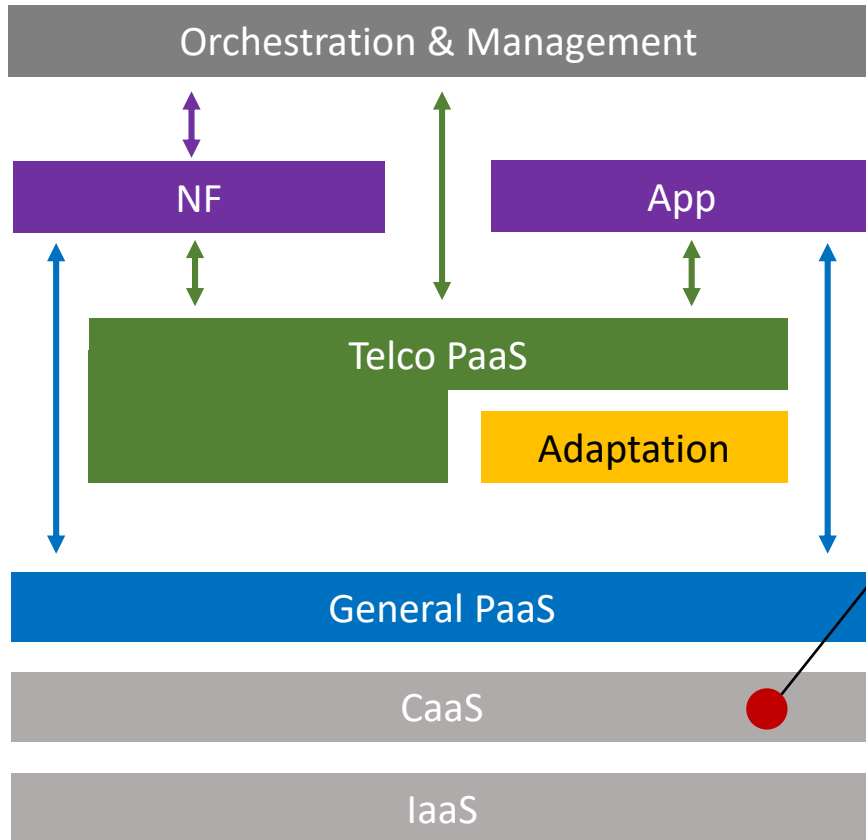NFs: O-RAN SC, TIP

XGVela as Upstream Project:

❖ Define a E2E use case for Telco specific by leveraging XGVela Telco PaaS as upstream.

❖ Reference Telco BPs can be used to realize Telco use case incorporation with XGVela

○ EALTEdge: Lightweight Telco Edge platform leverage EdgeGallery platform and network services.

As Downstream Project:

❖ Telco BP(EALTEdge, ICN, KNI etc.) can be used as base platform to provide general PaaS capabilities.

Real use case driven & Architecture Agnostic

Akraino Blueprints

Edge Use Case Driven	**Integration of Multiple Opensource Software**	**Production Readiness**	**Bridge gaps & Standardize Edge Features and APIs**	**Vendor Support Eco-system**
Development of features to support fully functional Edge Solution.	Fully Integrated Edge Stack	Multiple Validations with declarative stack	Compliant and Secure	Suppliers and Users upfront collaboration

XGVela | Collaboration with CNTT

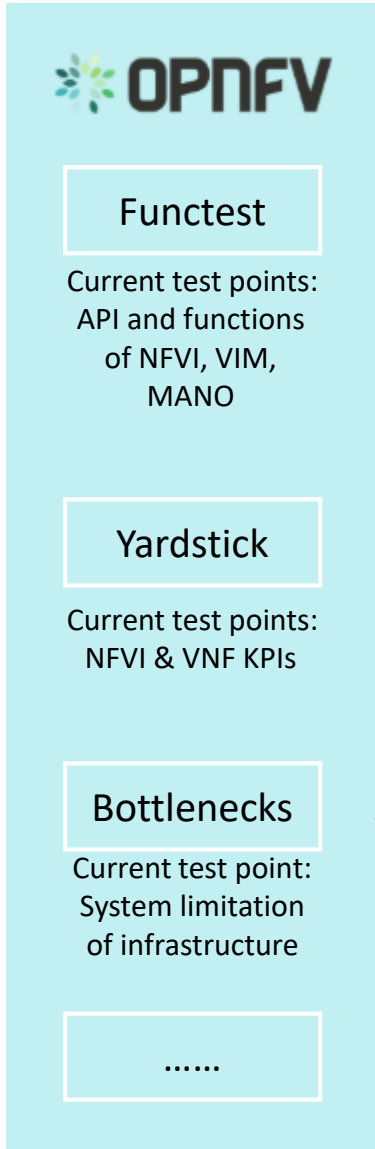— **CNTT RA2 defines a reference CaaS layer specific for telco**
   - Kubernetes node, Kubernetes, container runtime, network, storage, security…
   - Requirements & functional capabilities…
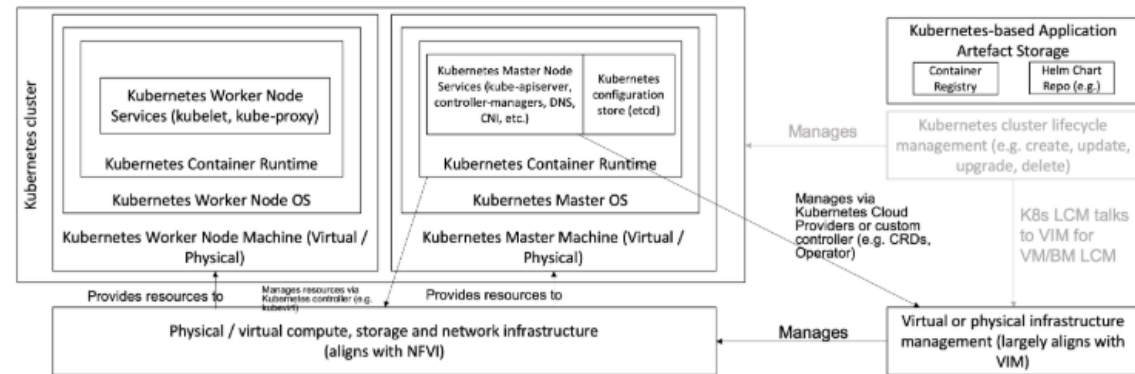
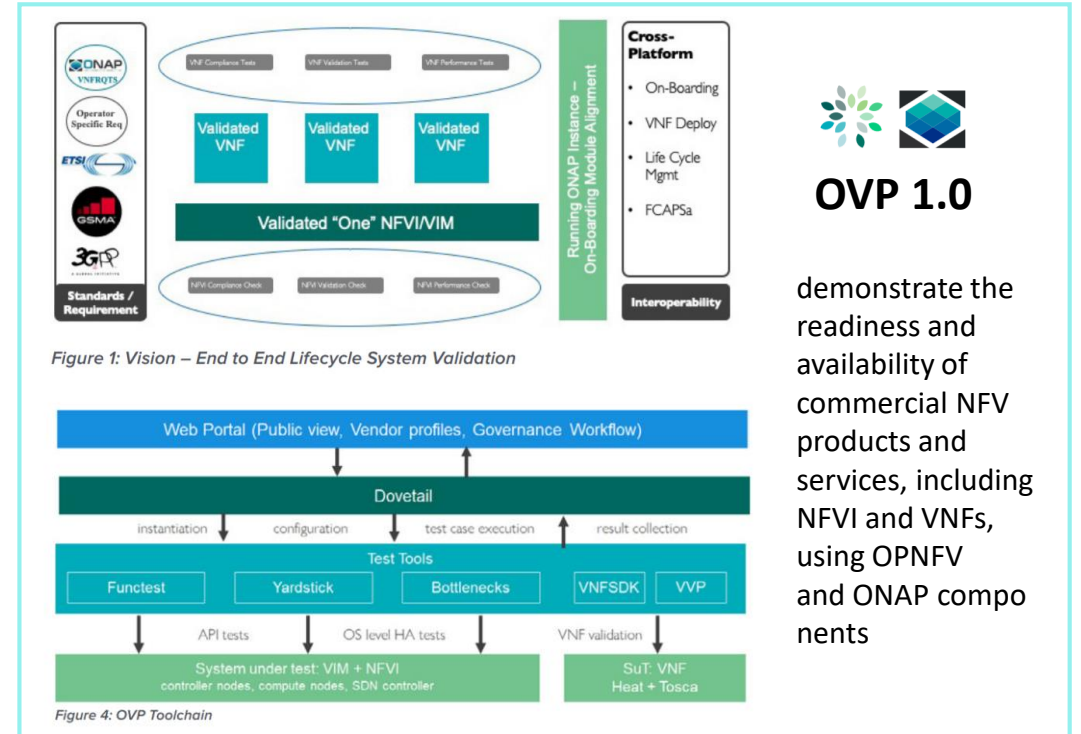— **Choose CaaS layer which meets CNTT RA2 to do integration when XGVela building PaaS**

— **Collaborate with CNTT to upstream new CaaS requirements emerging in PaaS**

XGVela | Collaboration with OPNFV & OVP2.0

OPNFV

Functest

Current test points: API and functions of NFVI, VIM, MANO

Yardstick

Current test points: NFVI & VNF KPIs

Bottlenecks

Current test point: System limitation of infrastructure

......

— **Possible collaboration points with OPNFV**

◆ **Test APIs and functions of XGVela PaaS**
- PaaS management (e.g. onboarding, LCM, monitoring, ….)
- PaaS component (e.g. protocol processing unit, regulatory service, telco load balancer…)

◆ **Test XGVela PaaS KPIs**
- Decompose CNF workload performance metrics into a number of characteristics/performance vectors
- Pick metrics related to PaaS framework and PaaS components
- Develop test case examples to realize the metrics

◆ **Test limitations of XGVela PaaS**
- Document relationship between bottlenecks and PaaS specific monitoring
- Test performance of PaaS over a wide range of hardware, virtualization layer, and software configurations

Figure 1: Vision – End to End Lifecycle System Validation

Figure 4: OVP Toolchain

OVP 1.0

demonstrate the readiness and availability of commercial NFV products and services, including NFVI and VNFs, using OPNFV and ONAP components

OVP 2.0 now evolves to support verification of CNF and CaaS. XGVela PaaS is an extension to the CNF and CaaS, which would play an important role in CNF end to end lifecycle system. XGVela could collaborate with OVP x.0 to support CNF e2e lifecycle system validation.

Premise: PaaS merges with CNF+CaaS system in the future

XGVela | Collaboration with TM Forum

— The **TM Forum** is a standards development organization (**SDO**) responsible for telco operations and business support systems (OSS/BSS).
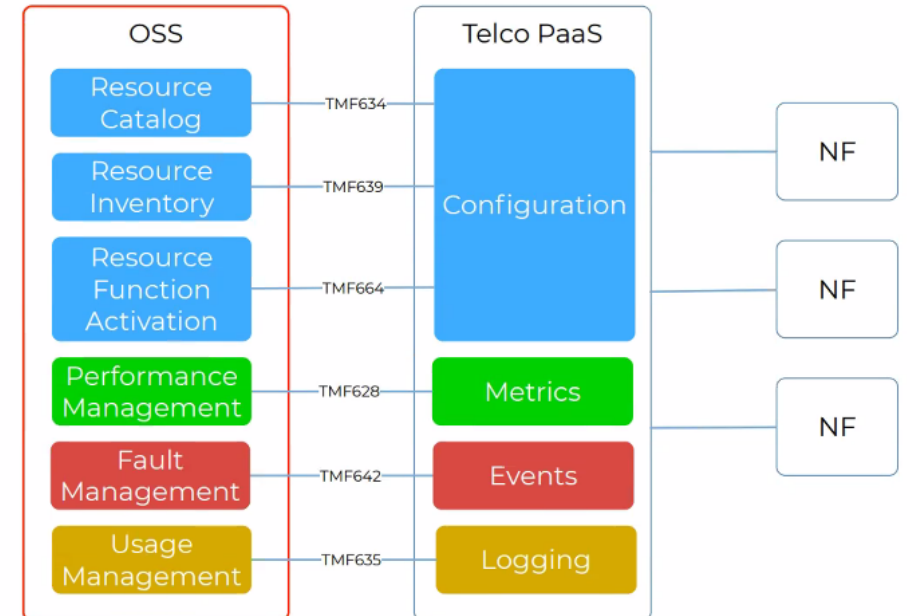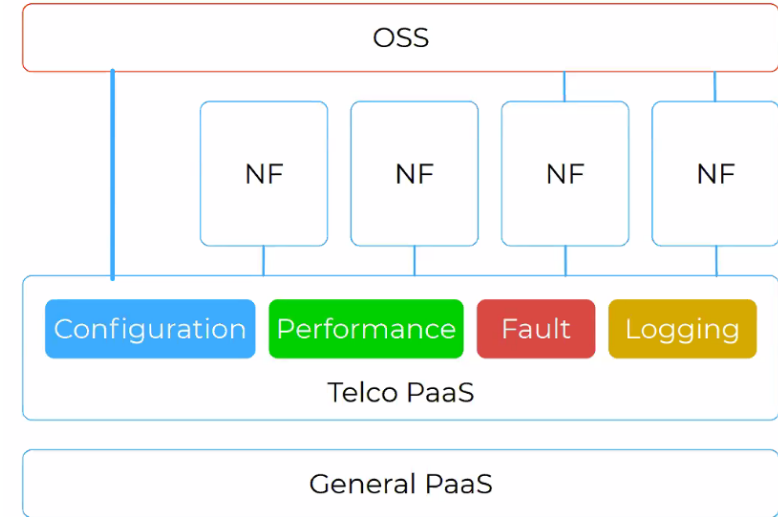
— **Possible collaboration points with TM Forum**

◆ **OSS may manage Network Functions through XGVela Telco PaaS**

– Configuration, metrics, fault, topology, logging management are possible PaaS capabilities provided by XGVela (CMaaS, MMaaS, FMaaS, TMaaS, LMaaS... of MTCIL contributed by Mavenir)

◆ **XGVela could follow Open APIs of TM Forum**

– OSS may manage hosted network functions through TM Forum Open APIs providing a consistent set of interfaces widely adopted by the industry

XGVela | Collaboration with 3GPP
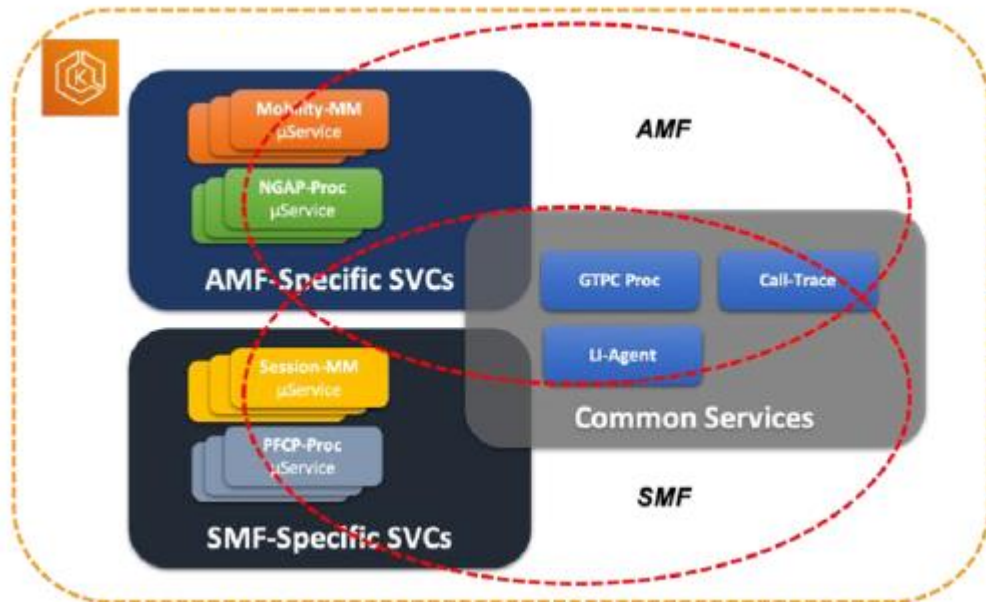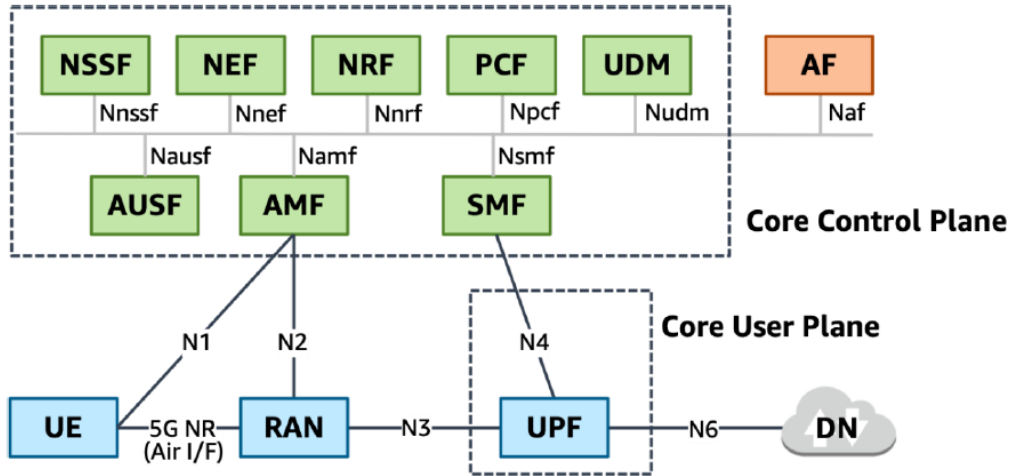
— **Possible collaboration points with 3GPP**
(examples *from whitepaper "5G Network Evolution with AWS"*)

- ◆ **XGVela functionalities may implement 5G and future generation of network using cloud native technologies**

  - – SBI: except for a few legacy interfaces such as N2 and N4, almost every interface is defined to use unified interface and HTTP/2 protocol

  - – PaaS functionalities such as service mesh, API gateway may help to implement this, reduce dependency among each interface, and helps with independent scaling of each function.

- ◆ **XGVela may implement common services of 5G and future generation of network as Telco PaaS (best vision)**

  - – One NF (e.g. AMF) can be logically defined with sharing common services with other NFs (e.g. SMF), while providing independent and more granular scaling of signaling processing containers

Thank you