XGVela Introduction

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Project Overview

› **Project Background:**

  › XGVela intends to provide a **telecom cloud native PaaS platform** designed to provide PaaS capabilities needed to run, develop, manage and maintain telco-related services.

› **Project Functionalities**:

  › **XGVela refines common capabilities required by upper layer services as PaaS functions on platform layer.**

  › The platform brings **General PaaS** functions from existing open source PaaS component projects (e.g. OKD, Kubernetes, Prometheus, Istio, Envoy, Zookeeper, etc.), and enhance them based on telco requirements.

  › Intends to generate **Telco PaaS** functions which have strong telecom characteristics and are under exploration.
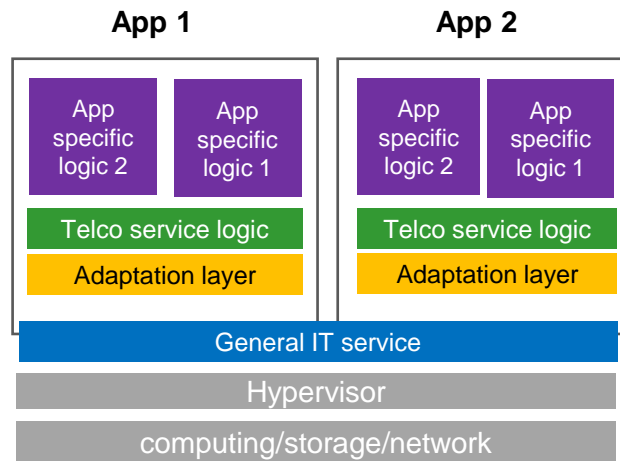
› **Partners:**

  › TSC member: China Mobile, Mavenir, RedHat, Huawei, Intel, SigScale, STC, ZTE, Ericsson, Nokia, China Telecom, China Unicom, WindRiver

  › Other Partners: Rakuten, Dish, TIM, Samsung, F5, Beijing University of Post & Telecommunications

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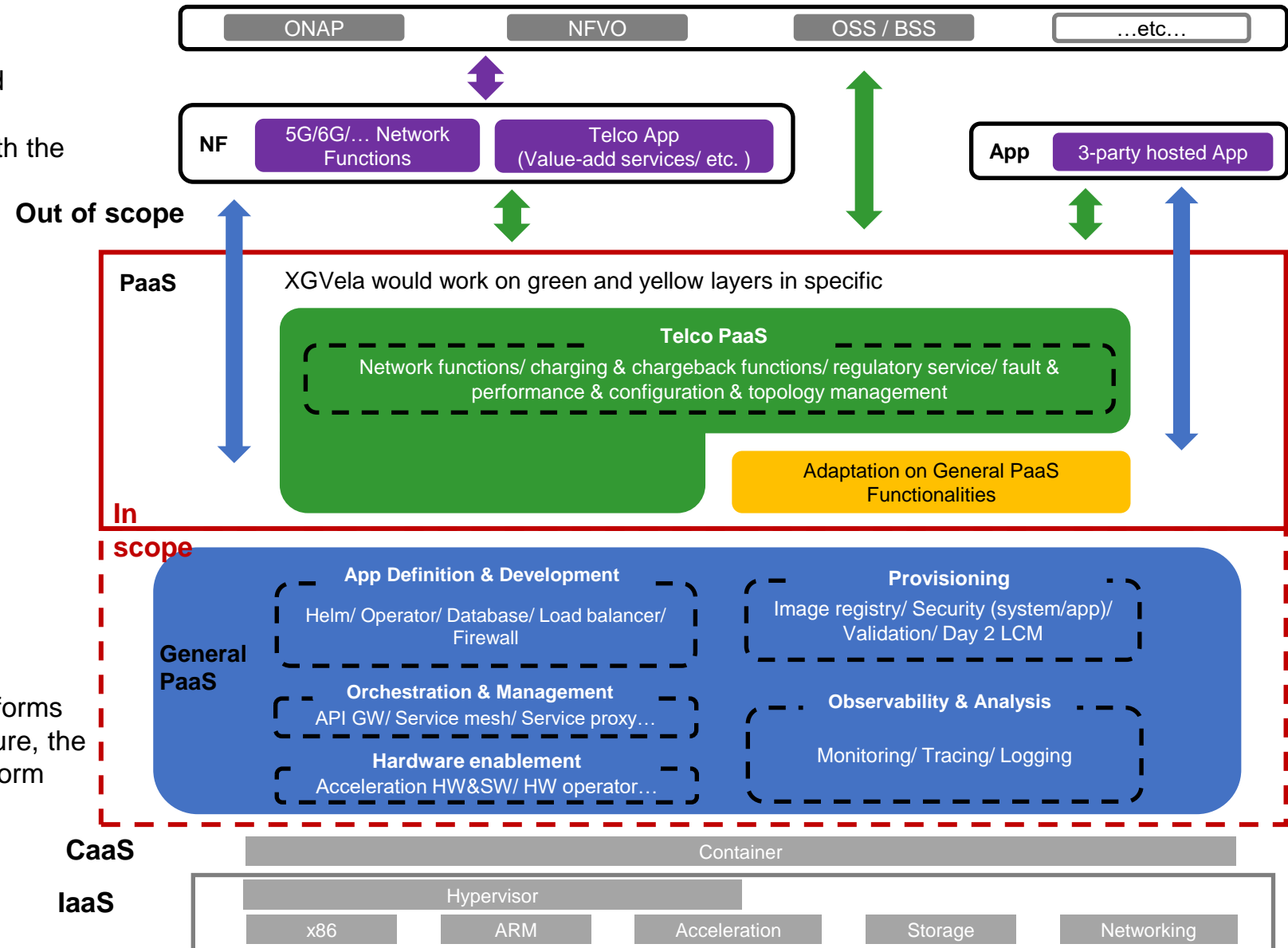
XGVela – High-level Architecture

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 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 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

Out of scope

PaaS   XGVela would work on green and yellow layers in specific

Telco PaaS
Network functions/ charging & chargeback functions/ regulatory service/ fault & performance & configuration & topology management

Adaptation on General PaaS Functionalities

In scope

General PaaS

App Definition & Development
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

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XGVela – Project Scope

› **Documentation**
  › XGVela requirements doc, architecture doc, etc.
  › XGVela platform User Guide

› **Development**
  › Adaptation layer:
    › Select the preferred General PaaS, analyze gaps with telecom requirements based on specific use cases
    › the gap between telecom requirements and General PaaS as input of Adaptation Layer, implement Adaptation Layer functionalities for General PaaS
  › Telco PaaS:
    › Explore Telco PaaS use cases, functionalities and realize them as adoptable PaaS components

› **Integration**
  › Integration of two or more of General PaaS, Telco PaaS, Adaptation Layer, NFs/Application, IaaS/CaaS, Management, etc.
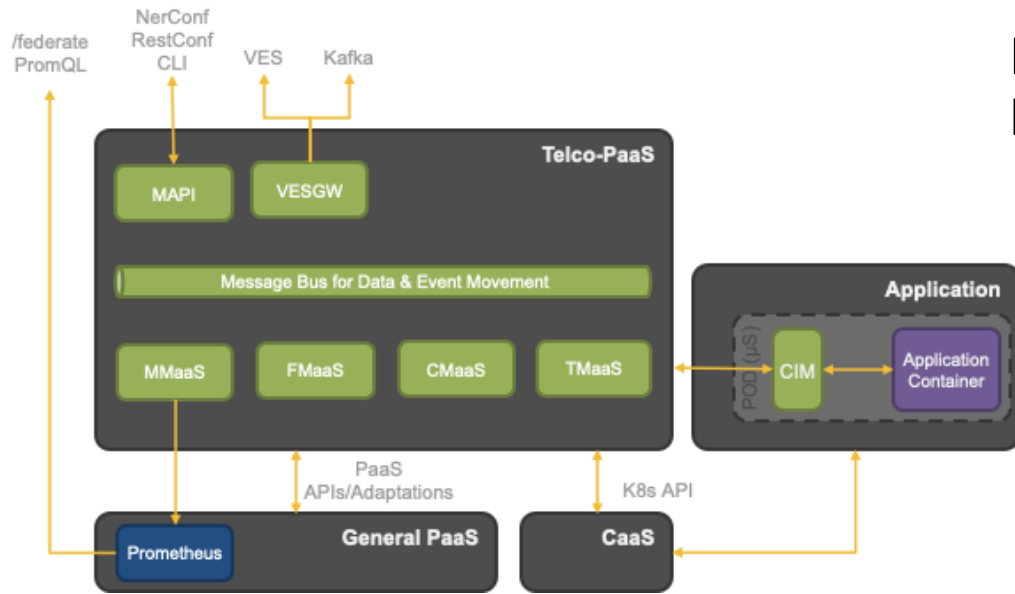
› **Testing**
  › Platform functionality testing, performance testing, and joint testing with other community and products
    › XGVela with cloud native network functions/applications
    › XGVela with related orchestration and management systems, etc

› **Platform Certification (long term goal)**

XGVela- Project Vitals

› **License:** Apache 2.0
› **Links:**
  › Confluence: https://wiki.lfnetworking.org/display/XGVela/XGVela+Home
  › Git Hub: https://github.com/XGVela
  › Mailing list: https://lists.xgvela.org/g/xgvela-tsc
  › Slack: https://app.slack.com/client/T01990B1UC9/C018V0NEZCM
› **Release plan:**
  › Details: https://wiki.lfnetworking.org/pages/viewpage.action?pageId=56068170
  › Outputs:
    › Doc 1: XGVela Operator Requirements
    › Doc 2: XGVela Architecture Doc
    › Code & code description: Observability related code (CMaaS, TMaaS, FMaaS…) (seedcode donated by Mavenir)
    › Demo: XGVela demo at ONES (details: https://wiki.lfnetworking.org/display/XGVela/Upcoming+Events?preview=/56066350/56068184/Everything%20about%20XGVela%2C%20the%20telco%20cloud%20native%20PaaS%20platform.pdf) ← Demo story is still under discussion, welcome to join us.

XGVela - Seed code

Status

✔ Seed code upload to GitHub
🌢 Build Integration (GitHub Actions, Maven)
◯ Code coverage

Key Stats

- 592 unique files
- ~57K LOC, ~8K Comments
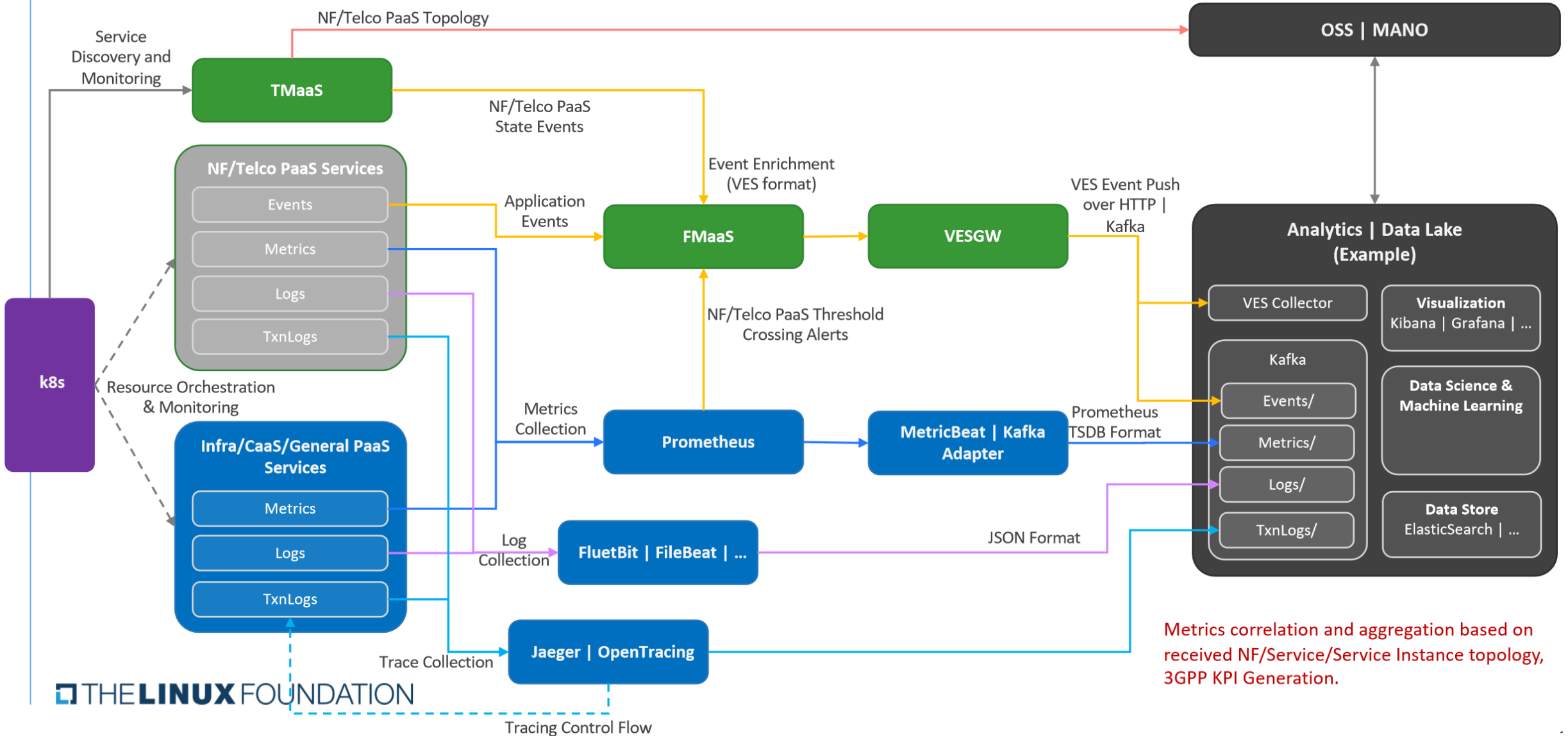- Primary languages - Go, Java

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Following Telco-PaaS functions are seeded from Mavenir MTCIL.

- **CMaaS: Configuration Management as a Service**
  Provides a consistent and versioned view of configuration using Yang and NetConf. Supports Day-0, 1 and 2 configuration flows. Interfaces with k8s for configuration discovery and push.

- **TMaaS: Topology Management as a Service**
  Automatically discovery k8s services and builds 3GPP ManagedObjects for NFs, manages NF and µService states, supports LCM.

- **FMaaS: Fault Management as a Service**
  Application and platform events, TCA (via MMaaS/Prometheus), event subscriptions and ONAP VES 7.1 compliant NBI.

- **VESGW: ONAP VES Gateway**
  Built on ONAP/VESPA project with enhancement to support multi NF streams.

- **CIM: CNF Interface Module**
  A sidecar that provides a local integration point API for applications.

- **Helm based packaging framework**

- *Metrics Management as a Service (MMaaS) - In Progress*
  Uses Prometheus (in General PaaS) for metrics collection. Implements the control plane for configuring Prometheus for NF service discovery, KPIs and TCA.
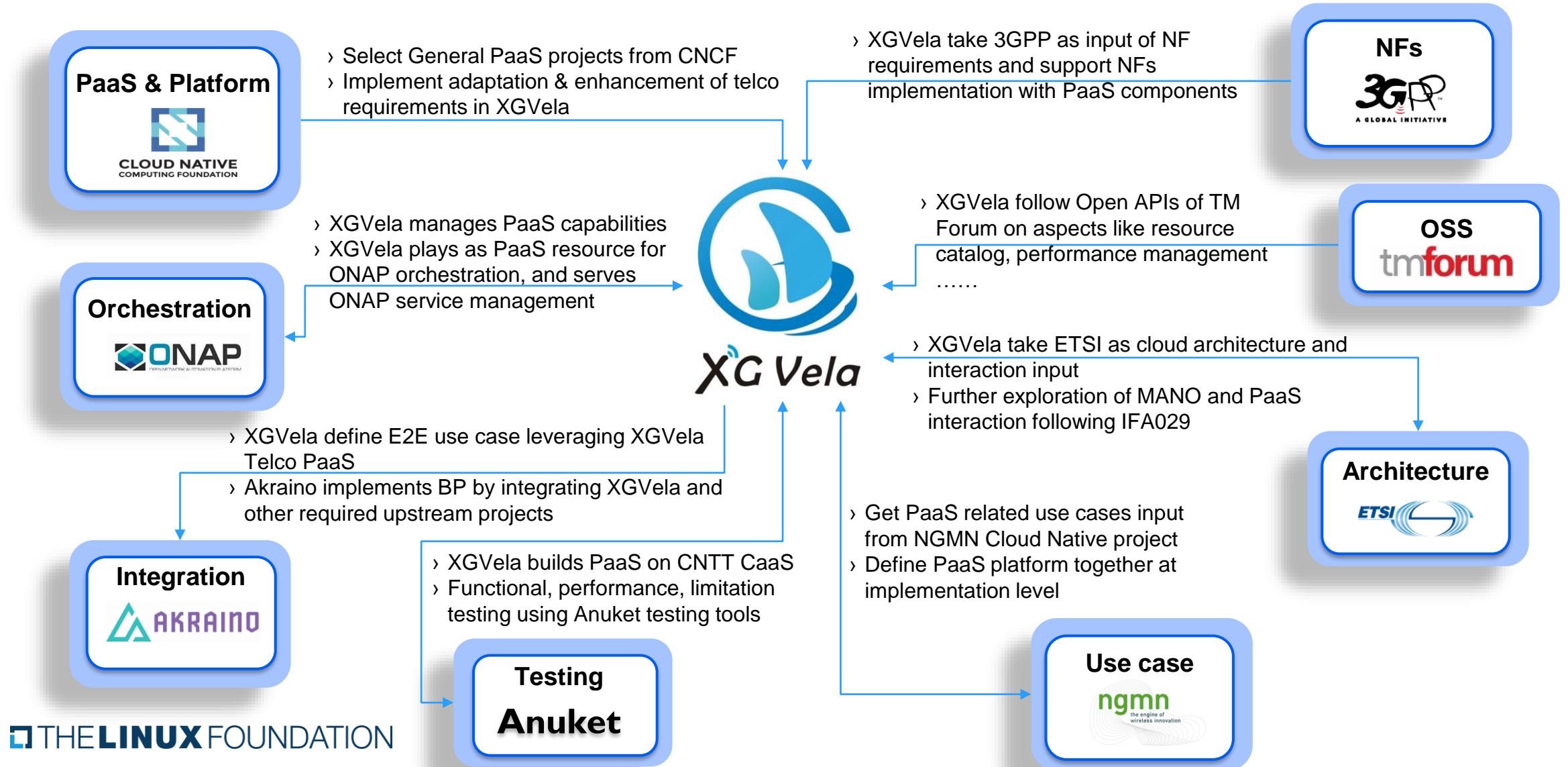
Observability Framework

XGVela- Potential Cross-Community Collaboration

PaaS & Platform

CLOUD NATIVE COMPUTING FOUNDATION

› Select General PaaS projects from CNCF
› Implement adaptation & enhancement of telco requirements in XGVela

› XGVela take 3GPP as input of NF requirements and support NFs implementation with PaaS components

NFs

3GPP A GLOBAL INITIATIVE

› XGVela manages PaaS capabilities
› XGVela plays as PaaS resource for ONAP orchestration, and serves ONAP service management

Orchestration

ONAP OPEN NETWORK AUTOMATION PLATFORM

XG Vela

› XGVela follow Open APIs of TM Forum on aspects like resource catalog, performance management ……

OSS

tmforum

› XGVela take ETSI as cloud architecture and interaction input
› Further exploration of MANO and PaaS interaction following IFA029

Architecture

ETSI

› XGVela define E2E use case leveraging XGVela Telco PaaS
› Akraino implements BP by integrating XGVela and other required upstream projects

Integration

AKRAINO

› XGVela builds PaaS on CNTT CaaS
› Functional, performance, limitation testing using Anuket testing tools

Testing

Anuket

› Get PaaS related use cases input from NGMN Cloud Native project
› Define PaaS platform together at implementation level

Use case

ngmn
the engine of wireless innovation

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XGVela- Cross-Community Collaboration

- Anuket & XGVela has created a survey about General PaaS.

- Survey background:

  - Workload + cloud infrastructure model hampers operators' business agility by the lack of a "platform" service.

  - General PaaS on cloud, which is the "platform" services, can provide telco services with simplified and agile applications development and enable smooth delivery to production

- Survey objective:

  - Identify and prioritize the categories and the set of Platform Services that should be provided by the General PaaS

  - Selection of PaaS software tools, products and services helps future integration.

- Survey link: https://linuxfoundation.surveymonkey.com/r/NKRF92Y

Thanks