XGVela

January 2021

THE LINUX FOUNDATION

Project Overview

› **Project Background:**

  › Donated by LFN member China Mobile, 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.

  › The first open source platform-as-a service(PaaS) for 5G and beyond network functions.

› **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.

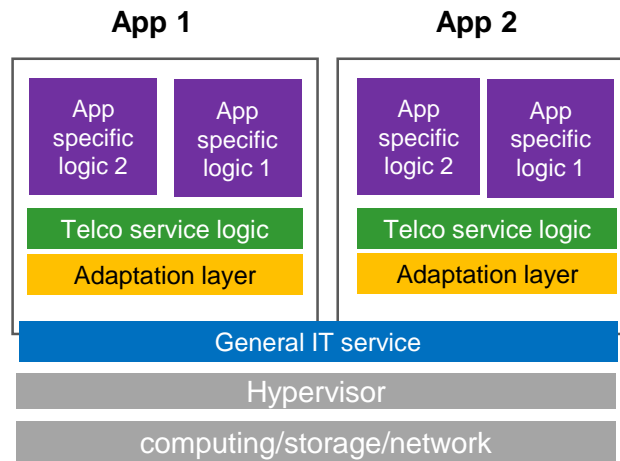 › Intends to generate **Telco PaaS** functions which have strong telecom characteristics and are under exploration.

› **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
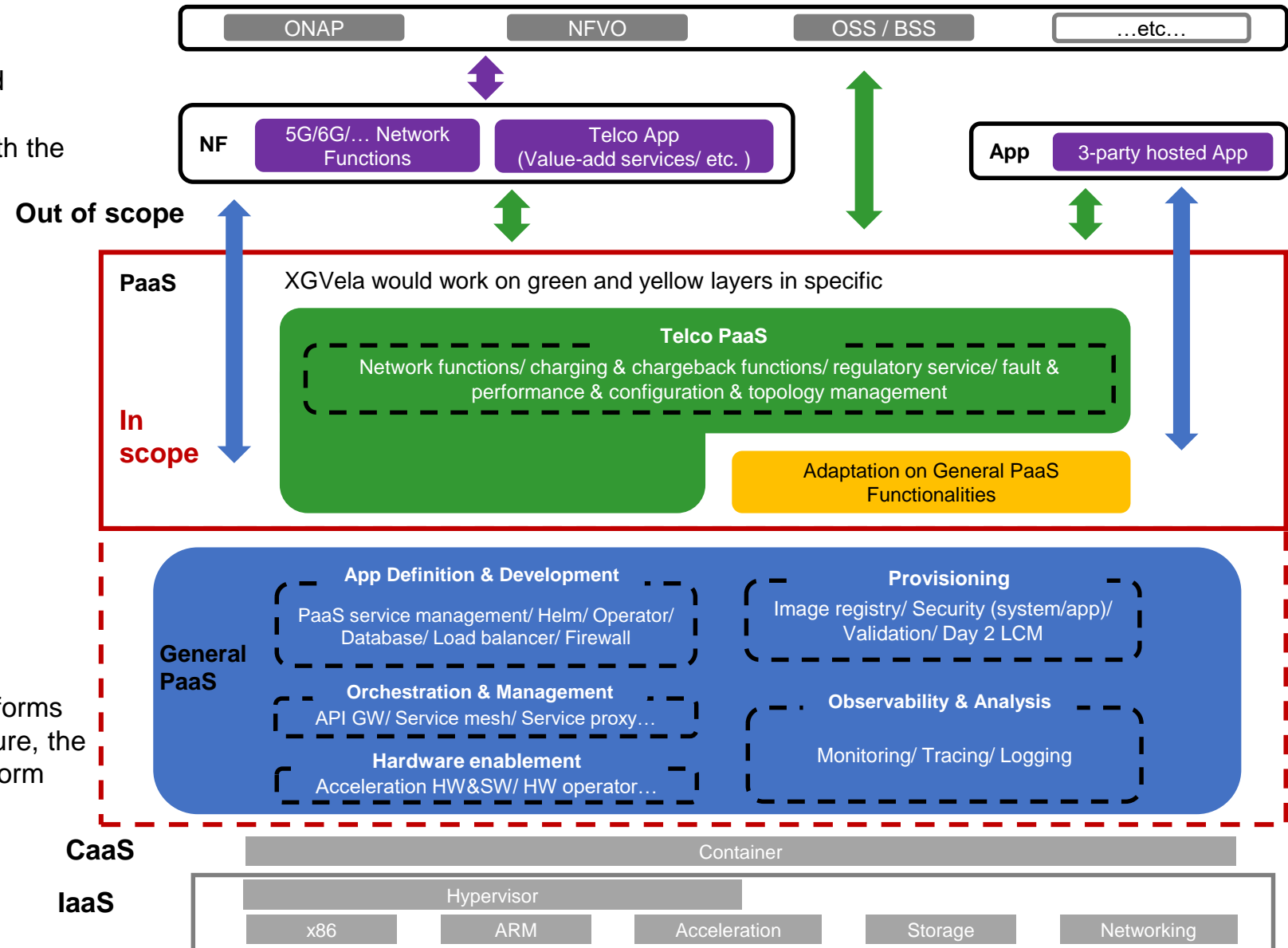
XGVela – High-level Architecture

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

In scope

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

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 – Project Vitals

› **Project name:** XGVela

› **Project creation date:** April 20, 2020

› **Project license:** Apache 2.0

› **Release Plan:**

  › **Seed code dropped on 12/24/2020**

    › GitHub location: https://github.com/XGVela

    › License scan in progress

  › **Release 1 scheduled for September 2021**

    › Architecture document: includes PaaS framework, General PaaS & Telco PaaS capabilities, software/tool recommendations, data model & information model, etc.

    › Platform code: functionalities will cover necessary PaaS framework, Telco Management and corresponding APIs. (align with Architecture doc)

  › For 2022 and beyond: one major release per year (Will revisit on need basis)

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.
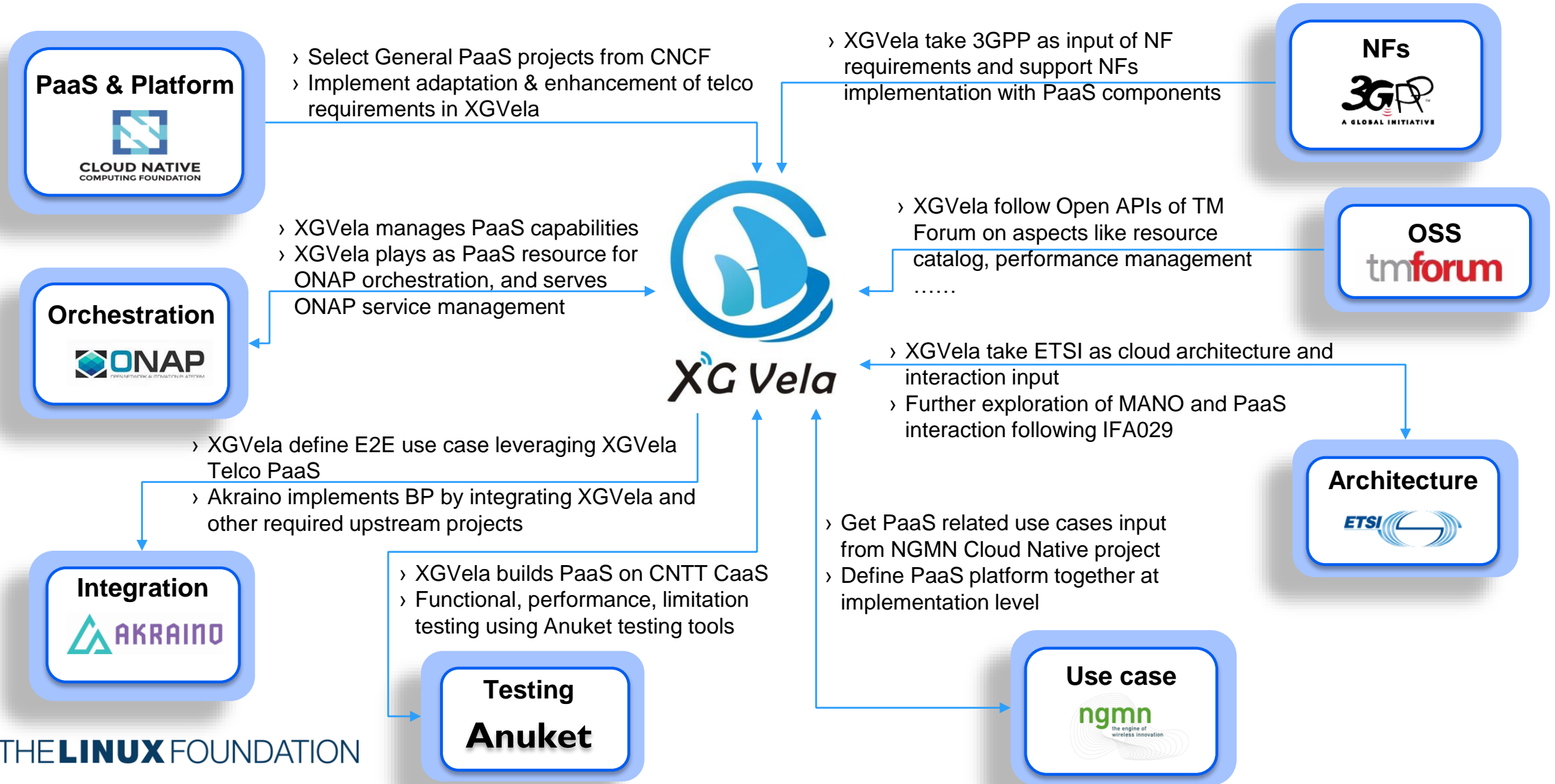› **Testing**
  › Platform functionality testing, performance testing, and joint testing with other community and products
    › XGVela with cloud native network functions/applications
    › XGVela with related orchestration and management systems, etc
› **Platform Certification (long term goal)**

Community Health

› Code is new - seed code dropped on 12/24/2020

› TSC established

   ○ 13 TSC members from 13 separate companies

› Weekly TSC meeting established

› Bi-weekly general community meeting established

› Mailing List Subscribers: 102 members & growing

› Represented Companies/Entities: 39 (based on mailing list from formation through EOY 2020)

› Number of repositories: 10

› Number of commits: 105 (code and non-code)

› Number of active committers: 15

› GitHub Activity 12/29/2020 through 01/11/2021: 785 views, 88 unique visitors

› Wiki edits: 42 revisions
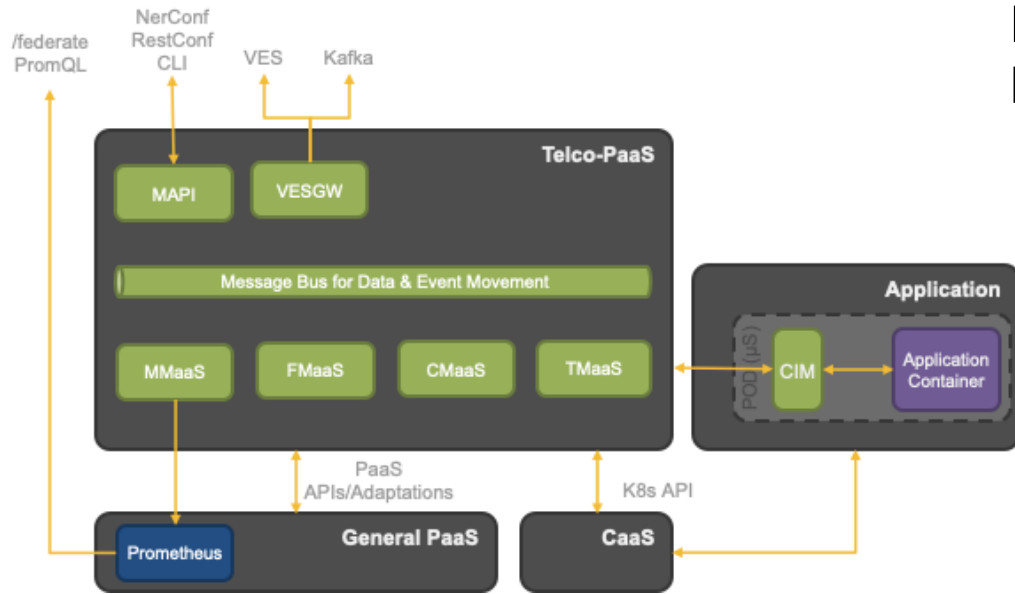
XGVela- Potential Cross-Project Interaction

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

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

Testing

Anuket

Use case

ngmn
the engine of wireless innovation

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Community Liaisons

Community	Liaison	Contact
CNCF	Ying Liu	liuyingyjy@chinamobile.com
ONAP	Seshu Kumar	seshu.kumar.m@huawei.com
Akraino	Khemendra Kumar	khemendra.kumar@huawei.com
Anuket	Ahmed ElSawaf	aelsawaf.c@stc.com.sa
NGMN	Qihui Zhao	zhaoqihui@chinamobile.com
ETSI	Ying Li	liyingyjy@chinamobile.com
TM Forum	Vance Shipley	vances@sigscale.com

XGVela - Seed code condition

Status

✔ Seed code upload to GitHub
🝑 Build Integration (GitHub Actions, Maven)
Security Scan

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 enhancements to support multi NF streams.

- CIM: CNF Interface Module
  A sidecar that implements various single node design patterns to enable loose coupling of application containers to the infrastructure.

- 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.

XGVela – Project Governance

› Project governance consists of TSC member, TSC chair & co-chair, Coordinator, Subcommittees (on-need-basis)

› Governance team is from Active Community Members:

  › Anyone from XGVela community with twenty (20) or more measurable contributions during the previous 12-month period

› Election cycle:

  › Every 12 months

› Election method:

  › Self nomination & public group voting

› Initial TSC makeup:

  › One (1) member from each participating company as agreed by the founding members

› Detailed responsibility of governance:

  › https://github.com/XGVela/XGVela/wiki/TSC-Operations-and-Procedures

› Technical Charter

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XGVela - Infrastructure Tooling
Uses modern LFX tooling platform and shared Confluence and Jira instances under LF Networking. No custom infrastructure.

› **Bug tracker**
  › Jira - under LF Networking Jira (1 project)? (integration with confluence, SCRUM epics)
  › GitHub issue
› **Chat tooling**
  › xgvela.slack.com
  › WhatsApp
› **Code repositories**
  › GitHub - https://github.com/XGVela
› **Image repositories**
  › GitHub Packages - https://github.com/XGVela
› **Workflow**
  › GitHub Actions - https://github.com/XGVela
› **Code review**
  › GitHub - https://github.com/XGVela

› **Projects Analytics**
  › LFX Insights
  › GitHub Insights
› **Continuous Integration tooling**
  › GitHub Actions - https://github.com/XGVela
  › Short term and long term plans are provided here
› **Product Documentation**
  › readthedocs.io
› **Mailing lists**
  › groups.io
    › main@lists.xgvela.org
    › xgvela-tsc@lists.xgvela.org
    › xgvela-tsc-private@lists.xgvela.org
› **Meeting calendars**
  › groups.io:
    › https://lists.xgvela.org/g/xgvela-tsc/calendar
› **Meeting minutes and project documents**
  › Confluence (under wiki.lfnetworking.org)

Detailed CI/CD plan:
https://github.com/XGVela/XGVela/blob/master/doc/XGVela%20LFN%20Entry%20Proposal/XGVela%20CICD%20Strategy.docx

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XGVela – Roadmap

2020

- Establish working group & clarify goals – *Completed*
- April – launch as LF unfunded project – *Completed*
- High-level architecture – *Completed*
- December – drop seed code – *Completed*

2021

- January – admission under LFN umbrella as Sandbox project
- Release 1 – Architecture Doc
  - Complete General PaaS and Telco PaaS primary feature definition – *on track*
  - Define PaaS framework and PaaS capability integration mechanism – *on track*
- Release 1 – Generate PaaS prototype (PaaS capability development and integration)
- Demo – Usecase and story discussion in progress

2022

- Continuously complete General PaaS and Telco PaaS definition (user story driven)
- Continuous platform capability implementation and integration
- Testing – functionality test, performance test, and associated test with other community (ONAP, Anuket, CNCF......)

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XGVela Community Meetings

- Calendar:
  - https://groups.io/

- XGVela TSC Meeting:
  - Bridge:
    - ✓ https://zoom.us/j/95282670859?pwd=Y2tZSGJGTVp3NGYwZHljMEhraG81UT09
  - When : Tuesday 1:00 pm UTC, weekly

- XGVela Project Meeting:
  - Bridge:
    - ✓ https://zoom.us/j/95137785359?pwd=eDhXSmJXdVVKOUpUcnNaS0N4d3FUdz09
  - When : Friday 1:00 pm UTC, Biweekly

Thanks