Anuket Virtualized Infrastructure Reference Model and its importance for Akraino

Beth Cohen, Anuket TSC Co-Chair

› Agenda

  › What is Anuket?

  › How Anuket got here?

  › Anuket Assured Testing and Conformance

  › Why is it important to Akraino?

  › What next?

Mission Statement
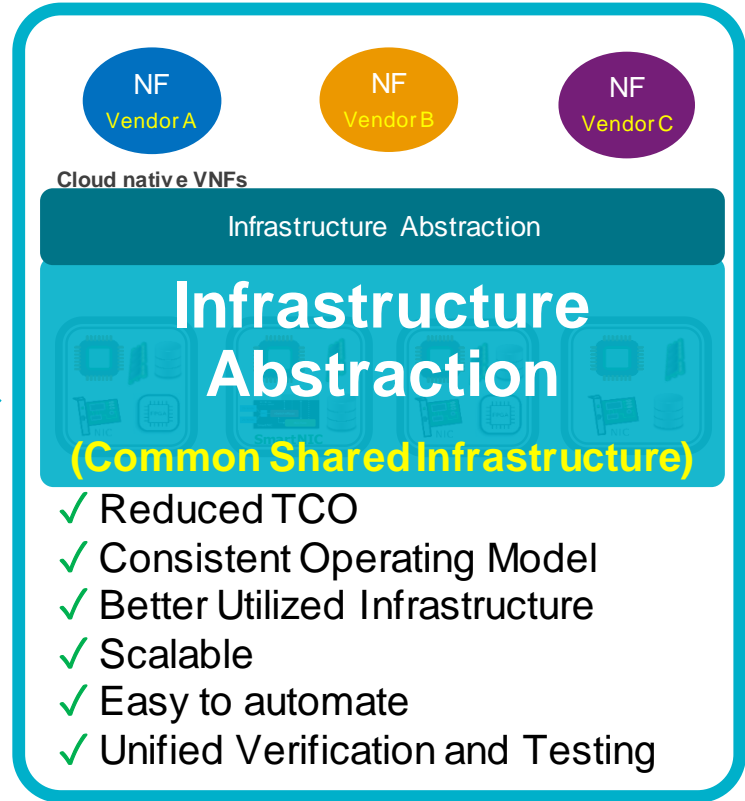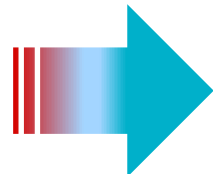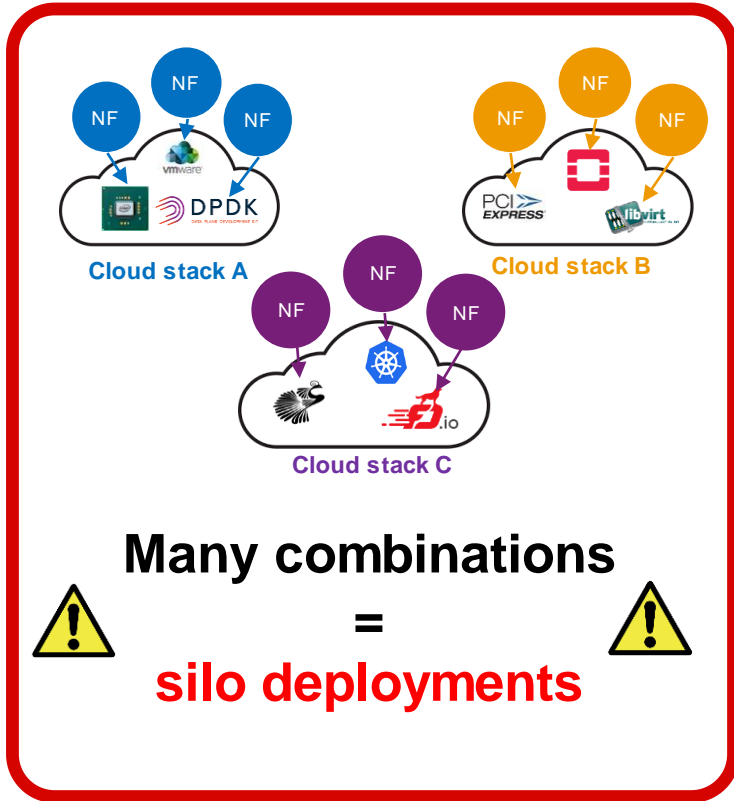
Empower the global communications community by creating and developing reference cloud infrastructure models, architectures, conformance programs and tools to deliver network services faster, more reliably, and securely.

Project Scope

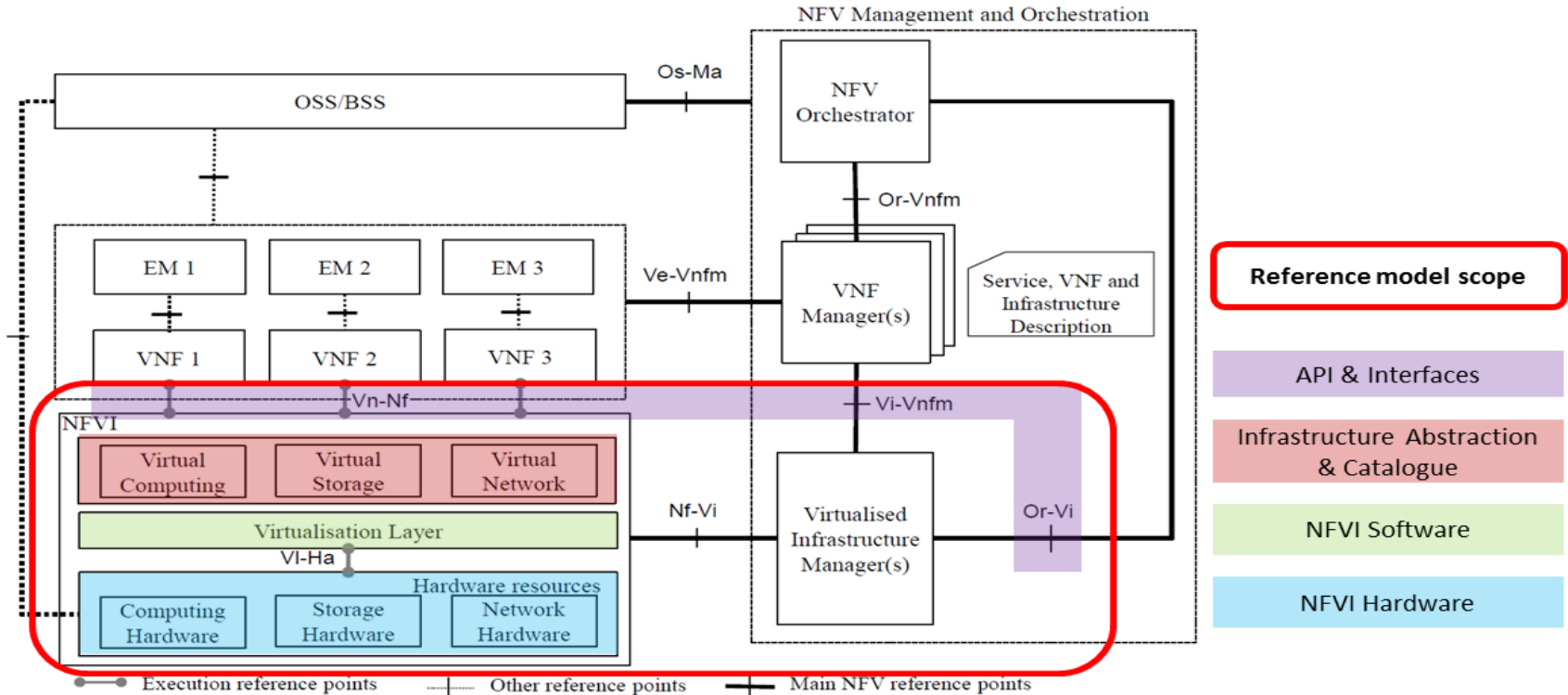Anuket develops open reference infrastructure models, architectures, tools, and programs. Open source software developed within the project will leverage OSI-approved licenses, while documentation, including specifications, will leverage open licenses. The scope of the project includes but is not limited to:

(a) *Enabling member communities to align on reference model, architecture and implementation requirements and specifications for cloud-based communications infrastructure and workloads*

(b) *Supporting open source and open standards communities in the ecosystem,*

(c) *Developing an integrated, tested, and validated open software reference infrastructure (including interfaces to hardware), with tools of its own design and from upstream testing projects,*

(d) *Helping design a conformance framework and validation programs,*

(e) *Contributing to and influencing upstream projects leveraging the reference infrastructure,*

(f) *Creating new open source components within the reference infrastructure where needed,*

(g) *Supporting ongoing strategic activities and evaluating emerging technologies to foster continued deployment success.*

Project Objectives and Scope Translated

› Establish reference model/architectures to support cloud native workloads

› Grow active participation from both the vendor and operator communities

› Two releases on 6-month Cadence: "M" = Moselle and "N" = Nile

› Validation of the Anuket project: Anuket Assured Badging program

› Link RCs and Anuket Assured: Extend documentation to make it easy to operate test cases as part of the program

Anuket Community Organization

Anuket

› A meld of the best from CNTT and OPNFV

› Operators and Vendors working on a common goal

› Architects and Developers working together

› Supports an E2E approach to Infrastructure for NFV applications

LFN Governance	LFN Operations	LFN Industry Programs
GB		
(MAC) SPC TAC	Staff Support IT Infrastructure Tooling	CVC

Project Marketing
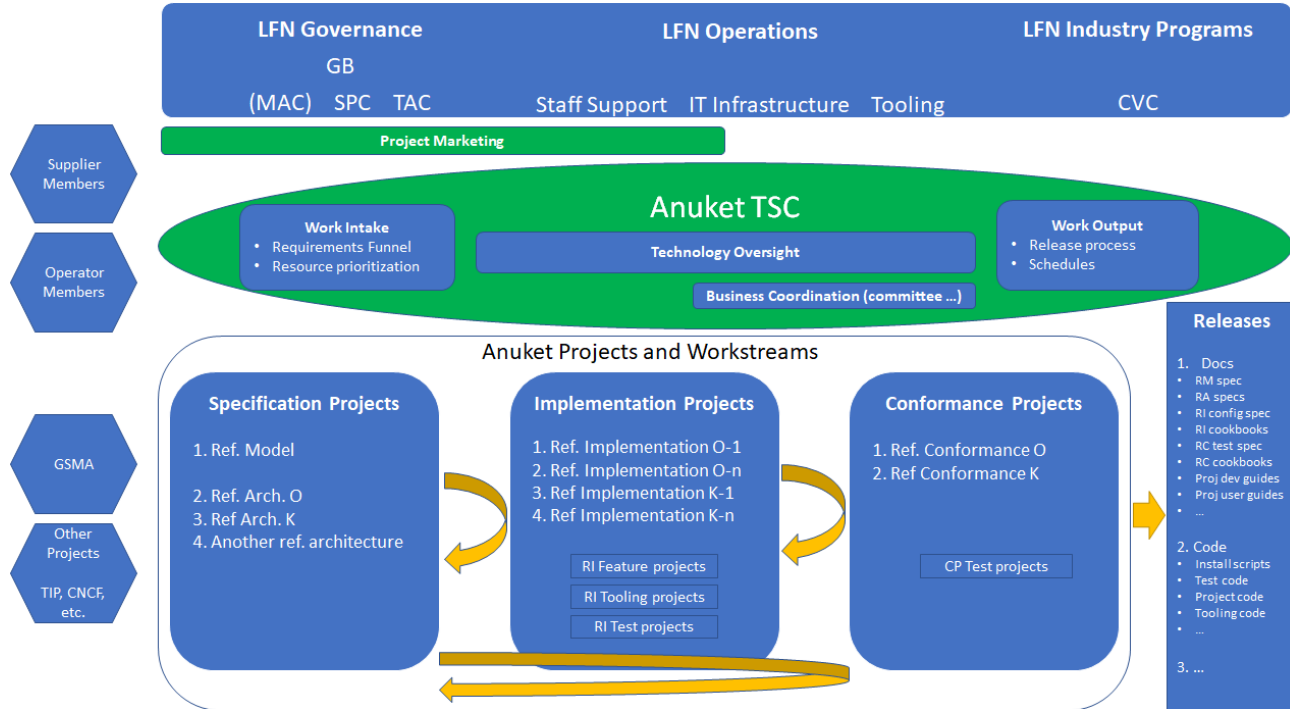
Supplier Members

Operator Members

GSMA

Other Projects

TIP, CNCF, etc.

Anuket TSC

Work Intake
- Requirements Funnel
- Resource prioritization

Technology Oversight

Work Output
- Release process
- Schedules

Business Coordination (committee ...)

Anuket Projects and Workstreams

Specification Projects
1. Ref. Model
2. Ref. Arch. O
3. Ref Arch. K
4. Another ref. architecture

Implementation Projects
1. Ref. Implementation O-1
2. Ref. Implementation O-n
3. Ref Implementation K-1
4. Ref Implementation K-n

RI Feature projects
RI Tooling projects
RI Test projects

Conformance Projects
1. Ref. Conformance O
2. Ref Conformance K

CP Test projects

Releases
1. Docs
- RM spec
- RA specs
- RI config spec
- RI cookbooks
- RC test spec
- RC cookbooks
- Proj dev guides
- Proj user guides
- ...

2. Code
- Install scripts
- Test code
- Project code
- Tooling code
- ...

3. ...

Project Workstream Overview

Anuket

- Business Requirements
- Operational Requirements
- Technology Requirements

- Code Implementing and Testing Requirements
- Upstream Code Collaboration
- Conformance and Performance Testing

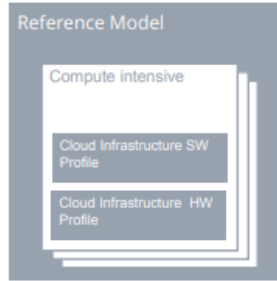| Partners	Reference Model	Reference Architecture	Reference Implementation	Reference Conformance	Compliance & Verification
ETSI	GSMA	RA1	Community Labs	X-Testing	Governance
GSMA		RA2	Installers	Functest	Process
3GPP			"Feature" Projects	VSPerf	Portal
CLOUD NATIVE COMPUTING FOUNDATION				NFV Bench	
			CI/CD	StorePerf	Badging
ONAP				Sample VNF	

- **Reference Model**: (This document) is a **NFVI Abstraction** of NFVI services and resources exposed to VNFs.

- **Reference Architecture**: High level NFVI system components and their interactions based on the Reference Model. It is expected that the Reference Architectures will conform to the Reference Model. The expectation is that there are only a few (3-5) Reference Architectures.

- **Reference Implementation**: Each Reference Architecture is expected to be implemented by at least one Reference Implementation.
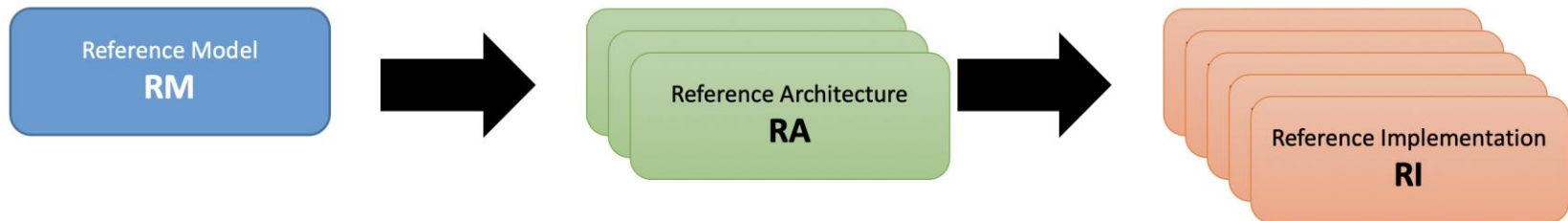
Anuket Workstream Process
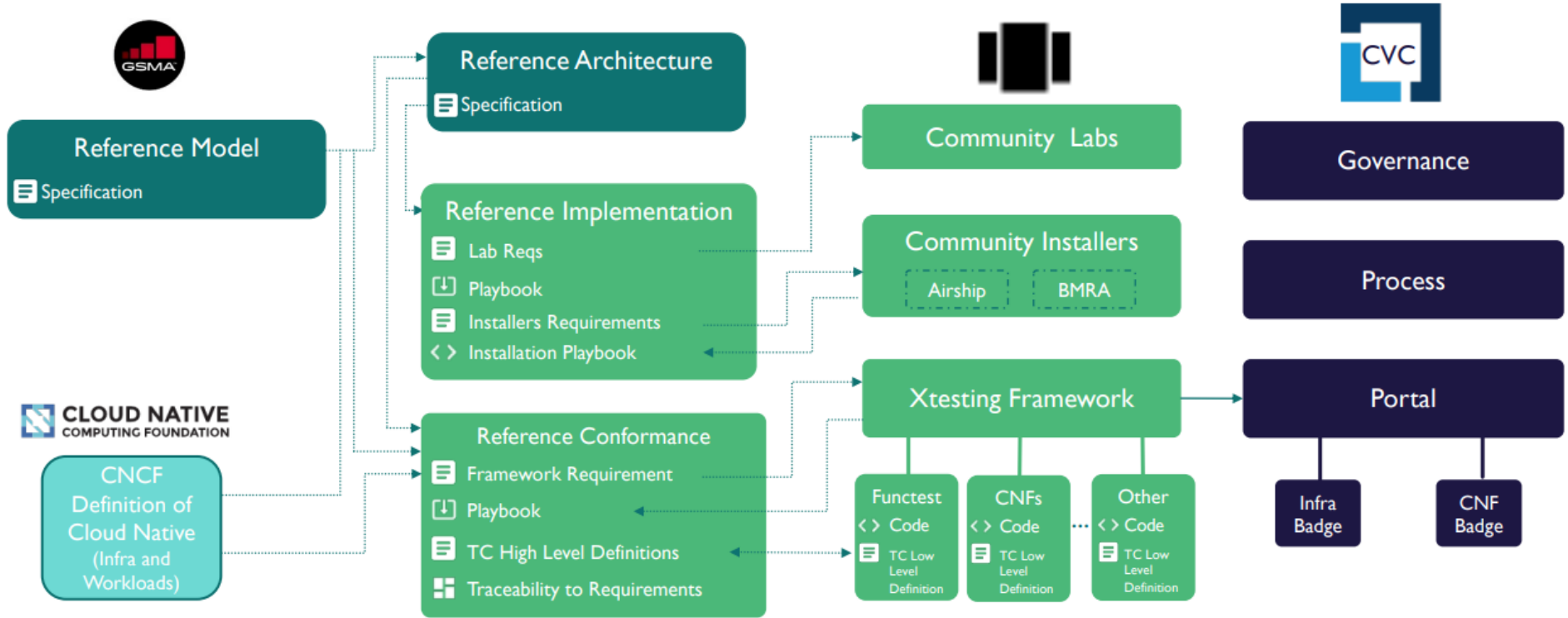
Types of project outputs

Reference Model

Compute intensive

Cloud Infrastructure SW Profile

Cloud Infrastructure HW Profile

Reference Architectures

B N B N ...

Reference Implementations

Implementation of the different Reference Architectures.

A collection of Cloud Infrastructure properties with standardized values for different usage profiles like Basic, Compute Intensive or Network Intensive.

Automated tests and test environment hosted by LF to test if an Cloud Infrastructure is compliant with the profiles.
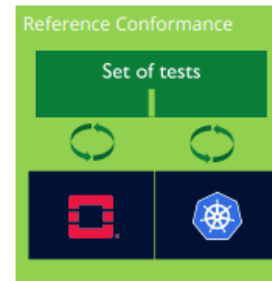
Verification program for Cloud Infrastructures and applications.
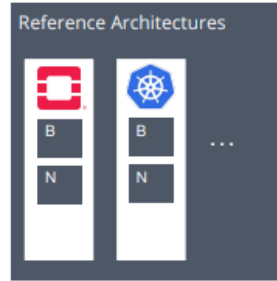
Definition of specific Cloud infrastructure implementations compliant to one or more profiles from the Reference Model.
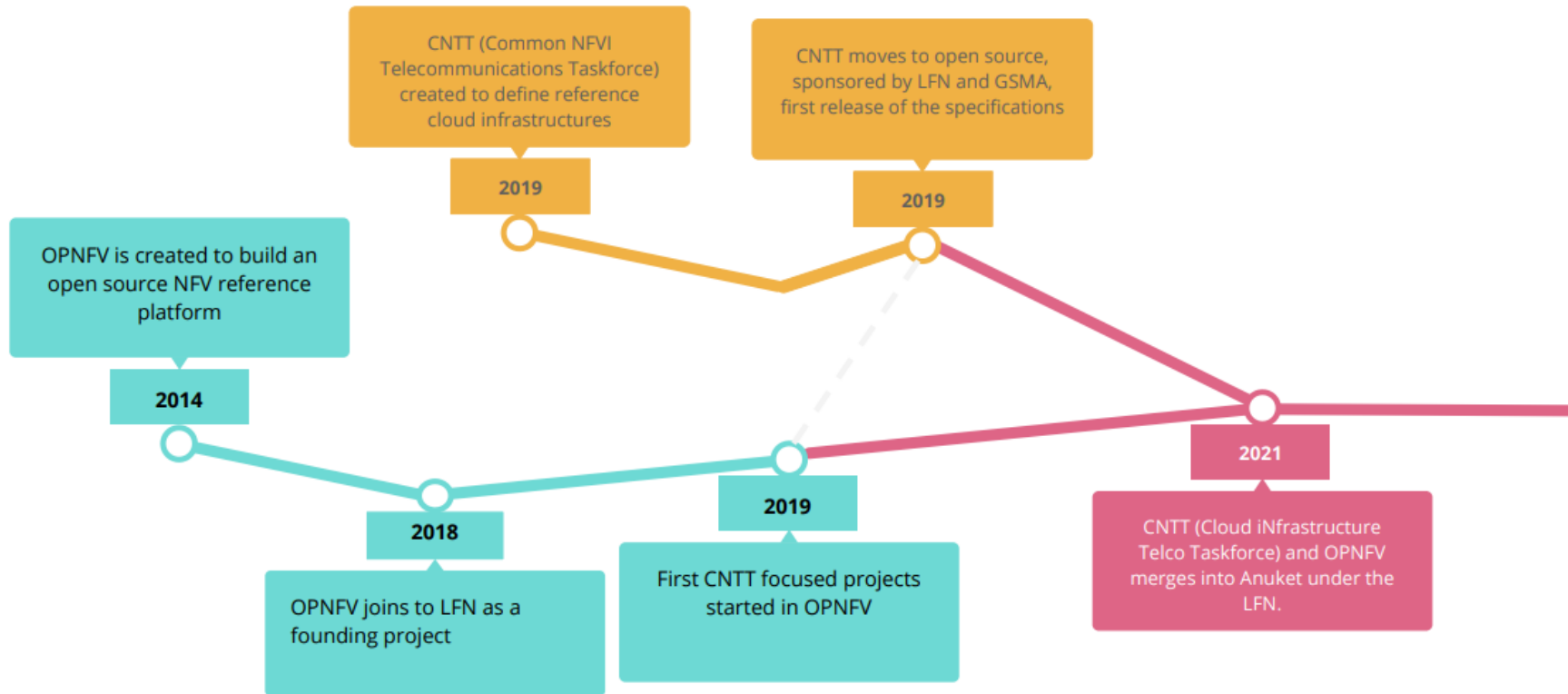
Reference Conformance

Set of tests

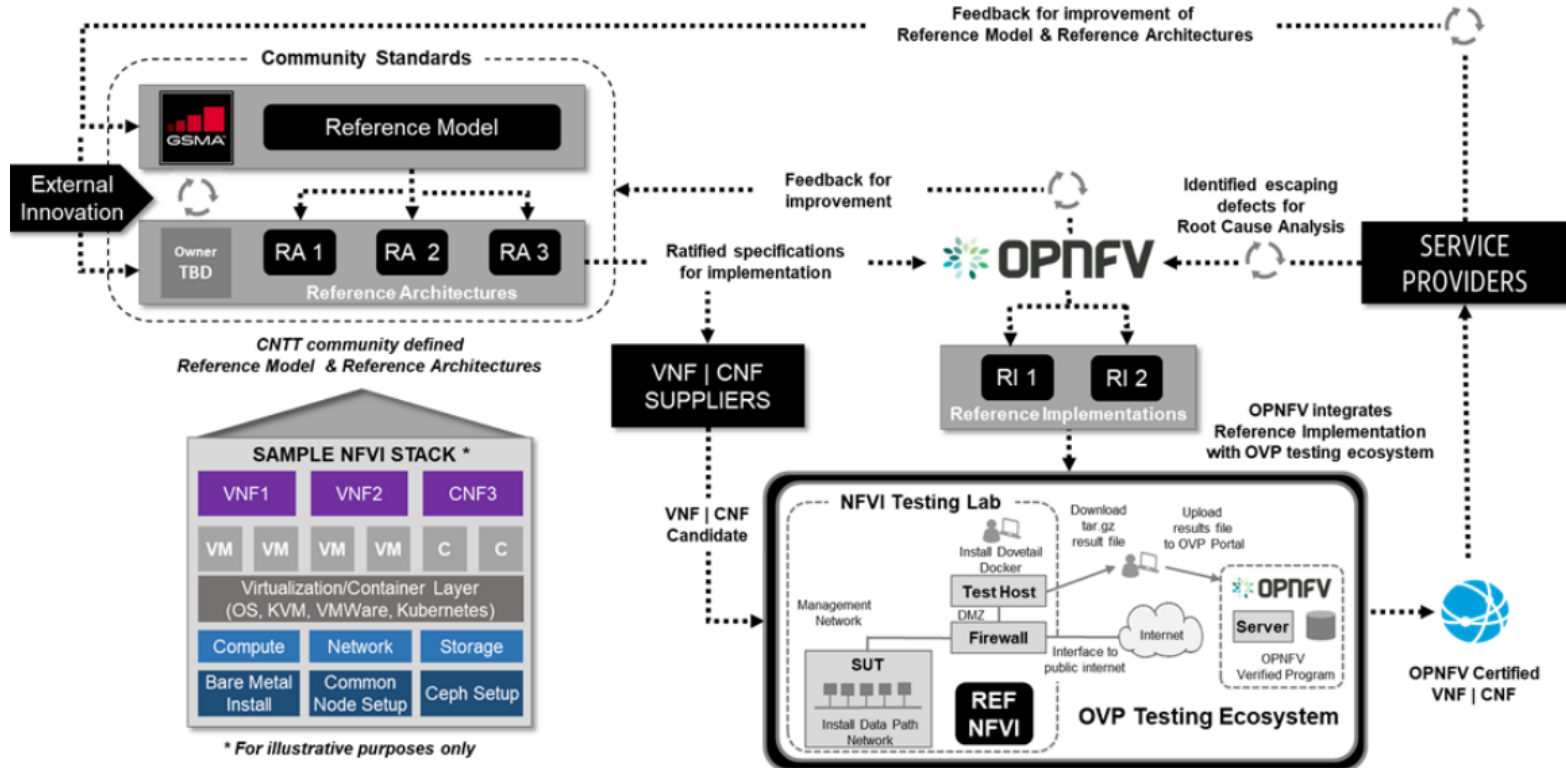Conformance test suite to test if an infrastructure is compliant with the RM and the RA

2022 Project Objectives

› Hybrid, Multi-Cloud model and AI/ML utilisation, will be a major theme of Anuket work in 2022, reflecting a growing global interest in more sophisticated operating models for telecommunication operators facing the challenges of real-life 5G/Edge/IoT implementations.

› Moselle (June) and Nile (December) releases planned
  › Add support for Hybrid and Multi-Cloud models
  › Thoth AI/ML networking to better define the required data models
  › Updates to interaction models, security, and life cycle requirements.
  › More detailed definition of security elements

History of Anuket

CNTT (Common NFVI Telecommunications Taskforce) created to define reference cloud infrastructures

2019

CNTT moves to open source, sponsored by LFN and GSMA, first release of the specifications

2019

OPNFV is created to build an open source NFV reference platform

2014

2018

OPNFV joins to LFN as a founding project

2019

First CNTT focused projects started in OPNFV

2021

CNTT (Cloud iNfrastructure Telco Taskforce) and OPNFV merges into Anuket under the LFN.

A Merger to Harness Innovation

Anuket

CNTT

- Operator Driven Common Requirements
- Conceptual Reference Model
- Architecture Definition
- Specifications

+

OPNFV

- Implementation & Integration
- Distributed Community Labs
- Functional & Performance Testing
- Conformance Programs
- Code
- CI/CD

=

Anuket

- End to end Technology Lifecycle from Requirements to Implementation
- Aligned with Operator drivers
- Harnesses Technology for Deployment

The Story Behind the Name

- Egyptian Goddess of the Nile
- Responsible for Annual Flooding of the Nile
- Associated with gazelles, arrows, and other swift-moving entities

Anuket Assured Program
(formerly OPNFV Verification Program)

› The Anuket Assured program is an open source, community-led compliance and verification program to demonstrate the readiness and availability of commercial cloud native and virtualized products and services, including NFVI, Cloud Native Infrastructure, VNFs, and CNFs, using Anuket and ONAP components.
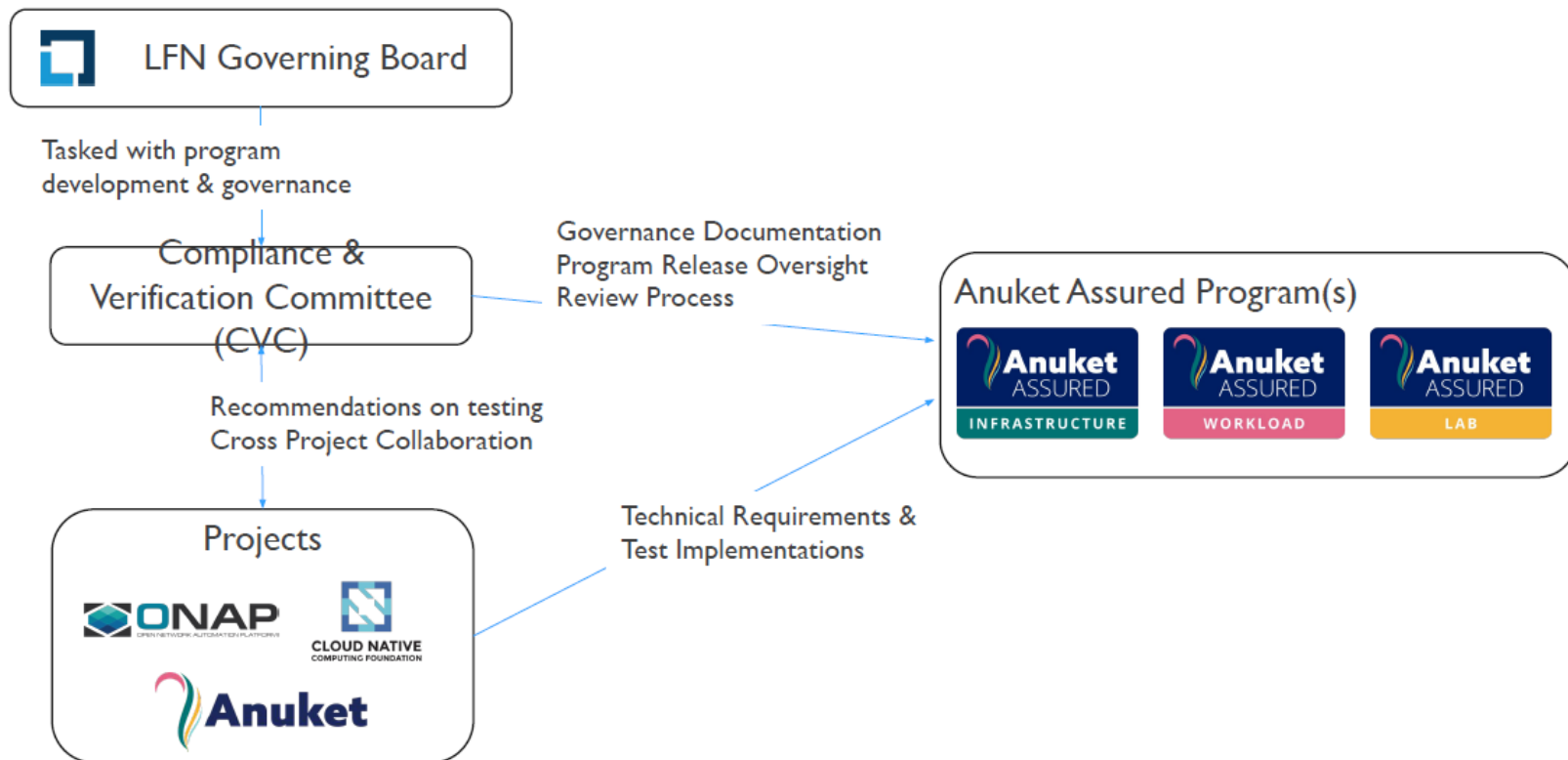
Anuket Assured Infrastructure

Anuket Assured Workload

Anuket Assured Lab
(coming Q2 2022)

Anuket Assured Program Structure

LFN Governing Board

Tasked with program development & governance

Compliance & Verification Committee (CVC)

Governance Documentation
Program Release Oversight
Review Process

Recommendations on testing
Cross Project Collaboration

Projects

ONAP OPEN NETWORK AUTOMATION PLATFORM

CLOUD NATIVE COMPUTING FOUNDATION

Anuket

Technical Requirements & Test Implementations

Anuket Assured Program(s)

Anuket ASSURED INFRASTRUCTURE

Anuket ASSURED WORKLOAD

Anuket ASSURED LAB

Anuket Assured Benefits

› Automated conformance and verification testing of workload and infrastructure for cloud native and virtualized stacks (VNFs and CNFs)

Key Benefits: Service Providers

Accelerate time to deployment for new network services.

Improve interoperability and software quality.

Reduce in-house testing effort and reduce costs.

Key Benefits: Vendors

Improve time to revenue for new product offerings.

Achieve greater alignment with service provider customer requirements.

Demonstrate product quality through open ecosystem testing.

Anuket Assured Participation

› To participate in the Anuket Assured Program.

  › Review the program Terms & Conditions

  › See the Program Documentation

  › See the Participation Instructions for developers on GitLab

  › Fill in the Application Form via DocuSign

› Send any questions to: anuketassured@lfnetworking.org.

Step 1:	Step 2:	Step 3:	Step 4:	Step 5:	Step 6:
Submission of Participation Form	Testing	Submission of Results	Notification of Reviewers	Community Review of Test Results	Grant of Use of Program Marks

What's in it for the Community?

Anuket

Network Operators

- Reduced Complexity
- Limit number of infrastructure platforms
- Reduced capital expenses
- Faster buildout intervals
- More efficient operations
- Simpler RFP processes

Network Function Vendors

- Reduced development costs
- Faster testing intervals
- Simplified sales cycles
- Ability to differentiate on value added features
- Reduced resources needed to support multiple infrastructure platforms

Infrastructure Vendors

- Reduced development costs
- Simpler and faster testing
- Streamlined sales cycles with both operators and Network Function Vendors
- Conformance allows differentiation on value added features

# A True Collaboration, with Benefits for All

Anuket

Scope

› Alignment on reference model, architecture and implementation requirements

› Supporting open source and open standards communities

› Integrated, tested, and validated open software reference infrastructure

› Conformance framework and validation programs

› Contributing to and influencing upstream projects

› Creating new open source components within the reference infrastructure where needed

Business Benefits

› Simplify operator operations

› Increase technology adoption velocity

› Reduce complexity

› More efficient use of ecosystem resources

› Allow competition to focus on features and services

› Fosters cross community collaboration with other standards bodies such as GSMA and ETSI

Relationship to other Open Source communities
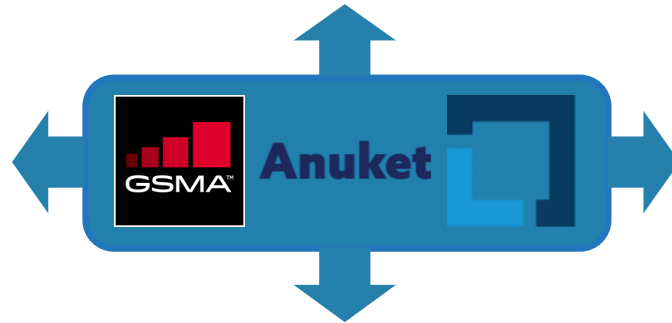
› Anuket Ambassadors: https://wiki.anuket.io/display/HOME/Anuket+Ambassadors

› Evangelize Anuket across the industry, attract new organizations, answer questions, and help onboard participants.
  › Beth Cohen, Verizon (East Coast, USA)
  › Bob Monkman, Intel (West Coast, USA)
  › Scot Steel, Microsoft (West Coast, USA)
  › Gergely Csatari, Nokia (Finland)
  › Walter Kozlowski, Telstra (Australia)
  › Parth Yadav, University of New Delhi (India)
  › Arif Khan, Coredge (India)

To contact any of these ambassadors,
email bwick@linuxfoundation.org.

How to Contribute

› Anuket Website: https://anuket.io

› Anuket Wiki: https://wiki.anuket.io

› Mailing Lists
  › Technical Steering Committee (TSC): https://lists.anuket.io/g/anuket-tsc
  › Technical Discussions: https://lists.anuket.io/g/anuket-tech-discuss
  › Reference Model: https://lists.anuket.io/g/rm
  › Reference Architecture for virtualized NFVI (RA1): https://lists.anuket.io/g/ra1
  › Reference Architecture for Cloud Native: https://lists.anuket.io/g/ra2
  › Reference Implementation for Cloud Native (RI2): https://lists.anuket.io/g/ri2
  › Marketing Working Group: anuket-marketing@lists.anuket.io

Participate in Anuket and build the infrastructure foundation for the next generation of Communications services