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?
**Problem Statement**

Many combinations = silo deployments

- Cloud stack A
- Cloud stack B
- Cloud stack C

![Diagram with NFs and Cloud Stacks]

**Infrastructure Abstraction**

(Common Shared Infrastructure)

- Reduced TCO
- Consistent Operating Model
- Better Utilized Infrastructure
- Scalable
- Easy to automate
- Unified Verification and Testing
Maps to ETSI NFV Architecture
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.
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
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
Project Workstream Overview

- Business Requirements
- Operational Requirements
- Technology Requirements

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

Partners

Reference Model

Reference Architecture

RA1

RA2

Reference Implementation

Reference Conformance

Community Labs

X-Testing

Functest

VSPerf

Installers

“Feature” Projects

NFV Bench

StorePerf

Sample VNF

CI/CD

Compliance & Verification

Governance

Process

Portal

Badging
The Development/Adoption Process

- **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

Reference Model
- Specification

Reference Architecture
- Specification

Reference Implementation
- Lab Reqs
- Playbook
- Installers Requirements
- Installation Playbook

Reference Conformance
- Framework Requirement
- Playbook
- TC High Level Definitions
- Traceability to Requirements

Community Labs

Community Installers
- Airship
- BMRA

Xtesting Framework
- Functest
  - Code
  - TC Low Level Definition
- CNFs
  - Code
  - TC Low Level Definition
- Other
  - Code
  - TC Low Level Definition

Governance

Process

Portal

CNCF
- Definition of Cloud Native (Infra and Workloads)

Infra Badge
CNF Badge
Types of project outputs

**Reference Model**
- Compute Intensive
- Cloud Infrastructure SW Profile
- Cloud Infrastructure HW Profile

**Reference Architectures**
- B
- B
- N
- N

**Reference Implementations**
Implementation of the different Reference Architectures.

**Reference Conformance**
- Set of tests
- Conformance test suite to test if an infrastructure is compliant with the RM and the RA

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.
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

2014
OPNFV is created to build an open source NFV reference platform

2018
OPNFV joins to LFN as a founding project

2019
CNTT (Common NFV Telecommunications Taskforce) created to define reference cloud infrastructures

2019
First CNTT focused projects started in OPNFV

2019
CNTT moves to open source, sponsored by LFN and GSMA, first release of the specifications

2021
CNTT (Cloud iNfrastructure Telco Taskforce) and OPNFV merges into Anuket under the LFN.
A Merger to Harness Innovation

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
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 Program Structure

LFN Governing Board

Tasked with program development & governance

Compliance & Verification Committee (CVC)

Recommendations on testing
Cross Project Collaboration

Governance Documentation
Program Release Oversight
Review Process

Anuket Assured Program(s)

Anuket Assured
INFRASTRUCTURE

Anuket Assured
WORKLOAD

Anuket Assured
LAB

Technical Requirements & Test Implementations

Projects

ONAP

CLOUD NATIVE COMPUTING FOUNDATION

Anuket
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.
What’s in it for the Community?

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
COMMUNITY

Note: View includes observers, supporters, & contributors
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
How to Connect

› 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