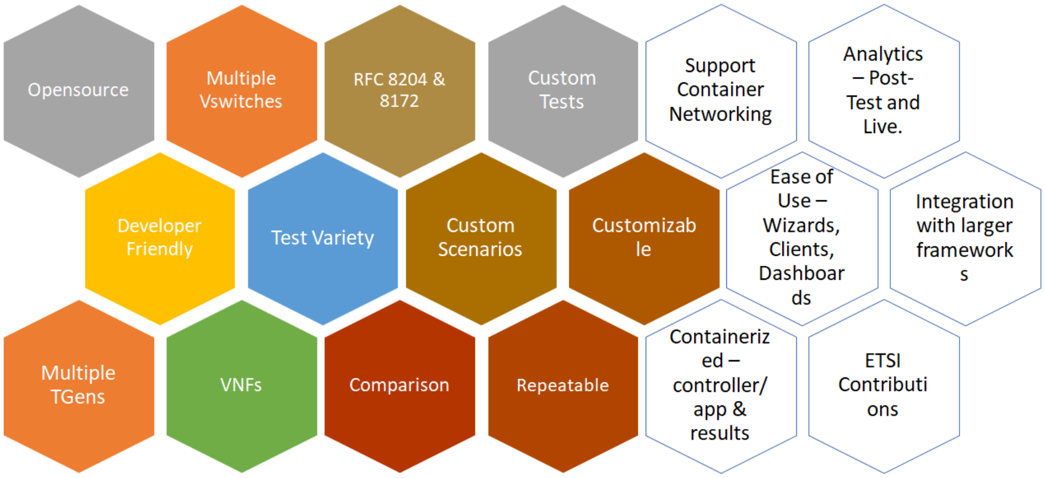
VSPERF: Iruya and Beyond

Introduction

The colored blocks shows the current Features of VSPERF, the White-blocks shows the features we plan to add to VSPERF, in near future.

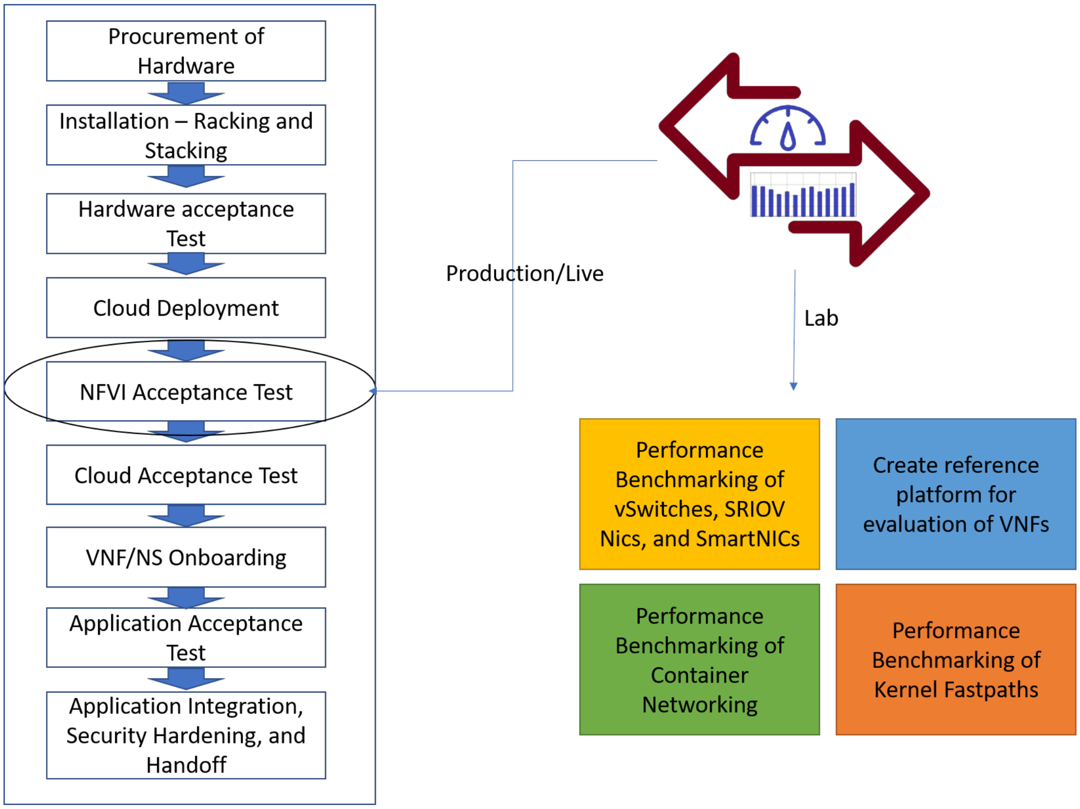


Opensource
Multiple Vswitches
RFC 8204 & 8172
Custom Tests
Support Container Networking
Analytics – Post-Test and Live.
Developer Friendly
Test Variety
Custom Scenarios
Customizable
Ease of Use – Wizards, Clients, Dashboards
Integration with larger frameworks
Multiple TGens
VNFs
Comparison
Repeatable
Containerized – controller/ app & results
ETSI Contributions

Significance of VSPERF

VSPERF Only

VSPERF can be used for both Lab and Production/Live Environments, as summarized in the figure below. Typically, in cloud deployments, Telcos define set of "Acceptance Tests" (AT) for cloud. Performance testcases can be part of this AT, and VSPERF is the ideal tool to be used to run those testcases.



Procurement of Hardware

Installation – Racking and Stacking

Hardware acceptance Test

Cloud Deployment

NFVI Acceptance Test

Cloud Acceptance Test

VNF/NS Onboarding

Application Acceptance Test

Application Integration, Security Hardening, and Handoff

Production/Live

Lab

Performance Benchmarking of vSwitches, SRIOV Nics, and SmartNICs

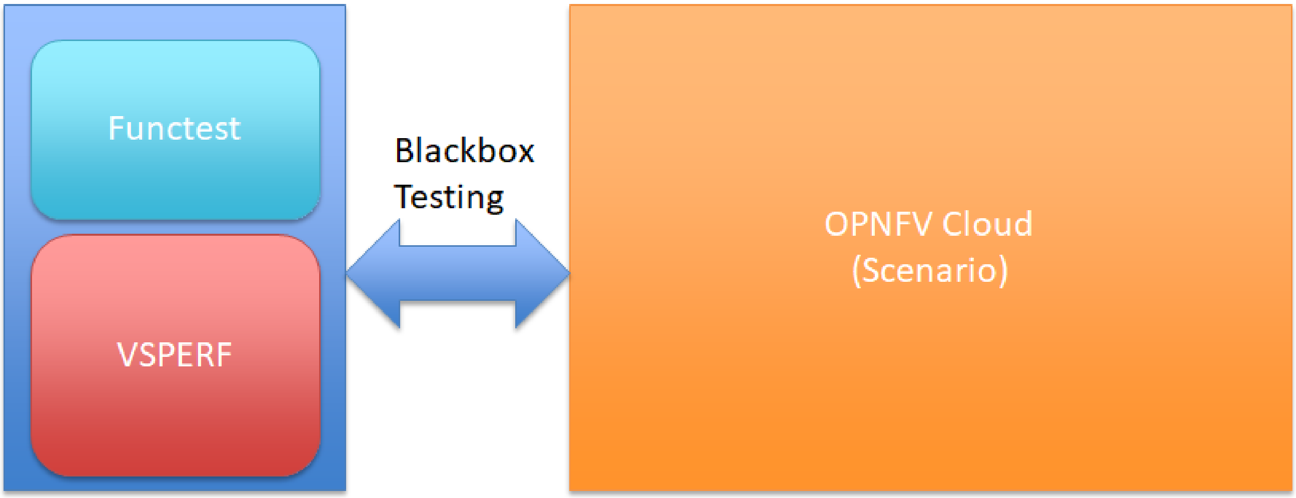
Create reference platform for evaluation of VNFs

Performance Benchmarking of Container Networking

Performance Benchmarking of Kernel Fastpaths

VSPERF with other OPNFV Testing Projects:

Similar to NFVBench, measure and assess the L2/L3 forwarding performance of an NFV-infrastructure solution stack (i.e. OPNFV scenario) using a black-box approach. It can be agnostic of the installer used, the hardware used, the controller used (ML2/OVS, ODL...), the network stack used (OVS, OVS-DPDK, VPP...).



Functest

VSPERF

Blackbox Testing

OPNFV Cloud (Scenario)

Five Main Focus Areas of VSPERF for Iruya and Beyond:

Continued Contribution to Standardization

ETSI TST 009 and VSPERF:

Section	**Compliance Comments**	**Missing Aspects**
Test Setups	Fully Compliant	
Throughput	Missing capacity reporting. Only throughput is reported.	Capacity with X % Loss
Latency	Missing Transfer time in percentile. Other 4 supported.	Transfer Time (Yth percentile, X % Thpt, Filter)
Delay Variation	Missing FDV and IFDV with %le and %ge throughput	FDV (Yth percentile, X % Thpt, Filter) and Inter-Frame Delay Variation (X % Thpt, Filter)
Loss	Missing loss ratio with %ge throughput and loss-free seconds.	Loss Ratio (X % Thpt, Filter), Loss-Free Seconds (X % Thpt, Filter)
Methods of Measurement	Pre-test requirements automated. Binary Search with LV needs minor update? NDR/PDR support is lacking. Setting up Cross-Numa scenarios automated. Better configuration for Soak-Tests	Binary Search with NDR/PDR is missing

IETF

GSMA

Container Networking Performance Benchmarking

Goal: **Automated Setup of DUT, Comparative Study, Generate Results**.

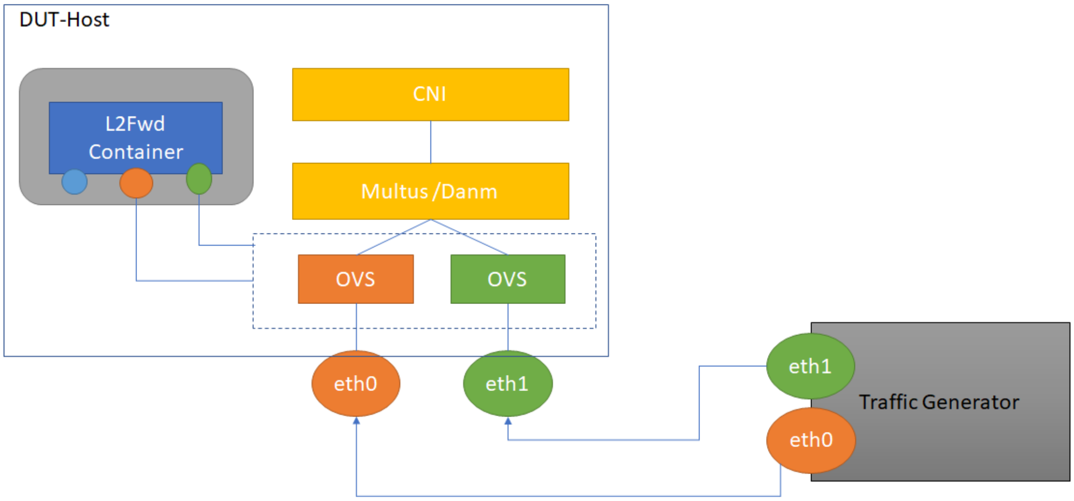
The setup requirements:

1. Single L2 Forwarding Container.
2. Two interfaces in Container for 'east' and 'west' traffic.
   a. CN solutions multiple interfaces support.
3. Two Physical Interfaces on the host to which Traffic-Generator is connected.
   a. CN solution to use these 2 physical interfaces.
   b. CN to bridge/route the traffic across physical-physical, physical-virtual, virtual-physical and virtual-virtual interfaces.

To realize the first step of "Automated Setup of DUT", there are different options:

1. CN without Kubernetes
2. CN With Kubernetes
   a. Manual
   b. kubeadm
   c. Kubespray + Kubeadm
   d. Multus/DanM
   e. Multus + ? Plugin
   f. Multus + Userspace CNI?

The DUT architecture would be:

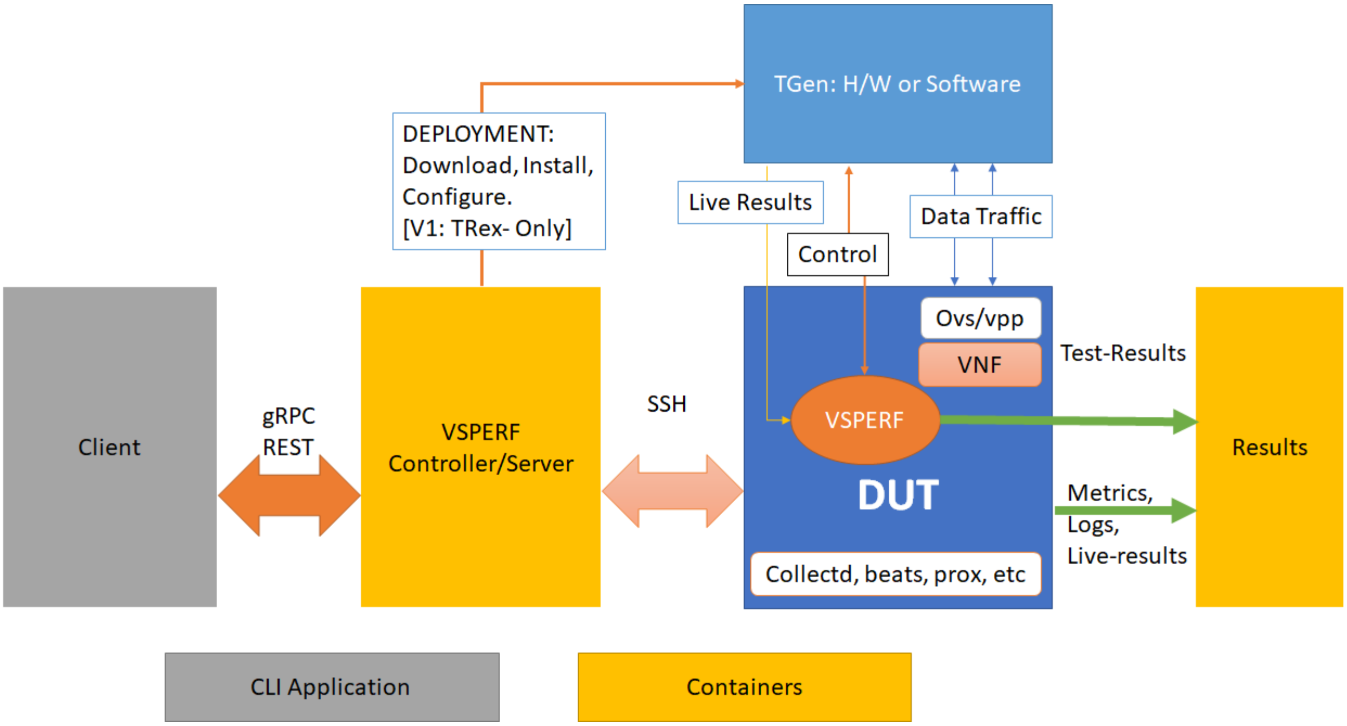


Containerization of VSPERF and Integration with Larger Test-Automation Frameworks

Target Frameworks: Dovetail and X-Testing.

This task has two main parts:

Part-1: Containerizing VSPERF.



Controller Container: Separating Deployment from Testing

No.	Title	Description	Comments
1	Auto-Deploy	This container takes the following inputs and automatically deploy VSPERF and setup the TGen if required.	Ideal for integrating with CI/CD based larger test automation Frameworks

2	Interactive-Deploy	This container, starts listening to commands from the user to perform the deployment of VSPERF and TGen	Ideal for integrating with other 'interactive' (web-based) test automation frameworks.
3	Auto-TestControl	This Container takes the following inputs and automatically runs the tests and publishes the results.	Ideal for integrating with CI/CD based larger test automation frameworks.
4	Interactive-TestControl	This container, starts listening to commands from the user to perform the testing.	Ideal for integrating with other 'interactive' (web-based) test automation frameworks.

Part-2: Integrating VSPERF with larger Test-Automation Frameworks

We are targeting both Dovetail and X-testing.

Analytics

Basic Analytics

Reference work, which was demonstrated at ONS-NA 2019 can be accessed here: https://github.com/opensource-tnbt/vsperf-notebooks

Advanced Analytics

Work in Progress, in collaboration with Unknown User (vipratos)

Ease of use

Configuration Generation Tool:

A PoC can be found here: https://github.com/opensource-tnbt/vsperfwizard

GUI based Test management tool.

Reuse Yardstick GUI?

Dashboard

Custom Dashboard to showcase the status of VSPERF Ongoing Test - Topology, Traffic, etc.

We are looking for some volunteers to develop this - Maybe we can reuse

Other Works:

1. New vSwitches support - Tungsten vRouter
2. Kernel Fastpaths (ex: AF_XDP)