How Standards and Open Source Interworking can Resolve Challenges Slowing down the Massive NFV Deployment

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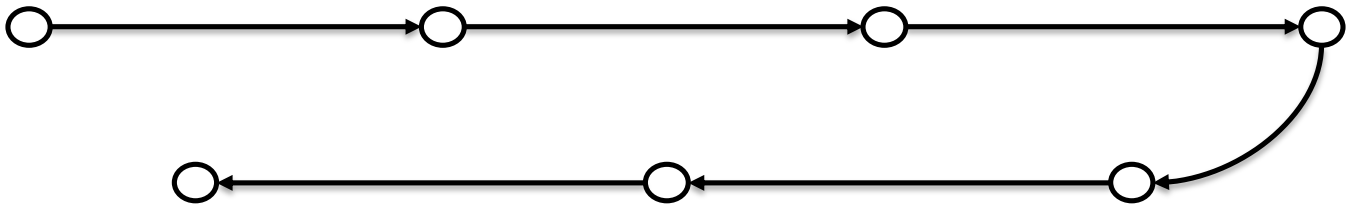
NFV History

ETSI NFV ISG was founded in 2012 with Intel, AT&T, DT, BT, etc.

The first whitepaper was published in Oct 2012

The second whitepaper and 5 specs were published in Oct 2013

In 2014, 25 PoC, 10+ Specs and the third whitepaper were published by ETSI ISG NFV. 3GPP SA5 started NFV study item.



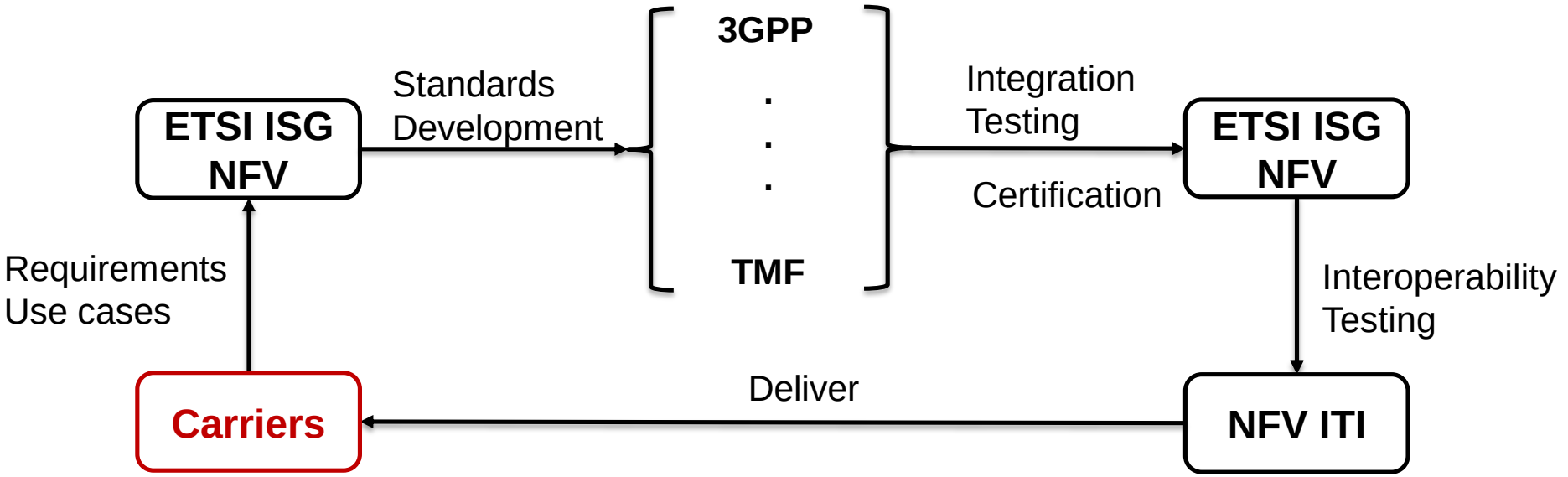
ETSI NFV ISG shifted to the Phase 2 from 2015, developing mandatory specs to help commercial deployment between 2016 and 2018. 9 specs were published. A TR was published by 3GPP.

In 2016, ISG Chair was re-elected, NFV commercial deployment was expected in 2020. NFV-ITI was initiated.

In 2017, HPE and many players reduced resource in ETSI NFV ISG, DT initiated ZSM ISG.

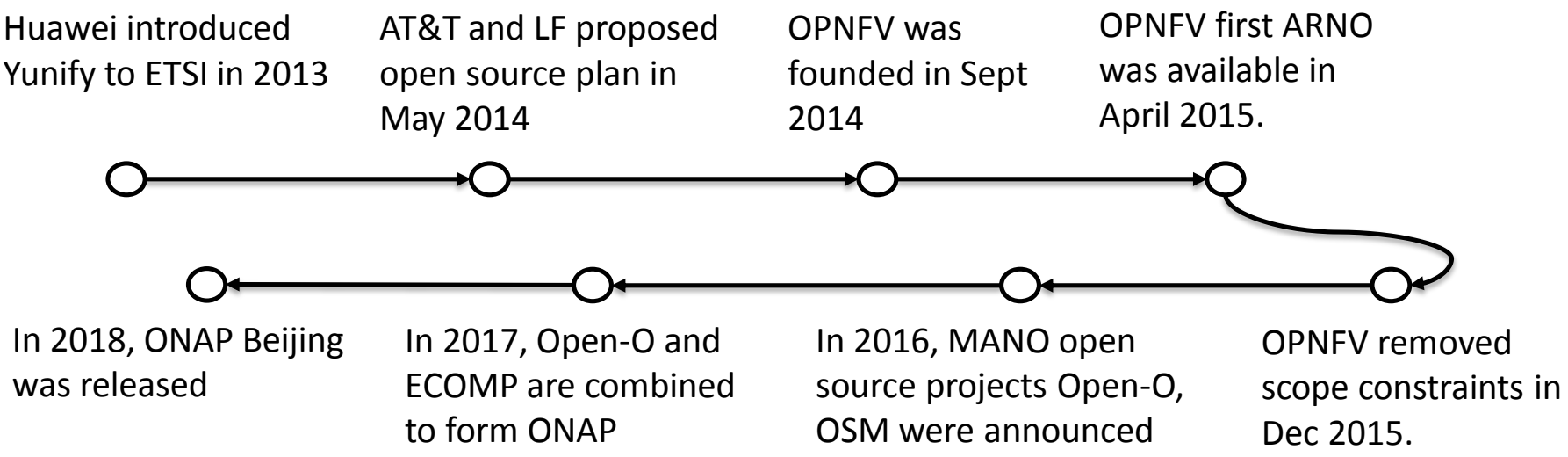
- In the first whitepaper, the reason and challenges to implement NFV are given.
- The famous architecture was proposed in 2013 to specify different blocks (VIM, VNFM, Orchestrator, NFVI, VNF, etc.) and interfaces in NFV system. Ideally, carriers want different providers to provision different blocks, and each block can be replaced easily in a plug-and-play way.
- Interoperability was always the TOP issue needs to be resolved.
- ETSI NFV ISG published many specs but most of them are optional.
- Time consuming for 3GPP, TMF, ETSI negotiating NFV standards.

Traditional Technology Landing Flow



Rises, the Open Source

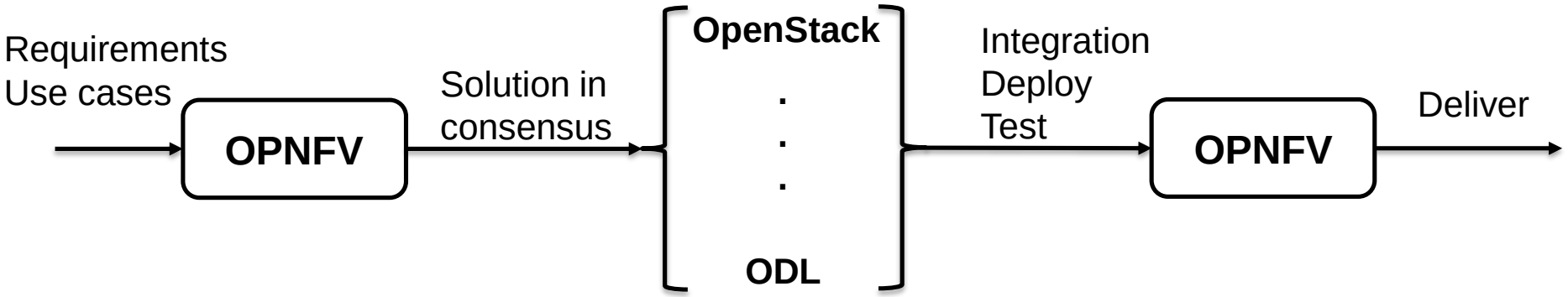
All players wanted to accelerate NFV technologies since 2012, and they found the development process is slow via traditional SDOs. Therefore, they introduced open source to make the progress faster.



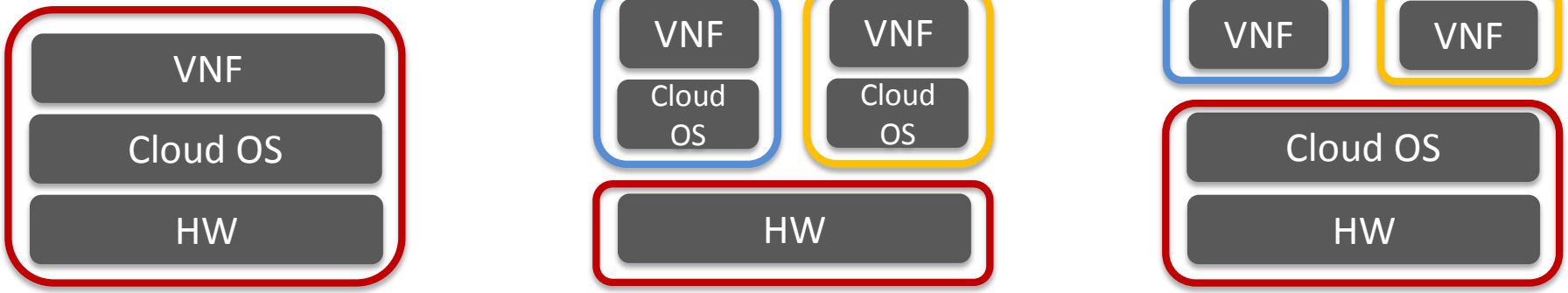
OPNFV

OPNFV facilitates the development and evolution of NFV components across various open source ecosystems. Through system level integration, deployment and testing, OPNFV creates a reference NFV platform to accelerate the transformation of enterprise and service provider networks. Participation is open to anyone, whether you are an employee of a member company or just passionate about network transformation.

OPNFV defines use cases, integrates & tests what other projects (OpenStack, Kubernetes, ODL, OVS, fd.io) create!



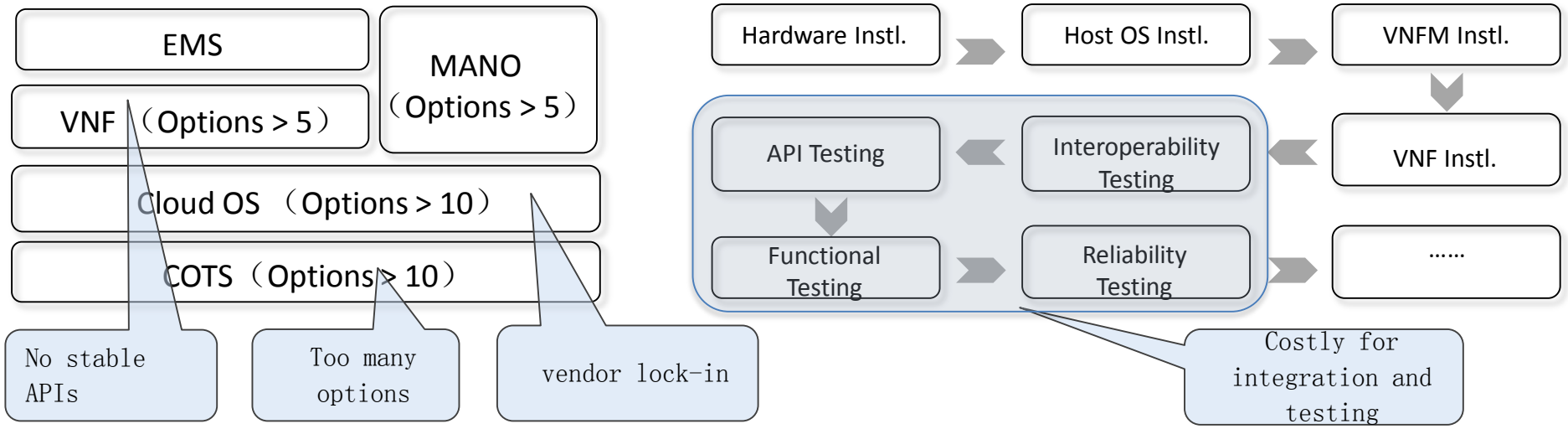
NFV Today



Model 1 *Model 2* *Model 3*

- Most carriers choose model 1 with full stack islands.
- Some carriers decouple HW from the SW stack with SW stack islands. HW is normally purchased with traditional server procurement procedures.
- Few carriers, move one step further, decouple the VNFs from the rest of stacks. This requires a lot of integration work between VNF vendors and the underneath SW stack.
- Carriers rarely decouple the full stack, not to mention being SI by themselves.
- This is only about the vertical layers that each VNF vendor brings their own VNFM.

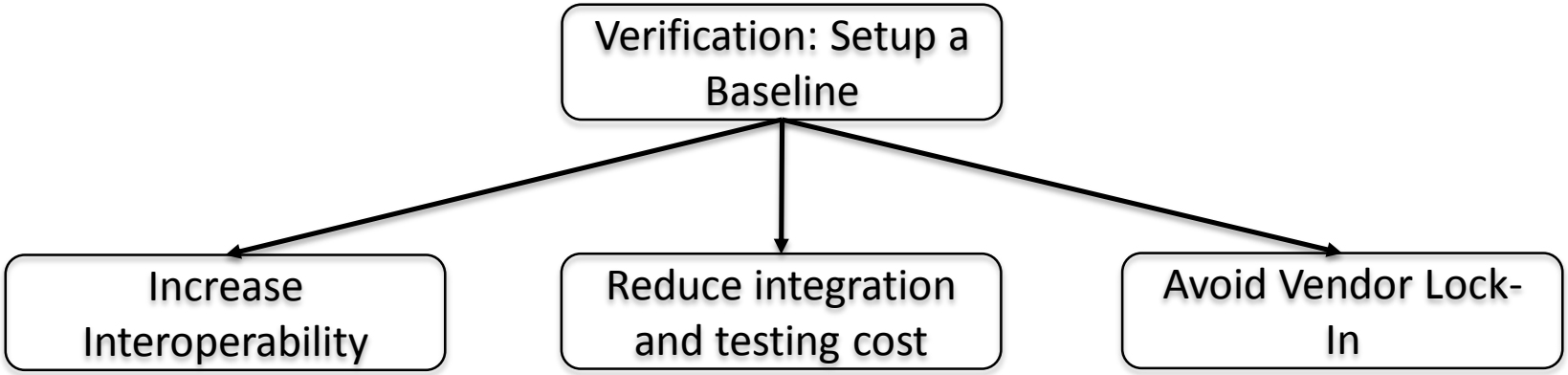
Challenges for NFV Massive Deployment



There are many issues when carriers wants to massively deploy the NFV technologies:

- No stable API between layers
- Too many options for the full stack
- Considerable cost for integration and testing
- Vendor lock-in on platforms

Values Open Source Verification Bring to the NFV Industry



WHY in Open Source?

- Many interfaces and blocks were developed in Open Source;
- Test cases are already developed in Open Source;
- Faster than SDOs;
- Not isolated from standards;

Consensus, the OPNFV Verification Program

The Board and TSC approved the OPNFV Verified Program

OPNFV Verified Program (OVP) has been launched early this year

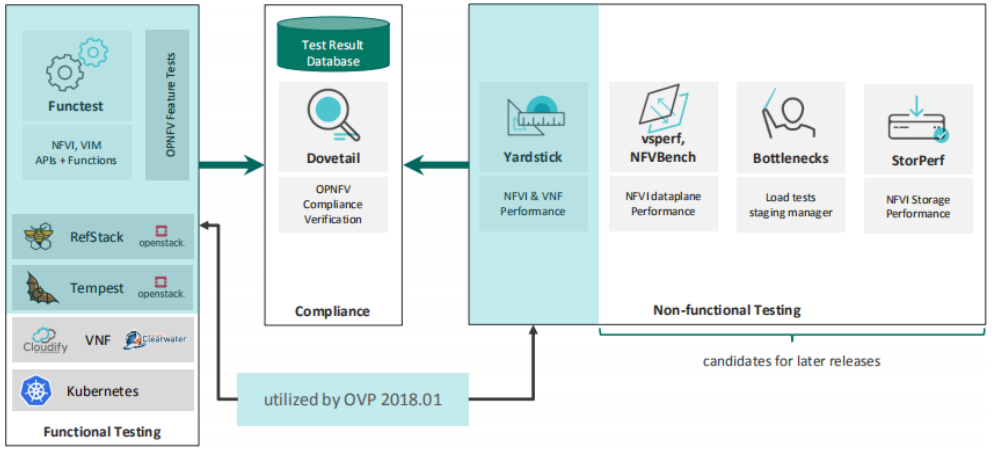
- OPNFV Verified Program (OVP) verifies that a commercial VIM/NFVI exposes the same
  - key APIs,
  - behaviors, and
  - characteristics

  as the OPNFV reference platform

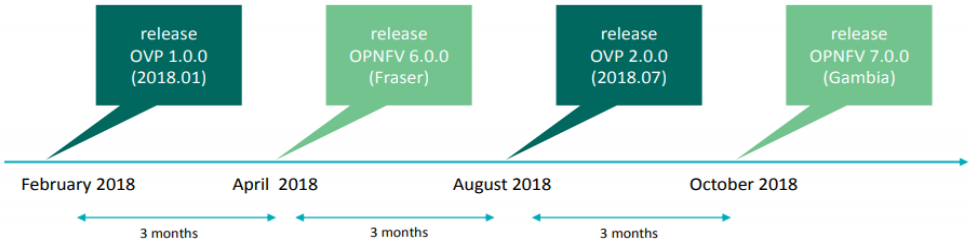
- Main objective: Reduce VIM selection and VNF onboarding cost
  - Establish industry-accepted technical baseline
  - Simplify RFIs and RFPs

Overview on the OPNFV Verification Program

- Test scope and coverage
  - Based on tests developed by OPNFV
  - and upstream communities



- Releases of OVP
  - Release cadence
    - 6 months between each type of release
    - 3 months shift between releases

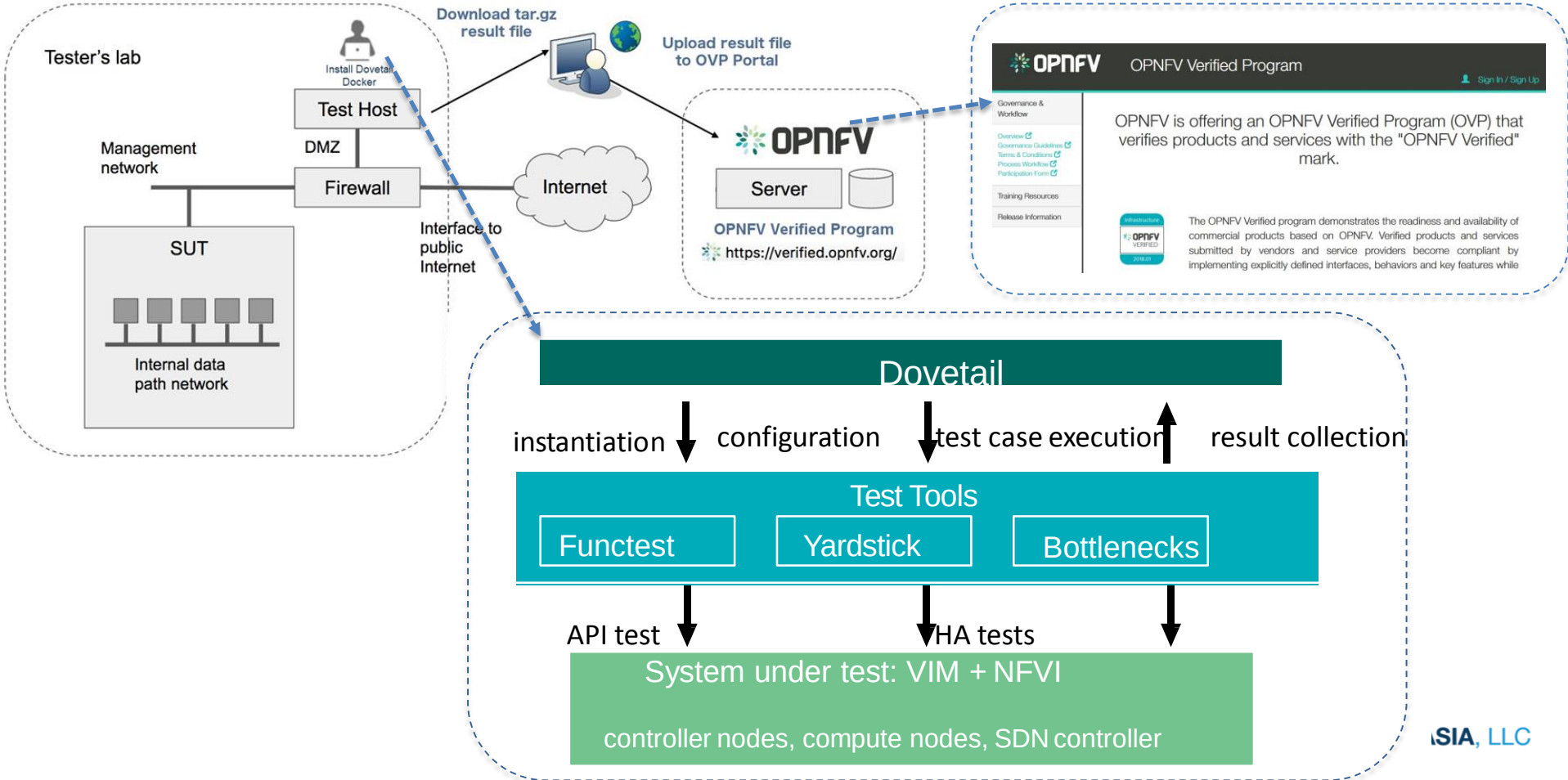


- Ways of Participation
  - Self testing: Deploy and run Dovetail in private lab
  - 3rd party labs: Utilize services offered by selected labs (under development)

OVP Technical Architecture

Main components of OVP

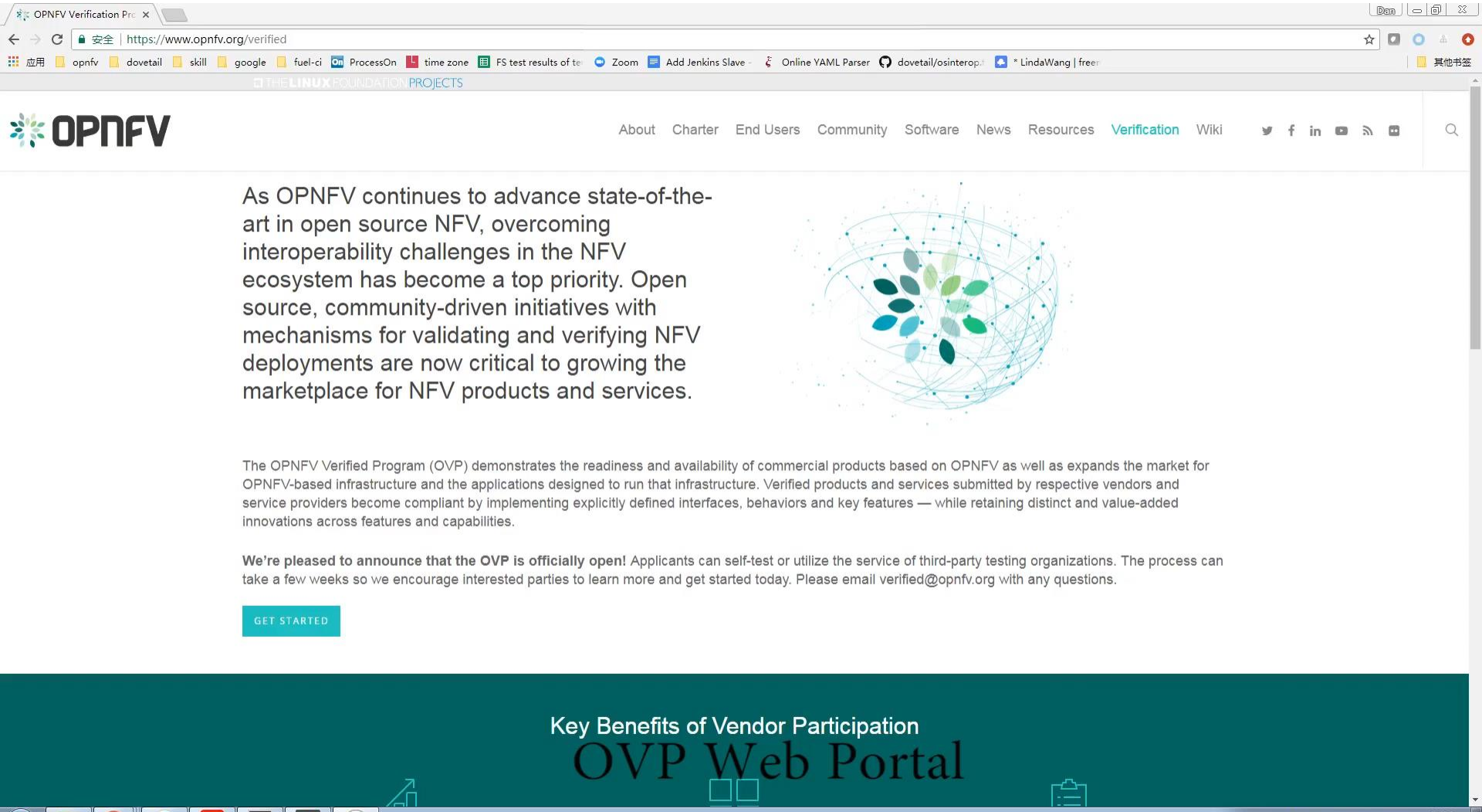
1. Dovetail: automated test and reporting tool leveraging OPNFV and upstream test tools
2. OVP web portal: upload, display, and review results



Compliance Verification Workflow

1. Submission of participation form
2. Testing
3. Submission of results
4. Notification of reviewers
5. Community review of test results
6. Grant of use of program marks

Compliance Verification Workflow



Today's OVP Test Suite

OPNFV Verified 2018.01

Mandatory test cases

- OpenStack interop API tests (205 tests)
- Basic layer 2 packet forwarding (2 tests)
- OpenStack control service high availability (8 tests)

Optional test cases

- IPv6 tenant networks (25 tests)
- BGPVPNs (4 tests)
- Fundamental VIM capabilities (30 tests)

- Os_interop： 全部来自tempest测试用例集，openstack官方认证项目osinterop的2016.08测试集，涵盖network, image, compute, volume, identity
- vPing： vping_ssh, vping_userdata
- HA： cinder-api, glance-api, nova-api, neutron-server, haproxy, keystone, cpu load, disk load.

- IPv6：选自tempest的ipv6相关测试用例
- BGPVPN：来自opnfv社区sdnvpn项目
- VIM capabilities：选自tempest中的scenario测试用例，覆盖forwarding packages, security group, dynamic network, vm lifesycle and multinode.

The Rolling Test Suite for OVP

OPNFV Verified 2018.0x

Functest test cases

- Tempest compute (smoke)
- Tempest identity v2 (smoke)
- Tempest identity v3 (smoke)
- Tempest image (smoke)
- Tempest network(smoke)
- Tempest volume(smoke)
- Tempest Neutron Trunk ports
- Tempest BGPVPN Tempest tests
- Security: Patrole RBAC tests
- VNF testing vIMS
- VNF testing vEPC

- smoke：tempest中所有标签为smoke的测试用例，基础的API测试
- Neutron trunk：tempest plugin测试用例，针对neutron trunkport的测试
- BGPVPN：tempest有关bgpvpn的plugin测试用例
- Patrole：tempest plugin，检测环境的role权限管理功能
- vIMS：部署cloudify和ims，运行测试用例检测
- vEPC：使用juju部署一个vEPC，测试attach流程

Yardstick test cases

- High-availability of one controller(restart)
- High-availability of message queue
- High-availability of Neutron L3 agent
- High-availability of OpenStack database

- HA restart：ipmi登录控制节点shutdown
- HA message queue：杀消息队列进程
- HA neutron l3：杀neutron_l3_agent
- HA database：杀数据库服务进程

Bottlenecks test cases

- Stress Testing

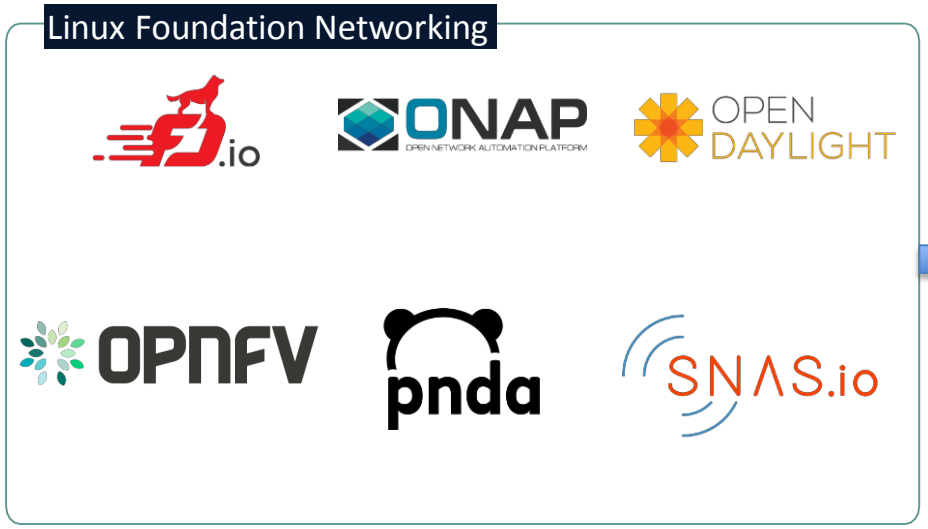
- Stress：Bottlenecks瓶颈测试项目，检测同时起20组虚机的能力

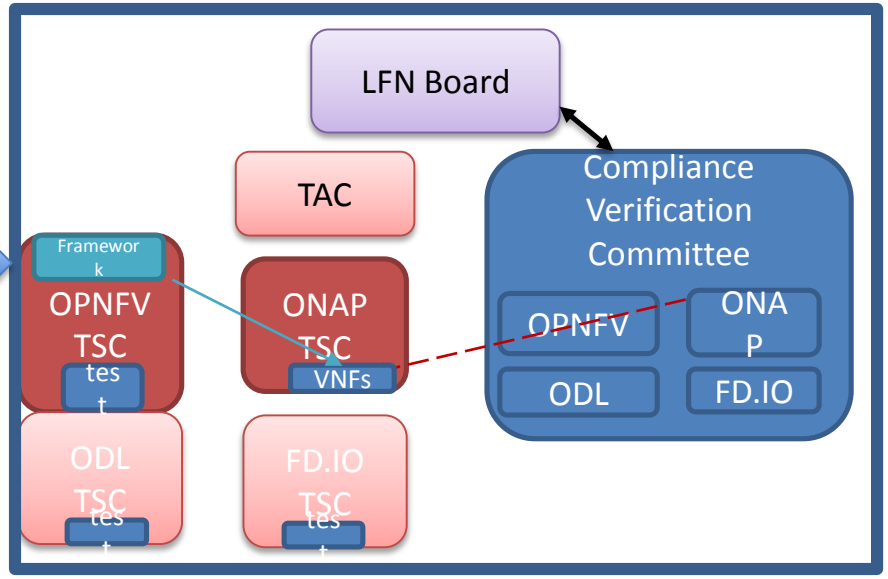
Open Source Verification in Nutshell is Another Form of Standards

Linux Foundation Networking

- Umbrella project covering 6 networking projects

propose expanding the program in 2018 to include VNF compliance





openstack. POWERED

openstack Compatible

certified kubernetes

OCI Certification Program (DRAFT)

This is a *draft process* for the OCI Certification Program. The OCI Certifcation Working Group (CertWG) is responsible for drafting the process around OCI Certification.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