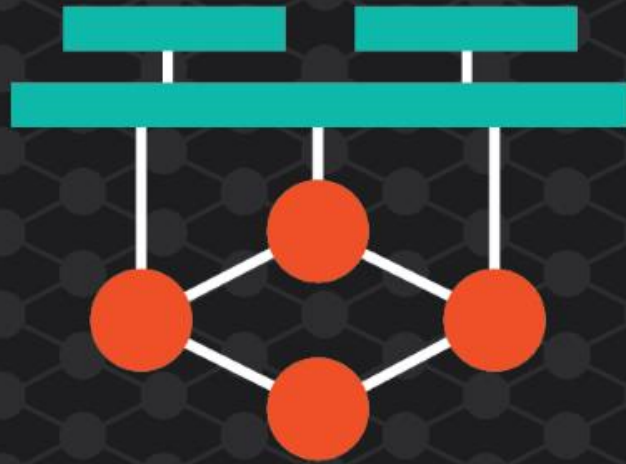


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# Establishing Compliance Verification Programs for Linux Foundation Networking Projects

Chris Donley & Georg Kunz



# LFN Compliance/Verification Program (CVP)

- “You can’t manage what you don’t measure” – P. Drucker
- Best way to ensure commercial products support open source value proposition is to establish a testing program
- LF Networking is providing a testing program to demonstrate SDN/NFV capabilities and interoperability
- Program began with OPNFV Verified Program
  - Supports both self-testing and third-party lab testing
  - Initial version tests commercial VIM+NFVI
- Expanding the program in 2018 to include VNF compliance
  - Requirements and tests defined by ONAP
  - Test framework provided by OPNFV (Dovetail)
  - Back-end infrastructure provided by Linux Foundation



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# Business Value

- Service Providers

- Builds ecosystem for LFN-compliant (OPNFV, ONAP) components and VNFs
- Helps ensure general interoperability and base level functionality
- Reduces testing load
- Shortcut for RFPs

- Vendors

- Defines industry threshold for entry into operator trials
- Simplifies interoperability
- Helps identify priorities for future development



# Challenges and Lessons Learned

- Launching a new compliance program *ALWAYS* takes a long time
  - Need to build trust in the organization, program, and testing methodology
- What is the source of truth? We don't have standards/specifications
  - We use the open source release for component-level verification
  - ONAP VNF Requirements for VNF verification
- How do we deal with validity periods and re-testing requirements?
  - Date-stamp the test version
  - Let the marketplace decide how long those results apply
- How do you build market interest?
  - Start with a cohort willing to “beta-test” the program and provide feedback



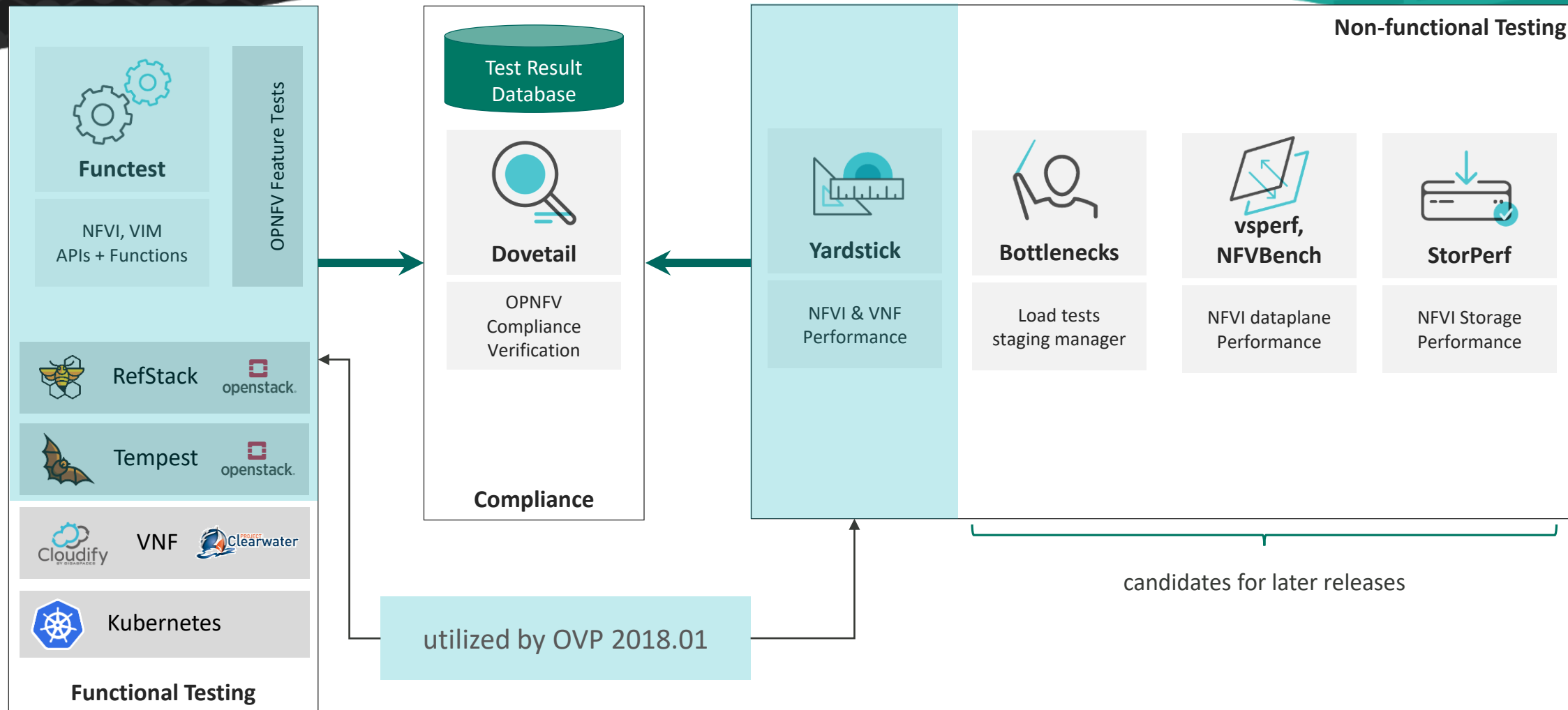


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# OPNFV Test Ecosystem





# Scope of 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)



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# OPNFV Verified 2018.09 released yesterday!





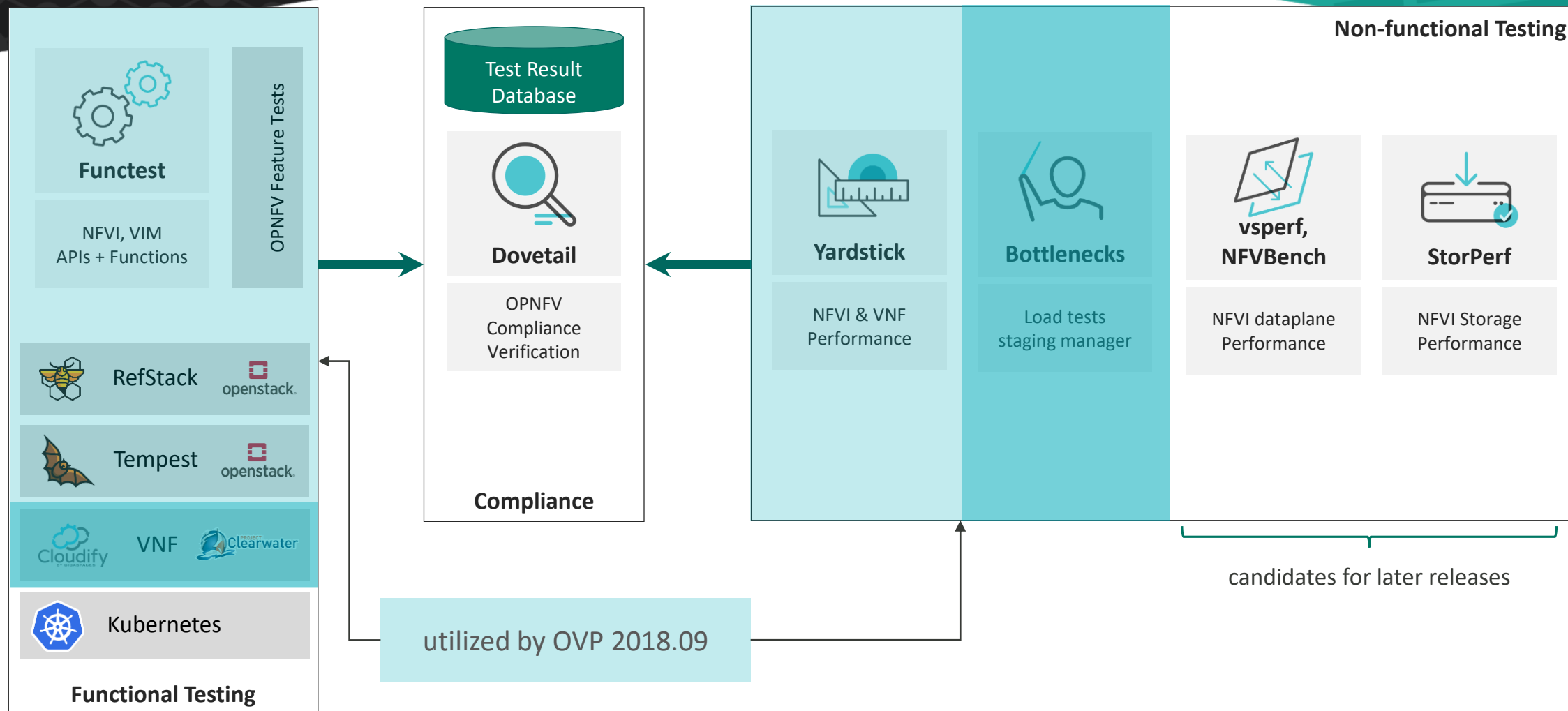


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# OPNFV Test Ecosystem





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# Scope of OPNFV Verified 2018.09

## Functest

- OpenStack Interop tests 2017.09
- vping (userdata and ssh)
- *Tempest compute*
- *Tempest identity v3*
- *Tempest image*
- *Tempest network API*
- *Tempest volume*
- *Tempest Neutron Trunk ports*
- *Tempest IPv6 API*
- *Security: Patrole RBAC tests*

mandatory

Total tests: 421

- Tempest IPv6 scenario tests
- Tempest multi node scheduling
- Tempest network security
- Tempest VM lifecycle
- BGVPN tests
- *Tempest network scenario tests*
- *Tempest BGPVPN Tempest API tests*
- *SNAPS smoke tests*
- *vIMS VNF*
- *vEPC VNF*

optional

Total tests: 59

## Yardstick

- High-availability of nova-api
- High-availability of neutron-server
- High-availability of keystone
- High-availability of glance-api
- High-availability of cinder-api
- High-availability under high CPU load
- High-availability under high disk load
- High-availability of haproxy
- *High-availability of message queue*
- *High-availability of OpenStack database*

mandatory

Total tests: 10

- *High-availability of Neutron L3 agent*
- *High-availability of one controller (restart)*

opt.

## Bottlenecks

- Stress testing

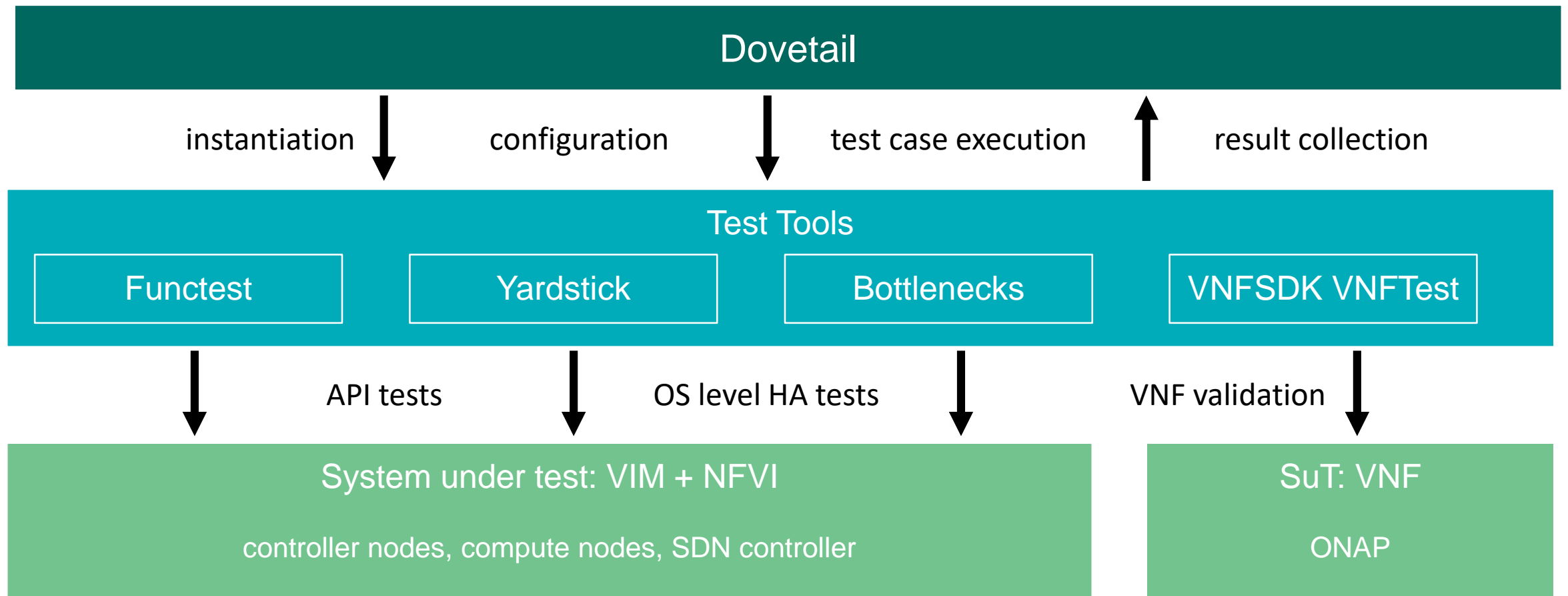
man.

normal font: carried over from OVP 2018.01  
*italic font: newly added test for OVP 2018.09*



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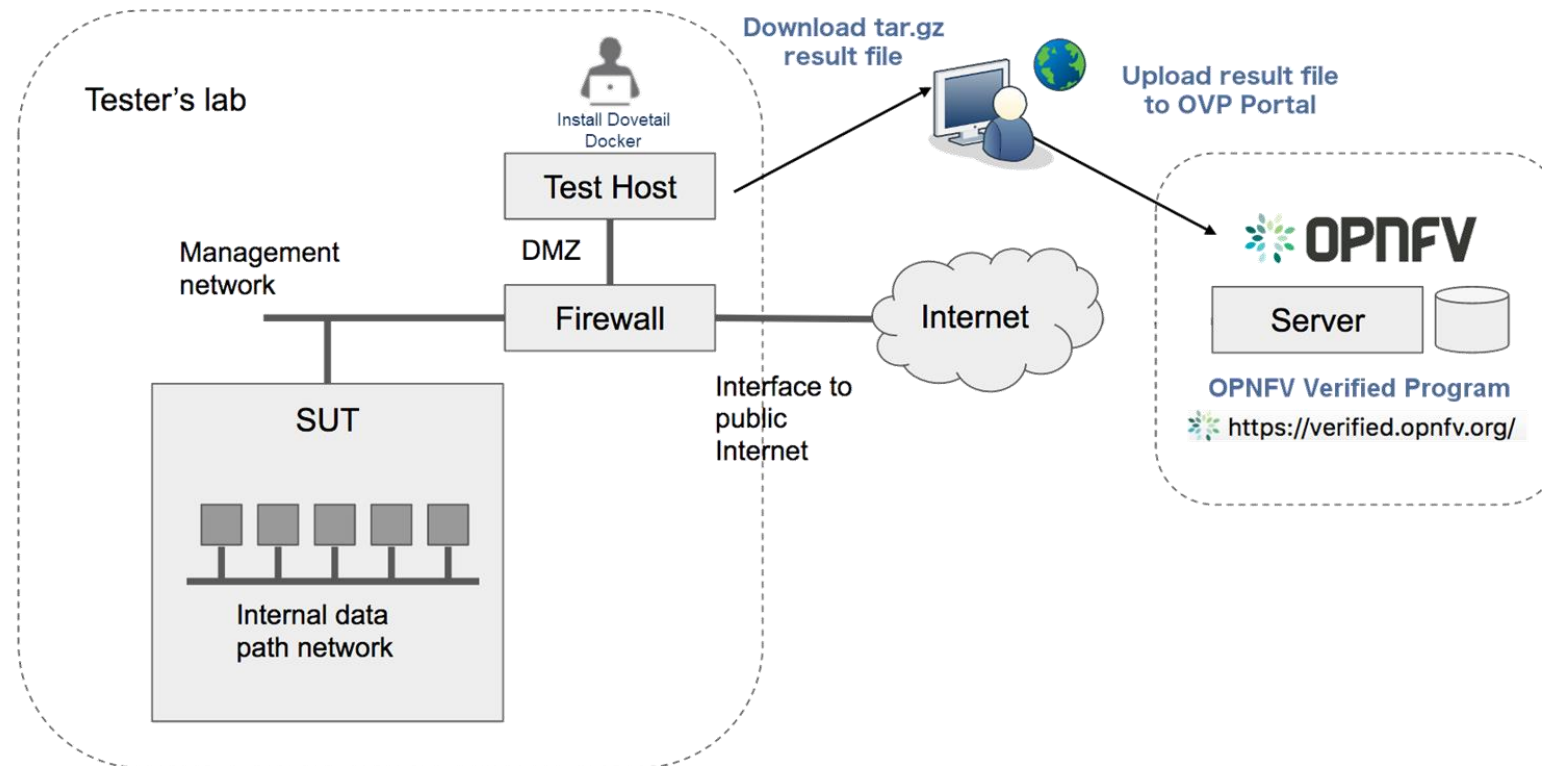
# Dovetail Test Execution Flow





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# Topology of Test Infrastructure





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## OPNFV Verified Program

[My Results](#) [Profile](#) [Sign Out](#)

Governance & Workflow

Release 2018.09

Release 2018.01

OPNFV Verified Program verifies products and services with the "OPNFV Verified" mark.



The OPNFV Verified Program (OVP) demonstrates the readiness and availability of commercial NFV products and services by implementing explicitly defined interfaces, behaviors and key features. This open source community-led initiative allows vendors and service providers to establish baseline conformance and interoperability while retaining distinct and value-added innovations across features and capabilities. Now in its second iteration, the program has doubled the number of mandatory tests from 215 to 432; and requires verified products to complete additional functional, high-availability, and NFV-focused tests. Future plans for OVP include adding third-party labs, as well as testing and verification of VNF deployments. View the directory of verified products and services below and navigate through the links in the left-hand



# VNF Compliance Verification Highlights

- Program is designed to start quickly raise the bar over time
  - Versions are date-stamped to make comparisons easy
  - We will make updates as new requirements and new tests are published
- Allows both self-testing and third-party lab testing
  - Larger vendors will likely self-test
  - Smaller vendors will turn to labs for help
- ONAP will define VNF Requirements and tests
  - VNF Requirements project
  - VNF SDK developing test tool and TOSCA-based scripts
  - VNF Validation Program (VVP) developing HEAT-based scripts

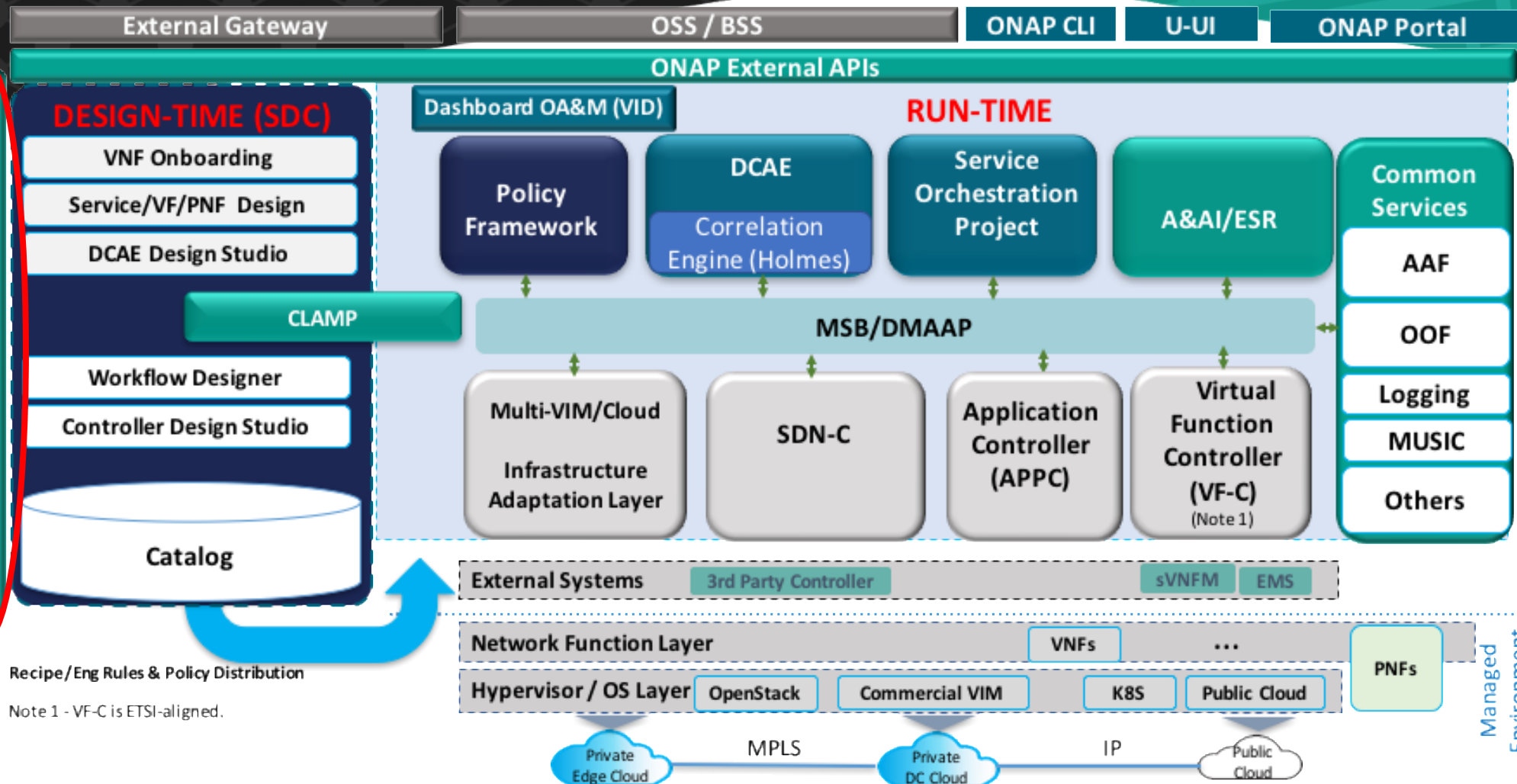




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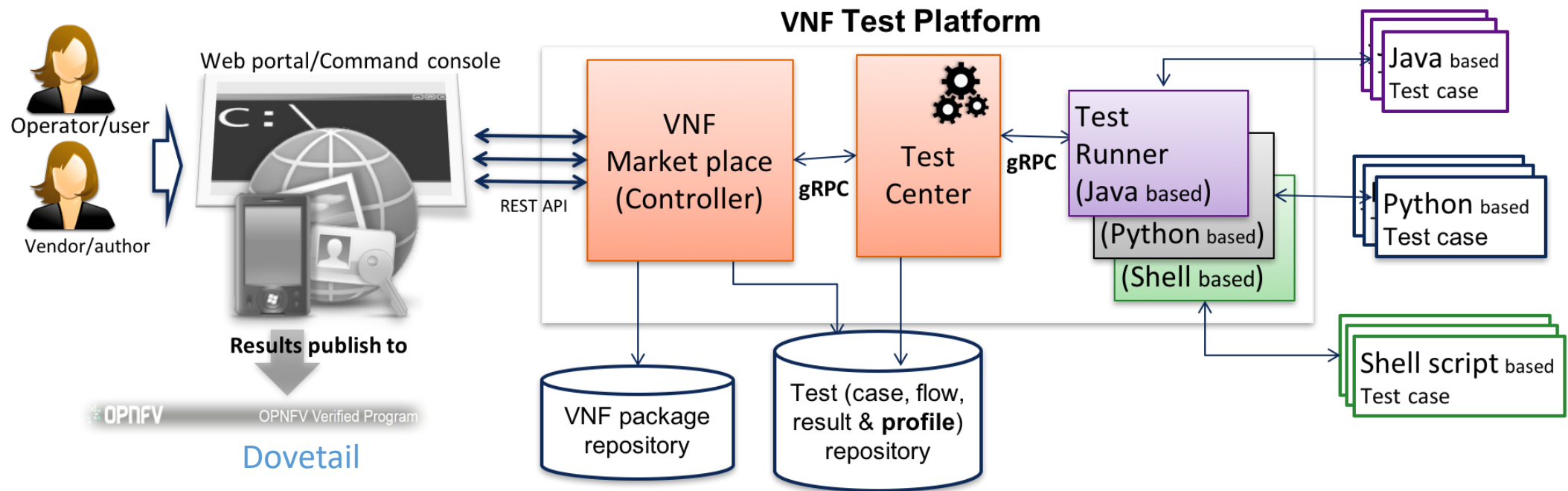
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# VNFSDK testing architecture





VNF Packaging

Lifecycle/Onboarding Tests

Functional Tests

Other  
(performance/security/etc.)

We Are  
Here



# Come Join us!

- LFN Compliance Verification Committee
  - Every other Monday, 1400 UTC
    - <https://wiki.lfnetworking.org/display/LN/Compliance+and+Verification+Committee>
- OPNFV Dovetail
  - Wednesdays, 1400 UTC
    - <https://wiki.opnfv.org/display/meetings/Dovetail>
- ONAP VNF Requirements
  - Tuesdays, 1200 UTC
    - <https://wiki.onap.org/display/DW/VNF+Requirements+Project>
- ONAP VNFSDK
  - Fridays, 1300 UTC
    - <https://wiki.onap.org/display/DW/VNF+SDK+Project>