OVP Automation Augment

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NE Testing: Reality

• The traditional network element test is divided into two processes: procurement test and network access test
• Different rounds of test are usually required before a new device obtains the network access license

- Testbed / lab test
- Pilot test
- Production network test
- ...Other test

• Different type of testing will be performed in the network access test
NE Testing: Reality

• The NE testing process is usually divided into four steps: test topology design, test environment setup, task execution and result analysis and certification.

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<tr>
<th>Test Topology Design</th>
<th>Test Environment Setup</th>
<th>Test Task Execution</th>
<th>Test Result Analysis &amp; Certification</th>
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| The tester, the network element manufacturer support personnel, and the test instrument engineer negotiate the test topology on site. | • Deploy the test env  
• Configure the NE  
• Configure the tester  
• Monitoring and recording. | Manually record test results, and confirm the test results by three parties. | Manually troubleshoot instrument and network element failures. |

At least 6 months are required for an NF to get a new or renewed network access permit.

• Changes after the introduction of NFV

Introduction of open source components  
Introduction of software component disaggregation  
The frequency for software upgrades  
Introduction of new function and service

Automated Testing
Objectives:
1. Common NFV automated test platform
2. Self-service certification NFV stores
3. Open ecosystem of 5G + AI and 5G + edge
NFV Testing Automation with OVP+ONAP

Function mapping with ONAP components

- Test Topology Design - ONAP SDC
- Test Environment Deploy - ONAP Orchestrator (SO, VF-C, APPC, etc)
- Test Task Execution - ONAP VTP (VNFSDK, VVP)
- Test Result Certificate - OPNFV OVP

NFV Testing Automation DevOps

Test Topology Auto Design
ONAP SDC
Workflow
- Test Topology Design - ONAP SDC
- Test Environment Deploy - ONAP Orchestrator (SO, VF-C, APPC, etc)
- Test Task Execution - ONAP VTP (VNFSDK, VVP)
- Test Result Certificate - OPNFV OVP

Test Environment Auto Deploy
ONAP Orchestrator
- Infra
- Days-Weeks
- Minutes-Hours
- Test tools integration
- Test execution
- Test result
- Infra

Test Task Auto Execution
ONAP VTP
- Minutes-Hours
- Test tools integration
- Test execution
- Test result
- Infra

Test Result Auto Analysis & Certification
OVP
- Weeks
- Infra
Goal: Quickly design a test service (topology) composed with tested VNF and test environment

Current situation: The service design need to be repeated for each VNF/test vendor

Possible solution: Define abstract testing service (topology) template for each type of VNF

Enhance SDC to support:

1. Abstract topology template definition
2. Flag the abstract VNF that can be replaced by real VNF
3. Instantiate step1 template using vendor VNF into a deployable template in runtime
Gap Analysis - Auto Deploy (Orchestrator)

**Goal:** Reduce unnecessary replication for different VNF vendor/revision between testing iterations

**Current situation:** The entire test environment need to be redeployed each time

**Possible solution:** Only replace the VNF to be tested

**Enhance Orchestrator to support:**

1. Only deploy the newly updated or upgraded VNF
2. Build the relationship between the existing instances with the new deployed instance
Goals:
1. Test instruments integration
2. Integration with OVP portal for automated OVP verification certification
3. VTP capability expansion
   • Loading different test scripts and cases
   • Flexible test process definition
   • Test report customization
Gap Analysis – Auto Analysis & Certification (OVP)

Goals:
1. Integrate with test framework to collect the test result automatically (Step 3 manually)

OVP Certification Process:

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

2. Building public certification store

OVP Certification Store

- Infrastructure
  - OPNFV Verified 2018.09
- VNF
  - OPNFV Verified 2019.04
- Lab
  - OPNFV Verified 2019
Suggestions for OVP

Suggestions: OVP provides common testing platform, focusing on process automation and integration of test tools from different upstream open source projects/communities and third party vendors (SUT vendors and Instrument vendors)

Benefit:
1. Reduce duplication of work across communities, specific test tools and test cases in different areas can be completed in the upstream projects and communities
2. OVP as the open verification program can leverage the capabilities of existing tools to quickly provide automated testing and certification.
**Capabilities for common automated test platform:**

1. Support loading and importing of different forms of test cases and use different executors to execute test cases.
2. Provide unified tool access standards, providing tool pre-deployment or on-demand deployment capabilities.
3. Provide adapter layer to integrate with different SUT.

**Requirements for SUT vendors and test tools/instruments vendors:**

1. No requirements for test case format except for formats not supported by the platform.
2. Follow the unified tool access standards to integrate with test platform.
3. Follow the SUT adapter layer specification to integrate with test platform.
Making some progress in Automated Test Environment Setup and Test Task Execution.
OVP VNF Compliance and Validation Testing with ONAP

The demo shown on 2019 ONS EU

VNF Compliance
- VNF Compliance Test Cases
- Testing Tools
- VNF Test Platform (VTP)

VNF Validation
- VNF validation Test Cases
- Testing Tools
- VNF Test Platform (VTP)

789 numbered requirements

VNF Requirements

Cover 309 requirements, 213 test cases

VNFSDK – TOSCA compliance test cases
VVP– HOT compliance test cases

OVP | Demo: TOSCA VNF Validation Testing
Developing independent VTP portal to improve the usability of VTP which can combine with OVP Portal to provide test service.
1. Virtual test instrument (vTI) LCM with ONAP (Done)

2. Test process automation (Test NS deployment, test instrument configuration, function and performance test execution)

   VTP integrates with virtual test instrument to perform function and performance testing (undergoing)

   The verification of the instrument integration solution provides the feasibility basis for OVP to provide functional test certification by integrating third-party test instruments.
Welcome feedback your requirements to help building open source testing and certification ecosystem

More expertise for NE and test instrument integration (esp. LCM and configuration) is welcome

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Back Slides
VTP Portal and OVP Portal Integration

Have done:
1, 2, 3, 5, 6, 7

Plan to do: 3’, 4

8 is operator’s test cases