End User Advisory Group

Analysis of survey result

NFV Testing Automation Survey

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Outline

› Introduction
› Summary from NFV Testing Automation Survey
› Testing automation whitepaper proposal
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.

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

- **Test Topology Design**
  - The tester, the network element manufacturer support personnel, and the test instrument engineer negotiate the test topology on site.
  - **Weeks**

- **Test Environment Setup**
  - Deploy the test env
  - Configure the NE
  - Configure the tester
  - Monitoring and recording.
  - **Months**

- **Test Task Execution**
  - Manually record test results, and confirm the test results by three parties.
  - **Months**

- **Test Result Analysis & Certification**
  - Manually troubleshoot instrument and network element failures.
  - **Weeks**

• 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
NFV Testing Automation Survey in EUAG- Introduction

• **Background:** Considering the scenario of NFV testing within operators, and in order to fully find out the potential extended application requirements of the general automated testing platform, we designed the automated testing survey in EUAG.

• **Participants:** EUAG Group

• **Response:** 6 participants, anonymous

• **Design of survey:** 34 Questions

1. **Testing process and content**
   - Before the introduction of NFV, investigate the test types and test contents of new equipment, equipment patches, resource pools and other network access tests.

2. **Testing Participants and Collaboration**
   - Investigate the personnel and division of labor involved in the network access test, including the development of test specifications, test environment provision, test execution, and test result summary.

3. **Test Restrictions**
   - Investigate network access tests factors, including network access times, test costs, test stability, and others.

4. **Changes of NFV Network Element Access Test**
   - Investigate test changes such as test organization, test cycle, and test frequency after the introduction of NFV.

5. **Status and Requirements of Test Automation**
   - After the introduction of NFV, investigate the automation requirements and the application of automation tools for various test phrase.

6. **Community Work Requirements**
   - Research on the requirements and value as well as co-construction ideas of community open source certification platform.
Summary from the survey-Part1

• Changes of NFV network element access test
  ➢ Increased test types and frequency
    a) Resource pool tests and network element tests are usually conducted separately.
    b) Pairing tests are needed between resource pools and network elements.
  ➢ Shorter upgrade cycle:
    Upgrade cycle is shortened from half-year to 2 ~ 3 weeks (1 ~ 2 months) compared to traditional physical network elements

• Limiting factors for NFV access test

  ![Diagram showing test environment in short supply, long approval process for access test, and insufficient stability of the production environment.]

• Optimization of NFV access test
  The functional testing and performance testing of Testbed/lab test are usually necessary before the new device or patch obtains the network access license.
  Specific optimization measures can include:
  ➢ Establish common test resource pool, reuse hardware and virtual resources between different rounds of test; introduce test management system to optimize the resource use approval process.
  ➢ Introduce automated tools and DevOps technology in different test stages.
  ➢ Provide integrated standards for third-party test tools and test scripts.
Summary from the survey - Part2

- Status and requirements of test automation
  - The life cycle test and the traditional business test are performed separately
  - Automation requirements priority
    - Test environment setup (highest)
    - Test execution (high)
    - Test design, test analysis, test scoring (medium)

- Problems to be solved in life cycle test and business function test
  - Automatic configuration of network element (most urgent)
  - Automatic deployment, test scripts integration from different vendors, automatic control of the test process (urgent)
  - Test tools/test instruments integration from different vendors, traceability of test results (medium)

- DevOps application status and cooperation mode
  - Some operators have introduced DevOps tools, and all operators hope to achieve full-automatic closed loop, including
    a) Network element codes are automatically built and automatically integrated
    b) Network element life cycle and service test is performed automatically
    c) Network elements are automatically deployed and brought online to a test or production environment
  - The DevOps cooperation model between operators and VNF suppliers is VNF vendors provide VNF software packages and operators implement CI/CD in their own DevOps environment.

  There is a requirements about how to load the VNF software package into the operator's DevOps environment automatically
Summary from the survey - Part3

• Significance of LFN OVP certification project for operators

The value of the LFN OVP certification program to operators is mainly reflected in:

➤ Build the automated test framework together, operators can reference the open source implementation of OVP test framework to support their network access test.
➤ Build test case executors together, operators can integrate existing test scripts and test tools with reference to test framework requirements, and leverage the capabilities of third-party tools to improve test efficiency.

For the enhancement of OVP automated test functions, the top priorities are:

➤ Topology design
➤ Test environment setup
➤ Test execution
➤ Test analysis

OPNFV Verification Program (OVP)
Testing automation whitepaper proposal (Automated testing application guidance whitepaper)

- Based on the operator's automated test requirements and bottlenecks responded from the preliminary NFV testing survey, we’d like to propose optimization suggestions for DevOps and automated testing from the operator's perspective in the form of a white paper.

- Draft of testing automation whitepaper:
  1. Introduction;
  2. CSPs automated testing requirements;
  3. Automated testing solutions from industry organizations - Best Practices;
  4. Guidance and recommendations for the implementation of automated testing requirements - Recommendations from CSPs;
  5. Others, still under discussion.
Testing automation whitepaper proposal (Automated testing application guidance whitepaper)

1. Introduction to the topic
   - Introduce the requirements background of DevOps and automatic testing (include NFV & CNF testing);
   - About the whitepaper

2. CSPs automated testing requirements
   - Introduction and analysis of NFV automatic testing survey;
   - Test requirements and bottlenecks
   - Automated testing requirement solution model

3. Automated testing solutions from industry organizations - Best Practices
   - Automated test scenarios and application analysis from open source industry organizations;
   - Automated test scenarios and application analysis from SDOs;
   - Others

4. Guidance and recommendations for the implementation of automated testing requirements - Recommendations from CSPs
   - Recommendations for participation of industry organizations related to automated testing
   - Recommendations for the implementation of automated testing applications

By EUAG
Thank you

If you have more expertise for automated testing, continuous testing, DevOps & CI/CD, or you are interested in any of the above aspects, welcome to discuss with us.

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