VNF Test Platform(VTP)

VNF / CNF - Recursive & Agile Test Orchestrator

Scenarios: LFN OVP & ONAP

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ONAP VNFSDK PTL

ONAP CLI PTL

OPNFV Dovetail PTL

3rd March 2020

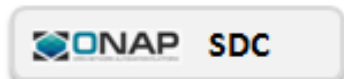# VNF Test Platform (VTP)

PERSONAS
- Operator
- Vendor

PARTNERS / LABs
- OPNFV Dovetail
- ONAP SDC
- LF NETWORKING OVP Lab
- Jenkins CI/CD/ CLI

LF NETWORKING **OVP Portal**
Publish Results

3rd-party test registry / provider

<TMF TEST REST API>
Test Controller

VNF Test Agile Orchestrator

TEST SCENARIOS

SDO spec. Test case (ETSI, VNFREQS)	HELM
Operator Test case ✓	
Vendor Test case ✓	

Functional Test case	
Lifecycle Test case ✓	CNF
Compliance Test case	CNF
Performance Test case	CNF

Java/Python/Script /Docker Container/ Robot based Test case ✓

ENVIRONMENT
Standards, MANO, VIM, VNF

- ETSI **TOSCA**
- openstack. **HEAT**
- GSMA **CNTT**

STANDARDS

ONAP OPEN NETWORK AUTOMATION PLATFORM

MANO

VNF or PNF or CNF
VNF manager.

openstack. **NFVi** docker kubernetes

A **Test orchestration agile platform** to manage and orchestrate different VNF testing scenario across different SUT environment like ONAP MANO, OpenStack Cloud, Vendor VNFM, SDN Controller, Kubernetes docker, etc under one umbrella across different Test providers and partner labs.

Artifacts ,Test case, profiles, results

Programming Interface
- ✓ Provides REST API over HTTP(s)
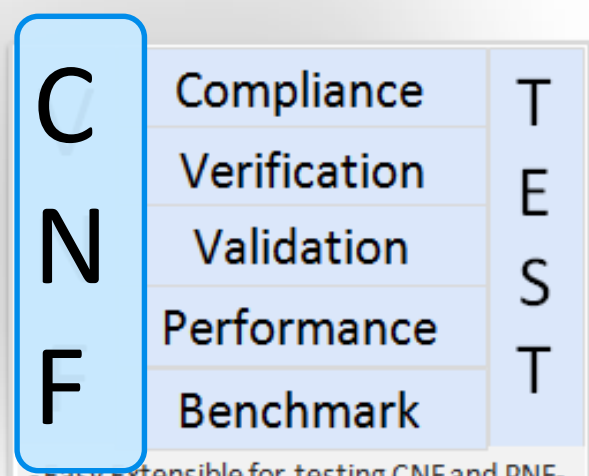- ✓ Role-based Access control

User Interface
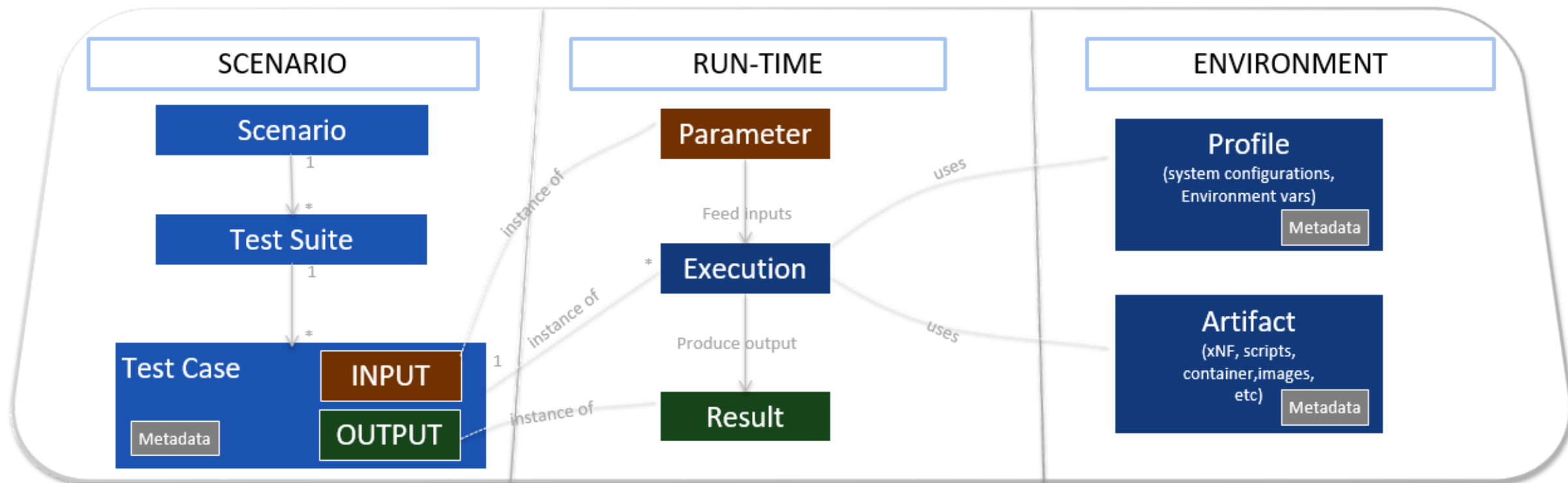- ✓ Web Portal
- ✓ Command Line Interface (CLI)

AGILE
- Test case Modeling & Standardization
- Test case management
- Test orchestration
- System Under Test (SUT) management

THE LINUX FOUNDATION

NFV **Operators**
TMF, ETSI **Standards**
VTP
Vendors VNF
Community ONAP MANO &OPNFV

C N F
- Compliance
- Verification
- Validation
- Performance
- Benchmark

T E S T

- Easy Extensible for testing CNF and PNF-

-- Powered by Open Command Platform (OCOMP) – an agile orchestrator, part of ONAP CLI project

VTP: Domain model

SCENARIO

- Scenario
  - 1
  - *
- Test Suite
  - 1
  - *
- Test Case
  - INPUT
  - OUTPUT
  - Metadata

RUN-TIME

- Parameter
- Feed inputs
- Execution
- Produce output
- Result

instance of
instance of
instance of

ENVIRONMENT

- Profile (system configurations, Environment vars)
  - Metadata
- Artifact (xNF, scripts, container,images, etc)
  - Metadata

uses
uses

✓**Scenario** is an logical entity to model any given situations for which test cases are made, ex: LFN OVP, vendor specific, functionality specific.
✓**Test suites** is an logical entity helps to group the tests into hierarchy with the notation *x.y.z*
✓**Test case** models the given real test case with required Inputs and Outputs.

✓**Execution** models every execution of given test case with unique identifier
✓**Parameter** is instance of Test case inputs, given by user while executing the test case
✓**Result** is instance of Test case output, produced by VTP as part of Execution
✓While execution, user could use Profile and Artifacts

✓**Profile** models the System configurations and Pre-defined test case parameters. Ex: GSMA profile, OpenStack environment details, etc
✓**Artifact** models the given binaries of any nature like VNF, Scripts, configuration files, certificates, etc
✓**Metadata** models tagging to support searching of test execution

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✓Test case *results* are **searchable** based on artifact, profile, scenario, test-case, metadata as VTP captures every test case execution with parameters and results.

🔲 THE LINUX FOUNDATION

Certification (Badging) Time

✦ **Vendor** wants to get certification for VNFs (TOSCA & HEAT) , CNF (helm) by compliance, verification, validation and performance

✦ As part of **OVP**, CVC prefers single project from ONAP to perform VNF certification testing

Design Time

✦ **Operator** wants to check the Operator's specific VSP compliance check when VNF is on-boarded in **SDC**

✦ **Operator** wants to design the service testing, similar to service design to enable service verification at run-time

Run Time

✦ On every service instantiation, **operators** want to verify the network service before activating for the consumer. (passive testing) thru **SO/VFC**

✦ **Operators** want to check the SLA of service on need basis (active testing)

VNF Test Platform (VTP)

VNFSDK – TOSCA compliance test cases (Add CNF Test cases)

VVP– HOT compliance test cases

CLI/Integration – TOSCA/HOT verification test cases

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VTP: As Agile Test Orchestrator

Role	Operator	OVP lab	CI/CD
As Command using CLI	X	X	X
As Test case using VTP	X	X	X

6X vs 1X

✓OCOMP **unifies the model and actions** as ONAP **managed object** (using OCS YAML)

    - **same user experience** across all ONAP services, Network services, VNF and use-cases.

✓**Develop once, share across roles** Certification, testing, devops and production/automation.

    - Saves everyone from duplicate effort spent on developing their own copy of same automation

2-in-1:

✓ Every **action** available as its to different role

    - as **command** from CLI console (**devops**)

    - as **test case** from VTP (**testing, certification, production**)

✓ **Tester fills the user role** in the absence of user

✓**User guarded from bugs** as already tested as part of Testing

devops

testing, certification, production

CLI — java

VTP — gRPC

Open Command Platform [OCOMP]#

Managed Object Model (MOM) OCS YAML

AGILE

ONAP

SO

VNF/NS

Sdc, aai, vfc, multivim, So, sdnc, policy, msb

https   https   http/snmp

Vendor CSARs   VSP

ETSI   TOSCA
openstack   HEAT

VNF life-cycle **Validation**
(automation, python, workflow, etc)
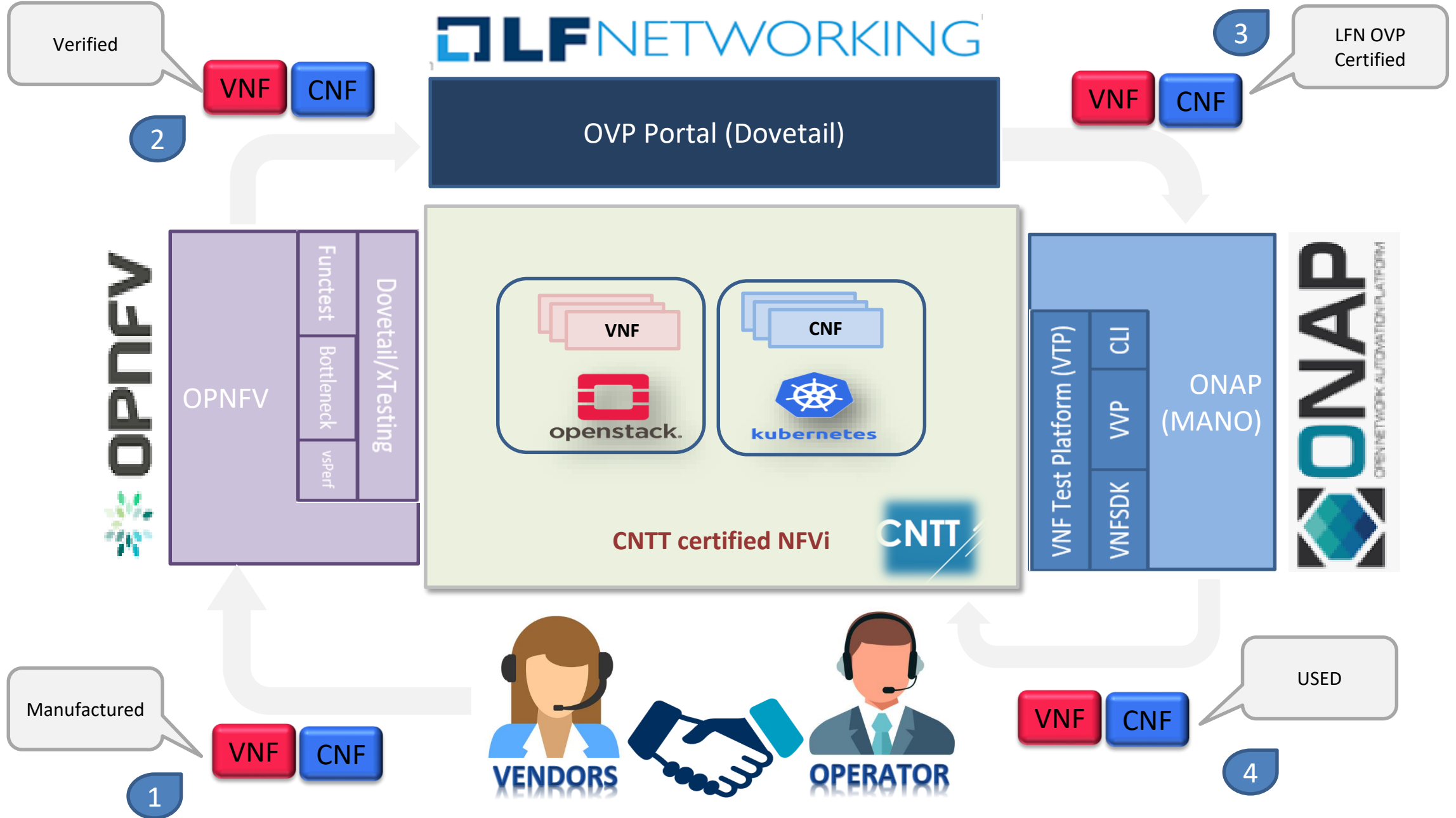
gRPC

Recursive
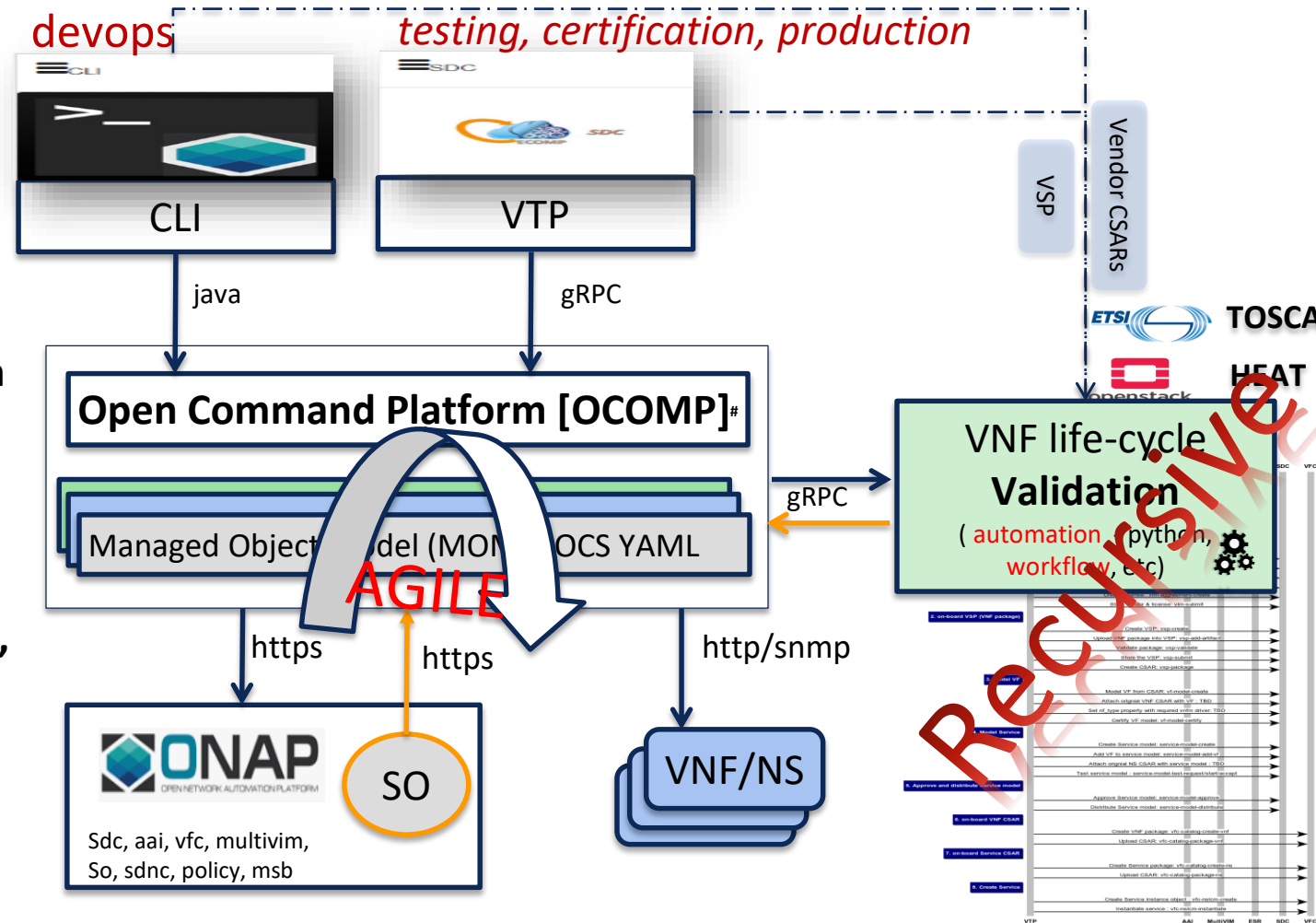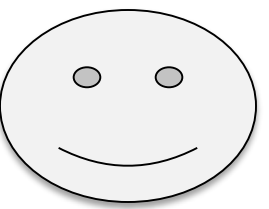
LFN OVP Perspective (VNF & CNF)

OPNFV Verification Program (OVP)

VTP scenarios (VNF) –

Badging   : OVP VNF Compliance & Validation (ONS EU 2019)
Design-time: Operator specific VSP compliance check (ONS NA 2019)
Runtime   : Network Service Test (ONAP G release ??)

VTP scenarios (CNF) –

Badging : OVP CNF Compliance & Validation
Design-time: Operator specific VSP compliance check
Runtime : Network Service Test

CNF:
SRIOV-enabled
Nw Flavor NIC speed

OVP portal

Check if CNF is badged ?

Certify CNF C&V

VTP Portal
(ONAP G release)

Upload
CNF Test results

VTP Backend

Upload
CVF

Market place

CNF	Badge
vFW	2019.12
vLBS	NA

Test Operator VSP
Compliance check

Pull list of **OVP certified** CNFs

Operator #1:
Flavor-match-test-1
security -check-test-1
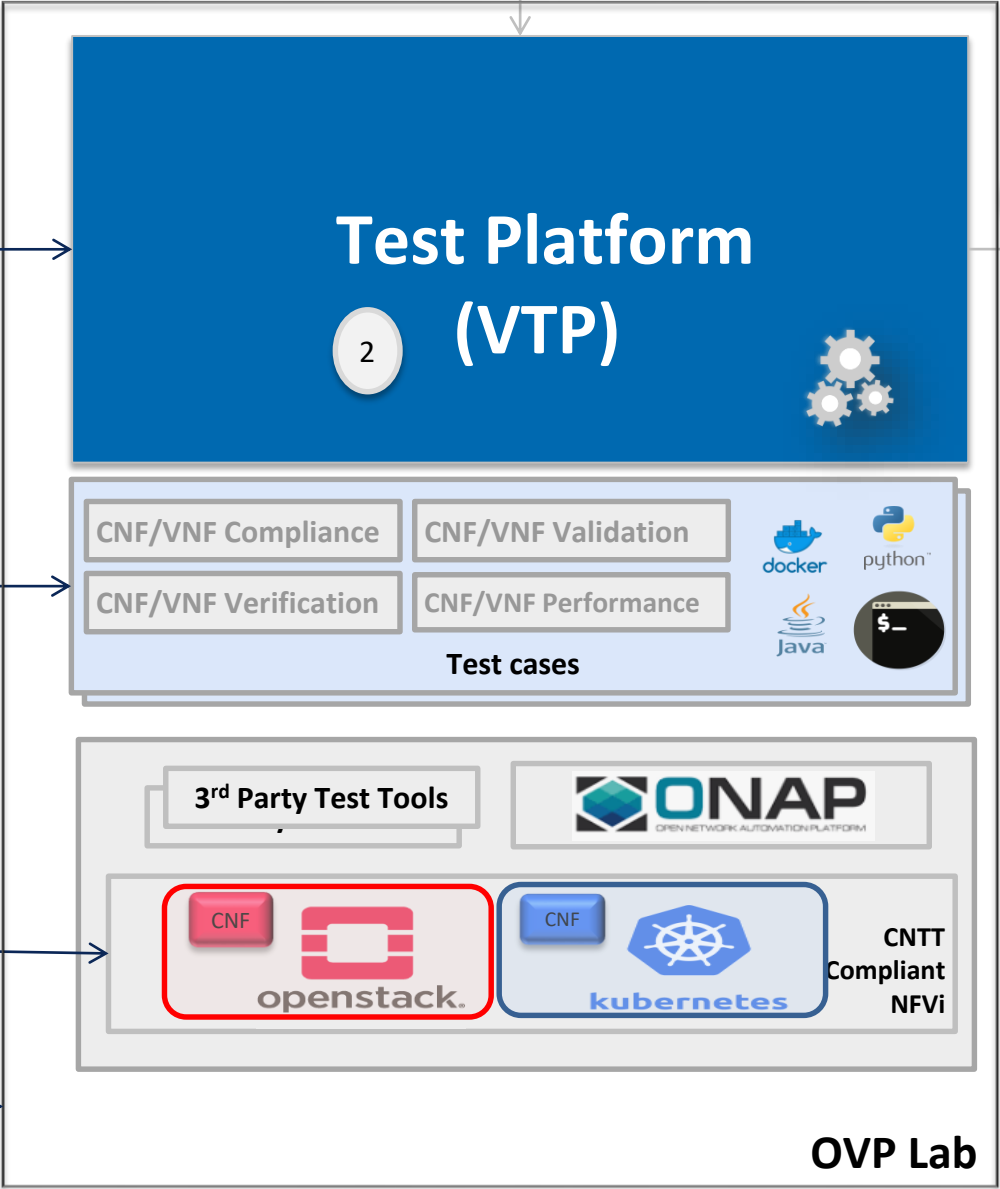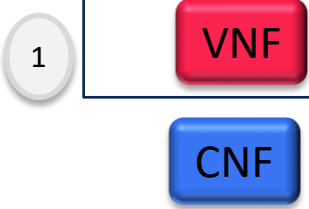
Operator #2:
Flavor-match-test-1
security -check-test-1

Validation :
Cnf-validation

Compliance:
Csar-validate

VTP Test cases

VSP
On-board

SDC

ONAP design-time

Service Test cases

Kubernetes

Flavor :
✓ NIC speed
✓ SRIOV

CNF

ONAP
Runtime

SO

Service Test

Telco Environment

ONAP
Component

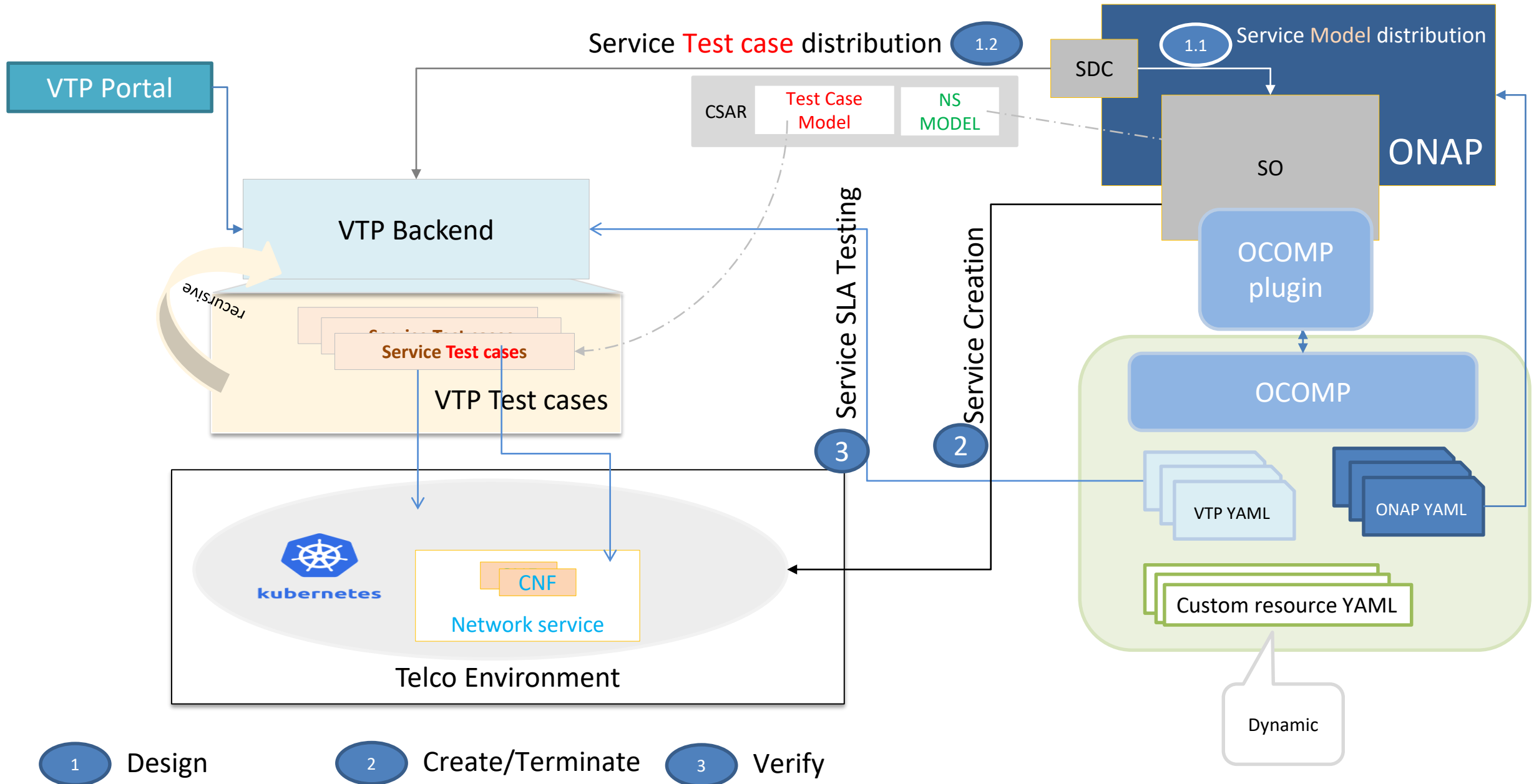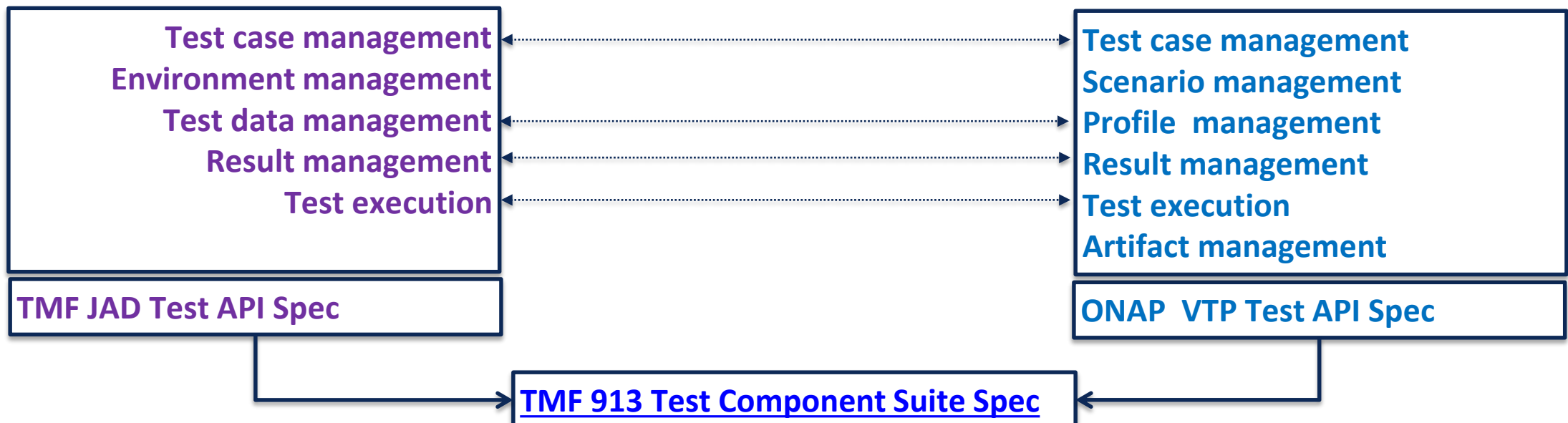# OVP Flow (End to End)
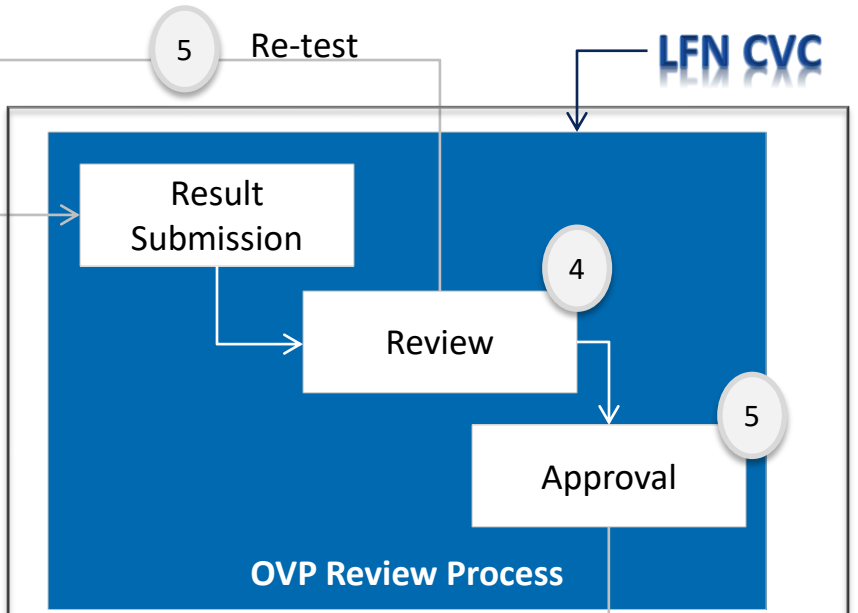
ONAP : Network Service Test (VNF)
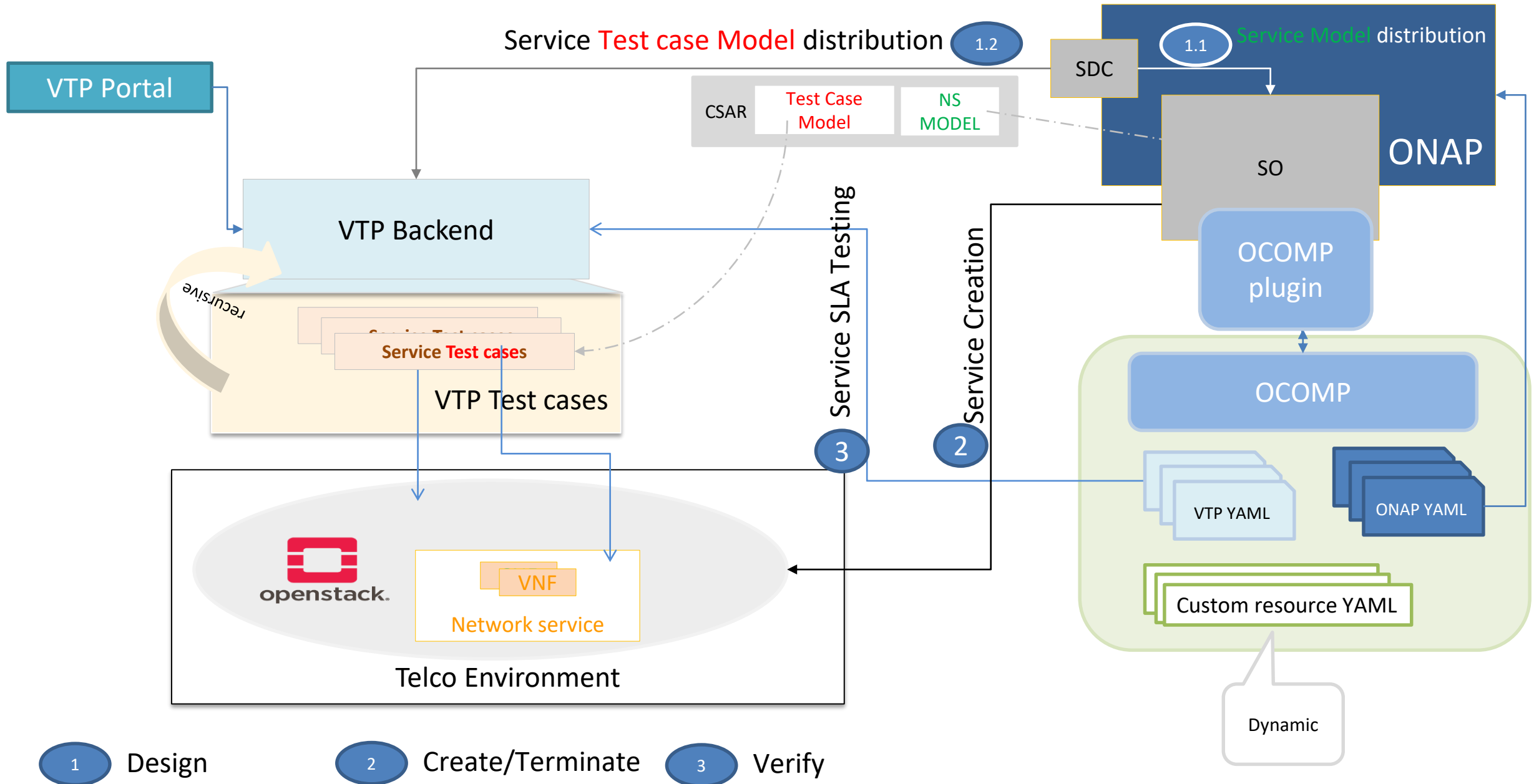
ONAP : Network Service Test (CNF)

TMForum (TMF) Contributions

TMF Test component Suite API : Collaboration of TMF Test API & ONAP VTP API

Test case management
Environment management
Test data management
Result management
Test execution

TMF JAD Test API Spec

Test case management
Scenario management
Profile management
Result management
Test execution
Artifact management

ONAP VTP Test API Spec

TMF 913 Test Component Suite Spec

- TMF704 - Test Case Management API
- TMF705 - Test Environment Management API
- TMF706 - Test Data Management AP
- TMF707 - Test Result Management API
- TMF708 - Test Execution API
- TMF709 - Test Scenario Management API
- TMF710 - General Test Artifact Management API

tmforum APPROVED

Test case management (TMF704)
Environment management (TMF705)
Test data management (TMF706)
Result management (TMF707)
Test execution (TMF708)
Scenario management (TMF709)
Artifact management (TMF710)

Results of Combined Effort :
✓Test case, Result & executions are derived from both JAD and VTP
✓Environment and Test data are derived from JAD. (VTP has corresponding feature as profile management for Test data management)
✓Scenario and Artifact are derived from VTP

Adoption of TMF API in VTP Frankfurt

VTP Portal

VNF Test Platform (VTP)

VNF Test Agile Orchestrator

Artifacts, Test case, profiles, results

VTP TMF adoption 4.0.0

[Base URL: serverRoot/tmf2vtp/v4/]

VTP TMF adoption

Schemes
HTTPS

testScenario
- GET /testScenario List or find TestScenario objects
- GET /testScenario/{id} Retrieves a TestScenario by ID

testSuite
- GET /testSuite List or find TestSuite objects
- GET /testSuite/{id} Retrieves a TestSuite by ID
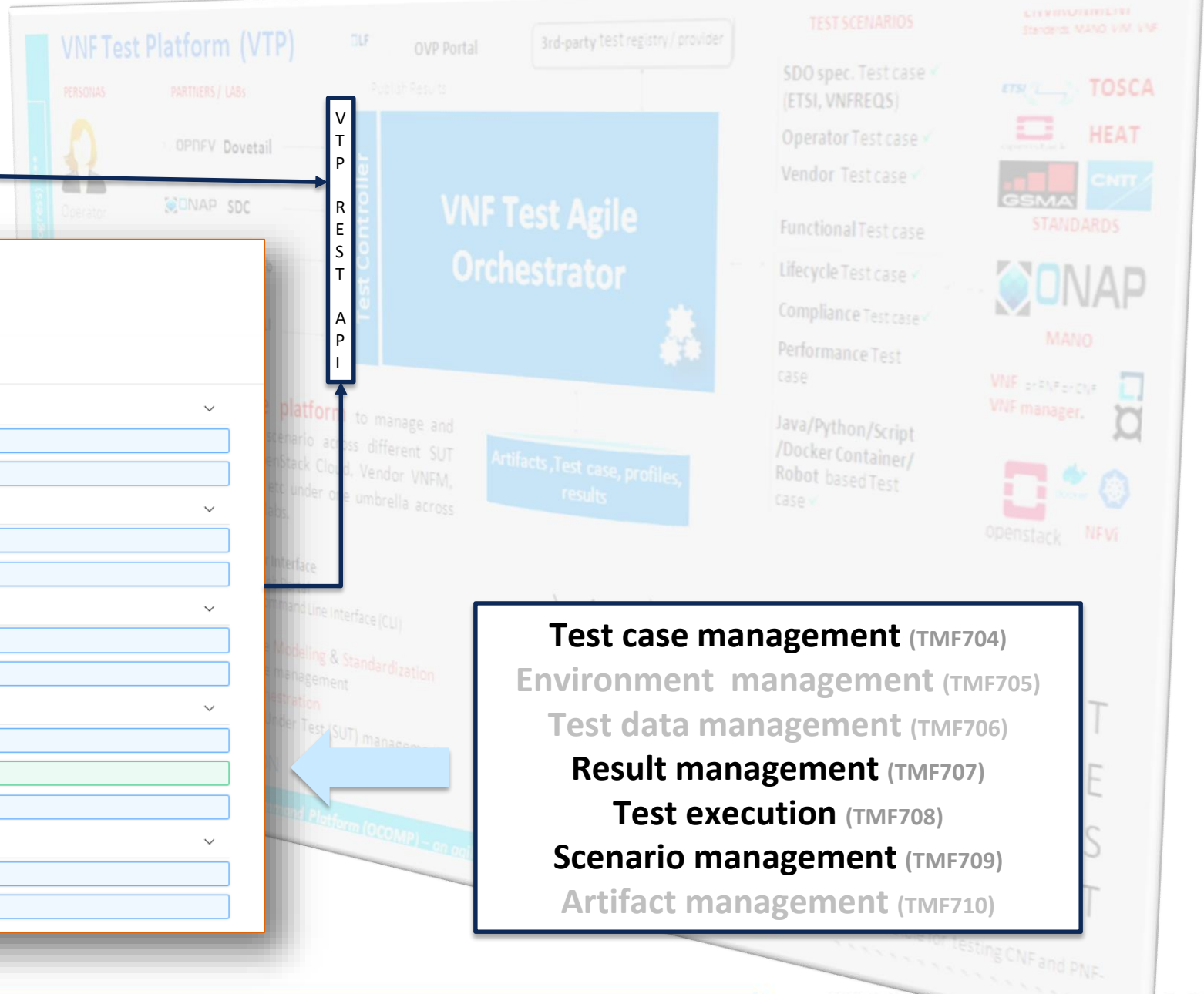
testCase
- GET /testCase List or find TestCase objects
- GET /testCase/{id} Retrieves a TestCase by ID

testCaseExecution
- GET /testCaseExecution List or find TestCaseExecution objects
- POST /testCaseExecution Creates a TestCaseExecution
- GET /testCaseExecution/{id} Retrieves a TestCaseExecution by ID

testCaseResult
- GET /testCaseResult List or find TestCaseResult objects
- GET /testCaseResult/{id} Retrieves a TestCaseResult by ID

Test case management (TMF704)
Environment management (TMF705)
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