

TMF FORUM & ONAP COLLABORATION ON standardizing vnf test api specification



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ONS NA -> ONS EU

- ✦ TMF is working on Test API to support test management across different vendors and operators scenarios
- ✦ VTP is working on supporting test management across different vendors and operators scenarios
- ✦ ONS NA 2019, we collaborated to synergise

VNF Test Platform (VTP)

PERSONAS



Operator



Vendor

PARTNERS / LABs



TMF Test API



Publish Results

Artifacts , Test case, profiles, results

SCENARIOS

- SDO Test case ✓ (ETSI, GSMA, VNFREQS)
- Operator Test case ✓
- Vendor Test case ✓

- Functional Test case
- Lifecycle Test case ✓
- Compliance Test case ✓
- Performance Test case

- Script Test case ✓
- Java Test case ✓
- Python Test case ✓
- 3rd-party registry / test-provider ✓

ENVIRONMENT

Standards, MANO, VIM, VNF



A **Test orchestration agile platform** to manage and automate different kinds of VNF testing and across different SUT environment like MANO, cloud, Edge, etc under one umbrella (OVP) and produce result analytics.

Built on **Open Command Platform (OCOMP)** – an ONAP CLI project

Programming Interface

- ✓ Provides REST API over HTTP(s)
- ✓ Role-based Access control
- ✓ User management

User Interface

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

Features

- ✓ Scenario Management
- ✓ Artifact management
- ✓ Profile Management
- ✓ Executions & Results management
- ✓ Dynamic test case deployment
- ✓ Auto discovery of test cases

Test scenarios

- ✓ Functional test, Performance test, Life cycle test
- ✓ ETSI TOSCA & OpenStack HEAT based compliance VNF testing
- ✓ Vendor, operator specific test cases
- ✓ OVP Test cases

Test case Implementation

- ✓ Support different technologies like java, python, shell, container, etc for test case executions.

3rd party test tool integration

- ✓ Supports 3rd-party registry integration
- ✓ OPNFV dovetail integration



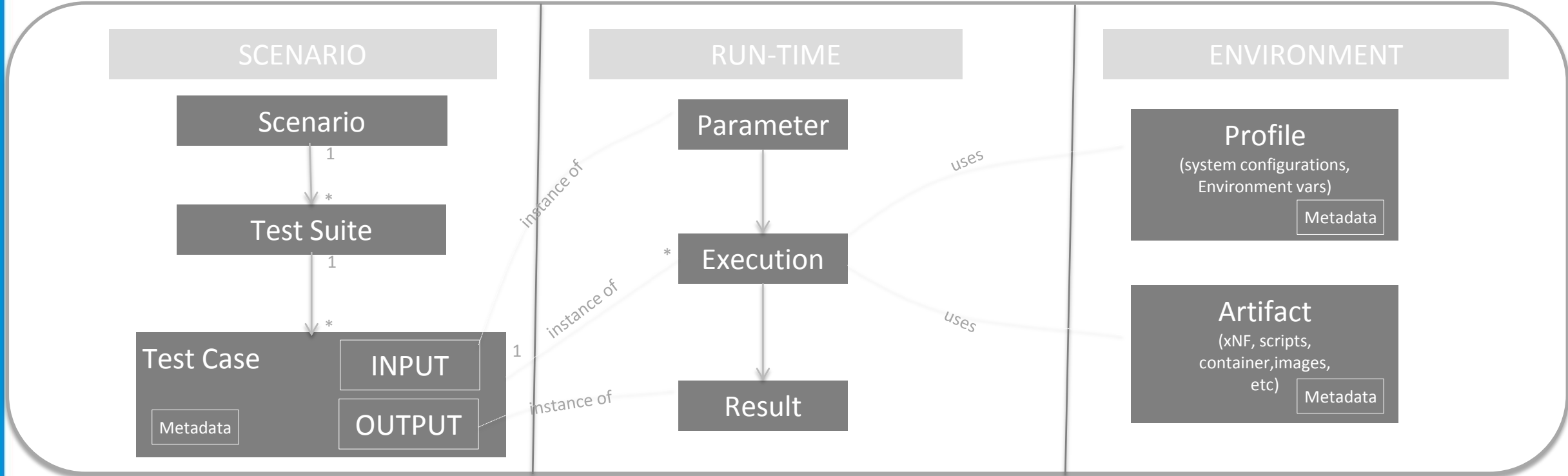
VTP is integrated across ONAP and OPNFV and REST API is standardized with **TMF Test API** (in progress)

In progress

Not supported

Supported

VNF Test Platform (VTP)



AGILE Test case Modeling & versioning
Test case management
Test orchestration
Environment management

TMF model vs VTP model

TMF

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Test-Result-Management

This API provides a mechanism to manage test results and r

API

Test-Execution

This API provides a contract for test case execution. Please s

API

OAS3

Test-Case-Management

This API provides a mechanism to manage test case models

API

Test-Environment-Management

This API provides a mechanism to manage test environment

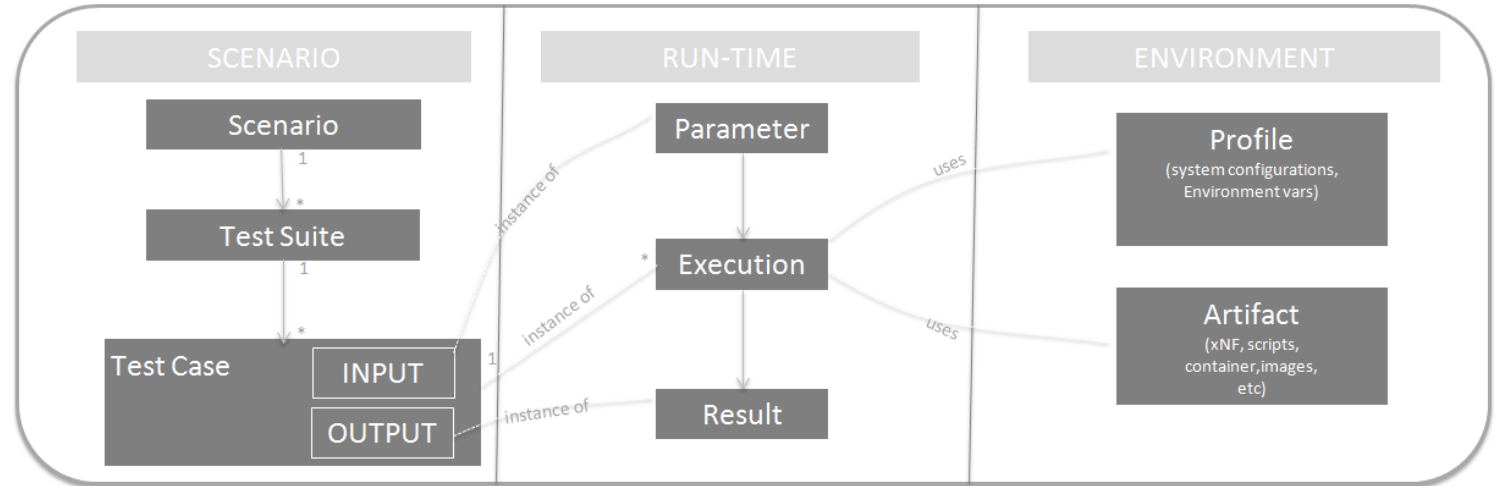
API

Test-Data-Management

This API provides a mechanism to manage test data models

API

VTP



API Feature Mapping

TMF	VTP
Test case management	Scenario Management
Test data management Test Environment management	Environment management
Test execution Test Result management	Execution management

TMF vs VTP Model mapping

TMF Feature	TMF Model	VTP Model	Notes
Test case management	Test Case	Test Case	1-1 mapping
	Test Suite	Test Suite	1-1 mapping
	High Level Function	Test Case	1-1 mapping VTP can model the high level function as another test case model itself Not exactly, used across multiple test caese
	Test Case Segment	Test Case	1-1 mapping VTP can model the test case segment as another test case model itself
	Test Flow	Test Suite	1-1 mapping VTP can model the test flow as another test case model itself (Test scripts with flows)
	Test suite	Scenario	It could be mapped to Test suite in TMF
Test data management	Test data instance	Profile	1-1 mapping Profile in VTP models the specific test case parameter with value {key: value}
	Test data schema	Parameter	1-1 mapping Test Parameter in VTP models the test case specific data.
	Test resources	Artifact	1-1 mapping
Test environment management	Environment meta-model	NIL	Domain knowledge of concrete resources,
	Environment instance	profile	1-1 mapping
	Resource api	NIL	Look into how to fit for ONAP
Test Execution management	Execution	Execution	1-1 mapping
	Run-time environment	Profile	1-1 mapping
Test result management	Test result	Test result	1-1 mapping

TMF API vs VTP API mapping

TMF API	VTP API	Notes
Test scenario management	Scenario management	0-1
Add scenario management inline with VTP	GET/vtp/scenarios POST/vtp/scenarios GET/vtp/scenarios/{scenario} PUT/vtp/scenarios/{scenario} DELETE/vtp/scenarios/{scenario}	Scenario brought into TMF from VTP
Test suite management	Test Suite management	1-1
GET/test-suite-models POST/test-suite-models GET/test-suite-models/{modelId} PUT/test-suite-models/{modelId} DELETE/test-suite-models/{modelId}	GET/vtp/scenarios/{scenario}/testsuites POST/vtp/scenarios/{scenario}/testsuites GET/vtp/scenarios/{scenario}/testsuites/{testsuite} PUT/vtp/scenarios/{scenario}/testsuites/{testsuite} DELETE/vtp/scenarios/{scenario}/testsuites/{testsuite}	
Test case management	Test case management	1-1
GET/test-case-models POST/test-case-models GET/test-case-models/{modelId} PUT/test-case-models/{modelId} DELETE/test-case-models/{modelId}	PUT/vtp/testcases GET/vtp/scenarios/{scenario}/testsuites/{testsuite}/testcases GET/vtp/scenarios/{scenario}/testsuites/{testsuite}/testcases/{testcase} DELETE/vtp/scenarios/{scenario}/testsuites/{testsuite}/testcases/{testcase} GET/vtp/scenarios/{scenario}/testcases	
Test segment management	Test case management	1-1'
GET/test-segment-models POST/test-segment-models GET/test-segment-models/{modelId} PUT/test-segment-models/{modelId} DELETE/test-segment-models/{modelId}	PUT/vtp/testcases GET/vtp/scenarios/{scenario}/testsuites/{testsuite}/testcases GET/vtp/scenarios/{scenario}/testsuites/{testsuite}/testcases/{testcase} DELETE/vtp/scenarios/{scenario}/testsuites/{testsuite}/testcases/{testcase} GET/vtp/scenarios/{scenario}/testcases	Test segment could be modeled using test case model in VTP

TMF API vs VTP API mapping

TMF API	VTP API	Notes
High level functions management	Test case management	1-1'
GET/high-level-functions POST/high-level-functions GET/high-level-functions/{modelId} PUT/high-level-functions/{modelId} DELETE/high-level-functions/{modelId}	PUT/vtp/testcases GET/vtp/scenarios/{scenario}/testsuites/{testsuite}/testcases GET/vtp/scenarios/{scenario}/testsuites/{testsuite}/testcases/{testcase} DELETE/vtp/scenarios/{scenario}/testsuites/{testsuite}/testcases/{testcase} GET/vtp/scenarios/{scenario}/testcases	high level functional test model could be modeled as Test case in VTP
Non-functional management	Test case management	1-1'
GET/non-functional-test-models POST/non-functional-test-models GET/non-functional-test-models/{modelId} PUT/non-functional-test-models/{modelId} DELETE/non-functional-test-models/{modelId}	PUT/vtp/testcases GET/vtp/scenarios/{scenario}/testsuites/{testsuite}/testcases GET/vtp/scenarios/{scenario}/testsuites/{testsuite}/testcases/{testcase} DELETE/vtp/scenarios/{scenario}/testsuites/{testsuite}/testcases/{testcase} GET/vtp/scenarios/{scenario}/testcases	Non-functional test model could be modeled as Test case in VTP
Test data instance management	Profile management	1-1'
GET/test-data-instances POST/test-data-instances GET/test-data-instances/{instanceId} PUT/test-data-instances/{instanceId} DELETE/test-data-instances/{instanceId}	GET/vtp/profiles POST/vtp/profiles GET/vtp/profiles/{profileName} PUT/vtp/profiles/{profileName} DELETE/vtp/profiles/{profileName}	
Test data schema management	Test data schema management	1-0
GET/test-data-schemas POST/test-data-schemas GET/test-data-schemas/{schemaId} PUT/test-data-schemas/{schemaId} DELETE/test-data-schemas/{schemaId}	Add Test data schema management inline with TMF	Test data schema brought into VTP from TMF

TMF API vs VTP API mapping

TMF API	VTP API	Notes
Environment meta-model management	Environment meta-model management	1-0
GET/environment-meta-model POST/environment-meta-model GET/environment-meta-model/{modelId} PUT/environment-meta-model/{modelId} DELETE/environment-meta-model/{modelId}	Add environment meta-model inline with TMF	Environment brought into VTP from TMF
Environment instance management	Profile management	1-1'
GET/environment-instances POST/environment-instances GET/environment-instances/{modelId} PUT/environment-instances/{modelId} DELETE/environment-instances/{modelId}	GET/vtp/profiles POST/vtp/profiles GET/vtp/profiles/{profileName} PUT/vtp/profiles/{profileName} DELETE/vtp/profiles/{profileName}	Environment details are modeled as profile in VTP.
Resource api		1-0
GET/resource-apis POST/resource-apis GET/resource-apis/{apild} PUT/resource-apis/{apild} DELETE/resource-apis/{apild}		Investigating on how to leverage it VTP
Provisioning artifact management	Artifact management	0-1
Add artifact management inline with TMF	GET/vtp/artifacts POST/vtp/artifacts GET/vtp/artifacts/{artifactCategory}/{artifactName} PUT/vtp/artifacts/{artifactCategory}/{artifactName} DELETE/vtp/artifacts/{artifactCategory}/{artifactName}	Artifact brought into TMF from VTP

TMF API vs VTP API mapping

TMF API	VTP API	Notes
Execution management	Execution management	1-1
POST/test-execution GET/test-execution/{executionId} DELETE/test-execution/{executionId}	GET/vtp/executions/{executionId} GET/vtp/executions POST/vtp/executions	
Runtime test environment	Profile management	1-1'
POST/runtime-test-environment GET/runtime-test-environment/{environmentId} DELETE/runtime-test-environment/{environmentId}	GET/vtp/profiles POST/vtp/profiles GET/vtp/profiles/{profileName} PUT/vtp/profiles/{profileName} DELETE/vtp/profiles/{profileName}	VTP provides profile which could be used to model runtime test environment as well
Result management	Execution management	1-1'
GET/test-results POST/test-results GET/test-results/{id} PUT/test-results/{id} DELETE/test-results/{id}	GET/vtp/executions/{executionId} GET/vtp/executions	VTP models the execution along with results. It would be add values to VTP if VTP could add additional capability to provide TMF result management by enabling searching ability

TOTAL resources in TMF : 13

TOTAL resources in VTP : 6

- 0-1 (TMF could leverage from VTP) : 2 no.s – **Scenario, Artifact**
- 1-0 (VTP could leverage from TMF) : 2 no.s – **Environment metadata, test data schema**
- 1-1 (directly mapped between VTP and TMF) : 3 no.s – Test suite, Test case, executions are
- 1-1' (Equivalent available in VTP for TMF) : 6 no.s

- Test Segment, High level functional, non-functional from TMF are mapped with Test case from VTP
- Test data, environment and run-time environment from TMF are mapped to profile from VTP.

VTP and TMF meeting Outcome: Summary

ONAP VTP and TMF forum teams had discussed on synergizing the API between TMF JAD test REST API spec and ONAP VNF test platform (VTP) REST API spec. Based on the discussion, following conclusions are made:

- TMF leverage following features from VTP:
Scenario, Artifact
- VTP leverage following features from TMF:
Environment metadata, test data schema

Following features are directly mapped between TMF and VTP as it is:
Test suite, Test case, executions

There are Equivalent feature available between VTP for TMF as given below:

TMF features (Test Segment, High level functional, non-functional) are mapped with Test case in VTP
TMF features (Test data, environment and run-time environment) are mapped to profile in VTP.

TMF enhancements with Scenario and Artifact from VTP

SMART BEAR
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Spec Type State

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Test-Result-Management
This API provides a mechanism to manage test results and related artifacts. Please see description for individual tags for more detail on the ma...
API

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Test-Execution
This API provides a contract for test case execution. Please see description for individual tags for more detail on the managed artifacts.
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API

Test Scenario management
This API provides the mechanism to manage the different testing scenario like OVP, 5G, etc

Test Artifact management
This API provides the mechanims to manage the different artifact such as VNF image, scripts, etc

SHOWING 1-5 OF 5

Final: TMF API SPEC merged with VTP API SPEC

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Test-Data-Management

This API provides a mechanism to manage test data models and related artifacts. Please see description ...

API

mrkanag

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VNF-Test-Platform-Artifact

VNF-Test-Platform-Artifact - [1.1.0]

API

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VNF-Test-Platform-Scenario

VNF-Test-Platform-Scenario - [1.1.0]

API



Thank you

Artifact analysis

Need of Artifact at different place

Test case management

```
GET/test-case-models
POST/test-case-models
GET/test-case-models/{modelId}
PUT/test-case-models/{modelId}
DELETE/test-case-models/{modelId}
```

Environment instance management

```
GET/environment-instances
POST/environment-instances
GET/environment-instances/{modelId}
PUT/environment-instances/{modelId}
DELETE/environment-instances/{modelId}
```

Run-time artifact

USER NEEDS TO PROVIDE THE BINARIES LIKE VNF, IMAGES, ETC WHILE RUNNING TEST CASE

POST /test-case-models
While user deploys the testcases, he/she would post the test case
Scripts, jars as part of POST request as below
{test-case-model-json + **testcase binaries**}

POST /environment-instances
While user setup environment such as ONAP, he/she would post the environment
With required installer binaries as part of POST request as below
{environment-instance-json + **environment binaries**}

When user executes the test cases, he/she would want to pass **the run-time binaries** such as VNF, App, etc. For this one, there could be different category of artifacts depends on the test case needs.

The need for binaries management is there across test-case mgmt, environment mgmt and run-time execution mgmt. To handle all these needs, VTP is providing Artifact management with **Categorized** which is required for organizing the binaries, something similar to file system **directory**, while **binary** could be considered as **file**. So its better to keep the artifact mgmt as separate group, and use it across test-case mgmt, environment mgmt and run-time mgmt.

Solution

In POST /test-case-models
Instead of {test-case-model-json + **testcase binaries**}

↓

Use {test-case-model-json + **testcase binary URI**
(/artifact/**testcase**/tc-jar1)}

Pre-defined Category: **testcase**

In POST /environment-instances
Instead of {environment-instance-json + **environment binaries**}

↓

Use {environment-instance-json + **environment binary URI**
(/artifact/**environment**/env-onap-1)}

Pre-defined Category: **environment**

Artifact management

```
GET/vtp/artifacts
POST/vtp/artifacts
GET/vtp/artifacts/{artifactCategory}/{artifactName}
PUT/vtp/artifacts/{artifactCategory}/{artifactName}
DELETE/vtp/artifacts/{artifactCategory}/{artifactName}
```