TM Forum Specification

Test Scenario Management API User Guide

TMF709

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NOTICE

Direct inquiries to the TM Forum office:

4 Century Drive, Suite 100
Parsippany, NJ 07054, USA
Tel No. +1 973 944 5100
Fax No. +1 973 998 7196
TM Forum Web Page: www.tmforum.org

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Introduction

The following document is the specification of the REST API for test scenario management. It includes the model definition as well as all available operations.

SAMPLE USE CASES

The reader will find examples of use cases in TMF913 “Test API Component Suite” document.

Support of polymorphism and extension patterns

Support of polymorphic collections and types and schema based extension is provided by means of a list of generic meta-attributes that we describe below. Polymorphism in collections occurs when entities inherit from base entities, for instance a TestScenario inheriting properties from the abstract ManagedArtifact entity.

Generic support of polymorphism and pattern extensions is described in the TMF API Guidelines v3.0 Part 2 document.

The @type attribute provides a way to represent the actual class type of an entity. For example, within a list of ManagedArtifact instances some may be instances of TestScenario where other could be instances of some other sub-class of ManagedArtifact. The @type gives this information. All resources and sub-resources of this API have a @type attributes that can be provided when this is useful.

The @schemaLocation property can be used in resources to allow specifying user-defined properties of an Entity or to specify the expected *characteristics* of an entity.

The @baseType attribute gives a way to provide explicitly the base of class of a given resource that has been extended.

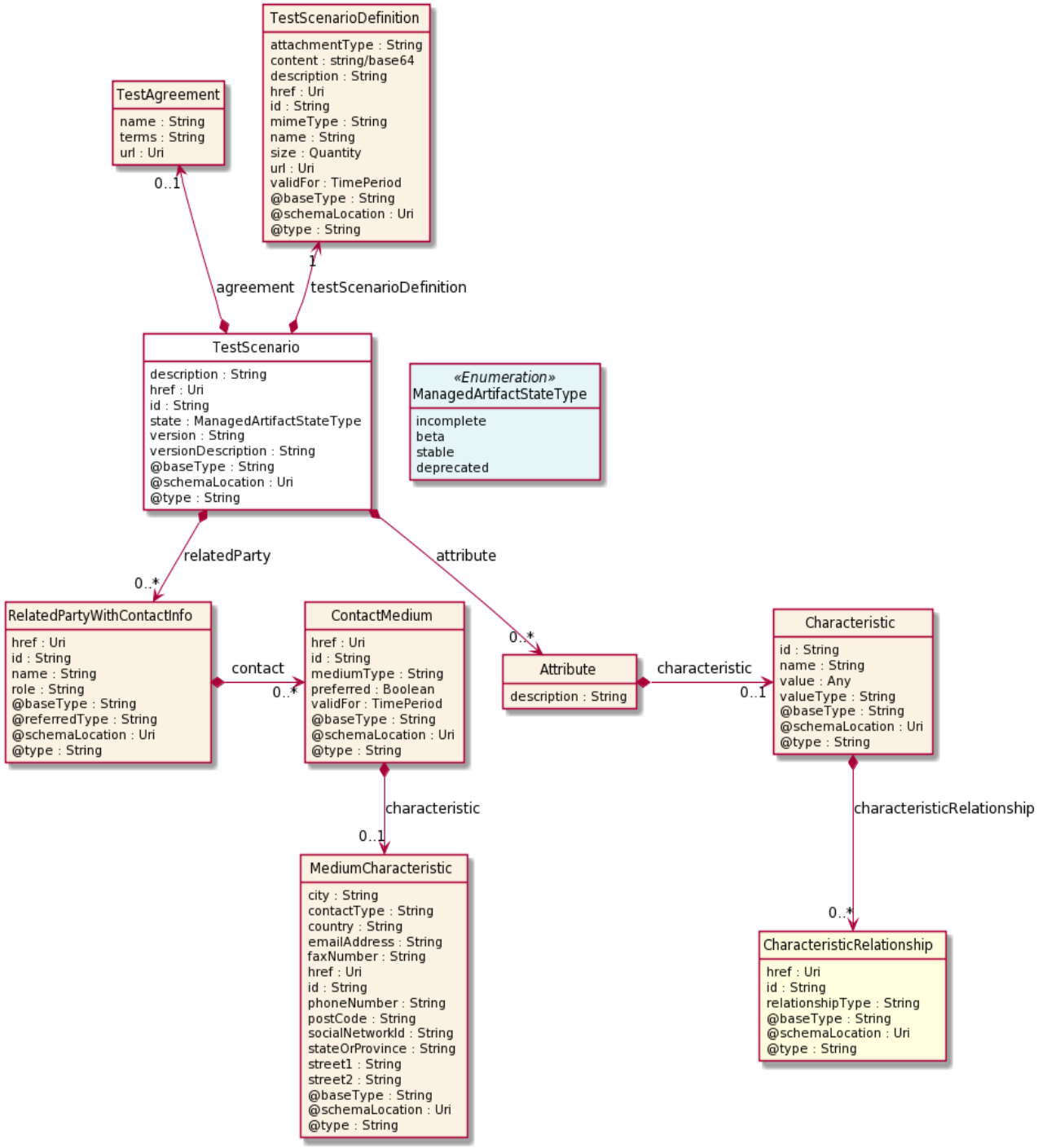
RESOURCE MODEL

Managed Entity and Task Resource Models

Test Scenario resource

A managed test scenario resource.

Resource model



Field descriptions

TestScenario fields

description	A string. The description for the artifact.
version	A string. The artifact version.
versionDescription	A string. The artifact version description.

href	An uri (Uri). Hyperlink reference.
id	A string. unique identifier.
href	An uri (Uri). Hyperlink reference.
id	A string. unique identifier.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
testScenarioDefinition	A test scenario definition (TestScenarioDefinition). Test scenario definition.
agreement	A test agreement (TestAgreement).
attribute	A list of attributes (Attribute [*]).
relatedParty	A list of related party with contact infos (RelatedPartyWithContactInfo [*]). Related party specialization that includes contact information.
state	A managed artifact state type (ManagedArtifactStateType). Possible values for the state of a managed artifact: 'incomplete', 'beta', 'stable', 'deprecated'.

Attribute sub-resource

characteristic	A characteristic (Characteristic). Describes a given characteristic of an object or entity through a name/value pair.
description	A string. The attribute description.

Characteristic sub-resource

Describes a given characteristic of an object or entity through a name/value pair.

@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
characteristicRelationship	A list of characteristic relationships (CharacteristicRelationship [*]). Another Characteristic that is related to the current Characteristic;.

id	A string. Unique identifier of the characteristic.
name	A string. Name of the characteristic.
value	An any (Any). The value of the characteristic.
valueType	A string. Data type of the value of the characteristic.

CharacteristicRelationship sub-resource

Another Characteristic that is related to the current Characteristic;.

href	An uri (Uri). Hyperlink reference.
id	A string. Unique identifier of the characteristic.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
relationshipType	A string. The type of relationship.

ContactMedium sub-resource

Indicates the contact medium that could be used to contact the party.

href	An uri (Uri). Hyperlink reference.
id	A string. unique identifier.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
characteristic	A medium characteristic (MediumCharacteristic). Any additional characteristic(s) of this contact medium.
mediumType	A string. Type of the contact medium, such as: email address, telephone number, postal address.
preferred	A boolean. If true, indicates that is the preferred contact medium.
validFor	A time period. The time period that the contact medium is valid for.

MediumCharacteristic sub-resource

Describes the contact medium characteristics that could be used to contact a party (an individual or an organization).

href	An uri (Uri). Hyperlink reference.
id	A string. unique identifier.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
city	A string. The city.
contactType	A string. The type of contact, for example: phone number such as mobile, fixed home, fixed office. postal address such as shipping instalation….
country	A string. The country.
emailAddress	A string. Full email address in standard format.
faxNumber	A string. The fax number of the contact.
phoneNumber	A string. The primary phone number of the contact.
postCode	A string. Postcode.
socialNetworkId	A string. Identifier as a member of a social network.
stateOrProvince	A string. State or province.
street1	A string. Describes the street.
street2	A string. Complementary street description.

Quantity sub-resource

An amount in a given unit.

amount	A float. Numeric value in a given unit.
units	A string. Unit.

RelatedPartyWithContactInfo sub-resource

Related party specialization that includes contact information.

@referredType	A string. The actual type of the target instance when needed for disambiguation.

role	A string. Role played by the related party.
name	A string. Name of the related entity.
href	An uri (Uri). Hyperlink reference.
id	A string. unique identifier.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
contact	A list of contact mediums (ContactMedium [*]). Indicates the contact medium that could be used to contact the party.

TestAgreement sub-resource

name	A string. The agreement name.
terms	A string. The terms of the agreement.
url	An uri (Uri). The agreement URL.

TestScenarioDefinition sub-resource

Test scenario definition.

attachmentType	A string. Attachment type such as video, picture.
content	A base 6 4 (Base64). The actual contents of the attachment object, if embedded, encoded as base64.
description	A string. A narrative text describing the content of the attachment.
href	An uri (Uri). Hyperlink reference.
id	A string. unique identifier.
mimeType	A string. Attachment mime type such as extension file for video, picture and document.
name	A string. The name of the attachment.
url	An uri (Uri). Uniform Resource Locator, is a web page address (a subset of URI).

@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
size	A quantity (Quantity). The size of the attachment.
validFor	A time period. The period of time for which the attachment is valid.

Json representation sample

We provide below the json representation of an example of a 'TestScenario' resource object


```
{
  "id": "35776d4f-1851-435c-8573-802438f41e7a",
  "href": "https://mycsp:8080/tmf-api/testScenario/v4/testScenario/35776d4f-1851-435c-8573-802438f41e7a",
  "description": "Sample test scenario",
  "version": "1.2.3",
  "relatedParty": [
    {
      "name": "testUser",
      "role": "Owner",
      "@referredType": "Individual",
      "contact": [
        {
          "mediumType": "email",
          "characteristic": {
            "emailAddress": "testUser@abc.com"
          }
        }
      ]
    }
  ],
  "state": "stable",
  "testScenarioDefinition": {
    "attachmentType": "testScenario",
    "content": "<base64-encoded test scenario>",
    "mimeType": "base64"
  }
}
```


Notification Resource Models

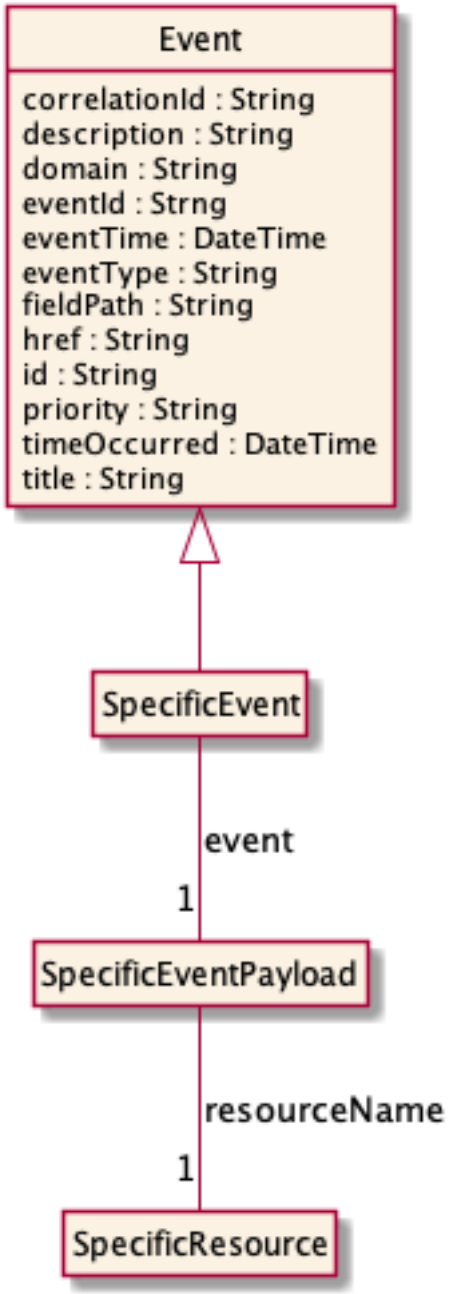
5 notifications are defined for this API

Notifications related to TestScenario:

- TestScenarioCreateEvent
- TestScenarioChangeEvent
- TestScenarioDeleteEvent

- TestScenarioAttributeValueChangeEvent
- TestScenarioStateChangeEvent

The notification structure for all notifications in this API follow the pattern depicted by the figure below.
A notification event resource (depicted by "SpecificEvent" placeholder) is a sub class of a generic Event structure containing at least an id of the event occurrence (eventId), an event timestamp (eventTime), and the name of the resource (eventType).
This notification structure owns an event payload structure ("SpecificEventPayload" placeholder) linked to the resource concerned by the notification using the resource name as access field ("resourceName" placeholder).



Test Scenario Create Event

Notification TestScenarioCreateEvent case for resource TestScenario

Json representation sample

We provide below the json representation of an example of a 'TestScenarioCreateEvent' notification event object

```
{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"TestScenarioCreateEvent",
   "event": {
     "testScenario" :
        {-- SEE TestScenario RESOURCE SAMPLE --}
  }
}
```

Test Scenario Change Event

Notification TestScenarioChangeEvent case for resource TestScenario

Json representation sample

We provide below the json representation of an example of a 'TestScenarioChangeEvent' notification event object

```
{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"TestScenarioChangeEvent",
   "event": {
     "testScenario" :
        {-- SEE TestScenario RESOURCE SAMPLE --}
  }
}
```

Test Scenario Delete Event

Notification TestScenarioDeleteEvent case for resource TestScenario

Json representation sample

We provide below the json representation of an example of a 'TestScenarioDeleteEvent' notification event object

```
{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"TestScenarioDeleteEvent",
   "event": {
     "testScenario" :
        {-- SEE TestScenario RESOURCE SAMPLE --}
```

```
   }
}
```

Test Scenario Attribute Value Change Event

Notification TestScenarioAttributeValueChangeEvent case for resource TestScenario

Json representation sample

We provide below the json representation of an example of a 'TestScenarioAttributeValueChangeEvent' notification event object

```
{
   "eventId":"00001",
   "eventTime":"2015-11-16T16:42:25-04:00",
   "eventType":"TestScenarioAttributeValueChangeEvent",
    "event": {
      "testScenario" :
         {-- SEE TestScenario RESOURCE SAMPLE --}
   }
}
```

Test Scenario State Change Event

Notification TestScenarioStateChangeEvent case for resource TestScenario

Json representation sample

We provide below the json representation of an example of a 'TestScenarioStateChangeEvent' notification event object

```
{
   "eventId":"00001",
   "eventTime":"2015-11-16T16:42:25-04:00",
   "eventType":"TestScenarioStateChangeEvent",
    "event": {
      "testScenario" :
         {-- SEE TestScenario RESOURCE SAMPLE --}
   }
}
```

API OPERATIONS

Remember the following Uniform Contract:

Operation on Entities	Uniform API Operation	Description
Query Entities	GET Resource	GET must be used to retrieve a representation of a resource.
Create Entity	POST Resource	POST must be used to create a new resource
Partial Update of an Entity	PATCH Resource	PATCH must be used to partially update a resource
Remove an Entity	DELETE Resource	DELETE must be used to remove a resource

Filtering and attribute selection rules are described in the TMF REST Design Guidelines.

Notifications are also described in a subsequent section.

Operations on Test Scenario

List test scenarios

```
GET /testScenario?fields=...&{filtering}
```

Description

This operation list test scenario entities.
Attribute selection is enabled for all first level attributes.
Filtering may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving a list of test scenarios.

Request

```
GET /tmf-api/testScenario/v4/testScenario
Accept: application/json
```

Response

200


```
[
  {
    "id": "35776d4f-1851-435c-8573-802438f41e7a",
    "href": "https://mycsp:8080/tmf-api/testScenario/v4/testScenario/35776d4f-1851-435c-8573-802438f41e7a",
    "description": "Sample test scenario",
    "version": "1.2.3",
    "relatedParty": [
      {
        "name": "testUser",
        "@referredType": "Individual",
        "role": "Owner",
        "contact": [
          {
            "mediumType": "email",
            "characteristic": {
              "emailAddress": "testUser@abc.com"
            }
          }
        ]
      }
    ],
    "state": "stable",
    "testScenarioDefinition": {
      "content": "<base64-encoded test scenario> - please see examples 1 and 2 in Appendix 1",
      "mimeType": "base64",
      "url": "http://myservice.com/scenario/1234"
    }
  }
]
```

Retrieve test scenario

GET /testScenario/{id}?fields=...&{filtering}

Description

This operation retrieves a test scenario entity.
Attribute selection is enabled for all first level attributes.
Filtering on sub-resources may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving a spesific test scenario.

Request

```
GET /tmf-api/testScenario/v4/testScenario/35776d4f-1851-435c-8573-802438f41e7a
Accept: application/json
```

Response

```
200

{
  "id": "35776d4f-1851-435c-8573-802438f41e7a",
  "href": "https://mycsp:8080/tmf-api/testScenario/v4/testScenario/35776d4f-1851-435c-8573-802438f41e7a",
  "description": "Sample test scenario",
  "version": "1.2.3",
  "relatedParty": [
    {
      "name": "testUser",
      "@referredType": "Individual",
      "role": "Owner",
      "contact": [
        {
          "mediumType": "email",
          "characteristic": {
            "emailAddress": "testUser@abc.com"
          }
        }
      ]
    }
  ],
  "state": "stable",
  "testScenarioDefinition": {
    "content": "<base64-encoded test scenario> - please see examples 1 and 2 in Appendix 1",
    "mimeType": "base64",
```

```
    "url": "http://myservice.com/scenario/1234"
  }
}
```

Create test scenario

POST /testScenario

Description

This operation creates a test scenario entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a TestScenario, including any possible rule conditions and applicable default values. Notice that it is up to an implementer to add additional mandatory attributes.

Mandatory Attributes	Rule
description	
version	
termsOfService	
contact	
license	
testScenarioDefinition	

Non Mandatory Attributes	Rule
versionDescription	
@baseType	
@schemaLocation	
@type	
agreement	
attribute	
relatedParty	
state	

Usage Samples

Here's an example of a request for creating a test scenario.

Request

```
POST /tmf-api/testScenario/v4/testScenario
Content-Type: application/json

{
```

```
  "description": "Sample test scenario",
  "version": "1.2.3",
  "relatedParty": [
    {
      "name": "testUser",
      "@referredType": "Individual",
      "role": "Owner",
      "contact": [
        {
          "mediumType": "email",
          "characteristic": {
            "emailAddress": "testUser@abc.com"
          }
        }
      ]
    }
  ],
  "state": "stable",
  "testScenarioDefinition": {
    "attachmentType": "testScenario",
    "content": "<base64-encoded test scenario> - please see examples 1 and 2 in Appendix 1",
    "mimeType": "base64"
  }
}
```


Response


```
201

{
  "id": "35776d4f-1851-435c-8573-802438f41e7a",
  "href": "https://mycsp:8080/tmf-api/testScenario/v4/testScenario/35776d4f-1851-435c-8573-802438f41e7a",
  "description": "Sample test scenario",
  "version": "1.2.3",
  "relatedParty": [
    {
      "name": "testUser",
      "@referredType": "Individual",
      "role": "Owner",
      "contact": [
        {
          "mediumType": "email",
          "characteristic": {
            "emailAddress": "testUser@abc.com"
          }
        }
      ]
    }
  ],
  "state": "stable",
  "testScenarioDefinition": {
    "content": "<base64-encoded test scenario> - please see examples 1 and 2 in Appendix 1",
```

```
      "mimeType": "base64",
      "url": "http://myservice.com/scenario/1234"
    }
}
```

Patch test scenario

PATCH /testScenario/{id}

Description

This operation allows partial updates of a test scenario entity. Support of json/merge (https://tools.ietf.org/html/rfc7386) is mandatory, support of json/patch (http://tools.ietf.org/html/rfc5789) is optional.

Note: If the update operation yields to the creation of sub-resources or relationships, the same rules concerning mandatory sub-resource attributes and default value settings in the POST operation applies to the PATCH operation. Hence these tables are not repeated here.

Patchable and Non Patchable Attributes

The tables below provide the list of patchable and non patchable attributes, including constraint rules on their usage.

Patchable Attributes	Rule
description	
versionDescription	
@baseType	
@schemaLocation	
@type	
testScenarioDefinition	
agreement	
attribute	
relatedParty	
state	

Non Patchable Attributes	Rule
id	
href	
version	

Usage Samples

Here's an example of a request for patching a TestScenario resource.

Request

```
PATCH /tmf-api/testScenario/v4/testScenario/35776d4f-1851-435c-8573-802438f41e7a
Content-Type: application/merge-patch+json

{
   "name": "new name"
}
```

Response

```
200

{
   "id": "35776d4f-1851-435c-8573-802438f41e7a",
   "href": "https://mycsp:8080/tmf-api/testScenario/v4/testScenario/35776d4f-1851-435c-8573-802438f41e7a",
   "description": "Sample test scenario",
   "version": "1.2.3",
   "relatedParty": [
      {
         "name": "testUser",
         "role": "Owner",
         "@referredType": "Individual",
         "contact": [
            {
               "mediumType": "email",
               "characteristic": {
                  "emailAddress": "testUser@abc.com"
               }
            }
         ]
      }
   ],
   "state": "stable",
   "testScenarioDefinition": {
      "attachmentType": "testScenario",
      "content": "<base64-encoded test scenario>",
      "mimeType": "base64"
   },
   "name": "new name"
}
```

Delete test scenario

```
DELETE /testScenario/{id}
```

Description

This operation deletes a test scenario entity.

Usage Samples

Here's an example of a request for deleting a test scenario.

Request
DELETE /tmf-api/testScenario/v4/testScenario/35776d4f-1851-435c-8573-802438f41e7a
Response
204

API NOTIFICATIONS

For every single of operation on the entities use the following templates and provide sample REST notification POST calls.

It is assumed that the Pub/Sub uses the Register and UnRegister mechanisms described in the REST Guidelines reproduced below.

Register listener

POST /hub

Description

Sets the communication endpoint address the service instance must use to deliver information about its health state, execution state, failures and metrics. Subsequent POST calls will be rejected by the service if it does not support multiple listeners. In this case DELETE /api/hub/{id} must be called before an endpoint can be created again.

Behavior

Returns HTTP/1.1 status code 204 if the request was successful.

Returns HTTP/1.1 status code 409 if request is not successful.

Usage Samples

Here's an example of a request for registering a listener.

Request
POST /api/hub Accept: application/json {"callback": "http://in.listener.com"}
Response
201 Content-Type: application/json Location: /api/hub/42 {"id":"42","callback":"http://in.listener.com","query":null}

Unregister listener

DELETE /hub/{id}

Description

Clears the communication endpoint address that was set by creating the Hub.

Behavior

Returns HTTP/1.1 status code 204 if the request was successful.

Returns HTTP/1.1 status code 404 if the resource is not found.

Usage Samples

Here's an example of a request for un-registering a listener.

Request
DELETE /api/hub/42 Accept: application/json
Response
204

Publish Event to listener

POST /client/listener

Description

Clears the communication endpoint address that was set by creating the Hub.

Provides to a registered listener the description of the event that was raised. The /client/listener url is the callback url passed when registering the listener.

Behavior

Returns HTTP/1.1 status code 201 if the service is able to set the configuration.

Usage Samples

Here's an example of a notification received by the listener. In this example “EVENT TYPE” should be replaced by one of the notification types supported by this API (see Notification resources Models section) and EVENT BODY refers to the data structure of the given notification type.

Request

POST /client/listener
Accept: application/json
 	
{
"event": {
EVENT BODY
},
"eventType": "EVENT_TYPE"
}

Response
201

For detailed examples on the general TM Forum notification mechanism, see the TMF REST Design Guidelines.

Appendix 1

Examples of base64-encoded Attachment content

Example 1. ONAP VTP test scenario representation example

In ONAP VTP test scenarios are logical entities that are referenced from other test artifacts, such as test cases or test suites. The artifacts pertaining to the same scenario are assembled by association.

Encoded value

ewogICAg4oCcbmFtZeKAnTog4oCcc2NlbmFyaW8gLTHigJ0sCiAgICDigJxkZXNjcmlwdGlvbuKAnTog4oCcU2F
tcGxlIHNjZW5hcmlv4oCdCn0K

Original /decoded JSON object

{
   “name”: “scenario -1”,
   “description”: “Sample VTP scenario”
}

Example 2. Test scenario representation example

In this example the test scenario contains references to test artifacts required for test scenario execution.

Encoded value

ewogICAg4oCcbmFtZeKAnTog4oCcc2NlbmFyaW8gLTLigJ0sCiAgICDigJxkZXNjcmlwdGlvbuKAnTog4oCcU2F
tcGxlIHNjZW5hcmlv4oCdLAogICAgInRlc3RTdWl0ZSI6IHsKICAgICAgICAiaWQiOiAiNGNiMThkNDAtYTM1Zi0
0MjYxLWE5ZTktMjBhYjU4NDk4YzQyIiwKICAgICAgICAiaHJlZiI6ICJodHRwczovL215Y3NwOjgwODAvdG1mL
WFwaS90ZXN0Q2FzZS92NC90ZXN0U3VpdGUvNGNiMThkNDAtYTM1Zi00MjYxLWE5ZTktMjBhYjU4NDk4Yz
QyIiwKICAgICAgICAiQHJlZmVycmVkVHlwZSI6ICJUZXN0U3VpdGUiCiAgICB9LAogICAgImFic3RyYWN0RW52
aXJvbm1lbnQiOiB7CiAgICAgICAgImlkIjogImY0Y2ZhMjgwLWYwZDctNDVlNS05OWY4LTExYmE2MDU5YzBk
ZCIsCiAgICAgICAgImhyZWYiOiAiaHR0cHM6Ly9teWNzcDo4MDgwL3RtZi1hcGkvdGVzdEVudmlyb25tZW50L
3Y0L2Fic3RyYWN0RW52aXJvbm1lbnQvZjRjZmEyODAtZjBkNy00NWU1LTk5ZjgtMTFiYTYwNTljMGRkIiwKIC
AgICAgICAiQHJlZmVycmVkVHlwZSI6ICJBYnN0cmFjdEVudmlyb25tZW50IgogICAgfSwKICAgICJwcm92aXNp
b25pbmdBcnRpZmFjdCI6IFt7CiAgICAgICAgICAiaWQiOiAiYmQ3M2VkMWYtMDVmYS00YTA4LWE0NjEtOD
M1MjQyZWU1MDVhIiwKICAgICAgICAgICJocmVmIjogImh0dHBzOi8vbXljc3A6ODA4MC90bWYtYXBpL3Rlc3
RFbnZpcm9ubWVudC92NC9wcm92aXNpb25pbmdBcnRpZmFjdC9iZDczZWQxZi0wNWZhLTRhMDgtYTQ2
MS04MzUyNDJlZTUwNWEiLAogICAgICAgICAgIkByZWZlcnJlZFR5cGUiOiAiUHJvdmlzaW9uaW5nQXJ0aWZh
Y3QiCiAgICB9XSwKICAgICJnZW5lcmFsVGVzdEFydGlmYWN0IjogW3sKICAgICAgICAiaWQiOiAiMTc4Y2E4Ym
ItODFiYy00N2VmLTkxMWUtZGQ4NmE0MGI4OTc0IiwKICAgICAgICAiaHJlZiI6ICJodHRwczovL215Y3NwOjg
wODAvdG1mLWFwaS9nZW5lcmFsVGVzdEFydGlmYWN0L3Y0L2dlbmVyYWxUZXN0QXJ0aWZhY3QvMTc4Y
2E4YmItODFiYy00N2VmLTkxMWUtZGQ4NmE0MGI4OTc0IiwKICAgICAgICAiQHJlZmVycmVkVHlwZSI6ICJHZ
W5lcmFsVGVzdEFydGlmYWN0IgogICAgfV0sCiAgICAidGVzdERhdGFJbnN0YW5jZSI6IFt7CiAgICAgICAgImlkIj

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Original /decoded JSON object


```
{
   “name”: “scenario -2”,
   “description”: “Sample scenario”,
   "testSuite": {
      "id": "4cb18d40-a35f-4261-a9e9-20ab58498c42",
      "href": "https://mycsp:8080/tmf-api/testCase/v4/testSuite/4cb18d40-a35f-4261-a9e9-
20ab58498c42",
      "@referredType": "TestSuite"
   },
   "abstractEnvironment": {
      "id": "f4cfa280-f0d7-45e5-99f8-11ba6059c0dd",
      "href": "https://mycsp:8080/tmf-api/testEnvironment/v4/abstractEnvironment/f4cfa280-f0d7-45e5-
99f8-11ba6059c0dd",
      "@referredType": "AbstractEnvironment"
   },
   "provisioningArtifact": [{
       "id": "bd73ed1f-05fa-4a08-a461-835242ee505a",
       "href": "https://mycsp:8080/tmf-api/testEnvironment/v4/provisioningArtifact/bd73ed1f-05fa-
4a08-a461-835242ee505a",
       "@referredType": "ProvisioningArtifact"
   }],
   "generalTestArtifact": [{
      "id": "178ca8bb-81bc-47ef-911e-dd86a40b8974",
      "href": "https://mycsp:8080/tmf-api/generalTestArtifact/v4/generalTestArtifact/178ca8bb-81bc-
47ef-911e-dd86a40b8974",
      "@referredType": "GeneralTestArtifact"
   }],
   "testDataInstance": [{
      "id": "2db74193-e5fb-462a-98e0-6b1ed970dfc7",
      "href": "https://mycsp:8080/tmf-api/testData/v4/testDataInstance/2db74193-e5fb-462a-98e0-
6b1ed970dfc7",
      "@referredType": "TestDataInstance"
   }]
}
```

Acknowledgements

Version History

Version Number	Date	Release led by:	Description
4.0.0	31-Jul-2020	Pierre Gauthier TM Forum pgauthier@tmforum.org Edward Pershwitz ITEA Technologies edward.pershwitz@iteatechnologies.com	First Release of the Document.

Release History

Release Status	Date	Release led by:	Description
Pre-production	31-Jul-2020	Pierre Gauthier Edward Pershwitz	First Release of the Document.
Production	23-Sep-2020	Adrienne Walcott	Updated to reflect TM Forum Approved Status

Contributors to Document

Kanagaraj Manickam	Huawei Technologies Co., Ltd