TM Forum Specification

Service Test Management API REST Specification

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NOTICE

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INTRODUCTION

The following document is the specification of the REST API for Service Test Management. It includes the model definition as well as all available operations. Possible actions are creating, updating and retrieving Service Test.

The Service Test API provides a standardized mechanism for placing a service test with all of the necessary test parameters. The API consists of a simple set of operations that interact with CRM/Service Management systems in a consistent manner. A service test is a procedure intended to check the quality, performance, or reliability of a service.

Service Test Management API manages service test resource and service specification test resource:

- A service test specification describes the service test in terms of parameters to be configured and measures to be taken.
- A service exists for a controlled test invocation on a service. The service test is executed according to a schedule. and contains service test configuration parameters that are to be applied at execution time, and service test measures that result.

SAMPLE USE CASES

SERVICE TEST FOR CUSTOMER EXPERIENCE ASSURANCE

The Service Test can be used for customer experience assurance while:

- The subscriber can launch service test from Self Service Portal to make sure the service quality while his/her experience is not good.
- The Call Center operator can execute service test to check the quality and analyze root cause for response while one customer has complaint
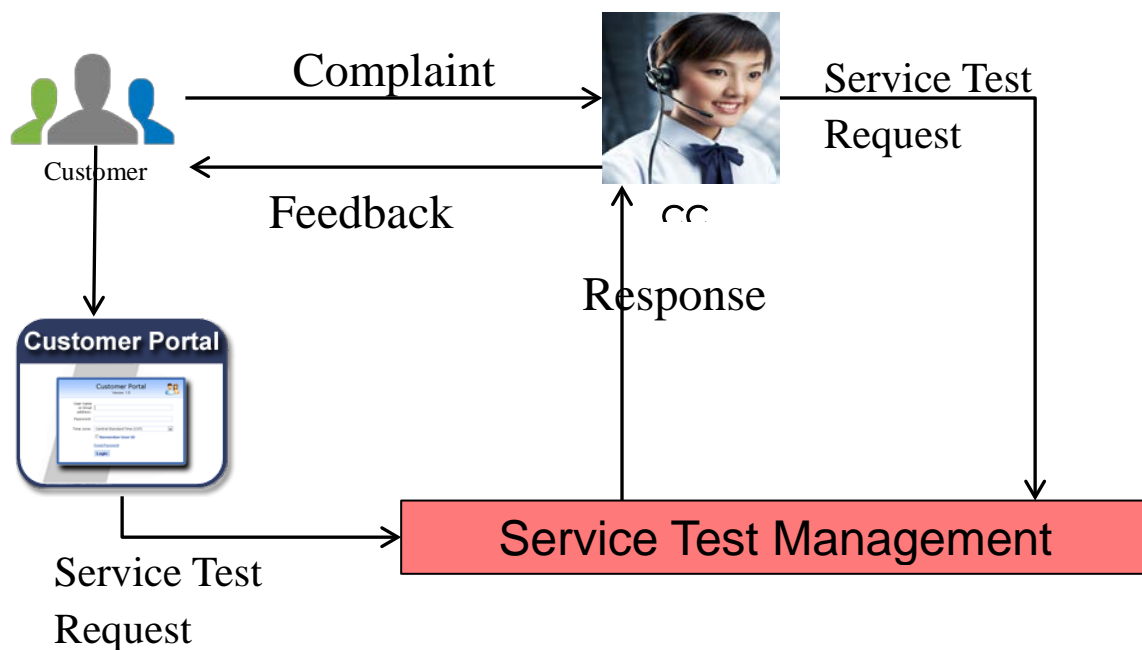
It could improve customer expereice and increase FCR(First Call Resolution) much.

PLANNED SERVICE TEST FOR IMPORTANCE SERVICE

The test job can be defined for some important services that the test will be executed against them periodically to assurance the service quality and find potential service downgrading in advance to avoid massive impact to customers.

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.

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. All resources and sub-resources of this API have a @type attributes that can be provided when this is useful. Such as ServiceTest, ServiceTestSpecification Entity. All resources and sub-resources of this API have a @type attributes that can be provided when this is useful.

The @referredType can be used within reference entities (like for instance ServiceRef) to explicitly denote the actual entity type of the referred class. Notice that in reference entities the @type, when used, denotes the class types of the reference itself, such as ServiceRef, and not the class type of the referred object. However, since reference classes are rarely sub-classed, @type is generally not useful in reference objects.

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.

Notice that because these meta-attributes have a generic meaning we will not repeat their definition in the resource description tables of each resource and each sub-resource.

RESOURCE MODEL

Managed Entity and Task Resource Models

SERVICE TEST RESOURCE

A service test is an entity that exists that exists for a controlled test invocation on a service. The service test is executed according to a schedule. and contains service test configuration parameters that are to be applied at execution time, and service test measures that result.

RESOURCE MODEL
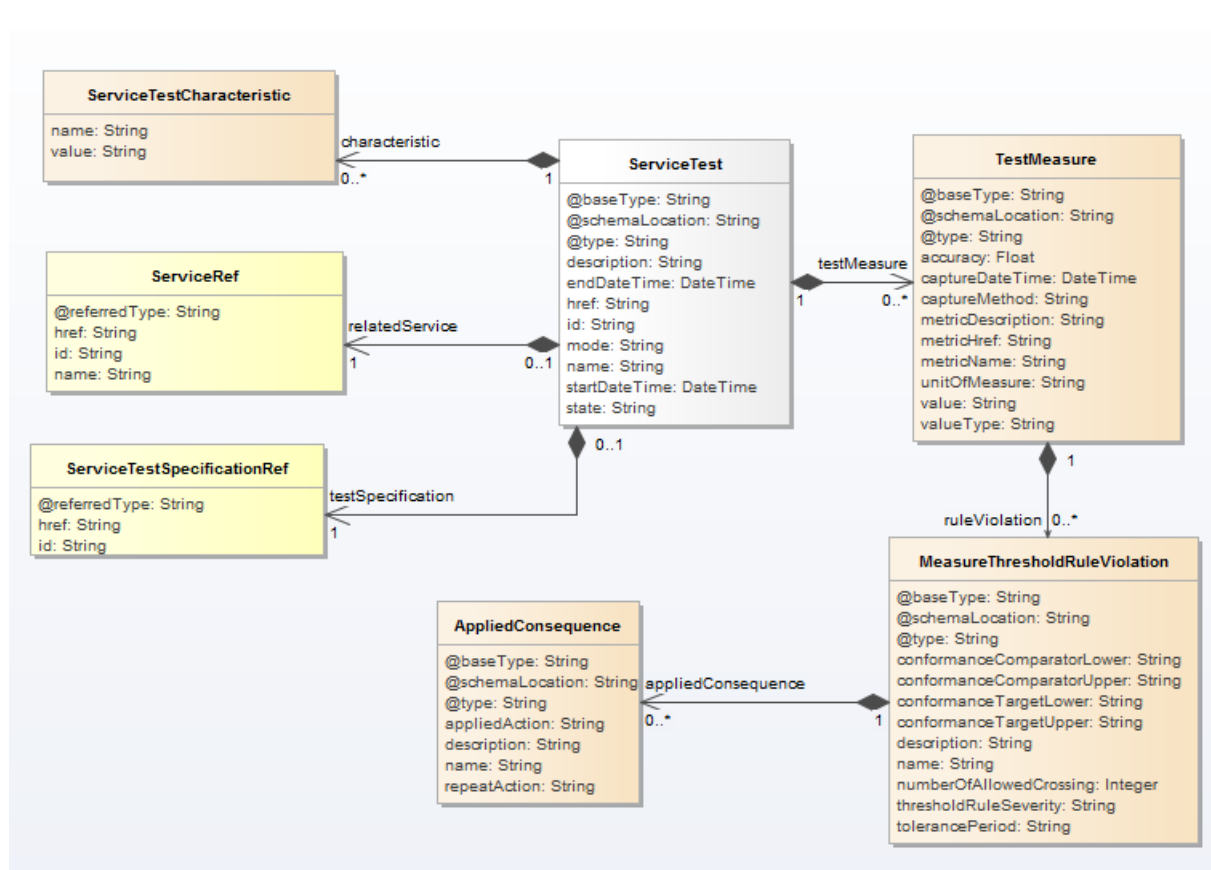
Fig.1. ServiceTest Resource

FIELD DESCRIPTIONS

ServiceTest

A service test is an entity that exists that exists for a controlled test invocation on a service. The service test is executed according to a schedule. And contains service test configuration parameters that are to be applied at execution time, and service test measures that result.

Field	Type	Description
description	String	Description of the service test
endDateTime	DateTime	The end date and time of the service test.
href	String	Hyperlink to access the service test
id	String	String. The identifier of the service test
mode	String	String. An indication of whether the service test is running in "PROACTIVE" or "ONDEMAND" mode
name	String	The name of the service test
startDateTime	DateTime	A DateTime. the start date and time of the service test.
state	String	The actual state the service test is in
relatedSpecification	ServiceTestSpecificationRef	The service test specification used by the service test.
characteristic	ServiceTestCharacteristic	The configuration of the service test is set by the service test characteristic.
relatedService	ServiceRef	The service of the service test
testMeasure	TestMeasure	A TestMeasure specifies a measure of a specific aspect of a product, service, or resource test, such as lost packets or connectivity status.
@type	String	Indicates the type of resource. Here can be service test.
@schemaLocation	String	Link to schema describing this REST resource.
@baseType	String	Indicates the base type of the resource. Here can be service test.

TestMeasure

A TestMeasure specifies a measure of a specific aspect of a product, service, or resource test, such as lost packets or connectivity status.

Field	Type	Description
@type	String	Indicates the type of resource.
@schemaLocation	String	Link to schema describing this REST resource.
@baseType	String	Indicates the base type of the resource. Here can be service test.
accuracy	Float	The number of digits of accuracy captured for Metrics associated
captureDateTime	DateTime	The date and time that capture the metric.
captureMethod	String	The method used to capture the Metrics. Note: This may be replaced by a set of entities similar to the Performance Monitoring Ref.
metricDescription	String	Brief description of the metric.
metricHref	String	Hyperlink to access a metric for detail information.
metricName	String	The name of metric.
unitOfMeasure	String	The unit of measure for the metric values, such as meters, cubic yards, kilograms [ISO 1000].

Field	Type	Description
Value	String	The value of Metric in the test. This also could be a document to record all values got during the service test.
valueType	String	A kind of value that the Metric value associated with a metricValue can take on, such as numeric, text, and so forth.
ruleViolation	MeasureThresholdRuleViolation	A measureThresholdRuleViolation is a violation of a rule that defines the in the MericDefMeasureThresholdRule.

MeasureThresholdRuleViolation

A measureThresholdRuleViolation is a violation of a rule that defines the in the
MericDefMeasureThresholdRule.

Field	Type	Description
@schemaLocation	String	Link to schema describing this REST resource.
@baseType	String	Indicates the base type of the resource. Here can be service test.
accuracy	Float	The number of digits of accuracy captured for Metrics associated
conformanceTargetLower	String	A String. A value used to determine if the threshold is crossed or ceases to be crossed. It represents the lower limit. the value should be less than the conformanceTargetUpper. the conformance comparators should also be logically defined so as to not lead to a logically impossible condition.
conformanceTargetUpper	String	A String. A value used to determine if the threshold is crossed or ceases to be crossed. It represents the Upper limit. The value should be greater than the conformanceTargetLower. The conformance comparators should also be logically defined so as to not lead to a logically impossible condition.
conformanceComparatorLower	String	A String. An operator that when applied on a value specifies whether a threshold is crossed or ceased to be crossed. This operator is used to compare with the conformanceTargetLower.
conformanceComparatorUpper	String	A String. An operator that when applied on a value specifies whether a threshold is crossed or ceased to be crossed. This operator is used to compare with the conformanceTargetUpper.
description	String	A String. Description for the MetricDefMeasureThresholdRule .
name	String	A String. Name for the MetricDefMeasureThresholdRule .
numberOfAllowedCrossing	Integer	The number of allowed crossing occurrences in reference to the tolerancePeriod without a consequence being initiated.
thresholdRuleSeverity	String	A threshold can be generated in different severity levels. A crossing for each level may require a different condition and possibly trigger a different consequence.
tolerancePeriod	String	An interval of time of allowed crossing occurrences before a consequence being initiated.
appliedConsequence	Object	An Applied Consequence defines the action (prescribed action or notification) to take when a MeasureThresholdRuleViolation occurs.

AppliedConsequence

An Applied Consequence defines the action (prescribed action or notification) to take when a MeasureThresholdRuleViolation occurs.

Field	Type	Description
@type	String	Indicates the type of resource.
@schemaLocation	String	Link to schema describing this REST resource.
@baseType	String	Indicates the base type of the resource. Here can be service test.
appliedAction	String	The action for a violated threshold. This could be a hyperlink to the action.
description	String	A narrative that explains in detail what the consequence is.
name	String	A word, term, or phrase by which Consequence is known and distinguished from other MetricDefMeasureConsequences.
repeatAction	String	An indicator use to specify that a consequence should cease being applied if a value is in the same range as the previous value or continue being applied if a value is in the same range as the previous value.

If the repeatAction is True, if the consequence is always applied as soon as the MetricMeasure value is in the range of values and if the repeatAction is False, the consequence is applied only if the previous MetricMeasure value wasn't in the same range. |

ServiceRef

The service of the service test

Field	Type	Description
href	String	A String. Hyperlink to access a service .
id	String	A String. Identifier of a service .
name	String	A String. A name to describe a service.
@referredType	String	Indicates the (class) type of place.

ServiceTestSpecificationRef

The service test specification used by the service test.

Field	Type	Description
href	String	Hyperlink to access a service test specification.
id	String	Identifier of a service test specification.
@referredType	String	Indicates the (class) type of place.

ServiceTestCharacteristic

The configuration of the service test is set by the service test characteristic.

Field	Type	Description
name	String	The name of the characteristic.
value	String	The value of characteristic.

JSON REPRESENTATION SAMPLE

We provide below the JSON representation of an example of Service Test Resource object:

```
{
  "href": "https://host:port/serviceTestManagement/v2/serviceTest/3112",
  "id": "3112",
  "description:": "This service test is a simple one",
  "endDateTime": "2016-03-02T24:00:00",
  "mode": "PROACTIVE",
  "startDateTime": "2016-03-02T00:00:00",
  "state": "Completed",
  "baseType": "basicTest",
  "@type": "performanceTest",
  "@schemaLocation": ""https://host:port/serviceTestManagement/serviceTest/schema/ performanceTest
.yml",
  "relatedService": {
    "href": "https://host:port/serviceManagement/service/21",
    "id": "21",
    "name": "gameService"
  },
  "relatedServiceTestSpecification":{
    "href": "https://host:port/serviceTestManagement/v2/serviceTest/22",
    "id": "22"
  "referredType": "performanceTestSpecification"
  },
  "characteristic": [
    {
      "name": "number",
      "value": "3"
    },
    {
      "name": "restart",
      "value": "Ture"
    }
  ],
  "testMeasure": [
    {
      "accuracy": 0.0001,
      "captureDateTime": "2016-03-02T11:12:00",
      "captureMethod": "automatic capture by instrument",
      "metricDescription": "This is the flow speed in a service",
      "metricHref": "https://host:port/metricManagement/metric/21",
      "metricName": "Flow speed",
      "unitOfMeasure": "A second",
      "value": "3000",
      "valueType": "bits",
```

```json
      "ruleViolation": [
        {
          "conformanceTargetUpper": "2500",
          "conformanceComparatorUpper": "greater than ",
          "description": "This speed is greater than the target upper",
          "name": "tooMuchTraffic",
          "numberOfAllowedCrossing": "0",
          "thresholdRuleSeverity": "1",
          "appliedConsequence": [
            {
              "appliedAction": "sendWarning",
              "description": "send a warning to the system",
              "name": "sendWarning",
              "repeatAction": "False"
            },
            {
              "appliedAction": "generateReport",
              "description": "generate a waring report ",
              "name": "generateReport",
              "repeatAction": "False"
            }
          ]
        }
      ]
    }
  ]
}
```

SERVICE TEST SPECIFICATION RESOURCE

A service test specification describes the service test in terms of parameters to be configured and measures to be taken.

RESOURCE MODEL

Fig.1. ServiceTestSpecification Resource

FIELD DESCRIPTIONS

ServiceTestSpecification

The service test specification describes the service test in terms of parameters to be configured and measures to be taken.

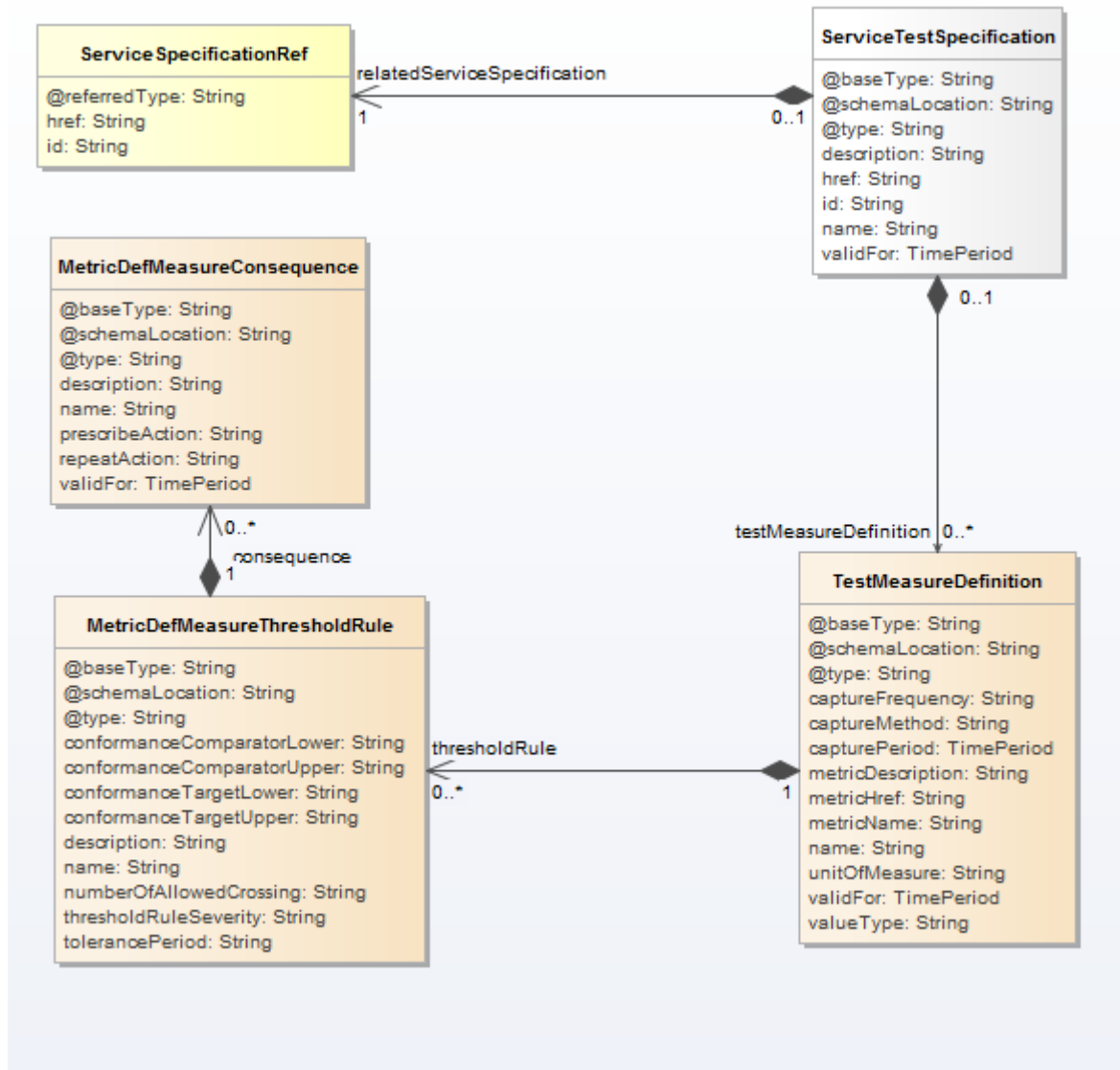| Field	Type	Description
description	String	Description of a service test specification.
href	String	Hyperlink to access a service test specification.

Field	Type	Description
id	String	Identifier of a service test specification.
name	String	Name of a service test specification.
validFor	TimePeriod	A period of a thing.
testMeasureDefinition	TestMeasureDefinition	A TestMeasureDefinition specifies a measure of a specific aspect of a product, service, or resource test, such as lost packets or connectivity status.
relatedServiceSpecification	ServiceSpecificationRef	The related service specification.
@type	String	Indicates the type of resource. Here can be service test specification.
@schemaLocation	String	Link to schema describing this REST resource.
@baseType	String	Indicates the base type of the resource. Here can be service test specification.

ServiceSpecificationRef

The related service specification.

Field	Type	Description
href	String	Hyperlink to access service specification.
id	String	The identifier of a service specification.
@referredType	String	Indicates the (class) type of place.

TestMeasureDefinition

A TestMeasureDefinition specifies a measure of a specific aspect of a product, service, or resource test, such as lost packets or connectivity status.

Field	Type	Description
@type	String	Indicates the type of resource.
@schemaLocation	String	Link to schema describing this REST resource.
@baseType	String	Indicates the base type of the resource.
captureFrequency	String	The frequency of capture for the metric. Note: This may be replaced by a set of entities similar to the Performance Monitoring.
captureMethod	String	The method used to capture the Metric. Note: This may be replaced by a set of entities similar to the Performance Monitoring.
capturePeriod	TimePeriod	A period of a capture.
metricDescription	String	Brief description of the metric.
metricHref	String	Hyperlink to access a metric for detail information.
metricName	String	The name of a metric that in the test measure.
name	String	The name of the TestMeasureDefinition.
unitOfMeasure	String	Name of a service test specification.
valueType	String	A kind of value that the Metric value can take on, such as numeric, text, and so forth.

Field	Type	Description
validFor	TimePeriod	A period of a thing.
thresholdRule	MetricDefMeasureThresholdRule	A thresholdRule is a rule that defines the condition (raise or clear) to achieve to apply consequences when a threshold is crossed or ceased to be crossed. It also defines the severity of the raise or clear of the threshold.

MetricDefMeasureThresholdRule

A MetricDefMeasureThresholdRule is a rule that defines the condition (raise or clear) to achieve to apply consequences when a threshold is crossed or ceased to be crossed. It also defines the severity of the raise or clear of the threshold.

Field	Type	Description
@type	String	Indicates the type of resource.
@schemaLocation	String	Link to schema describing this REST resource.
@baseType	String	Indicates the base type of the resource.
conformanceTargetLower	String	A value used to determine if the threshold is crossed or ceases to be crossed. It represents the lower limit. the value should be less than the conformanceTargetUpper. the conformance comparators should also be logically defined so as to not lead to a logically impossible condition.
conformanceTargetUpper	String	A value used to determine if the threshold is crossed or ceases to be crossed. It represents the Upper limit. The value should be greater than the conformanceTargetLower. The conformance comparators should also be logically defined so as to not lead to a logically impossible condition.
conformanceComparatorLower	String	An operator that when applied on a value specifies whether a threshold is crossed or ceased to be crossed. This operator is used to compare with the conformanceTargetLower.
conformanceComparatorUpper	String	An operator that when applied on a value specifies whether a threshold is crossed or ceased to be crossed. This operator is used to compare with the conformanceTargetUpper.
description	String	Description for the MetricDefMeasureThresholdRule .
name	String	Name for the MetricDefMeasureThresholdRule .
numberOfAllowedCrossing	Integer	The number of allowed crossing occurrences in reference to the tolerancePeriod without a consequence being initiated.
thresholdRuleSeverity	String	A threshold can be generated in different severity levels. A crossing for each level may require a different condition and possibly trigger a different consequence.
tolerancePeriod	String	An interval of time of allowed crossing occurrences before a consequence being initiated.
consequence	MetricDefMeasureConsequence	A MetricDefMeasureConsequence defines the action (prescribed action or notification) to take when a MetricDefMeasureThresholdRule is crossed.

MetricDefMeasureConsequence

A MetricDefMeasureConsequence defines the action (prescribed action or notification) to take when a MetricDefMeasureThresholdRule is crossed.

Field	Type	Description
@type	String	Indicates the type of resource.
@schemaLocation	String	Link to schema describing this REST resource.
@baseType	String	Indicates the base type of the resource.
description	String	A narrative that explains in detail what the consequence is.
name	String	A word, term, or phrase by which a MetricDefMeasureConsequence is known and distinguished from other MetricDefMeasureConsequences.
prescribeAction	String	Recommended remedy for a violated threshold. This could be the hyperlink to the action.
repeatAction	String	An indicator use to specify that a consequence should cease being applied if a value is in the same range as the previous value or continue being applied if a value is in the same range as the previous value. If the repeatAction is True, if the consequence is always applied as soon as the MetricMeasure value is in the range of values and if the repeatAcation is False, the consequence is applied only if the previous MetricMeasure value wasn't in the same range.
validFor	TimePeriod	A period of a thing.

JSON REPRESENTATION SAMPLE

We provide below the JSON representation of an example of Service Test Specification Resource object:

```
{
   "description": "a service description",
   "href": "https://host:port/serviceTestManagement/v2/serviceTestSpecification/12",
   "id": "12",
   "name": "monkey test",
   "@baseType" : "basicTest",
   "@type" : "performanceTest",
   "@schemaLocation" : "",
     "validFor": {
        "endDateTime": "2017-03-01T00:00:00",
     "startDateTime": "2016-03-01T00:00:00"
   },
   "testMeasureDefinition": [
```

```json
{
   "captureFrequency": "once",
   "captureMethod": "automatic capture by instrument",
   "metricDescription": "This is the flow speed in a service",
   "metricHref": "https://host:port/metricManagement/metric/21",
   "metricName": "Flow speed",
   "name": "Definition of Flow speed",
   "unitOfMeasure": "A second",
   "valueType": "bits",
   "capturePeriod": {
      "endDateTime": "T00:00:00",
      "startDateTime": "T00:00:00"
   },
   "thresholdRule": [
      {
         "conformanceTargetUpper": "2500",
         "conformanceComparatorUpper": "greater than ",
         "description": "This speed is greater than the target upper",
         "name": "tooMuchTraffic",
         "numberOfAllowedCrossing": "0",
         "thresholdRuleSeverity": "1",
         "tolerancePeriod": "15 minutes",
         "consequence": [
            {
               "appliedAction": "sendWarning",
               "description": "send a warning to the system",
               "name": "sendWarning",
               "repeatAction": "False",
               "validFor": {
                  "endDateTime": "2017-03-01T00:00:00",
                  "startDateTime": "2016-03-01T00:00:00"
               }
            },
            {
               "appliedAction": "generateReport",
               "description": "generate a waring report ",
               "name": "generateReport",
               "repeatAction": "False",
               "validFor": {
                  "endDateTime": "2017-03-01T00:00:00",
                  "startDateTime": "2016-03-01T00:00:00"
               }
            }
         ]
      }
   ],
   "validFor": {
```

```
            "endDateTime": "2017-03-01T00:00:00",
            "startDateTime": "2016-03-01T00:00:00"
        }
      }
    ],
    "relatedServiceSpecification": {
       "href": "https://host:port/serviceManagement/serviceSpecification/31",
       "id": "31",
       "@referredType": "basicServiceSpecification"


    }
}
```

Notification Resource Models

6 notifications are defined for this API

Notifications related to ServiceTestSpecification:
   -ServiceTestSpecificationCreationNotification
   -ServiceTestSpecificationAttributeValueChangeNotification
   -ServiceTestSpecificationRemoveNotification

Notifications related to ServiceTest:
   - ServiceTestCreationNotification
   - ServiceTestAttributeValueChangeNotification
   - ServiceTestRemoveNotification

The notification structure for all notifications in this API follow the pattern depicted by the figure below.

A notification resource (depicted by "SpecificNotification" placeholder) is a sub class of a generic Notification structure containing an id of the event occurence (eventId), an event timestamp (eventTime), and the name of the notification resource (eventType).

This notification structure owns an event structure ("SpecificEvent" placeholder) linked to the resource concerned by the notification using the resource name as access field ("resourceName" placeholder).
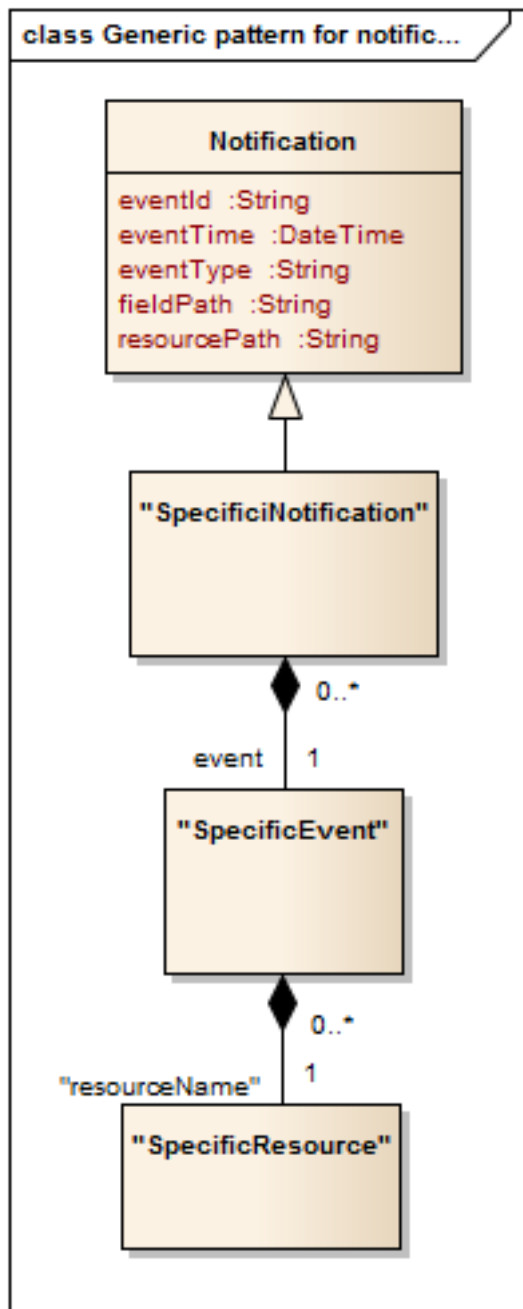
SERVICE TEST SPECIFICATION CREAT NOTIFICATION

Notification sent when a new ServiceTestSpecification resource is created.

Json representation sample

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

```
{
   "eventId":"00001",
   "eventTime":"2016-03-01T16:42:25-45:00",
   "eventType":"ServiceTestSpecificationCreationNotification",
    "event": {
      " ServiceTestSpecification " :
         {-- SEE ServiceTestSpecification RESOURCE SAMPLE --}
   }
}
```

SERVICE TEST SPECIFICATION ATTRIBUTE VALUE CHANGE NOTIFICATION

Notification sent when removing a ServiceTestSpecification resource.

Json representation sample

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

```
{
   "eventId":"00002",
   "eventTime":"2016-03-01T16:48:00",
   "eventType":" ServiceTestSpecificationAttributeChangeNotification ",
    "event": {
      "ServiceTestSpecification" :
         {-- SEE ServiceTestSpecification RESOURCE SAMPLE --}
   }
}
```

SERVICE TEST SPECIFICATION REMOVE NOTIFICATION

Notification sent when removing a ServiceTestSpecification resource.

Json representation sample

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

```
{
   "eventId":"00003",
   "eventTime":"2016-03-05T16:48:00",
   "eventType":"ServiceTestSpecificationRemoveNotification",
    "event": {
      "ServiceTestSpecification" :
         {-- SEE ServiceTestSpecification RESOURCE SAMPLE --}
```

```
    }
}
```

SERVICE TEST CREATION NOTIFICATION

Notification sent when a new ServiceTest resource is created.

Json representation sample

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

```
{
   "eventId":"00004",
   "eventTime":"2016-03-01T16:42:25",
   "eventType":"ServiceTestCreationNotification",
    "event": {
      "serviceTest" :
         {-- SEE ServiceTest RESOURCE SAMPLE --}
   }
}
```

SERVICE TEST ATTRIBUTE VALUE CHANGE NOTIFICATION

Notification sent when changing an attribute of a ServiceTest resource.

Json representation sample

We provide below the json representation of an example of a 'ServiceTest AttributeValueChangeNotification' notification object

```
{
   "eventId":"00005",
   "eventTime":"2016-03-02T16:42:25",
   "eventType":" ServiceTest AttributeValueChangeNotificationNotification",
    "event": {
      "serviceTest" :
         {-- SEE ServiceTest RESOURCE SAMPLE --}
   }
}
```

SERVICE TEST REMVOE NOTIFICATION

Notification sent when changing an attribute of a ServiceTest resource.

Json representation sample

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

```
{
   "eventId":"00005",
   "eventTime":"2016-03-02T16:42:25",
   "eventType":" ServiceTestRemoveNotification",
    "event": {
      "serviceTest" :
         {-- SEE ServiceTest RESOURCE SAMPLE --}
   }
}
```

Service Test Management API REST Specification

API OPERATIONS ON SERVICE LEVEL OBJECTIVE

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
Complete Update of an Entity	PUT Resource	PUT must be used to completely update a resource identified by its resource URI
Remove an Entity	DELETE Resource	DELETE must be used to remove a resource
Execute an Action on an Entity	POST on TASK Resource	POST must be used to execute Task Resources
Other Request Methods	POST on TASK Resource	GET and POST must not be used to tunnel other request methods.

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

Notifications are also described in a subsequent section.

GET /serviceTest/{ID}?fields=...&{filtering}

Description

This operation retrieves a service test 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 ServiceTest resource.

Request
GET /serviceTestManagement/v2/serviceTest/3112?fields=href,id,description Accept: application/json

Response

200
 	
{
   "href": "https://host:port/serviceTestManagement/v2/serviceTest/3112",
   "id": "3112",
   "description:": "This service test is a simple one",
}

GET /serviceTest?fields=...&{filtering}

Description

This operation list service test 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 ServiceTest resources.

<table>
<tr><td>

Request

</td></tr>
<tr><td>

GET /serviceTestManagement/v2/serviceTest
Accept: application/json

</td></tr>
<tr><td>

Response

</td></tr>
<tr><td>

```
200

[
{
  "href": "https://host:port/serviceTestManagement/v2/serviceTest/3112",
  "id": "3112",
  "description:": "This service test is a simple one",
  "endDateTime": "2016-03-02T24:00:00",
  "mode": "PROACTIVE",
  "startDateTime": "2016-03-02T00:00:00",
  "state": "Completed",
  "relatedService": {
     "href": "https://host:port/serviceManagement/v2/service/21",
     "id": "21",
     "name": "gameService"
  },
  "relatedServiceTestSpecification":{
     "href": "https://host:port/serviceTestManagement/v2/serviceTest/22",
     "id": "22"
  },
  "characteristic": [
     {
        "name": "number",
        "value": "3"
     },
     {
        "name": "restart",
        "value": "Ture"
     }
  ],
  "testMeasure": [
     {
        "accuracy": 0.0001,
        "captureDateTime": "2016-03-02T11:12:00",
        "captureMethod": "automatic capture by instrument",
        "metricDescription": "This is the flow speed in a service",
        "metricHref": "https://host:port/metricManagement/metric/21",
        "metricName": "Flow speed",
        "unitOfMeasure": "A second",
        "value": "3000",
        "valueType": "bits",
```

</td></tr>
</table>

```
        "ruleViolation": [
          {
            "conformanceTargetUpper": "2500",
            "conformanComparatorUpper": "greater than ",
            "description": "This speed is greater than the target upper",
            "name": "tooMuchTraffic",
            "numberOfAllowedCrossing": "0",
            "thresholdRuleSeverity": "1",
            "appliedConsquence": [
              {
                "appliedAction": "sendWarning",
                "description": "send a warning to the system",
                "name": "sendWarning",
                "repeatAction": "False"
              },
              {
                "appliedAction": "generateReport",
                "description": "generate a waring report ",
                "name": "generateReport",
                "repeatAction": "False"
              }
            ]
          }
        ]
      }
    ]
  }
]
```

POST /serviceTest

Description

This operation creates a service test entity.

Usage Samples

Here's an example of a request for creating a ServiceTest resource. In this example the request only passes mandatory attributes.

Request
POST /serviceTestManagement/v2/serviceTest Content-Type: application/json

```
{
   "description:": "This service test is a simple one",
   "endDateTime": "2016-03-02T24:00:00",
   "mode": "PROACTIVE",
   "startDateTime": "2016-03-02T00:00:00",
   "state": " In Progress",
   "relatedService": {
      "href": "https://host:port/serviceManagement/v2/service/21",
      "id": "21",
      "name": "gameService"
   },
   "relatedServiceTestSpecification":{
      "href": "https://host:port/serviceTestManagement/v2/serviceTest/22",
      "id": "22"
   },
}
```

Response

```
201

{
   "href": "https://host:port/serviceTestManagement/v2/serviceTest/89757",
   "id": "89757",
   "description:": "This service test is a simple one",
   "endDateTime": "2016-03-02T24:00:00",
   "mode": "PROACTIVE",
   "startDateTime": "2016-03-02T00:00:00",
   "state": "In Progress",
   "relatedService": {
      "href": "https://host:port/serviceManagement/v2/service/21",
      "id": "21",
      "name": "gameService"
   },
   "relatedServiceTestSpecification":{
      "href": "https://host:port/serviceTestManagement/v2/serviceTest/22",
      "id": "22"
   },
}
```

PATCH /serviceTest/{ID}

Description

This operation allows partial updates of a service test 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.

Usage Samples

Here's an example of requests for patching a ServiceTest resource.

Changing the status to 'prospective' (using json-merge)

Request

PATCH /serviceTestManagement/v2/serviceTest/42
Content-Type: application/merge-patch+json
 	
{
   "status": "Completed"
}

Response

200
 	
{
  "href": "https://host:port/serviceTestManagement/v2/serviceTest/89757",
  "id": "89757",
  "description:": "This service test is a simple one",
  "endDateTime": "2016-03-02T24:00:00",
  "mode": "PROACTIVE",
  "startDateTime": "2016-03-02T00:00:00",
  "state": "Completed",
  "relatedService": {
    "href": "https://host:port/serviceManagement/v2/service/21",
    "id": "21",
    "name": "gameService"
  },
  "relatedServiceTestSpecification":{
    "href": "https://host:port/serviceTestManagement/v2/serviceTest/22",
    "id": "22"
  },
}

DELETE /serviceTest/{ID}

Description

This operation deletes a service test entity.

Usage Samples

Here's an example of a request for deleting a ServiceTest resource.

Request
DELETE /serviceTestManagement/v2/serviceTest/89757
Response
204

API OPERATIONS ON SERVICE LEVEL SPECIFICATION

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
Complete Update of an Entity	PUT Resource	PUT must be used to completely update a resource identified by its resource URI
Remove an Entity	DELETE Resource	DELETE must be used to remove a resource
Execute an Action on an Entity	POST on TASK Resource	POST must be used to execute Task Resources
Other Request Methods	POST on TASK Resource	GET and POST must not be used to tunnel other request methods.

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

Notifications are also described in a subsequent section.

GET /serviceTestSpecification/{ID}?fields=...&{filtering}

Description

This operation retrieves a service test specification 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 ServiceTestSpecification resource.

Request
GET /serveictTestManagement/v2/serviceTestSpecification/12?fields=description,href,id,name,validFor, relatedServiceSpecification Accept: application/json
Response

200
 	
{
   "description": "a service description",
   "href": "https://host:port/serviceTestManagement/v2/serviceTestSpecification/12",
   "id": "12",
   "name": "monkey test",
   "validFor": {
     "endDateTime": "2017-03-01T00:00:00",
     "startDateTime": "2016-03-01T00:00:00"
   },
   "relatedServiceSpecification": {
     "href": "https://host:port/serviceManagement/v2/serviceSpecification/31",
     "id": "31",
   }
}

GET /serviceTestSpecification?fields=...&{filtering}

Description

This operation list service test specification 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 ServiceTestSpecification resources.

Request
GET /serveictTestManagement/v2/serviceTestSpecification Accept: application/json

Response
200

```
[
{
   "description": "a service description",
   "href": "https://host:port/serviceTestManagement/v2/serviceTestSpecification/12",
   "id": "12",
   "name": "monkey test",
   "validFor": {
      "endDateTime": "2017-03-01T00:00:00",
      "startDateTime": "2016-03-01T00:00:00"
   },
   "testMeasureDefinition": [
     {
        "captureFrequency": "once",
        "captureMethod": "automatic capture by instrument",
        "metricDescription": "This is the flow speed in a service",
        "metricHref": "https://host:port/metricManagement/metric/21",
        "metricName": "Flow speed",
        "name": "Definition of Flow speed",
        "unitOfMeasure": "A second",
        "valueType": "bits",
        "capturePeriod": {
           "endDateTime": "T00:00:00",
           "startDateTime": "T00:00:00"
        },
        "thresholdRule": [
          {
```

```
                "conformanceTargetUpper": "2500",
                "conformanceComparatorUpper": "greater than ",
                "description": "This speed is greater than the target upper",
                "name": "tooMuchTraffic",
                "numberOfAllowedCrossing": "0",
                "thresholdRuleSeverity": "1",
                "tolerancePeriod": "15 minutes",
                "consequence": [
                  {
                    "appliedAction": "sendWarning",
                    "description": "send a warning to the system",
                    "name": "sendWarning",
                    "repeatAction": "False",
                    "validFor": {
                      "endDateTime": "2017-03-01T00:00:00",
                      "startDateTime": "2016-03-01T00:00:00"
                    }
                  },
                  {
                    "appliedAction": "generateReport",
                    "description": "generate a waring report ",
                    "name": "generateReport",
                    "repeatAction": "False",
                    "validFor": {
                      "endDateTime": "2017-03-01T00:00:00",
                      "startDateTime": "2016-03-01T00:00:00"
                    }
                  }
                ]
            }
        ],
        "validFor": {
          "endDateTime": "2017-03-01T00:00:00",
          "startDateTime": "2016-03-01T00:00:00"
        }
      }
    ],
    "relatedServiceSpecification": {
      "href": "https://host:port/serviceManagement/serviceSpecification/31",
      "id": "31",
    }
}
]
```

POST /serviceTestSpecification

Description

This operation creates a service test specification entity.

Usage Samples

Here's an example of a request for creating a ServiceTestSpecification resource. In this example the request only passes mandatory attributes.

<table>
<tr><td>

Request

</td></tr>
<tr><td>

```
POST /serveictTestManagement/v2/ServiceTestSpecification
Content-Type: application/json

{
    "description": "a service description",
    "name": "monkey test",
    "validFor": {
        "endDateTime": "2017-03-01T00:00:00",
        "startDateTime": "2016-03-01T00:00:00"
    },
    "relatedServiceSpecification": {
        "href": "https://host:port/serviceManagement/v2/serviceSpecification/31",
        "id": "31",
    }
}
```

</td></tr>
<tr><td>

Response

</td></tr>
<tr><td>

```
201

{
    "description": "a service description",
    "href": "https://host:port/serviceTestManagement/v2/serviceTestSpecification/13",
    "id": "13",
    "name": "monkey test",
    "validFor": {
        "endDateTime": "2017-03-01T00:00:00",
        "startDateTime": "2016-03-01T00:00:00"
    },
    "relatedServiceSpecification": {
        "href": "https://host:port/serviceManagement/v2/serviceSpecification/31",
        "id": "31",
```

</td></tr>
</table>

```
    }
}
```

PATCH /serviceTestSpecification/{ID}

Description

This operation allows partial updates of a service test specification 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.

Usage Samples

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

Request

```
PATCH /serveictTestManagement/v2/ServiceTestSpecification/13
Content-Type: application/merge-patch+json

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

Response

```
200

{
   "description": "a service description",
   "href": "https://host:port/serviceTestManagement/v2/serviceTestSpecification/13",
   "id": "13",
   "name": "new name",
   "validFor": {
       "endDateTime": "2017-03-01T00:00:00",
       "startDateTime": "2016-03-01T00:00:00"
   },
   "relatedServiceSpecification": {
       "href": "https://host:port/serviceManagement/v2/serviceSpecification/31",
```

```
      "id": "31",
    }
}
```

DELETE /serviceTestSpecification/{ID}

Description

This operation deletes a service test specification type entity.

Usage Samples

Here's an example of a request for deleting a ServiceTestSpecification resource.

Request
DELETE /serveictTestManagement/serviceTestSpecification/12
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.

ACKNOWLEDGEMENTS

VERSION HISTORY

Version Number	Date	Release led by:	Description
Release 1.0.0	11/28/2016	Pierre Gauthier	
Release 2.0.0	28-Feb-2018	Hongxia Hao haohongxia@huawei.com	**Main change points:** 1.Remove mandatory and non-mandatory related description to Conformance Profile document. 2. Align with DG 3.0 , but no hypermedia 3. Modify some names like RelatedClassRef (suggested by Mariano) 4.Modify some typos
Release 2.1.0	06-Dec-2018	Hongxia Hao	Updated to TM Forum new brand guidelines.
Release 2.1.1	27-Jun-2018	Adrienne Walcott	Formatting/style edits prior to R18 publishing.

RELEASE HISTORY

Release Number	Date	Release led by:	Description
16.5.0	December 2016	Yisong Jiang in HUAWEI Pierre Gauthier	Initial Release
18.0.0	June 2018	Hongxia Hao	Updated Release

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