

# TM Forum Specification

## Resource Activation API User Guide

TMF702

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N/A

# Introduction

The following document is intended to provide details of the REST API interface for the Resource Activation API. The intent of this API is to provide a consistent/standardized mechanism to activate Resources. It includes the model definition as well as all available operations.

The Resource Activation model definition is based on the same Resource model as in the Resource Inventory.

## SAMPLE USE CASES

### **Resource Activation queries (Use Case 1)**

The Resource Activation API can be used to query the resource instances to acquire resource activation states and the attributes.

### **Resource Activation create/update (Use Case 2)**

The Resource Activation API can be used to create/update to configure and activate the resource instances.

## 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 LogicalResource and PhysicalResource inheriting properties from the abstract Resource 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 Resource instances some may be instances of LogicalResource where other could be instances of PhysicalResource. 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 @referredType can be used within reference entities (like for instance a ResourceRef object) to explicitly denote the actual entity type of the referred class. Notice that in reference entities the @type, when used, denotes the class type of the reference itself, such as LogicalResourceRef or PhysicalResourceRef, 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.



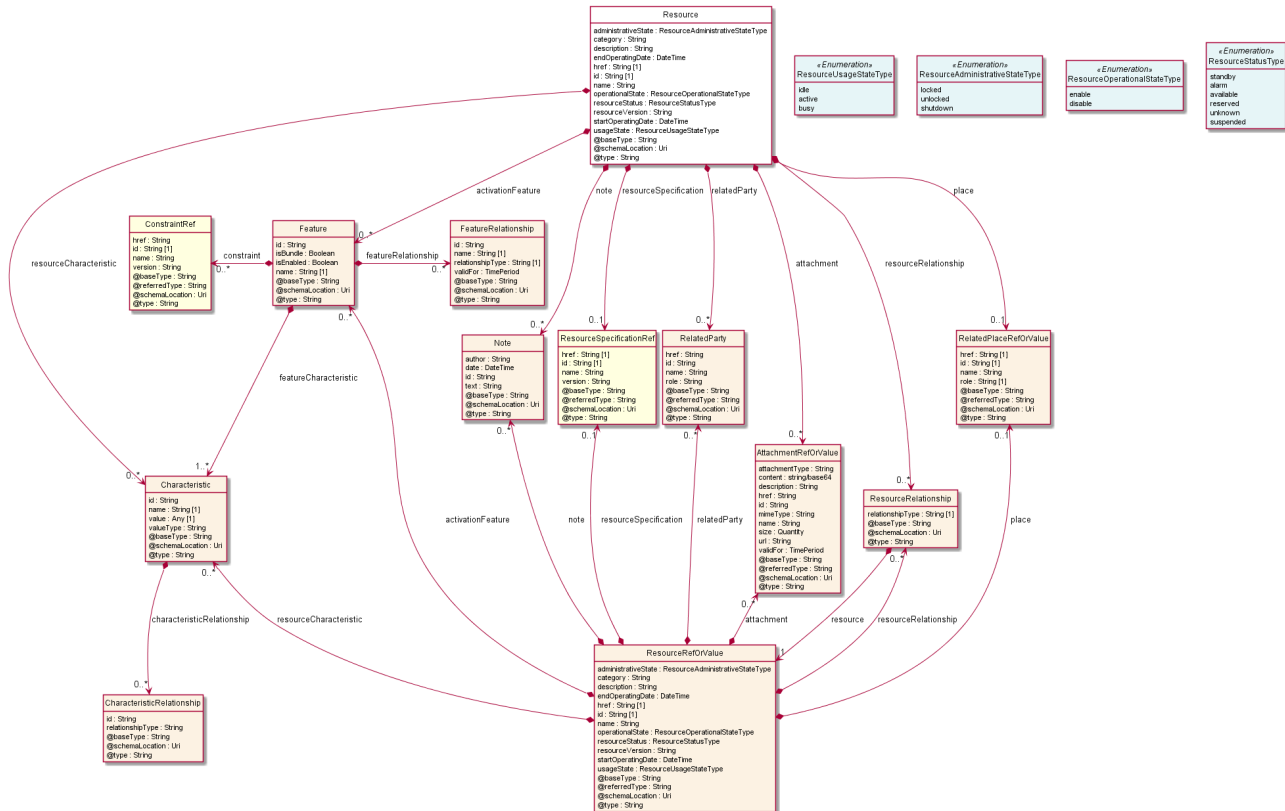
# RESOURCE MODEL

## Managed Entity and Task Resource Models

### Resource resource

Resource is an abstract entity that describes the common set of attributes shared by all concrete resources (e.g. TPE, EQUIPMENT) in the inventory.

### Resource model



### Field descriptions

#### Resource fields

- activationFeature** A list of features (Feature [\*]). Applicable configuration features of a resource for activation.
- administrativeState** A resource administrative state type (ResourceAdministrativeStateType). Tracks the administrative state of the resource, such as locked, unlocked, shutdown and so on.
- attachment** A list of attachment ref or values (AttachmentRefOrValue [\*]). the attribute type, schemaLocation and referredType are related to the contained entity and not to AttachmentRefOrValue itself.
- category** A string. Category of the concrete resource. e.g Gold, Silver for MSISDN concrete resource.

description	A string. free-text description of the resource.
endOperatingDate	A date time (DateTime). A date time( DateTime). The date till the resource is operating.
href	A string. The URI for the object itself.
id	A string. Identifier of an instance of the resource. Required to be unique within the resource type. Used in URIs as the identifier for specific instances of a type.
name	A string. A string used to give a name to the resource.
note	A list of notes (Note [*]). Extra information about a given entity.
operationalState	A resource operational state type (ResourceOperationalStateType). Tracks the operational state of the resource, such as enable, disable and so on.
place	A related place ref or value (RelatedPlaceRefOrValue). Related Entity reference. A related place defines a place described by reference or by value linked to a specific entity. The polymorphic attributes @type, @schemaLocation & @referredType are related to the place entity and not the RelatedPlaceRefOrValue class itself.
relatedParty	A list of related parties (RelatedParty [*]). Related Entity reference. A related party defines party or party role linked to a specific entity.
resourceCharacteristic	A list of characteristics (Characteristic [*]). Describes a given characteristic of an object or entity through a name/value pair.
resourceRelationship	A list of resource relationships (ResourceRelationship [*]). Linked resources to the one instantiate, such as [bundled] if the resource is a bundle and you want to describe the bundled resources inside this bundle; [reliesOn] if the resource needs another already owned resource to rely on (e.g. an option on an already owned mobile access resource) [targets] or [isTargeted] (depending on the way of expressing the link) for any other kind of links that may be useful.
resourceSpecification	A resource specification reference (ResourceSpecificationRef). The ResourceSpecification is required to realize a ProductSpecification.
resourceStatus	A resource status type (ResourceStatusType). Tracks the resource status of the resource, such as standby, alarm, available, reserved, suspended and so on.
resourceVersion	A string. A field that identifies the specific version of an instance of a resource.
startOperatingDate	A date time (DateTime). A date time( DateTime). The date from which the resource is operating.
usageState	A resource usage state type (ResourceUsageStateType). Tracks the usage state of the resource, such as idle, active, busy and so on.

AttachmentRefOrValue sub-resource

An attachment by value or by reference. For AttachmentRefOrValue, the attribute type, schemaLocation and referredType are related to the contained entity and not to AttachmentRefOrValue itself.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
description	A string. A narrative text describing the content of the attachment.
href	A string. URI for this Attachment.
id	A string. Unique identifier for this particular attachment.
url	A string. Uniform Resource Locator, is a web page address (a subset of URI).
name	A string. The name of the attachment.
attachmentType	A string. Attachment type such as video, picture.
content	A base 64 (Base64). The actual contents of the attachment object, if embedded, encoded as base64.
contentType	A string. Attachment mime type such as extension file for video, picture and document.
size	A quantity (Quantity). The size of the attachment.
validFor	A time period. The period of time for which the attachment is valid.

Characteristic sub-resource

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

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;

id	A string. Unique identifier of the characteristic.
relationshipType	A string. The type of relationship.

Feature sub-resource

Applicable configuration features for a resource specification.

constraint	A list of constraint references (ConstraintRef [*]). This is a list of feature constraints.
featureCharacteristic	A list of characteristics (Characteristic [1..*]). This is a list of Characteristics for a particular applicable feature of a resource.
featureRelationship	A list of feature relationships (FeatureRelationship [*]). Configuration feature.
id	A string. Unique identifier of the feature.
isBundle	A boolean. True if this is a feature group. Default is false.
isEnabled	A boolean. True if this feature is enabled. Default is true.
name	A string. This is the name for the feature.

#### FeatureRelationship sub-resource

Configuration feature.

id	A string. Unique identifier of the target feature.
name	A string. This is the name of the target feature.
relationshipType	A string. This is the type of the feature relationship.
validFor	A time period. The period for which this feature relationship is valid.

#### Note sub-resource

Extra information about a given entity.

author	A string. Author of the note.
date	A date time (DateTime). Date of the note.
id	A string. Identifier of the note within its containing entity (may or may not be globally unique, depending on provider implementation).
text	A string. Text of the note.

#### Quantity sub-resource

An amount in a given unit.

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

#### RelatedParty sub-resource

Related Entity reference. A related party defines party or party role linked to a specific entity.

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

href	A string. Reference of the related entity.
id	A string. Unique identifier of a related entity.
name	A string. Name of the related entity.
role	A string. Role played by the related party.

#### RelatedPlaceRefOrValue sub-resource

Related Entity reference. A related place defines a place described by reference or by value linked to a specific entity. The polymorphic attributes @type, @schemaLocation & @referredType are related to the place entity and not the RelatedPlaceRefOrValue class itself.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Unique reference of the place.
id	A string. Unique identifier of the place.
name	A string. A user-friendly name for the place, such as "Paris Store", "London Store", "Main Home".
role	A string.

#### ResourceRefOrValue sub-resource

A resource to be created defined by value or existing defined by reference. The polymorphic attributes @type, @schemaLocation & @referredType are related to the product entity and not the RelatedProductRefOrValue class itself.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. The URI for the object itself.
id	A string. Identifier of an instance of the resource. Required to be unique within the resource type. Used in URIs as the identifier for specific instances of a type.
name	A string. A string used to give a name to the resource.
category	A string. Category of the concrete resource. e.g Gold, Silver for MSISDN concrete resource.
description	A string. free-text description of the resource.
endOperatingDate	A date time (DateTime). A date time( DateTime). The date till the resource is operating.
resourceVersion	A string. A field that identifies the specific version of an instance of a resource.
startOperatingDate	A date time (DateTime). A date time( DateTime). The date from which the resource is operating.

activationFeature	A list of features (Feature [*]). Applicable configuration features of a resource for activation.
administrativeState	A resource administrative state type (ResourceAdministrativeStateType). Tracks the administrative state of the resource, such as locked, unlocked, shutdown and so on.
attachment	A list of attachment ref or values (AttachmentRefOrValue [*]). the attribute type,schemaLocation and referredType are related to the contained entity and not to AttchmentRefOrValue itself.
note	A list of notes (Note [*]). Extra information about a given entity.
operationalState	A resource operational state type (ResourceOperationalStateType). Tracks the operational state of the resource, such as enable, disable and so on.
place	A related place ref or value (RelatedPlaceRefOrValue). Related Entity reference. A related place defines a place described by reference or by value linked to a specific entity. The polymorphic attributes @type, @schemaLocation & @referredType are related to the place entity and not the RelatedPlaceRefOrValue class itself.
relatedParty	A list of related parties (RelatedParty [*]). Related Entity reference. A related party defines party or party role linked to a specific entity.
resourceCharacteristic	A list of characteristics (Characteristic [*]). Describes a given characteristic of an object or entity through a name/value pair.
resourceRelationship	A list of resource relationships (ResourceRelationship [*]). Linked resources to the one instantiate, such as [bundled] if the resource is a bundle and you want to describe the bundled resources inside this bundle; [reliesOn] if the resource needs another already owned resource to rely on (e.g. an option on an already owned mobile access resource) [targets] or [isTargeted] (depending on the way of expressing the link) for any other kind of links that may be useful.
resourceSpecification	A resource specification reference (ResourceSpecificationRef). The ResourceSpecification is required to realize a ProductSpecification.
resourceStatus	A resource status type (ResourceStatusType). Tracks the resource status of the resource, such as standby, alarm, available, reserved, suspended and so on.
usageState	A resource usage state type (ResourceUsageStateType). Tracks the usage state of the resource, such as idle, active, busy and so on.

#### ResourceRelationship sub-resource

Linked resources to the one instantiate, such as [bundled] if the resource is a bundle and you want to describe the bundled resources inside this bundle; [reliesOn] if the resource needs another already owned resource to rely on (e.g. an option on an already owned mobile access resource) [targets] or [isTargeted] (depending on the way of expressing the link) for any other kind of links that may be useful.

relationshipType	A string. Type of the resource relationship, such as [bundled] if the resource is a
------------------	---

bundle and you want to describe the bundled resources inside this bundle; [reliesOn] if the resource needs another already owned resource to rely on (e.g. an option on an already owned mobile access resource) [targets] or [isTargeted] (depending on the way of expressing the link) for any other kind of links that may be useful.

**resource** A resource ref or value (ResourceRefOrValue). A resource to be created defined by value or existing defined by reference. The polymorphic attributes @type, @schemaLocation & @referredType are related to the product entity and not the RelatedProductRefOrValue class itself.

#### ConstraintRef relationship

Constraint reference. The Constraint resource represents a policy/rule applied to an entity or entity spec.

**@referredType** A string. The (class) type of the referred constraint.

**href** A string. Hyperlink reference to the target constraint.

**id** A string. reference id to the target constraint.

**name** A string. Name given to the constraint.

**version** A string. constraint version.

#### ResourceSpecificationRef relationship

Resource Specification reference: The ResourceSpecification is required to realize a ProductSpecification.

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

**href** A string. Reference of the resource specification.

**id** A string. Unique identifier of the resource specification.

**name** A string. Name of the requiredResourceSpecification.

**version** A string. Resource specification version.

#### **Json representation sample**

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

```
{
  "id": "8044",
  "href": "http://server:port/resourceInventoryManagement/resource/8044",
  "description": "This is a MSISDN resource with the category Premium and with a reserved resourceStatus for organisations.",
  "category": "Premium",
  "value": "0170112231",
  "endOperatingDate": "2022-07-04T08:00.000Z",
  "name": "MobileNumber xx",
  "administrativeState": "locked",
  "operationalState": "enable",
  "usageState": "active",
  "resourceStatus": "reserved",
```

```

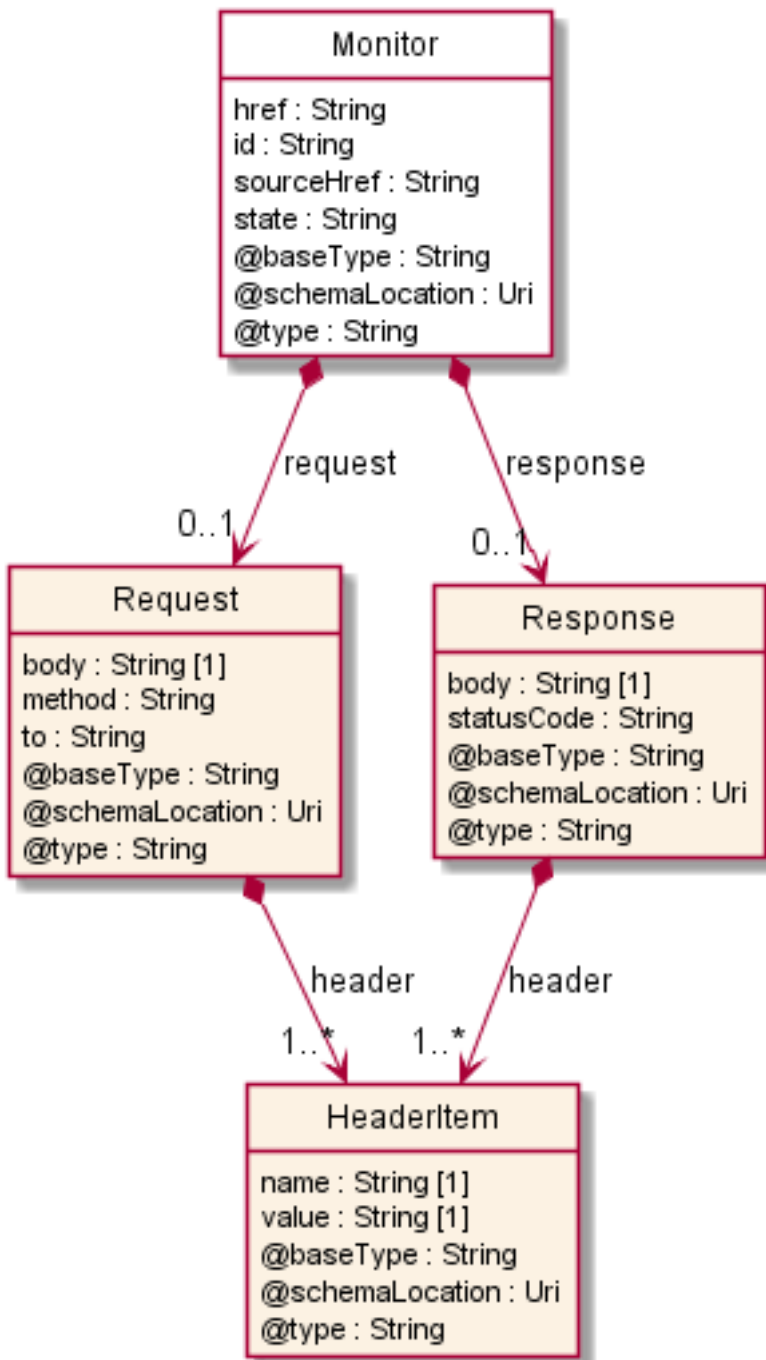
"relatedParty": [
  {
    "href": "https://server:port/tmf-api/partyManagement/v4/individual/456",
    "id": "456",
    "name": "John Doe",
    "role": "user",
    "@referredType": "Individual"
  }
],
"note": [
  {
    "text": "something about this resource"
  }
],
"place": {
  "id": "9912",
  "href": "https://host:port/geographicAddressManagement/v4/geographicAddress/9912",
  "@type": "PlaceRef",
  "@referredType": "GeographicAddress"
},
"resourceRelationship": [
  {
    "relationshipType": "contains",
    "resource": {
      "id": "44",
      "href": "http://server:port/resourceInventoryManagement/resource/44"
    }
  }
],
"resourceSpecification": {
  "id": "4",
  "href": "http://server:port/resourceCatalogManagement/resourceSpecification/4",
  "@referredType": "LogicalResourceSpecification"
},
"startOperatingDate": "2020-03-04T00:00.000Z",
"version": "business v2",
"@type": "MSISDN",
"@schemaLocation": "http://server:port/MSISDN_Resource.schema.json",
"@baseType": "Resource"
}

```

## Monitor resource

Monitoring of resources.



**Resource model****Field descriptions**Monitor fields

href	A string. reference to this monitor.
id	A string. Identifier of an instance of the monitor. Required to be unique within the resource type. Used in URIs as the identifier for specific instances of a type.
request	A request (Request). Represents the request.

response	A response (Response). Represents the response.
sourceHref	A string. The monitored resource href.
state	A string. The Monitor state of the resource. InProgress, InError, Completed.

HeaderItem sub-resource

An item typically included in a request or response.

name	A string. The name of the header item, e.g. locale.
value	A string. The value of the header item, e.g. en-us.

Request sub-resource

A response to a request.

body	A string. The body of the request. For example, for an HTTP request might contain content of a form.
header	A list of header items (HeaderItem [1..*]). Items included in the header of the request. For example, for an HTTP request might contain requested locale, basic authentication.
method	A string. The protocol of the request, e.g. http.
to	A string. The target of the request, e.g. a URL for an HTTP request.

Response sub-resource

A response to a request.

body	A string. The body of the response. For example, for an HTTP response might contain HTML for rendering.
header	A list of header items (HeaderItem [1..*]). Items included in the header of the response. For example, for an HTTP response might contain negotiated locale.
statusCode	A string. The status of the response. For example, for an HTTP response would be codes such as 200, 400, etc.

**Json representation sample**

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

```
{
  "href": "https://server:port/tmf-api/monitor/v4/monitor/4035",
  "id": "4035",
  "request": {
    "text": "--SEE RESOURCE REQUEST SAMPLE--"
  },
  "response": {
    "text": "--SEE RESOURCE RESPONSE SAMPLE--"
  }
}
```

```
    },  
    "sourceHref": "http://server:port/resourceInventoryManagement/logicalResource/444",  
    "state": "completed"  
  }  
}
```

## Notification Resource Models

8 notifications are defined for this API

Notifications related to Resource:

- ResourceCreateEvent
- ResourceAttributeValueChangeEvent
- ResourceStateChangeEvent
- ResourceDeleteEvent

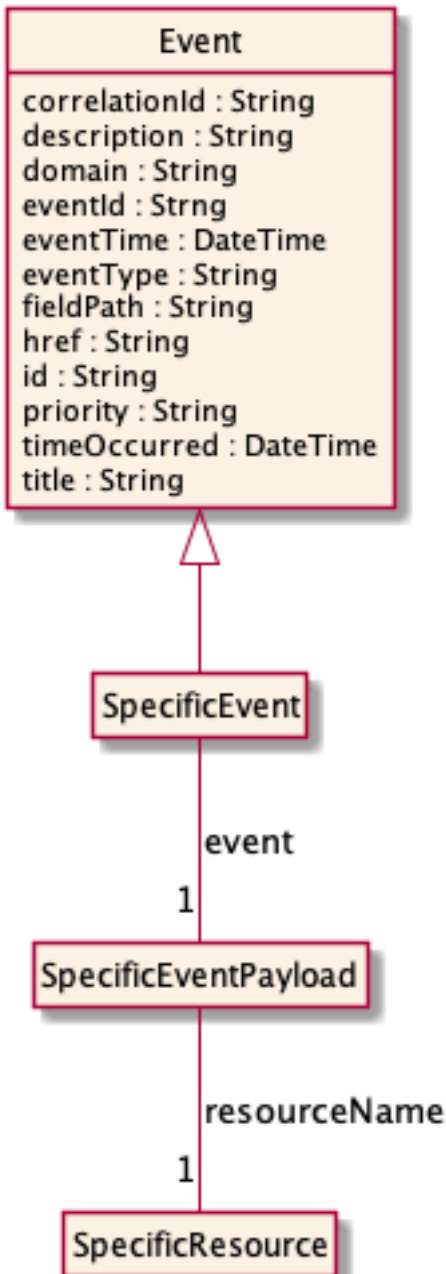
Notifications related to Monitor:

- MonitorCreateEvent
- MonitorAttributeValueChangeEvent
- MonitorStateChangeEvent
- MonitorDeleteEvent

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).



## Resource Create Event

Notification ResourceCreateEvent case for resource Resource

### Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ResourceCreateEvent",
  "event": {
    "resource" :
      [-- SEE Resource RESOURCE SAMPLE --]
  }
}

```

```
}

```

## Resource Attribute Value Change Event

Notification ResourceAttributeValueChangeEvent case for resource Resource

### Json representation sample

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

```
{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ResourceAttributeValueChangeEvent",
  "event": {
    "resource" :
      [-- SEE Resource RESOURCE SAMPLE --]
  }
}
```

## Resource State Change Event

Notification ResourceStateChangeEvent case for resource Resource

### Json representation sample

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

```
{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ResourceStateChangeEvent",
  "event": {
    "resource" :
      [-- SEE Resource RESOURCE SAMPLE --]
  }
}
```

## Resource Delete Event

Notification ResourceDeleteEvent case for resource Resource

### Json representation sample

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

```
{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ResourceDeleteEvent",
  "event": {
    "resource" :
```

```

    {
      {-- SEE Resource RESOURCE SAMPLE --}
    }
  }

```

## Monitor Create Event

Notification MonitorCreateEvent case for resource Monitor

### Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"MonitorCreateEvent",
  "event": {
    "monitor" :
      {-- SEE Monitor RESOURCE SAMPLE --}
  }
}

```

## Monitor Attribute Value Change Event

Notification MonitorAttributeValueChangeEvent case for resource Monitor

### Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"MonitorAttributeValueChangeEvent",
  "event": {
    "monitor" :
      {-- SEE Monitor RESOURCE SAMPLE --}
  }
}

```

## Monitor State Change Event

Notification MonitorStateChangeEvent case for resource Monitor

### Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"MonitorStateChangeEvent",

```

```
"event": {  
  "monitor" :  
    [-- SEE Monitor RESOURCE SAMPLE --]  
}  
}
```

## Monitor Delete Event

Notification MonitorDeleteEvent case for resource Monitor

### Json representation sample

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

```
{  
  "eventId":"00001",  
  "eventTime":"2015-11-16T16:42:25-04:00",  
  "eventType":"MonitorDeleteEvent",  
  "event": {  
    "monitor" :  
      [-- SEE Monitor 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 Resource

#### List resources

**GET /resource?fields=...&{filtering}**

#### Description

This operation list resource 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 activated Resource(s). The given criteria is the @type (MSISDN) and usageState (active).

<b>Request</b>
<pre>GET /tmf-api/ResourceActivationAndConfiguration/v4/resource?fields=id,href,usageState,@type&amp;usageState=active&amp;@type=MSISDN Accept: application/json</pre>
<b>Response</b>
<pre>200  {   "id": "444",   "href": "http://server:port/resourceInventoryManagement/logicalResource/444",   "category": "Premium",   "value": "0170123456",   "usageState": "idle",   "@type": "MSISDN" }</pre>

## Retrieve resource

**GET /resource/{id}?fields=...&{filtering}**

### Description

This operation retrieves a resource 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 an activated LogicalResource for use case 1. The given criteria is the Resource id 444.

<b>Request</b>
<pre>GET /tmf-api/ResourceActivationAndConfiguration/v4/resource/444 Accept: application/json</pre>

Response
<pre> 200  {   "id": "444",   "href": "http://server:port/resourceInventoryManagement/logicalResource/444",   "description": "This is a MSISDN resource with the category Premium and with an unlocked administrativeState.",   "category": "Premium",   "value": "0170123456",   "administrativeState": "unlocked",   "operationalState": "disable",   "usageState": "idle",   "resourceStatus": "available",   "resourceSpecification": {     "id": "4",     "href": " http://server:port/resourceCatalogManagement/resourceSpecification/4",     "@referredType": "LogicalResourceSpecification"   },   "resourceCharacteristic": [     {       "name": "premiumValue",       "valueType": "string",       "value": "gold"     }   ],   "relatedParty": [     {       "href": "https://server:port/tmf-api/partyManagement/v4/individual/456",       "id": "456",       "name": "John Doe",       "role": "user",       "@referredType": "Individual"     }   ],   "@type": "MSISDN",   "@schemaLocation": "http://server:port/MSISDN.schema.json",   "@baseType": "Resource" } </pre>

Here's an example of a request for retrieving an activated PhysicalResource for use case 1. The given criteria is the Resource id 42.

Request
<pre> GET /tmf-api/ResourceActivationAndConfiguration/v4/resource/42 Accept: application/json </pre>
Response
<pre> 200 </pre>

```

{
  "id": "42",
  "href": "http://server:port/resourceInventoryManagement/resource/42",
  "publicIdentifier": "07455559833",
  "name": "RouterXX",
  "administrativeState": "unlocked",
  "operationalState": "enable",
  "usageState": "idle",
  "resourceStatus": "available",
  "serialNumber": "12444545544",
  "versionNumber": "1.22",
  "manufactureDate": "05-04-2017T00:00.000Z",
  "resourceSpecification": {
    "id": "4",
    "href": " http://server:port/resourceCatalogManagement/resourceSpecification/4",
    "@referredType": "PhysicalResourceSpecification"
  },
  "resourceRelationship": [
    {
      "relationshipType": "contains",
      "resource": {
        "id": "44",
        "href": " http://server:port/resourceInventoryManagement/resource/44"
      }
    }
  ],
  "relatedParty": [
    {
      "href": "https://server:port/tmf-api/partyManagement/v4/individual/456",
      "id": "456",
      "name": "John Doe",
      "role": "user",
      "@referredType": "Individual"
    }
  ],
  "resourceAttachment": [
    {
      "id": "123",
      "href": "http://server:port/documentManagement/document/123"
    }
  ],
  "note": [
    {
      "text": "something about this resource"
    }
  ],
  "place": {
    "id": "9912",
    "href": "https://host:port/geographicAddressManagement/v4/geographicAddress/9912",
    "@type": "PlaceRef",
    "@referredType": "GeographicAddress"
  },
  "@type": "Equipment ",
  "@schemaLocation": "http://server:port/partyManagement/schema/Equipment.schema.json",
  "@baseType": "Resource"
}

```

**Create resource****POST /resource****Description**

This operation creates a resource entity.

**Mandatory and Non Mandatory Attributes**

The following tables provide the list of mandatory and non mandatory attributes when creating a Resource, 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
href	
id	

Non Mandatory Attributes	Rule
activationFeature	
administrativeState	
attachment	
category	
description	
endOperatingDate	
name	
note	
operationalState	
place	
relatedParty	
resourceCharacteristic	
resourceRelationship	
resourceSpecification	
resourceStatus	
resourceVersion	
startOperatingDate	
usageState	

**Usage Samples**

Here's an example of a request for creating a LogicalResource for activation use case 2 - the resulting resource ID is 444.

Request
POST /tmf-api/ResourceActivationAndConfiguration/v4/resource Content-Type: application/json {

```

"category": "Premium",
"value": "0170123456",
"administrativeState": "unlocked",
"operationalState": "disable",
"usageState": "idle",
"resourceStatus": "available",
"resourceSpecification": {
  "id": "4",
  "href": " http://server:port/resourceCatalogManagement/resourceSpecification/4",
  "@referredType": "LogicalResourceSpecification"
},
"resourceCharacteristic": [
  {
    "name": "premiumValue",
    "valueType": "string",
    "value": "gold"
  }
],
"relatedParty": [
  {
    "href": "https://server:port/tmf-api/partyManagement/v4/individual/456",
    "id": "456",
    "name": "John Doe",
    "role": "user",
    "@referredType": "Individual"
  }
],
"@type": "MSISDN",
"@schemaLocation": "http://server:port/MSISDN.schema.json",
"@baseType": "Resource"
}

```

## Response

```

201

{
  "id": "444",
  "href": "http://server:port/resourceInventoryManagement/logicalResource/444",
  "category": "Premium",
  "value": "0170123456",
  "administrativeState": "unlocked",
  "operationalState": "disable",
  "usageState": "idle",
  "resourceStatus": "available",
  "resourceSpecification": {
    "id": "4",
    "href": "http://server:port/resourceCatalogManagement/resourceSpecification/4",
    "@referredType": "LogicalResourceSpecification"
  },
  "resourceCharacteristic": [
    {
      "name": "premiumValue",
      "valueType": "string",
      "value": "gold"
    }
  ]
}

```

```

    }
  ],
  "relatedParty": [
    {
      "href": "https://server:port/tmf-api/partyManagement/v4/individual/456",
      "id": "456",
      "name": "John Doe",
      "role": "user",
      "@referredType": "Individual"
    }
  ],
  "@type": "MSISDN",
  "@schemaLocation": "http://server:port/MSISDN.schema.json",
  "@baseType": "Resource"
}

```

## Patch resource

### PATCH /resource/{id}

#### Description

This operation allows partial updates of a resource 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
activationFeature	
administrativeState	
attachment	
category	
description	
endOperatingDate	
name	
note	
operationalState	
place	
relatedParty	
resourceCharacteristic	
resourceRelationship	
resourceSpecification	
resourceStatus	

Patchable Attributes	Rule
resourceVersion	
startOperatingDate	
usageState	

Non Patchable Attributes	Rule
id	
href	

## Usage Samples

Here's an example of a request for updating a usageState of a PhysicalResource for use case 2 - Change value of the resourceStatus for resource id 42.

Request
PATCH /tmf-api/ResourceActivationAndConfiguration/v4/resource/42 Content-Type: merge-patch/json  <pre>{   "resourceStatus": "reserved" }</pre>
Response
200  <pre>{   "id": "42",   "href": "http://server:port/resourceInventoryManagement/resource/42",   "publicIdentifier": "07455559833",   "name": "RouterXX",   "administrativeState": "unlocked",   "operationalState": "enable",   "usageState": "idle",   "resourceStatus": "reserved",   "serialNumber": "12444545544",   "versionNumber": "1.22",   "manufactureDate": "05-04-2017T08:00.000Z",   "resourceSpecification": {     "id": "4",     "href": "http://server:port/resourceCatalogManagement/resourceSpecification/4",     "@referredType": "PhysicalResourceSpecification"   },   "resourceRelationship": [     {       "type": "contains",       "resource": {         "id": "44",         "href": "http://server:port/resourceInventoryManagement/resource/44"       }     }   ] }</pre>

```

    }
  }
],
"relatedParty": [
  {
    "href": "https://server:port/tmf-api/partyManagement/v4/individual/456",
    "id": "456",
    "name": "John Doe",
    "role": "user",
    "@referredType": "Individual"
  }
],
"resourceAttachment": [
  {
    "id": "123",
    "href": "http://server:port/documentManagement/document/123"
  }
],
"note": [
  {
    "text": "something about this resource"
  }
],
"place": {
  "id": "9912",
  "href": "https://host:port/geographicAddressManagement/v4/geographicAddress/9912",
  "@type": "PlaceRef",
  "@referredType": "GeographicAddress"
},
"@type": "Equipment",
"@schemaLocation": "http://server:port/partyManagement/schema/Equipment.schema.json",
"@baseType": "Resource"
}

```

## Delete resource

**DELETE** /resource/{id}

### Description

This operation deletes a resource entity.

### Usage Samples

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

Request
DELETE /tmf-api/ResourceActivationAndConfiguration/v4/resource/444



<b>Response</b>
204

## Operations on Monitor

### List monitors

**GET** /monitor?fields=...&{filtering}

#### Description

This operation list monitor 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 Monitor resource. The given criteria is the state (completed).

<b>Request</b>
GET /tmf-api/ResourceActivationAndConfiguration/v4/monitor?fields=id,href,response,state&state=inProcess Accept: application/json
<b>Response</b>
200  <pre>{   "id": "5634",   "href": "https://server:port/resource/v4/monitor/5634",   "response": {     "text": "--SEE RESOURCE RESPONSE SAMPLE--"   },   "state": "InProgress" }</pre>

## Retrieve monitor

```
GET /monitor/{id}?fields=...&{filtering}
```

### Description

This operation retrieves a monitor 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 the Monitor for use case 1. The given criteria is the Monitor id 5633.

<b>Request</b>
GET /tmf-api/ResourceActivationAndConfiguration/v4/monitor/5633 Accept: application/json
<b>Response</b>
200  { "id": "5633", "href": "https://<server>/resource/v4/monitor/5633", "response": { "text": "--SEE RESOURCE RESPONSE SAMPLE--" }, "state": "completed" }

## 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.

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

## 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.

<b>Request</b>
DELETE /api/hub/42 Accept: application/json
<b>Response</b>
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.

<b>Request</b>
POST /client/listener Accept: application/json  { "event": { EVENT BODY }, "eventType": "EVENT_TYPE" }
<b>Response</b>
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	15-Apr-2017	Pierre Gauthier TM Forum <a href="mailto:pgauthier@tmforum.org">pgauthier@tmforum.org</a>  Mariano Belaunde Orange Labs	First Release of the Document.
Release 2.0	06-Nov-2018	Mariano Belaunde Orange Labs	Alignment with Guidelines 3.0
Version 4.0.0	28-May-2020	Thomas Braun  Deutsche Telekom	Based on the TMF Open API Common Data Model

## Release History

Release Number	Date	Release led by:	Description
Pre-production	28-May-2020	Thomas Braun  Deutsche Telekom	Based on the TMF Open API Common Data Model