**TM Forum Specification**

**XXX Management API REST Specification**

**TMFXXX**

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Introduction

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

# SAMPLE USE CASES

Reader will find example of use cases using Usage API in “Open Digital Business Scenarios and Use Cases” 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 BillingAccount and SettlementAccount inheriting properties from the abstract Account 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 Account instances some may be instances of BillingAccount where other could be instances of SettlementAccount. 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 an AccountRef 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 BillingAccountRef or SettlementAccountRef, 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.

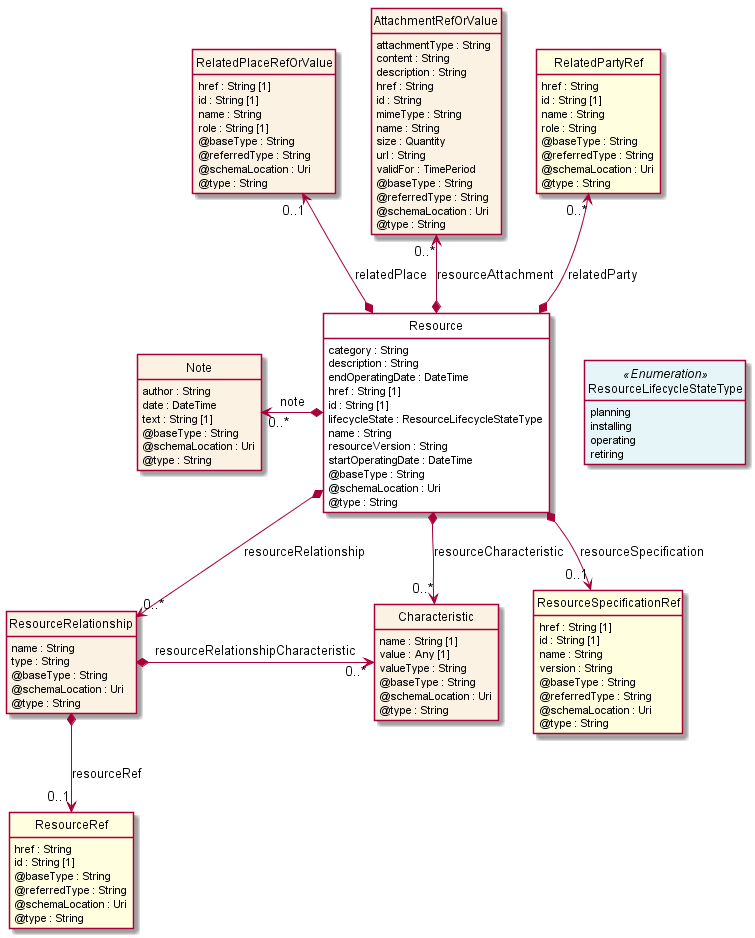
# RESOURCE MODEL

## 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

|  |  |
| --- | --- |
| 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. |
| lifecycleState | A resource lifecycle state type (ResourceLifecycleStateType). Tracks the lifecycle status of the resource, such as planning, installing, opereating, retiring and so on. |
| 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. |
| relatedParty | A list of related party references (RelatedPartyRef [\*]). A related party defines party or party role linked to a specific entity. |
| relatedPlace | 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. |
| resourceAttachment | 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. |
| 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 [\*]). |
| resourceSpecification | A resource specification reference (ResourceSpecificationRef). The ResourceSpecification is required to realize a ProductSpecification. |
| 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. |

*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 AttchmentRefOrValue 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 string. The actual contents of the attachment object, if embedded, encoded as base64. |
| mimeType | 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.

|  |  |
| --- | --- |
| 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. |

*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. |
| 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. |

*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. |

*ResourceRelationship* sub-resource

|  |  |
| --- | --- |
| name | A string. |
| resourceRef | A resource reference (ResourceRef). |
| resourceRelationshipCharacteristic | A list of characteristics (Characteristic [\*]). Describes a given characteristic of an object or entity through a name/value pair. |
| type | A string. |

*RelatedPartyRef* relationship

RelatedParty 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 party, could be a party reference or a party role reference. |
| id | A string. Unique identifier of a related party. |
| name | A string. Name of the related party. |
| role | A string. Role of the related party. |

*ResourceRef* relationship

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

*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**

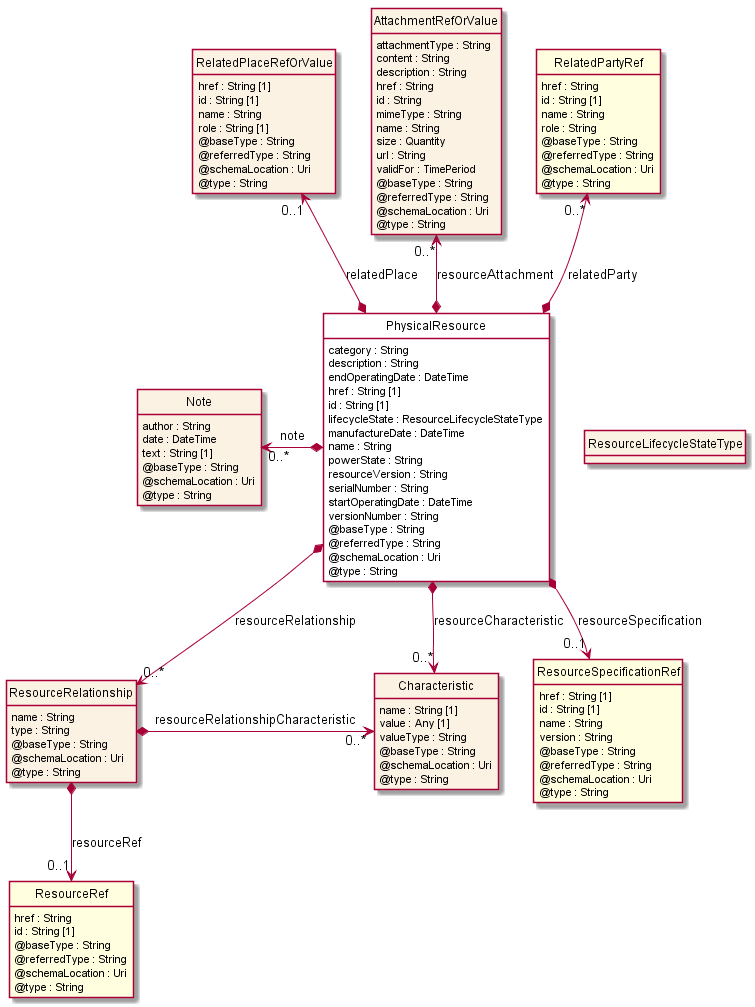
We provide below the json representation of an example of a 'Resource' resource object

|  |
| --- |
| {  "category": "a string ...",  "characteristic": [  {}  ],  "description": "This resource ...",  "endOperatingDate": "2019-07-04T00:00",  "href": "https:/host:port/tmf-api/resource/v1/resource/8031",  "id": "8031",  "lifecycleState": "a string ...",  "name": "a string ...",  "note": [  {}  ],  "partyRole": [  {}  ],  "place": {},  "relatedParty": [  {}  ],  "resourceRelationship": [  {}  ],  "resourceSpecification": {},  "startOperatingDate": "2019-07-04T00:00",  "version": "a string ..." } |

### Physical Resource resource

Physical resource is a type of resource that describes the common set of attributes shared by all concrete physical resources (e.g. EQUIPMENT) in the inventory.

**Resource model**



**Field descriptions**

*PhysicalResource* fields

|  |  |
| --- | --- |
| 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. |
| 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. |
| @referredType | A string. The actual type of the target instance when needed for disambiguation. |
| manufactureDate | A date time (DateTime). This is a string attribute that defines the date of manufacture of this item in the fixed format "dd/mm/yyyy". This is an optional attribute. |
| powerState | A string. This defines the current power status of the hardware item. Values include:   0: Unknown  1: Not Applicable  2: No Power Applied  3: Full Power Applied  4: Power Save - Normal  5: Power Save - Degraded  6: Power Save - Standby  7: Power Save - Critical  8: Power Save - Low Power Mode  9: Power Save - Unknown  10: Power Cycle  11: Power Warning  12: Power Off. |
| serialNumber | A string. This is a string that represents a manufacturer-allocated number used to identify different instances of the same hardware item. The ModelNumber and PartNumber attributes are used to identify different types of hardware items. This is a REQUIRED attribute. |
| versionNumber | A string. This is a string that identifies the version of this physical resource. This is an optional attribute. |
| lifecycleState | A resource lifecycle state type (ResourceLifecycleStateType). Tracks the lifecycle status of the resource, such as planning, installing, opereating, retiring and so on. |
| note | A list of notes (Note [\*]). Extra information about a given entity. |
| relatedParty | A list of related party references (RelatedPartyRef [\*]). A related party defines party or party role linked to a specific entity. |
| relatedPlace | 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. |
| resourceAttachment | 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. |
| 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 [\*]). |
| resourceSpecification | A resource specification reference (ResourceSpecificationRef). The ResourceSpecification is required to realize a ProductSpecification. |

*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 AttchmentRefOrValue 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 string. The actual contents of the attachment object, if embedded, encoded as base64. |
| mimeType | 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.

|  |  |
| --- | --- |
| 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. |

*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. |
| 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. |

*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. |

*ResourceRelationship* sub-resource

|  |  |
| --- | --- |
| name | A string. |
| resourceRef | A resource reference (ResourceRef). |
| resourceRelationshipCharacteristic | A list of characteristics (Characteristic [\*]). Describes a given characteristic of an object or entity through a name/value pair. |
| type | A string. |

*RelatedPartyRef* relationship

RelatedParty 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 party, could be a party reference or a party role reference. |
| id | A string. Unique identifier of a related party. |
| name | A string. Name of the related party. |
| role | A string. Role of the related party. |

*ResourceRef* relationship

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

*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**

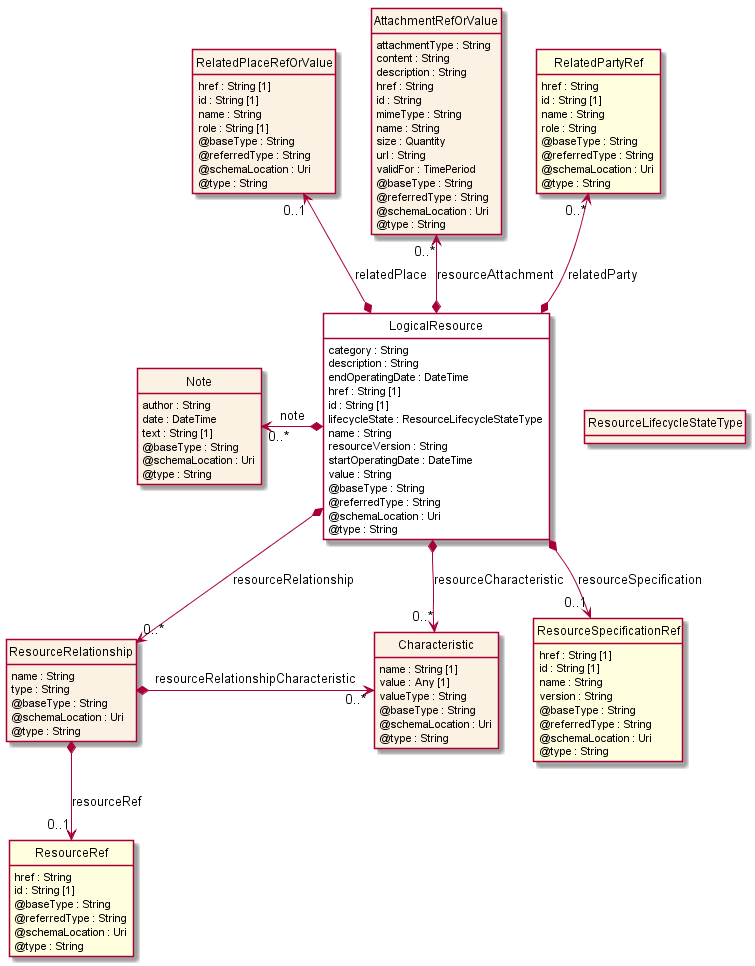
We provide below the json representation of an example of a 'PhysicalResource' resource object

|  |
| --- |
| {  "category": "a string ...",  "description": "This physical resource ...",  "endOperatingDate": "2019-10-22T00:00",  "href": "https:/host:port/tmf-api/physicalResource/v1/physicalResource/9510",  "id": "9510",  "name": "a string ...",  "resourceVersion": "a string ...",  "startOperatingDate": "2019-10-22T00:00",  "manufactureDate": "2019-10-22T00:00",  "powerState": "a string ...",  "serialNumber": "a string ...",  "versionNumber": "a string ...",  "lifecycleState": {},  "note": [  {}  ],  "relatedParty": [  {}  ],  "relatedPlace": {},  "resourceAttachment": [  {}  ],  "resourceCharacteristic": [  {}  ],  "resourceRelationship": [  {}  ],  "resourceSpecification": {} } |

### Logical Resource resource

Logic resource is a type of resource that describes the common set of attributes shared by all concrete logical resources (e.g. TPE, MSISDN, IP Addresses) in the inventory.

**Resource model**



**Field descriptions**

*LogicalResource* fields

|  |  |
| --- | --- |
| 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. |
| 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. |
| @referredType | A string. The actual type of the target instance when needed for disambiguation. |
| value | A string. the value of the logical resource. E.g '0746712345' for MSISDN's. |
| lifecycleState | A resource lifecycle state type (ResourceLifecycleStateType). Tracks the lifecycle status of the resource, such as planning, installing, opereating, retiring and so on. |
| note | A list of notes (Note [\*]). Extra information about a given entity. |
| relatedParty | A list of related party references (RelatedPartyRef [\*]). A related party defines party or party role linked to a specific entity. |
| relatedPlace | 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. |
| resourceAttachment | 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. |
| 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 [\*]). |
| resourceSpecification | A resource specification reference (ResourceSpecificationRef). The ResourceSpecification is required to realize a ProductSpecification. |

*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 AttchmentRefOrValue 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 string. The actual contents of the attachment object, if embedded, encoded as base64. |
| mimeType | 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.

|  |  |
| --- | --- |
| 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. |

*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. |
| 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. |

*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. |

*ResourceRelationship* sub-resource

|  |  |
| --- | --- |
| name | A string. |
| resourceRef | A resource reference (ResourceRef). |
| resourceRelationshipCharacteristic | A list of characteristics (Characteristic [\*]). Describes a given characteristic of an object or entity through a name/value pair. |
| type | A string. |

*RelatedPartyRef* relationship

RelatedParty 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 party, could be a party reference or a party role reference. |
| id | A string. Unique identifier of a related party. |
| name | A string. Name of the related party. |
| role | A string. Role of the related party. |

*ResourceRef* relationship

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

*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 'LogicalResource' resource object

|  |
| --- |
| {  "category": "a string ...",  "description": "This logical resource ...",  "endOperatingDate": "2019-10-22T00:00",  "href": "https:/host:port/tmf-api/logicalResource/v1/logicalResource/6437",  "id": "6437",  "name": "a string ...",  "resourceVersion": "a string ...",  "startOperatingDate": "2019-10-22T00:00",  "value": "a string ...",  "lifecycleState": {},  "note": [  {}  ],  "relatedParty": [  {}  ],  "relatedPlace": {},  "resourceAttachment": [  {}  ],  "resourceCharacteristic": [  {}  ],  "resourceRelationship": [  {}  ],  "resourceSpecification": {} } |

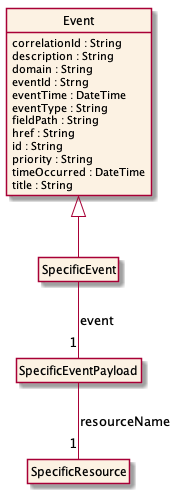
## Notification Resource Models

8 notifications are defined for this API

Notifications related to Resource:  
 - ResourceCreateEvent  
 - ResourceAttributeValueChangeEvent  
 - ResourceStateChangeEvent  
 - ResourceDeleteEvent

Notifications related to PhysicalResource:  
 - PhysicalResourceCreateEvent  
 - PhysicalResourceAttributeValueChangeEvent  
 - PhysicalResourceStateChangeEvent  
 - PhysicalResourceDeleteEvent

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 --}  } } |

### Physical Resource Create Event

Notification PhysicalResourceCreateEvent case for resource PhysicalResource

**Json representation sample**

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

|  |
| --- |
| {  "eventId":"00001",  "eventTime":"2015-11-16T16:42:25-04:00",  "eventType":"PhysicalResourceCreateEvent",  "event": {  "physicalResource" :   {-- SEE PhysicalResource RESOURCE SAMPLE --}  } } |

### Physical Resource Attribute Value Change Event

Notification PhysicalResourceAttributeValueChangeEvent case for resource PhysicalResource

**Json representation sample**

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

|  |
| --- |
| {  "eventId":"00001",  "eventTime":"2015-11-16T16:42:25-04:00",  "eventType":"PhysicalResourceAttributeValueChangeEvent",  "event": {  "physicalResource" :   {-- SEE PhysicalResource RESOURCE SAMPLE --}  } } |

### Physical Resource State Change Event

Notification PhysicalResourceStateChangeEvent case for resource PhysicalResource

**Json representation sample**

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

|  |
| --- |
| {  "eventId":"00001",  "eventTime":"2015-11-16T16:42:25-04:00",  "eventType":"PhysicalResourceStateChangeEvent",  "event": {  "physicalResource" :   {-- SEE PhysicalResource RESOURCE SAMPLE --}  } } |

### Physical Resource Delete Event

Notification PhysicalResourceDeleteEvent case for resource PhysicalResource

**Json representation sample**

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

|  |
| --- |
| {  "eventId":"00001",  "eventTime":"2015-11-16T16:42:25-04:00",  "eventType":"PhysicalResourceDeleteEvent",  "event": {  "physicalResource" :   {-- SEE PhysicalResource 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 |
| 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.

## 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 Resource resources.

|  |
| --- |
| **Request** |
| GET /tmf-api/resourceInventoryManagement/v4/resource Accept: application/json |
| **Response** |
| 200  [ {  "category": "a string ...",  "characteristic": [  {}  ],  "description": "This resource ...",  "endOperatingDate": "2019-07-04T00:00",  "href": "https:/host:port/tmf-api/resource/v1/resource/8031",  "id": "8031",  "lifecycleState": "a string ...",  "name": "a string ...",  "note": [  {}  ],  "partyRole": [  {}  ],  "place": {},  "relatedParty": [  {}  ],  "resourceRelationship": [  {}  ],  "resourceSpecification": {},  "startOperatingDate": "2019-07-04T00:00",  "version": "a string ..." } ] |

### 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 a Resource resource.

|  |
| --- |
| **Request** |
| GET /tmf-api/resourceInventoryManagement/v4/resource/8031 Accept: application/json |
| **Response** |
| 200  {  "category": "a string ...",  "characteristic": [  {}  ],  "description": "This resource ...",  "endOperatingDate": "2019-07-04T00:00",  "href": "https:/host:port/tmf-api/resource/v1/resource/8031",  "id": "8031",  "lifecycleState": "a string ...",  "name": "a string ...",  "note": [  {}  ],  "partyRole": [  {}  ],  "place": {},  "relatedParty": [  {}  ],  "resourceRelationship": [  {}  ],  "resourceSpecification": {},  "startOperatingDate": "2019-07-04T00:00",  "version": "a string ..." } |

### 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 |
| name |  |
| href |  |
| id |  |

|  |  |
| --- | --- |
| Non Mandatory Attributes | Rule |
| category |  |
| description |  |
| endOperatingDate |  |
| lifecycleState |  |
| note |  |
| relatedParty |  |
| relatedPlace |  |
| resourceAttachment |  |
| resourceCharacteristic |  |
| resourceRelationship |  |
| resourceSpecification |  |
| resourceVersion |  |
| startOperatingDate |  |

**Usage Samples**

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

|  |
| --- |
| **Request** |
| POST /tmf-api/resourceInventoryManagement/v4/resource Content-Type: application/json  {  "href": "https:/host:port/tmf-api/resource/v1/resource/8031",  "id": "8031",  "name": "a string ..." } |
| **Response** |
| 201  {  "href": "https:/host:port/tmf-api/resource/v1/resource/8031",  "id": "8031",  "name": "a string ..." } |

### 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 |
| category |  |
| description |  |
| endOperatingDate |  |
| lifecycleState |  |
| name |  |
| note |  |
| relatedParty |  |
| relatedPlace |  |
| resourceAttachment |  |
| resourceCharacteristic |  |
| resourceRelationship |  |
| resourceSpecification |  |
| resourceVersion |  |
| startOperatingDate |  |

|  |  |
| --- | --- |
| Non Patchable Attributes | Rule |
| href |  |
| id |  |

**Usage Samples**

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

|  |
| --- |
| **Request** |
| PATCH /tmf-api/resourceInventoryManagement/v4/resource/8031 Content-Type: application/merge-patch+json  {  "name": "new name" } |
| **Response** |
| 200  {  "category": "a string ...",  "characteristic": [  {}  ],  "description": "This resource ...",  "endOperatingDate": "2019-07-04T00:00",  "href": "https:/host:port/tmf-api/resource/v1/resource/8031",  "id": "8031",  "lifecycleState": "a string ...",  "name": "new name",  "note": [  {}  ],  "partyRole": [  {}  ],  "place": {},  "relatedParty": [  {}  ],  "resourceRelationship": [  {}  ],  "resourceSpecification": {},  "startOperatingDate": "2019-07-04T00:00",  "version": "a string ..." } |

### 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 resource.

|  |
| --- |
| **Request** |
| DELETE /tmf-api/resourceInventoryManagement/v4/resource/42 |
| **Response** |
| 204 |

## Operations on Physical Resource

### List physical resources

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

**Description**

This operation list physical 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 PhysicalResource resources.

|  |
| --- |
| **Request** |
| GET /tmf-api/resourceInventoryManagement/v4/physicalResource Accept: application/json |
| **Response** |
| 200  [ {  "category": "a string ...",  "description": "This physical resource ...",  "endOperatingDate": "2019-10-22T00:00",  "href": "https:/host:port/tmf-api/physicalResource/v1/physicalResource/9510",  "id": "9510",  "name": "a string ...",  "resourceVersion": "a string ...",  "startOperatingDate": "2019-10-22T00:00",  "manufactureDate": "2019-10-22T00:00",  "powerState": "a string ...",  "serialNumber": "a string ...",  "versionNumber": "a string ...",  "lifecycleState": {},  "note": [  {}  ],  "relatedParty": [  {}  ],  "relatedPlace": {},  "resourceAttachment": [  {}  ],  "resourceCharacteristic": [  {}  ],  "resourceRelationship": [  {}  ],  "resourceSpecification": {} } ] |

### Retrieve physical resource

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

**Description**

This operation retrieves a physical 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 a PhysicalResource resource.

|  |
| --- |
| **Request** |
| GET /tmf-api/resourceInventoryManagement/v4/physicalResource/9510 Accept: application/json |
| **Response** |
| 200  {  "category": "a string ...",  "description": "This physical resource ...",  "endOperatingDate": "2019-10-22T00:00",  "href": "https:/host:port/tmf-api/physicalResource/v1/physicalResource/9510",  "id": "9510",  "name": "a string ...",  "resourceVersion": "a string ...",  "startOperatingDate": "2019-10-22T00:00",  "manufactureDate": "2019-10-22T00:00",  "powerState": "a string ...",  "serialNumber": "a string ...",  "versionNumber": "a string ...",  "lifecycleState": {},  "note": [  {}  ],  "relatedParty": [  {}  ],  "relatedPlace": {},  "resourceAttachment": [  {}  ],  "resourceCharacteristic": [  {}  ],  "resourceRelationship": [  {}  ],  "resourceSpecification": {} } |

### Create physical resource

**POST /physicalResource**

**Description**

This operation creates a physical resource entity.

**Mandatory and Non Mandatory Attributes**

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

|  |  |
| --- | --- |
| Non Mandatory Attributes | Rule |
| category |  |
| description |  |
| endOperatingDate |  |
| resourceVersion |  |
| startOperatingDate |  |
| @referredType |  |
| manufactureDate |  |
| powerState |  |
| serialNumber |  |
| versionNumber |  |
| lifecycleState |  |
| note |  |
| relatedParty |  |
| relatedPlace |  |
| resourceAttachment |  |
| resourceCharacteristic |  |
| resourceRelationship |  |
| resourceSpecification |  |

**Usage Samples**

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

|  |
| --- |
| **Request** |
| POST /tmf-api/resourceInventoryManagement/v4/physicalResource Content-Type: application/json  {  "href": "https:/host:port/tmf-api/physicalResource/v1/physicalResource/9510",  "id": "9510",  "name": "a string ..." } |
| **Response** |
| 201  {  "href": "https:/host:port/tmf-api/physicalResource/v1/physicalResource/9510",  "id": "9510",  "name": "a string ..." } |

### Patch physical resource

**PATCH /physicalResource/{id}**

**Description**

This operation allows partial updates of a physical 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 |
| category |  |
| description |  |
| endOperatingDate |  |
| name |  |
| resourceVersion |  |
| startOperatingDate |  |
| @referredType |  |
| manufactureDate |  |
| powerState |  |
| serialNumber |  |
| versionNumber |  |
| lifecycleState |  |
| note |  |
| relatedParty |  |
| relatedPlace |  |
| resourceAttachment |  |
| resourceCharacteristic |  |
| resourceRelationship |  |
| resourceSpecification |  |

|  |  |
| --- | --- |
| Non Patchable Attributes | Rule |
| href |  |
| id |  |

**Usage Samples**

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

|  |
| --- |
| **Request** |
| PATCH /tmf-api/resourceInventoryManagement/v4/physicalResource/9510 Content-Type: application/merge-patch+json  {  "name": "new name" } |
| **Response** |
| 200  {  "category": "a string ...",  "description": "This physical resource ...",  "endOperatingDate": "2019-10-22T00:00",  "href": "https:/host:port/tmf-api/physicalResource/v1/physicalResource/9510",  "id": "9510",  "name": "new name",  "resourceVersion": "a string ...",  "startOperatingDate": "2019-10-22T00:00",  "manufactureDate": "2019-10-22T00:00",  "powerState": "a string ...",  "serialNumber": "a string ...",  "versionNumber": "a string ...",  "lifecycleState": {},  "note": [  {}  ],  "relatedParty": [  {}  ],  "relatedPlace": {},  "resourceAttachment": [  {}  ],  "resourceCharacteristic": [  {}  ],  "resourceRelationship": [  {}  ],  "resourceSpecification": {} } |

### Delete physical resource

**DELETE /physicalResource/{id}**

**Description**

This operation deletes a physical resource entity.

**Usage Samples**

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

|  |
| --- |
| **Request** |
| DELETE /tmf-api/resourceInventoryManagement/v4/physicalResource/42 |
| **Response** |
| 204 |

## Operations on Logical Resource

# 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

## Release History

|  |  |  |  |
| --- | --- | --- | --- |
| **Release Number** | **Date** | **Release led by:** | **Description** |
| Release 1.0 | 04/15/2017 | Pierre Gauthier TM Forum [pgauthier@tmforum.org](mailto:pgauthier@tmforum.org)  Mariano Belaunde Orange Labs | First Release of the Document. |
| Release 2.0 | 11/06/2018 | Mariano Belaunde  Orange Labs | Alignment with Guidelines 3.0 |

## Contributors to Document

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