

TM Forum Specification

Resource Catalog Management API User Guide

TMF634

Team Approved Date: 12-Oct-2020

Release Status: Pre-Production	Approval Status: Team Approved
Version 4.1.0	IPR Mode: RAND

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N/A

Introduction

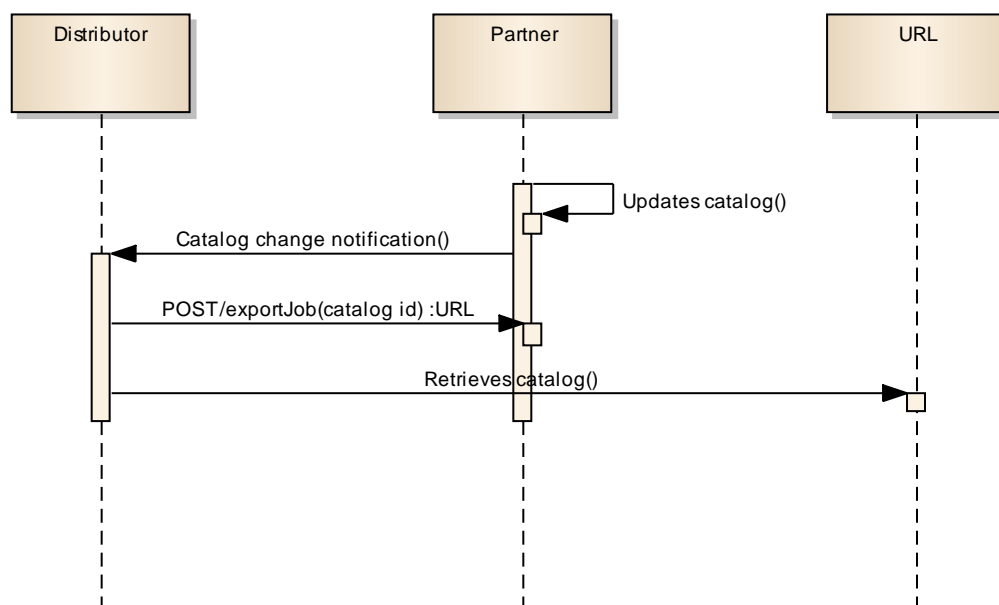
The Resource Catalog Management API allows the management of the entire lifecycle of the Resource Catalog elements and the consultation of resource catalog elements during several processes such as ordering process.

Sample Use Cases

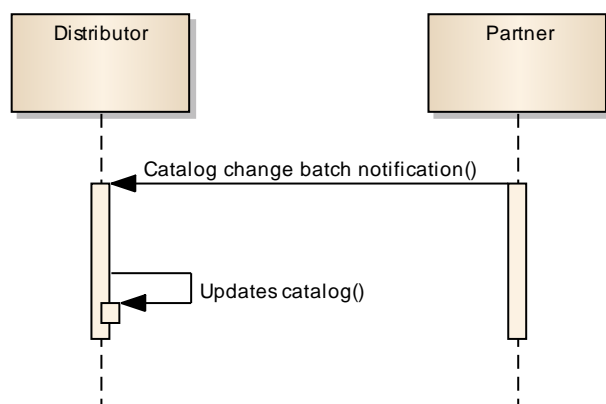
Lifecycle Management Use Cases

The Resource Catalog Management API allows the management of the entire lifecycle of the resource catalog elements. The followings are use case examples of resource catalog management. Please refer to Frameworkx guidebook GB978 for more information.

UC1: A partner updates his catalog. He notifies his distributor the catalog change. The distributor requests a catalog export. Then, he retrieves the catalog at the provided URL.



UC2: A partner updates his catalog. He notifies all catalog changes in detail to his distributor. This one updates his catalog copy.



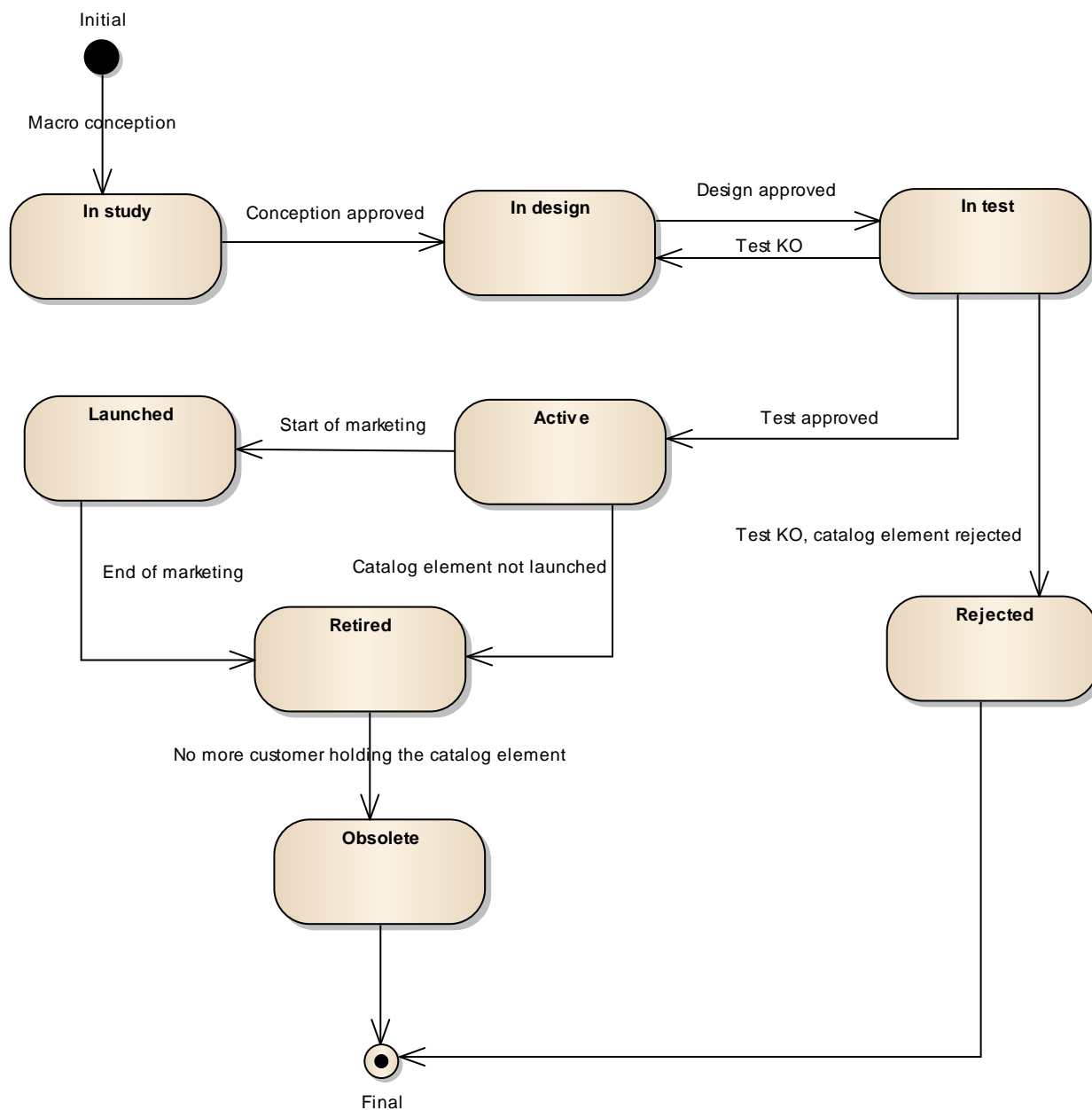
UC3: A catalog administrator wants to retrieve effective duration of a resource candidate based on resource candidate identifier or other search criteria (GET /resourceCandidate/{ID}).

UC4: A catalog administrator wants to retrieve all resource candidates in resource catalog (GET /resourceCandidate).

UC5: A catalog administrator wants to update the lifecycle status (from Launched to retired for example) of a resource candidate (PATCH /resourceCandidate/{ID}).

Lifecycle Management

Resource Lifecycle Management is responsible for managing the entire lifecycle of the resource catalog element and its underlying components. This include all the processes required to design, build, deploy, maintain and ultimately retire the catalog element.



When the macro conception of a catalog element is started the first status of the later is “In Study”.

When the conception of the catalog element is accepted, its status is changed to “In Design”.

If the design is approved its status is changed to “In Test”.

Then either the test is OK and then its status is changed to “Active” or the test is KO and its status is changed to “Rejected”. The Rejected status is a final status.

When a catalog element is in a “Active” status it means, it has been validated and tested, but it is still not available for customers.

When the beginning of marketing is reached, its status is changed to “Launched”. At this moment, customers can buy it.

If the catalog element is not launched, its status is changed to “Retired”.

The same status is achieved when a catalog element reaches the end of marketing.

The “Retired” status means it cannot be sold to any new customers, but previous customers can still have it.

When no more customer holds the catalog element, its status is changed to “Obsolete” meaning it can be removed from the catalog.

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 `PhysicalDeviceSpecification` and `PhysicalBlackBoxSpec` inheriting properties from the base `PhysicalResourceSpecification` 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 `PhysicalResourceSpecification` instances some may be instances of `PhysicalDeviceSpecification` where other could be instances of `PhysicalBlackBoxSpec`. 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 `PhysicalResourceSpecificationRef` 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 `PhysicalResourceSpecificationRef`, 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.

Characteristics and Features

The catalog model allows a specification to be described by characteristics and/or by features. Both approaches are valid, and they can be combined in the same specification

Characteristics

A characteristic is a name-value pair defining an aspect of the instantiated entity. The corresponding characteristic specification includes metadata such as:

- The name of the characteristic
- The value (data) type of the characteristic (could be simple or complex)
- Whether or not the value can be set at instantiation
- Whether or not the value must be supplied at instantiation, and the cardinality (how many values are allowed)
- List or range of allowed values

For example, a virtual firewall can run on multiple operating systems. This could be implemented as a characteristic describing the operating system hosting the firewall.

- The name of the characteristic could be **Host Operating System**
- The value type would be **string**
- It is a configurable characteristic
- The value must be supplied
- The valid values could be **RH Linux, Ubuntu, Oracle Linux**

In the characteristic approach, the onus is on the consumer of the inventory API to set characteristic values explicitly according to the metadata provided by the corresponding catalog API.

Features

A feature is an intent-based way of specifying the capabilities of the instantiated entity. The feature is defined by a feature specification that typically includes characteristics and related definitions, but at instantiation time the feature is simply selected (by default or explicitly by the consumer of the inventory API) and the behavior is applied implicitly.

For example, a virtual firewall may be able to operate based on layer 4 (stateful firewall) or layer 7 (application) of the OSI networking model. A feature would be defined for each of these capabilities. At instantiation time, the consumer would select (say) the layer 7 feature and thus the instantiated firewall would operate at layer 7.

Characteristic-Based or Schema-Based

The Open API Catalog models, Resource Catalog included, present two complementary methods for defining how entities can be instantiated:

- Characteristic-based
- Schema-based

These approaches will be compared using an example of a Virtual Storage resource, which has a characteristic Maximum Storage.

Characteristic-Based

In this approach, the characteristics of the entity are specified dynamically, using the `CharacteristicSpecification` to define the behavior of the characteristic. A JSON fragment might appear as follows:

```
{
  "name": "Virtual Storage Medium",
  "description": "This resource specification defines the virtual storage medium",
  "@type": "LogicalResourceSpecification",
  "@baseType": "ResourceSpecification",
  "resourceSpecCharacteristic": [
    {
      "name": "Maximum Allowed Storage",
      "description": "The storage limit in the virtual storage medium, ",
      "valueType": "integer",
      "configurable": true,
      "minCardinality": 1,
      "maxCardinality": 1,
      "isUnique": true,
      "resourceSpecCharacteristicValue": [
        {
          "valueType": "integer",
          "value": 1024000
        },
        {
          "valueType": "integer",
          "value": 2048000
        }
      ]
    }
  ]
}
```

This fragment shows that the characteristic is named Maximum Allowed Storage, and has valid values 1G and 2G, one of which must be chosen when instantiating a particular storage.

Schema-Based

In this approach, the characteristics of the entity are specified in a strongly-typed schema, and the specification points to the schema. A JSON fragment might appear as follows:

```
{
  "name": "Virtual Storage Medium",
  "description": "This resource specification defines the virtual storage medium",
  "@type": "LogicalResourceSpecification",
  "@baseType": "ResourceSpecification",
  "targetResourceSchema": {
    "@type": "VirtualStorage",
    "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Resource/VirtualStorage.schema.json"
  }
}
```

And the referred schema file might appear as follows:

```
{
  "$schema": "http://json-schema.org/draft-07/schema#",
  "$id": "VirtualStorage.schema.json",
  "title": "VirtualStorage",
  "definitions": {
    " VirtualStorage ": {
      "$id": "# VirtualStorage ",
      "description": "This resource specification defines the virtual storage
medium.",
      "type": "object",
      "properties": {
        "Maximum Allowed Storage": {
          "type": "integer",
          "description": "The storage limit in the virtual storage medium",
          "enum": [1024000, 2048000]
        }
      },
      "required": ["Maximum Allowed Storage"],
      "allOf": [
        {
          "$ref":
"LogicalResourceSpecification.schema.json#LogicalResourceSpecification"
        }
      ]
    }
  }
}
```

This fragment shows that Virtual Storage has a strongly-typed attribute named Maximum Allowed Storage, with valid values 1G and 2G, one of which must be chosen when instantiating a particular storage.

Note: in this paradigm the metadata describing the attribute is limited by the semantics of json schema. Additional metadata, that is part of the Characteristic Specification model, is not represented in the schema file.

RESOURCE MODEL

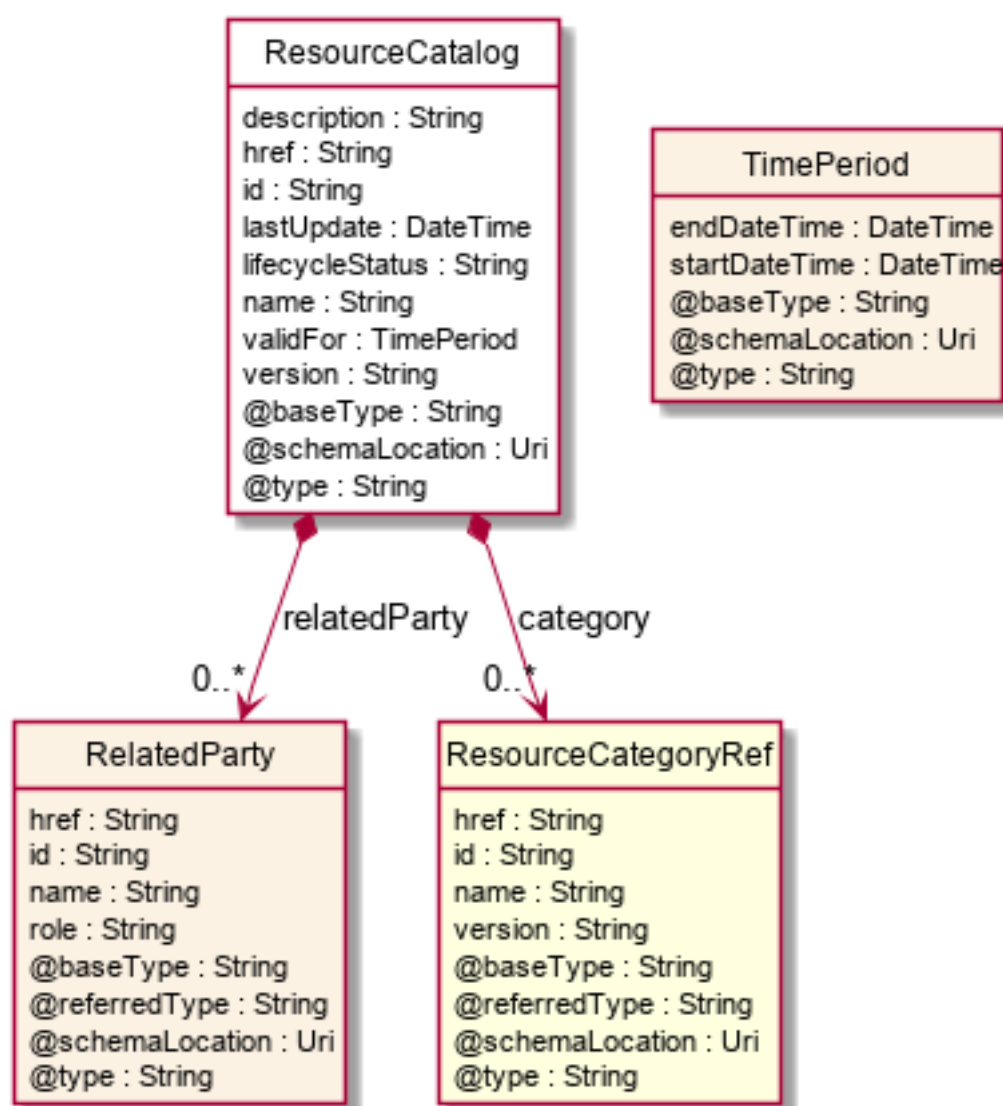
Managed Entity and Task Resource Models

Resource Catalog resource

The root entity for resource catalog management.

A resource catalog is a group of resource specifications made available through resource candidates that an organization provides to the consumers (internal consumers like its employees or B2B customers or B2C customers).

Resource model



Field descriptions

ResourceCatalog fields

category	A list of resource category references (ResourceCategoryRef [*]). List of root categories contained in this catalog.
description	A string. Description of this catalog.
href	A string. Unique reference of the catalog.
id	A string. Unique identifier of the Catalog.
lastUpdate	A date time (DateTime). Date and time of the last update.
lifecycleStatus	A string. Used to indicate the current lifecycle status.
name	A string. Name of the catalog.
relatedParty	A list of related parties (RelatedParty [*]). List of parties involved in this catalog.
validFor	A time period. The period for which the catalog is valid.
version	A string. Catalog version.

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.

ResourceCategoryRef relationship

The (resource) category resource is used to group resource candidates in logical containers. Categories can contain other categories.

@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.
version	A string. Category version.

Json representation sample

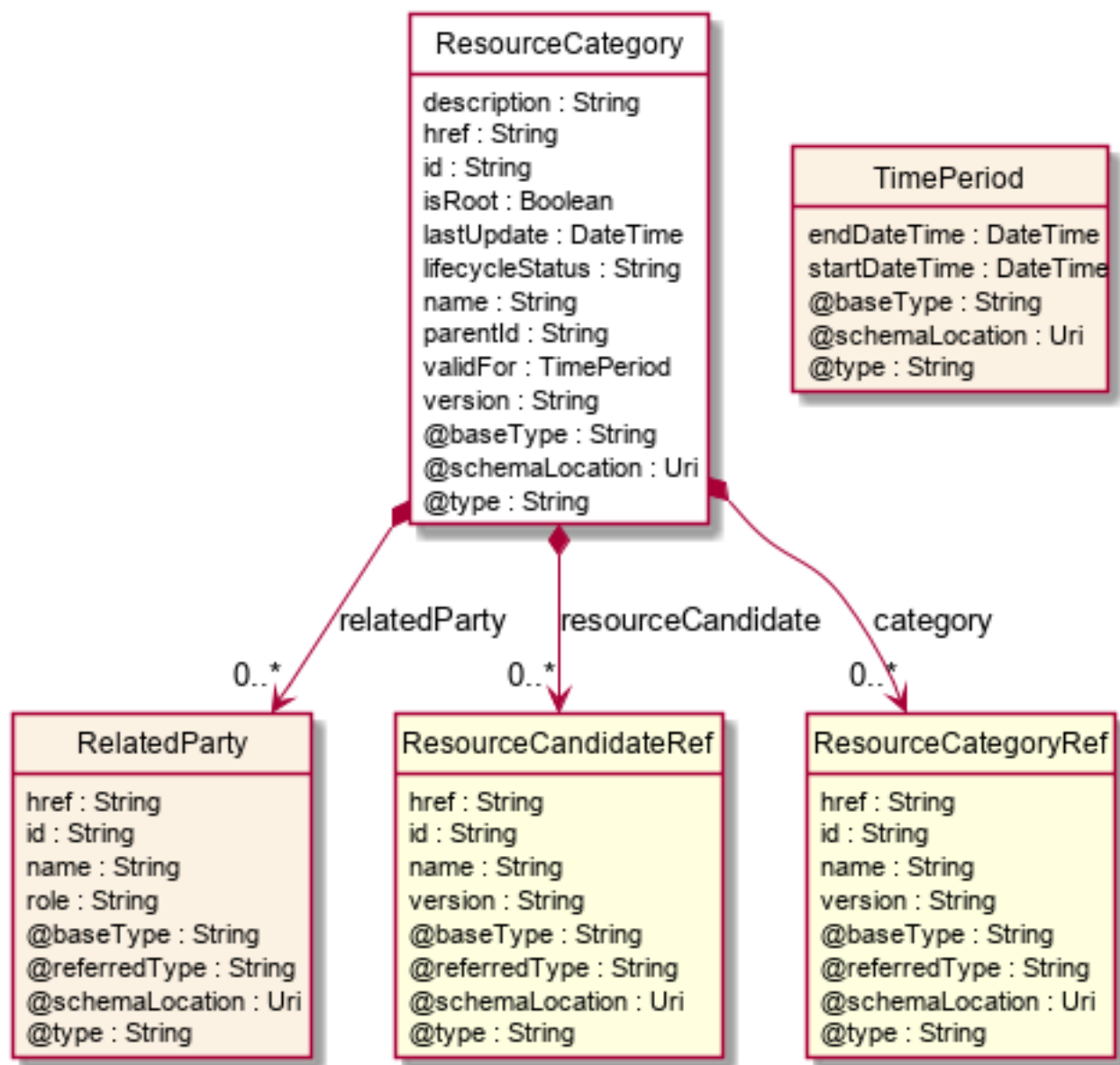
We provide below the json representation of an example of a 'ResourceCatalog' resource object

```
{
  "id": "5574",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCatalog/5574",
  "name": "Cloud Resource Catalog",
  "description": "This resource catalog points to entities in the area of cloud management",
  "@type": "ResourceCatalog",
  "version": "1.0",
  "validFor": {
    "startDateTime": "2017-08-23T00:00:22.920Z",
    "endDateTime": "2018-03-25T00:00:22.920Z"
  },
  "lastUpdate": "2018-03-24T00:00:22.920Z",
  "lifecycleStatus": "Active",
  "relatedParty": [
    {
      "id": "5858",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/organization/5858",
      "role": "Supplier",
      "name": "Gustave Flaubert",
      "@referredType": "Organization"
    }
  ],
  "category": [
    {
      "id": "4569",
      "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCategory/4569",
      "version": "1.0",
      "name": "Secure Home"
    }
  ]
}
```

Resource Category resource

The (resource) category resource is used to group resource candidates in logical containers. Categories can contain other categories.

Resource model



Field descriptions

ResourceCategory fields

category	A list of resource category references (ResourceCategoryRef [*]). The category resource is used to group product offerings, service and resource candidates in logical containers. Categories can contain other (sub-)categories and/or product offerings.
description	A string. Description of the category.
href	A string. Hyperlink reference to the category.
id	A string. Unique identifier of the category.

isRoot	A boolean. If true, this Boolean indicates that the category is a root of categories.
lastUpdate	A date time (DateTime). Date and time of the last update.
lifecycleStatus	A string. Used to indicate the current lifecycle status.
name	A string. Name of the category.
parentId	A string. Unique identifier of the parent category.
relatedParty	A list of related parties (RelatedParty [*]). List of parties involved in this category.
resourceCandidate	A list of resource candidate references (ResourceCandidateRef [*]). List of resource candidates accessible via this category.
validFor	A time period. The period for which the category is valid.
version	A string. Category version.

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.

ResourceCandidateRef relationship

ResourceCandidate is an entity that makes a resource specification available to a catalog. A ResourceCandidate and its associated resource specification may be published - made visible - in any number of resource catalogs, or in none.

@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.
version	A string. the version of resource candidate.

ResourceCategoryRef relationship

The (resource) category resource is used to group resource candidates in logical containers. Categories can contain other categories.

@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.
version	A string. Category version.

Json representation sample

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

```
{
  "id": "8121",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCategory/8121",
  "name": "Network Logical Resources",
  "description": "This resource category groups together logical resources that are implemented in the network",
  "@type": "ResourceCategory",
  "version": "1.0",
  "validFor": {
    "startDateTime": "2017-08-23T00:00:22.920Z",
    "endDateTime": "2018-03-25T00:00:22.920Z"
  },
  "lifecycleStatus": "Active",
  "lastUpdate": "2018-03-24T00:00:22.920Z",
  "isRoot": true,
  "category": [
    {
      "id": "5982",
      "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/category/5982",
      "version": "3.2",
      "name": "IoT"
    }
  ],
  "resourceCandidate": [
    {
      "id": "5298",
      "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCandidate/5298",
      "version": "1.0",
      "name": "Elastic Storage"
    },
    {
      "id": "7479",
      "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCandidate/7479",
      "version": "3.2",
      "name": "Virtual Storage Medium"
    }
  ],
  "relatedParty": [
```

```

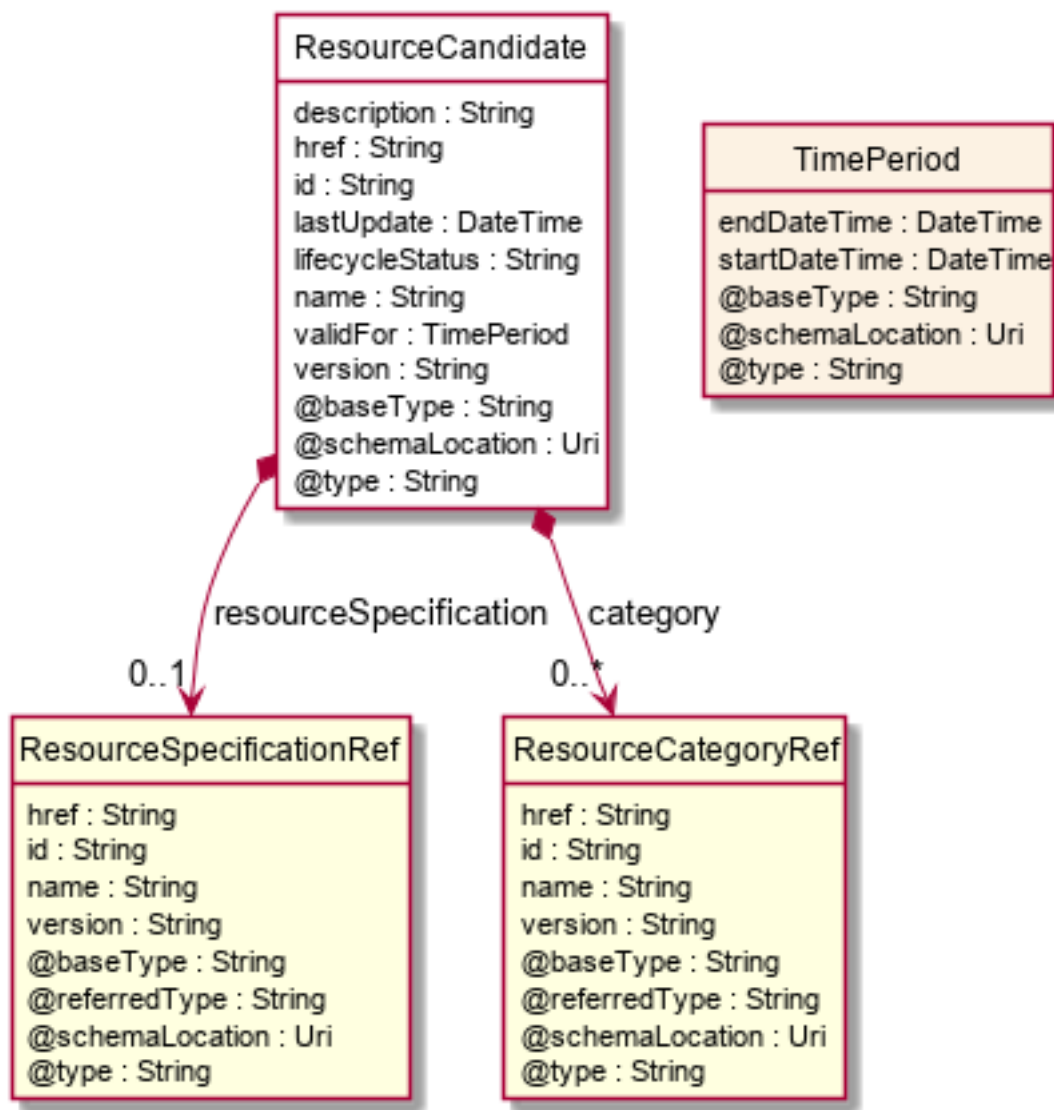
{
  "id": "4434",
  "href": "https://mycsp.com:8080/tmf-api/partyManagement/organization/4434",
  "role": "employee",
  "name": "Jimmy Doe",
  "@referredType": "Organization"
}
]
}

```

Resource Candidate resource

ResourceCandidate is an entity that makes a resource specification available to a catalog. A ResourceCandidate and its associated resource specification may be published - made visible - in any number of resource catalogs, or in none.

Resource model



Field descriptionsResourceCandidate fields

category	A list of resource category references (ResourceCategoryRef [*]). The categories in which this candidate is exposed.
description	A string. Description of this REST resource.
href	A string. Hyperlink reference to this REST resource.
id	A string. Unique identifier of this REST resource.
lastUpdate	A date time (DateTime). Date and time of the last update of this REST resource.
lifecycleStatus	A string. Used to indicate the current lifecycle status of the resource candidate.
name	A string. Name given to this REST resource.
resourceSpecification	A resource specification reference (ResourceSpecificationRef). The detailed specification for this candidate.
validFor	A time period. The period for which this REST resource is valid.
version	A string. the version of resource candidate.

ResourceCategoryRef relationship

The (resource) category resource is used to group resource candidates in logical containers. Categories can contain other categories.

@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.
version	A string. Category version.

ResourceSpecificationRef relationship

Resources are physical or non-physical components (or some combination of these) within an enterprise's infrastructure or inventory. They are typically consumed or used by services (for example a physical port assigned to a service) or contribute to the realization of a Product (for example, a SIM card). They can be drawn from the Application, Computing and Network domains, and include, for example, Network Elements, software, IT systems, content and information, and technology components.

A ResourceSpecification is an abstract base class for representing a generic means for implementing a particular

type of Resource. In essence, a ResourceSpecification defines the common attributes and relationships of a set of related Resources, while Resource defines a specific instance that is based on a particular ResourceSpecification.

@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.
version	A string. Resource Specification version.

Json representation sample

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

```
{
  "id": "7479",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCandidate/7479",
  "name": "Virtual Storage Medium",
  "description": "This resource candidate makes the virtual storage medium specification available in the cloud catalog",
  "@type": "ResourceCandidate",
  "version": "3.2",
  "validFor": {
    "startDateTime": "2017-08-23T00:00:22.920Z",
    "endDateTime": "2018-03-25T00:00:22.920Z"
  },
  "lastUpdate": "2018-03-24T00:00:22.920Z",
  "lifecycleStatus": "Active",
  "category": [
    {
      "id": "5355",
      "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/category/5355",
      "version": "1.1",
      "name": "Cloud Resources"
    }
  ],
  "resourceSpecification": {
    "id": "42",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/42",
    "version": "3.0",
    "name": "VirtualStorageMedium"
  }
}
```

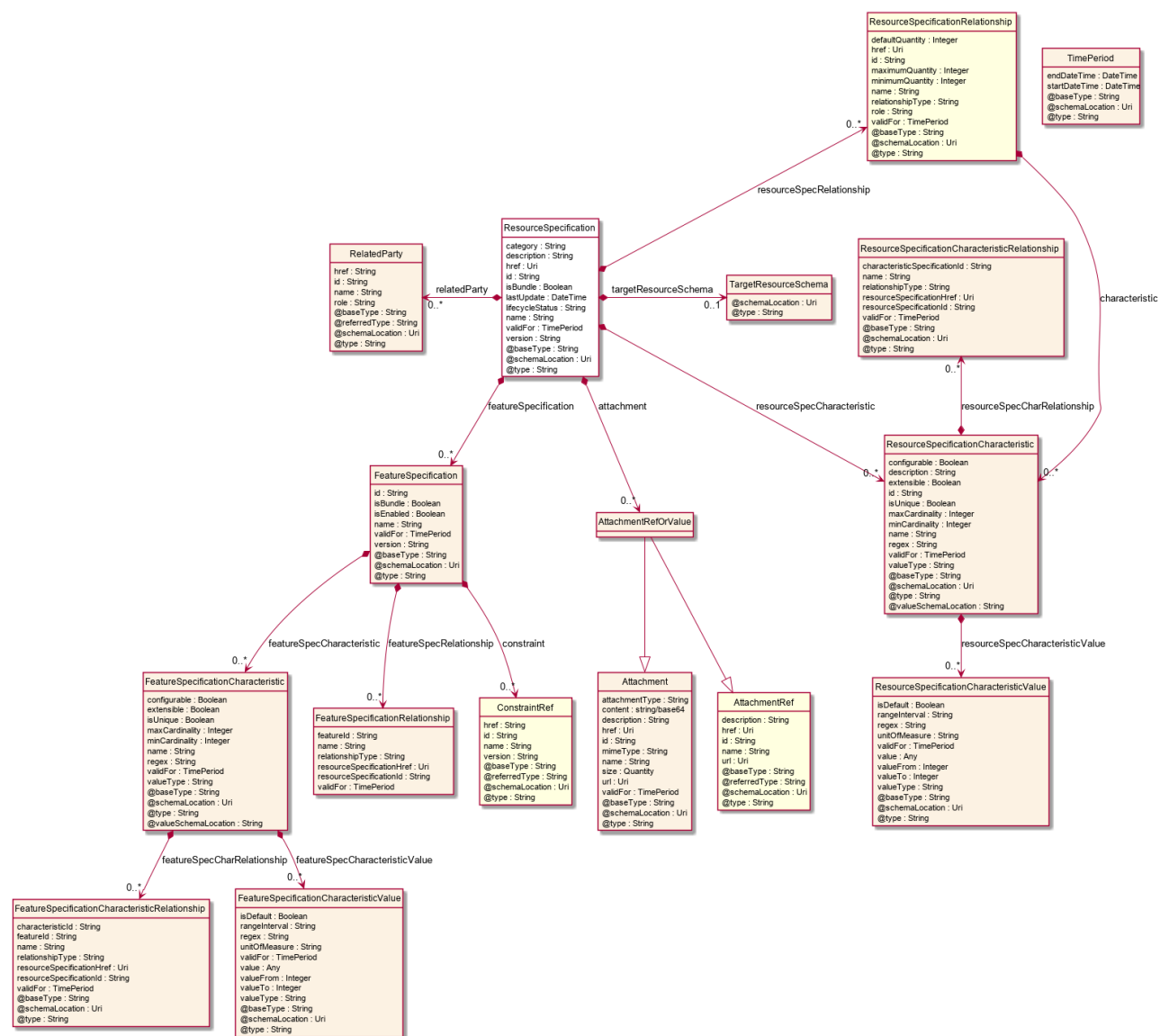
Resource Specification resource

Resources are physical or non-physical components (or some combination of these) within an enterprise's infrastructure or inventory. They are typically consumed or used by services (for example a physical port assigned to a service) or contribute to the realization of a Product (for example, a SIM card). They can be drawn from the Application, Computing and Network domains, and include, for example, Network Elements, software, IT systems,

content and information, and technology components.

A ResourceSpecification is an abstract base class for representing a generic means for implementing a particular type of Resource. In essence, a ResourceSpecification defines the common attributes and relationships of a set of related Resources, while Resource defines a specific instance that is based on a particular ResourceSpecification.

Resource model



Field descriptions

ResourceSpecification fields

attachment

A list of attachment ref or values (AttachmentRefOrValue [*]). Complements the description of an element (for instance a resource) through video, pictures ...

category	A string. Category of the target resource like NetworkConnectivity, PhysicalLinks, Generic, L2Network and so on.
description	A string. Description of this REST resource.
featureSpecification	A list of feature specifications (FeatureSpecification [*]). A list of Features for this specification.
href	A string. Hyperlink reference to this REST resource.
id	A string. Unique identifier of this REST resource.
isBundle	A boolean. A flag indicates that if this resource specification is a bundled specification (true) or single (false).
lastUpdate	A date time (DateTime). Date and time of the last update of this REST resource.
lifecycleStatus	A string. Used to indicate the current lifecycle status of the resource specification.
name	A string. Name given to this REST resource.
relatedParty	A list of related parties (RelatedParty [*]). A related party defines party or party role linked to a specific entity.
resourceSpecCharacteristic	A list of resource specification characteristics (ResourceSpecificationCharacteristic [*]). A characteristic quality or distinctive feature of a ResourceSpecification. The characteristic can be take on a discrete value, such as color, can take on a range of values, (for example, sensitivity of 100-240 mV), or can be derived from a formula (for example, usage time (hrs) = 30 - talk time *3). Certain characteristics, such as color, may be configured during the ordering or some other process.
resourceSpecRelationship	A list of resource specification relationships (ResourceSpecificationRelationship [*]). A migration, substitution, dependency or exclusivity relationship between/among resource specifications.
targetResourceSchema	A target resource schema (TargetResourceSchema). A target resource schema reference. The reference object to the schema and type of target resource which is described by resource specification.
validFor	A time period. The period for which this REST resource is valid.
version	A string. Resource Specification version.

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 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.

FeatureSpecification sub-resource

Specification for applicable configuration features for a resource specification.

constraint	A list of constraint references (ConstraintRef [*]). This is a list of feature constraints.
featureSpecCharacteristic	A list of feature specification characteristics (FeatureSpecificationCharacteristic [*]). This is a list of characteristics for a particular feature.
featureSpecRelationship	A list of feature specification relationships (FeatureSpecificationRelationship [*]). A dependency, exclusivity or aggregation relationship between/among feature specifications.
id	A string. Identifier of the feature specification. Must be locally unique within the containing resource specification, thus allowing direct access to the feature spec.
isBundle	A boolean. A flag indicating if this is a feature group (true) or not (false).
isEnabled	A boolean. A flag indicating if the feature is enabled (true) or not (false).
name	A string. Unique name given to the feature specification.
validFor	A time period. The period for which this feature specification is valid.
version	A string. Version of the feature specification.

FeatureSpecificationCharacteristic sub-resource

Configuration feature characteristic specification.

@valueSchemaLocation	A string. This (optional) field provides a link to the schema describing the value type.
configurable	A boolean. True is the feature is configurable.
extensible	A boolean. An indicator that specifies that the values for the characteristic can be extended by adding new values when instantiating a characteristic for a feature.
featureSpecCharRelationship	A list of feature specification characteristic relationships (FeatureSpecificationCharacteristicRelationship [*]). An aggregation, migration, substitution, dependency or exclusivity relationship between/among feature characteristics.
featureSpecCharacteristicValue	A list of feature specification characteristic values (FeatureSpecificationCharacteristicValue [*]). Used to define a set of attributes, each of which can be assigned to a corresponding set of attributes in a FeatureCharacteristic object.
isUnique	A boolean. An indicator that specifies if a value is unique for the specification.
maxCardinality	An integer. The maximum number of instances a CharacteristicValue can take on.
minCardinality	An integer. The minimum number of instances a CharacteristicValue can take on.
name	A string. This is the name for the feature characteristic.
regex	A string. A rule or principle represented in regular expression used to derive the value of a characteristic value.
validFor	A time period. The period of time for which a characteristic is applicable.
valueType	A string. A kind of value that the characteristic can take on.

FeatureSpecificationCharacteristicRelationship sub-resource

An aggregation, migration, substitution, dependency or exclusivity relationship between/among FeatureSpecificationCharacteristics.

characteristicId	A string. Unique identifier of the characteristic within the the target feature specification.
featureId	A string. Unique identifier of the target feature specification within the resource specification.

name	A string. Name of the target characteristic.
relationshipType	A string. Type of relationship such as aggregation, migration, substitution, dependency, exclusivity.
resourceSpecificationHref	A string. Hyperlink reference to the resource specification containing the target feature and feature characteristic.
resourceSpecificationId	A string. Unique identifier of the resource specification containing the target feature and feature characteristic.
validFor	A time period. The period for which the object is valid.

FeatureSpecificationCharacteristicValue sub-resource

A number or text that can be assigned to a FeatureSpecificationCharacteristic.

isDefault	A boolean. True if the value is the default value for a characteristic.
rangeInterval	A string. Specifies the inclusion or exclusion of the valueFrom and valueTo attributes.
regex	A string. A regular expression constraint for given value.
unitOfMeasure	A string. A determinate quantity or magnitude of the kind designated, taken as a standard of comparison for others of the same kind, in assigning to them numerical values.
validFor	A time period. The period of time for which a value is applicable.
value	An any (Any). A discrete value that the characteristic can take on, or the actual value of the characteristic.
valueFrom	An integer. The low range value that a characteristic can take on.
valueTo	An integer. The upper range value that a characteristic can take on.
valueType	A string. A kind of value that the characteristic value can take on.

FeatureSpecificationRelationship sub-resource

Configuration feature.

featureId	A string. Unique identifier of the target feature specification.
name	A string. This is the name of the target feature specification.
relationshipType	A string. This is the type of the feature specification relationship.
resourceSpecificationHref	A string. Hyperlink reference to the resource specification containing the target feature.

resourceSpecificationId	A string. Unique identifier of the resource specification containing the target feature.
validFor	A time period. The period for which this feature specification relationship is valid.

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.

ResourceSpecificationCharacteristic sub-resource

This class defines the characteristic features of a resource specification. Every ResourceSpecification has a variety of important attributes, methods, constraints, and relationships, which distinguish a resource specification from other resource specifications.

@valueSchemaLocation	A string. This (optional) field provides a link to the schema describing the value type.
configurable	A boolean. If true, the Boolean indicates that the ResourceSpecCharacteristic is configurable.
description	A string. A narrative that explains the CharacteristicSpecification.
extensible	A boolean. An indicator that specifies that the values for the characteristic can be extended by adding new values when instantiating a characteristic for a resource.
id	A string. Unique ID for the characteristic.
isUnique	A boolean. An indicator that specifies if a value is unique for the specification. Possible values are; "unique while value is in effect" and "unique whether value is in effect or not".

maxCardinality	An integer. The maximum number of instances a CharacteristicValue can take on. For example, zero to five phone numbers in a group calling plan, where five is the value for the maxCardinality.
minCardinality	An integer. The minimum number of instances a CharacteristicValue can take on. For example, zero to five phone numbers in a group calling plan, where zero is the value for the minCardinality.
name	A string. A word, term, or phrase by which this characteristic specification is known and distinguished from other characteristic specifications.
regex	A string. A rule or principle represented in regular expression used to derive the value of a characteristic value.
resourceSpecCharRelationship	A list of resource specification characteristic relationships (ResourceSpecificationCharacteristicRelationship [*]). An aggregation, migration, substitution, dependency or exclusivity relationship between/among Specification Characteristics.
resourceSpecCharacteristicValue	A list of resource specification characteristic values (ResourceSpecificationCharacteristicValue [*]). A ResourceSpecificationCharacteristicValue object is used to define a set of attributes, each of which can be assigned to a corresponding set of attributes in a ResourceSpecificationCharacteristic object. The values of the attributes in the ResourceSpecificationCharacteristicValue object describe the values of the attributes that a corresponding ResourceSpecificationCharacteristic object can take on.
validFor	A time period. The period of time for which a characteristic is applicable.
valueType	A string. A kind of value that the characteristic can take on, such as numeric, text and so forth.

ResourceSpecificationCharacteristicRelationship sub-resource

An aggregation, migration, substitution, dependency or exclusivity relationship between/among ResourceSpecificationCharacteristics. The specification characteristic is embedded within the specification whose ID and href are in this entity, and identified by its ID.

characteristicSpecificationId	A string. Unique identifier of the characteristic within the specification.
name	A string. Name of the target characteristic within the specification.
relationshipType	A string. Type of relationship such as aggregation, migration, substitution, dependency, exclusivity.

resourceSpecificationHref	A string. Hyperlink reference to the resource specification containing the target characteristic.
resourceSpecificationId	A string. Unique identifier of the resource specification containing the target characteristic.
validFor	A time period. The period for which the object is valid.

ResourceSpecificationCharacteristicValue sub-resource

A number or text that can be assigned to a ResourceSpecCharacteristic.

isDefault	A boolean. If true, the Boolean Indicates if the value is the default value for a characteristic.
rangeInterval	A string. An indicator that specifies the inclusion or exclusion of the valueFrom and valueTo attributes. If applicable, possible values are "open", "closed", "closedBottom" and "closedTop".
regex	A string. A regular expression constraint for given value.
unitOfMeasure	A string. A length, surface, volume, dry measure, liquid measure, money, weight, time, and the like. In general, a determinate quantity or magnitude of the kind designated, taken as a standard of comparison for others of the same kind, in assigning to them numerical values, as 1 foot, 1 yard, 1 mile, 1 square foot.
validFor	A time period. The period of time for which a value is applicable.
value	An any (Any). A discrete value that the characteristic can take on, or the actual value of the characteristic.
valueFrom	An integer. The low range value that a characteristic can take on.
valueTo	An integer. The upper range value that a characteristic can take on.
valueType	A string. A kind of value that the characteristic value can take on, such as numeric, text and so forth.

ResourceSpecificationRelationship sub-resource

A migration, substitution, dependency or exclusivity relationship between/among resource specifications.

characteristic	A list of resource specification characteristics (ResourceSpecificationCharacteristic [*]). A characteristic that refines the relationship. For example, consider the relationship between a slot and a card. For a half-height card it is important to know the position at which the card is inserted, so a characteristic Position might be defined on the relationship to allow capturing of this in the inventory.
----------------	---

defaultQuantity	An integer. The default number of the related resource that should be instantiated, for example a rack would typically have 4 cards, although it could support more.
href	A string. Reference of the target ResourceSpecification.
id	A string. Unique identifier of target ResourceSpecification.
maximumQuantity	An integer. The maximum number of the related resource that should be instantiated, for example a rack supports a maximum of 16 cards.
minimumQuantity	An integer. The minimum number of the related resource that should be instantiated, for example a rack must have at least 1 card.
name	A string. The name given to the target resource specification instance.
relationshipType	A string. Type of relationship such as migration, substitution, dependency, exclusivity.
role	A string. The association role for this resource specification.
validFor	A time period. The period for which the ResourceSpecRelationship is valid.

TargetResourceSchema sub-resource

The reference object to the schema and type of target resource which is described by resource specification.

@schemaLocation	A string. This field provides a link to the schema describing the target resource.
@type	A string. Class type of the target resource.

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.

Json representation sample

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

```
{
  "id": "42",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/42",
  "name": "Virtual Storage Medium",
  "description": "This resource specification defines the virtual storage medium",
}
```

```

"@type": "LogicalResourceSpecification",
"@baseType": "ResourceSpecification",
"@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Resource/LogicalResourceSpecification.schema.json",
"version": "3.2",
"validFor": {
  "startDateTime": "2017-08-12T00:00:00.000Z",
  "endDateTime": "2018-03-07T00:00:00.000Z"
},
"lastUpdate": "2017-08-09T00:00:00.000Z",
"lifecycleStatus": "Active",
"isBundle": false,
"category": "Cloud resource",
"attachment": [
  {
    "id": "25552",
    "href": "https://mycsp.com:8080/tmf-api/documentManagement/v4/attachment/25552",
    "name": "Configuration Instructions",
    "mimeType": "application/pdf",
    "url": "https://mycsp.com:7070/docloader?docnum=9567457677"
  }
],
"relatedParty": [
  {
    "id": "5858",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/organization/5858",
    "role": "Supplier",
    "name": "Gustave Flaubert",
    "@referredType": "Organization"
  }
],
"resourceSpecCharacteristic": [
  {
    "name": "Maximum Allowed Storage",
    "description": "The storage limit in the virtual storage medium, ",
    "valueType": "integer",
    "configurable": true,
    "minCardinality": 1,
    "maxCardinality": 1,
    "isUnique": true,
    "resourceSpecCharacteristicValue": [
      {
        "valueType": "integer",
        "value": 1024000
      },
      {
        "valueType": "integer",
        "value": 2048000
      }
    ]
  }
],
"resourceSpecRelationship": [
  {
    "id": "556788",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/556788",

```

```

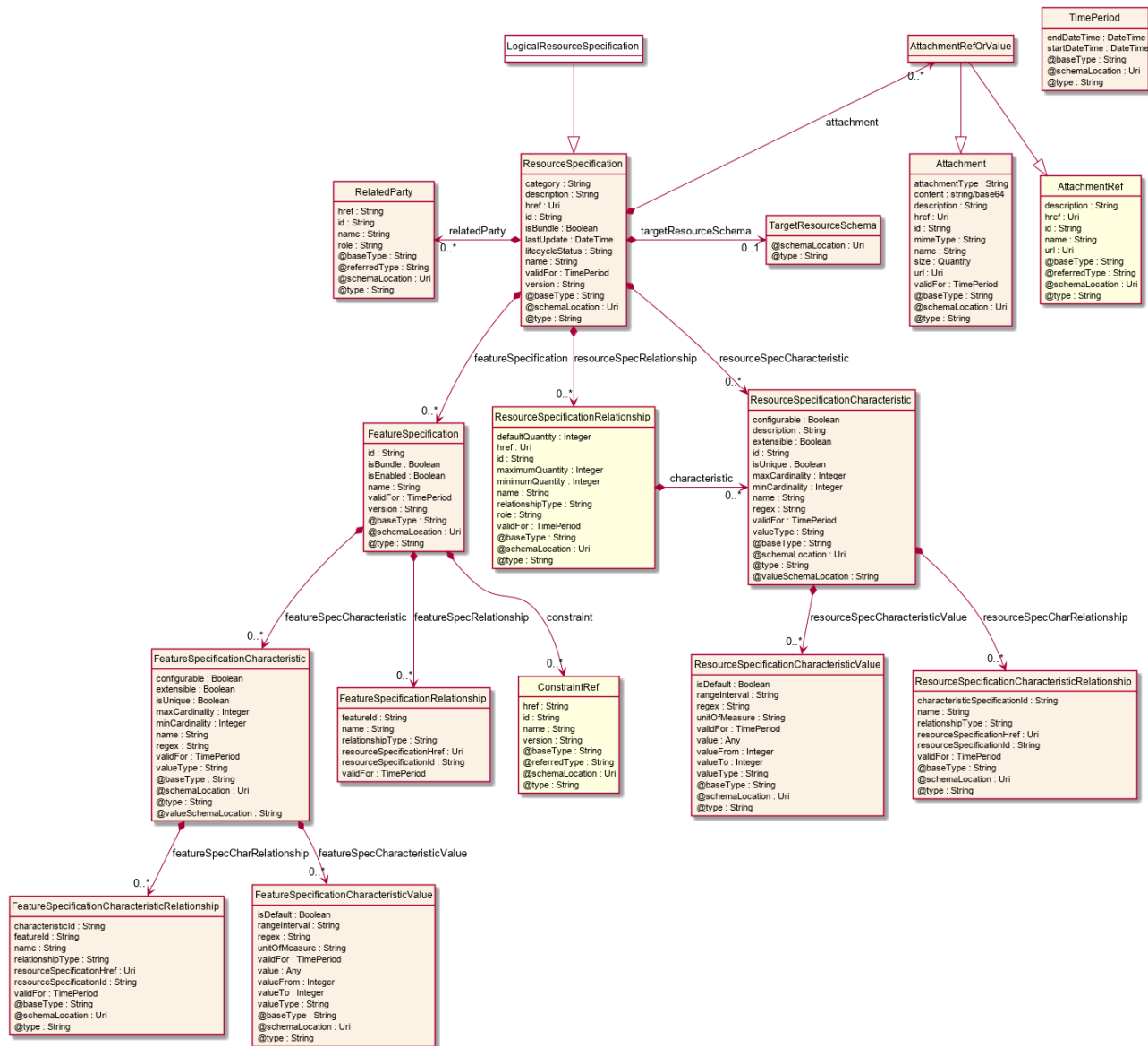
    "name": "Underlying Physical Disk",
    "relationshipType": "dependency"
  }
},
"targetResourceSchema": {
  "@type": "VirtualStorage",
  "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Resource/VirtualStorage.schema.json"
}
}

```

Logical Resource Specification resource

This is a base class that is used to define the invariant characteristics and behavior (attributes, methods, constraints, and relationships) of a LogicalResource.

Resource model



Field descriptionsLogicalResourceSpecification fields

category	A string. Category of the target resource like NetworkConnectivity, PhysicalLinks, Generic, L2Network and so on.
description	A string. Description of this REST resource.
href	A string. Hyperlink reference to this REST resource.
id	A string. Unique identifier of this REST resource.
isBundle	A boolean. A flag indicates that if this resource specification is a bundled specification (true) or single (false).
lastUpdate	A date time (DateTime). Date and time of the last update of this REST resource.
lifecycleStatus	A string. Used to indicate the current lifecycle status of the resource specification.
name	A string. Name given to this REST resource.
version	A string. Resource Specification version.
attachment	A list of attachment ref or values (AttachmentRefOrValue [*]). Complements the description of an element (for instance a resource) through video, pictures ...
featureSpecification	A list of feature specifications (FeatureSpecification [*]). A list of Features for this specification.
relatedParty	A list of related parties (RelatedParty [*]). A related party defines party or party role linked to a specific entity.
resourceSpecCharacteristic	A list of resource specification characteristics (ResourceSpecificationCharacteristic [*]). A characteristic quality or distinctive feature of a ResourceSpecification. The characteristic can be take on a discrete value, such as color, can take on a range of values, (for example, sensitivity of 100-240 mV), or can be derived from a formula (for example, usage time (hrs) = 30 - talk time *3). Certain characteristics, such as color, may be configured during the ordering or some other process.
resourceSpecRelationship	A list of resource specification relationships (ResourceSpecificationRelationship [*]). A migration, substitution, dependency or exclusivity relationship between/among resource specifications.
targetResourceSchema	A target resource schema (TargetResourceSchema). A target resource schema reference. The reference object to the schema and type of target resource which is described by resource specification.

validFor A time period. The period for which this REST resource is valid.

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.

FeatureSpecification sub-resource

Specification for applicable configuration features for a resource specification.

constraint A list of constraint references (ConstraintRef [*]). This is a list of feature constraints.

featureSpecCharacteristic A list of feature specification characteristics (FeatureSpecificationCharacteristic [*]). This is a list of characteristics for a particular feature.

featureSpecRelationship A list of feature specification relationships (FeatureSpecificationRelationship [*]). A dependency, exclusivity or aggregation relationship between/among feature specifications.

id A string. Identifier of the feature specification. Must be locally unique within the containing resource specification, thus allowing direct access to the feature spec.

isBundle A boolean. A flag indicating if this is a feature group (true) or not (false).

isEnabled A boolean. A flag indicating if the feature is enabled (true) or not (false).

name	A string. Unique name given to the feature specification.
validFor	A time period. The period for which this feature specification is valid.
version	A string. Version of the feature specification.

FeatureSpecificationCharacteristic sub-resource

Configuration feature characteristic specification.

@valueSchemaLocation	A string. This (optional) field provides a link to the schema describing the value type.
configurable	A boolean. True is the feature is configurable.
extensible	A boolean. An indicator that specifies that the values for the characteristic can be extended by adding new values when instantiating a characteristic for a feature.
featureSpecCharRelationship	A list of feature specification characteristic relationships (FeatureSpecificationCharacteristicRelationship [*]). An aggregation, migration, substitution, dependency or exclusivity relationship between/among feature characteristics.
featureSpecCharacteristicValue	A list of feature specification characteristic values (FeatureSpecificationCharacteristicValue [*]). Used to define a set of attributes, each of which can be assigned to a corresponding set of attributes in a FeatureCharacteristic object.
isUnique	A boolean. An indicator that specifies if a value is unique for the specification.
maxCardinality	An integer. The maximum number of instances a CharacteristicValue can take on.
minCardinality	An integer. The minimum number of instances a CharacteristicValue can take on.
name	A string. This is the name for the feature characteristic.
regex	A string. A rule or principle represented in regular expression used to derive the value of a characteristic value.
validFor	A time period. The period of time for which a characteristic is applicable.
valueType	A string. A kind of value that the characteristic can take on.

FeatureSpecificationCharacteristicRelationship sub-resource

An aggregation, migration, substitution, dependency or exclusivity relationship between/among FeatureSpecificationCharacteristics.

characteristicId	A string. Unique identifier of the characteristic within the the target feature specification.
featureId	A string. Unique identifier of the target feature specification within the resource specification.
name	A string. Name of the target characteristic.
relationshipType	A string. Type of relationship such as aggregation, migration, substitution, dependency, exclusivity.
resourceSpecificationHref	A string. Hyperlink reference to the resource specification containing the target feature and feature characteristic.
resourceSpecificationId	A string. Unique identifier of the resource specification containing the target feature and feature characteristic.
validFor	A time period. The period for which the object is valid.

FeatureSpecificationCharacteristicValue sub-resource

A number or text that can be assigned to a FeatureSpecificationCharacteristic.

isDefault	A boolean. True if the value is the default value for a characteristic.
rangeInterval	A string. Specifies the inclusion or exclusion of the valueFrom and valueTo attributes.
regex	A string. A regular expression constraint for given value.
unitOfMeasure	A string. A determinate quantity or magnitude of the kind designated, taken as a standard of comparison for others of the same kind, in assigning to them numerical values.
validFor	A time period. The period of time for which a value is applicable.
value	An any (Any). A discrete value that the characteristic can take on, or the actual value of the characteristic.
valueFrom	An integer. The low range value that a characteristic can take on.
valueTo	An integer. The upper range value that a characteristic can take on.
valueType	A string. A kind of value that the characteristic value can take on.

FeatureSpecificationRelationship sub-resource

Configuration feature.

featureId	A string. Unique identifier of the target feature specification.
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name	A string. This is the name of the target feature specification.
relationshipType	A string. This is the type of the feature specification relationship.
resourceSpecificationHref	A string. Hyperlink reference to the resource specification containing the target feature.
resourceSpecificationId	A string. Unique identifier of the resource specification containing the target feature.
validFor	A time period. The period for which this feature specification relationship is valid.

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.

ResourceSpecificationCharacteristic sub-resource

This class defines the characteristic features of a resource specification. Every ResourceSpecification has a variety of important attributes, methods, constraints, and relationships, which distinguish a resource specification from other resource specifications.

@valueSchemaLocation	A string. This (optional) field provides a link to the schema describing the value type.
configurable	A boolean. If true, the Boolean indicates that the ResourceSpecCharacteristic is configurable.
description	A string. A narrative that explains the CharacteristicSpecification.
extensible	A boolean. An indicator that specifies that the values for the characteristic can be extended by adding new values when instantiating a characteristic for a resource.

id	A string. Unique ID for the characteristic.
isUnique	A boolean. An indicator that specifies if a value is unique for the specification. Possible values are; "unique while value is in effect" and "unique whether value is in effect or not".
maxCardinality	An integer. The maximum number of instances a CharacteristicValue can take on. For example, zero to five phone numbers in a group calling plan, where five is the value for the maxCardinality.
minCardinality	An integer. The minimum number of instances a CharacteristicValue can take on. For example, zero to five phone numbers in a group calling plan, where zero is the value for the minCardinality.
name	A string. A word, term, or phrase by which this characteristic specification is known and distinguished from other characteristic specifications.
regex	A string. A rule or principle represented in regular expression used to derive the value of a characteristic value.
resourceSpecCharRelationship	A list of resource specification characteristic relationships (ResourceSpecificationCharacteristicRelationship [*]). An aggregation, migration, substitution, dependency or exclusivity relationship between/among Specification Characteristics.
resourceSpecCharacteristicValue	A list of resource specification characteristic values (ResourceSpecificationCharacteristicValue [*]). A ResourceSpecificationCharacteristicValue object is used to define a set of attributes, each of which can be assigned to a corresponding set of attributes in a ResourceSpecificationCharacteristic object. The values of the attributes in the ResourceSpecificationCharacteristicValue object describe the values of the attributes that a corresponding ResourceSpecificationCharacteristic object can take on.
validFor	A time period. The period of time for which a characteristic is applicable.
valueType	A string. A kind of value that the characteristic can take on, such as numeric, text and so forth.

ResourceSpecificationCharacteristicRelationship sub-resource

An aggregation, migration, substitution, dependency or exclusivity relationship between/among ResourceSpecificationCharacteristics. The specification characteristic is embedded within the specification whose ID and href are in this entity, and identified by its ID.

characteristicSpecificationId A string. Unique identifier of the characteristic within the specification.

name	A string. Name of the target characteristic within the specification.
relationshipType	A string. Type of relationship such as aggregation, migration, substitution, dependency, exclusivity.
resourceSpecificationHref	A string. Hyperlink reference to the resource specification containing the target characteristic.
resourceSpecificationId	A string. Unique identifier of the resource specification containing the target characteristic.
validFor	A time period. The period for which the object is valid.

ResourceSpecificationCharacteristicValue sub-resource

A number or text that can be assigned to a ResourceSpecCharacteristic.

isDefault	A boolean. If true, the Boolean Indicates if the value is the default value for a characteristic.
rangeInterval	A string. An indicator that specifies the inclusion or exclusion of the valueFrom and valueTo attributes. If applicable, possible values are "open", "closed", "closedBottom" and "closedTop".
regex	A string. A regular expression constraint for given value.
unitOfMeasure	A string. A length, surface, volume, dry measure, liquid measure, money, weight, time, and the like. In general, a determinate quantity or magnitude of the kind designated, taken as a standard of comparison for others of the same kind, in assigning to them numerical values, as 1 foot, 1 yard, 1 mile, 1 square foot.
validFor	A time period. The period of time for which a value is applicable.
value	An any (Any). A discrete value that the characteristic can take on, or the actual value of the characteristic.
valueFrom	An integer. The low range value that a characteristic can take on.
valueTo	An integer. The upper range value that a characteristic can take on.
valueType	A string. A kind of value that the characteristic value can take on, such as numeric, text and so forth.

ResourceSpecificationRelationship sub-resource

A migration, substitution, dependency or exclusivity relationship between/among resource specifications.

characteristic	A list of resource specification characteristics (ResourceSpecificationCharacteristic [*]). A characteristic that refines the relationship. For example, consider the
----------------	---

relationship between a slot and a card. For a half-height card it is important to know the position at which the card is inserted, so a characteristic Position might be defined on the relationship to allow capturing of this in the inventory.

defaultQuantity	An integer. The default number of the related resource that should be instantiated, for example a rack would typically have 4 cards, although it could support more.
href	A string. Reference of the target ResourceSpecification.
id	A string. Unique identifier of target ResourceSpecification.
maximumQuantity	An integer. The maximum number of the related resource that should be instantiated, for example a rack supports a maximum of 16 cards.
minimumQuantity	An integer. The minimum number of the related resource that should be instantiated, for example a rack must have at least 1 card.
name	A string. The name given to the target resource specification instance.
relationshipType	A string. Type of relationship such as migration, substitution, dependency, exclusivity.
role	A string. The association role for this resource specification.
validFor	A time period. The period for which the ResourceSpecRelationship is valid.

TargetResourceSchema sub-resource

The reference object to the schema and type of target resource which is described by resource specification.

@schemaLocation	A string. This field provides a link to the schema describing the target resource.
@type	A string. Class type of the target resource.

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.

Json representation sample

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

```

{
  "id": "42",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/42",
  "name": "Virtual Storage Medium",
  "description": "This resource specification defines the virtual storage medium",
  "@type": "LogicalResourceSpecification",
  "@baseType": "ResourceSpecification",
  "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Resource/LogicalResourceSpecification.schema.json",
  "version": "3.2",
  "validFor": {
    "startDateTime": "2017-08-12T00:00:00.000Z",
    "endDateTime": "2018-03-07T00:00:00.000Z"
  },
  "lastUpdate": "2017-08-09T00:00:00.000Z",
  "lifecycleStatus": "Active",
  "isBundle": false,
  "category": "Cloud resource",
  "attachment": [
    {
      "id": "25552",
      "href": "https://mycsp.com:8080/tmf-api/documentManagement/v4/attachment/25552",
      "name": "Configuration Instructions",
      "mimeType": "application/pdf",
      "url": "https://mycsp.com:7070/docloader?docnum=9567457677"
    }
  ],
  "relatedParty": [
    {
      "id": "5858",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/organization/5858",
      "role": "Supplier",
      "name": "Gustave Flaubert",
      "@referredType": "Organization"
    }
  ],
  "resourceSpecCharacteristic": [
    {
      "name": "Maximum Allowed Storage",
      "description": "The storage limit in the virtual storage medium, ",
      "valueType": "integer",
      "configurable": true,
      "minCardinality": 1,
      "maxCardinality": 1,
      "isUnique": true,
      "resourceSpecCharacteristicValue": [
        {
          "valueType": "integer",
          "value": 1024000
        },
        {
          "valueType": "integer",
          "value": 2048000
        }
      ]
    }
  ]
}

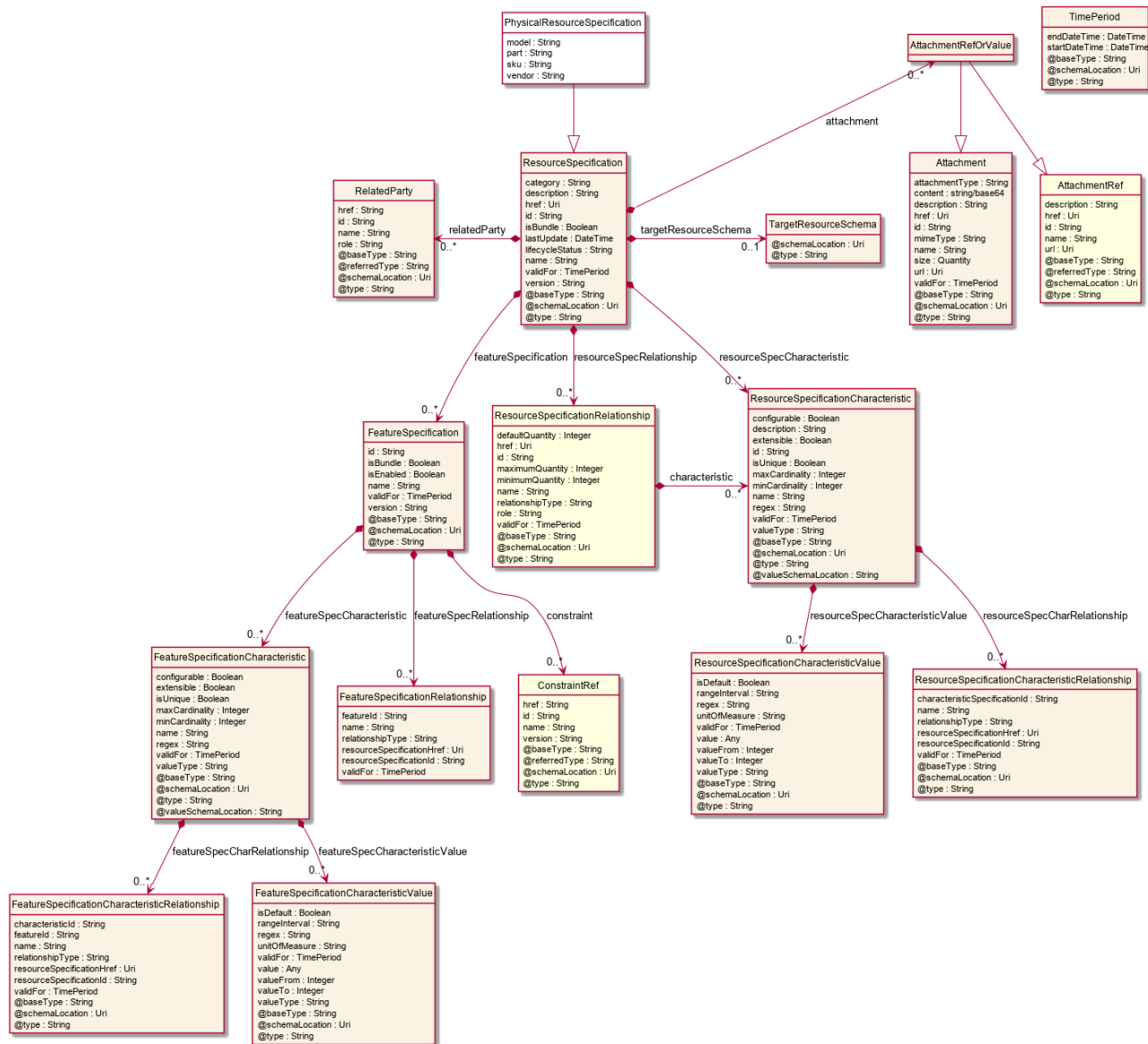
```

```
  },
  "resourceSpecRelationship": [
    {
      "id": "556788",
      "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/556788",
      "name": "Underlying Physical Disk",
      "relationshipType": "dependency"
    }
  ],
  "targetResourceSchema": {
    "@type": "VirtualStorage",
    "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Resource/VirtualStorage.schema.json"
  }
}
```

Physical Resource Specification resource

This is a concrete class that is used to define the invariant characteristics and behavior (attributes, methods, constraints, and relationships) of a PhysicalResource.

Resource model



Field descriptions

PhysicalResourceSpecification fields

category	A string. Category of the target resource like NetworkConnectivity, PhysicalLinks, Generic, L2Network and so on.
description	A string. Description of this REST resource.
href	A string. Hyperlink reference to this REST resource.
id	A string. Unique identifier of this REST resource.
isBundle	A boolean. A flag indicates that if this resource specification is a bundled specification (true) or single (false).

lastUpdate	A date time (DateTime). Date and time of the last update of this REST resource.
lifecycleStatus	A string. Used to indicate the current lifecycle status of the resource specification.
name	A string. Name given to this REST resource.
version	A string. Resource Specification version.
model	A string. This is a string that represents a manufacturer-allocated number used to identify the general type and/or category of the hardware item. This, in combination with the Part and the Vendor, identify different types of hardware items. The SerialNumber can then be used to differentiate between different instances of the same type of hardware item. This is an optional attribute.
part	A string. This is a string that defines a manufacturer-allocated part number assigned by the organization that manufactures the hardware item. This, in combination with the Model and the Vendor, identify different types of hardware items. The SerialNumber can then be used to differentiate between different instances of the same type of hardware item. This is a REQUIRED attribute.
sku	A string. This is a string that defines the manufacturer-allocated Stock Keeping Unit (SKU) number of the hardware item. This is an optional attribute.
vendor	A string. This is a string that defines the name of the manufacturer. This, in combination with the Model and the Part, identify different types of hardware items. The SerialNumber can then be used to differentiate between different instances of the same type of hardware item. This is a REQUIRED attribute for a physical resource.
attachment	A list of attachment ref or values (AttachmentRefOrValue [*]). Complements the description of an element (for instance a resource) through video, pictures ...
featureSpecification	A list of feature specifications (FeatureSpecification [*]). A list of Features for this specification.
relatedParty	A list of related parties (RelatedParty [*]). A related party defines party or party role linked to a specific entity.
resourceSpecCharacteristic	A list of resource specification characteristics (ResourceSpecificationCharacteristic [*]). A characteristic quality or distinctive feature of a ResourceSpecification. The characteristic can be take on a discrete value, such as color, can take on a range of values, (for example, sensitivity of 100-240 mV), or can be derived from a formula (for example, usage time (hrs) = 30 - talk time *3). Certain characteristics, such as color, may be configured during the ordering or some other process.

resourceSpecRelationship	A list of resource specification relationships (ResourceSpecificationRelationship [*]). A migration, substitution, dependency or exclusivity relationship between/among resource specifications.
targetResourceSchema	A target resource schema (TargetResourceSchema). A target resource schema reference. The reference object to the schema and type of target resource which is described by resource specification.
validFor	A time period. The period for which this REST resource is valid.

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.

FeatureSpecification sub-resource

Specification for applicable configuration features for a resource specification.

constraint	A list of constraint references (ConstraintRef [*]). This is a list of feature constraints.
featureSpecCharacteristic	A list of feature specification characteristics (FeatureSpecificationCharacteristic [*]). This is a list of characteristics for a particular feature.

featureSpecRelationship	A list of feature specification relationships (FeatureSpecificationRelationship [*]). A dependency, exclusivity or aggregation relationship between/among feature specifications.
id	A string. Identifier of the feature specification. Must be locally unique within the containing resource specification, thus allowing direct access to the feature spec.
isBundle	A boolean. A flag indicating if this is a feature group (true) or not (false).
isEnabled	A boolean. A flag indicating if the feature is enabled (true) or not (false).
name	A string. Unique name given to the feature specification.
validFor	A time period. The period for which this feature specification is valid.
version	A string. Version of the feature specification.

FeatureSpecificationCharacteristic sub-resource

Configuration feature characteristic specification.

@valueSchemaLocation	A string. This (optional) field provides a link to the schema describing the value type.
configurable	A boolean. True if the feature is configurable.
extensible	A boolean. An indicator that specifies that the values for the characteristic can be extended by adding new values when instantiating a characteristic for a feature.
featureSpecCharRelationship	A list of feature specification characteristic relationships (FeatureSpecificationCharacteristicRelationship [*]). An aggregation, migration, substitution, dependency or exclusivity relationship between/among feature characteristics.
featureSpecCharacteristicValue	A list of feature specification characteristic values (FeatureSpecificationCharacteristicValue [*]). Used to define a set of attributes, each of which can be assigned to a corresponding set of attributes in a FeatureCharacteristic object.
isUnique	A boolean. An indicator that specifies if a value is unique for the specification.
maxCardinality	An integer. The maximum number of instances a CharacteristicValue can take on.
minCardinality	An integer. The minimum number of instances a CharacteristicValue can take on.

name	A string. This is the name for the feature characteristic.
regex	A string. A rule or principle represented in regular expression used to derive the value of a characteristic value.
validFor	A time period. The period of time for which a characteristic is applicable.
valueType	A string. A kind of value that the characteristic can take on.

FeatureSpecificationCharacteristicRelationship sub-resource

An aggregation, migration, substitution, dependency or exclusivity relationship between/among FeatureSpecificationCharacteristics.

characteristicId	A string. Unique identifier of the characteristic within the target feature specification.
featureId	A string. Unique identifier of the target feature specification within the resource specification.
name	A string. Name of the target characteristic.
relationshipType	A string. Type of relationship such as aggregation, migration, substitution, dependency, exclusivity.
resourceSpecificationHref	A string. Hyperlink reference to the resource specification containing the target feature and feature characteristic.
resourceSpecificationId	A string. Unique identifier of the resource specification containing the target feature and feature characteristic.
validFor	A time period. The period for which the object is valid.

FeatureSpecificationCharacteristicValue sub-resource

A number or text that can be assigned to a FeatureSpecificationCharacteristic.

isDefault	A boolean. True if the value is the default value for a characteristic.
rangeInterval	A string. Specifies the inclusion or exclusion of the valueFrom and valueTo attributes.
regex	A string. A regular expression constraint for given value.
unitOfMeasure	A string. A determinate quantity or magnitude of the kind designated, taken as a standard of comparison for others of the same kind, in assigning to them numerical values.
validFor	A time period. The period of time for which a value is applicable.

value	An any (Any). A discrete value that the characteristic can take on, or the actual value of the characteristic.
valueFrom	An integer. The low range value that a characteristic can take on.
valueTo	An integer. The upper range value that a characteristic can take on.
valueType	A string. A kind of value that the characteristic value can take on.

FeatureSpecificationRelationship sub-resource

Configuration feature.

featureId	A string. Unique identifier of the target feature specification.
name	A string. This is the name of the target feature specification.
relationshipType	A string. This is the type of the feature specification relationship.
resourceSpecificationHref	A string. Hyperlink reference to the resource specification containing the target feature.
resourceSpecificationId	A string. Unique identifier of the resource specification containing the target feature.
validFor	A time period. The period for which this feature specification relationship is valid.

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.

ResourceSpecificationCharacteristic sub-resource

This class defines the characteristic features of a resource specification. Every ResourceSpecification has a variety of important attributes, methods, constraints, and relationships, which distinguish a resource specification from other resource specifications.

@valueSchemaLocation	A string. This (optional) field provides a link to the schema describing the value type.
configurable	A boolean. If true, the Boolean indicates that the ResourceSpecCharacteristic is configurable.
description	A string. A narrative that explains the CharacteristicSpecification.
extensible	A boolean. An indicator that specifies that the values for the characteristic can be extended by adding new values when instantiating a characteristic for a resource.
id	A string. Unique ID for the characteristic.
isUnique	A boolean. An indicator that specifies if a value is unique for the specification. Possible values are; "unique while value is in effect" and "unique whether value is in effect or not".
maxCardinality	An integer. The maximum number of instances a CharacteristicValue can take on. For example, zero to five phone numbers in a group calling plan, where five is the value for the maxCardinality.
minCardinality	An integer. The minimum number of instances a CharacteristicValue can take on. For example, zero to five phone numbers in a group calling plan, where zero is the value for the minCardinality.
name	A string. A word, term, or phrase by which this characteristic specification is known and distinguished from other characteristic specifications.
regex	A string. A rule or principle represented in regular expression used to derive the value of a characteristic value.
resourceSpecCharRelationship	A list of resource specification characteristic relationships (ResourceSpecificationCharacteristicRelationship [*]). An aggregation, migration, substitution, dependency or exclusivity relationship between/among Specification Characteristics.
resourceSpecCharacteristicValue	A list of resource specification characteristic values (ResourceSpecificationCharacteristicValue [*]). A ResourceSpecificationCharacteristicValue object is used to define a set of attributes, each of which can be assigned to a corresponding set of attributes in a ResourceSpecificationCharacteristic object. The values of the attributes in the ResourceSpecificationCharacteristicValue object describe the values of

the attributes that a corresponding ResourceSpecificationCharacteristic object can take on.

validFor	A time period. The period of time for which a characteristic is applicable.
valueType	A string. A kind of value that the characteristic can take on, such as numeric, text and so forth.

ResourceSpecificationCharacteristicRelationship sub-resource

An aggregation, migration, substitution, dependency or exclusivity relationship between/among ResourceSpecificationCharacteristics. The specification characteristic is embedded within the specification whose ID and href are in this entity, and identified by its ID.

characteristicSpecificationId	A string. Unique identifier of the characteristic within the specification.
name	A string. Name of the target characteristic within the specification.
relationshipType	A string. Type of relationship such as aggregation, migration, substitution, dependency, exclusivity.
resourceSpecificationHref	A string. Hyperlink reference to the resource specification containing the target characteristic.
resourceSpecificationId	A string. Unique identifier of the resource specification containing the target characteristic.
validFor	A time period. The period for which the object is valid.

ResourceSpecificationCharacteristicValue sub-resource

A number or text that can be assigned to a ResourceSpecCharacteristic.

isDefault	A boolean. If true, the Boolean Indicates if the value is the default value for a characteristic.
rangeInterval	A string. An indicator that specifies the inclusion or exclusion of the valueFrom and valueTo attributes. If applicable, possible values are "open", "closed", "closedBottom" and "closedTop".
regex	A string. A regular expression constraint for given value.
unitOfMeasure	A string. A length, surface, volume, dry measure, liquid measure, money, weight, time, and the like. In general, a determinate quantity or magnitude of the kind designated, taken as a standard of comparison for others of the same kind, in assigning to them numerical values, as 1 foot, 1 yard, 1 mile, 1 square foot.
validFor	A time period. The period of time for which a value is applicable.

value	An any (Any). A discrete value that the characteristic can take on, or the actual value of the characteristic.
valueFrom	An integer. The low range value that a characteristic can take on.
valueTo	An integer. The upper range value that a characteristic can take on.
valueType	A string. A kind of value that the characteristic value can take on, such as numeric, text and so forth.

ResourceSpecificationRelationship sub-resource

A migration, substitution, dependency or exclusivity relationship between/among resource specifications.

characteristic	A list of resource specification characteristics (ResourceSpecificationCharacteristic [*]). A characteristic that refines the relationship. For example, consider the relationship between a slot and a card. For a half-height card it is important to know the position at which the card is inserted, so a characteristic Position might be defined on the relationship to allow capturing of this in the inventory.
defaultQuantity	An integer. The default number of the related resource that should be instantiated, for example a rack would typically have 4 cards, although it could support more.
href	A string. Reference of the target ResourceSpecification.
id	A string. Unique identifier of target ResourceSpecification.
maximumQuantity	An integer. The maximum number of the related resource that should be instantiated, for example a rack supports a maximum of 16 cards.
minimumQuantity	An integer. The minimum number of the related resource that should be instantiated, for example a rack must have at least 1 card.
name	A string. The name given to the target resource specification instance.
relationshipType	A string. Type of relationship such as migration, substitution, dependency, exclusivity.
role	A string. The association role for this resource specification.
validFor	A time period. The period for which the ResourceSpecRelationship is valid.

TargetResourceSchema sub-resource

The reference object to the schema and type of target resource which is described by resource specification.

@schemaLocation	A string. This field provides a link to the schema describing the target resource.
@type	A string. Class type of the target resource.

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.

Json representation sample

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

```
{
  "id": "43",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/43",
  "name": "Nokia 7750 SR-s Service Router",
  "description": "This resource specification defines an IP router provided by Nokia",
  "@type": "PhysicalResourceSpecification",
  "@baseType": "ResourceSpecification",
  "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Resource/PhysicalResourceSpecification.schema.json",
  "version": "3.2",
  "validFor": {
    "startDateTime": "2017-08-12T00:00:00.000Z",
    "endDateTime": "2018-03-07T00:00:00.000Z"
  },
  "lastUpdate": "2017-08-09T00:00:00.000Z",
  "lifecycleStatus": "Active",
  "isBundle": false,
  "category": "Router resource",
  "attachment": [
    {
      "id": "25553",
      "href": "https://mycsp.com:8080/tmf-api/documentManagement/v4/attachment/25553",
      "name": "Data Sheet",
      "mimeType": "application/pdf",
      "url": "https://onestore.nokia.com/asset/205421"
    }
  ],
  "relatedParty": [
    {
      "id": "5855",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/organization/5855",
      "role": "Supplier",
      "name": "Nokia Networks",
      "@referredType": "Organization"
    }
  ],
  "resourceSpecCharacteristic": [
    {
```

```

    "name": "Power Supply Option",
    "description": "The type of power supply that can be chosen",
    "valueType": "string",
    "configurable": true,
    "minCardinality": 1,
    "maxCardinality": 1,
    "isUnique": true,
    "resourceSpecCharacteristicValue": [
      {
        "valueType": "string",
        "value": "AC/HVDC"
      },
      {
        "valueType": "string",
        "value": "LVDC"
      }
    ]
  },
  "resourceSpecRelationship": [
    {
      "id": "556234",
      "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/556234",
      "name": "SR OS Operating System",
      "relationshipType": "dependency"
    }
  ],
  "featureSpecification": [
    {
      "id": "l22m455f-671a-499d-a95j-8h46fe3bc88c",
      "name": "log",
      "validFor": {
        "startDateTime": "2015-11-21T00:00:00.000Z",
        "endDateTime": "2019-12-31T23:59:59.999Z"
      },
      "featureSpecCharacteristic": [
        {
          "name": "logSize",
          "description": "Log Size in MB",
          "valueType": "integer",
          "configurable": true,
          "validFor": {
            "startDateTime": "2015-11-22T00:00:00.000Z",
            "endDateTime": "2019-12-31T23:59:59.999Z"
          },
          "@type": "FeatureSpecificationCharacteristic",
          "minCardinality": 0,
          "maxCardinality": 1,
          "isUnique": true,
          "extensible": false,
          "featureSpecCharacteristicValue": [
            {
              "isDefault": true,
              "valueType": "integer",
              "value": 2000,

```

```

        "validFor": {
          "startDateTime": "2015-11-22T00:00:00.000Z",
          "endDateTime": "2019-12-31T23:59:59.999Z"
        }
      },
      {
        "isDefault": false,
        "valueType": "integer",
        "value": 4000,
        "validFor": {
          "startDateTime": "2015-11-22T00:00:00.000Z",
          "endDateTime": "2019-12-31T23:59:59.999Z"
        }
      }
    ]
  },
  {
    "id": "db723e27-58d3-4120-b564-af199cb32bd3",
    "name": "IPAddressing",
    "isBundle": true,
    "validFor": {
      "startDateTime": "2017-05-24T00:00:00.000Z",
      "endDateTime": "2019-12-31T23:59:59.999Z"
    },
    "constraint": [
      {
        "id": "34",
        "version": "1.0",
        "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/v4/constraint/34",
        "name": "ReliesOnIPv4OrIPv6"
      }
    ],
    "featureSpecRelationship": [
      {
        "relationshipType": "requires",
        "featureId": "43883a81-58ef-45af-ace4-993298ae8361",
        "parentSpecificationId": "755232457686",
        "parentSpecificationHref": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/resourceSpecification/755232457686",
        "name": "IPv4Addressing",
        "validFor": {
          "startDateTime": "2017-05-24T00:00:00.000Z",
          "endDateTime": "2019-12-31T23:59:59.999Z"
        }
      },
      {
        "relationshipType": "requires",
        "featureId": "b85f845f-011a-468f-a90e-9e07fe3bc90a",
        "parentSpecificationId": "755232457686",
        "parentSpecificationHref": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/resourceSpecification/755232457686",
        "name": "IPv6Addressing",
        "validFor": {

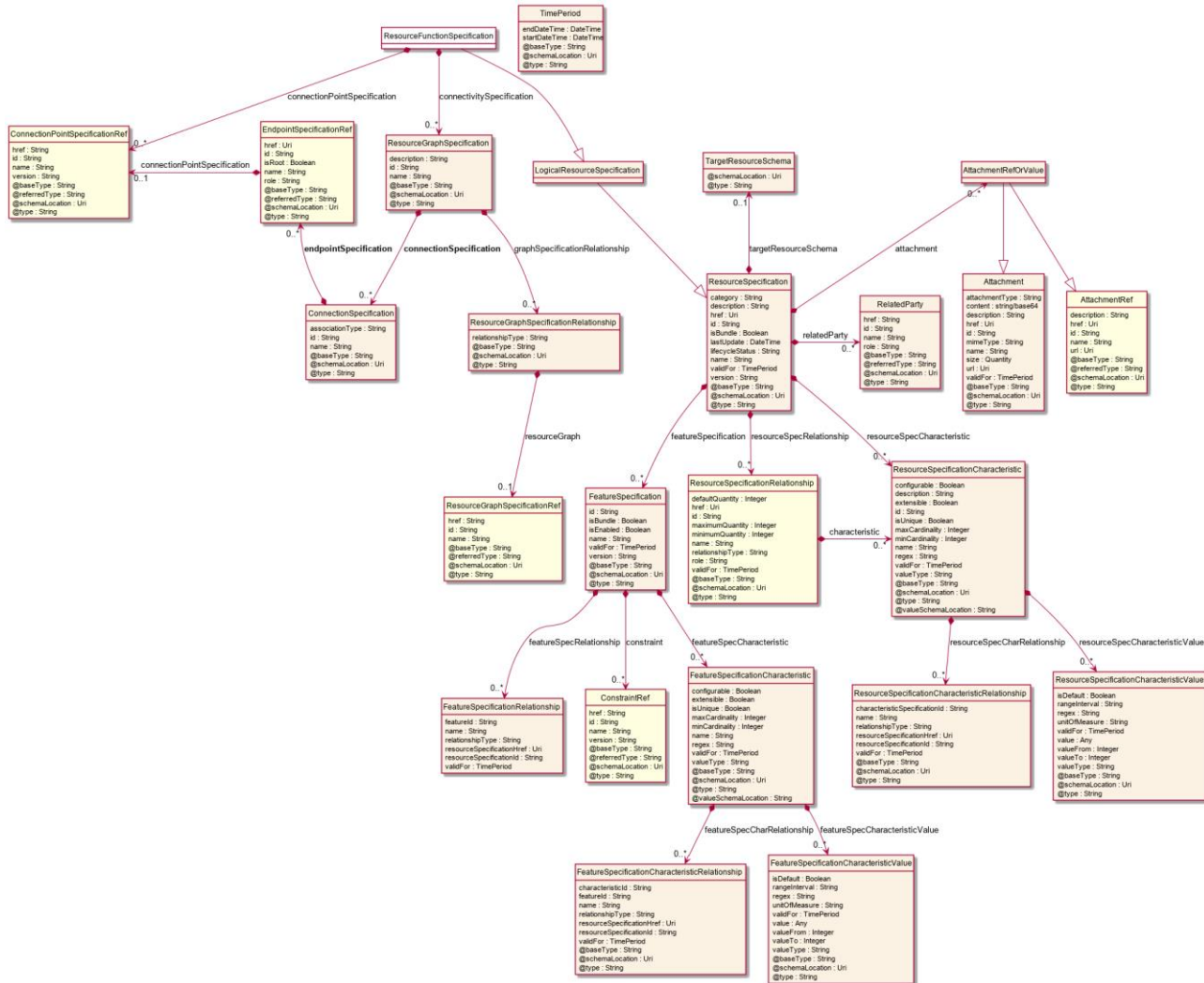
```

```
        "startDateTime": "2017-05-24T00:00:00.000Z",
        "endDateTime": "2019-12-31T23:59:59.999Z"
      }
    }
  ]
},
"targetResourceSchema": {
  "@type": "NokiaRouter",
  "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Resource/NokiaRouter.schema.json"
},
"model": "7750 SR",
"part": "2s",
"sku": "3HE09264AA",
"vendor": "Nokia Networks"
}
```

Resource Function Specification resource

Specifies a function as a behavior to transform inputs of any nature into outputs of any nature independently from the way it is provided.

Resource model



Field descriptions

ResourceFunctionSpecification fields

category	A string. Category of the target resource like NetworkConnectivity, PhysicalLinks, Generic, L2Network and so on.
description	A string. Description of this REST resource.
href	A string. Hyperlink reference to this REST resource.
id	A string. Unique identifier of this REST resource.
isBundle	A boolean. A flag indicates that if this resource specification is a bundled specification (true) or single (false).
lastUpdate	A date time (DateTime). Date and time of the last update of this REST resource.

lifecycleStatus	A string. Used to indicate the current lifecycle status of the resource specification.
name	A string. Name given to this REST resource.
version	A string. Resource Specification version.
connectionPointSpecification	A list of connection point specification references (ConnectionPointSpecificationRef [*]). External connection point specifications. These are the service access points (SAP) where inputs and outputs of the function are available.
connectivitySpecification	A list of resource graph specifications (ResourceGraphSpecification [*]). Internal connectivity potential specifications.
attachment	A list of attachment ref or values (AttachmentRefOrValue [*]). Complements the description of an element (for instance a resource) through video, pictures ...
featureSpecification	A list of feature specifications (FeatureSpecification [*]). A list of Features for this specification.
relatedParty	A list of related parties (RelatedParty [*]). A related party defines party or party role linked to a specific entity.
resourceSpecCharacteristic	A list of resource specification characteristics (ResourceSpecificationCharacteristic [*]). A characteristic quality or distinctive feature of a ResourceSpecification. The characteristic can be take on a discrete value, such as color, can take on a range of values, (for example, sensitivity of 100-240 mV), or can be derived from a formula (for example, usage time (hrs) = 30 - talk time *3). Certain characteristics, such as color, may be configured during the ordering or some other process.
resourceSpecRelationship	A list of resource specification relationships (ResourceSpecificationRelationship [*]). A migration, substitution, dependency or exclusivity relationship between/among resource specifications.
targetResourceSchema	A target resource schema (TargetResourceSchema). A target resource schema reference. The reference object to the schema and type of target resource which is described by resource specification.
validFor	A time period. The period for which this REST resource is valid.

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 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.

ConnectionSpecification sub-resource

A specification for an edge in a resource graph.

associationType	A string. Association type.
endpointSpecification	A list of endpoint specification references (EndpointSpecificationRef [1..*]). Specifications for resource graph vertices connected by this edge.
id	A string. Unique identifier for graph edge specification.
name	A string. Descriptive name for graph edge specification.

FeatureSpecification sub-resource

Specification for applicable configuration features for a resource specification.

constraint	A list of constraint references (ConstraintRef [*]). This is a list of feature constraints.
featureSpecCharacteristic	A list of feature specification characteristics (FeatureSpecificationCharacteristic [*]). This is a list of characteristics for a particular feature.
featureSpecRelationship	A list of feature specification relationships (FeatureSpecificationRelationship [*]). A dependency, exclusivity or aggregation relationship between/among feature specifications.

id	A string. Identifier of the feature specification. Must be locally unique within the containing resource specification, thus allowing direct access to the feature spec.
isBundle	A boolean. A flag indicating if this is a feature group (true) or not (false).
isEnabled	A boolean. A flag indicating if the feature is enabled (true) or not (false).
name	A string. Unique name given to the feature specification.
validFor	A time period. The period for which this feature specification is valid.
version	A string. Version of the feature specification.

FeatureSpecificationCharacteristic sub-resource

Configuration feature characteristic specification.

@valueSchemaLocation	A string. This (optional) field provides a link to the schema describing the value type.
configurable	A boolean. True is the feature is configurable.
extensible	A boolean. An indicator that specifies that the values for the characteristic can be extended by adding new values when instantiating a characteristic for a feature.
featureSpecCharRelationship	A list of feature specification characteristic relationships (FeatureSpecificationCharacteristicRelationship [*]). An aggregation, migration, substitution, dependency or exclusivity relationship between/among feature characteristics.
featureSpecCharacteristicValue	A list of feature specification characteristic values (FeatureSpecificationCharacteristicValue [*]). Used to define a set of attributes, each of which can be assigned to a corresponding set of attributes in a FeatureCharacteristic object.
isUnique	A boolean. An indicator that specifies if a value is unique for the specification.
maxCardinality	An integer. The maximum number of instances a CharacteristicValue can take on.
minCardinality	An integer. The minimum number of instances a CharacteristicValue can take on.
name	A string. This is the name for the feature characteristic.
regex	A string. A rule or principle represented in regular expression used to derive the value of a characteristic value.

validFor	A time period. The period of time for which a characteristic is applicable.
valueType	A string. A kind of value that the characteristic can take on.

FeatureSpecificationCharacteristicRelationship sub-resource

An aggregation, migration, substitution, dependency or exclusivity relationship between/among FeatureSpecificationCharacteristics.

characteristicId	A string. Unique identifier of the characteristic within the target feature specification.
featureId	A string. Unique identifier of the target feature specification within the resource specification.
name	A string. Name of the target characteristic.
relationshipType	A string. Type of relationship such as aggregation, migration, substitution, dependency, exclusivity.
resourceSpecificationHref	A string. Hyperlink reference to the resource specification containing the target feature and feature characteristic.
resourceSpecificationId	A string. Unique identifier of the resource specification containing the target feature and feature characteristic.
validFor	A time period. The period for which the object is valid.

FeatureSpecificationCharacteristicValue sub-resource

A number or text that can be assigned to a FeatureSpecificationCharacteristic.

isDefault	A boolean. True if the value is the default value for a characteristic.
rangeInterval	A string. Specifies the inclusion or exclusion of the valueFrom and valueTo attributes.
regex	A string. A regular expression constraint for given value.
unitOfMeasure	A string. A determinate quantity or magnitude of the kind designated, taken as a standard of comparison for others of the same kind, in assigning to them numerical values.
validFor	A time period. The period of time for which a value is applicable.
value	An any (Any). A discrete value that the characteristic can take on, or the actual value of the characteristic.
valueFrom	An integer. The low range value that a characteristic can take on.

valueTo	An integer. The upper range value that a characteristic can take on.
valueType	A string. A kind of value that the characteristic value can take on.

FeatureSpecificationRelationship sub-resource

Configuration feature.

featureId	A string. Unique identifier of the target feature specification.
name	A string. This is the name of the target feature specification.
relationshipType	A string. This is the type of the feature specification relationship.
resourceSpecificationHref	A string. Hyperlink reference to the resource specification containing the target feature.
resourceSpecificationId	A string. Unique identifier of the resource specification containing the target feature.
validFor	A time period. The period for which this feature specification relationship is valid.

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.

ResourceGraphSpecification sub-resource

Resource graph specification.

connectionSpecification	A list of connection specifications (ConnectionSpecification [1..*]). Resource graph edge specifications.
description	A string. Description of the resource graph specification.

graphSpecificationRelationship	A list of resource graph specification relationships (ResourceGraphSpecificationRelationship [*]). Relationships to other resource graph specifications.
id	A string. Unique identifier of the resource graph specification.
name	A string. Descriptive name for the resource graph specification.

ResourceGraphSpecificationRelationship sub-resource

Describes link between resource graph specifications.

relationshipType	A string. Semantic of the relationship.
resourceGraph	A resource graph specification reference (ResourceGraphSpecificationRef). A reference to the related resource graph specification.

ResourceSpecificationCharacteristic sub-resource

This class defines the characteristic features of a resource specification. Every ResourceSpecification has a variety of important attributes, methods, constraints, and relationships, which distinguish a resource specification from other resource specifications.

@valueSchemaLocation	A string. This (optional) field provides a link to the schema describing the value type.
configurable	A boolean. If true, the Boolean indicates that the ResourceSpecCharacteristic is configurable.
description	A string. A narrative that explains the CharacteristicSpecification.
extensible	A boolean. An indicator that specifies that the values for the characteristic can be extended by adding new values when instantiating a characteristic for a resource.
id	A string. Unique ID for the characteristic.
isUnique	A boolean. An indicator that specifies if a value is unique for the specification. Possible values are; "unique while value is in effect" and "unique whether value is in effect or not".
maxCardinality	An integer. The maximum number of instances a CharacteristicValue can take on. For example, zero to five phone numbers in a group calling plan, where five is the value for the maxCardinality.
minCardinality	An integer. The minimum number of instances a CharacteristicValue can take on. For example, zero to five phone numbers in a group calling plan, where zero is the value for the minCardinality.

name	A string. A word, term, or phrase by which this characteristic specification is known and distinguished from other characteristic specifications.
regex	A string. A rule or principle represented in regular expression used to derive the value of a characteristic value.
resourceSpecCharRelationship	A list of resource specification characteristic relationships (ResourceSpecificationCharacteristicRelationship [*]). An aggregation, migration, substitution, dependency or exclusivity relationship between/among Specification Characteristics.
resourceSpecCharacteristicValue	A list of resource specification characteristic values (ResourceSpecificationCharacteristicValue [*]). A ResourceSpecificationCharacteristicValue object is used to define a set of attributes, each of which can be assigned to a corresponding set of attributes in a ResourceSpecificationCharacteristic object. The values of the attributes in the ResourceSpecificationCharacteristicValue object describe the values of the attributes that a corresponding ResourceSpecificationCharacteristic object can take on.
validFor	A time period. The period of time for which a characteristic is applicable.
valueType	A string. A kind of value that the characteristic can take on, such as numeric, text and so forth.

ResourceSpecificationCharacteristicRelationship sub-resource

An aggregation, migration, substitution, dependency or exclusivity relationship between/among ResourceSpecificationCharacteristics. The specification characteristic is embedded within the specification whose ID and href are in this entity, and identified by its ID.

characteristicSpecificationId	A string. Unique identifier of the characteristic within the specification.
name	A string. Name of the target characteristic within the specification.
relationshipType	A string. Type of relationship such as aggregation, migration, substitution, dependency, exclusivity.
resourceSpecificationHref	A string. Hyperlink reference to the resource specification containing the target characteristic.
resourceSpecificationId	A string. Unique identifier of the resource specification containing the target characteristic.
validFor	A time period. The period for which the object is valid.

ResourceSpecificationCharacteristicValue sub-resource

A number or text that can be assigned to a ResourceSpecCharacteristic.

isDefault	A boolean. If true, the Boolean Indicates if the value is the default value for a characteristic.
rangeInterval	A string. An indicator that specifies the inclusion or exclusion of the valueFrom and valueTo attributes. If applicable, possible values are "open", "closed", "closedBottom" and "closedTop".
regex	A string. A regular expression constraint for given value.
unitOfMeasure	A string. A length, surface, volume, dry measure, liquid measure, money, weight, time, and the like. In general, a determinate quantity or magnitude of the kind designated, taken as a standard of comparison for others of the same kind, in assigning to them numerical values, as 1 foot, 1 yard, 1 mile, 1 square foot.
validFor	A time period. The period of time for which a value is applicable.
value	An any (Any). A discrete value that the characteristic can take on, or the actual value of the characteristic.
valueFrom	An integer. The low range value that a characteristic can take on.
valueTo	An integer. The upper range value that a characteristic can take on.
valueType	A string. A kind of value that the characteristic value can take on, such as numeric, text and so forth.

ResourceSpecificationRelationship sub-resource

A migration, substitution, dependency or exclusivity relationship between/among resource specifications.

characteristic	A list of resource specification characteristics (ResourceSpecificationCharacteristic [*]). A characteristic that refines the relationship. For example, consider the relationship between a slot and a card. For a half-height card, it is important to know the position at which the card is inserted, so a characteristic Position might be defined on the relationship to allow capturing of this in the inventory.
defaultQuantity	An integer. The default number of the related resource that should be instantiated, for example a rack would typically have 4 cards, although it could support more.
href	A string. Reference of the target ResourceSpecification.
id	A string. Unique identifier of target ResourceSpecification.
maximumQuantity	An integer. The maximum number of the related resource that should be instantiated, for example a rack supports a maximum of 16 cards.

minimumQuantity	An integer. The minimum number of the related resource that should be instantiated, for example a rack must have at least 1 card.
name	A string. The name given to the target resource specification instance.
relationshipType	A string. Type of relationship such as migration, substitution, dependency, exclusivity.
role	A string. The association role for this resource specification.
validFor	A time period. The period for which the ResourceSpecRelationship is valid.

TargetResourceSchema sub-resource

The reference object to the schema and type of target resource which is described by resource specification.

@schemaLocation	A string. This field provides a link to the schema describing the target resource.
@type	A string. Class type of the target resource.

ConnectionPointSpecificationRef relationship

Connection point specification reference. A connection point provides a service access point (SAP) for input and/or output of the resource function.

@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.
version	A string. Connection point specification version.

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.

EndpointSpecificationRef relationship

A specification for a vertex in a resource graph.

@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.
connectionPointSpecification	A connection point specification reference (ConnectionPointSpecificationRef). A specification for the connection point (SAP) of the associated resource function (optional).
isRoot	A boolean. Directionality: true when endpoint is a source, false when a sink. If true for all endpoints, connectivity is bidirectional. Default is true.
role	A string. Role of the Resource Function.

ResourceGraphSpecificationRef relationship

Resource graph specification reference.

@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.

Json representation sample

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

```
{
  "id": "5fc91de8-88be-4c7c-8b3c-e08ccc53b889",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/5fc91de8-88be-4c7c-8b3c-e08ccc53b889",
  "name": "Medium to Large Enterprise Firewall - Model 134985.3",
  "description": "This is a type of firewall to be used for our medium to large enterprise customers",
  "@type": "ResourceFunctionSpecification",
  "validFor": {
    "startDateTime": "2019-08-01T00:00:00.000Z",
    "endDateTime": "2019-08-31T23:59:59.999Z"
  },
  "lastUpdate": "2019-08-03T12:34:17.645Z",
  "lifecycleStatus": "Active",
  "isBundle": false,
  "category": "Security",
  "relatedParty": [
    {
      "id": "77b93cf8-54b1-49f6-82cd-4913d93101ef",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/v4/organization/77b93cf8-54b1-49f6-82cd-4913d93101ef",
    }
  ]
}
```

```

    "role": "Supplier",
    "name": "Firewall Express",
    "@referredType": "Organization"
  }
],
"resourceSpecCharacteristic": [
  {
    "name": "operatingSystem",
    "description": "Operating System",
    "valueType": "string",
    "configurable": true,
    "validFor": {
      "startDateTime": "2019-08-01T00:00:00.000Z",
      "endDateTime": "2019-12-31T23:59:59.999Z"
    },
    "@type": "ResourceSpecificationCharacteristic",
    "minCardinality": 1,
    "maxCardinality": 1,
    "isUnique": true,
    "extensible": false,
    "resourceSpecCharacteristicValue": [
      {
        "isDefault": true,
        "valueType": "string",
        "value": "Android Pie",
        "validFor": {
          "startDateTime": "2019-08-01T00:00:00.000Z",
          "endDateTime": "2020-08-31T23:59:59.999Z"
        }
      },
      {
        "isDefault": false,
        "valueType": "string",
        "value": "Windows 10",
        "validFor": {
          "startDateTime": "2015-07-29T00:00:00.000Z",
          "endDateTime": "2025-10-25T23:59:59.999Z"
        }
      },
      {
        "isDefault": false,
        "valueType": "string",
        "value": "macOS 10.14.6",
        "validFor": {
          "startDateTime": "2019-06-23T00:00:00.000Z",
          "endDateTime": "2021-12-31T23:59:59.999Z"
        }
      }
    ]
  },
  {
    "name": "maxTraffic",
    "description": "Max Traffic size in GBs/sec",
    "valueType": "integer",
    "configurable": false,

```



```
"extensible": true,
"validFor": {
  "startDateTime": "2018-11-17T00:00:00.000Z",
  "endDateTime": "2019-12-31T23:59:59.999Z"
},
"resourceSpecCharacteristicValue": [
  {
    "valueType": "integer",
    "value": 25
  }
]
},
{
  "name": "keywords",
  "description": "Keywords",
  "valueType": "string",
  "configurable": false,
  "extensible": true,
  "validFor": {
    "startDateTime": "2016-03-15T00:00:00.000Z",
    "endDateTime": "2019-12-31T23:59:59.999Z"
  },
  "resourceSpecCharacteristicValue": [
    {
      "valueType": "string",
      "value": "Firewall"
    },
    {
      "valueType": "string",
      "value": "Large Enterprise"
    },
    {
      "valueType": "string",
      "value": "Medium Enterprise"
    }
  ]
},
{
  "name": "language",
  "description": "Language supported in the RF package and user interface (if any)",
  "valueType": "string",
  "configurable": true,
  "minCardinality": 0,
  "maxCardinality": 3,
  "extensible": true,
  "validFor": {
    "startDateTime": "2016-03-15T00:00:00.000Z",
    "endDateTime": "2019-12-31T23:59:59.999Z"
  },
  "resourceSpecCharacteristicValue": [
    {
      "valueType": "string",
      "value": "en"
    },
    {
```

```

        "valueType": "string",
        "value": "es"
      },
      {
        "valueType": "string",
        "value": "fr"
      }
    ]
  },
  "featureSpecification": [
    {
      "id": "h776f845f-z20a-468f-v44m-9e07fe3bd28l",
      "name": "L2&L3",
      "validFor": {
        "startDateTime": "2018-05-11T00:00:00.000Z",
        "endDateTime": "2019-12-31T23:59:59.999Z"
      }
    },
    {
      "id": "g535f845f-032a-468f-a86e-9e07fe3bc85b",
      "name": "OSI-L4",
      "validFor": {
        "startDateTime": "2018-05-13T00:00:00.000Z",
        "endDateTime": "2019-12-31T23:59:59.999Z"
      }
    },
    {
      "id": "k463345f-011a-463a-a92f-4h2kfe3bc44b",
      "name": "OSI-L7",
      "validFor": {
        "startDateTime": "2018-05-16T00:00:00.000Z",
        "endDateTime": "2019-12-31T23:59:59.999Z"
      }
    },
    {
      "id": "f78g245f-671a-468f-a95j-9e07fe3bc98b",
      "name": "tarpit",
      "validFor": {
        "startDateTime": "2018-07-12T00:00:00.000Z",
        "endDateTime": "2019-12-31T23:59:59.999Z"
      }
    },
    {
      "id": "l22m455f-671a-499d-a95j-8h46fe3bc88c",
      "name": "log",
      "validFor": {
        "startDateTime": "2015-11-21T00:00:00.000Z",
        "endDateTime": "2019-12-31T23:59:59.999Z"
      }
    },
    "featureSpecCharacteristic": [
      {
        "name": "logSize",
        "description": "Log Size in MB",
        "valueType": "integer",

```

```

    "configurable": true,
    "validFor": {
      "startDateTime": "2015-11-22T00:00:00.000Z",
      "endDateTime": "2019-12-31T23:59:59.999Z"
    },
    "@type": "FeatureSpecificationCharacteristic",
    "minCardinality": 0,
    "maxCardinality": 1,
    "isUnique": true,
    "extensible": false,
    "featureSpecCharacteristicValue": [
      {
        "isDefault": true,
        "valueType": "integer",
        "value": 2000,
        "validFor": {
          "startDateTime": "2015-11-22T00:00:00.000Z",
          "endDateTime": "2019-12-31T23:59:59.999Z"
        }
      },
      {
        "isDefault": false,
        "valueType": "integer",
        "value": 4000,
        "validFor": {
          "startDateTime": "2015-11-22T00:00:00.000Z",
          "endDateTime": "2019-12-31T23:59:59.999Z"
        }
      }
    ]
  },
  {
    "id": "db723e27-58d3-4120-b564-af199cb32bd3",
    "name": "IPAddressing",
    "isBundle": true,
    "validFor": {
      "startDateTime": "2017-05-24T00:00:00.000Z",
      "endDateTime": "2019-12-31T23:59:59.999Z"
    },
    "constraint": [
      {
        "@referredType": "ValidationConstraint",
        "id": "bbccbc46-9b94-41aa-8ea8-5c33306d3c62",
        "href": "https://mycsp.com:8080/tmf-api/entityCatalog/v4/constraint/bbccbc46-9b94-41aa-8ea8-5c33306d3c62",
        "name": "ReliesOnIPv4OrIPv6"
      }
    ],
    "featureSpecRelationship": [
      {
        "relationshipType": "requires",
        "featureId": "43883a81-58ef-45af-ace4-993298ae8361",
        "parentSpecificationId": "755232457686",

```

```

    "parentSpecificationHref": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/resourceSpecification/755232457686",
    "name": "IPv4Addressing",
    "validFor": {
      "startDateTime": "2017-05-24T00:00:00.000Z",
      "endDateTime": "2019-12-31T23:59:59.999Z"
    }
  },
  {
    "relationshipType": "requires",
    "featureId": "b85f845f-011a-468f-a90e-9e07fe3bc90a",
    "parentSpecificationId": "755232457686",
    "parentSpecificationHref": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/resourceSpecification/755232457686",
    "name": "IPv6Addressing",
    "validFor": {
      "startDateTime": "2017-05-24T00:00:00.000Z",
      "endDateTime": "2019-12-31T23:59:59.999Z"
    }
  }
]
},
{
  "id": "43883a81-58ef-45af-ace4-993298ae8361",
  "name": "IPv4Addressing",
  "validFor": {
    "startDateTime": "2017-05-24T00:00:00.000Z",
    "endDateTime": "2019-12-31T23:59:59.999Z"
  }
},
{
  "id": "b85f845f-011a-468f-a90e-9e07fe3bc90a",
  "name": "IPv6Addressing",
  "validFor": {
    "startDateTime": "2017-05-24T00:00:00.000Z",
    "endDateTime": "2019-12-31T23:59:59.999Z"
  },
  "isEnabled": false
}
],
"resourceSpecRelationship": [
  {
    "id": "a19e5f96-3df4-4e34-95f7-30e66c42acd2",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/a19e5f96-3df4-4e34-95f7-
30e66c42acd2",
    "name": "SWI.1",
    "relationshipType": "contains"
  },
  {
    "id": "aa013f8c-5f08-47ff-a2cb-f297359277c2",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/aa013f8c-5f08-47ff-a2cb-
f297359277c2",
    "name": "SWI.2",
    "relationshipType": "contains"
  },
]

```

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{
  "id": "3a3b5bc7-039e-45b0-ada1-75560ec54108",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/3a3b5bc7-039e-45b0-ada1-75560ec54108",
  "name": "SWI.3",
  "relationshipType": "contains"
},
{
  "id": "4fbe07a3-42bb-45cd-b92c-d8d48f17dbc8",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/4fbe07a3-42bb-45cd-b92c-d8d48f17dbc8",
  "name": "SWI.4",
  "relationshipType": "contains"
},
{
  "id": "4a5c5d7c-0758-4896-a1aa-2f2a2241c4b5",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/4a5c5d7c-0758-4896-a1aa-2f2a2241c4b5",
  "name": "SWI.5",
  "relationshipType": "contains"
}
],
"connectionPointSpecification": [
{
  "id": "feeb7495-4dc5-4e0f-bf64-5973faac050c",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/feeb7495-4dc5-4e0f-bf64-5973faac050c",
  "@type": "ConnectionPointSpecificationRef",
  "@referredType": "ConnectionPointSpecification",
  "name": "CP1.1"
},
{
  "id": "ca331dcc-2c52-4346-bfbe-5d4170fe1b83",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/ca331dcc-2c52-4346-bfbe-5d4170fe1b83",
  "@type": "ConnectionPointSpecificationRef",
  "@referredType": "ResourceFunctionSpecification",
  "name": "CP3.2"
},
{
  "id": "3e35575c-897e-4dad-952d-3fcf87af698f",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/3e35575c-897e-4dad-952d-3fcf87af698f",
  "@type": "ConnectionPointSpecificationRef",
  "@referredType": "ResourceFunctionSpecification",
  "name": "CP5.2"
},
{
  "id": "9b2069ec-3bf7-43d2-afd8-1fa5711f905e",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/9b2069ec-3bf7-43d2-afd8-1fa5711f905e",
  "@type": "ConnectionPointSpecificationRef",
  "@referredType": "ResourceFunctionSpecification",
  "name": "CP1.4"
}
]
}

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```

    },
    "connectivitySpecification": [
      {
        "id": "2171b1da-0c68-412a-b986-18791d132ddd",
        "name": "Internal Connectivity Potential Graph",
        "@type": "ResourceGraphSpecification",
        "connectionSpecification": [
          {
            "name": "AdjacencyPair1",
            "@type": "ConnectionSpecification",
            "associationType": "pointtoPoint",
            "endpointSpecification": [
              {
                "id": "a19e5f96-3df4-4e34-95f7-30e66c42acd2",
                "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/a19e5f96-3df4-4e34-95f7-30e66c42acd2",
                "@type": "EndpointSpecificationRef",
                "@referredType": "ResourceFunctionSpecification",
                "name": "SWI.1",
                "isRoot": true,
                "connectionPointSpecification": {
                  "id": "8c237137-46b1-4eac-9b20-0f2b35f5ffb2",
                  "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/8c237137-46b1-4eac-9b20-0f2b35f5ffb2",
                  "@type": "ConnectionPointSpecificationRef",
                  "@referredType": "ResourceFunctionSpecification",
                  "name": "CP1.2"
                }
              },
            ],
          },
          {
            "id": "aa013f8c-5f08-47ff-a2cb-f297359277c2",
            "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/aa013f8c-5f08-47ff-a2cb-f297359277c232",
            "@type": "EndpointSpecificationRef",
            "@referredType": "ResourceFunctionSpecification",
            "name": "SWI.2",
            "isRoot": false,
            "connectionPointSpecification": {
              "id": "c8937fec-1923-4bdc-99d1-4a168f14d445",
              "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/c8937fec-1923-4bdc-99d1-4a168f14d445",
              "@type": "ConnectionPointSpecificationRef",
              "@referredType": "ResourceFunctionSpecification",
              "name": "CP2.1"
            }
          }
        ]
      }
    ],
    {
      "name": "AdjacencyPair2",
      "@type": "ConnectionSpecification",
      "associationType": "pointtoPoint",
      "endpointSpecification": [
        {
          "id": "aa013f8c-5f08-47ff-a2cb-f297359277c2",

```

```

    "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/aa013f8c-5f08-47ff-
a2cb-f297359277c2",
    "@type": "EndpointSpecificationRef",
    "@referredType": "ResourceFunctionSpecification",
    "name": "SWI.2",
    "isRoot": true,
    "connectionPointSpecification": {
      "id": "acbdf06a-1f2e-4815-8db5-4220bc87ade2",
      "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/acbdf06a-1f2e-
4815-8db5-4220bc87ade2",
      "@type": "ConnectionPointSpecificationRef",
      "@referredType": "ResourceFunctionSpecification",
      "name": "CP2.2"
    }
  },
  {
    "id": "3a3b5bc7-039e-45b0-ada1-75560ec54108",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/3a3b5bc7-039e-
45b0-ada1-75560ec54108",
    "@type": "EndpointSpecificationRef",
    "@referredType": "ResourceFunctionSpecification",
    "name": "SWI.3",
    "isRoot": false,
    "connectionPointSpecification": {
      "id": "0564e364-dd52-461b-a9f6-718e342e2217",
      "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/0564e364-dd52-
461b-a9f6-718e342e2217",
      "@type": "ConnectionPointSpecificationRef",
      "@referredType": "ResourceFunctionSpecification",
      "name": "CP3.1"
    }
  }
]
},
{
  "name": "AdjacencyPair3",
  "@type": "ConnectionSpecification",
  "associationType": "pointtoPoint",
  "endpointSpecification": [
    {
      "id": "3a3b5bc7-039e-45b0-ada1-75560ec54108",
      "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/3a3b5bc7-039e-
45b0-ada1-75560ec54108",
      "@type": "EndpointSpecificationRef",
      "@referredType": "ResourceFunctionSpecification",
      "name": "SWI.3",
      "isRoot": true,
      "connectionPointSpecification": {
        "id": "14ae7a86-8d6e-407e-adf0-f99505e48b67",
        "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/14ae7a86-8d6e-
407e-adf0-f99505e48b67",
        "@type": "ConnectionPointSpecificationRef",
        "@referredType": "ResourceFunctionSpecification",
        "name": "CP3.3"
      }
    }
  ]
}

```

```

    },
    {
      "id": "4fbe07a3-42bb-45cd-b92c-d8d48f17dbc8",
      "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/4fbe07a3-42bb-45cd-b92c-d8d48f17dbc8",
      "@type": "EndpointSpecificationRef",
      "@referredType": "ResourceFunctionSpecification",
      "name": "SWI.4",
      "isRoot": false,
      "connectionPointSpecification": {
        "id": "98b5906c-bbd0-4bb9-8551-1eaac552a4a3",
        "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/98b5906c-bbd0-4bb9-8551-1eaac552a4a3",
        "@type": "ConnectionPointSpecificationRef",
        "@referredType": "ResourceFunctionSpecification",
        "name": "CP4.1"
      }
    }
  ]
},
{
  "name": "AdjacencyPair4",
  "@type": "ConnectionSpecification",
  "associationType": "pointtoPoint",
  "endpointSpecification": [
    {
      "id": "4fbe07a3-42bb-45cd-b92c-d8d48f17dbc8",
      "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/4fbe07a3-42bb-45cd-b92c-d8d48f17dbc8",
      "@type": "EndpointSpecificationRef",
      "@referredType": "ResourceFunctionSpecification",
      "name": "SWI.4",
      "isRoot": true,
      "connectionPointSpecification": {
        "id": "415a8aa1-5d8b-4a7b-a886-cfb248fba864",
        "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/415a8aa1-5d8b-4a7b-a886-cfb248fba864",
        "@type": "ConnectionPointSpecificationRef",
        "@referredType": "ResourceFunctionSpecification",
        "name": "CP4.2"
      }
    }
  ],
  {
    "id": "4a5c5d7c-0758-4896-a1aa-2f2a2241c4b5",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/4a5c5d7c-0758-4896-a1aa-2f2a2241c4b5",
    "@type": "EndpointSpecificationRef",
    "@referredType": "ResourceFunctionSpecification",
    "name": "SWI.5",
    "isRoot": false,
    "connectionPointSpecification": {
      "id": "29bf728a-08c1-4bb9-84b0-5ad63468b1fb",
      "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/29bf728a-08c1-4bb9-84b0-5ad63468b1fb",
      "@type": "ConnectionPointSpecificationRef",

```



```

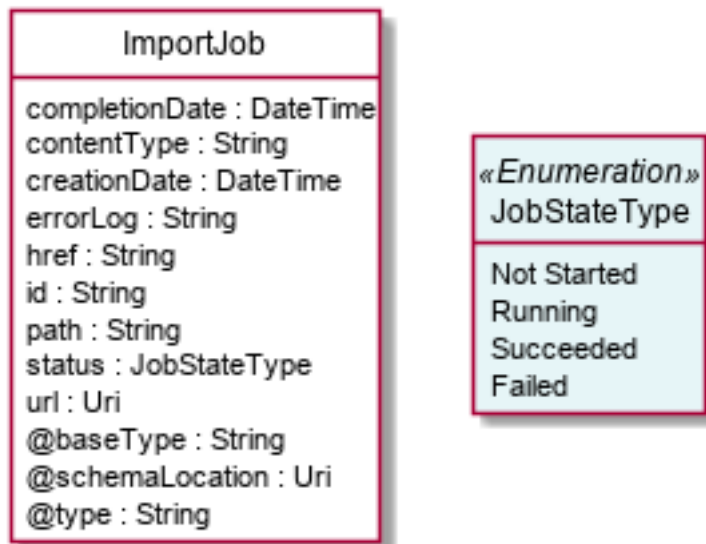
        "@referredType": "ResourceFunctionSpecification",
        "name": "CP5.1"
    }
}
],
{
    "name": "AdjacencyPair5",
    "@type": "ConnectionSpecification",
    "associationType": "pointToPoint",
    "endpointSpecification": [
        {
            "id": "4a5c5d7c-0758-4896-a1aa-2f2a2241c4b5",
            "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/4a5c5d7c-0758-4896-a1aa-2f2a2241c4b5",
            "@type": "EndpointSpecificationRef",
            "@referredType": "ResourceFunctionSpecification",
            "name": "SWI.5",
            "isRoot": true,
            "connectionPointSpecification": {
                "id": "e26d911c-3e61-409c-bcca-c7500e12b5a6",
                "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/e26d911c-3e61-409c-bcca-c7500e12b5a6",
                "@type": "ConnectionPointSpecificationRef",
                "@referredType": "ResourceFunctionSpecification",
                "name": "CP5.3"
            }
        },
        {
            "id": "a19e5f96-3df4-4e34-95f7-30e66c42acd2",
            "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/a19e5f96-3df4-4e34-95f7-30e66c42acd2",
            "@type": "EndpointSpecificationRef",
            "@referredType": "ResourceFunctionSpecification",
            "name": "SWI.1",
            "isRoot": false,
            "connectionPointSpecification": {
                "id": "62606a50-3cce-4225-b862-3b9ac72ef8ca",
                "href": "https://mycsp.com:8080/tmf-api/resourceCatalog/v4/resourceSpecification/62606a50-3cce-4225-b862-3b9ac72ef8ca",
                "@type": "ConnectionPointSpecificationRef",
                "@referredType": "ResourceFunctionSpecification",
                "name": "CP1.3"
            }
        }
    ]
}
]
}
]
}

```

Import Job resource

Represents a task used to import resources from a file.

Resource model



Field descriptions

ImportJob fields

<code>completionDate</code>	A date time (DateTime). Date at which the job was completed.
<code>contentType</code>	A string. Indicates the format of the imported data.
<code>creationDate</code>	A date time (DateTime). Date at which the job was created.
<code>errorLog</code>	A string. Reason for failure if status is failed.
<code>href</code>	A string. Reference of the import job.
<code>id</code>	A string. Identifier of the import job.
<code>path</code>	A string. URL of the root resource where the content of the file specified by the import job must be applied.
<code>status</code>	A job state type (JobStateType). Status of the import job (not started, running, succeeded, failed).
<code>url</code>	A string. URL of the file containing the data to be imported.

Json representation sample

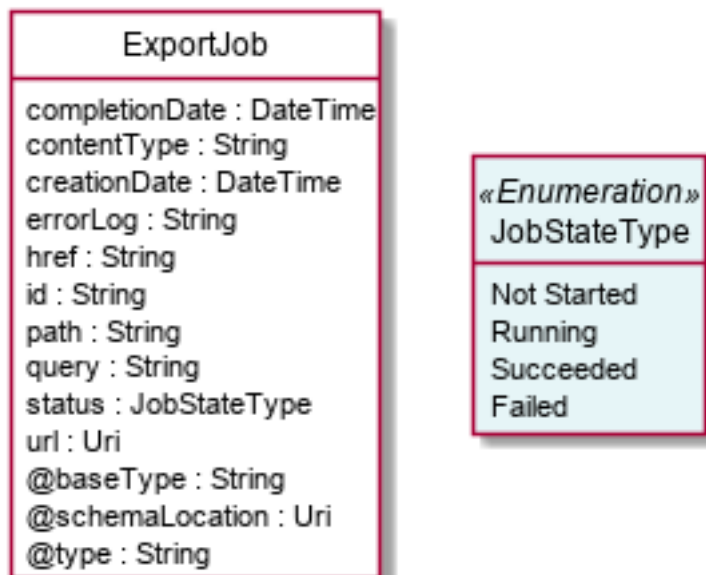
We provide below the json representation of an example of an 'ImportJob' resource object

```
{
  "id": "2341",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/v4/importJob/2341",
  "contentType": "application/json",
  "creationDate": "2018-08-27T00:00:00.000Z",
  "completionDate": "2018-08-27T00:05:00.000Z",
  "path": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/v4/resourceCatalog/3830",
  "status": "Succeeded",
  "url": "https://my-platform/daily/job/NHCFD6",
  "errorLog": "http://my-platform/logging/errors.log",
  "@type": "ImportJob"
}
```

Export Job resource

Represents a task used to export resources to a file.

Resource model



Field descriptions

ExportJob fields

<code>completionDate</code>	A date time (DateTime). Data at which the job was completed.
<code>contentType</code>	A string. The format of the exported data.
<code>creationDate</code>	A date time (DateTime). Date at which the job was created.
<code>errorLog</code>	A string. Reason for failure.
<code>href</code>	A string. Reference of the export job.

id	A string. Identifier of the export job.
path	A string. URL of the root resource acting as the source for streaming content to the file specified by the export job.
query	A string. Used to scope the exported data.
status	A job state type (JobStateType). Status of the export job (not started, running, succeeded, failed).
url	A string. URL of the file containing the data to be exported.

Json representation sample

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

```
{
  "id": "5435",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/v4/exportJob/5435",
  "contentType": "application/json",
  "creationDate": "2018-08-27T00:00:00.000Z",
  "path": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/v4/Catalog/3830",
  "query": "category.id=7757",
  "status": "Running",
  "url": "https://my-platform/daily/job/EHCFD6",
  "errorLog": "http://my-platform/logging/errors.log",
  "@type": "ExportJob"
}
```

Notification Resource Models

16 notifications are defined for this API

Notifications related to ResourceCatalog:

- ResourceCatalogCreateEvent
- ResourceCatalogChangeEvent
- ResourceCatalogDeleteEvent

Notifications related to ResourceCategory:

- ResourceCategoryCreateEvent
- ResourceCategoryChangeEvent
- ResourceCategoryDeleteEvent

Notifications related to ResourceCandidate:

- ResourceCandidateCreateEvent
- ResourceCandidateChangeEvent
- ResourceCandidateDeleteEvent

Notifications related to ResourceSpecification:

- ResourceSpecificationCreateEvent
- ResourceSpecificationChangeEvent
- ResourceSpecificationDeleteEvent

Notifications related to ImportJob:

- ImportJobCreateEvent
- ImportJobStateChangeEvent

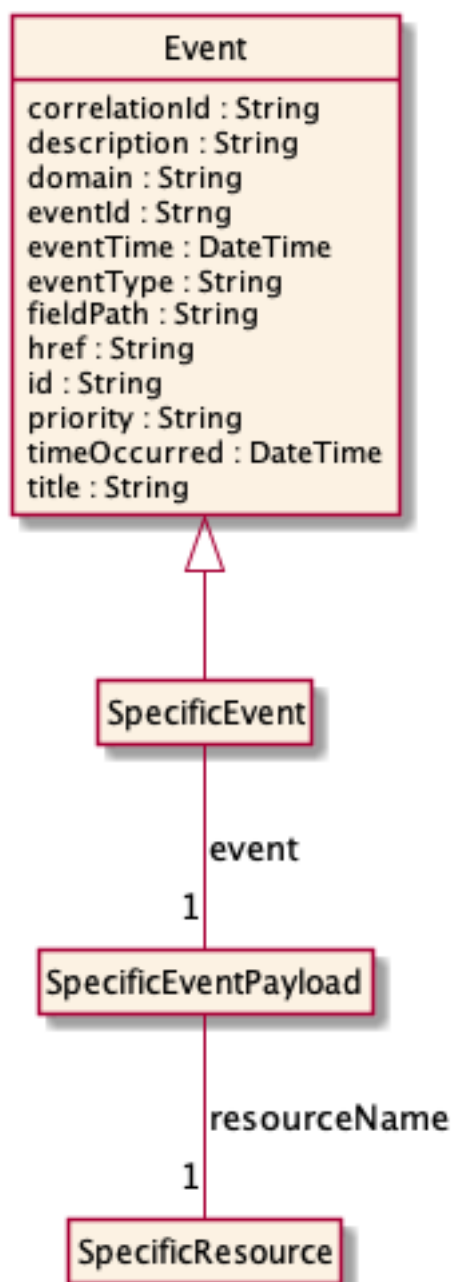
Notifications related to ExportJob:

- ExportJobCreateEvent
- ExportJobStateChangeEvent

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 Catalog Create Event

Notification `ResourceCatalogCreateEvent` case for resource `ResourceCatalog`

Json representation sample

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

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

```
"eventType": "ResourceCatalogCreateEvent",
"event": {
  "resourceCatalog" :
    {-- SEE ResourceCatalog RESOURCE SAMPLE --}
}
}
```

Resource Catalog Change Event

Notification ResourceCatalogChangeEvent case for resource ResourceCatalog

Json representation sample

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

```
{
  "eventId": "00001",
  "eventTime": "2015-11-16T16:42:25-04:00",
  "eventType": "ResourceCatalogChangeEvent",
  "event": {
    "resourceCatalog" :
      {-- SEE ResourceCatalog RESOURCE SAMPLE --}
  }
}
```

Resource Catalog Delete Event

Notification ResourceCatalogDeleteEvent case for resource ResourceCatalog

Json representation sample

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

```
{
  "eventId": "00001",
  "eventTime": "2015-11-16T16:42:25-04:00",
  "eventType": "ResourceCatalogDeleteEvent",
  "event": {
    "resourceCatalog" :
      {-- SEE ResourceCatalog RESOURCE SAMPLE --}
  }
}
```

Resource Category Create Event

Notification ResourceCategoryCreateEvent case for resource ResourceCategory

Json representation sample

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

```
{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ResourceCategoryCreateEvent",
  "event": {
    "resourceCategory" :
      {-- SEE ResourceCategory RESOURCE SAMPLE --}
  }
}
```

Resource Category Change Event

Notification ResourceCategoryChangeEvent case for resource ResourceCategory

Json representation sample

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

```
{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ResourceCategoryChangeEvent",
  "event": {
    "resourceCategory" :
      {-- SEE ResourceCategory RESOURCE SAMPLE --}
  }
}
```

Resource Category Delete Event

Notification ResourceCategoryDeleteEvent case for resource ResourceCategory

Json representation sample

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

```
{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ResourceCategoryDeleteEvent",
  "event": {
    "resourceCategory" :
      {-- SEE ResourceCategory RESOURCE SAMPLE --}
  }
}
```



```
}  
}
```

Resource Candidate Create Event

Notification ResourceCandidateCreateEvent case for resource ResourceCandidate

Json representation sample

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

```
{  
  "eventId":"00001",  
  "eventTime":"2015-11-16T16:42:25-04:00",  
  "eventType":"ResourceCandidateCreateEvent",  
  "event": {  
    "resourceCandidate" :  
      {-- SEE ResourceCandidate RESOURCE SAMPLE --}  
  }  
}
```

Resource Candidate Change Event

Notification ResourceCandidateChangeEvent case for resource ResourceCandidate

Json representation sample

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

```
{  
  "eventId":"00001",  
  "eventTime":"2015-11-16T16:42:25-04:00",  
  "eventType":"ResourceCandidateChangeEvent",  
  "event": {  
    "resourceCandidate" :  
      {-- SEE ResourceCandidate RESOURCE SAMPLE --}  
  }  
}
```

Resource Candidate Delete Event

Notification ResourceCandidateDeleteEvent case for resource ResourceCandidate

Json representation sample

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

```
{
  "eventId": "00001",
  "eventTime": "2015-11-16T16:42:25-04:00",
  "eventType": "ResourceCandidateDeleteEvent",
  "event": {
    "resourceCandidate":
      {-- SEE ResourceCandidate RESOURCE SAMPLE --}
  }
}
```

Resource Specification Create Event

Notification ResourceSpecificationCreateEvent case for resource ResourceSpecification

Json representation sample

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

```
{
  "eventId": "00001",
  "eventTime": "2015-11-16T16:42:25-04:00",
  "eventType": "ResourceSpecificationCreateEvent",
  "event": {
    "resourceSpecification":
      {-- SEE ResourceSpecification RESOURCE SAMPLE --}
  }
}
```

Resource Specification Change Event

Notification ResourceSpecificationChangeEvent case for resource ResourceSpecification

Json representation sample

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

```
{
  "eventId": "00001",
  "eventTime": "2015-11-16T16:42:25-04:00",
  "eventType": "ResourceSpecificationChangeEvent",
  "event": {
    "resourceSpecification":
      {-- SEE ResourceSpecification RESOURCE SAMPLE --}
  }
}
```

Resource Specification Delete Event

Notification ResourceSpecificationDeleteEvent case for resource ResourceSpecification

Json representation sample

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

```
{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ResourceSpecificationDeleteEvent",
  "event": {
    "resourceSpecification" :
      {-- SEE ResourceSpecification RESOURCE SAMPLE --}
  }
}
```

Import Job Create Event

Notification ImportJobCreateEvent case for resource ImportJob

Json representation sample

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

```
{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ImportJobCreateEvent",
  "event": {
    "importJob" :
      {-- SEE ImportJob RESOURCE SAMPLE --}
  }
}
```

Import Job State Change Event

Notification ImportJobStateChangeEvent case for resource ImportJob

Json representation sample

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

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

```
"importJob" :  
  {-- SEE ImportJob RESOURCE SAMPLE --}  
}  
}
```

Export Job Create Event

Notification ExportJobCreateEvent case for resource ExportJob

Json representation sample

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

```
{  
  "eventId":"00001",  
  "eventTime":"2015-11-16T16:42:25-04:00",  
  "eventType":"ExportJobCreateEvent",  
  "event": {  
    "exportJob" :  
      {-- SEE ExportJob RESOURCE SAMPLE --}  
  }  
}
```

Export Job State Change Event

Notification ExportJobStateChangeEvent case for resource ExportJob

Json representation sample

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

```
{  
  "eventId":"00001",  
  "eventTime":"2015-11-16T16:42:25-04:00",  
  "eventType":"ExportJobStateChangeEvent",  
  "event": {  
    "exportJob" :  
      {-- SEE ExportJob 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
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 Catalog

List resource catalogs

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

Description

This operation list resource catalog 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 multiple catalogs.

Request
<pre>GET /tmf-api/resourceCatalog/v4/resourceCatalog?category.id=7757 Accept: application/json</pre>
Response
<pre>200 [{ "id": "5574", "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCatalog/5574", "name": "Cloud Resource Catalog", "description": "This resource catalog points to entities in the area of cloud management", "@type": "ResourceCatalog", "version": "1.0", "validFor": { "startDateTime": "2017-08-10T00:00:00.000Z", "endDateTime": "2018-03-07T00:00:00.000Z" }, "lastUpdate": "2017-08-09T00:00:00.000Z", "lifecycleStatus": "Active", "relatedParty": [{ "id": "5858", "href": "https://mycsp.com:8080/tmf-api/partyManagement/organization/5858", "role": "Supplier", "name": "Gustave Flaubert", "@referredType": "Organization" }], "category": [{ "id": "7757", "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCategory/4569", "version": "1.0", "name": "Secure Home"</pre>

```

    }
  ]
},
{
  "id": "5578",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCatalog/5578",
  "name": "Router Catalog",
  "description": "This resource catalog points to entities in the area of routers",
  "@type": "ResourceCatalog",
  "version": "1.0",
  "validFor": {
    "startDateTime": "2017-08-10T00:00:00.000Z",
    "endDateTime": "2018-03-07T00:00:00.000Z"
  },
  "lastUpdate": "2017-09-01T00:00:00.000Z",
  "lifecycleStatus": "Active",
  "relatedParty": [
    {
      "id": "58998",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/organization/58998",
      "role": "Supplier",
      "name": "Nokia Networks",
      "@referredType": "Organization"
    }
  ],
  "category": [
    {
      "id": "7757",
      "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCategory/4578",
      "version": "1.0",
      "name": "Routers"
    }
  ]
}
]

```

Retrieve resource catalog

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

Description

This operation retrieves a resource catalog 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 specific catalog.

Request
GET /tmf-api/resourceCatalog/v4/resourceCatalog/5574 Accept: application/json
Response
200 <pre>{ "id": "5574", "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCatalog/5574", "name": "Cloud Resource Catalog", "description": "This resource catalog points to entities in the area of cloud management", "@type": "ResourceCatalog", "version": "1.0", "validFor": { "startDateTime": "2017-08-10T00:00:00.000Z", "endDateTime": "2018-03-07T00:00:00.000Z" }, "lastUpdate": "2017-08-09T00:00:00.000Z", "lifecycleStatus": "Active", "relatedParty": [{ "id": "5858", "href": "https://mycsp.com:8080/tmf-api/partyManagement/organization/5858", "role": "Supplier", "name": "Gustave Flaubert", "@referredType": "Organization" }], "category": [{ "id": "4569", "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCategory/4569", "version": "1.0", "name": "Secure Home" }] }</pre>

Create resource catalog

POST /resourceCatalog

Description

This operation creates a resource catalog entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a ResourceCatalog, 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	

Non Mandatory Attributes	Rule
category	
description	
lastUpdate	
lifecycleStatus	
relatedParty	
validFor	
version	

Usage Samples

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

Request
POST /tmf-api/resourceCatalog/v4/resourceCatalog Content-Type: application/json <pre>{ "name": "Cloud Resource Catalog", "description": "This resource catalog points to entities in the area of cloud management", "@type": "ResourceCatalog" }</pre>
Response
201 <pre>{ "id": "5574", "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCatalog/5574", "name": "Cloud Resource Catalog", "description": "This resource catalog points to entities in the area of cloud management", "lastUpdate": "2017-08-27T00:00:00.000Z", "lifecycleStatus": "Tentative", "@type": "ResourceCatalog" }</pre>

}

Patch resource catalog

PATCH /resourceCatalog/{id}

Description

This operation allows partial updates of a resource catalog 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	
lastUpdate	
lifecycleStatus	
name	
relatedParty	
validFor	
version	

Non Patchable Attributes	Rule
id	
href	

Usage Samples

Here's an example of a request for patching a catalog. In this example, a new version is set, together with validity period.

Request
PATCH /tmf-api/resourceCatalog/v4/resourceCatalog/5574 Content-Type: application/merge-patch+json

```
{
  "version": "2.0",
  "validFor": {
    "startDateTime": "2018-03-25T00:00:00.000Z",
    "endDateTime": "2018-09-25T00:00:00.000Z"
  }
}
```

Response

200

```
{
  "id": "5574",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCatalog/5574",
  "name": "Cloud Resource Catalog",
  "description": "This resource catalog points to entities in the area of cloud management",
  "@type": "ResourceCatalog",
  "version": "2.0",
  "validFor": {
    "startDateTime": "2018-03-25T00:00:00.000Z",
    "endDateTime": "2018-09-25T00:00:00.000Z"
  },
  "lastUpdate": "2017-08-09T00:00:00.000Z",
  "lifecycleStatus": "Active",
  "relatedParty": [
    {
      "id": "5858",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/organization/5858",
      "role": "Supplier",
      "name": "Gustave Flaubert",
      "@referredType": "Organization"
    }
  ],
  "category": [
    {
      "id": "4569",
      "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCategory/4569",
      "version": "1.0",
      "name": "Secure Home"
    }
  ]
}
```

Delete resource catalog**DELETE** /resourceCatalog/{id}**Description**

This operation deletes a resource catalog entity.

Usage Samples

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

Request
DELETE /tmf-api/resourceCatalog/v4/resourceCatalog/5574
Response
204

Operations on Resource Category

List resource categories

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

Description

This operation list resource category 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 all the root categories.

Request
GET /tmf-api/resourceCatalog/v4/resourceCategory?isRoot=true Accept: application/json
Response

200

```
[
  {
    "id": "8121",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCategory/8121",
    "name": "Network Logical Resources",
    "description": "This resource category groups together logical resources that are implemented in the network",
    "@type": "ResourceCategory",
    "version": "1.0",
    "validFor": {
      "startDateTime": "2017-08-11T00:00:00.000Z",
      "endDateTime": "2018-03-07T00:00:00.000Z"
    },
    "lifecycleStatus": "Active",
    "lastUpdate": "2017-08-09T00:00:00.000Z",
    "isRoot": true,
    "category": [
      {
        "id": "5982",
        "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/category/5982",
        "version": "3.2",
        "name": "IoT"
      }
    ],
    "resourceCandidate": [
      {
        "id": "5298",
        "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCandidate/5298",
        "version": "1.0",
        "name": "Elastic Storage"
      },
      {
        "id": "7479",
        "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCandidate/7479",
        "version": "3.2",
        "name": "Virtual Storage Medium"
      }
    ],
    "relatedParty": [
      {
        "id": "4434",
        "href": "https://mycsp.com:8080/tmf-api/partyManagement/organization/4434",
        "role": "employee",
        "name": "Jimmy Doe",
        "@referredType": "Organization"
      }
    ]
  },
  {
    "id": "8123",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCategory/8121",
    "name": "Network Physical Resources",
    "description": "This resource category groups together physical resources that are implemented in the network",
```

```
"@type": "ResourceCategory",
"version": "1.0",
"validFor": {
  "startDateTime": "2017-08-11T00:00:00.000Z",
  "endDateTime": "2018-03-07T00:00:00.000Z"
},
"lifecycleStatus": "Active",
"lastUpdate": "2017-08-09T00:00:00.000Z",
"isRoot": true,
"category": [
  {
    "id": "5588",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/category/5588",
    "version": "3.2",
    "name": "Router"
  }
],
"resourceCandidate": [
  {
    "id": "3421",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCandidate/3421",
    "version": "1.0",
    "name": "Nokia Router"
  },
  {
    "id": "2431",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCandidate/2431",
    "version": "3.2",
    "name": "Ericsson Router"
  }
],
"relatedParty": [
  {
    "id": "4434",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/organization/4434",
    "role": "employee",
    "name": "Jimmy Doe",
    "@referredType": "Organization"
  }
]
}
```

Retrieve resource category

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

Description

This operation retrieves a resource category 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 specific category.

Request
GET /tmf-api/resourceCatalog/v4/resourceCategory/8121 Accept: application/json
Response
200 <pre>{ "id": "8121", "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCategory/8121", "name": "Network Logical Resources", "description": "This resource category groups together logical resources that are implemented in the network", "@type": "ResourceCategory", "version": "1.0", "validFor": { "startDateTime": "2017-08-11T00:00:00.000Z", "endDateTime": "2018-03-07T00:00:00.000Z" }, "lifecycleStatus": "Active", "lastUpdate": "2017-08-09T00:00:00.000Z", "isRoot": true, "category": [{ "id": "5982", "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/category/5982", "version": "3.2", "name": "IoT" }], "resourceCandidate": [{ "id": "5298", "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCandidate/5298", "version": "1.0", "name": "Elastic Storage" }, { "id": "7479", "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCandidate/7479", "version": "3.2", "name": "Virtual Storage Medium" }], "relatedParty": [{</pre>

```

    "id": "4434",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/organization/4434",
    "role": "employee",
    "name": "Jimmy Doe",
    "@referredType": "Organization"
  }
]
}

```

Create resource category

POST /resourceCategory

Description

This operation creates a resource category entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a ResourceCategory, 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	

Non Mandatory Attributes	Rule
category	
description	
isRoot	
lastUpdate	
lifecycleStatus	
parentId	
relatedParty	
resourceCandidate	
validFor	
version	

Usage Samples

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

Request

POST /tmf-api/resourceCatalog/v4/resourceCategory

Content-Type: application/json

```
{
  "name": "Network Logical Resources",
  "description": "This resource category groups together logical resources that are implemented in the network",
  "@type": "ResourceCategory"
}
```

Response

201

```
{
  "id": "8121",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCategory/8121",
  "name": "Network Logical Resources",
  "description": "This resource category groups together logical resources that are implemented in the network",
  "@type": "ResourceCategory",
  "version": "1.0",
  "validFor": {
    "startDateTime": "2017-08-11T00:00:00.000Z",
    "endDateTime": "2018-03-07T00:00:00.000Z"
  },
  "lifecycleStatus": "Tentative",
  "lastUpdate": "2017-08-09T00:00:00.000Z"
}
```

Patch resource category

PATCH /resourceCategory/{id}

Description

This operation allows partial updates of a resource category 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	
isRoot	
lastUpdate	
lifecycleStatus	
name	
parentId	
relatedParty	
resourceCandidate	
validFor	
version	

Non Patchable Attributes	Rule
id	
href	

Usage Samples

Here's an example of a request for patching a category. In this example, a new version is set, together with validity period.

Request
PATCH /tmf-api/resourceCatalog/v4/resourceCategory/8121 Content-Type: application/merge-patch+json <pre>{ "version": "2.0", "validFor": { "startDateTime": "2018-03-25T00:00:00.000Z", "endDateTime": "2018-09-25T00:00:00.000Z" } }</pre>
Response
200 <pre>{ "id": "8121", "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCategory/8121", "name": "Network Logical Resources", "description": "This resource category groups together logical resources that are implemented in the network", "@type": "ResourceCategory", "version": "2.0", "validFor": {</pre>

```
{
  "startTime": "2018-03-25T00:00:00.000Z",
  "endTime": "2018-09-25T00:00:00.000Z",
},
"lifecycleStatus": "Active",
"lastUpdate": "2017-08-09T00:00:00.000Z",
"isRoot": true,
"category": [
  {
    "id": "5982",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/category/5982",
    "version": "3.2",
    "name": "IoT"
  }
],
"resourceCandidate": [
  {
    "id": "5298",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCandidate/5298",
    "version": "1.0",
    "name": "Elastic Storage"
  },
  {
    "id": "7479",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCandidate/7479",
    "version": "3.2",
    "name": "Virtual Storage Medium"
  }
],
"relatedParty": [
  {
    "id": "4434",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/organization/4434",
    "role": "employee",
    "name": "Jimmy Doe",
    "@referredType": "Organization"
  }
]
}
```

Delete resource category

DELETE /resourceCategory/{id}

Description

This operation deletes a resource category entity.

Usage Samples

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

Request
DELETE /tmf-api/resourceCatalog/v4/resourceCategory/8121
Response
204

Operations on Resource Candidate

List resource candidates

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

Description

This operation list resource candidate 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 multiple candidates.

Request
GET /tmf-api/resourceCatalog/v4/resourceCandidate?version=2.1 Accept: application/json
Response
200 [{ "id": "7479", "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCandidate/7479", "name": "Virtual Storage Medium", "description": "This resource candidate makes the virtual storage medium specification available in the cloud catalog", "@type": "ResourceCandidate",

```

"version": "2.1",
"validFor": {
  "startDateTime": "2017-08-12T00:00:00.000Z",
  "endDateTime": "2018-03-07T00:00:00.000Z"
},
"lastUpdate": "2017-08-09T00:00:00.000Z",
"lifecycleStatus": "Active",
"category": [
  {
    "id": "5355",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/category/5355",
    "version": "1.1",
    "name": "Cloud Resources"
  }
],
"resourceSpecification": {
  "id": "42",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/42",
  "version": "3.0",
  "name": "VirtualStorageMedium"
}
},
{
  "id": "7991",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCandidate/7991",
  "name": "Router",
  "description": "This resource candidate makes the Nokia Router available in the hardware catalog",
  "@type": "ResourceCandidate",
  "version": "2.1",
  "validFor": {
    "startDateTime": "2017-08-12T00:00:00.000Z",
    "endDateTime": "2019-12-31T00:00:00.000Z"
  },
  "lastUpdate": "2018-08-09T00:00:00.000Z",
  "lifecycleStatus": "Active",
  "category": [
    {
      "id": "53116",
      "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/category/53116",
      "version": "1.1",
      "name": "Routers"
    }
  ],
  "resourceSpecification": {
    "id": "32",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/32",
    "version": "3.0",
    "name": "NokiaRouter"
  }
}
]

```

Retrieve resource candidate**GET /resourceCandidate/{id}?fields=...&{filtering}****Description**

This operation retrieves a resource candidate 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 specific candidate.

Request
GET /tmf-api/resourceCatalog/v4/resourceCandidate/7479 Accept: application/json
Response
200 { "id": "7479", "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCandidate/7479", "name": "Virtual Storage Medium", "description": "This resource candidate makes the virtual storage medium specification available in the cloud catalog", "@type": "ResourceCandidate", "version": "3.2", "validFor": { "startDateTime": "2017-08-12T00:00:00.000Z", "endDateTime": "2018-03-07T00:00:00.000Z" }, "lastUpdate": "2017-08-09T00:00:00.000Z", "lifecycleStatus": "Active", "category": [{ "id": "5355", "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/category/5355", "version": "1.1", "name": "Cloud Resources" }], "resourceSpecification": { "id": "42", "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/42",


```

    "version": "3.0",
    "name": "VirtualStorageMedium"
  }
}

```

Create resource candidate

POST /resourceCandidate

Description

This operation creates a resource candidate entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a ResourceCandidate, 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	

Non Mandatory Attributes	Rule
category	
description	
lastUpdate	
lifecycleStatus	
resourceSpecification	
validFor	
version	

Usage Samples

Here's an example of a request for creating a specific candidate.

Request
POST /tmf-api/resourceCatalog/v4/resourceCandidate Content-Type: application/json <pre> { "name": "Virtual Storage Medium", "description": "This resource candidate makes the virtual storage medium specification available in the cloud catalog", "@type": "ResourceCandidate" } </pre>

Response

201

```
{
  "id": "7479",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCandidate/7479",
  "name": "Virtual Storage Medium",
  "description": "This resource candidate makes the virtual storage medium specification available in the cloud catalog",
  "lastUpdate": "2017-08-09T00:00:00.000Z",
  "lifecycleStatus": "Active",
  "@type": "ResourceCandidate"
}
```

Patch resource candidate**PATCH /resourceCandidate/{id}****Description**

This operation allows partial updates of a resource candidate 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	
lastUpdate	
lifecycleStatus	
name	
resourceSpecification	
validFor	
version	

Non Patchable Attributes	Rule
id	
href	

Usage Samples

Here's an example of a request for patching an candidate. In this example, a new version is set, together with validity period.

Request
PATCH /tmf-api/resourceCatalog/v4/resourceCandidate/7479 Content-Type: application/merge-patch+json <pre>{ "version": "3.3", "validFor": { "startDateTime": "2018-03-23T00:00:00.000Z", "endDateTime": "2018-09-25T00:00:00.000Z" } }</pre>
Response
200 <pre>{ "id": "7479", "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceCandidate/7479", "name": "Virtual Storage Medium", "description": "This resource candidate makes the virtual storage medium specification available in the cloud catalog", "@type": "ResourceCandidate", "version": "3.3", "validFor": { "startDateTime": "2017-08-12T00:00:00.000Z", "endDateTime": "2018-03-07T00:00:00.000Z" }, "lastUpdate": "2017-08-09T00:00:00.000Z", "lifecycleStatus": "Active", "category": [{ "id": "5355", "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/category/5355", "version": "1.1", "name": "Cloud Resources" }], "resourceSpecification": { "id": "42", "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/42", "version": "3.0", "name": "VirtualStorageMedium" } }</pre>

```
}  
}
```

Delete resource candidate

DELETE /resourceCandidate/{id}

Description

This operation deletes a resource candidate entity.

Usage Samples

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

Request
DELETE /tmf-api/resourceCatalog/v4/resourceCandidate/7479
Response
204

Operations on Resource Specification

List resource specifications

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

Description

This operation list resource 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 multiple resource specifications.

Request

GET /tmf-api/resourceCatalog/v4/resourceSpecification
 Accept: application/json

Response

200

```
[
  {
    "id": "42",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/42",
    "name": "Virtual Storage Medium",
    "description": "This resource specification defines the virtual storage medium",
    "@type": "LogicalResourceSpecification",
    "@baseType": "ResourceSpecification",
    "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Resource/LogicalResourceSpecification.schema.json",
    "version": "3.2",
    "validFor": {
      "startDateTime": "2017-08-12T00:00:00.000Z",
      "endDateTime": "2018-03-07T00:00:00.000Z"
    },
    "lastUpdate": "2017-08-09T00:00:00.000Z",
    "lifecycleStatus": "Active",
    "isBundle": false,
    "category": "Cloud resource",
    "attachment": [
      {
        "id": "25552",
        "href": "https://mycsp.com:8080/tmf-api/documentManagement/v4/attachment/25552",
        "name": "Configuration Instructions",
        "mimeType": "application/pdf",
        "url": "https://mycsp.com:7070/docloader?docnum=9567457677"
      }
    ],
    "relatedParty": [
      {
        "id": "5858",
        "href": "https://mycsp.com:8080/tmf-api/partyManagement/organization/5858",
        "role": "Supplier",
        "name": "Gustave Flaubert",
        "@referredType": "Organization"
      }
    ],
    "resourceSpecCharacteristic": [
      {
        "name": "Maximum Allowed Storage",
        "description": "The storage limit in the virtual storage medium, ",
        "valueType": "integer",
```

```

    "configurable": true,
    "minCardinality": 1,
    "maxCardinality": 1,
    "isUnique": true,
    "resourceSpecCharacteristicValue": [
      {
        "valueType": "integer",
        "value": 1024000
      },
      {
        "valueType": "integer",
        "value": 2048000
      }
    ]
  },
  "resourceSpecRelationship": [
    {
      "id": "556788",
      "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/556788",
      "name": "Underlying Physical Disk",
      "relationshipType": "dependency"
    }
  ],
  "targetResourceSchema": {
    "@type": "VirtualStorage",
    "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Resource/VirtualStorage.schema.json"
  }
},
{
  "id": "43",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/43",
  "name": "Nokia 7750 SR-s Service Router",
  "description": "This resource specification defines an IP router provided by Nokia",
  "@type": "PhysicalResourceSpecification",
  "@baseType": "ResourceSpecification",
  "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Resource/PhysicalResourceSpecification.schema.json",
  "version": "3.2",
  "validFor": {
    "startDateTime": "2017-08-12T00:00:00.000Z",
    "endDateTime": "2018-03-07T00:00:00.000Z"
  },
  "lastUpdate": "2017-08-09T00:00:00.000Z",
  "lifecycleStatus": "Active",
  "isBundle": false,
  "category": "Router resource",
  "attachment": [
    {
      "id": "25553",
      "href": "https://mycsp.com:8080/tmf-api/documentManagement/v4/attachment/25553",
      "name": "Data Sheet",
      "mimeType": "application/pdf",
      "url": "https://onestore.nokia.com/asset/205421"
    }
  ]
}

```

```

    }
  ],
  "relatedParty": [
    {
      "id": "5855",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/organization/5855",
      "role": "Supplier",
      "name": "Nokia Networks",
      "@referredType": "Organization"
    }
  ],
  "resourceSpecCharacteristic": [
    {
      "name": "Power Supply Option",
      "description": "The type of power supply that can be chosen",
      "valueType": "string",
      "configurable": true,
      "minCardinality": 1,
      "maxCardinality": 1,
      "isUnique": true,
      "resourceSpecCharacteristicValue": [
        {
          "valueType": "string",
          "value": "AC/HVDC"
        },
        {
          "valueType": "string",
          "value": "LVDC"
        }
      ]
    }
  ]
},
"resourceSpecRelationship": [
  {
    "id": "556234",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/556234",
    "name": "SR OS Operating System",
    "relationshipType": "dependency"
  }
],
"targetResourceSchema": {
  "@type": "NokiaRouter",
  "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Resource/NokiaRouter.schema.json"
},
"model": "7750 SR",
"part": "2s",
"sku": "3HE09264AA",
"vendor": "Nokia Networks"
}
]

```

Retrieve resource specification

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

Description

This operation retrieves a resource 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 specific specification.

Request
GET /tmf-api/resourceCatalog/v4/resourceSpecification/42 Accept: application/json
Response
200 { "id": "42", "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/42", "name": "Virtual Storage Medium", "description": "This resource specification defines the virtual storage medium", "@type": "LogicalResourceSpecification", "@baseType": "ResourceSpecification", "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Resource/LogicalResourceSpecification.schema.json", "version": "3.2", "validFor": { "startDateTime": "2017-08-12T00:00:00.000Z", "endDateTime": "2018-03-07T00:00:00.000Z" }, "lastUpdate": "2017-08-09T00:00:00.000Z", "lifecycleStatus": "Active", "isBundle": false, "category": "Cloud resource", "attachment": [{ "id": "25552", "href": "https://mycsp.com:8080/tmf-api/documentManagement/v4/attachment/25552", "name": "Configuration Instructions", "mimeType": "application/pdf",


```

        "url": "https://mycsp.com:7070/docloader?docnum=9567457677"
    }
  ],
  "relatedParty": [
    {
      "id": "5858",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/organization/5858",
      "role": "Supplier",
      "name": "Gustave Flaubert",
      "@referredType": "Organization"
    }
  ],
  "resourceSpecCharacteristic": [
    {
      "name": "Maximum Allowed Storage",
      "description": "The storage limit in the virtual storage medium, ",
      "valueType": "integer",
      "configurable": true,
      "minCardinality": 1,
      "maxCardinality": 1,
      "isUnique": true,
      "resourceSpecCharacteristicValue": [
        {
          "valueType": "integer",
          "value": 1024000
        },
        {
          "valueType": "integer",
          "value": 2048000
        }
      ]
    }
  ]
},
"resourceSpecRelationship": [
  {
    "id": "556788",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/556788",
    "name": "Underlying Physical Disk",
    "relationshipType": "dependency"
  }
],
"targetResourceSchema": {
  "@type": "VirtualStorage",
  "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Resource/VirtualStorage.schema.json"
}
}

```

Create resource specification

POST /resourceSpecification

Description

This operation creates a resource specification entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a ResourceSpecification, 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	

Non Mandatory Attributes	Rule
attachment	
category	
description	
featureSpecification	
isBundle	
lastUpdate	
lifecycleStatus	
relatedParty	
resourceSpecCharacteristic	
resourceSpecRelationship	
targetResourceSchema	
validFor	
version	

Usage Samples

Here's an example of a request for creating a specification. This example shows a characteristic-based implementation.

Request
POST /tmf-api/resourceCatalog/v4/resourceSpecification Content-Type: application/json <pre>{ "name": "Virtual Storage Medium", "description": "This resource specification defines the virtual storage medium", "@type": "LogicalResourceSpecification", "@baseType": "ResourceSpecification", "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Resource/LogicalResourceSpecification.schema.json", "version": "1.0", "validFor": { "startDateTime": "2017-08-12T00:00:00.000Z", "endDateTime": "2018-03-07T00:00:00.000Z" } }</pre>

```
},
"isBundle": false,
"category": "Cloud resource",
"attachment": [
  {
    "id": "25552",
    "href": "https://mycsp.com:8080/tmf-api/documentManagement/v4/attachment/25552",
    "name": "Configuration Instructions",
    "mimeType": "application/pdf",
    "url": "https://mycsp.com:7070/docloader?docnum=9567457677"
  }
],
"relatedParty": [
  {
    "id": "5858",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/organization/5858",
    "role": "Supplier",
    "name": "Gustave Flaubert",
    "@referredType": "Organization"
  }
],
"resourceSpecCharacteristic": [
  {
    "name": "Maximum Allowed Storage",
    "description": "The storage limit in the virtual storage medium, ",
    "valueType": "integer",
    "configurable": true,
    "minCardinality": 1,
    "maxCardinality": 1,
    "isUnique": true,
    "resourceSpecCharacteristicValue": [
      {
        "valueType": "integer",
        "value": 1024000
      },
      {
        "valueType": "integer",
        "value": 2048000
      }
    ]
  }
],
"resourceSpecRelationship": [
  {
    "id": "556788",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/556788",
    "name": "Underlying Physical Disk",
    "relationshipType": "dependency"
  }
]
}
```

Response

201

```

{
  "id": "42",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/42",
  "name": "Virtual Storage Medium",
  "description": "This resource specification defines the virtual storage medium",
  "@type": "LogicalResourceSpecification",
  "@baseType": "ResourceSpecification",
  "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Resource/LogicalResourceSpecification.schema.json",
  "version": "1.0",
  "validFor": {
    "startDateTime": "2017-08-12T00:00:00.000Z",
    "endDateTime": "2018-03-07T00:00:00.000Z"
  },
  "lastUpdate": "2017-08-09T00:00:00.000Z",
  "lifecycleStatus": "Tentative",
  "isBundle": false,
  "category": "Cloud resource",
  "attachment": [
    {
      "id": "25552",
      "href": "https://mycsp.com:8080/tmf-api/documentManagement/v4/attachment/25552",
      "name": "Configuration Instructions",
      "mimeType": "application/pdf",
      "url": "https://mycsp.com:7070/docloader?docnum=9567457677"
    }
  ],
  "relatedParty": [
    {
      "id": "5858",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/organization/5858",
      "role": "Supplier",
      "name": "Gustave Flaubert",
      "@referredType": "Organization"
    }
  ],
  "resourceSpecCharacteristic": [
    {
      "name": "Maximum Allowed Storage",
      "description": "The storage limit in the virtual storage medium, ",
      "valueType": "integer",
      "configurable": true,
      "minCardinality": 1,
      "maxCardinality": 1,
      "isUnique": true,
      "resourceSpecCharacteristicValue": [
        {
          "valueType": "integer",
          "value": 1024000
        }
      ]
    }
  ]
}

```

```

    },
    {
      "valueType": "integer",
      "value": 2048000
    }
  ]
}
],
"resourceSpecRelationship": [
  {
    "id": "556788",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/556788",
    "name": "Underlying Physical Disk",
    "relationshipType": "dependency"
  }
]
}

```

Here's an example of a request for creating a specification. This example shows a schema-based implementation.

Request

POST /tmf-api/resourceCatalog/v4/resourceSpecification

Content-Type: application/json

```

{
  "name": "Virtual Storage Medium",
  "description": "This resource specification defines the virtual storage medium",
  "@type": "LogicalResourceSpecification",
  "@baseType": "ResourceSpecification",
  "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Resource/LogicalResourceSpecification.schema.json",
  "version": "1.0",
  "validFor": {
    "startDateTime": "2017-08-12T00:00:00.000Z",
    "endDateTime": "2018-03-07T00:00:00.000Z"
  },
  "isBundle": false,
  "category": "Cloud resource",
  "attachment": [
    {
      "id": "25552",
      "href": "https://mycsp.com:8080/tmf-api/documentManagement/v4/attachment/25552",
      "name": "Configuration Instructions",
      "mimeType": "application/pdf",
      "url": "https://mycsp.com:7070/docloader?docnum=9567457677"
    }
  ],
  "relatedParty": [
    {
      "id": "5858",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/organization/5858",
    }
  ]
}

```

```

    "role": "Supplier",
    "name": "Gustave Flaubert",
    "@referredType": "Organization"
  }
],
"resourceSpecRelationship": [
  {
    "id": "556788",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/556788",
    "name": "Underlying Physical Disk",
    "relationshipType": "dependency"
  }
],
"targetResourceSchema": {
  "@type": "VirtualStorage",
  "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Resource/VirtualStorage.schema.json"
}
}

```

Response

201

```

{
  "id": "42",
  "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/42",
  "name": "Virtual Storage Medium",
  "description": "This resource specification defines the virtual storage medium",
  "@type": "LogicalResourceSpecification",
  "@baseType": "ResourceSpecification",
  "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Resource/LogicalResourceSpecification.schema.json",
  "version": "1.0",
  "validFor": {
    "startDateTime": "2017-08-12T00:00:00.000Z",
    "endDateTime": "2018-03-07T00:00:00.000Z"
  },
  "lastUpdate": "2017-08-09T00:00:00.000Z",
  "lifecycleStatus": "Tentative",
  "isBundle": false,
  "category": "Cloud resource",
  "attachment": [
    {
      "id": "25552",
      "href": "https://mycsp.com:8080/tmf-api/documentManagement/v4/attachment/25552",
      "name": "Configuration Instructions",
      "mimeType": "application/pdf",
      "url": "https://mycsp.com:7070/docloader?docnum=9567457677"
    }
  ],
  "relatedParty": [
    {

```

```

    "id": "5858",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/organization/5858",
    "role": "Supplier",
    "name": "Gustave Flaubert",
    "@referredType": "Organization"
  }
],
"resourceSpecRelationship": [
  {
    "id": "556788",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/556788",
    "name": "Underlying Physical Disk",
    "relationshipType": "dependency"
  }
],
"targetResourceSchema": {
  "@type": "VirtualStorage",
  "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Resource/VirtualStorage.schema.json"
}
}

```

Patch resource specification

PATCH /resourceSpecification/{id}

Description

This operation allows partial updates of a resource 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.

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
attachment	
category	
description	
featureSpecification	
isBundle	
lastUpdate	
lifecycleStatus	
name	

relatedParty	
resourceSpecCharacteristic	
resourceSpecRelationship	
targetResourceSchema	
validFor	
version	

Non Patchable Attributes	Rule
id	
href	

Usage Samples

Here's an example of a request for patching a specification. In this example, a new version is set, together with validity period.

Request
PATCH /tmf-api/resourceCatalog/v4/resourceSpecification/42 Content-Type: application/merge-patch+json <pre>{ "version": "4.0", "validFor": { "startDateTime": "2019-03-23T00:00:00.000Z", "endDateTime": "2020-09-25T00:00:00.000Z" } }</pre>
Response
200 <pre>{ "id": "42", "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/42", "name": "Virtual Storage Medium", "description": "This resource specification defines the virtual storage medium", "@type": "LogicalResourceSpecification", "@baseType": "ResourceSpecification", "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Resource/LogicalResourceSpecification.schema.json", "version": "4.0", "validFor": { "startDateTime": "2019-03-23T00:00:00.000Z", "endDateTime": "2020-09-25T00:00:00.000Z" }, "lastUpdate": "2019-03-20T00:00:00.000Z", "lifecycleStatus": "Active", "isBundle": false, "category": "Cloud resource", "attachment": [{ "id": "25552",</pre>

```

    "href": "https://mycsp.com:8080/tmf-api/documentManagement/v4/attachment/25552",
    "name": "Configuration Instructions",
    "mimeType": "application/pdf",
    "url": "https://mycsp.com:7070/docloader?docnum=9567457677"
  }
],
"relatedParty": [
  {
    "id": "5858",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/organization/5858",
    "role": "Supplier",
    "name": "Gustave Flaubert",
    "@referredType": "Organization"
  }
],
"resourceSpecCharacteristic": [
  {
    "name": "Maximum Allowed Storage",
    "description": "The storage limit in the virtual storage medium, ",
    "valueType": "integer",
    "configurable": true,
    "minCardinality": 1,
    "maxCardinality": 1,
    "isUnique": true,
    "resourceSpecCharacteristicValue": [
      {
        "valueType": "integer",
        "value": 1024000
      },
      {
        "valueType": "integer",
        "value": 2048000
      }
    ]
  }
]
],
"resourceSpecRelationship": [
  {
    "id": "556788",
    "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/resourceSpecification/556788",
    "name": "Underlying Physical Disk",
    "relationshipType": "dependency"
  }
],
"targetResourceSchema": {
  "@type": "VirtualStorage",
  "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Resource/VirtualStorage.schema.json"
}
}

```

Delete resource specification

DELETE /resourceSpecification/{id}

Description

This operation deletes a resource specification entity.

Usage Samples

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

Request
DELETE /tmf-api/resourceCatalog/v4/resourceSpecification/42
Response
204

Operations on Import Job

List import jobs

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

Description

This operation list import job 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 multiple import jobs.

Request
GET /tmf-api/resourceCatalog/v4/importJob?creationDate=2017-08-27 Accept: application/json

Response

200

```
[
  {
    "id": "7497",
    "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/importJob/7497",
    "contentType": "application/json",
    "creationDate": "2017-08-27T00:00:00.000Z",
    "completionDate": "2017-08-27T00:05:00.000Z",
    "path": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/Catalog/3830",
    "status": "Succeeded",
    "url": "https://my-platform/daily/job/NHCFD6",
    "errorLog": "http://my-platform/logging/errors.log",
    "@type": "ImportJob"
  },
  {
    "id": "7498",
    "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/importJob/7498",
    "contentType": "application/json",
    "creationDate": "2017-08-27T00:00:00.000Z",
    "path": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/Catalog/3830",
    "status": "Running",
    "url": "https://my-platform/daily/job/NHCFD6",
    "errorLog": "http://my-platform/logging/errors.log",
    "@type": "ImportJob"
  }
]
```

Retrieve import job

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

Description

This operation retrieves an import job 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 specific import job.

Request

GET /tmf-api/resourceCatalog/v4/importJob/7497
Accept: application/json

Response

200

```
{
  "id": "7497",
  "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/importJob/7497",
  "contentType": "application/json",
  "creationDate": "2018-08-27T00:00:00.000Z",
  "completionDate": "2018-08-27T00:05",
  "path": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/Catalog/3830",
  "status": "completed",
  "url": "https://my-platform/daily/job/NHCFD6",
  "errorLog": "http://my-platform/logging/errors.log",
  "@type": "ImportJob"
}
```

Create import job

POST /importJob

Description

This operation creates an import job entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating an ImportJob, 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
url	

Non Mandatory Attributes	Rule
completionDate	
contentType	
creationDate	
errorLog	
path	
status	

Usage Samples

Here's an example of a request for creating an import job.

Request
<pre>POST /tmf-api/resourceCatalog/v4/importJob Content-Type: application/json { "contentType": "application/json", "path": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/Catalog/3830", "url": "https://my-platform/daily/job/NHCFD6", "@type": "ImportJob" }</pre>
Response
<pre>201 { "id": "7497", "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/importJob/7497", "contentType": "application/json", "creationDate": "2018-08-27T00:00:00.000Z", "path": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/Catalog/3830", "status": "Running", "url": "https://my-platform/daily/job/NHCFD6", "errorLog": "http://my-platform/logging/errors.log", "@type": "ImportJob" }</pre>

Delete import job

DELETE /importJob/{id}

Description

This operation deletes an import job entity.

Usage Samples

Here's an example of a request for deleting an import job.

Request

DELETE /tmf-api/resourceCatalog/v4/importJob/7497
Response
204

Operations on Export Job

List export jobs

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

Description

This operation list export job 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 multiple export jobs.

Request
GET /tmf-api/resourceCatalog/v4/exportJob?creationDate=2017-08-27 Accept: application/json
Response
200 [{ "id": "5435", "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/exportJob/5435", "contentType": "application/json", "creationDate": "2017-08-27T00:00:00.000Z", "path": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/Catalog/3830", "query": "category.id=7757", "status": "Running", "url": "https://my-platform/daily/job/EHCFD6", "errorLog": "http://my-platform/logging/errors.log",

```

    "@type": "ExportJob"
  },
  {
    "id": "5431",
    "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/exportJob/5431",
    "contentType": "application/json",
    "creationDate": "2017-08-27T00:00:00.000Z",
    "completionDate": "2017-08-27T00:05:00.000Z",
    "path": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/Catalog/3830",
    "query": "category.id=7753",
    "status": "Succeeded",
    "url": "https://my-platform/daily/job/EHCFD6",
    "errorLog": "http://my-platform/logging/errors.log",
    "@type": "ExportJob"
  }
]

```

Retrieve export job

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

Description

This operation retrieves an export job 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 specific export job.

Request
GET /tmf-api/resourceCatalog/v4/exportJob/1866 Accept: application/json
Response
200 <pre> { "id": "5435", "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/exportJob/5435", "contentType": "application/json", "creationDate": "2018-08-27T00:00:00.000Z", "path": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/Catalog/3830", </pre>


```

"query": "category.id=7757",
"status": "Running",
"url": "https://my-platform/daily/job/EHC6D6",
"errorLog": "http://my-platform/logging/errors.log",
"@type": "ImportJob"
}

```

Create export job

POST /exportJob

Description

This operation creates an export job entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating an ExportJob, 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
url	

Non Mandatory Attributes	Rule
completionDate	
contentType	
creationDate	
errorLog	
path	
query	
status	

Usage Samples

Here's an example of a request for creating an export job.

Request
POST /tmf-api/resourceCatalog/v4/exportJob Content-Type: application/json <pre> { "contentType": "application/json", "path": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/v4/Catalog/3830", "query": "category.id=7757", "url": "https://my-platform/daily/job/EHC6D6", </pre>

<pre>"errorLog": "http://my-platform/logging/errors.log", "@type": "ExportJob" }</pre>
Response
<pre>201 { "id": "5435", "href": "https://mycsp.com:8080/tmf-api/resourceCatalogManagement/v4/exportJob/5435", "contentType": "application/json", "creationDate": "2018-08-27T00:00:00.000Z", "path": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/Catalog/3830", "query": "category.id=7757", "status": "Running", "url": "https://my-platform/daily/job/EHCFD6", "errorLog": "http://my-platform/logging/errors.log", "@type": "ExportJob" }</pre>

Delete export job

DELETE /exportJob/{id}

Description

This operation deletes an export job entity.

Usage Samples

Here's an example of a request for deleting an export job.

Request
<pre>DELETE /tmf-api/resourceCatalog/v4/exportJob/1866</pre>
Response
<pre>204</pre>

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
<div>POST /client/listener</div> <div>Accept: application/json</div> <div><pre>{ "event": { EVENT BODY }, "eventType": "EVENT_TYPE" }</pre></div>
Response
201

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

Lifecycle Management Extensions to Catalog

In Lifecycle Management, there is a requirement to distinguish between entities existing with different life cycle version numbers and accessible via different ACL mechanisms. For example, the same Resource Candidate may exist in a Catalog but with different version numbers.

It may be possible for an administrator to see all the existing versions or for a partner to see only a subset of all the existing versions.

The entity version number is not dependent on the version number of the API. For example, in PLM the same API (running at a specific version number) may be used to retrieve entities with different PLM version numbers.

In order to distinguish resources representing entities running with different version numbers and accessible through the same API version, the following directive can be used `/id:(version=x)` and the version attribute is added to each entity.

```
{
  "id": "42",
  "href": "http://serverlocation:port/catalogManagement/resourceCandidate/42",
  "version": "1.0",
  "lastUpdate": "2017-04-19T16:42:23-04:00",
  "name": "Virtual Storage Medium",
  "description": "Virtual Storage Medium",
  "lifecycleStatus": "Active",
  ....
}
```

Note that the catalog resources in this case may have the same ID but may be distinguished by the inclusion of the version number in their ID i.e. `/42:(version=1.0)`, `/42:(version=2.0)`.

In the following examples, we will assume that two versions of the Virtual Storage Medium Resource Candidate exist in the Resource Catalog. The Inactive and Active versions respectively version 1.0 and version 2.0.

Query all versioned catalog resources

Users with different roles may have access to different versions of the entities in the catalog. For example, user A may have access to only the version 1.0 of the entities while user B may have access to version 1.0 and version 2.0.

Admin user of Catalog have access to all the versions of the resources while non-admin users have by default access to only the latest version of the entities in the Catalog.

For example, the following request on the admin endpoint will return all the versioned resources matching a specific ID.

REQUEST

GET api/admin/catalogManagement/resourceCandidate/?id=42

Accept: application/json

RESPONSE

200

Content-Type: application/json

```
[
{
  "id": "42",
  "href": "http://serverlocation:port/catalogManagement/resourceCandidate/42",
  "version": "1.0",
  "lastUpdate": "2016-04-19T16:42:23-04:00",
  "name": "Virtual Storage Medium",
  "description": "Virtual Storage Medium",
  "lifecycleStatus": "Active",
  ....
},
{
  "id": "42",
  "href": "http://serverlocation:port/catalogManagement/resourceCandidate/42",
  "version": "2.0",
  "lastUpdate": "2016-04-19T16:42:23-04:00",
  "name": "Virtual Storage Medium",
  "description": "Virtual Storage Medium",
  "lifecycleStatus": "Active",
  ....
}
]
```

Query a specific versioned catalog resource

In general, a non-admin API user only has visibility to the latest version number or visibility to a subset of versioned catalog resources.

It may be possible for an admin API user to retrieve a resource with a specific version number by using an ID and versioning filtering criteria.

REQUEST
GET api/admin/catalogManagement/resourceCandidate/?id=42&version=1.0 Accept: application/json
RESPONSE
200 Content-Type: application/json [{ "id": "42", "href": "http://serverlocation:port/catalogManagement/resourceCandidate/42", "version": "1.0", "lastUpdate": "2016-04-19T16:42:23-04:00", "name": "Virtual Storage Medium", "description": "Virtual Storage Medium", "lifecycleStatus": "Active", },]

Query current version of a catalog resource

By default, only the most current version is returned (for admin and non-admin).

REQUEST
GET api/admin/catalogManagement/resourceCandidate/42 Accept: application/json
RESPONSE
200 Content-Type: application/json <pre>{ "id": "42", "href": "http://serverlocation:port/catalogManagement/resourceCandidate/42", "version": "2.0", "lastUpdate": "2016-04-19T16:42:23-04:00", "name": "Virtual Storage Medium", "description": "Virtual Storage Medium", "lifecycleStatus": "Active", }</pre>

Create new version of a catalog resource

POST is used to create a new version of a catalog resource.

The constraint is that the version numbers for the resource having the same ID must differ.

REQUEST
POST catalogManagement/resourceCandidate Content-type: application/json <pre>{ "id": "42",</pre>

```
"version": "3.0",  
  
"name": "Virtual Storage Medium",  
"description": "Virtual Storage Medium",  
"lifecycleStatus": "Active",  
"validFor": {  
    "startDateTime": "2016-04-19T16:42:23-04:00",  
    "endDateTime": "2016-06-19T00:00:00-04:00"  
},  
  
...  
}
```

RESPONSE

201

Content-Type: application/json

```
{  
    "id": "42",  
    "href": "http://serverlocation:port/catalogManagement/resourceCandidate/42",  
    "version": "3.0",  
    "lastUpdate": "2016-04-19T16:42:23-04:00",  
    "name": "Virtual Storage Medium",  
    "description": "Virtual Storage Medium",  
    "lifecycleStatus": "Active",  
    "validFor": {  
        "startDateTime": "2016-04-19T16:42:23-04:00",  
        "endDateTime": "2016-06-19T00:00:00-04:00"  
    },  
  
    ...  
}
```

Modify an existing version of a catalog resource

By default, PATCH or PUT will be acting only on the latest version of a Catalog Resource. For example, PATCH `/.../resourceCandidate/42` will only update the Virtual Storage Medium ResourceCandidate at Version 2.0 (which is the most current).

To update a specific version of an entity the (Version=X) directive is added to the ID (i.e. `/id:(version=x)`).

Note that this capability is only available to API users having the proper authorizations to change the catalog entities with specific version numbers.

For example, to change the Virtual Storage Medium versioned at 1.0 we could use:

/resourceCandidate/42:(Version=1.0)

REQUEST

PATCH /catalogManagement/resourceCandidate/42:(Version=1.0)

Content-type: application/json-patch+json

```
{  
  "lifecycleStatus": "Active"  
}
```

RESPONSE

200

Content-Type: application/json

```
{  
  "id": "42",  
  "href": "http://serverlocation:port/catalogManagement/resourceCandidate/42",  
  "version": "1.0",  
  "lifecycleStatus": "Active",  
  ....  
}
```

Role-Based Access Control

The user presents their credentials for authentication

If the credentials are valid

1. The user is given access to the catalog
2. As defined by their role(s)
3. As defined by their access rights
4. As defined by the access type: CRUD, discover
5. As defined by the pre-defined filter

For example, if they issue a get on a catalog that a party has no access, they get an error response

Or if they try to modify an area of the catalog but do not have Write Access, they get an error response

Normally we anticipate that the OAUTH2 or Open ID Connect are used as the authorization APIs and that ACL are established between authorized parties with regards to the content of the Catalog (i.e. GET but also enable of update operations on specific entities).

Acknowledgements

Version History

Version Number	Date	Modified by:	Description of changes
2.0.2	04-Dec-2017	Adrienne Walcott	Updated to reflect TM Forum Approved Status
4.0.0	03-Apr-2020	Jonathan Goldberg Amdocs Jonathan.Goldberg@amdocs.com	Schemafication project
4.0.1	25-May-2020	Adrienne Walcott	Updated to reflect TM Forum Approved Status
4.1.0	04-Nov-2020	Jonathan Goldberg Amdocs Jonathan.Goldberg@amdocs.com	Updated examples

Release History

Release Status	Date	Release led by:	Description
Release 1.0	15-Apr-2013	Pierre Gauthier TM Forum pgauthier@tmforum.org	First Release of Draft Version of the Document.
Release 1.7	16-Aug-2016	Kamal Maghsoudlou Ericsson kamal.maghsoudlou@ericsson.com	Updated following resource catalog API discussion in the Vancouver Action Week

Release 16.5.0	30-Aug-2016	Kamal Maghsoudlou Ericsson kamal.maghsoudlou@ericsson.com	Incorporated comments from the review meeting
Release 17.0	06-Aug-2017	Kamal Maghsoudlou Ericsson kamal.maghsoudlou@ericsson.com	<ul style="list-style-type: none"> added polymorphism support for REST resources, incorporated comments from review meeting
Release 17.0.1	04-Dec-2017	Adrienne Walcott	Updated to reflect TM Forum Approved Status
Pre-production	03-Apr-2020	Pierre Gauthier TM Forum pgauthier@tmforum.org	First Release of Draft Version of the Document.
Production	25-May-2020	Adrienne Walcott	Updated to reflect TM Forum Approved Status
Pre-production	04-Nov-2020	Jonathan Goldberg Amdocs Jonathan.Goldberg@amdocs.com	Updated examples

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