

TM Forum Specification

Product Catalog Management

TMF620

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Introduction

The catalog management API allows the management of the entire lifecycle of the catalog elements (product offerings, product offering prices, product specifications), the consultation of catalog elements during several processes such as ordering process, campaign management, sales management.

Characteristics and Features

The Product Catalog model allows a specification to be described by characteristics. Contrast with the other catalogs (Service and Resource), where specifications can be defined by characteristics and/or by features.

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**

The onus is on the consumer of the instance APIs (Product Order, Product Inventory) to set characteristic values explicitly according to the metadata provided by the corresponding catalog API.

Characteristic-Based or Schema-Based

The Open API Catalog models, Product 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:

```
{
    "@type": "ProductSpecification",
    "name": "Virtual Storage Medium",
    "description": "This product specification defines the virtual storage medium",
    "productSpecCharacteristic": [
        {
            "@type": "CharacteristicSpecification",
            "name": "Maximum Allowed Storage",
            "description": "The storage limit in the virtual storage medium",
            "valueType": "number",
            "configurable": true,
            "minCardinality": 1,
            "maxCardinality": 1,
            "isUnique": true,
            "characteristicValueSpecification": [
                {
                    "@type": "IntegerCharacteristicValueSpecification",
                    "valueType": "number",
                    "value": 1024000
                },
                {
                    "@type": "IntegerCharacteristicValueSpecification",
                    "valueType": "number",
                    "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:

```
{  
    "@type": "VirtualStorageMedium",  
    "name": "Virtual Storage Medium",  
    "description": "This product specification defines the virtual storage medium",  
    "targetProductSchema": {  
        "@type": "TargetProductSchema",  
        "@schemaLocation":  
            "https://mycsp.com:8080/tmf-api/schema/Product/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": {  
            "$id": "#VirtualStorage",  
            "description": "This product specification defines the virtual storage  
medium.",  
            "type": "object",  
            "properties": {  
                "Maximum Allowed Storage": {  
                    "type": "number",  
                    "description": "The storage limit in the virtual storage  
medium",  
                    "enum": [1024000, 2048000]  
                },  
                "required": ["Maximum Allowed Storage"],  
                "allOf": [  
                    {  
                        "$ref": "Product.schema.json#Product"  
                    }  
                ]  
            }  
        }  
    }  
}
```

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.

Multiple Catalogs

The Product Catalog Management API model supports multiple catalogs. This allows service providers to expose multiple catalogs, for example for different sub-markets. Each catalog can have a different category tree, so that the service provider can arrange the catalog elements by categories in a way that meets the business needs of the specific catalog.

The underlying catalog elements (Product Offering, Product Offering Price, Product Specification) exist independently of the catalog(s) through which they are exposed. Thus, a direct search on any of these entities, without specifying a catalog, will retrieve the entities irrespective of the catalog(s).

Note: Use of the Catalog entity is optional. A product catalog software system that does not support multiple catalogs does not need to expose the Catalog entity at all.

Lifecycle Management Extensions to Catalog

In Product Lifecycle Management (PLM), 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 Product Offerings 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/productOffering/42",  
    "version": "1.0",  
    "lastUpdate": "2020-09-23T16:42:23-04:00",  
    "name": "Virtual Storage Medium",  
    "description": "Virtual Storage Medium",  
    "isBundle": "true",  
    "lifecycleStatus": "Active",  
    ...  
}
```

Note that the catalog resources in this case may have the same ID (42) 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 Product Offering exist in the Product 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.

Catalog users with administrative permissions have access to all the versions of the resources while non-administrative users have by default access to only the latest version of the entities in the Catalog.

For example, the following request for a user with administration permissions will return all the versioned resources matching a specific ID.

Note: Distinguish between this request, which uses the filter syntax and is defined to return an array, as against the retrieve by ID syntax GET productOffering/42, which is defined to return a single entity.

REQUEST

```
GET productOffering?id=42
Accept: application/json
```

RESPONSE

```
200
Content-Type: application/json
[
  {
    "id": "42",
    "href": "http://serverlocation:port/catalogManagement/productOffering/42?version=1.0",
    "version": "1.0",
    "lastUpdate": "2020-09-22T16:42:23-04:00",
    "name": "Virtual Storage Medium",
    "description": "Virtual Storage Medium",
    "isBundle": "true",
    "lifecycleStatus": "Inactive",
    ...
  },
  {
    "id": "42",
    "href": "http://serverlocation:port/catalogManagement/productOffering/42?version=2.0",
    "version": "2.0",
    "lastUpdate": "2020-09-23T16:42:23-05:00",
    "name": "Virtual Storage Medium",
    "description": "Virtual Storage Medium",
    "isBundle": "true",
    "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 productOffering?id=42&version=1.0
```

```
Accept: application/json
```

RESPONSE

```
200
Content-Type: application/json
[
  {
    "id": "42",
    "href": "http://serverlocation:port/catalogManagement/productOffering/42?version=1.0",
    "version": "1.0",
    "lastUpdate": "2020-09-22T16:42:23-04:00",
    "name": "Virtual Storage Medium",
    "description": "Virtual Storage Medium",
    "isBundle": "true",
    "lifecycleStatus": "Active",
    ...
  }
]
```

Retrieve current version of a catalog resource

Only the most current version is returned (for admin and non-admin).

REQUEST

```
GET productOffering/42
Accept: application/json
```

RESPONSE

```
200
Content-Type: application/json
{
  "id": "42",
  "href": "http://serverlocation:port/catalogManagement/productOffering/42",
  "version": "2.0",
  "lastUpdate": "2020-09-23T16:42:23-04:00",
  "name": "Virtual Storage Medium",
  "description": "Virtual Storage Medium",
  "isBundle": "true",
  "lifecycleStatus": "Active",
  ...
}
```

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 productOffering

Content-type: application/json
{
    "id": "42",
    "version": "3.0",
    "name": "Virtual Storage Medium",
    "description": "Virtual Storage Medium",
    "isBundle": "true",
    "lifecycleStatus": "Active",
    "validFor": {
        "startDateTime": "2020-11-06T16:42:23-04:00",
        "endDateTime": "2022-06-19T00:00:00-04:00"
    }
}
```

RESPONSE

```
Content-Type: application/json
{
    "id": "42",
    "href": "http://serverlocation:port/catalogManagement/productOffering/42?version=3.0",
    "version": "3.0",
    "lastUpdate": "2020-09-23T16:42:23-04:00",
    "name": "Virtual Storage Medium",
    "description": "Virtual Storage Medium",
    "isBundle": "true",
    "lifecycleStatus": "Active",
    "validFor": {
        "startDateTime": "2020-11-06T16:42:23-04:00",
        "endDateTime": "2022-06-19T00:00:00-04:00"
    }
}
```

Modify an existing version of a catalog resource

By default, PATCH will be acting only on the latest version of a catalog resource. For example, PATCH /.../productOffering/42 will only update the Virtual Storage ProductOffering 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 versioned at 1.0 we could use: /productOffering/42:(Version=1.0)

REQUEST

```
PATCH productOffering/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/productOffering/42?version=1.0",
    "version": "1.0",
    "lifecycleStatus": "Active"
}
```

Role based Access Control

The user presents their credentials for authentication

If the credentials are valid

- The user is given access to the catalog
- As defined by their role(s)
- As defined by their access rights
- As defined by the access type: CRUD, discover
- 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.

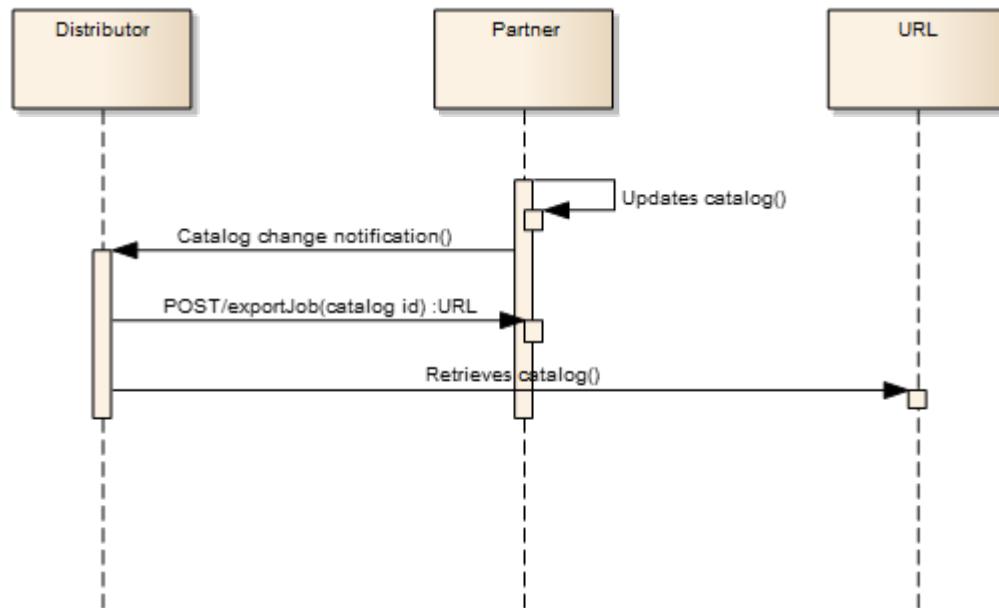
Normally we anticipate that the OAUTH2 or Open ID Connect are used as the authorization APIs and that ACL are established between authorized parties with regards to the content of the Catalog (i.e. GET but also enable of update operations on specific entities).

Sample Use Cases

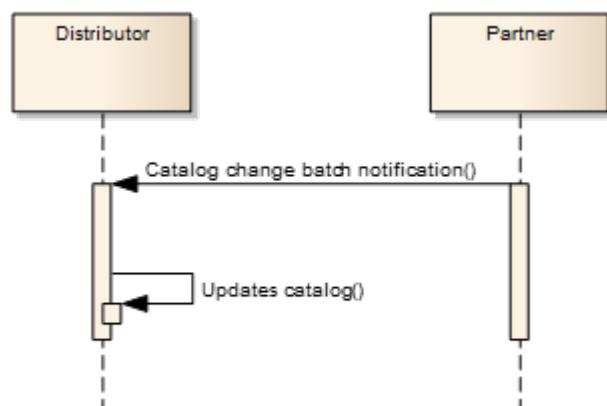
Lifecycle Management Use Case

The catalog management API allows the management of the entire lifecycle of the catalog elements.

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 product offering based on product offering identifier or other search criteria (GET /productOffering/{ID}).

UC4: A catalog administrator wants to retrieve all the bundled product offerings included in a

product offering bundle (GET/productOffering).

UC5: A catalog administrator wants to update the lifecycle status (from Launched to retired for example) of a product offering (PATCH/productOffering).

Order Management Use Case

The catalog management API allows the lookup of the catalog elements during order capture.

UC1: A distributor wants to browse product offerings during order capture and to retrieve product offerings belonging to a given category, for a given channel and a given place. He gets all details on product offerings, product offering prices, product specifications and its characteristics (GET/depth).

UC2: A distributor wants to retrieve the characteristics including prices of a given product offering (GET/productOffering).

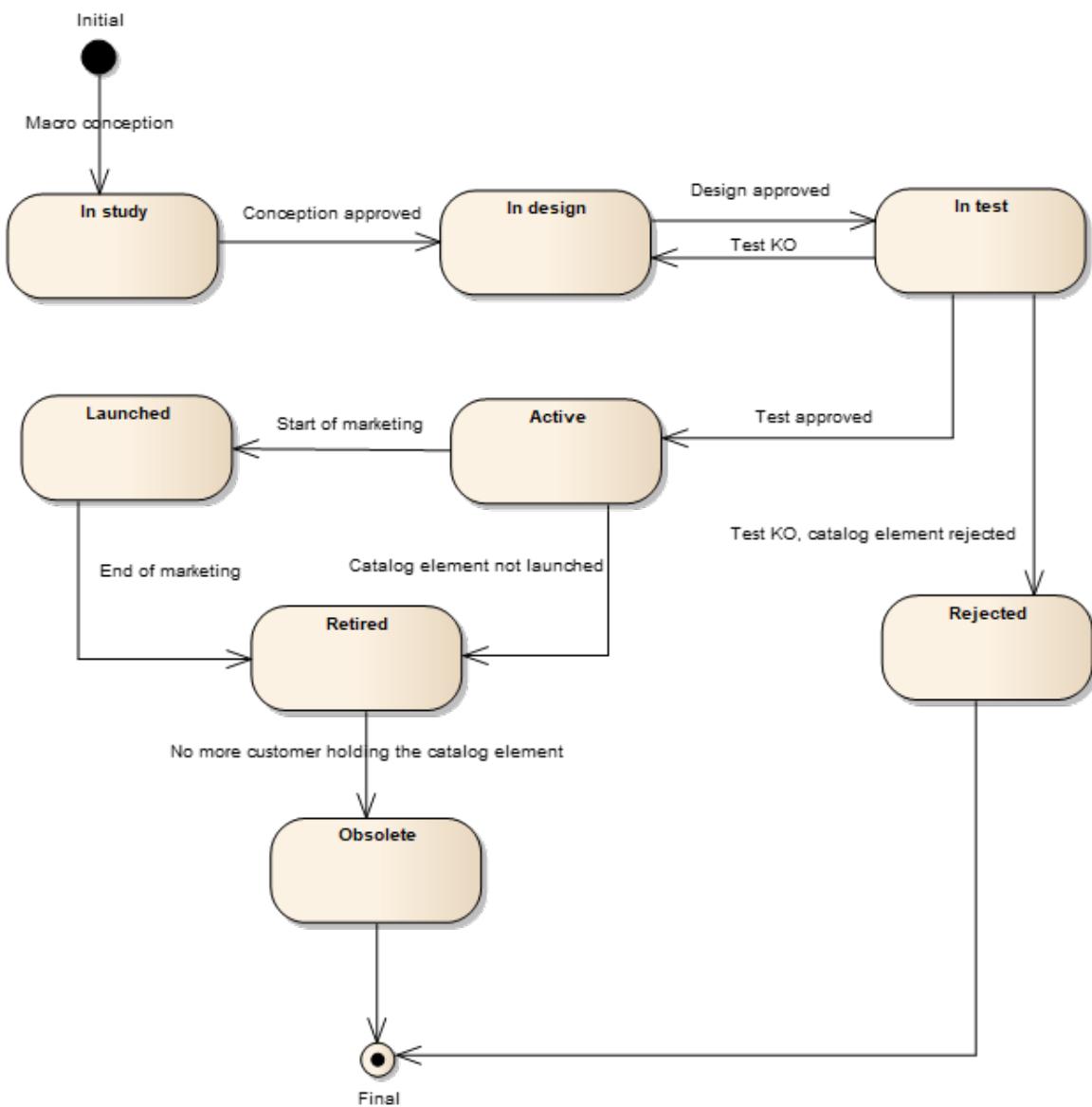
UC3: A distributor wants to know if a product offering is available at customer's location (GET/productOffering).

UC4: A distributor wants to know which SLA applies on a given product offering (GET/productOffering).

UC5: A distributor wants to retrieve all product offerings belonging to a partner (GET/productOffering).

Entity Lifecycle States

Resource Lifecycle Management is responsible for managing the entire lifecycle of the 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 (failed) 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 TypeAProductSpecification and TypeBProductSpecification inheriting properties from the base ProductSpecification entity.

Generic support of polymorphism and pattern extensions is described in the TMF630 (TMF API Guidelines) document.

The @type attribute provides a way to represent the actual class type of an entity. For example, within a list of ProductSpecification instances some may be instances of TypeAProductSpecification where other could be instances of TypeBProductSpecification. 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 RelatedParty 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 RelatedParty, and not the class type of the referred object. However, since reference classes are rarely sub-classed, @type is generally not useful in reference objects.

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

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

RESOURCE MODEL

Managed Entity and Task Resource Models

Category resource

The category resource is used to group product offerings, service and resource candidates in logical containers. Categories can contain other categories and/or product offerings, resource or service candidates.

Resource model

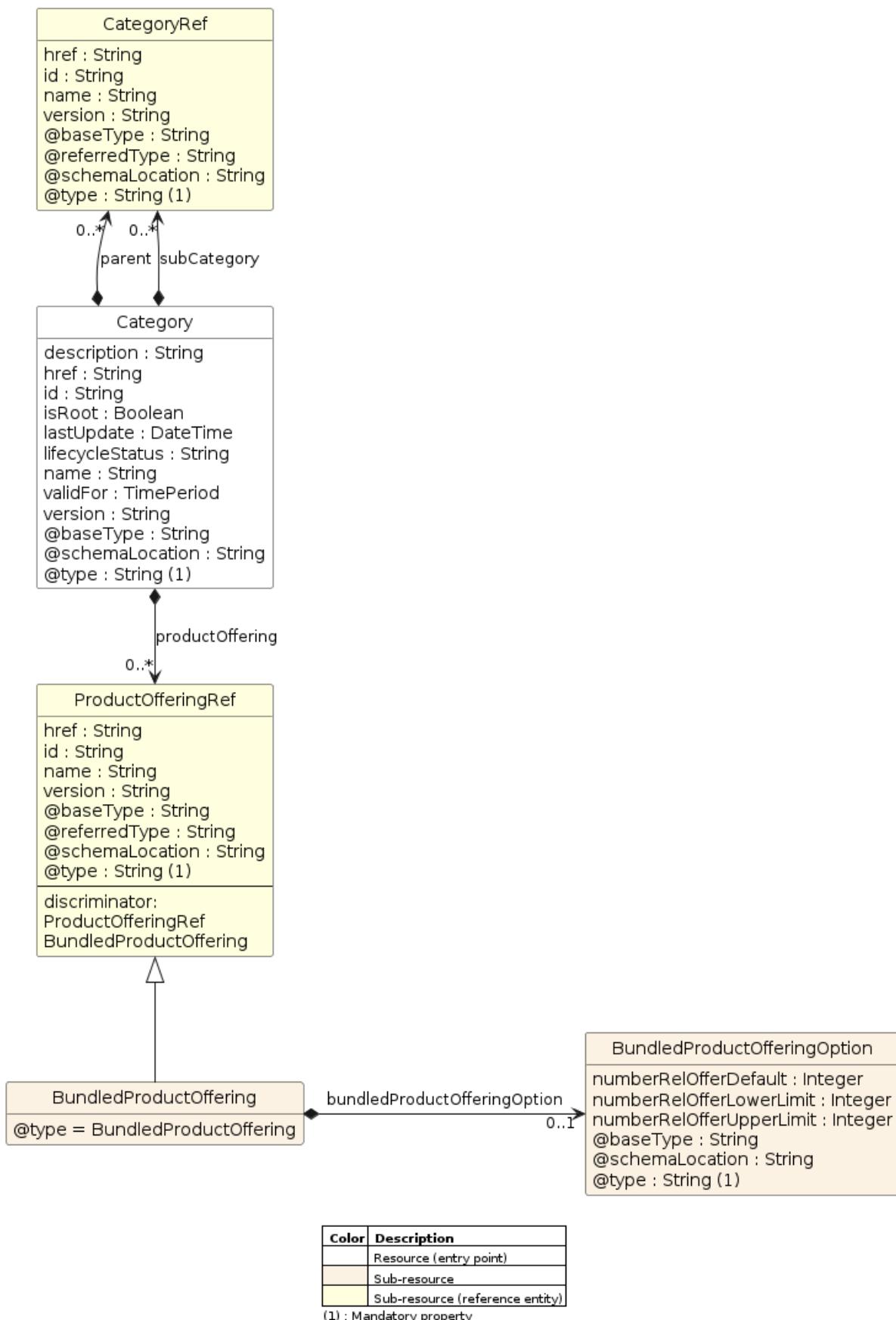


Figure 1 - Category

Field descriptions

Category fields

description	A String. Description of the category.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
isRoot	A Boolean. If true, this Boolean indicates that the category is a root of categories.
lastUpdate	A 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.
parent	A CategoryRef. Reference to a category in the catalog.
productOffering	A ProductOfferingRef. List of product offerings that are referred to by the category.
subCategory	A CategoryRef. 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.
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
version	A String. Category version.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

BundledProductOffering sub-resource fields

bundledProductOfferingOption	A BundledProductOfferingOption. A set of numbers that specifies the lower and upper limits for a ProductOffering that can be procured as part of the related BundledProductOffering. Values can range from 0 to unbounded.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
version	A String. Version of the product offering.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.

@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

BundledProductOfferingOption sub-resource fields

numberRelOfferDefault	An Integer. Default number of product offerings that should be procured as part of the related BundledProductOffering.
numberRelOfferLowerLimit	An Integer. Lower limit for a product offering that can be procured as part of the related BundledProductOffering.
numberRelOfferUpperLimit	An Integer. Upper limit for a product offering that can be procured as part of the related BundledProductOffering.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

CategoryRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
version	A String. Version of the category.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

ProductOfferingRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
version	A String. Version of the product offering.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.

<code>@schemaLocation</code>	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
<code>@type</code>	A String. When sub-classing, this defines the sub-class Extensible name.

Json representation sample(s)

We provide below a JSON representation as example of the 'Category' resource object.

```
{
  "id": "1708",
  "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/Category/1708",
  "name": "Cloud Services",
  "description": "A category to hold all available cloud service offers",
  "version": "1.0",
  "validFor": {
    "startDateTime": "2020-08-24T00:00:00Z",
    "endDateTime": "2024-03-25T00:00:00Z"
  },
  "lifecycleStatus": "Active",
  "lastUpdate": "2020-08-27T00:00:00Z",
  "isRoot": true,
  "subCategory": [
    {
      "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/6086",
      "id": "6086",
      "name": "Cloud Storage",
      "version": "1.0",
      "@referredType": "Category",
      "@type": "CategoryRef"
    },
    {
      "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/6087",
      "id": "6087",
      "name": "Software as a Service",
      "version": "2.0",
      "@referredType": "Category",
      "@type": "CategoryRef"
    }
  ],
  "productOffering": [
    {
      "id": "7655",
      "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/7655",
      "name": "Hosted Basic Firewall for business",
      "@referredType": "ProductOffering",
      "@type": "ProductOfferingRef"
    }
  ],
  "@type": "Category"
}
```

ImportJob resource

Represents a task used to import resources from a file.

Resource model

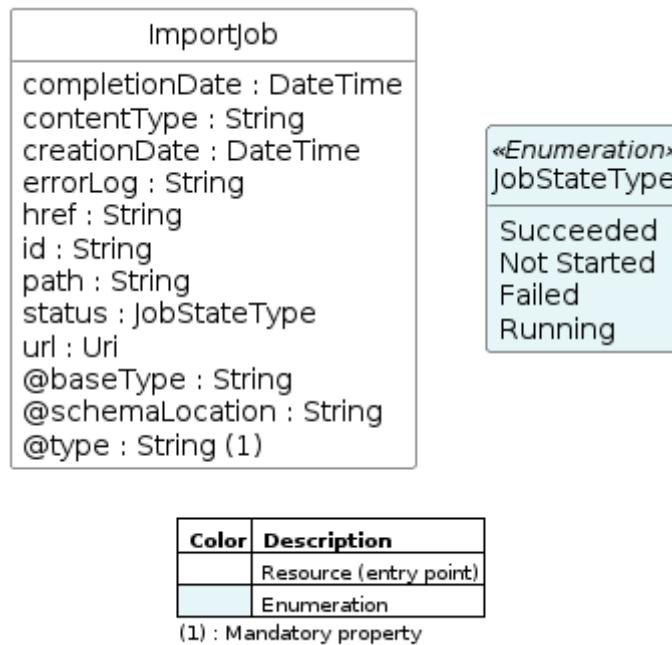


Figure 2 - ImportJob

Field descriptions

ImportJob fields

completionDate	A DateTime. Date at which the job was completed.
contentType	A String. Indicates the format of the imported data.
creationDate	A DateTime. Date at which the job was created.
errorLog	A String. Path to file or stream where errors encountered during the job processing can be written.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
path	A String. URL of the root resource where the content of the file specified by the import job must be applied.
status	A JobStateType. Valid values for the state of a batch job (e.g. catalog import).
url	A Uri. URL of the file containing the data to be imported.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.

<code>@type</code>	A String. When sub-classing, this defines the sub-class Extensible name.
--------------------	--

Json representation sample(s)

We provide below a JSON representation as example of the 'ImportJob' resource object.

```
{
  "id": "2341",
  "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/importJob/2341",
  "contentType": "application/json",
  "creationDate": "2020-08-25T00:00:00Z",
  "completionDate": "2020-08-25T00:01:31Z",
  "path": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/",
  "status": "Succeeded",
  "url": "ftp://ftp.mycsp.com/productCatalogManagement/1866.json",
  "errorLog": "http://my-platform/logging/errors.log",
  "@type": "ImportJob"
}
```

ExportJob resource

Represents a task used to export resources to a file.

Resource model

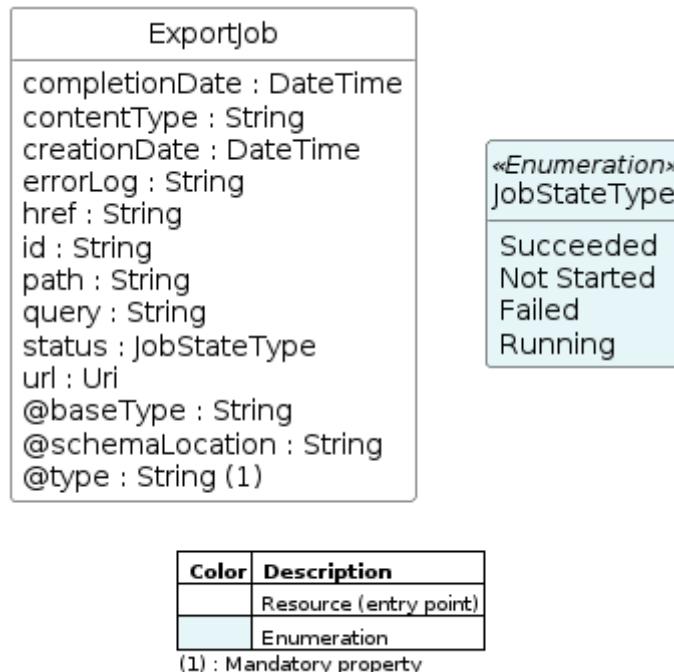


Figure 3 - ExportJob

Field descriptions

ExportJob fields

completionDate	A DateTime. Data at which the job was completed.
contentType	A String. The format of the exported data.
creationDate	A DateTime. Date at which the job was created.
errorLog	A String. Path to file or stream where errors encountered during the job processing can be written.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
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 JobStateType. Valid values for the state of a batch job (e.g. catalog import).
url	A Uri. URL of the file containing the data to be exported.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

Json representation sample(s)

We provide below a JSON representation as example of the 'ExportJob' resource object.

```
{
  "id": "5435",
  "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/exportJob/5435",
  "contentType": "application/json",
  "creationDate": "2020-09-23T00:00:00Z",
  "path": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/category",
  "query": "category.id=7757",
  "status": "Running",
  "url": "ftp://ftp.mycsp.com/productCatalogManagement/1866.json",
  "errorLog": "http://my-platform/logging/errors.log",
  "@type": "ExportJob"
}
```

ProductCatalog resource

A collection of Product Offerings, intended for a specific DistributionChannel, enhanced with additional information such as SLA parameters, invoicing and shipping details.

Resource model

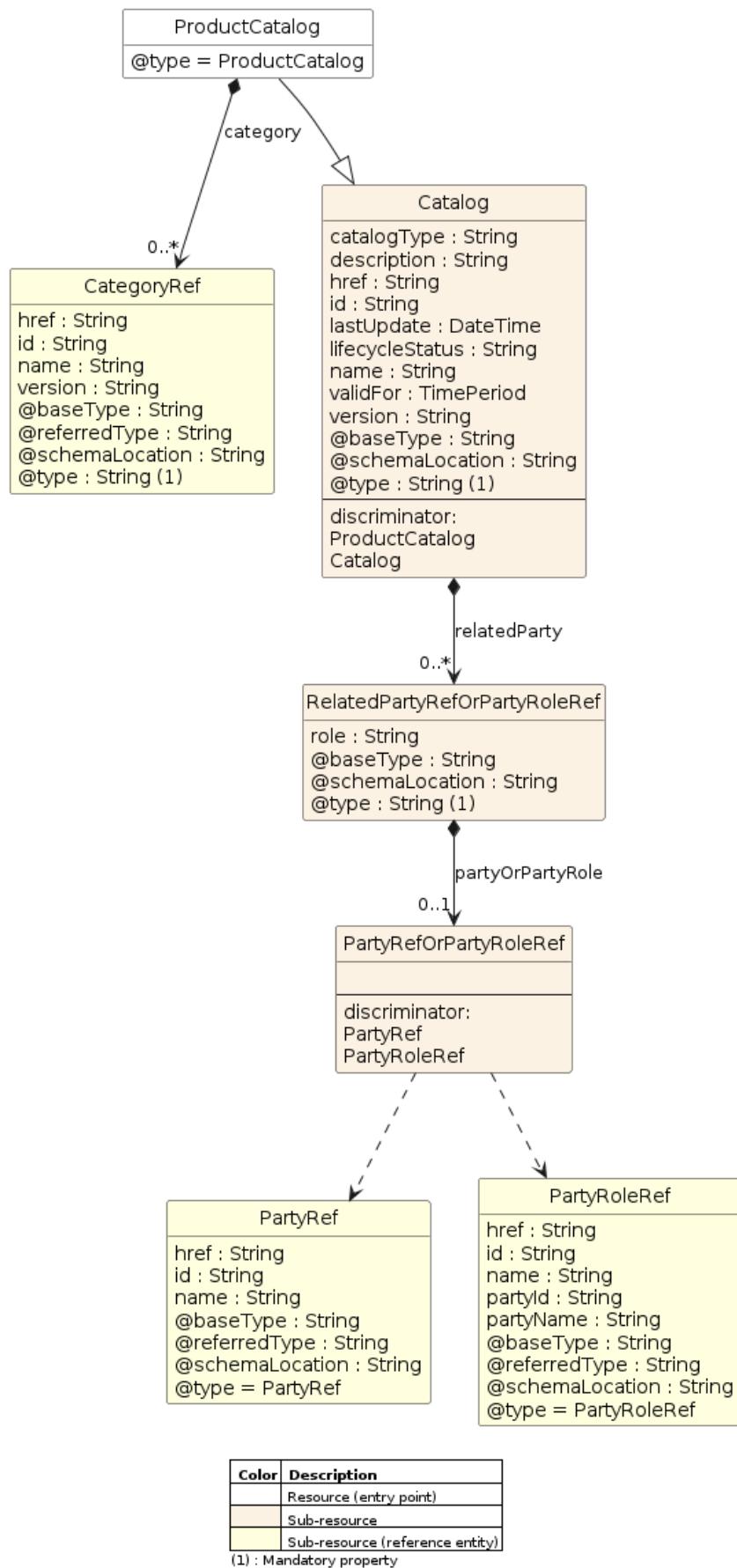


Figure 4 - ProductCatalog

Field descriptions

ProductCatalog fields

catalogType	A String. Type of this Catalog, like Product, Service, Resource etc.
category	A CategoryRef. List of root categories contained in this catalog.
description	A String. Description of this catalog.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
lastUpdate	A 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 RelatedPartyRefOrPartyRoleRef. List of parties involved in this catalog.
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startTime only, or both.
version	A String. Catalog version.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

Catalog sub-resource fields

catalogType	A String. Type of this Catalog, like Product, Service, Resource etc.
description	A String. Description of this catalog.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
lastUpdate	A 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 RelatedPartyRefOrPartyRoleRef. List of parties involved in this catalog.
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startTime only, or both.
version	A String. Catalog version.
@baseType	A String. When sub-classing, this defines the super-class.

@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

CategoryRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
version	A String. Version of the category.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

PartyRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

PartyRoleRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
partyId	A String. The identifier of the engaged party that is linked to the PartyRole object.
partyName	A String. The name of the engaged party that is linked to the PartyRole object.
@baseType	A String. When sub-classing, this defines the super-class.

@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

RelatedPartyRefOrPartyRoleRef sub-resource fields

partyOrPartyRole	A PartyRefOrPartyRoleRef.
role	A String. Role played by the related party or party role in the context of the specific entity it is linked to. Such as 'initiator', 'customer', 'salesAgent', 'user'.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

Json representation sample(s)

We provide below a JSON representation as example of the 'ProductCatalog' resource object.

```
{
    "id": "3830",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/Catalog/3830",
    "name": "Catalog Wholesale Business",
    "description": "This catalog describes Product Offerings and technical
specifications intended to address the wholesale business segment.",
    "catalogType": "ProductCatalog",
    "version": "1.0",
    "validFor": [
        "startDateTime": "2020-08-29T00:00:00Z",
        "endDateTime": "2024-03-25T00:00:00Z"
    ],
    "lastUpdate": "2020-08-27T00:00:00Z",
    "lifecycleStatus": "Active",
    "relatedParty": [
        {
            "role": "vendor",
            "@type": "RelatedPartyRefOrPartyRoleRef",
            "partyOrPartyRole": {
                "id": "3426",
                "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/organization/3426",
                "name": "Broadly Broad Ltd",
                "@type": "PartyRef",
                "@referredType": "Organization"
            }
        },
        {
            ...
        }
    ]
}
```

```
        "role": "Reviser",
        "@type": "RelatedPartyRefOrPartyRoleRef",
        "partyOrPartyRole": {
            "id": "115566",
            "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/individual/115566",
            "name": "Roger Collins",
            "@type": "PartyRef",
            "@referredType": "Individual"
        }
    },
    "category": [
        {
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/7757",
            "id": "7757",
            "name": "business",
            "version": "1.0",
            "@referredType": "Category",
            "@type": "CategoryRef"
        }
    ],
    "@type": "Catalog"
}
```

ProductOffering resource

Represents entities that are orderable from the provider of the catalog, this resource includes pricing information.

Resource model

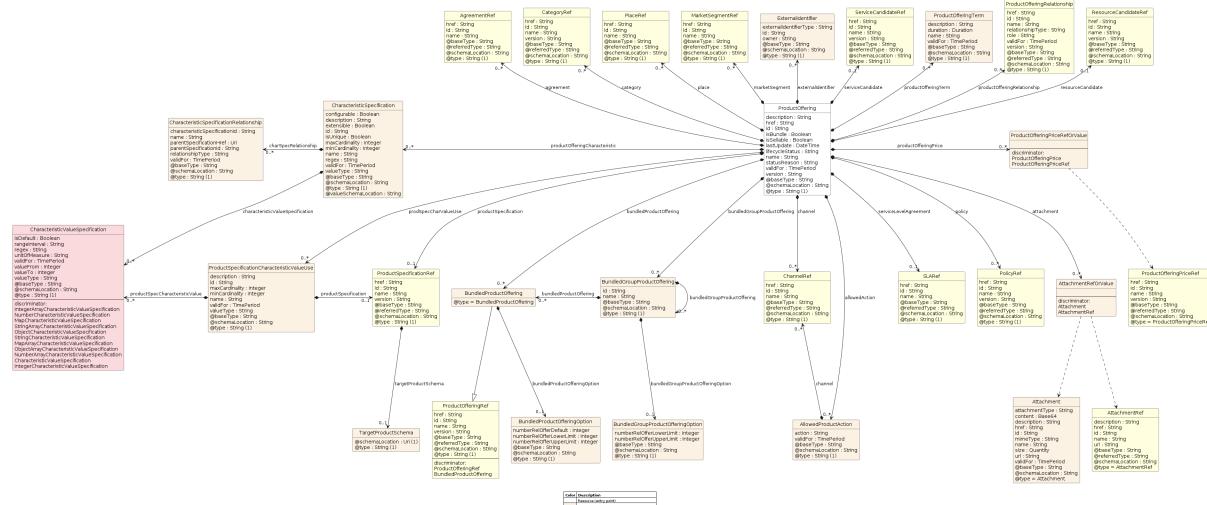


Figure 5 - ProductOffering

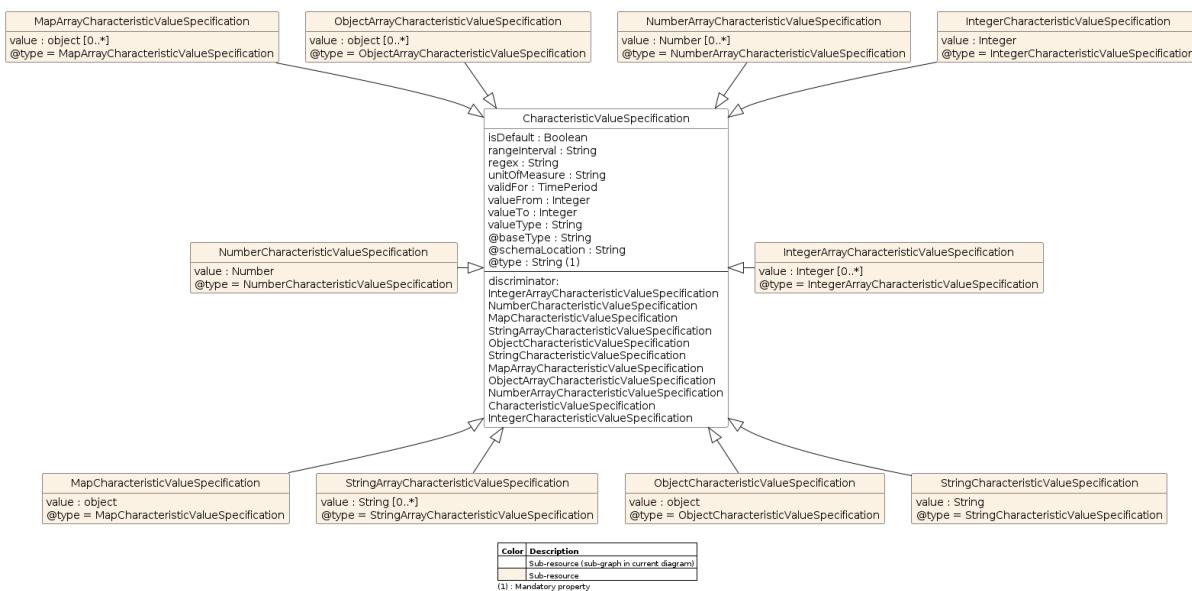


Figure 6 - CharacteristicValueSpecification

Field descriptions

ProductOffering fields

agreement	An AgreementRef . An agreement represents a contract or arrangement, either written or verbal and sometimes enforceable by law, such as a service level agreement or a customer price agreement. An agreement involves a number of other business entities, such as products, services, and resources and/or their specifications.
allowedAction	An AllowedProductAction . List of actions that can be executed (in context of a product order) on products instantiated from this offering.
attachment	An AttachmentRefOrValue . Complements the description of an element (for instance a product) through video, pictures...
bundledGroupProductOffering	A BundledGroupProductOffering . A group of ProductOfferings that can be selected for instantiation, e.g. between 2 and 7 from a list of 15 channel packs.
bundledProductOffering	A BundledProductOffering . A type of ProductOffering that belongs to a grouping of ProductOfferings made available to the market. It inherits of all attributes of ProductOffering.
category	A CategoryRef . The category resource is used to group product offerings, service and resource candidates in logical containers. Categories can contain other categories and/or product offerings, resource or service candidates.
channel	A ChannelRef . The channel defines the channel for selling product offerings.
description	A String . Description of the productOffering.
externalIdentifier	An ExternalIdentifier . List of external identifiers for the offering, e.g. identifier in source catalog.

href	A String. Hyperlink reference.
id	A String. Unique identifier.
isBundle	A Boolean. IsBundle determines whether a productOffering represents a single productOffering (false), or a bundle of productOfferings (true).
isSellable	A Boolean. A flag indicating if this product offer can be sold stand-alone for sale or not. If this flag is false it indicates that the offer can only be sold within a bundle.
lastUpdate	A DateTime. Date and time of the last update.
lifecycleStatus	A String. Used to indicate the current lifecycle status.
marketSegment	A MarketSegmentRef. Provides references to the corresponding market segment as target of product offerings. A market segment is grouping of Parties, GeographicAreas, SalesChannels, and so forth.
name	A String. Name of the productOffering.
place	A PlaceRef. Place defines the places where the products are sold or delivered.
policy	A PolicyRef. The Policy resource represents a policy/rule applied to ProductOffering.
prodSpecCharValueUse	A ProductSpecificationCharacteristicValueUse. A use of the ProductSpecificationCharacteristicValue by a ProductOffering to which additional properties (attributes) apply or override the properties of similar properties contained in ProductSpecificationCharacteristicValue. It should be noted that characteristics which their value(s) addressed by this object must exist in corresponding product specification. The available characteristic values for a ProductSpecificationCharacteristic in a Product specification can be modified at the ProductOffering level. For example, a characteristic 'Color' might have values White, Blue, Green, and Red. But, the list of values can be restricted to e.g. White and Blue in an associated product offering. It should be noted that the list of values in 'ProductSpecificationCharacteristicValueUse' is a strict subset of the list of values as defined in the corresponding product specification characteristics.
productOfferingCharacteristic	A CharacteristicSpecification. A characteristic quality or distinctive feature of a ProductOffering. The characteristic can take on a discrete value fixed at design (catalog authoring) time, such as Mobile Plan Rank, and is not generally modifiable at inventory level.
productOfferingPrice	A ProductOfferingPriceRefOrValue. An amount, usually of money, that is asked for or allowed when a ProductOffering is bought, rented, or leased. The price is valid for a defined period of time and may not represent the actual price paid by a customer.
productOfferingRelationship	A ProductOfferingRelationship. A relationship between this product offering and other product offerings.

productOfferingTerm	A ProductOfferingTerm. A condition under which a ProductOffering is made available to Customers. For instance, a productOffering can be offered with multiple commitment periods.
productSpecification	A ProductSpecificationRef. ProductSpecification reference. A product Specification represents entities that are orderable from the provider of the catalog.
resourceCandidate	A ResourceCandidateRef. 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.
serviceCandidate	A ServiceCandidateRef. ServiceCandidate reference. ServiceCandidate is an entity that makes a ServiceSpecification available to a catalog.
serviceLevelAgreement	A SLARef. ServiceLevelAgreement reference: A service level agreement (SLA) is a type of agreement that represents a formal negotiated agreement between two parties designed to create a common understanding about products, services, priorities, responsibilities, and so forth. The SLA is a set of appropriate procedures and targets formally or informally agreed between parties in order to achieve and maintain specified Quality of Service.
statusReason	A String. A string providing a complementary information on the value of the lifecycle status attribute.
validFor	A TimePeriod. A period of time, either as a deadline (endDateOnly) a startDateTime only, or both.
version	A String. ProductOffering version.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

AgreementRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.

@type	A String. When sub-classing, this defines the sub-class Extensible name.
--------------	--

AllowedProductAction sub-resource fields

action	A String. The name of the action.
channel	A ChannelRef. A list of sales channels in which this action is allowed; for instance Remove might be allowed only in an assisted channel not in a self-service channel.
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

Attachment sub-resource fields

attachmentType	A String. A business characterization of the purpose of the attachment, for example logo, instructionManual, contractCopy.
content	A Base64. The actual contents of the attachment object, if embedded, encoded as base64.
description	A String. A narrative text describing the content of the attachment.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
mimeType	A String. A technical characterization of the attachment content format using IETF Mime Types.
name	A String. The name of the attachment.
size	A Quantity. An amount in a given unit.
url	A String. Uniform Resource Locator, is a web page address (a subset of URI).
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

AttachmentRef sub-resource fields

description	A String. A narrative text describing the content of the attachment.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
url	A String. Link to the attachment media/content.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

BundledGroupProductOffering sub-resource fields

bundledGroupProductOffering	A BundledGroupProductOffering. Child groups of product offerings, to enable hierarchical sub-grouping.
bundledGroupProductOfferingOption	A BundledGroupProductOfferingOption. Defines for a BundledProductOfferingGroup (i.e. a group of multiple child offerings of a parent product offering), how many instances from the child offerings can be chosen in total. For example facilitate the choice of between 2 and 7 channel packs from a list, and cause certain items to be selected by default.
bundledProductOffering	A BundledProductOffering. Child offerings, from which instances can be created as direct or hierarchically indirect children of the parent offering.
id	A String. Locally unique identifier of the group, useful in case the parent product offering or group includes multiple groups.
name	A String. The name of the group of child offerings. Required to distinguish several choice groups.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

BundledGroupProductOfferingOption sub-resource fields

numberRelOfferLowerLimit	An Integer. The minimum total number of instances of the child offerings directly or hierarchically in the group that should be instantiated.
numberRelOfferUpperLimit	An Integer. The maximum total number of instances of the child offerings directly or hierarchically in the group that should be instantiated.

@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

BundledProductOffering sub-resource fields

bundledProductOfferingOption	A BundledProductOfferingOption. A set of numbers that specifies the lower and upper limits for a ProductOffering that can be procured as part of the related BundledProductOffering. Values can range from 0 to unbounded.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
version	A String. Version of the product offering.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

BundledProductOfferingOption sub-resource fields

numberRelOfferDefault	An Integer. Default number of produc offereings that should be procured as part of the related BundledProductOffering.
numberRelOfferLowerLimit	An Integer. Lower limit for a product offering that can be procured as part of the related BundledProductOffering.
numberRelOfferUpperLimit	An Integer. Upper limit for a product offering that can be procured as part of the related BundledProductOffering.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

BundledProductOfferingPriceRelationship sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.

version	A String. Version of the referred product offering price.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

CategoryRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
version	A String. Version of the category.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

ChannelRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

CharacteristicSpecification sub-resource fields

charSpecRelationship	A CharacteristicSpecificationRelationship. An aggregation, migration, substitution, dependency or exclusivity relationship between/among Specification Characteristics.
----------------------	---

characteristicValueSpecification	A CharacteristicValueSpecification. A CharacteristicValueSpecification object is used to define a set of attributes, each of which can be assigned to a corresponding set of attributes in a CharacteristicSpecification object. The values of the attributes in the CharacteristicValueSpecification object describe the values of the attributes that a corresponding Characteristic object can take on.
configurable	A Boolean. If true, the Boolean indicates that the target Characteristic 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. Specifies if the value of this characteristic is unique across all entities instantiated from the specification that uses this characteristic. For example, consider a ProductSpecification for a set-top box, with a CharacteristicSpecification cardID. Each set-top box must have a different value for cardID, so this isUnique attribute would be set to true for the characteristic.
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.
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
valueType	A String. A kind of value that the characteristic can take on, such as numeric, text and so forth.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.
@valueSchemaLocation	A String. This (optional) field provides a link to the schema describing the value type.

CharacteristicSpecificationRelationship sub-resource fields

characteristicSpecificationId	A String. Unique identifier of the characteristic within the specification.
name	A String. Name of the target characteristic within the specification.
parentSpecificationHref	A Uri. Hyperlink reference to the parent specification containing the target characteristic.
parentSpecificationId	A String. Unique identifier of the parent specification containing the target characteristic.
relationshipType	A String. Type of relationship such as aggregation, migration, substitution, dependency, exclusivity.
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

CharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

Duration sub-resource fields

amount	An Integer. Time interval (number of seconds, minutes, hours, etc.).
units	A String. Unit of time (seconds, minutes, hours, etc.).

ExternalIdentifier sub-resource fields

externalIdentifierType	A String. Type of the identification, typically would be the type of the entity within the external system.
id	A String. Identification of the entity within the external system.
owner	A String. Name of the external system that owns the entity.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

IntegerArrayCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
value	An Integer.
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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

IntegerCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
value	An Integer. 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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

MapArrayCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
value	An object.
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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

MapCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endTime only) a startTime only, or both.
value	An object. 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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

MarketSegmentRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
@baseType	A String. When sub-classing, this defines the super-class.

@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

NumberArrayCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endTime only) a startTime only, or both.
value	A Number.
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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

NumberCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
value	A Number. 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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

ObjectArrayCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
value	An object.
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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.

@type	A String. When sub-classing, this defines the sub-class Extensible name.
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ObjectCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endTime only) a startTime only, or both.
value	An object. 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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

PlaceRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

PolicyRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
version	A String.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

PricingLogicAlgorithm sub-resource fields

description	A String. Description of the PricingLogicAlgorithm.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name given to the PricingLogicAlgorithm.
plaSpecId	A String. Id of corresponding PricingLogicAlgorithm specification.
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

ProductOfferingPrice sub-resource fields

bundledPopRelationship	A BundledProductOfferingPriceRelationship. This object represents a bundle relationship from a bundle product offering price (parent) to a simple product offering price (child). A simple product offering price may participate in more than one bundle relationship.
description	A String. Description of the productOfferingPrice.
externalIdentifier	An ExternalIdentifier. List of external identifiers for the offering price, e.g. identifier in source catalog.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
isBundle	A Boolean. A flag indicating if this ProductOfferingPrice is composite (bundle) or not.
lastUpdate	A DateTime. The last update time of this ProductOfferingPrice.

lifecycleStatus	A String. The lifecycle status of this ProductOfferingPrice.
name	A String. Name of the productOfferingPrice.
percentage	A Float. Percentage to apply if this Product Offering Price is an Alteration (such as a Discount).
place	A PlaceRef. Place defines the places where the products are sold or delivered.
policy	A PolicyRef. The Policy resource represents a policy/rule applied to ProductOfferingPrice.
popRelationship	A ProductOfferingPriceRelationship. Product Offering Prices related to this Product Offering Price, for example a price alteration such as allowance or discount.
price	A Money. A base / value business entity used to represent money.
priceType	A String. A category that describes the price, such as recurring, discount, allowance, penalty, and so forth.
pricingLogicAlgorithm	A PricingLogicAlgorithm. The PricingLogicAlgorithm entity represents an instantiation of an interface specification to external rating function (without a modeled behavior in SID). Some of the parameters of the interface definition may be already set (such as price per unit) and some may be gathered during the rating process from the event (such as call duration) or from ProductCharacteristicValues (such as assigned bandwidth).
prodSpecCharValueUse	A ProductSpecificationCharacteristicValueUse. A use of the ProductSpecificationCharacteristicValue by a ProductOfferingPrice to which additional properties (attributes) apply or override the properties of similar properties contained in ProductSpecificationCharacteristicValue. It should be noted that characteristics which their value(s) addressed by this object must exist in corresponding product specification. The available characteristic values for a ProductSpecificationCharacteristic in a Product specification can be modified at the ProductOffering and ProcutOfferingPrice level. The list of values in ProductSpecificationCharacteristicValueUse is a strict subset of the list of values as defined in the corresponding product specification characteristics.
productOfferingTerm	A ProductOfferingTerm. A list of conditions under which a ProductOfferingPrice is made available to Customers. For instance, a Product Offering Price can be offered with multiple commitment periods.
recurringChargePeriodLength	An Integer. The period of the recurring charge: 1, 2,It sets to zero if it is not applicable.
recurringChargePeriodType	A String. The period to repeat the application of the price Could be month, week...
tax	A TaxItem. An amount of money levied on the price of a Product by a legislative body.
unitOfMeasure	A Quantity. An amount in a given unit.

validFor	A TimePeriod. A period of time, either as a deadline (endTime only) a startTime only, or both.
version	A String. ProductOfferingPrice version.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

ProductOfferingPriceRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
version	A String. Version of the product offering price.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

ProductOfferingPriceRelationship sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
relationshipType	A String. Type of the relationship, for example override, discount, etc.
role	A String. The association role for the source product offering price.
version	A String. Version of the referred product offering price.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

ProductOfferingRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
version	A String. Version of the product offering.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

ProductOfferingRelationship sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
relationshipType	A String. Type of relationship between product offerings such as requires, exchangableTo, optionalFor.
role	A String. The association role for the source product offering.
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
version	A String. Version of the referred product offering.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

ProductOfferingTerm sub-resource fields

description	A String. Description of the productOfferingTerm.
duration	A Duration. A time interval in a given unit of time.
name	A String. Name of the productOfferingTerm.
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.

@type	A String. When sub-classing, this defines the sub-class Extensible name.
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ProductSpecificationCharacteristicValueUse sub-resource fields

description	A String. A narrative that explains in detail what the productSpecificationCharacteristic is.
id	A String. Unique ID for the characteristic.
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. Name of the associated productSpecificationCharacteristic.
productSpecCharacteristicValue	A CharacteristicValueSpecification. A number or text that can be assigned to a ProductSpecificationCharacteristic.
productSpecification	A ProductSpecificationRef. ProductSpecification reference. A product Specification represents entities that are orderable from the provider of the catalog.
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
valueType	A String. A kind of value that the characteristic can take on, such as numeric, text and so forth.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

ProductSpecificationRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
targetProductSchema	A TargetProductSchema. The reference object to the schema and type of target product which is described by product specification.
version	A String. Version of the product specification.
@baseType	A String. When sub-classing, this defines the super-class.

@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

ResourceCandidateRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
version	A String. The version of resource candidate.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

SLARef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

ServiceCandidateRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
version	A String. Version of the service candidate.
@baseType	A String. When sub-classing, this defines the super-class.

@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

StringArrayCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endTime only) a startTime only, or both.
value	A String.
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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

StringCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
value	A String. 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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

TargetProductSchema sub-resource fields

@schemaLocation	A Uri. This field provides a link to the schema describing the target product.
@type	A String. Class type of the target product.

TaxItem sub-resource fields

taxAmount	A Money. A base / value business entity used to represent money.
taxCategory	A String. Tax category.
taxRate	A Float. Applied rate of the tax.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

Json representation sample(s)

We provide below a JSON representation as example of the 'ProductOffering' resource object.

```
{
  "id": "7655",
  "href": "https://mycsp.com:8080/tmf-
```

```
api/productCatalogManagement/v5/productOffering/7655",
    "name": "Basic Firewall for Business",
    "description": "This product offering suggests a firewall service that can be deployed in business customer premise.",
    "version": "2.1",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2021-08-25T00:00:00Z"
    },
    "lastUpdate": "2020-09-27T00:00:00Z",
    "lifecycleStatus": "Active",
    "isBundle": false,
    "isSellable": true,
    "statusReason": "Released for sale",
    "place": [
        {
            "id": "9979",
            "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v5/geographicAddress/9979",
                "name": "San Francisco Bay Area",
                "@referredType": "GeographicAddress",
                "@type": "PlaceRef"
        }
    ],
    "productOfferingCharacteristic": [
        {
            "name": "complexityRank",
            "description": "Gives an indication of how complex this is to deploy",
            "valueType": "number",
            "configurable": false,
            "productOfferingCharacteristicValue": [
                {
                    "valueType": "number",
                    "value": 8,
                    "@type": "NumberCharacteristicValueSpecification"
                }
            ],
            "@type": "ProductOfferingCharacteristic"
        }
    ],
    "allowedAction": [
        {
            "action": "add",
            "validFor": {
                "startDateTime": "2020-09-23T00:00:00Z",
                "endDateTime": "2021-08-25T00:00:00Z"
            },
            "channel": [
                {
                    "id": "4407",
                    "href": "https://mycsp.com:8080/tmf-
api/salesChannelManagement/v5/channel/4407",
                        "name": "Assisted Channel",
                        "@referredType": "SalesChannel",
                        "@type": "ChannelRef"
                },
                {
                    "id": "4406",
                    "href": "https://mycsp.com:8080/tmf-
api/salesChannelManagement/v5/channel/4406",
                        "name": "Online Channel",
                        "@referredType": "SalesChannel",
                        "@type": "ChannelRef"
                }
            ]
        }
    ]
}
```

```
        }
    ],
    "@type": "AllowedProductAction"
},
{
    "action": "remove",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2023-08-25T00:00:00Z"
    },
    "channel": [
        {
            "id": "4407",
            "href": "https://mycsp.com:8080/tmf-
api/salesChannelManagement/v5/channel/4407",
            "name": "Assisted Channel",
            "@referredType": "SalesChannel",
            "@type": "ChannelRef"
        }
    ],
    "@type": "AllowedProductAction"
}
],
"bundledGroupProductOfferingOption": [
{
    "id": "1",
    "name": "Software Add-ons",
    "numberRelOfferLowerLimit": 1,
    "numberRelOfferUpperLimit": 2,
    "productOffering": [
        {
            "id": "7688",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/7688",
            "name": "Reporting Widget",
            "isDefault": false,
            "@referredType": "ProductOffering",
            "@type": "BundledGroupProductOffering"
        },
        {
            "id": "7689",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/7689",
            "name": "Deep Packet Inspector",
            "isDefault": false,
            "@referredType": "ProductOffering",
            "@type": "BundledGroupProductOffering"
        }
    ],
    "@type": "BundledGroupProductOfferingOption"
}
],
"serviceLevelAgreement": {
    "id": "8082",
    "href": "https://mycsp.com:8080/tmf-api/slaManagement/v5/sla/8082",
    "name": "Gold SLA for Business",
    "@referredType": "ServiceLevelAgreement",
    "@type": "ServiceLevelAgreementRef"
},
"productSpecification": {
    "id": "9881",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
```

```
        "version": "1.1",
        "name": "Robotics999",
        "@referredType": "ProductSpecification",
        "@type": "ProductSpecificationRef"
    },
    "channel": [
        {
            "id": "4406",
            "href": "https://mycsp.com:8080/tmf-
api/salesChannelManagement/v5/channel/4406",
            "name": "Online Channel",
            "@referredType": "SalesChannel",
            "@type": "ChannelRef"
        }
    ],
    "serviceCandidate": {
        "id": "8167",
        "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceCandidate/8167",
        "version": "1.0",
        "name": "Mega Max",
        "@referredType": "ServiceCandidate",
        "@type": "ServiceCandidateRef"
    },
    "category": [
        {
            "id": "2646",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/2646",
            "version": "2.0",
            "name": "Cloud",
            "@referredType": "Category",
            "@type": "CategoryRef"
        }
    ],
    "resourceCandidate": {
        "id": "8937",
        "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v5/resourceCandidate/8937",
        "name": "Mega Band",
        "@referredType": "ResourceCandidate",
        "@type": "ResourceCandidateRef"
    },
    "productOfferingTerm": [
        {
            "name": "New Client Condition",
            "description": "This product offering term is for new client at fix
duration of less than a year",
            "duration": {
                "amount": 12,
                "units": "Month"
            },
            "validFor": {
                "startDateTime": "2020-09-23T00:00:00Z",
                "endDateTime": "2021-09-23T00:00:00Z"
            },
            "@type": "ProductOfferingTerm"
        }
    ],
    "productOfferingPrice": [
        {
            "id": "1747",
            "href": "https://mycsp.com:8080/tmf-
```

```
api/productCatalogManagement/v5/productOfferingPrice/1747",
    "name": "Recurring Monthly Price for Business Firewall",
    "@referredType": "ProductOfferingPrice",
    "@type": "ProductOfferingPrice"
}
],
"agreement": [
{
    "id": "5537",
    "href": "https://mycsp.com:8080/tmf-
api/agreementManagement/v5/agreement/5537",
        "name": "Moon",
        "@referredType": "Agreement",
        "@type": "AgreementRef"
}
],
"attachment": [
{
    "description": "This attachment gives a block diagram of the firewall.",

    "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
        "mimeType": "image/jpeg",
        "id": "22",
        "url": "https://mycsp.com:7070/docloader?docnum=3534536",
        "@referredType": "Attachment",
        "@type": "AttachmentRefOrValue"
}
],
"marketSegment": [
{
    "id": "1266",
    "href": "https://mycsp.com:8080/tmf-
api/productOfferingReferences/v5/marketSegment/1266",
        "name": "North Region",
        "@referredType": "MarketSegment",
        "@type": "MarketSegmentRef"
}
],
"bundledProductOffering": [
],
"productOfferingRelationship": [
{
    "id": "331",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/331",
        "relationshipType": "DependsOn",
        "validFor": {
            "startDateTime": "2020-09-23T16:42:23Z"
        },
        "role": "A-Role",
        "name": "Carrier Grade NAT",
        "@referredType": "ProductOffering",
        "@type": "ProductOfferingRelationship"
}
],
"prodSpecCharValueUse": [
{
    "name": "Number of Ports",
    "id": "3331",
    "description": "The total Number of Ports for this product",
    "valueType": "number",
    "minCardinality": 1,
}
```

```
        "maxCardinality": 1,
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2021-09-23T00:00:00Z"
        },
        "@type": "ProductSpecificationCharacteristicValueUse",
        "productSpecCharacteristicValue": [
            {
                "isDefault": true,
                "valueType": "number",
                "validFor": {
                    "startDateTime": "2020-09-23T00:00:00Z",
                    "endDateTime": "2021-09-23T00:00:00Z"
                },
                "value": 8,
                "@type": "NumberCharacteristicValueSpecification"
            },
            {
                "isDefault": false,
                "valueType": "number",
                "validFor": {
                    "startDateTime": "2020-09-23T00:00:00Z",
                    "endDateTime": "2021-09-23T00:00:00Z"
                },
                "value": 16,
                "@type": "NumberCharacteristicValueSpecification"
            }
        ],
        "productSpecification": {
            "id": "9881",
            "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/productSpecification/9881",
            "version": "1.1",
            "name": "Robotics999",
            "@REFERREDTYPE": "ProductSpecification",
            "@type": "ProductSpecificationRef"
        }
    }
],
"@type": "ProductOffering"
}
```

ProductSpecification resource

Is a detailed description of a tangible or intangible object made available externally in the form of a ProductOffering to customers or other parties playing a party role.

Resource model

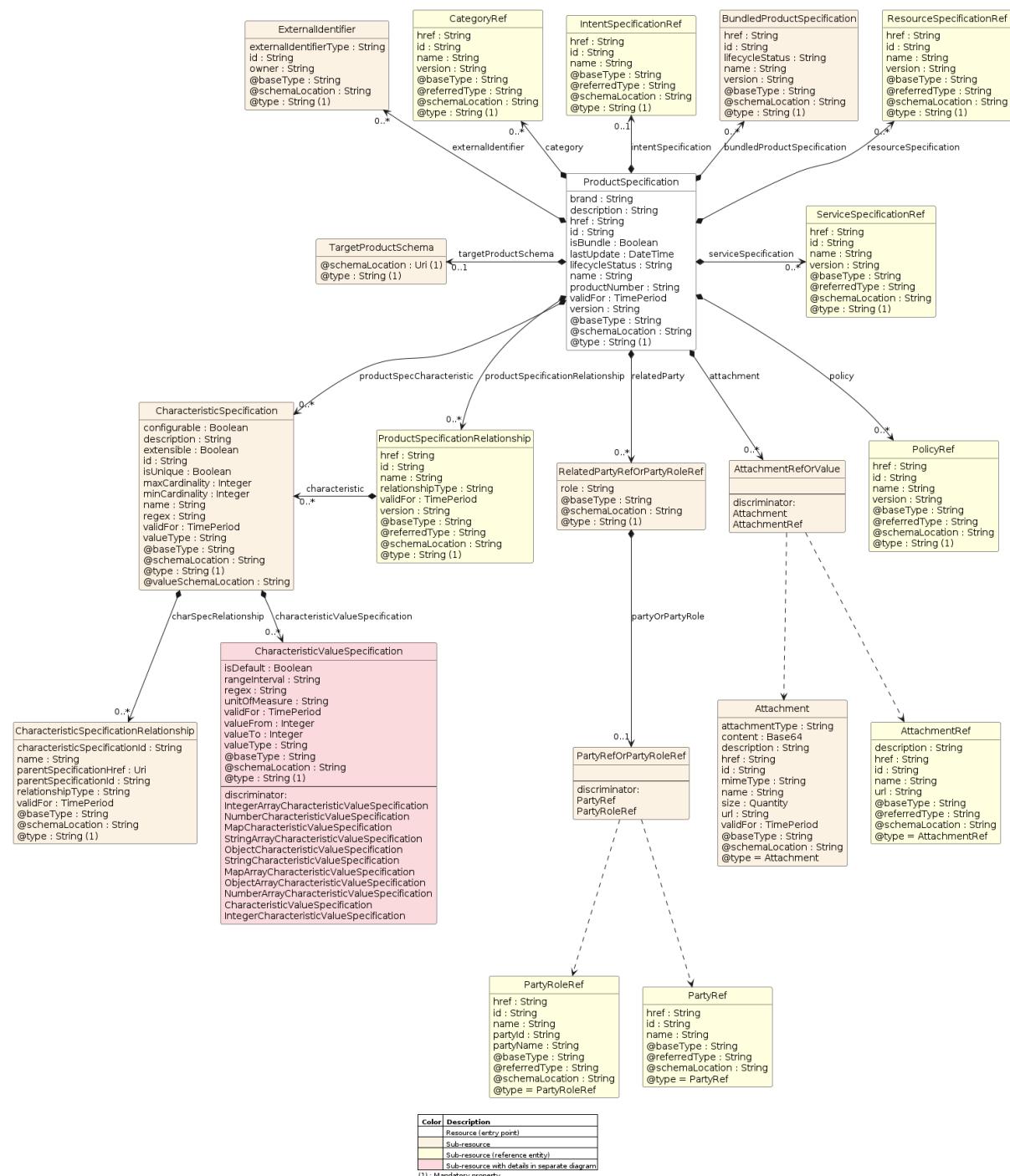


Figure 7 - ProductSpecification

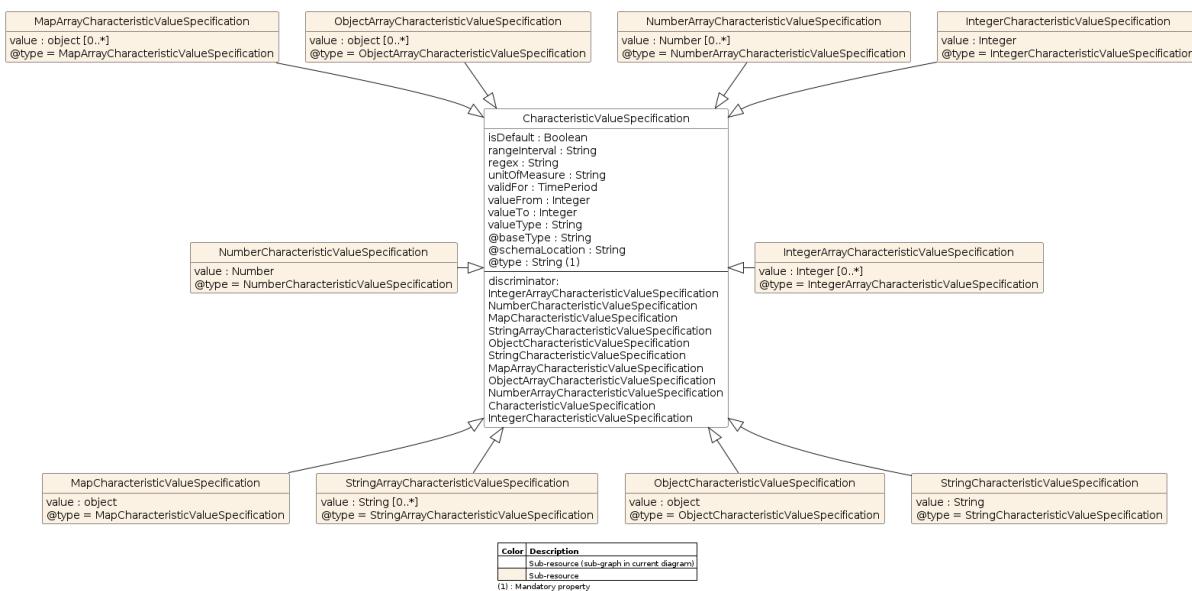


Figure 8 - CharacteristicValueSpecification

Field descriptions

ProductSpecification fields

attachment	An AttachmentRefOrValue. Complements the description of an element (for instance a product) through video, pictures...
brand	A String. The manufacturer or trademark of the specification.
bundledProductSpecification	A BundledProductSpecification. A type of ProductSpecification that belongs to a grouping of ProductSpecifications made available to the market. It inherits of all attributes of ProductSpecification.
category	A CategoryRef. The category resource is used to group product specifications in logical containers. Categories can contain other categories and/or other catalog entries.
description	A String. A narrative that explains in detail what the product specification is.
externalIdentifier	An ExternalIdentifier. List of external identifiers for the specification, e.g. identifier in source catalog.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
intentSpecification	An IntentSpecificationRef.
isBundle	A Boolean. IsBundle determines whether a productSpecification represents a single productSpecification (false), or a bundle of productSpecification (true).
lastUpdate	A DateTime. Date and time of the last update.
lifecycleStatus	A String. Used to indicate the current lifecycle status.
name	A String. Name of the product specification.

policy	A PolicyRef. The Policy resource represents a policy/rule applied to ProductSpecification.
productNumber	A String. An identification number assigned to uniquely identify the specification.
productSpecCharacteristic	A CharacteristicSpecification. A characteristic quality or distinctive feature of a ProductSpecification. 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.
productSpecificationRelationship	A ProductSpecificationRelationship. A migration, substitution, dependency or exclusivity relationship between/among product specifications.
relatedParty	A RelatedPartyRefOrPartyRoleRef. A related party defines party or party role linked to a specific entity.
resourceSpecification	A ResourceSpecificationRef. The ResourceSpecification is required to realize a ProductSpecification.
serviceSpecification	A ServiceSpecificationRef. ServiceSpecification(s) required to realize a ProductSpecification.
targetProductSchema	A TargetProductSchema. The reference object to the schema and type of target product which is described by product specification.
validFor	A TimePeriod. A period of time, either as a deadline (endDateOnly) a startDateTime only, or both.
version	A String. Product specification version.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

Attachment sub-resource fields

attachmentType	A String. A business characterization of the purpose of the attachment, for example logo, instructionManual, contractCopy.
content	A Base64. The actual contents of the attachment object, if embedded, encoded as base64.
description	A String. A narrative text describing the content of the attachment.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
mimeType	A String. A technical characterization of the attachment content format using IETF Mime Types.

name	A String. The name of the attachment.
size	A Quantity. An amount in a given unit.
url	A String. Uniform Resource Locator, is a web page address (a subset of URI).
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

AttachmentRef sub-resource fields

description	A String. A narrative text describing the content of the attachment.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
url	A String. Link to the attachment media/content.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

BundledProductSpecification sub-resource fields

href	A String. Reference of the product specification.
id	A String. Unique identifier of the product specification.
lifecycleStatus	A String. Used to indicate the current lifecycle status.
name	A String. Name of the product specification.
version	A String. Version of the product specification.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

CategoryRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
version	A String. Version of the category.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

CharacteristicSpecification sub-resource fields

charSpecRelationship	A CharacteristicSpecificationRelationship. An aggregation, migration, substitution, dependency or exclusivity relationship between/among Specification Characteristics.
characteristicValueSpecification	A CharacteristicValueSpecification. A CharacteristicValueSpecification object is used to define a set of attributes, each of which can be assigned to a corresponding set of attributes in a CharacteristicSpecification object. The values of the attributes in the CharacteristicValueSpecification object describe the values of the attributes that a corresponding Characteristic object can take on.
configurable	A Boolean. If true, the Boolean indicates that the target Characteristic 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. Specifies if the value of this characteristic is unique across all entities instantiated from the specification that uses this characteristic. For example, consider a ProductSpecification for a set-top box, with a CharacteristicSpecification cardID. Each set-top box must have a different value for cardID, so this isUnique attribute would be set to true for the characteristic.
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.
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
valueType	A String. A kind of value that the characteristic can take on, such as numeric, text and so forth.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.
@valueSchemaLocation	A String. This (optional) field provides a link to the schema describing the value type.

CharacteristicSpecificationRelationship sub-resource fields

characteristicSpecificationId	A String. Unique identifier of the characteristic within the specification.
name	A String. Name of the target characteristic within the specification.
parentSpecificationHref	A Uri. Hyperlink reference to the parent specification containing the target characteristic.
parentSpecificationId	A String. Unique identifier of the parent specification containing the target characteristic.
relationshipType	A String. Type of relationship such as aggregation, migration, substitution, dependency, exclusivity.
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

CharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endTime only) a startTime only, or both.
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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

ExternalIdentifier sub-resource fields

externalIdentifierType	A String. Type of the identification, typically would be the type of the entity within the external system.
id	A String. Identification of the entity within the external system.
owner	A String. Name of the external system that owns the entity.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

IntegerArrayCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
value	An Integer.
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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

IntegerCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
value	An Integer. 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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

IntentSpecificationRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

MapArrayCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
value	An object.
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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

MapCharacteristicValueSpecification sub-resource fields

isDefault	A Boolean. If true, the Boolean Indicates if the value is the default value for a characteristic.
-----------	---

rangelInterval	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 TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
value	An object. 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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

NumberArrayCharacteristicValueSpecification sub-resource fields

isDefault	A Boolean. If true, the Boolean Indicates if the value is the default value for a characteristic.
rangelInterval	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 TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
value	A Number.
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.

@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

NumberCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
value	A Number. 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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

ObjectArrayCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
value	An object.
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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

ObjectCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
value	An object. 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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.

@type	A String. When sub-classing, this defines the sub-class Extensible name.
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PartyRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

PartyRoleRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
partyId	A String. The identifier of the engaged party that is linked to the PartyRole object.
partyName	A String. The name of the engaged party that is linked to the PartyRole object.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

PolicyRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
version	A String.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.

@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

ProductSpecificationRelationship sub-resource fields

characteristic	A CharacteristicSpecification. A characteristic that refines the relationship. For example, consider the relationship between broadband and TV. For a 4k TV it is important to know the minimum bandwidth to support 4k, so a characteristic Resolution might be defined on the relationship to allow capturing of this in the inventory.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
relationshipType	A String. Type of the relationship, for example override, discount, etc.
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
version	A String. Version of the referred product specification.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

RelatedPartyRefOrPartyRoleRef sub-resource fields

partyOrPartyRole	A PartyRefOrPartyRoleRef.
role	A String. Role played by the related party or party role in the context of the specific entity it is linked to. Such as 'initiator', 'customer', 'salesAgent', 'user'.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

ResourceSpecificationRef sub-resource fields

href	A String. Hyperlink reference.
------	--------------------------------

<code>id</code>	A String. Unique identifier.
<code>name</code>	A String. Name of the referred entity.
<code>version</code>	A String. Resource Specification version.
<code>@baseType</code>	A String. When sub-classing, this defines the super-class.
<code>@referredType</code>	A String. The actual type of the target instance when needed for disambiguation.
<code>@schemaLocation</code>	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
<code>@type</code>	A String. When sub-classing, this defines the sub-class Extensible name.

ServiceSpecificationRef sub-resource fields

<code>href</code>	A String. Hyperlink reference.
<code>id</code>	A String. Unique identifier.
<code>name</code>	A String. Name of the referred entity.
<code>version</code>	A String. Service specification version.
<code>@baseType</code>	A String. When sub-classing, this defines the super-class.
<code>@referredType</code>	A String. The actual type of the target instance when needed for disambiguation.
<code>@schemaLocation</code>	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
<code>@type</code>	A String. When sub-classing, this defines the sub-class Extensible name.

StringArrayCharacteristicValueSpecification sub-resource fields

<code>isDefault</code>	A Boolean. If true, the Boolean Indicates if the value is the default value for a characteristic.
<code>rangeInterval</code>	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".
<code>regex</code>	A String. A regular expression constraint for given value.
<code>unitOfMeasure</code>	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.
<code>validFor</code>	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
<code>value</code>	A String.
<code>valueFrom</code>	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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

StringCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endTime only) a startTime only, or both.
value	A String. 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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

TargetProductSchema sub-resource fields

@schemaLocation	A Uri. This field provides a link to the schema describing the target product.
@type	A String. Class type of the target product.

Json representation sample(s)

We provide below a JSON representation as example of the 'ProductSpecification' resource object.

```
{  
    "id": "9881",  
    "href": "https://mycsp.com:8080/tmf-  
api/productCatalogManagement/v5/productSpecification/9881",  
    "name": "Cisco Firepower NGFW",  
    "brand": "Cisco",  
    "productNumber": "CSC-340-NGFW",  
    "description": "Powerful product that integrates with a firewall, including  
intrusion prevention, advanced malware protection, cloud-based sandboxing, URL  
filtering, endpoint protection, web gateway, email security, network traffic  
analysis, network access control and CASB.",  
    "isBundle": true,  
    "lastUpdate": "2020-09-23T16:42:23Z",  
    "lifecycleStatus": "Active",  
    "validFor": {  
        "startDateTime": "2020-09-23T00:00:00Z",  
        "endDateTime": "2022-11-24T16:42:23Z"  
    },  
    "version": "2.0",  
    "relatedParty": [  
        {  
            "role": "Owner",  
            "@type": "RelatedPartyRefOrPartyRoleRef",  
            "partyOrPartyRole": {  
                "id": "1234",  
                "href": "https://mycsp.com:8080/tmf-  
api/partyManagement/v5/partyRole/1234",  
                "name": "Gustave Flaubert",  
                "@type": "PartyRef",  
                "@referredType": "Individual"  
            }  
        }  
    ],  
    "attachment": [  
        {  
            "id": "22",  
            "href": "https://mycsp.com:8080/tmf-  
api/documentManagement/v5/attachment/22",  
            "name": "Product Picture",  
            "mimeType": "image/jpeg",  
            "url": "https://mycsp.com:7070/docloader?docnum=774451234",  
            "@referredType": "Attachment",  
            "@type": "AttachmentRefOrValue"  
        },  
        {  
            "id": "33",  
            "href": "https://mycsp.com:8080/tmf-  
api/documentManagement/v5/attachment/22",  
            "name": "Product Manual",  
            "mimeType": "application/pdf",  
            "url": "https://mycsp.com:7070/docloader?docnum=774454321",  
            "@referredType": "Attachment",  
            "@type": "AttachmentRefOrValue"  
        }  
    ],  
    "bundledProductSpecification": [  
        {  
            "id": "15",  
            "name": "Cisco Firepower NGFW",  
            "brand": "Cisco",  
            "productNumber": "CSC-340-NGFW",  
            "description": "Powerful product that integrates with a firewall, including  
intrusion prevention, advanced malware protection, cloud-based sandboxing, URL  
filtering, endpoint protection, web gateway, email security, network traffic  
analysis, network access control and CASB.",  
            "isBundle": true,  
            "lastUpdate": "2020-09-23T16:42:23Z",  
            "lifecycleStatus": "Active",  
            "validFor": {  
                "startDateTime": "2020-09-23T00:00:00Z",  
                "endDateTime": "2022-11-24T16:42:23Z"  
            },  
            "version": "2.0",  
            "relatedParty": [  
                {  
                    "role": "Owner",  
                    "@type": "RelatedPartyRefOrPartyRoleRef",  
                    "partyOrPartyRole": {  
                        "id": "1234",  
                        "href": "https://mycsp.com:8080/tmf-  
api/partyManagement/v5/partyRole/1234",  
                        "name": "Gustave Flaubert",  
                        "@type": "PartyRef",  
                        "@referredType": "Individual"  
                    }  
                }  
            ],  
            "attachment": [  
                {  
                    "id": "22",  
                    "href": "https://mycsp.com:8080/tmf-  
api/documentManagement/v5/attachment/22",  
                    "name": "Product Picture",  
                    "mimeType": "image/jpeg",  
                    "url": "https://mycsp.com:7070/docloader?docnum=774451234",  
                    "@referredType": "Attachment",  
                    "@type": "AttachmentRefOrValue"  
                },  
                {  
                    "id": "33",  
                    "href": "https://mycsp.com:8080/tmf-  
api/documentManagement/v5/attachment/22",  
                    "name": "Product Manual",  
                    "mimeType": "application/pdf",  
                    "url": "https://mycsp.com:7070/docloader?docnum=774454321",  
                    "@referredType": "Attachment",  
                    "@type": "AttachmentRefOrValue"  
                }  
            ]  
        }  
    ]  
}
```

```
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/15",
        "name": "URL Filter",
        "@type": "BundledProductSpecification",
        "@baseType": "",
        "lifecycleStatus": "Active"
    },
{
    "id": "64",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/64",
    "name": "Malware Protector",
    "@type": "BundledProductSpecification",
    "@baseType": "",
    "lifecycleStatus": "Active"
}
],
"targetProductSchema": {
    "@type": "Firewall",
    "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Product/Firewall.schema.json"
},
"productSpecificationRelationship": [
    {
        "id": "23",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/23",
        "relationshipType": "OptionalFor",
        "validFor": {
            "startDateTime": "2020-09-23T16:42:23Z"
        },
        "name": "DataPlan",
        "role": "A-Item",
        "@referredType": "ProductSpecification",
        "@type": "ProductSpecificationRelationship"
    }
],
"serviceSpecification": [
    {
        "id": "22",
        "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/22",
        "name": "Firewall",
        "version": "1.0",
        "@referredType": "ServiceSpecification",
        "@type": "ServiceSpecificationRef"
    }
],
"resourceSpecification": [
    {
        "id": "63",
        "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v5/resourceSpecification/63",
        "name": "Firewall Port",
        "version": "1.0",
        "@referredType": "PhysicalResourceSpecification",
        "@type": "ResourceSpecificationRef"
    }
],
"productSpecCharacteristic": [
    {
        "name": "Number of Ports",
        "value": "10G"
    }
]
```

```
"description": "The total Number of Ports for this product",
"valueType": "number",
"configurable": true,
"minCardinality": 1,
"maxCardinality": 1,
"isUnique": true,
"@type": "CharacteristicSpecification",
"charSpecRelationship": [
    {
        "parentSpecificationId": "43",
        "parentSpecificationHref": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/43",
        "characteristicSpecificationId": "2",
        "relationshipType": "Dependency",
        "name": "Bandwidth",
        "validFor": {
            "startDateTime": "2020-09-23T16:42:23-04:00"
        },
        "@type": "CharacteristicSpecificationRelationship"
    }
],
"characteristicValueSpecification": [
    {
        "isDefault": true,
        "valueType": "number",
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2022-11-24T00:00:00Z"
        },
        "value": 8,
        "@type": "NumberCharacteristicValueSpecification"
    },
    {
        "isDefault": false,
        "valueType": "number",
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2022-11-24T00:00:00Z"
        },
        "value": 16,
        "@type": "NumberCharacteristicValueSpecification"
    },
    {
        "isDefault": false,
        "valueType": "number",
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2022-11-24T00:00:00Z"
        },
        "value": 24,
        "@type": "NumberCharacteristicValueSpecification"
    }
],
"validFor": {
    "startDateTime": "2020-09-23T16:42:23Z"
}
},
{
    "name": "Color",
    "description": "Color of the Firewall housing",
    "valueType": "string",
    "configurable": true,
    "minCardinality": 1,
```

```
    "maxCardinality": 1,
    "extensible": true,
    "isUnique": true,
    "@type": "CharacteristicSpecification",
    "characteristicValueSpecification": [
        {
            "isDefault": true,
            "valueType": "string",
            "value": "Black",
            "@type": "StringCharacteristicValueSpecification"
        },
        {
            "isDefault": false,
            "valueType": "string",
            "value": "White",
            "@type": "StringCharacteristicValueSpecification"
        }
    ],
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z"
    }
},
"@type": "ProductSpecification"
}
```

ProductOfferingPrice resource

Is based on both the basic cost to develop and produce products and the enterprises policy on revenue targets. This price may be further revised through discounting (a Product Offering Price that reflects an alteration). The price, applied for a productOffering may also be influenced by the productOfferingTerm, the customer selected, eg: a productOffering can be offered with multiple terms, like commitment periods for the contract. The price may be influenced by this productOfferingTerm. A productOffering may be cheaper with a 24 month commitment than with a 12 month commitment.

Resource model

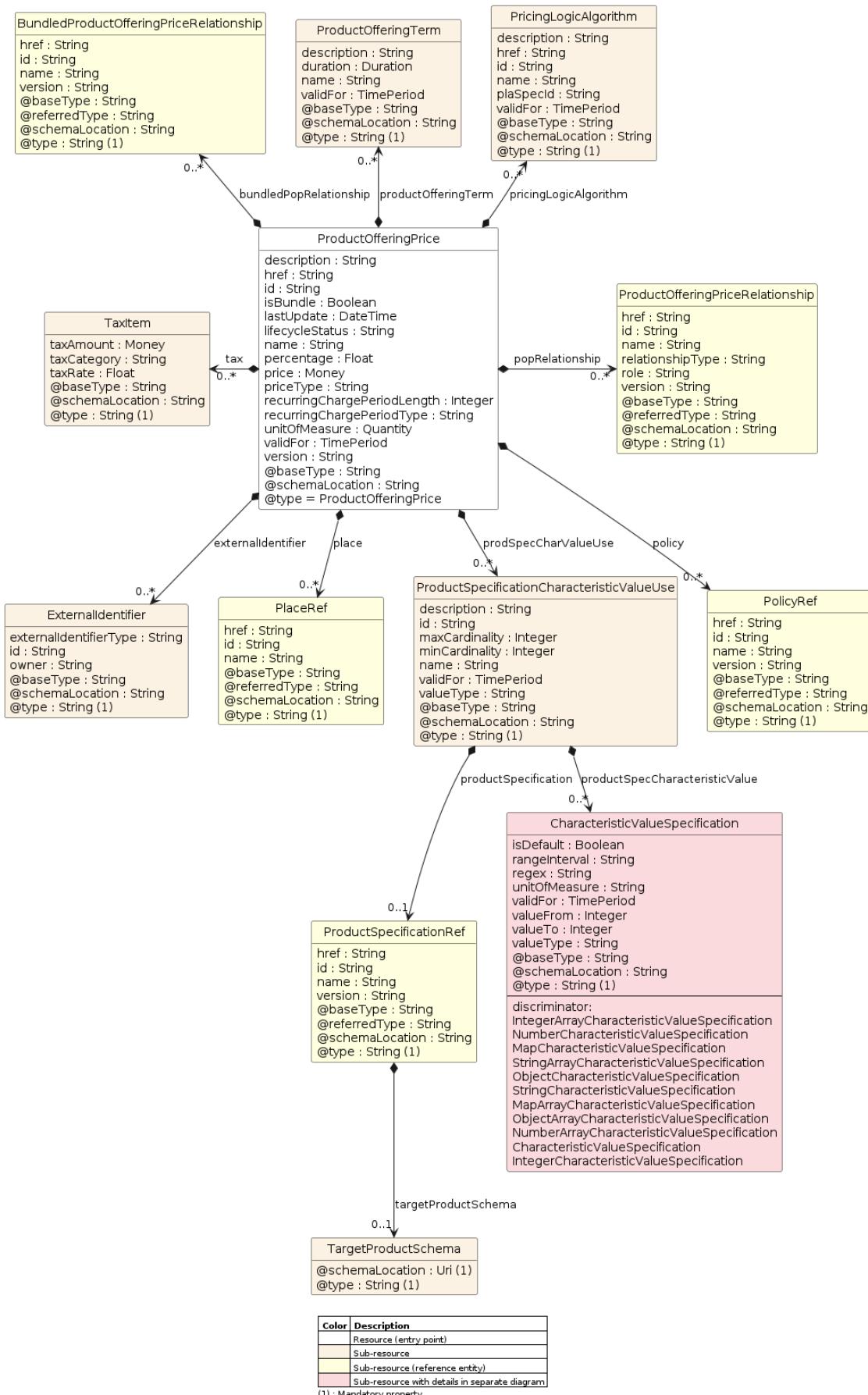


Figure 9 - ProductOfferingPrice

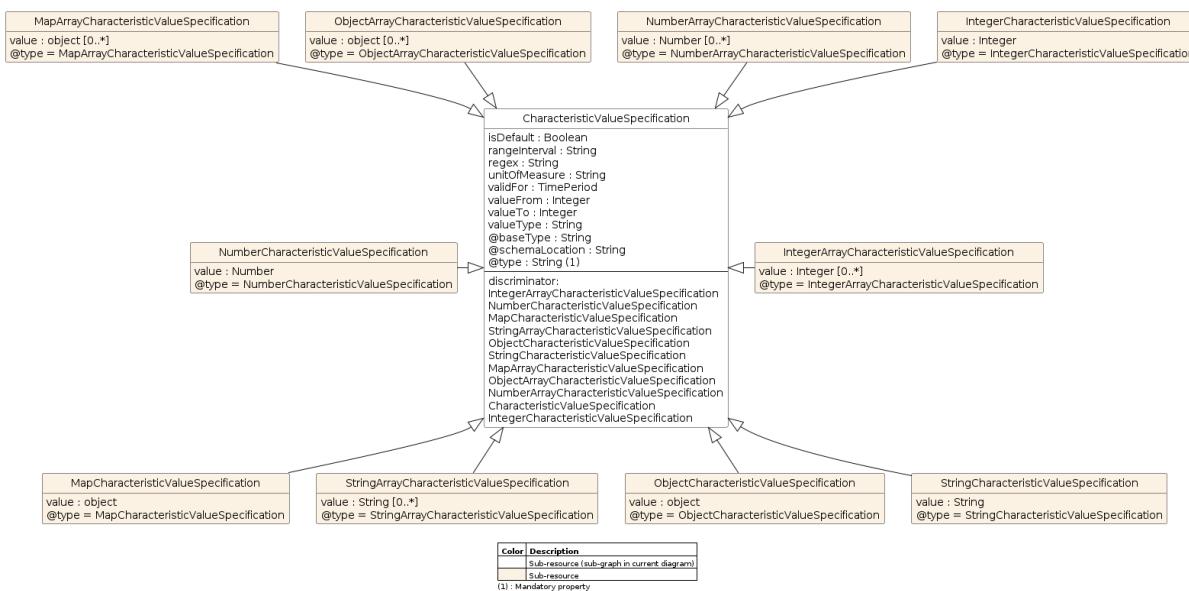


Figure 10 - CharacteristicValueSpecification

Field descriptions

ProductOfferingPrice fields

bundledPopRelationship	A BundledProductOfferingPriceRelationship. This object represents a bundle relationship from a bundle product offering price (parent) to a simple product offering price (child). A simple product offering price may participate in more than one bundle relationship.
description	A String. Description of the productOfferingPrice.
externalIdentifier	An ExternalIdentifier. List of external identifiers for the offering price, e.g. identifier in source catalog.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
isBundle	A Boolean. A flag indicating if this ProductOfferingPrice is composite (bundle) or not.
lastUpdate	A DateTime. The last update time of this ProductOfferingPrice.
lifecycleStatus	A String. The lifecycle status of this ProductOfferingPrice.
name	A String. Name of the productOfferingPrice.
percentage	A Float. Percentage to apply if this Product Offering Price is an Alteration (such as a Discount).
place	A PlaceRef. Place defines the places where the products are sold or delivered.
policy	A PolicyRef. The Policy resource represents a policy/rule applied to ProductOfferingPrice.
popRelationship	A ProductOfferingPriceRelationship. Product Offering Prices related to this Product Offering Price, for example a price alteration such as allowance or discount.

price	A Money. A base / value business entity used to represent money.
priceType	A String. A category that describes the price, such as recurring, discount, allowance, penalty, and so forth.
pricingLogicAlgorithm	A PricingLogicAlgorithm. The PricingLogicAlgorithm entity represents an instantiation of an interface specification to external rating function (without a modeled behavior in SID). Some of the parameters of the interface definition may be already set (such as price per unit) and some may be gathered during the rating process from the event (such as call duration) or from ProductCharacteristicValues (such as assigned bandwidth).
prodSpecCharValueUse	A ProductSpecificationCharacteristicValueUse. A use of the ProductSpecificationCharacteristicValue by a ProductOfferingPrice to which additional properties (attributes) apply or override the properties of similar properties contained in ProductSpecificationCharacteristicValue. It should be noted that characteristics which their value(s) addressed by this object must exist in corresponding product specification. The available characteristic values for a ProductSpecificationCharacteristic in a Product specification can be modified at the ProductOffering and ProductOfferingPrice level. The list of values in ProductSpecificationCharacteristicValueUse is a strict subset of the list of values as defined in the corresponding product specification characteristics.
productOfferingTerm	A ProductOfferingTerm. A list of conditions under which a ProductOfferingPrice is made available to Customers. For instance, a Product Offering Price can be offered with multiple commitment periods.
recurringChargePeriodLength	An Integer. The period of the recurring charge: 1, 2,It sets to zero if it is not applicable.
recurringChargePeriodType	A String. The period to repeat the application of the price Could be month, week...
tax	A TaxItem. An amount of money levied on the price of a Product by a legislative body.
unitOfMeasure	A Quantity. An amount in a given unit.
validFor	A TimePeriod. A period of time, either as a deadline (endDateOnly) a startTimeOnly, or both.
version	A String. ProductOfferingPrice version.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

BundledProductOfferingPriceRelationship sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
version	A String. Version of the referred product offering price.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

CharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endTime only) a startTime only, or both.
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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

Duration sub-resource fields

amount	An Integer. Time interval (number of seconds, minutes, hours, etc.).
units	A String. Unit of time (seconds, minutes, hours, etc.).

ExternalIdentifier sub-resource fields

externalIdentifierType	A String. Type of the identification, typically would be the type of the entity within the external system.
id	A String. Identification of the entity within the external system.
owner	A String. Name of the external system that owns the entity.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

IntegerArrayCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endTime only) a startTime only, or both.
value	An Integer.
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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

IntegerCharacteristicValueSpecification sub-resource fields

isDefault	A Boolean. If true, the Boolean Indicates if the value is the default value for a characteristic.
-----------	---

rangelInterval	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 TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
value	An Integer. 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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

MapArrayCharacteristicValueSpecification sub-resource fields

isDefault	A Boolean. If true, the Boolean Indicates if the value is the default value for a characteristic.
rangelInterval	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 TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
value	An object.
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.

@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

MapCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
value	An object. 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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

NumberArrayCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
value	A Number.
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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

NumberCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
value	A Number. 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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.

@type	A String. When sub-classing, this defines the sub-class Extensible name.
-------	--

ObjectArrayCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endTime only) a startTime only, or both.
value	An object.
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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

ObjectCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endTime only) a startTime only, or both.

value	An object. 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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

PlaceRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

PolicyRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
version	A String.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

PricingLogicAlgorithm sub-resource fields

description	A String. Description of the PricingLogicAlgorithm.
-------------	---

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name given to the PricingLogicAlgorithm.
plaSpecId	A String. Id of corresponding PricingLogicAlgorithm specification.
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

ProductOfferingPriceRelationship sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
relationshipType	A String. Type of the relationship, for example override, discount, etc.
role	A String. The association role for the source product offering price.
version	A String. Version of the referred product offering price.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

ProductOfferingTerm sub-resource fields

description	A String. Description of the productOfferingTerm.
duration	A Duration. A time interval in a given unit of time.
name	A String. Name of the productOfferingTerm.
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.

@type	A String. When sub-classing, this defines the sub-class Extensible name.
--------------	--

ProductSpecificationCharacteristicValueUse sub-resource fields

description	A String. A narrative that explains in detail what the productSpecificationCharacteristic is.
id	A String. Unique ID for the characteristic.
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. Name of the associated productSpecificationCharacteristic.
productSpecCharacteristicValue	A CharacteristicValueSpecification. A number or text that can be assigned to a ProductSpecificationCharacteristic.
productSpecification	A ProductSpecificationRef. ProductSpecification reference. A product Specification represents entities that are orderable from the provider of the catalog.
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
valueType	A String. A kind of value that the characteristic can take on, such as numeric, text and so forth.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

ProductSpecificationRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
targetProductSchema	A TargetProductSchema. The reference object to the schema and type of target product which is described by product specification.
version	A String. Version of the product specification.
@baseType	A String. When sub-classing, this defines the super-class.

@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

StringArrayCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endTime only) a startTime only, or both.
value	A String.
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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

StringCharacteristicValueSpecification sub-resource fields

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 TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
value	A String. 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.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

TargetProductSchema sub-resource fields

@schemaLocation	A Uri. This field provides a link to the schema describing the target product.
@type	A String. Class type of the target product.

TaxItem sub-resource fields

taxAmount	A Money. A base / value business entity used to represent money.
taxCategory	A String. Tax category.
taxRate	A Float. Applied rate of the tax.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String. When sub-classing, this defines the sub-class Extensible name.

Json representation sample(s)

We provide below a JSON representation as example of the 'ProductOfferingPrice' resource object.

```
{
  "id": "1747",
  "href": "https://mycsp.com:8080/tmf-
```

```
api/productCatalogManagement/v5/productOfferingPrice/1747",
  "name": "Recurring Charge for Business Firewall",
  "description": "This pricing describes the recurring charge for a firewall service that can be deployed in business customer premise.",
  "version": "2.0",
  "validFor": {
    "startDateTime": "2020-09-22T00:00:00Z",
    "endDateTime": "2021-09-22T00:00:00Z"
  },
  "priceType": "recurring",
  "recurringChargePeriodType": "monthly",
  "recurringChargePeriodLength": 1,
  "lastUpdate": "2020-09-23T00:00:00Z",
  "isBundle": false,
  "lifecycleStatus": "Active",
  "unitOfMeasure": {
    "amount": 1,
    "units": "Month"
  },
  "price": {
    "unit": "EUR",
    "value": 50
  },
  "percentage": 0.0,
  "productOfferingTerm": [
    {
      "name": "12 Month",
      "description": "12 month contract",
      "duration": {
        "amount": 12,
        "units": "Month"
      },
      "validFor": {
        "startDateTime": "2020-09-22T16:42:23Z",
        "endDateTime": "2021-09-22T00:00:00Z"
      },
      "@type": "ProductOfferingTerm"
    }
  ],
  "place": [
    {
      "id": "2707",
      "href": "https://mycsp.com:8080/tmf-api/geographicAddressManagement/v5/geographicAddress/2707",
      "name": "San Francisco Bay Area",
      "@referredType": "GeographicAddress",
      "@type": "PlaceRef"
    }
  ],
  "policy": [
    {
      "@referredType": "Policy",
      "name": "PriceRuleNol",
      "id": "2503",
      "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/policy/2503",
      "@type": "PolicyRef"
    }
  ],
  "pricingLogicAlgorithm": [
    {
      "id": "2777",
      "href": "https://mycsp.com:8080/tmf-
```

```
api/productCatalogManagement/v5/PricingLogicAlgorithm/2777",
    "name": "RecurringRatingPLA",
    "description": "Algorithm that rates Recurring event",
    "plaSpecId": "2801",
    "validFor": {
        "startDateTime": "2020-09-22T16:42:23Z",
        "endDateTime": "2021-09-22T00:00:00Z"
    },
    "@type": "PricingLogicAlgorithm"
}
],
"tax": [
{
    "taxAmount": {
        "unit": "EUR",
        "value": 10
    },
    "taxCategory": "VAT",
    "taxRate": 20.0,
    "@type": "TaxItem"
}
],
"popRelationship": [
{
    "id": "1741",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1741",
    "relationshipType": "discountedBy",
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z",
        "endDateTime": "2021-09-22T00:00:00Z"
    },
    "role": "A-Charge",
    "@referredType": "ProductOfferingPriceAlteration",
    "@type": "ProductOfferingPriceRelationship"
}
],
"@type": "ProductOfferingPrice"
}
```

Notification Resource Models

24 notifications are defined for this API.

Notifications related to Category:

- Category State Change Event
- Category Delete Event
- Category Create Event
- Category Attribute Value Change Event

Notifications related to ImportJob:

- Import Job Create Event
- Import Job State Change Event

Notifications related to ExportJob:

- Export Job Create Event
- Export Job State Change Event

Notifications related to ProductCatalog:

- Product Catalog State Change Event
- Product Catalog Attribute Value Change Event
- Product Catalog Create Event
- Product Catalog Delete Event

Notifications related to ProductOffering:

- Product Offering Attribute Value Change Event
- Product Offering State Change Event
- Product Offering Delete Event
- Product Offering Create Event

Notifications related to ProductSpecification:

- Product Specification Attribute Value Change Event
- Product Specification Create Event
- Product Specification Delete Event
- Product Specification State Change Event

Notifications related to ProductOfferingPrice:

- Product Offering Price State Change Event
- Product Offering Price Create Event
- Product Offering Price Attribute Value Change Event
- Product Offering Price Delete Event

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).

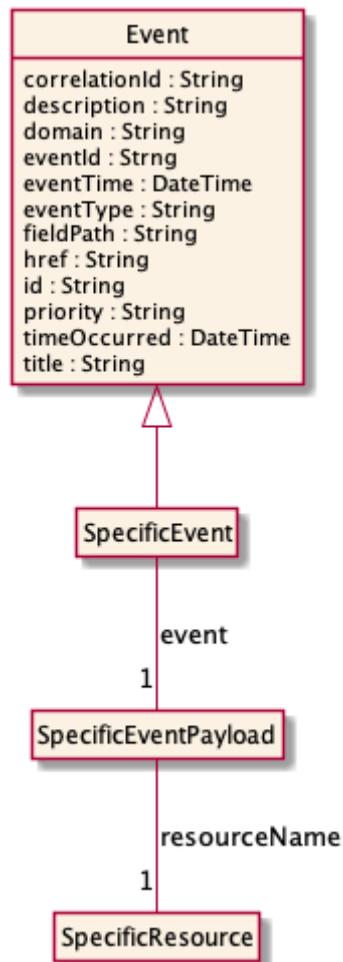


Figure 11 Notification Pattern

Category State Change Event

Message example for CategoryStateChangeEvent event with ?fields=state property only

```

Content-Type: application/json

{
  "correlationId": "d991dd5c-cb42",
  "description": "CategoryStateChangeEvent illustration",
  "domain": "Commercial",
  "eventId": "4768-a3c5-c47b06010b06",
  "eventTime": "2022-08-25T12:17:59.625Z",
  "eventType": "CategoryStateChangeEvent",
  "priority": "4",
  "timeOcurred": "2022-08-25T12:17:58.436Z",
  "title": "CategoryStateChangeEvent",
  "event": {
    "Category": {
      "id": "9881",
      "href": "http://servername/Category/9881",
      "@type": "Category",
      "lifecycleStatus": "Active"
    }
  },
  "reportingSystem": {
  }
}
  
```

```

    "id": "868",
    "name": "APP-394",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"source": {
    "id": "372",
    "name": "APP-92",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"@baseType": "Event",
"@type": "CategoryStateChangeEvent"
}

```

Category Delete Event

Message example for CategoryDeleteEvent event

```

Content-Type: application/json

{
    "correlationId": "90cfcc73d-deb7",
    "description": "CategoryDeleteEvent illustration",
    "domain": "Commercial",
    "eventId": "47d6-9751-40e4f01440c9",
    "eventTime": "2022-08-25T12:18:12.202Z",
    "eventType": "CategoryDeleteEvent",
    "priority": "4",
    "timeOccurred": "2022-08-25T12:18:07.224Z",
    "title": "CategoryDeleteEvent",
    "event": {
        "category": {
            "id": "9881",
            "href": "http://servername/Category/9881",
            "@type": "Category"
        }
    },
    "reportingSystem": {
        "id": "759",
        "name": "APP-745",
        "@type": "ReportingResource",
        "@referredType": "LogicalResource"
    },
    "source": {
        "id": "705",
        "name": "APP-317",
        "@type": "ReportingResource",
        "@referredType": "LogicalResource"
    },
    "@baseType": "Event",
    "@type": "CategoryDeleteEvent"
}

```

Category Create Event

Message example for CategoryCreateEvent event

```
Content-Type: application/json

{
  "correlationId": "be58c421-12cf",
  "description": "Category CreateEvent illustration",
  "domain": "Commercial",
  "eventId": "4a0a-9a52-86f728494b4e",
  "eventTime": "2022-08-25T12:17:59.603Z",
  "eventType": "CategoryCreateEvent",
  "priority": "3",
  "timeOccurred": "2022-08-25T12:17:52.237Z",
  "title": "CategoryCreateEvent",
  "event": {
    "Category": {
      "id": "9881",
      "href": "http://servername/Category/9881",
      "name": "Cloud Services",
      "description": "A category to hold all available cloud service offers.",
      "lastUpdate": "2020-09-23T16:42:23.0Z",
      "lifecycleStatus": "Active",
      "isRoot": true,
      "version": "2.0",
      "validFor": {
        "startDateTime": "2020-09-23T16:42:23.0Z"
      },
      "subCategory": [
        {
          "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/6086",
          "id": "6086",
          "description": "A category to hold all available cloud service offers.",
          "name": "Cloud Storage",
          "version": "1.0",
          "@referredType": "Category",
          "@type": "CategoryRef"
        }
      ],
      "productOffering": [
        {
          "id": "7655",
          "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/7655",
          "name": "Hosted Basic Firewall for business",
          "@referredType": "ProductOffering",
          "@type": "ProductOfferingRef"
        }
      ]
    }
  },
  "@baseType": "Event",
  "@type": "CategoryCreateEvent"
}
```

Category Attribute Value Change Event

Message example for CategoryAttributeValueChangeEvent event

```
Content-Type: application/json
```

```
{
  "correlationId": "d107a5f0-9257",
  "description": "CategoryAttributeValueChangeEvent illustration",
  "domain": "Commercial",
  "eventId": "456b-8663-72338e38d4f0",
  "eventTime": "2022-08-25T12:18:12.181Z",
  "eventType": "CategoryAttributeValueChangeEvent",
  "priority": "1",
  "timeOcurred": "2022-08-25T12:18:11.750Z",
  "title": "CategoryAttributeValueChangeEvent",
  "event": {
    "category": {
      "href": "http://servername/Category/9881",
      "id": "3180",
      "@type": "Category",
      "version": "2.0",
      "validFor": {
        "startDateTime": "2020-09-23T16:42:23.0Z"
      }
    }
  },
  "reportingSystem": {
    "id": "759",
    "name": "APP-745",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
  },
  "source": {
    "id": "705",
    "name": "APP-317",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
  },
  "@baseType": "Event",
  "@type": "CategoryAttributeValueChangeEvent"
}
```

Import Job Create Event

Message example for ImportJobCreateEvent event

```
Content-Type: application/json

{
  "correlationId": "95003dd3-e325",
  "description": "ImportJobCreateEvent illustration",
  "domain": "Commercial",
  "eventId": "4010-9b59-509a64cf85a8",
  "eventTime": "2022-08-25T12:18:12.171Z",
  "eventType": "ImportJobCreateEvent",
  "priority": "1",
  "timeOcurred": "2022-08-25T12:18:06.252Z",
  "title": "ImportJobCreateEvent",
  "event": {
    "importJob": {
      "id": "2341",
      "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/importJob/2341",
      "contentType": "application/json",
      "creationDate": "2020-08-25T00:00:00Z"
    }
  }
}
```

```

    "completionDate": "2020-08-25T00:01:31Z",
    "path": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/",
    "status": "Running",
    "url": "ftp://ftp.mycsp.com/productCatalogManagement/1866.json",
    "errorLog": "http://my-platform/logging/errors.log",
    "@type": "ImportJob"
  },
},
"reportingSystem": {
  "id": "759",
  "name": "APP-745",
  "@type": "ReportingResource",
  "@referredType": "LogicalResource"
},
"source": {
  "id": "705",
  "name": "APP-317",
  "@type": "ReportingResource",
  "@referredType": "LogicalResource"
},
"@baseType": "Event",
"@type": "ImportJobCreateEvent"
}
}

```

Import Job State Change Event

Message example for ImportJobStateChangeEvent event

```

Content-Type: application/json

{
  "correlationId": "f3a34f89-0046",
  "description": "ImportJobStateChangeEvent illustration",
  "domain": "Commercial",
  "eventId": "4996-b9b1-e533c09a0186",
  "eventTime": "2022-08-25T12:17:59.636Z",
  "eventType": "ImportJobStateChangeEvent",
  "priority": "2",
  "timeOccurred": "2022-08-25T12:17:55.035Z",
  "title": "ImportJobStateChangeEvent",
  "event": {
    "importJob": {
      "id": "2341",
      "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/importJob/2341",
      "status": "Succeeded",
      "@type": "ImportJob"
    }
  },
  "reportingSystem": {
    "id": "868",
    "name": "APP-394",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
  },
  "source": {
    "id": "372",
    "name": "APP-92",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
  }
}

```

```
    },
    "@baseType": "Event",
    "@type": "ImportJobStateChangeEvent"
}
```

Export Job Create Event

Message example for ExportJobCreateEvent event

```
Content-Type: application/json

{
    "correlationId": "95003dd3-e325",
    "description": "ExportJobCreateEvent illustration",
    "domain": "Commercial",
    "eventId": "4010-9b59-509a64cf85a8",
    "eventTime": "2022-08-25T12:18:12.171Z",
    "eventType": "ExportJobCreateEvent",
    "priority": "1",
    "timeOccurred": "2022-08-25T12:18:06.252Z",
    "title": "ExportJobCreateEvent",
    "event": {
        "exportJob": {
            "id": "5435",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/exportJob/5435",
            "contentType": "application/json",
            "creationDate": "2020-09-23T00:00:00Z",
            "path": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category",
            "query": "category.id=7757",
            "status": "Running",
            "url": "ftp://ftp.mycsp.com/productCatalogManagement/1866.json",
            "errorLog": "http://my-platform/logging/errors.log",
            "@type": "ExportJob"
        }
    },
    "reportingSystem": {
        "id": "759",
        "name": "APP-745",
        "@type": "ReportingResource",
        "@referredType": "LogicalResource"
    },
    "source": {
        "id": "705",
        "name": "APP-317",
        "@type": "ReportingResource",
        "@referredType": "LogicalResource"
    },
    "@baseType": "Event",
    "@type": "ExportJobCreateEvent"
}
```

Export Job State Change Event

Message example for ExportJobStateChangeEvent event

```
Content-Type: application/json

{
  "correlationId": "f3a34f89-0046",
  "description": "ExportJobStateChangeEvent illustration",
  "domain": "Commercial",
  "eventId": "4996-b9b1-e533c09a0186",
  "eventTime": "2022-08-25T12:17:59.636Z",
  "eventType": "ExportJobStateChangeEvent",
  "priority": "2",
  "timeOcurred": "2022-08-25T12:17:55.035Z",
  "title": "ExportJobStateChangeEvent",
  "event": {
    "exportJob": {
      "id": "5435",
      "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/exportJob/5435",
      "status": "Succeeded",
      "@type": "ExportJob"
    }
  },
  "reportingSystem": {
    "id": "868",
    "name": "APP-394",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
  },
  "source": {
    "id": "372",
    "name": "APP-92",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
  },
  "@baseType": "Event",
  "@type": "ExportJobStateChangeEvent"
}
```

Product Catalog State Change Event

Message example for CatalogStateChangeEvent event with ?fields=state property only

```
Content-Type: application/json

{
  "correlationId": "f3a34f89-0046",
  "description": "CatalogStateChangeEvent illustration",
  "domain": "Commercial",
  "eventId": "4996-b9b1-e533c09a0186",
  "eventTime": "2022-08-25T12:17:59.636Z",
  "eventType": "CatalogStateChangeEvent",
  "priority": "2",
  "timeOcurred": "2022-08-25T12:17:55.035Z",
  "title": "CatalogStateChangeEvent",
  "event": {
    "catalog": {
      "id": "3830",
      "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/Catalog/3830",
      "lifecycleStatus": "Active",
    }
  }
}
```

```
        "@type": "Catalog"
    },
},
"reportingSystem": {
    "id": "868",
    "name": "APP-394",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"source": {
    "id": "372",
    "name": "APP-92",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"@baseType": "Event",
"@type": "CatalogStateChangeEvent"
}
```

Product Catalog Attribute Value Change Event

Message example for CatalogAttributeValueChangeEvent event

```
Content-Type: application/json

{
    "correlationId": "f3a34f89-0046",
    "description": "CatalogAttributeValueChangeEvent illustration",
    "domain": "Commercial",
    "eventId": "4996-b9b1-e533c09a0186",
    "eventTime": "2022-08-25T12:17:59.636Z",
    "eventType": "CatalogAttributeValueChangeEvent",
    "priority": "2",
    "timeOcurred": "2022-08-25T12:17:55.035Z",
    "title": "CatalogAttributeValueChangeEvent",
    "event": {
        "catalog": {
            "id": "3830",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v4/Catalog/3830",
            "version": "2.0",
            "validFor": {
                "startDateTime": "2020-08-29T00:00:00Z"
            },
            "@type": "Catalog"
        }
    },
    "reportingSystem": {
        "id": "868",
        "name": "APP-394",
        "@type": "ReportingResource",
        "@referredType": "LogicalResource"
    },
    "source": {
        "id": "372",
        "name": "APP-92",
        "@type": "ReportingResource",
        "@referredType": "LogicalResource"
    },
    "@baseType": "Event",
    "@type": "CatalogAttributeValueChangeEvent"
}
```

```
    "@type": "CatalogAttributeValueChangeEvent"
}
```

Product Catalog Create Event

Message example for CatalogCreateEvent event

```
Content-Type: application/json

{
  "correlationId": "95003dd3-e325",
  "description": "CatalogCreateEvent illustration",
  "domain": "Commercial",
  "eventId": "4010-9b59-509a64cf85a8",
  "eventTime": "2022-08-25T12:18:12.171Z",
  "eventType": "CatalogCreateEvent",
  "priority": "1",
  "timeOcurred": "2022-08-25T12:18:06.252Z",
  "title": "CatalogCreateEvent",
  "event": {
    "catalog": {
      "id": "3830",
      "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v4/Catalog/3830",
      "name": "Catalog Wholesale Business",
      "description": "This catalog describes Product Offerings and technical
specifications intended to address the wholesale business segment.",
      "catalogType": "ProductCatalog",
      "version": "1.0",
      "validFor": {
        "startDateTime": "2020-08-29T00:00:00Z",
        "endDateTime": "2024-03-25T00:00:00Z"
      },
      "lastUpdate": "2020-08-27T00:00:00Z",
      "lifecycleStatus": "Active",
      "relatedParty": [
        {
          "role": "vendor",
          "@type": "RelatedPartyRefOrPartyRoleRef",
          "partyOrPartyRole": {
            "id": "3426",
            "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/organization/3426",
            "name": "Broadly Broad Ltd",
            "@type": "PartyRef",
            "@referredType": "Organization"
          }
        }
      ],
      "@type": "Catalog"
    }
  },
  "reportingSystem": {
    "id": "759",
    "name": "APP-745",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
  },
  "source": {
    "id": "705",
    "name": "Source A"
  }
}
```

```
    "name": "APP-317",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"@baseType": "Event",
"@type": "CatalogCreateEvent"
}
```

Product Catalog Delete Event

Message example for CatalogDeleteEvent event

```
Content-Type: application/json

{
  "correlationId": "f3a34f89-0046",
  "description": "CatalogDeleteEvent illustration",
  "domain": "Commercial",
  "eventId": "4996-b9b1-e533c09a0186",
  "eventTime": "2022-08-25T12:17:59.636Z",
  "eventType": "CatalogDeleteEvent",
  "priority": "2",
  "timeOccurred": "2022-08-25T12:17:55.035Z",
  "title": "CatalogDeleteEvent",
  "event": {
    "catalog": {
      "id": "3830",
      "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v4/Catalog/3830",
      "@type": "Catalog"
    }
  },
  "reportingSystem": {
    "id": "868",
    "name": "APP-394",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
  },
  "source": {
    "id": "372",
    "name": "APP-92",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
  },
  "@baseType": "Event",
  "@type": "CatalogDeleteEvent"
}
```

Product Offering Attribute Value Change Event

Message example for ProductOfferingAttributeValueChangeEvent event

```
Content-Type: application/json

{
  "correlationId": "d107a5f0-9257",
  "description": "ProductOfferingAttributeValueChangeEvent illustration",
  "@type": "ProductOfferingAttributeValueChangeEvent"
}
```

```

"domain": "Commercial",
"eventId": "456b-8663-72338e38d4f0",
"eventTime": "2022-08-25T12:18:12.181Z",
"eventType": "ProductOfferingAttributeValueChangeEvent",
"priority": "1",
"timeOccurred": "2022-08-25T12:18:11.750Z",
"title": "ProductOfferingAttributeValueChangeEvent",
"event": {
    "productOffering": {
        "id": "7655",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/7655",
        "name": "Basic Firewall for Business (corrected)",
        "description": "This product offering suggests a firewall service that can
be deployed in business customer premise (corrected).",
        "version": "2.2",
        "validFor": {
            "startDateTime": "2021-08-25T00:00:00Z",
            "endDateTime": "2022-08-25T00:00:00Z"
        },
        "@type": "ProductOffering"
    }
},
"reportingSystem": {
    "id": "759",
    "name": "APP-745",
    "@type": "ProductOffering",
    "@referredType": "LogicalResource"
},
"source": {
    "id": "705",
    "name": "APP-317",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"@baseType": "Event",
"@type": "ProductOfferingAttributeValueChangeEvent"
}
}

```

Product Offering State Change Event

Message example for ProductOfferingStateChangeEvent event with ?fields=state property only

```

Content-Type: application/json

{
    "correlationId": "d991dd5c-cb42",
    "description": "ProductOfferingStateChangeEvent illustration",
    "domain": "Commercial",
    "eventId": "4768-a3c5-c47b06010b06",
    "eventTime": "2022-08-25T12:17:59.625Z",
    "eventType": "ProductOfferingStateChangeEvent",
    "priority": "4",
    "timeOccurred": "2022-08-25T12:17:58.436Z",
    "title": "ProductOfferingStateChangeEvent",
    "event": {
        "ProductOffering": {
            "href": "https://mycsp.com:8080/tmf-

```

```
api/productCatalogManagement/v4/productOffering/1747",
    "id": "1747",
    "@type": "ProductOffering",
    "lifecycleStatus": "Active"
}
},
"reportingSystem": {
    "id": "868",
    "name": "APP-394",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"source": {
    "id": "372",
    "name": "APP-92",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"@baseType": "Event",
"@type": "ProductOfferingStateChangeEvent"
}
```

Product Offering Delete Event

Message example for ProductOfferingDeleteEvent event

```
Content-Type: application/json

{
    "correlationId": "90cfc73d-deb7",
    "description": "ProductOffering illustration",
    "domain": "Commercial",
    "eventId": "47d6-9751-40e4f01440c9",
    "eventTime": "2022-08-25T12:18:12.202Z",
    "eventType": "ProductOfferingDeleteEvent",
    "priority": "4",
    "timeOcurred": "2022-08-25T12:18:07.224Z",
    "title": "ProductOfferingDeleteEvent",
    "event": {
        "productOffering": {
            "id": "1747",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/1747",
            "@type": "ProductOffering"
        }
    },
    "reportingSystem": {
        "id": "759",
        "name": "APP-745",
        "@type": "ReportingResource",
        "@referredType": "LogicalResource"
    },
    "source": {
        "id": "705",
        "name": "APP-317",
        "@type": "ReportingResource",
        "@referredType": "LogicalResource"
    },
    "@baseType": "Event",
    "@type": "ProductOfferingDeleteEvent"
}
```

}

Product Offering Create Event

Message example for ProductOfferingCreateEvent event

```
Content-Type: application/json

{
    "correlationId": "be58c421-12cf",
    "description": "ProductOffering CreateEvent illustration",
    "domain": "Commercial",
    "eventId": "4a0a-9a52-86f728494b4e",
    "eventTime": "2022-08-25T12:17:59.603Z",
    "eventType": "ProductOfferingCreateEvent",
    "priority": "3",
    "timeOcurred": "2022-08-25T12:17:52.237Z",
    "title": "ProductOfferingCreateEvent",
    "event": {
        "productOffering": {
            "id": "7655",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/7655",
            "name": "Basic Firewall for Business",
            "description": "This product offering suggests a firewall service that can
be deployed in business customer premise.",
            "version": "2.1",
            "validFor": {
                "startDateTime": "2020-09-23T00:00:00Z",
                "endDateTime": "2021-08-25T00:00:00Z"
            },
            "lastUpdate": "2020-09-27T00:00:00Z",
            "lifecycleStatus": "Active",
            "isBundle": false,
            "isSellable": true,
            "statusReason": "Released for sale",
            "place": [
                {
                    "id": "9979",
                    "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v5/geographicAddress/9979",
                    "name": "San Francisco Bay Area",
                    "@referredType": "GeographicAddress",
                    "@type": "PlaceRef"
                }
            ],
            "productOfferingCharacteristic": [
                {
                    "name": "complexityRank",
                    "description": "Gives an indication of how complex this is to
deploy",
                    "valueType": "number",
                    "configurable": false,
                    "productOfferingCharacteristicValue": [
                        {
                            "valueType": "number",
                            "value": 8,
                            "@type": "NumberCharacteristicValueSpecification"
                        }
                    ]
                }
            ]
        }
    }
}
```

```
        "@type": "ProductOfferingCharacteristic"
    }
],
"allowedAction": [
{
    "action": "add",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2021-08-25T00:00:00Z"
    },
    "channel": [
{
    "id": "4407",
    "href": "https://mycsp.com:8080/tmf-
api/salesChannelManagement/v5/channel/4407",
        "name": "Assisted Channel",
        "@referredType": "SalesChannel",
        "@type": "ChannelRef"
},
{
    "id": "4406",
    "href": "https://mycsp.com:8080/tmf-
api/salesChannelManagement/v5/channel/4406",
        "name": "Online Channel",
        "@referredType": "SalesChannel",
        "@type": "ChannelRef"
}
],
    "@type": "AllowedProductAction"
},
{
    "action": "remove",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2023-08-25T00:00:00Z"
    },
    "channel": [
{
    "id": "4407",
    "href": "https://mycsp.com:8080/tmf-
api/salesChannelManagement/v5/channel/4407",
        "name": "Assisted Channel",
        "@referredType": "SalesChannel",
        "@type": "ChannelRef"
}
],
    "@type": "AllowedProductAction"
}
],
"bundledGroupProductOfferingOption": [
{
    "id": "1",
    "name": "Software Add-ons",
    "numberRelOfferLowerLimit": 1,
    "numberRelOfferUpperLimit": 2,
    "productOffering": [
{
    "id": "7688",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/7688",
        "name": "Reporting Widget",
        "isDefault": false,
        "@referredType": "ProductOffering",
        "numberRelOfferLowerLimit": 1,
        "numberRelOfferUpperLimit": 2
}
]
}
]
```

```
        "@type": "BundledGroupProductOffering"
    },
    {
        "id": "7689",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/7689",
        "name": "Deep Packet Inspector",
        "isDefault": false,
        "@referredType": "ProductOffering",
        "@type": "BundledGroupProductOffering"
    }
],
"@type": "BundledGroupProductOfferingOption"
}
],
"serviceLevelAgreement": {
    "id": "8082",
    "href": "https://mycsp.com:8080/tmf-api/slaManagement/v5/sla/8082",
    "name": "Gold SLA for Business",
    "@referredType": "ServiceLevelAgreement",
    "@type": "ServiceLevelAgreementRef"
},
"productSpecification": {
    "id": "9881",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
    "version": "1.1",
    "name": "Robotics999",
    "@referredType": "ProductSpecification",
    "@type": "ProductSpecificationRef"
},
"channel": [
    {
        "id": "4406",
        "href": "https://mycsp.com:8080/tmf-
api/salesChannelManagement/v5/channel/4406",
        "name": "Online Channel",
        "@referredType": "SalesChannel",
        "@type": "ChannelRef"
    }
],
"serviceCandidate": {
    "id": "8167",
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceCandidate/8167",
    "version": "1.0",
    "name": "Mega Max",
    "@referredType": "ServiceCandidate",
    "@type": "ServiceCandidateRef"
},
"category": [
    {
        "id": "2646",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/2646",
        "version": "2.0",
        "name": "Cloud",
        "@referredType": "Category",
        "@type": "CategoryRef"
    }
],
"resourceCandidate": {
    "id": "8937",

```

```
        "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v5/resourceCandidate/8937",
        "name": "Mega Band",
        "@referredType": "ResourceCandidate",
        "@type": "ResourceCandidateRef"
    },
    "productOfferingTerm": [
        {
            "name": "New Client Condition",
            "description": "This product offering term is for new client at fix
duration of less than a year",
            "duration": {
                "amount": 12,
                "units": "Month"
            },
            "validFor": {
                "startDateTime": "2020-09-23T00:00:00Z",
                "endDateTime": "2021-09-23T00:00:00Z"
            },
            "@type": "ProductOfferingTerm"
        }
    ],
    "productOfferingPrice": [
        {
            "id": "1747",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1747",
            "name": "Recurring Monthly Price for Business Firewall",
            "@referredType": "ProductOfferingPrice",
            "@type": "ProductOfferingPrice"
        }
    ],
    "agreement": [
        {
            "id": "5537",
            "href": "https://mycsp.com:8080/tmf-
api/agreementManagement/v5/agreement/5537",
            "name": "Moon",
            "@referredType": "Agreement",
            "@type": "AgreementRef"
        }
    ],
    "attachment": [
        {
            "description": "This attachment gives a block diagram of the
firewall.",
            "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
            "mimeType": "image/jpeg",
            "id": "22",
            "url": "https://mycsp.com:7070/docloader?docnum=3534536",
            "@referredType": "Attachment",
            "@type": "AttachmentRefOrValue"
        }
    ],
    "marketSegment": [
        {
            "id": "1266",
            "href": "https://mycsp.com:8080/tmf-
api/productOfferingReferences/v5/marketSegment/1266",
            "name": "North Region",
            "@referredType": "MarketSegment",
            "@type": "MarketSegmentRef"
        }
    ]
]
```

```
        }
    ],
    "bundledProductOffering": [
    ],
    "productOfferingRelationship": [
    {
        "id": "331",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/331",
        "relationshipType": "DependsOn",
        "validFor": {
            "startDateTime": "2020-09-23T16:42:23Z"
        },
        "role": "A-Role",
        "name": "Carrier Grade NAT",
        "@referredType": "ProductOffering",
        "@type": "ProductOfferingRelationship"
    }
],
"prodSpecCharValueUse": [
{
    "name": "Number of Ports",
    "id": "3331",
    "description": "The total Number of Ports for this product",
    "valueType": "number",
    "minCardinality": 1,
    "maxCardinality": 1,
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2021-09-23T00:00:00Z"
    },
    "@type": "ProductSpecificationCharacteristicValueUse",
    "productSpecCharacteristicValue": [
    {
        "isDefault": true,
        "valueType": "number",
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2021-09-23T00:00:00Z"
        },
        "value": 8,
        "@type": "NumberCharacteristicValueSpecification"
    },
    {
        "isDefault": false,
        "valueType": "number",
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2021-09-23T00:00:00Z"
        },
        "value": 16,
        "@type": "NumberCharacteristicValueSpecification"
    }
],
"productSpecification": {
    "id": "9881",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
    "version": "1.1",
    "name": "Robotics999",
    "@referredType": "ProductSpecification",
    "@type": "ProductSpecificationRef"
}
```

```

        }
    ],
    "@type": "ProductOffering"
}
},
"reportingSystem": {
    "id": "759",
    "name": "APP-745",
    "@type": "ProductOffering",
    "@referredType": "LogicalResource"
},
"source": {
    "id": "705",
    "name": "APP-317",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"@baseType": "Event",
"@type": "ProductOfferingPriceAttributeValueChangeEvent"
}
}

```

Product Specification Attribute Value Change Event

Message example for ProductSpecificationAttributeValueChangeEvent event

```

Content-Type: application/json

{
    "correlationId": "4eeb06e2-8210",
    "description": "ProductSpecificationAttributeValueChangeEvent illustration",
    "domain": "Commercial",
    "eventId": "46c2-8e2b-0182de193a9c",
    "eventTime": "2022-08-25T12:17:59.613Z",
    "eventType": "ProductSpecificationAttributeValueChangeEvent",
    "priority": "2",
    "timeOccurred": "2022-08-25T12:17:57.413Z",
    "title": "ProductSpecificationAttributeValueChangeEvent",
    "event": {
        "productSpecification": {
            "href": "http://servername/productSpecification/9881",
            "id": "9881",
            "@type": "ProductSpecification",
            "attachment": [
                {
                    "id": "22",
                    "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
                    "name": "Product Picture",
                    "mimeType": "image/jpeg",
                    "url": "https://mycsp.com:7070/docloader?docnum=774451234",
                    "@referredType": "Attachment",
                    "@type": "AttachmentRefOrValue"
                },
                {
                    "id": "33",
                    "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
                    "name": "Product Manual",
                    "mimeType": "application/pdf",
                    "url": "https://mycsp.com:7070/docloader?docnum=774454321",
                    "@type": "AttachmentRefOrValue"
                }
            ]
        }
    }
}

```

```

        "@referredType": "Attachment",
        "@type": "AttachmentRefOrValue"
    }
]
}
},
"reportingSystem": {
    "id": "868",
    "name": "APP-394",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"source": {
    "id": "372",
    "name": "APP-92",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"@baseType": "Event",
"@type": "ProductSpecificationAttributeValueChangeEvent"
}
}

```

Product Specification Create Event

Message example for ProductSpecificationCreateEvent event

```

Content-Type: application/json

{
    "correlationId": "be58c421-12cf",
    "description": "ProductSpecificationCreateEvent illustration",
    "domain": "Commercial",
    "eventId": "4a0a-9a52-86f728494b4e",
    "eventTime": "2022-08-25T12:17:59.603Z",
    "eventType": "ProductSpecificationCreateEvent",
    "priority": "3",
    "timeOccurred": "2022-08-25T12:17:52.237Z",
    "title": "ProductSpecificationCreateEvent",
    "event": {
        "productSpecification": {
            "id": "9881",
            "href": "http://servername/productSpecification/9881",
            "name": "Cisco Firepower NGFW",
            "brand": "Cisco",
            "productNumber": "CSC-340-NGFW",
            "description": "Powerful product that integrates with a firewall, including intrusion prevention, advanced malware protection, cloud-based sandboxing, URL filtering, endpoint protection, web gateway, email security, network traffic analysis, network access control and CASB.",
            "isBundle": true,
            "lastUpdate": "2020-09-23T16:42:23Z",
            "lifecycleStatus": "Active",
            "validFor": {
                "startDateTime": "2020-09-23T00:00:00Z",
                "endDateTime": "2022-11-24T16:42:23Z"
            },
            "version": "2.0",
            "relatedParty": [
                {
                    "role": "Owner",

```

```
    "@type": "RelatedPartyRefOrPartyRoleRef",
    "partyOrPartyRole": [
        {
            "id": "1234",
            "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/partyRole/1234",
            "name": "Gustave Flaubert",
            "@type": "PartyRefOrPartyRoleRef",
            "@referredType": "PartyRole"
        }
    ],
    "attachment": [
        {
            "id": "22",
            "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
            "name": "Product Picture",
            "mimeType": "image/jpeg",
            "url": "https://mycsp.com:7070/docloader?docnum=774451234",
            "@referredType": "Attachment",
            "@type": "AttachmentRefOrValue"
        },
        {
            "id": "33",
            "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
            "name": "Product Manual",
            "mimeType": "application/pdf",
            "url": "https://mycsp.com:7070/docloader?docnum=774454321",
            "@referredType": "Attachment",
            "@type": "AttachmentRefOrValue"
        }
    ],
    "bundledProductSpecification": [
        {
            "id": "15",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/15",
            "name": "URL Filter",
            "@type": "BundledProductSpecification",
            "lifecycleStatus": "Active"
        },
        {
            "id": "64",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/64",
            "name": "Malware Protector",
            "@type": "BundledProductSpecification",
            "lifecycleStatus": "Active"
        }
    ],
    "targetProductSchema": {
        "@type": "Firewall",
        "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Product/Firewall.schema.json"
    },
    "productSpecificationRelationship": [
        {
            "id": "23",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/23",
            "relationshipType": "OptionalFor",
            "validFor": {
                "id": "24",
                "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/24"
            }
        }
    ]
]
```

```
        "startDateTime": "2020-09-23T16:42:23Z"
    },
    "name": "DataPlan",
    "role": "A-Item",
    "@referredType": "ProductSpecification",
    "@type": "ProductSpecificationRelationship"
}
],
"serviceSpecification": [
{
    "id": "22",
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/22",
    "name": "Firewall",
    "version": "1.0",
    "@referredType": "ServiceSpecification",
    "@type": "ServiceSpecificationRef"
}
],
"resourceSpecification": [
{
    "id": "63",
    "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v5/resourceSpecification/63",
    "name": "Firewall Port",
    "version": "1.0",
    "@referredType": "PhysicalResourceSpecification",
    "@type": "ResourceSpecificationRef"
}
],
"productSpecCharacteristic": [
{
    "name": "Number of Ports",
    "description": "The total Number of Ports for this product",
    "valueType": "number",
    "configurable": true,
    "minCardinality": 1,
    "maxCardinality": 1,
    "isUnique": true,
    "@type": "CharacteristicSpecification",
    "productSpecCharRelationship": [
{
        "parentSpecificationId": "43",
        "parentSpecificationHref": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/43",
        "characteristicSpecificationId": "2",
        "relationshipType": "Dependency",
        "name": "Bandwidth",
        "validFor": {
            "startDateTime": "2020-09-23T16:42:23-04:00"
        },
        "@type": "CharacteristicSpecificationRelationship"
}
],
"characteristicValueSpecification": [
{
    "isDefault": true,
    "valueType": "number",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2022-11-24T00:00:00Z"
    },
    "value": 8
}
```

```
        "@type": "NumberCharacteristicValueSpecification"
    },
    {
        "isDefault": false,
        "valueType": "number",
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2022-11-24T00:00:00Z"
        },
        "value": 16,
        "@type": "NumberCharacteristicValueSpecification"
    },
    {
        "isDefault": false,
        "valueType": "number",
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2022-11-24T00:00:00Z"
        },
        "value": 24,
        "@type": "NumberCharacteristicValueSpecification"
    }
],
"validFor": {
    "startDateTime": "2020-09-23T16:42:23Z"
}
},
{
    "name": "Color",
    "description": "Color of the Firewall housing",
    "valueType": "string",
    "configurable": true,
    "minCardinality": 1,
    "maxCardinality": 1,
    "extensible": true,
    "isUnique": true,
    "@type": "CharacteristicSpecification",
    "characteristicValueSpecification": [
        {
            "isDefault": true,
            "valueType": "string",
            "value": "Black",
            "@type": "StringCharacteristicValueSpecification"
        },
        {
            "isDefault": false,
            "valueType": "string",
            "value": "White",
            "@type": "StringCharacteristicValueSpecification"
        }
    ],
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z"
    }
}
],
"@type": "ProductSpecification"
},
"reportingSystem": {
    "id": "868",
    "name": "APP-394",
    "@type": "ReportingResource",
}
```

```
    "@referredType": "LogicalResource"
},
"source": {
    "id": "372",
    "name": "APP-92",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"@baseType": "Event",
"@type": "ProductSpecificationCreateEvent"
}
```

Product Specification Delete Event

Message example for ProductSpecificationDeleteEvent event

```
Content-Type: application/json

{
    "correlationId": "f3a34f89-0046",
    "description": "ProductSpecificationDeleteEvent illustration",
    "domain": "Commercial",
    "eventId": "4996-b9b1-e533c09a0186",
    "eventTime": "2022-08-25T12:17:59.636Z",
    "eventType": "ProductSpecificationDeleteEvent",
    "priority": "2",
    "timeOcurred": "2022-08-25T12:17:55.035Z",
    "title": "ProductSpecificationDeleteEvent",
    "event": {
        "productSpecification": {
            "id": "9881",
            "href": "http://servername/productSpecification/9881",
            "@type": "ProductSpecification"
        }
    },
    "reportingSystem": {
        "id": "868",
        "name": "APP-394",
        "@type": "ReportingResource",
        "@referredType": "LogicalResource"
    },
    "source": {
        "id": "372",
        "name": "APP-92",
        "@type": "ReportingResource",
        "@referredType": "LogicalResource"
    },
    "@baseType": "Event",
    "@type": "ProductSpecificationDeleteEvent"
}
```

Product Specification State Change Event

Message example for ProductSpecificationStateChangeEvent event with ?fields=state property only

```
Content-Type: application/json

{
    "correlationId": "d991dd5c-cb42",
    "description": "ProductSpecificationStateChangeEvent illustration",
    "domain": "Commercial",
    "eventId": "4768-a3c5-c47b06010b06",
    "eventTime": "2022-08-25T12:17:59.625Z",
    "eventType": "ProductSpecificationStateChangeEvent",
    "priority": "4",
    "timeOcurred": "2022-08-25T12:17:58.436Z",
    "title": "ProductSpecificationStateChangeEvent",
    "event": {
        "productSpecification": {
            "href": "http://servername/productSpecification/9881",
            "id": "9881",
            "@type": "ProductSpecification",
            "lifecycleStatus": "Active"
        }
    },
    "reportingSystem": {
        "id": "868",
        "name": "APP-394",
        "@type": "ReportingResource",
        "@referredType": "LogicalResource"
    },
    "source": {
        "id": "372",
        "name": "APP-92",
        "@type": "ReportingResource",
        "@referredType": "LogicalResource"
    },
    "@baseType": "Event",
    "@type": "ProductSpecificationStateChangeEvent"
}
```

Product Offering Price State Change Event

Message example for ProductOfferingPriceStateChangeEvent event with ?fields=state property only

```
Content-Type: application/json

{
    "correlationId": "d991dd5c-cb42",
    "description": "ProductOfferingPriceStateChangeEvent illustration",
    "domain": "Commercial",
    "eventId": "4768-a3c5-c47b06010b06",
    "eventTime": "2022-08-25T12:17:59.625Z",
    "eventType": "ProductOfferingPriceStateChangeEvent",
    "priority": "4",
    "timeOcurred": "2022-08-25T12:17:58.436Z",
    "title": "ProductOfferingPriceStateChangeEvent",
    "event": {
        "ProductOfferingPrice": {
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v4/productOfferingPrice/1747",
            "id": "1747",
            "label": "Offering Price"
        }
    }
}
```

```

    "@type": "ProductOfferingPrice",
    "lifecycleStatus": "Active"
  }
},
"reportingSystem": {
  "id": "868",
  "name": "APP-394",
  "@type": "ReportingResource",
  "@referredType": "LogicalResource"
},
"source": {
  "id": "372",
  "name": "APP-92",
  "@type": "ReportingResource",
  "@referredType": "LogicalResource"
},
"@baseType": "Event",
"@type": "ProductOfferingPriceStateChangeEvent"
}

```

Product Offering Price Create Event

Message example for ProductOfferingPriceCreateEvent event

```

Content-Type: application/json

{
  "correlationId": "be58c421-12cf",
  "description": "ProductOfferingPrice CreateEvent illustration",
  "domain": "Commercial",
  "eventId": "4a0a-9a52-86f728494b4e",
  "eventTime": "2022-08-25T12:17:59.603Z",
  "eventType": "ProductOfferingPriceCreateEvent",
  "priority": "3",
  "timeOcurred": "2022-08-25T12:17:52.237Z",
  "title": "ProductOfferingPriceCreateEvent",
  "event": {
    "productOfferingPrice": {
      "id": "1747",
      "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v4/productOfferingPrice/1747",
      "name": "Recurring Charge for Business Firewall",
      "description": "This pricing describes the recurring charge for a firewall
service that can be deployed in business customer premise.",
      "version": "1.0",
      "validFor": {
        "startDateTime": "2020-09-22T00:00:00Z",
        "endDateTime": "2021-09-22T00:00:00Z"
      },
      "priceType": "recurring",
      "recurringChargePeriodType": "monthly",
      "recurringChargePeriodLength": 1,
      "lastUpdate": "2020-09-23T00:00:00Z",
      "isBundle": false,
      "lifecycleStatus": "Active",
      "unitOfMeasure": {
        "amount": 1,
        "units": "Month"
      },
      "price": {
        "amount": 100,
        "currency": "USD"
      }
    }
  }
}

```

```
        "unit": "EUR",
        "value": 50
    },
    "percentage": 0,
    "productOfferingTerm": [
        {
            "name": "12 Month",
            "description": "12 month contract",
            "duration": {
                "amount": 12,
                "units": "Month"
            },
            "validFor": {
                "startDateTime": "2020-09-22T16:42:23.0Z",
                "endDateTime": "2021-09-22T00:00:00.0Z"
            },
            "@type": "ProductOfferingTerm"
        }
    ],
    "place": [
        {
            "id": "2707",
            "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v4/geographicAddress/2707",
            "name": "San Francisco Bay Area",
            "@referredType": "GeographicAddress",
            "@type": "PlaceRef"
        }
    ],
    "policy": [
        {
            "@referredType": "Policy",
            "name": "PriceRuleNo1",
            "id": "2503",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/policy/2503",
            "@type": "PolicyRef"
        }
    ],
    "pricingLogicAlgorithm": [
        {
            "id": "2777",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v4/PricingLogicAlgorithm/2777",
            "name": "RecurringRatingPLA",
            "description": "Algorithm that rates Recurring event",
            "plaSpecId": "2801",
            "validFor": {
                "startDateTime": "2020-09-22T16:42:23.0Z",
                "endDateTime": "2021-09-22T00:00:00.0Z"
            },
            "@type": "PricingLogicAlgorithm"
        }
    ],
    "tax": [
        {
            "taxAmount": {
                "unit": "EUR",
                "value": 10
            },
            "taxCategory": "VAT",
            "taxRate": 20,
            "@type": "TaxItem"
        }
    ]
]
```

```

        }
    ],
    "popRelationship": [
        {
            "id": "1741",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v4/productOfferingPrice/1741",
            "relationshipType": "discountedBy",
            "validFor": {
                "startDateTime": "2020-09-23T16:42:23.0Z",
                "endDateTime": "2021-09-22T00:00:00.0Z"
            },
            "role": "A-Charge",
            "@referredType": "ProductOfferingPriceAlteration",
            "@type": "ProductOfferingPriceRelationship"
        }
    ],
    "bundledPopRelationship": [],
    "@type": "ProductOfferingPrice"
}
},
"reportingSystem": {
    "id": "759",
    "name": "APP-745",
    "@type": "ProductOfferingPrice",
    "@referredType": "LogicalResource"
},
"source": {
    "id": "705",
    "name": "APP-317",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"@baseType": "Event",
"@type": "ProductOfferingPriceAttributeValueChangeEvent"
}

```

Product Offering Price Attribute Value Change Event

Message example for ProductOfferingPriceAttributeValueChangeEvent event

```

Content-Type: application/json

{
    "correlationId": "d107a5f0-9257",
    "description": "ProductOfferingPriceAttributeValueChangeEvent illustration",
    "domain": "Commercial",
    "eventId": "456b-8663-72338e38d4f0",
    "eventTime": "2022-08-25T12:18:12.181Z",
    "eventType": "ProductOfferingPriceAttributeValueChangeEvent",
    "priority": "1",
    "timeOcurred": "2022-08-25T12:18:11.750Z",
    "title": "ProductOfferingPriceAttributeValueChangeEvent",
    "event": {
        "productOfferingPrice": {
            "id": "1747",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v4/productOfferingPrice/1747",
            "@type": "ProductOfferingPrice",
            "place": [

```

```
{
    "id": "2707",
    "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v4/geographicAddress/2707",
    "name": "San Francisco Bay Area",
    "@referredType": "GeographicAddress",
    "@type": "PlaceRef"
}
]
}
},
"reportingSystem": {
    "id": "759",
    "name": "APP-745",
    "@type": "ProductOfferingPrice",
    "@referredType": "LogicalResource"
},
"source": {
    "id": "705",
    "name": "APP-317",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"@baseType": "Event",
"@type": "ProductOfferingPriceAttributeValueChangeEvent"
}
```

Product Offering Price Delete Event

Message example for ProductOfferingPriceDeleteEvent event

```
Content-Type: application/json

{
    "correlationId": "90cfcc73d-deb7",
    "description": "ProductOfferingPrice illustration",
    "domain": "Commercial",
    "eventId": "47d6-9751-40e4f01440c9",
    "eventTime": "2022-08-25T12:18:12.202Z",
    "eventType": "ProductOfferingPriceDeleteEvent",
    "priority": "4",
    "timeOccurred": "2022-08-25T12:18:07.224Z",
    "title": "ProductOfferingPriceDeleteEvent",
    "event": {
        "productOfferingPrice": {
            "id": "1747",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v4/productOfferingPrice/1747",
            "@type": "ProductOfferingPrice"
        }
    },
    "reportingSystem": {
        "id": "759",
        "name": "APP-745",
        "@type": "ReportingResource",
        "@referredType": "LogicalResource"
    },
    "source": {
        "id": "705",
        "name": "APP-317",
        "@type": "LogicalResource"
    }
}
```

```
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"@baseType": "Event",
"@type": "ProductOfferingPriceDeleteEvent"
}
```

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 Category

Retrieves a Category by ID

`GET /category/{id}?fields=...`

Description

This operation retrieves a Category entity. 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 is an example of a request for retrieving a specific category.

Request

```
GET /category/1708
Content-Type: application/json
```

Response

```
200
```

```
{
  "id": "1708",
  "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/Category/1708",
  "name": "Cloud Services",
  "description": "A category to hold all available cloud service offers",
  "version": "1.0",
  "validFor": {
    "startDateTime": "2020-08-24T00:00:00Z",
    "endDateTime": "2024-03-25T00:00:00Z"
  },
  "lifecycleStatus": "Active",
  "lastUpdate": "2020-08-27T00:00:00Z",
  "isRoot": true,
  "subCategory": [
    {
      "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/6086",
      "id": "6086",
      "name": "Cloud Storage",
      "version": "1.0",
      "@referredType": "Category",
      "@type": "CategoryRef"
    },
    {
      "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/6087",
      "id": "6087",
      "name": "Software as a Service",
      "version": "2.0",
      "@referredType": "Category",
      "@type": "CategoryRef"
    }
  ],
  "productOffering": [
    {
      "id": "7655",
      "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/7655",
      "name": "Hosted Basic Firewall for business",
      "@referredType": "ProductOffering",
      "@type": "ProductOfferingRef"
    }
  ],
  "@type": "Category"
}
```

List or find Category objects

GET /category?fields=...

Description

This operation list 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 is an example of a request for retrieving multiple categories.

Request

```
GET /category  
Content-Type: application/json
```

Response

```
200  
[  
  {  
    "id": "1708",  
    "href": "https://mycsp.com:8080/tmf-  
api/productCatalogManagement/v5/Category/1708",  
    "name": "Cloud Services",  
    "description": "A category to hold all available cloud service offers",  
    "version": "1.0",  
    "validFor": {  
      "startDateTime": "2020-08-24T00:00:00Z",  
      "endDateTime": "2024-03-25T00:00:00Z"  
    },  
    "lifecycleStatus": "Active",  
    "lastUpdate": "2020-08-27T00:00:00Z",  
    "isRoot": true,  
    "subCategory": [  
      {  
        "href": "https://mycsp.com:8080/tmf-  
api/productCatalogManagement/v5/category/6086",  
        "id": "6086",  
        "name": "Cloud Storage",  
        "version": "1.0",  
        "@referredType": "Category",  
        "@type": "CategoryRef"  
      },  
      {  
        "href": "https://mycsp.com:8080/tmf-  
api/productCatalogManagement/v5/category/6087",  
        "id": "6087",  
        "name": "Software as a Service",  
        "version": "2.0",  
        "@referredType": "Category",  
        "@type": "CategoryRef"  
      }  
    ],  
    "productOffering": [  
      {  
        "id": "7655",  
        "href": "https://mycsp.com:8080/tmf-  
api/productCatalogManagement/v5/productOffering/7655",  
        "name": "Hosted Basic Firewall for business",  
        "@referredType": "ProductOffering",  
        "@type": "ProductOfferingRef"  
      }  
    ],  
    "@type": "Category"  
  },  
  {  
    "id": "3435",  
    "href": "https://mycsp.com:8080/tmf-
```

```

api/productCatalogManagement/v5/Category/3435",
    "name": "Business Services",
    "description": "A category to hold all available Business service offers",
    "version": "1.0",
    "validFor": {
        "startDateTime": "2020-08-24T00:00:00Z"
    },
    "lifecycleStatus": "Active",
    "isRoot": false,
    "parent": {
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/1708",
            "id": "1708",
            "name": "Services",
            "version": "1.0",
            "@referredType": "Category",
            "@type": "CategoryRef"
        },
        "lastUpdate": "2020-08-27T00:00:00Z",
        "subCategory": [
            {
                "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/3466",
                    "id": "3466",
                    "name": "Managed Services",
                    "version": "1.0",
                    "@referredType": "Category",
                    "@type": "CategoryRef"
                },
                {
                    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/3467",
                        "id": "3467",
                        "name": "Mobile for Corporates",
                        "version": "1.0",
                        "@referredType": "Category",
                        "@type": "CategoryRef"
                    }
                ],
                "productOffering": [
                ],
                "@type": "Category"
            }
        ]
    ]
}

```

Creates a Category

POST /category?fields=...

Description

This operation creates a Category entity.

Mandatory Attributes

Mandatory Attributes	Rule
name	

Mandatory Attributes	Rule
@type	

Usage samples

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

Request

```
POST /category
Content-Type: application/json

{
    "id": "1708",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/Category/1708",
    "name": "Cloud Services",
    "description": "A category to hold all available cloud service offers",
    "version": "1.0",
    "validFor": {
        "startDateTime": "2020-08-24T00:00:00Z",
        "endDateTime": "2024-03-25T00:00:00Z"
    },
    "lifecycleStatus": "Active",
    "lastUpdate": "2020-08-27T00:00:00Z",
    "isRoot": true,
    "subCategory": [
        {
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/6086",
            "id": "6086",
            "name": "Cloud Storage",
            "version": "1.0",
            "@referredType": "Category",
            "@type": "CategoryRef"
        },
        {
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/6087",
            "id": "6087",
            "name": "Software as a Service",
            "version": "2.0",
            "@referredType": "Category",
            "@type": "CategoryRef"
        }
    ],
    "@type": "Category"
}
```

Response

```
201
{
    "id": "1708",
```

```

    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/Category/1708",
    "name": "Cloud Services",
    "description": "A category to hold all available cloud service offers",
    "version": "1.0",
    "validFor": {
        "startDateTime": "2020-08-24T00:00:00Z",
        "endDateTime": "2024-03-25T00:00:00Z"
    },
    "lifecycleStatus": "Active",
    "lastUpdate": "2020-08-27T00:00:00Z",
    "isRoot": true,
    "subCategory": [
        {
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/6086",
            "id": "6086",
            "name": "Cloud Storage",
            "version": "1.0",
            "@referredType": "Category",
            "@type": "CategoryRef"
        },
        {
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/6087",
            "id": "6087",
            "name": "Software as a Service",
            "version": "2.0",
            "@referredType": "Category",
            "@type": "CategoryRef"
        }
    ],
    "productOffering": [
    ],
    "@type": "Category"
}

```

Updates partially a Category

PATCH /category/{id}?fields=...

Description

This operation allows partial updates of a 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

Non Patchable Attributes	Rule
href	
id	

Non Patchable Attributes	Rule
lastUpdate	
@baseType	@baseType is immutable
@schemaLocation	@schemaLocation is immutable
@type	@type is immutable

Patchable Attributes	Rule
description	
isRoot	
lifecycleStatus	
name	
parent	
productOffering	
subCategory	
validFor	
version	

Usage samples

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

Request

```
PATCH /category/{id}
Content-Type: application/merge-patch+json

{
    "version": "2.0",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z"
    },
    "@type": "Category"
}
```

Response

```
200
{
    "id": "1708",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/Category/1708",
    "name": "Cloud Services",
    "description": "A category to hold all available cloud service offers",
    "version": "2.0",
```

```
"validFor": {
    "startDateTime": "2020-09-23T00:00:00Z"
},
"lifecycleStatus": "Active",
"lastUpdate": "2020-09-22T00:00:00Z",
"isRoot": true,
"subCategory": [
    {
        "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/category/6086",
        "id": "6086",
        "name": "Cloud Storage",
        "version": "1.0",
        "@referredType": "Category",
        "@type": "CategoryRef"
    },
    {
        "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/category/6087",
        "id": "6087",
        "name": "Software as a Service",
        "version": "2.0",
        "@referredType": "Category",
        "@type": "CategoryRef"
    }
],
"productOffering": [
    {
        "id": "7655",
        "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/productOffering/7655",
        "name": "Hosted Basic Firewall for business",
        "@type": "ProductOfferingRef",
        "@referredType": "ProductOffering"
    }
],
"@type": "Category"
}
```

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

Request

```
PATCH /category/{id}
Content-Type: application/json

{
    "version": "2.0",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z"
    },
    "@type": "Category"
}
```

Response

```
200

{
    "id": "1708",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/Category/1708",
    "name": "Cloud Services",
    "description": "A category to hold all available cloud service offers",
    "version": "2.0",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z"
    },
    "lifecycleStatus": "Active",
    "lastUpdate": "2020-09-22T00:00:00Z",
    "isRoot": true,
    "subCategory": [
        {
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/6086",
            "id": "6086",
            "name": "Cloud Storage",
            "version": "1.0",
            "@referredType": "Category",
            "@type": "CategoryRef"
        },
        {
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/6087",
            "id": "6087",
            "name": "Software as a Service",
            "version": "2.0",
            "@referredType": "Category",
            "@type": "CategoryRef"
        }
    ],
    "productOffering": [
        {
            "id": "7655",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/7655",
            "name": "Hosted Basic Firewall for business",
            "@type": "ProductOfferingRef",
            "@referredType": "ProductOffering"
        }
    ],
    "@type": "Category"
}
```

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

Request

```
PATCH /category/{id}
Content-Type: application/json-patch+json

[
    {
        "op": "replace",
        "path": "/version",
        "value": "3.0"
    }
]
```

```
        "path": "/version",
        "value": "2.0"
    },
    {
        "op": "replace",
        "path": "/validFor/startDateTime",
        "value": "2020-09-23T00:00:00Z"
    },
    {
        "op": "remove",
        "path": "/validFor/endDateTime"
    }
]
```

Response

200

```
{
    "id": "1708",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/Category/1708",
    "name": "Cloud Services",
    "description": "A category to hold all available cloud service offers",
    "version": "2.0",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z"
    },
    "lifecycleStatus": "Active",
    "lastUpdate": "2020-09-22T00:00:00Z",
    "isRoot": true,
    "subCategory": [
        {
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/6086",
            "id": "6086",
            "name": "Cloud Storage",
            "version": "1.0",
            "@referredType": "Category",
            "@type": "CategoryRef"
        },
        {
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/6087",
            "id": "6087",
            "name": "Software as a Service",
            "version": "2.0",
            "@referredType": "Category",
            "@type": "CategoryRef"
        }
    ],
    "productOffering": [
        {
            "id": "7655",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/7655",
            "name": "Hosted Basic Firewall for business",
            "@type": "ProductOfferingRef",
            "@referredType": "ProductOffering"
        }
    ]
}
```

```
    ],
    "@type": "Category"
}
```

Here is an example of a request for patching a category. In this example, a specific subcategory is removed.

Request

```
PATCH /category/{id}
Content-Type: application/json-patch+json

[
    {
        "op": "remove",
        "path": "/subCategory?id=6087"
    }
]
```

Response

```
200

{
    "id": "1708",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/Category/1708",
    "name": "Cloud Services",
    "description": "A category to hold all available cloud service offers",
    "version": "2.0",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z"
    },
    "lifecycleStatus": "Active",
    "lastUpdate": "2020-09-22T00:00:00Z",
    "isRoot": true,
    "subCategory": [
        {
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/6086",
            "id": "6086",
            "name": "Cloud Storage",
            "version": "1.0",
            "@referredType": "Category",
            "@type": "CategoryRef"
        }
    ],
    "productOffering": [
        {
            "id": "7655",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/7655",
            "name": "Hosted Basic Firewall for business",
            "@type": "ProductOfferingRef",
            "@referredType": "ProductOffering"
        }
    ],
}
```

```
    "@type": "Category"  
}
```

Deletes a Category

DELETE /category/{id}

Description

This operation deletes a Category entity.

Usage samples

Here is an example of a request for deleting a category.

Request

```
DELETE /category/{id}  
Content-Type: application/json  
  
{  
}
```

Response

```
204
```

Operations on ImportJob

List or find ImportJob objects

GET /importJob?fields=...

Description

This operation lists ImportJob 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 is an example of a request for retrieving multiple import jobs.

Request

```
GET /importJob?creationDate=2020-08-25Z  
Content-Type: application/json
```

Response

```
200
[
  {
    "id": "2340",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/importJob/2340",
    "contentType": "application/json",
    "creationDate": "2020-08-25T00:00:00Z",
    "completionDate": "2020-08-25T00:00:19Z",
    "path": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/Catalog/",
    "status": "Failed",
    "url": "ftp://ftp.mycsp.com/productCatalogManagement/2544.json",
    "errorLog": "http://my-platform/logging/errors.log",
    "@type": "ImportJob"
  },
  {
    "id": "2341",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/importJob/2341",
    "contentType": "application/json",
    "creationDate": "2020-08-25T00:00:00Z",
    "completionDate": "2020-08-25T00:01:31Z",
    "path": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/",
    "status": "Succeeded",
    "url": "ftp://ftp.mycsp.com/productCatalogManagement/1877.json",
    "errorLog": "",
    "@type": "ImportJob"
  }
]
```

Retrieves a ImportJob by ID

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

Description

This operation retrieves an ImportJob entity. 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 is an example of a request for retrieving a specific import job.

Request

```
GET /importJob/2341
Content-Type: application/json
```

Response

```
200
```

```
{
  "id": "2341",
  "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/importJob/2341",
  "contentType": "application/json",
  "creationDate": "2020-08-25T00:00:00Z",
  "completionDate": "2020-08-25T00:01:31Z",
  "path": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/",
  "status": "Succeeded",
  "url": "ftp://ftp.mycsp.com/productCatalogManagement/1866.json",
  "errorLog": "http://my-platform/logging/errors.log",
  "@type": "ImportJob"
}
```

Creates a ImportJob

POST /importJob?fields=...

Description

This operation creates an ImportJob entity.

Mandatory Attributes

Mandatory Attributes	Rule
url	
@type	

Usage samples

Here is an example of a request for creating an import job.

Request

```
POST /importJob
Content-Type: application/json

{
  "contentType": "application/json",
  "path": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/",
  "url": "ftp://ftp.mycsp.com/productCatalogManagement/1877.json",
  "@type": "ImportJob"
}
```

Response

```
201

{
  "id": "2341",
  "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/importJob/2341",
```

```
"contentType": "application/json",
"creationDate": "2020-08-25T00:00:00Z",
"completionDate": "2020-08-25T00:01:31Z",
"path": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/",
"status": "Succeeded",
"url": "ftp://ftp.mycsp.com/productCatalogManagement/1877.json",
"errorLog": "http://my-platform/logging/errors.log",
"@type": "ImportJob"
}
```

Deletes a ImportJob

DELETE /importJob/{id}

Description

This operation deletes an ImportJob entity.

Usage samples

Here is an example of a request for deleting an Import Job.

Request

```
DELETE /importJob/{id}
Content-Type: application/json

{}
```

Response

```
204
```

Operations on ExportJob

List or find ExportJob objects

GET /exportJob?fields=...

Description

This operation list ExportJob 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 is an example of a request for retrieving multiple export jobs.

Request

```
GET /exportJob?creationDate=2020-09-23Z
Content-Type: application/json
```

Response

```
200
[
  {
    "id": "5435",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/exportJob/5435",
    "contentType": "application/json",
    "creationDate": "2020-09-23T00:00:00Z",
    "path": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/category",
    "query": "category.id=7757",
    "status": "Running",
    "url": "ftp://ftp.mycsp.com/productCatalogManagement/1866.json",
    "errorLog": "http://my-platform/logging/errors.log",
    "@type": "ExportJob"
  },
  {
    "id": "5431",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/exportJob/5431",
    "contentType": "application/json",
    "creationDate": "2020-09-23T00:00:00Z",
    "completionDate": "2020-09-23T00:02:31Z",
    "path": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/",
    "query": "@type=ProductOffering",
    "status": "Failed",
    "url": "ftp://ftp.mycsp.com/productCatalogManagement/1899.json",
    "errorLog": "http://my-platform/logging/errors.log",
    "@type": "ExportJob"
  }
]
```

Retrieves a ExportJob by ID

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

Description

This operation retrieves an ExportJob entity. 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 is an example of a request for retrieving a specific export job.

Request

```
GET /exportJob/5435
```

```
Content-Type: application/json
```

Response

```
200

{
    "id": "5435",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/exportJob/5435",
    "contentType": "application/json",
    "creationDate": "2020-09-23T00:00:00Z",
    "path": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/category",
    "query": "category.id=7757",
    "status": "Running",
    "url": "ftp://ftp.mycsp.com/productCatalogManagement/1866.json",
    "errorLog": "http://my-platform/logging/errors.log",
    "@type": "ExportJob"
}
```

Creates a ExportJob

POST /exportJob?fields=...

Description

This operation creates an ExportJob entity.

Mandatory Attributes

Mandatory Attributes	Rule
url	
@type	

Usage samples

Here is an example of a request for creating an export job.

Request

```
POST /exportJob
Content-Type: application/json

{
    "contentType": "application/json",
    "path": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/category",
    "query": "category.id=7757",
    "url": "ftp://ftp.mycsp.com/productCatalogManagement/1866.json",
    "@type": "ExportJob"
}
```

Response

```
201

{
  "id": "5435",
  "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/exportJob/5435",
  "contentType": "application/json",
  "creationDate": "2020-09-23T00:00:00Z",
  "path": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/category",
  "query": "category.id=7757",
  "status": "Running",
  "url": "ftp://ftp.mycsp.com/productCatalogManagement/1866.json",
  "errorLog": "http://my-platform/logging/errors.log",
  "@type": "ExportJob"
}
```

Deletes a ExportJob

DELETE /exportJob/{id}

Description

This operation deletes an ExportJob entity.

Usage samples

Here is an example of a request for deleting an Export Job.

Request

```
DELETE /exportJob/{id}
Content-Type: application/json

{}
```

Response

```
204
```

Operations on ProductCatalog

Retrieves a ProductCatalog by ID

GET /productCatalog/{id}?fields=...

Description

This operation retrieves a ProductCatalog entity. 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 is an example of a request for retrieving a specific catalog.

Request

```
GET /productCatalog/3830
Content-Type: application/json
```

Response

```
200

{
    "id": "3830",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/Catalog/3830",
    "name": "Catalog Wholesale Business",
    "description": "This catalog describes Product Offerings and technical
specifications intended to address the wholesale business segment.",
    "catalogType": "ProductCatalog",
    "version": "1.0",
    "validFor": {
        "startDateTime": "2020-08-29T00:00:00Z",
        "endDateTime": "2024-03-25T00:00:00Z"
    },
    "lastUpdate": "2020-08-27T00:00:00Z",
    "lifecycleStatus": "Active",
    "relatedParty": [
        {
            "role": "vendor",
            "@type": "RelatedPartyRefOrPartyRoleRef",
            "partyOrPartyRole": {
                "id": "3426",
                "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/organization/3426",
                "name": "Broadly Broad Ltd",
                "@type": "PartyRef",
                "@referredType": "Organization"
            }
        },
        {
            "role": "Reviser",
            "@type": "RelatedPartyRefOrPartyRoleRef",
            "partyOrPartyRole": {
                "id": "115566",
                "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/individual/115566",
                "name": "Roger Collins",
                "@type": "PartyRef",
                "@referredType": "Individual"
            }
        }
    ],
    "category": [
        {
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/7757",
            "name": "Category A"
        }
    ]
}
```

```

        "id": "7757",
        "name": "business",
        "version": "1.0",
        "@referredType": "Category",
        "@type": "CategoryRef"
    }
],
"@type": "Catalog"
}

```

List or find ProductCatalog objects

GET /productCatalog?fields=...

Description

This operation list ProductCatalog 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 is an example of a request for retrieving multiple catalogs.

Request

```

GET /productCatalog?catalogType=ProductCatalog
Content-Type: application/json

```

Response

```

200
[
{
    "id": "2027",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/Catalog/2027",
    "name": "IoT Product Catalog",
    "description": "This catalog describes Product Offerings and technical
specifications intended to address the IoT products.",
    "catalogType": "ProductCatalog",
    "version": "2.0",
    "validFor": [
        "startDateTime": "2020-09-29T00:00:00Z",
        "endDateTime": "2024-09-25T00:00:00Z"
    ],
    "lastUpdate": "2020-10-27T00:00:00Z",
    "lifecycleStatus": "Active",
    "relatedParty": [
        {
            "role": "vendor",
            "@type": "RelatedPartyRefOrPartyRoleRef",
            "partyOrPartyRole": {
                "id": "3426",

```

```
        "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/organization/3426",
        "name": "Broadly Broad Ltd",
        "@type": "PartyRef",
        "@referredType": "Organization"
    }
},
{
    "role": "Reviser",
    "@type": "RelatedPartyRefOrPartyRoleRef",
    "partyOrPartyRole": {
        "id": "115566",
        "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/individual/115566",
        "name": "Roger Collins",
        "@type": "PartyRef",
        "@referredType": "Individual"
    }
},
],
"category": [
{
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/2129",
    "id": "2129",
    "name": "iotProducts",
    "version": "1.0",
    "@referredType": "Category",
    "@type": "CategoryRef"
}
],
"@type": "Catalog"
},
{
    "id": "3830",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/Catalog/3830",
    "name": "Catalog Wholesale Business",
    "description": "This catalog describes Product Offerings and technical
specifications intended to address the wholesale business segment.",
    "catalogType": "ProductCatalog",
    "version": "1.0",
    "validFor": {
        "startDateTime": "2020-08-29T00:00:00Z",
        "endDateTime": "2024-03-25T00:00:00Z"
    },
    "lastUpdate": "2020-08-27T00:00:00Z",
    "lifecycleStatus": "Active",
    "relatedParty": [
    {
        "role": "vendor",
        "@type": "RelatedPartyRefOrPartyRoleRef",
        "partyOrPartyRole": {
            "id": "3426",
            "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/organization/3426",
            "name": "Broadly Broad Ltd",
            "@type": "PartyRef",
            "@referredType": "Organization"
        }
    },
    {
        "role": "Reviser",
    }
]
```

```

        "@type": "RelatedPartyRefOrPartyRoleRef",
        "partyOrPartyRole": {
            "id": "115566",
            "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/individual/115566",
            "name": "Roger Collins",
            "@type": "PartyRef",
            "@referredType": "Individual"
        }
    }
],
"category": [
{
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/7757",
    "id": "7757",
    "name": "business",
    "version": "1.0",
    "@referredType": "Category",
    "@type": "CategoryRef"
}
],
"@type": "Catalog"
}
]

```

Creates a ProductCatalog

POST /productCatalog?fields=...

Description

This operation creates a ProductCatalog entity.

Mandatory Attributes

Mandatory Attributes	Rule
name	
@type	

Usage samples

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

Request

```

POST /productCatalog
Content-Type: application/json

{
    "name": "Catalog Wholesale Business",
    "description": "This catalog describes Product Offerings and technical
specifications intended to address the wholesale business segment.",
    "catalogType": "ProductCatalog",

```

```
"version": "1.0",
"validFor": {
    "startDateTime": "2020-08-29T00:00:00Z",
    "endDateTime": "2024-03-25T00:00:00Z"
},
"lifecycleStatus": "Active",
"relatedParty": [
    {
        "role": "vendor",
        "@type": "RelatedPartyRefOrPartyRoleRef",
        "partyOrPartyRole": {
            "id": "3426",
            "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/organization/3426",
            "name": "Broadly Broad Ltd",
            "@type": "PartyRef",
            "@referredType": "Organization"
        }
    }
],
"@type": "Catalog"
}
```

Response

```
201

{
    "id": "3830",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/Catalog/3830",
    "name": "Catalog Wholesale Business",
    "description": "This catalog describes Product Offerings and technical
specifications intended to address the wholesale business segment.",
    "catalogType": "ProductCatalog",
    "version": "1.0",
    "validFor": {
        "startDateTime": "2020-08-29T00:00:00Z",
        "endDateTime": "2024-03-25T00:00:00Z"
    },
    "lastUpdate": "2020-08-27T00:00:00Z",
    "lifecycleStatus": "Active",
    "relatedParty": [
        {
            "role": "vendor",
            "@type": "RelatedPartyRefOrPartyRoleRef",
            "partyOrPartyRole": {
                "id": "3426",
                "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/organization/3426",
                "name": "Broadly Broad Ltd",
                "@type": "PartyRef",
                "@referredType": "Organization"
            }
        }
    ],
    "category": [
    ],
    "@type": "Catalog"
}
```

```
}
```

Updates partially a ProductCatalog

PATCH /productCatalog/{id}?fields=...

Description

This operation allows partial updates of a ProductCatalog 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

Non Patchable Attributes	Rule
href	
id	
lastUpdate	
@baseType	@baseType is immutable
@schemaLocation	@schemaLocation is immutable
@type	@type is immutable

Patchable Attributes	Rule
catalogType	
category	
description	
lifecycleStatus	
name	
relatedParty	
validFor	
version	

Usage samples

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

Request

```
PATCH /productCatalog/{id}
Content-Type: application/merge-patch+json
```

```
{  
    "version": "2.0",  
    "validFor": {  
        "startDateTime": "2020-09-23T00:00:00Z"  
    },  
    "@type": "Catalog"  
}
```

Response

```
200  
  
{  
    "id": "3830",  
    "href": "https://mycsp.com:8080/tmf-  
api/productCatalogManagement/v5/Catalog/3830",  
    "name": "Catalog Wholesale Business",  
    "description": "This catalog describes Product Offerings and technical  
specifications intended to address the wholesale business segment.",  
    "catalogType": "ProductCatalog",  
    "version": "2.0",  
    "validFor": {  
        "startDateTime": "2020-09-23T00:00:00Z"  
    },  
    "lastUpdate": "2020-09-22T00:00:00Z",  
    "lifecycleStatus": "Active",  
    "relatedParty": [  
        {  
            "role": "vendor",  
            "@type": "RelatedPartyRefOrPartyRoleRef",  
            "partyOrPartyRole": {  
                "id": "3426",  
                "href": "https://mycsp.com:8080/tmf-  
api/partyManagement/v5/organization/3426",  
                "name": "Broadly Broad Ltd",  
                "@type": "PartyRef",  
                "@referredType": "Organization"  
            }  
        },  
        {  
            "role": "Reviser",  
            "@type": "RelatedPartyRefOrPartyRoleRef",  
            "partyOrPartyRole": {  
                "id": "115566",  
                "href": "https://mycsp.com:8080/tmf-  
api/partyManagement/v5/individual/115566",  
                "name": "Roger Collins",  
                "@type": "PartyRef",  
                "@referredType": "Individual"  
            }  
        }  
    ],  
    "category": [  
        {  
            "href": "https://mycsp.com:8080/tmf-  
api/productCatalogManagement/v5/category/7757",  
            "id": "7757",  
            "name": "business",  
            "version": "1.0",  
        }  
    ]  
}
```

```
        "@referredType": "Category",
        "@type": "CategoryRef"
    }
],
"@type": "Catalog"
}
```

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

Request

```
PATCH /productCatalog/{id}
Content-Type: application/json

{
    "version": "2.0",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z"
    },
    "@type": "Catalog"
}
```

Response

```
200

{
    "id": "3830",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/Catalog/3830",
    "name": "Catalog Wholesale Business",
    "description": "This catalog describes Product Offerings and technical
specifications intended to address the wholesale business segment.",
    "catalogType": "ProductCatalog",
    "version": "2.0",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z"
    },
    "lastUpdate": "2020-09-22T00:00:00Z",
    "lifecycleStatus": "Active",
    "relatedParty": [
        {
            "role": "vendor",
            "@type": "RelatedPartyRefOrPartyRoleRef",
            "partyOrPartyRole": {
                "id": "3426",
                "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/organization/3426",
                "name": "Broadly Broad Ltd",
                "@type": "PartyRef",
                "@referredType": "Organization"
            }
        },
        {
            "role": "Reviser",
            "@type": "RelatedPartyRefOrPartyRoleRef",

```

```

        "partyOrPartyRole": [
            {
                "id": "115566",
                "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/individual/115566",
                "name": "Roger Collins",
                "@type": "PartyRef",
                "@referredType": "Individual"
            }
        ],
        "category": [
            {
                "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/7757",
                "id": "7757",
                "name": "business",
                "version": "1.0",
                "@referredType": "Category",
                "@type": "CategoryRef"
            }
        ],
        "@type": "Catalog"
    }
}

```

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

Request

```

PATCH /productCatalog/{id}
Content-Type: application/json-patch+json

[
    {
        "op": "replace",
        "path": "/version",
        "value": "2.0"
    },
    {
        "op": "replace",
        "path": "/validFor/startDateTime",
        "value": "2020-09-23T00:00:00Z"
    },
    {
        "op": "remove",
        "path": "/validFor/endDateTime"
    }
]

```

Response

```

200
{
    "id": "3830",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/Catalog/3830",
}

```

```

    "name": "Catalog Wholesale Business",
    "description": "This catalog describes Product Offerings and technical
specifications intended to address the wholesale business segment.",
    "catalogType": "ProductCatalog",
    "version": "2.0",
    "validFor": [
        {
            "startDateTime": "2020-09-23T00:00:00Z"
        },
        {
            "lastUpdate": "2020-09-22T00:00:00Z",
            "lifecycleStatus": "Active",
            "relatedParty": [
                {
                    "role": "vendor",
                    "@type": "RelatedPartyRefOrPartyRoleRef",
                    "partyOrPartyRole": {
                        "id": "3426",
                        "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/organization/3426",
                        "name": "Broadly Broad Ltd",
                        "@type": "PartyRef",
                        "@referredType": "Organization"
                    }
                },
                {
                    "role": "Reviser",
                    "@type": "RelatedPartyRefOrPartyRoleRef",
                    "partyOrPartyRole": {
                        "id": "115566",
                        "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/individual/115566",
                        "name": "Roger Collins",
                        "@type": "PartyRef",
                        "@referredType": "Individual"
                    }
                }
            ],
            "category": [
                {
                    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/7757",
                    "id": "7757",
                    "name": "business",
                    "version": "1.0",
                    "@referredType": "Category",
                    "@type": "CategoryRef"
                }
            ],
            "@type": "Catalog"
        }
    ]
}

```

Here is an example of a request for patching a catalog. In this example, vendor related party is removed.

Request

```

PATCH /productCatalog/{id}
Content-Type: application/json-patch-query+json

[
{
}
]

```

```

        "op": "remove",
        "path": "/relatedParty?role=vendor"
    }
]

```

Response

```

200

{
    "id": "3830",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/Catalog/3830",
    "name": "Catalog Wholesale Business",
    "description": "This catalog describes Product Offerings and technical
specifications intended to address the wholesale business segment.",
    "catalogType": "ProductCatalog",
    "version": "2.0",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z"
    },
    "lastUpdate": "2020-09-22T00:00:00Z",
    "lifecycleStatus": "Active",
    "relatedParty": [
        {
            "role": "Reviser",
            "@type": "RelatedPartyRefOrPartyRoleRef",
            "partyOrPartyRole": {
                "id": "115566",
                "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/individual/115566",
                "name": "Roger Collins",
                "@type": "PartyRef",
                "@referredType": "Individual"
            }
        }
    ],
    "category": [
        {
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/7757",
            "id": "7757",
            "name": "business",
            "version": "1.0",
            "@referredType": "Category",
            "@type": "CategoryRef"
        }
    ],
    "@type": "Catalog"
}

```

Deletes a ProductCatalog

DELETE /productCatalog/{id}

Description

This operation deletes a ProductCatalog entity.

Usage samples

Here is an example of a request for deleting a catalog.

Request

```
DELETE /productCatalog/{id}
Content-Type: application/json

{}
```

Response

```
204
```

Operations on ProductOffering

Retrieves a ProductOffering by ID

```
GET /productOffering/{id}?fields=...
```

Description

This operation retrieves a ProductOffering entity. 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 is an example of a request for retrieving a specific offering.

Request

```
GET /productOffering/7655
Content-Type: application/json
```

Response

```
200

{
  "id": "7655",
  "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/7655",
  "name": "Basic Firewall for Business",
  "description": "This product offering suggests a firewall service that can be
deployed in business customer premise.",
  "version": "2.1",
  "validFor": {
```

```
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2021-08-25T00:00:00Z"
    },
    "lastUpdate": "2020-09-27T00:00:00Z",
    "lifecycleStatus": "Active",
    "isBundle": false,
    "isSellable": true,
    "statusReason": "Released for sale",
    "place": [
        {
            "id": "9979",
            "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v5/geographicAddress/9979",
            "name": "San Francisco Bay Area",
            "@referredType": "GeographicAddress",
            "@type": "PlaceRef"
        }
    ],
    "serviceLevelAgreement": {
        "id": "8082",
        "href": "https://mycsp.com:8080/tmf-api/slaManagement/v5/sla/8082",
        "name": "Gold SLA for Business",
        "@referredType": "ServiceLevelAgreement",
        "@type": "ServiceLevelAgreementRef"
    },
    "productSpecification": {
        "id": "9881",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
        "version": "1.1",
        "name": "Robotics999",
        "@referredType": "ProductSpecification",
        "@type": "ProductSpecificationRef"
    },
    "channel": [
        {
            "id": "4406",
            "href": "https://mycsp.com:8080/tmf-
api/salesChannelManagement/v5/channel/4406",
            "name": "Online Channel",
            "@referredType": "Channel",
            "@type": "ChannelRef"
        }
    ],
    "serviceCandidate": {
        "id": "8167",
        "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceCandidate/8167",
        "version": "1.0",
        "name": "Mega Max",
        "@referredType": "ServiceCandidate",
        "@type": "ServiceCandidateRef"
    },
    "category": [
        {
            "id": "2646",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/2646",
            "version": "2.0",
            "name": "Cloud",
            "@referredType": "Category",
            "@type": "CategoryRef"
        }
    ]
}
```

```
],
  "resourceCandidate": {
    "id": "8937",
    "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v5/resourceCandidate/8937",
    "name": "Mega Band",
    "@referredType": "ResourceCandidate",
    "@type": "ResourceCandidateRef"
  },
  "productOfferingTerm": [
    {
      "name": "New Client Condition",
      "description": "This product offering term is for new client at fix
duration of less than a year",
      "duration": {
        "amount": 12,
        "units": "Month"
      },
      "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2021-09-23T00:00:00Z"
      },
      "@type": "ProductOfferingTerm"
    }
  ],
  "productOfferingPrice": [
    {
      "id": "1747",
      "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1747",
      "name": "Recurring Monthly Price for Business Firewall",
      "@referredType": "ProductOfferingPrice",
      "@type": "ProductOfferingPrice"
    }
  ],
  "agreement": [
    {
      "id": "5537",
      "href": "https://mycsp.com:8080/tmf-
api/agreementManagement/v5/agreement/5537",
      "name": "Moon",
      "@referredType": "Agreement",
      "@type": "AgreementRef"
    }
  ],
  "attachment": [
    {
      "description": "This attachment gives a block diagram of the firewall.",

      "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
      "mimeType": "image/jpeg",
      "id": "22",
      "url": "https://mycsp.com:7070/docloader?docnum=3534536",
      "@referredType": "Attachment",
      "@type": "AttachmentRefOrValue"
    }
  ],
  "marketSegment": [
    {
      "id": "1266",
      "href": "https://mycsp.com:8080/tmf-
api/productOfferingReferences/v5/marketSegment/1266",
      "name": "Business Firewall"
    }
  ]
]
```

```
        "name": "North Region",
        "@referredType": "MarketSegment",
        "@type": "MarketSegmentRef"
    }
],
"bundledProductOffering": [
],
"productOfferingRelationship": [
{
    "id": "331",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/331",
    "relationshipType": "DependsOn",
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z"
    },
    "role": "A-Role",
    "name": "Carrier Grade NAT",
    "@referredType": "ProductOffering",
    "@type": "ProductOfferingRelationship"
}
],
"prodSpecCharValueUse": [
{
    "name": "Number of Ports",
    "id": "3331",
    "description": "The total Number of Ports for this product",
    "valueType": "number",
    "minCardinality": 1,
    "maxCardinality": 1,
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2021-09-23T00:00:00Z"
    },
    "@type": "ProductSpecificationCharacteristicValueUse",
    "productSpecCharacteristicValue": [
{
        "isDefault": true,
        "valueType": "number",
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2021-09-23T00:00:00Z"
        },
        "value": 8,
        "@type": "NumberCharacteristicValueSpecification"
},
{
        "isDefault": false,
        "valueType": "number",
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2021-09-23T00:00:00Z"
        },
        "value": 16,
        "@type": "NumberCharacteristicValueSpecification"
}
],
"productSpecification": {
    "id": "9881",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
    "version": "1.1",
    "name": "Robotics999",
}
```

```

        "@referredType": "ProductSpecification",
        "@type": "ProductSpecificationRef"
    }
}
],
"@type": "ProductOffering"
}

```

List or find ProductOffering objects

GET /productOffering?fields=...

Description

This operation list ProductOffering 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 is an example of a request for retrieving multiple offerings.

Request

```

GET /productOffering?isSellable=true
Content-Type: application/json

```

Response

```

200
[
{
    "id": "7655",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/7655",
    "name": "Basic Firewall for Business",
    "description": "This product offering suggests a firewall service that can
be deployed in business customer premise.",
    "version": "2.1",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2021-08-25T00:00:00Z"
    },
    "lastUpdate": "2020-09-27T00:00:00Z",
    "lifecycleStatus": "Active",
    "isBundle": false,
    "isSellable": true,
    "statusReason": "Released for sale",
    "place": [
        {
            "id": "9979",
            "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v5/geographicAddress/9979",
            "name": "San Francisco Bay Area",

```

```
        "@referredType": "GeographicAddress",
        "@type": "PlaceRef"
    }
],
"serviceLevelAgreement": {
    "id": "8082",
    "href": "https://mycsp.com:8080/tmf-api/slaManagement/v5/sla/8082",
    "name": "Gold SLA for Business",
    "@referredType": "ServiceLevelAgreement",
    "@type": "ServiceLevelAgreementRef"
},
"productSpecification": {
    "id": "9881",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
    "version": "1.1",
    "name": "Robotics999",
    "@referredType": "ProductSpecification",
    "@type": "ProductSpecificationRef"
},
"channel": [
{
    "id": "4406",
    "href": "https://mycsp.com:8080/tmf-
api/salesChannelManagement/v5/channel/4406",
    "name": "Online Channel",
    "@referredType": "SalesChannel",
    "@type": "ChannelRef"
}
],
"serviceCandidate": {
    "id": "8167",
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceCandidate/8167",
    "version": "1.0",
    "name": "Mega Max",
    "@referredType": "ServiceCandidate",
    "@type": "ServiceCandidateRef"
},
"category": [
{
    "id": "2646",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/2646",
    "version": "2.0",
    "name": "Cloud",
    "@referredType": "Category",
    "@type": "CategoryRef"
}
],
"resourceCandidate": {
    "id": "8937",
    "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v5/resourceCandidate/8937",
    "name": "Mega Band",
    "@referredType": "ResourceCandidate",
    "@type": "ResourceCandidateRef"
},
"productOfferingTerm": [
{
    "name": "New Client Condition",
    "description": "This product offering term is for new client at fix
duration of less than a year"
}
```

```
        "duration": {
            "amount": 12,
            "units": "Month"
        },
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2021-09-23T00:00:00Z"
        },
        "@type": "ProductOfferingTerm"
    }
],
"productOfferingPrice": [
{
    "id": "1747",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1747",
    "name": "Recurring Monthly Price for Business Firewall",
    "@referredType": "ProductOfferingPrice",
    "@type": "ProductOfferingPrice"
}
],
"agreement": [
{
    "id": "5537",
    "href": "https://mycsp.com:8080/tmf-
api/agreementManagement/v5/agreement/5537",
    "name": "Moon",
    "@referredType": "Agreement",
    "@type": "AgreementRef"
}
],
"attachment": [
{
    "description": "This attachment gives a block diagram of the
firewall.",
    "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
    "mimeType": "image/jpeg",
    "id": "22",
    "url": "https://mycsp.com:7070/docloader?docnum=3534536",
    "@referredType": "Attachment",
    "@type": "AttachmentRefOrValue"
}
],
"marketSegment": [
{
    "id": "1266",
    "href": "https://mycsp.com:8080/tmf-
api/productOfferingReferences/v5/marketSegment/1266",
    "name": "North Region",
    "@referredType": "MarketSegment",
    "@type": "MarketSegmentRef"
}
],
"bundledProductOffering": [
],
"productOfferingRelationship": [
{
    "id": "331",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/331",
    "relationshipType": "DependsOn",
    "validFor": {
```

```
        "startDateTime": "2020-09-23T16:42:23Z"
    },
    "role": "A-Role",
    "name": "Carrier Grade NAT",
    "@referredType": "ProductOffering",
    "@type": "ProductOfferingRelationship"
}
],
"prodSpecCharValueUse": [
{
    "name": "Number of Ports",
    "id": "3331",
    "description": "The total Number of Ports for this product",
    "valueType": "number",
    "minCardinality": 1,
    "maxCardinality": 1,
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2021-09-23T00:00:00Z"
    },
    "@type": "ProductSpecificationCharacteristicValueUse",
    "productSpecCharacteristicValue": [
        {
            "isDefault": true,
            "valueType": "number",
            "validFor": {
                "startDateTime": "2020-09-23T00:00:00Z",
                "endDateTime": "2021-09-23T00:00:00Z"
            },
            "value": 8,
            "@type": "NumberCharacteristicValueSpecification"
        },
        {
            "isDefault": false,
            "valueType": "number",
            "validFor": {
                "startDateTime": "2020-09-23T00:00:00Z",
                "endDateTime": "2021-09-23T00:00:00Z"
            },
            "value": 16,
            "@type": "NumberCharacteristicValueSpecification"
        }
    ],
    "productSpecification": {
        "id": "9881",
        "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/productSpecification/9881",
        "version": "1.1",
        "name": "Robotics999",
        "@referredType": "ProductSpecification",
        "@type": "ProductSpecificationRef"
    }
}
],
"@type": "ProductOffering"
},
{
    "id": "2909",
    "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/productOffering/2909",
    "name": "Enhanced Broadband for business",
    "description": "This product offering suggesting broadband with high speed bandwidth that can be deployed in business customer premise."
}
```

```
"version": "1.0",
"validFor": {
    "startDateTime": "2020-08-25T00:00:00Z",
    "endDateTime": "2021-08-25T00:00:00Z"
},
"lastUpdate": "2020-08-27T00:00:00Z",
"lifecycleStatus": "Active",
"isBundle": false,
"isSellable": true,
"statusReason": "None",
"place": [
    {
        "id": "2927",
        "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v5/geographicAddress/2927",
        "name": "Toronto",
        "@referredType": "GeographicAddress",
        "@type": "PlaceRef"
    }
],
"serviceLevelAgreement": {
    "id": "8082",
    "href": "https://mycsp.com:8080/tmf-api/slaManagement/v5/sla/8082",
    "name": "Gold SLA for Business",
    "@referredType": "ServiceLevelAgreement",
    "@type": "ServiceLevelAgreementRef"
},
"productSpecification": {
    "id": "5843",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/5843",
    "version": "1.0",
    "name": "Enhanced Broadband PS",
    "@referredType": "ProductSpecification",
    "@type": "ProductSpecificationRef"
},
"channel": [
    {
        "id": "4406",
        "href": "https://mycsp.com:8080/tmf-
api/salesChannelManagement/v5/channel/4406",
        "name": "Online Channel",
        "@referredType": "SalesChannel",
        "@type": "ChannelRef"
    }
],
"category": [
    {
        "id": "5051",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/5051",
        "version": "2.0",
        "name": "WiredServices",
        "@referredType": "Category",
        "@type": "CategoryRef"
    }
],
"productOfferingTerm": [
    {
        "name": "3-year term",
        "description": "This product offering term is for a 3-year plan
agreement",
        "duration": {
            "value": "3",
            "unit": "years"
        }
    }
]
```

```
        "amount": 36,
        "units": "Month"
    },
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2023-09-23T00:00:00Z"
    },
    "@type": "ProductOfferingTerm"
}
],
"productOfferingPrice": [
{
    "id": "1103",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1103",
    "name": "Recurring Monthly Price",
    "@referredType": "ProductOfferingPrice",
    "@type": "ProductOfferingPrice"
}
],
"agreement": [
{
    "id": "5557",
    "href": "https://mycsp.com:8080/tmf-
api/agreementManagement/v5/agreement/5557",
    "name": "Service Contract",
    "@referredType": "Agreement",
    "@type": "AgreementRef"
}
],
"attachment": [
{
    "description": "This attachment gives a block diagram of the
firewall.",
    "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/2213",
    "mimeType": "image/jpeg",
    "id": "2213",
    "url": "https://mycsp.com:7070/docloader?docnum=3531741",
    "@referredType": "Attachment",
    "@type": "AttachmentRefOrValue"
}
],
"marketSegment": [
],
"bundledProductOffering": [
],
"productOfferingRelationship": [
],
"prodSpecCharValueUse": [
{
    "name": "Bandwidth",
    "description": "The total Number of Mbps for this product",
    "id": "1907",
    "valueType": "number",
    "minCardinality": 1,
    "maxCardinality": 1,
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2021-09-23T00:00:00Z"
    },
    "@type": "ProductSpecificationCharacteristicValueUse",
    "productSpecCharacteristicValue": [

```

```
{
  "isDefault": true,
  "valueType": "number",
  "validFor": {
    "startDateTime": "2020-09-23T00:00:00Z",
    "endDateTime": "2021-09-23T00:00:00Z"
  },
  "value": 1000,
  "@type": "NumberCharacteristicValueSpecification"
},
{
  "isDefault": false,
  "valueType": "number",
  "validFor": {
    "startDateTime": "2020-09-23T00:00:00Z",
    "endDateTime": "2021-09-23T00:00:00Z"
  },
  "value": 2000,
  "@type": "NumberCharacteristicValueSpecification"
},
],
"productSpecification": {
  "id": "5843",
  "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/productSpecification/5843",
  "version": "1.0",
  "name": "Enhanced Broadband PS",
  "@referredType": "ProductSpecification",
  "@type": "ProductSpecificationRef"
}
}
],
"@type": "ProductOffering"
}
]
```

Creates a ProductOffering

POST /productOffering?fields=...

Description

This operation creates a ProductOffering entity.

Mandatory Attributes

Mandatory Attributes	Rule
lastUpdate	
lifecycleStatus	
name	
@type	

Usage samples

Here is an example of a request for creating a specific offering. The request includes the

product specification and the category.

Request

```
POST /productOffering
Content-Type: application/json

{
    "id": "7655",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/7655",
    "name": "Basic Firewall for Business",
    "description": "This product offering suggests a firewall service that can be
deployed in business customer premise.",
    "version": "1.0",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2021-08-25T00:00:00Z"
    },
    "lastUpdate": "2020-09-27T00:00:00Z",
    "lifecycleStatus": "Active",
    "isBundle": false,
    "isSellable": true,
    "statusReason": "Released for sale",
    "place": [
        {
            "id": "9979",
            "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v5/geographicAddress/9979",
            "name": "San Francisco Bay Area",
            "@referredType": "GeographicAddress",
            "@type": "PlaceRef"
        }
    ],
    "serviceLevelAgreement": {
        "id": "8082",
        "href": "https://mycsp.com:8080/tmf-api/slaManagement/v5/sla/8082",
        "name": "Gold SLA for Business",
        "@referredType": "ServiceLevelAgreement",
        "@type": "ServiceLevelAgreementRef"
    },
    "productSpecification": {
        "id": "9881",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
        "version": "1.1",
        "name": "Robotics999",
        "@referredType": "ProductSpecification",
        "@type": "ProductSpecificationRef"
    },
    "channel": [
        {
            "id": "4406",
            "href": "https://mycsp.com:8080/tmf-
api/salesChannelManagement/v5/channel/4406",
            "name": "Online Channel",
            "@referredType": "Channel",
            "@type": "ChannelRef"
        }
    ],
    "serviceCandidate": {
```

```
        "id": "8167",
        "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceCandidate/8167",
        "version": "1.0",
        "name": "Mega Max",
        "@referredType": "ServiceCandidate",
        "@type": "ServiceCandidateRef"
    },
    "category": [
        {
            "id": "2646",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/2646",
            "version": "2.0",
            "name": "Cloud",
            "@referredType": "Category",
            "@type": "CategoryRef"
        }
    ],
    "resourceCandidate": {
        "id": "8937",
        "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v5/resourceCandidate/8937",
        "name": "Mega Band",
        "@referredType": "ResourceCandidate",
        "@type": "ResourceCandidateRef"
    },
    "productOfferingTerm": [
        {
            "name": "New Client Condition",
            "description": "This product offering term is for new client at fix
duration of less than a year",
            "duration": {
                "amount": 12,
                "units": "Month"
            },
            "validFor": {
                "startDateTime": "2020-09-23T00:00:00Z",
                "endDateTime": "2021-09-23T00:00:00Z"
            },
            "@type": "ProductOfferingTerm"
        }
    ],
    "productOfferingPrice": [
        {
            "id": "1747",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1747",
            "name": "Recurring Monthly Price for Business Firewall",
            "@referredType": "ProductOfferingPrice",
            "@type": "ProductOfferingPrice"
        }
    ],
    "agreement": [
        {
            "id": "5537",
            "href": "https://mycsp.com:8080/tmf-
api/agreementManagement/v5/agreement/5537",
            "name": "Moon",
            "@referredType": "Agreement",
            "@type": "AgreementRef"
        }
    ]
}
```

```
"attachment": [
    {
        "description": "This attachment gives a block diagram of the firewall.",
        "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
        "mimeType": "image/jpeg",
        "id": "22",
        "name": "My Attachment",
        "url": "https://mycsp.com:7070/docloader?docnum=3534536",
        "@referredType": "Attachment",
        "@type": "AttachmentRef"
    }
],
"marketSegment": [
    {
        "id": "1266",
        "href": "https://mycsp.com:8080/tmf-
api/productOfferingReferences/v5/marketSegment/1266",
        "name": "North Region",
        "@referredType": "MarketSegment",
        "@type": "MarketSegmentRef"
    }
],
"bundledProductOffering": [],
"productOfferingRelationship": [
    {
        "id": "331",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/331",
        "relationshipType": "DependsOn",
        "validFor": {
            "startDateTime": "2020-09-23T16:42:23Z"
        },
        "role": "A-Role",
        "name": "Carrier Grade NAT",
        "@referredType": "ProductOffering",
        "@type": "ProductOfferingRelationship"
    }
],
"prodSpecCharValueUse": [
    {
        "name": "Number of Ports",
        "id": "3331",
        "description": "The total Number of Ports for this product",
        "valueType": "number",
        "minCardinality": 1,
        "maxCardinality": 1,
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2021-09-23T00:00:00Z"
        },
        "@type": "ProductSpecificationCharacteristicValueUse",
        "productSpecCharacteristicValue": [
            {
                "isDefault": true,
                "valueType": "number",
                "validFor": {
                    "startDateTime": "2020-09-23T00:00:00Z",
                    "endDateTime": "2021-09-23T00:00:00Z"
                },
                "value": "8",
                "@type": "NumberCharacteristicValueSpecification"
            }
        ]
    }
],
```

```
{
    "isDefault": false,
    "valueType": "number",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2021-09-23T00:00:00Z"
    },
    "value": "16",
    "@type": "NumberCharacteristicValueSpecification"
}
],
"productSpecification": {
    "id": "9881",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
    "version": "1.1",
    "name": "Robotics999",
    "@referredType": "ProductSpecification",
    "@type": "ProductSpecificationRef"
}
}
],
"@type": "ProductOffering"
}
```

Response

```
201

{
    "id": "7655",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/7655",
    "name": "Basic Firewall for Business",
    "description": "This product offering suggests a firewall service that can be
deployed in business customer premise.",
    "version": "1.0",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2021-08-25T00:00:00Z"
    },
    "lastUpdate": "2020-09-27T00:00:00Z",
    "lifecycleStatus": "Active",
    "isBundle": false,
    "isSellable": true,
    "statusReason": "Released for sale",
    "place": [
        {
            "id": "9979",
            "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v5/geographicAddress/9979",
            "name": "San Francisco Bay Area",
            "@referredType": "GeographicAddress",
            "@type": "PlaceRef"
        }
    ],
    "serviceLevelAgreement": {
        "id": "8082",
        "href": "https://mycsp.com:8080/tmf-api/slaManagement/v5/sla/8082",
        "name": "Gold SLA for Business",
    }
}
```

```
    "@referredType": "ServiceLevelAgreement",
    "@type": "ServiceLevelAgreementRef"
},
"productSpecification": {
    "id": "9881",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
    "version": "1.1",
    "name": "Robotics999",
    "@referredType": "ProductSpecification",
    "@type": "ProductSpecificationRef"
},
"channel": [
    {
        "id": "4406",
        "href": "https://mycsp.com:8080/tmf-
api/salesChannelManagement/v5/channel/4406",
        "name": "Online Channel",
        "@referredType": "Channel",
        "@type": "ChannelRef"
    }
],
"serviceCandidate": {
    "id": "8167",
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceCandidate/8167",
    "version": "1.0",
    "name": "Mega Max",
    "@referredType": "ServiceCandidate",
    "@type": "ServiceCandidateRef"
},
"category": [
    {
        "id": "2646",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/2646",
        "version": "2.0",
        "name": "Cloud",
        "@referredType": "Category",
        "@type": "CategoryRef"
    }
],
"resourceCandidate": {
    "id": "8937",
    "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v5/resourceCandidate/8937",
    "name": "Mega Band",
    "@referredType": "ResourceCandidate",
    "@type": "ResourceCandidateRef"
},
"productOfferingTerm": [
    {
        "name": "New Client Condition",
        "description": "This product offering term is for new client at fix
duration of less than a year",
        "duration": {
            "amount": 12,
            "units": "Month"
        },
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2021-09-23T00:00:00Z"
        }
    }
]
```

```
        "@type": "ProductOfferingTerm"
    }
],
"productOfferingPrice": [
{
    "id": "1747",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1747",
    "name": "Recurring Monthly Price for Business Firewall",
    "@referredType": "ProductOfferingPrice",
    "@type": "ProductOfferingPrice"
}
],
"agreement": [
{
    "id": "5537",
    "href": "https://mycsp.com:8080/tmf-
api/agreementManagement/v5/agreement/5537",
    "name": "Moon",
    "@referredType": "Agreement",
    "@type": "AgreementRef"
}
],
"attachment": [
{
    "description": "This attachment gives a block diagram of the firewall.",

    "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
    "mimeType": "image/jpeg",
    "id": "22",
    "url": "https://mycsp.com:7070/docloader?docnum=3534536",
    "@referredType": "Attachment",
    "@type": "AttachmentRefOrValue"
}
],
"marketSegment": [
{
    "id": "1266",
    "href": "https://mycsp.com:8080/tmf-
api/productOfferingReferences/v5/marketSegment/1266",
    "name": "North Region",
    "@referredType": "MarketSegment",
    "@type": "MarketSegmentRef"
}
],
"bundledProductOffering": [
],
"productOfferingRelationship": [
{
    "id": "331",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/331",
    "relationshipType": "DependsOn",
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z"
    },
    "role": "A-Role",
    "name": "Carrier Grade NAT",
    "@referredType": "ProductOffering",
    "@type": "ProductOfferingRelationship"
}
]
,
```

```

"prodSpecCharValueUse": [
    {
        "name": "Number of Ports",
        "id": "3331",
        "description": "The total Number of Ports for this product",
        "valueType": "number",
        "minCardinality": 1,
        "maxCardinality": 1,
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2021-09-23T00:00:00Z"
        },
        "@type": "ProductSpecificationCharacteristicValueUse",
        "productSpecCharacteristicValue": [
            {
                "isDefault": true,
                "valueType": "number",
                "validFor": {
                    "startDateTime": "2020-09-23T00:00:00Z",
                    "endDateTime": "2021-09-23T00:00:00Z"
                },
                "value": 8,
                "@type": "NumberCharacteristicValueSpecification"
            },
            {
                "isDefault": false,
                "valueType": "number",
                "validFor": {
                    "startDateTime": "2020-09-23T00:00:00Z",
                    "endDateTime": "2021-09-23T00:00:00Z"
                },
                "value": 16,
                "@type": "NumberCharacteristicValueSpecification"
            }
        ],
        "productSpecification": {
            "id": "9881",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
            "version": "1.1",
            "name": "Robotics999",
            "@referredType": "ProductSpecification",
            "@type": "ProductSpecificationRef"
        }
    }
],
"@type": "ProductOffering"
}

```

Updates partially a ProductOffering

PATCH /productOffering/{id}?fields=...

Description

This operation allows partial updates of a ProductOffering 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

Non Patchable Attributes	Rule
href	
id	
lastUpdate	
@baseType	@baseType is immutable
@schemaLocation	@schemaLocation is immutable
@type	@type is immutable

Patchable Attributes	Rule
agreement	
allowedAction	
attachment	
bundledGroupProductOffering	
bundledProductOffering	
category	
channel	
description	
externalIdentifier	
isBundle	
isSellable	
lifecycleStatus	
marketSegment	
name	
place	
policy	
prodSpecCharValueUse	
productOfferingCharacteristic	
productOfferingPrice	
productOfferingRelationship	
productOfferingTerm	
productSpecification	
resourceCandidate	

Patchable Attributes	Rule
serviceCandidate	
serviceLevelAgreement	
statusReason	
validFor	
version	

Usage samples

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

Request

```
PATCH /productOffering/{id}
Content-Type: application/merge-patch+json

{
    "version": "3.0",
    "validFor": {
        "startDateTime": "2020-11-06T00:00:00Z",
        "endDateTime": "2021-11-06T00:00:00Z"
    },
    "@type": "ProductOffering"
}
```

Response

```
200

{
    "id": "7655",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/7655",
    "name": "Basic Firewall for Business",
    "description": "This product offering suggests a firewall service that can be
deployed in business customer premise.",
    "version": "3.0",
    "validFor": {
        "startDateTime": "2020-11-06T00:00:00Z",
        "endDateTime": "2021-11-06T00:00:00Z"
    },
    "lastUpdate": "2020-09-27T00:00:00Z",
    "lifecycleStatus": "Active",
    "isBundle": false,
    "isSellable": true,
    "statusReason": "Released for sale",
    "place": [
        {
            "id": "9979",
            "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v5/geographicAddress/9979",
            "name": "San Francisco Bay Area",
        }
    ]
}
```

```
        "@referredType": "GeographicAddress",
        "@type": "PlaceRef"
    }
],
"serviceLevelAgreement": {
    "id": "8082",
    "href": "https://mycsp.com:8080/tmf-api/slaManagement/v5/sla/8082",
    "name": "Gold SLA for Business",
    "@referredType": "ServiceLevelAgreement",
    "@type": "ServiceLevelAgreementRef"
},
"productSpecification": {
    "id": "9881",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
    "version": "1.1",
    "name": "Robotics999",
    "@referredType": "ProductSpecification",
    "@type": "ProductSpecificationRef"
},
"channel": [
    {
        "id": "4406",
        "href": "https://mycsp.com:8080/tmf-
api/salesChannelManagement/v5/channel/4406",
        "name": "Online Channel",
        "@referredType": "SalesChannel",
        "@type": "ChannelRef"
    }
],
"serviceCandidate": {
    "id": "8167",
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceCandidate/8167",
    "version": "1.0",
    "name": "Mega Max",
    "@referredType": "ServiceCandidate",
    "@type": "ServiceCandidateRef"
},
"category": [
    {
        "id": "2646",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/2646",
        "version": "2.0",
        "name": "Cloud",
        "@referredType": "Category",
        "@type": "CategoryRef"
    }
],
"resourceCandidate": {
    "id": "8937",
    "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v5/resourceCandidate/8937",
    "name": "Mega Band",
    "@referredType": "ResourceCandidate",
    "@type": "ResourceCandidateRef"
},
"productOfferingTerm": [
    {
        "name": "New Client Condition",
        "description": "This product offering term is for new client at fix
duration of less than a year"
    }
]
```

```
        "duration": {
            "amount": 12,
            "units": "Month"
        },
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2021-09-23T00:00:00Z"
        },
        "@type": "ProductOfferingTerm"
    }
],
"productOfferingPrice": [
{
    "id": "1747",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1747",
    "name": "Recurring Monthly Price for Business Firewall",
    "@referredType": "ProductOfferingPrice",
    "@type": "ProductOfferingPrice"
}
],
"agreement": [
{
    "id": "5537",
    "href": "https://mycsp.com:8080/tmf-
api/agreementManagement/v5/agreement/5537",
    "name": "Moon",
    "@referredType": "Agreement",
    "@type": "AgreementRef"
}
],
"attachment": [
{
    "description": "This attachment gives a block diagram of the firewall.",

    "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
    "mimeType": "image/jpeg",
    "id": "22",
    "url": "https://mycsp.com:7070/docloader?docnum=3534536",
    "@referredType": "Attachment",
    "@type": "AttachmentRefOrValue"
}
],
"marketSegment": [
{
    "id": "1266",
    "href": "https://mycsp.com:8080/tmf-
api/productOfferingReferences/v5/marketSegment/1266",
    "name": "North Region",
    "@referredType": "MarketSegment",
    "@type": "MarketSegmentRef"
}
],
"bundledProductOffering": [
],
"productOfferingRelationship": [
{
    "id": "331",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/331",
    "relationshipType": "DependsOn",
    "validFor": {
```

```
        "startDateTime": "2020-09-23T16:42:23Z"
    },
    "role": "A-Role",
    "name": "Carrier Grade NAT",
    "@referredType": "ProductOffering",
    "@type": "ProductOfferingRelationship"
}
],
"prodSpecCharValueUse": [
{
    "name": "Number of Ports",
    "id": "3331",
    "description": "The total Number of Ports for this product",
    "valueType": "number",
    "minCardinality": 1,
    "maxCardinality": 1,
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2021-09-23T00:00:00Z"
    },
    "@type": "ProductSpecificationCharacteristicValueUse",
    "productSpecCharacteristicValue": [
{
        "isDefault": true,
        "valueType": "number",
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2021-09-23T00:00:00Z"
        },
        "value": 8,
        "@type": "NumberCharacteristicValueSpecification"
},
{
        "isDefault": false,
        "valueType": "number",
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2021-09-23T00:00:00Z"
        },
        "value": 16,
        "@type": "NumberCharacteristicValueSpecification"
}
],
"productSpecification": {
    "id": "9881",
    "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/productSpecification/9881",
    "version": "1.1",
    "name": "Robotics999",
    "@referredType": "ProductSpecification",
    "@type": "ProductSpecificationRef"
}
}
],
"@type": "ProductOffering"
}
```

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

Request

```
PATCH /productOffering/{id}
Content-Type: application/json

{
    "version": "3.0",
    "validFor": {
        "startDateTime": "2020-11-06T00:00:00Z",
        "endDateTime": "2021-11-06T00:00:00Z"
    },
    "@type": "ProductOffering"
}
```

Response

```
200

{
    "id": "7655",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/7655",
    "name": "Basic Firewall for Business",
    "description": "This product offering suggests a firewall service that can be
deployed in business customer premise.",
    "version": "3.0",
    "validFor": {
        "startDateTime": "2020-11-06T00:00:00Z",
        "endDateTime": "2021-11-06T00:00:00Z"
    },
    "lastUpdate": "2020-09-27T00:00:00Z",
    "lifecycleStatus": "Active",
    "isBundle": false,
    "isSellable": true,
    "statusReason": "Released for sale",
    "place": [
        {
            "id": "9979",
            "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v5/geographicAddress/9979",
            "name": "San Francisco Bay Area",
            "@referredType": "GeographicAddress",
            "@type": "PlaceRef"
        }
    ],
    "serviceLevelAgreement": {
        "id": "8082",
        "href": "https://mycsp.com:8080/tmf-api/slaManagement/v5/sla/8082",
        "name": "Gold SLA for Business",
        "@referredType": "ServiceLevelAgreement",
        "@type": "ServiceLevelAgreementRef"
    },
    "productSpecification": {
        "id": "9881",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
        "version": "1.1",
        "name": "Robotics999",
        "@referredType": "ProductSpecification",
        "@type": "ProductSpecificationRef"
    },
}
```

```
"channel": [
    {
        "id": "4406",
        "href": "https://mycsp.com:8080/tmf-
api/salesChannelManagement/v5/channel/4406",
        "name": "Online Channel",
        "@referredType": "SalesChannel",
        "@type": "ChannelRef"
    }
],
"serviceCandidate": {
    "id": "8167",
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceCandidate/8167",
    "version": "1.0",
    "name": "Mega Max",
    "@referredType": "ServiceCandidate",
    "@type": "ServiceCandidateRef"
},
"category": [
    {
        "id": "2646",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/2646",
        "version": "2.0",
        "name": "Cloud",
        "@referredType": "Category",
        "@type": "CategoryRef"
    }
],
"resourceCandidate": {
    "id": "8937",
    "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v5/resourceCandidate/8937",
    "name": "Mega Band",
    "@referredType": "ResourceCandidate",
    "@type": "ResourceCandidateRef"
},
"productOfferingTerm": [
    {
        "name": "New Client Condition",
        "description": "This product offering term is for new client at fix
duration of less than a year",
        "duration": {
            "amount": 12,
            "units": "Month"
        },
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2021-09-23T00:00:00Z"
        },
        "@type": "ProductOfferingTerm"
    }
],
"productOfferingPrice": [
    {
        "id": "1747",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1747",
        "name": "Recurring Monthly Price for Business Firewall",
        "@referredType": "ProductOfferingPrice",
        "@type": "ProductOfferingPrice"
    }
]
```

```
],
"agreement": [
  {
    "id": "5537",
    "href": "https://mycsp.com:8080/tmf-
api/agreementManagement/v5/agreement/5537",
    "name": "Moon",
    "@referredType": "Agreement",
    "@type": "AgreementRef"
  }
],
"attachment": [
  {
    "description": "This attachment gives a block diagram of the firewall.",

    "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
    "mimeType": "image/jpeg",
    "id": "22",
    "url": "https://mycsp.com:7070/docloader?docnum=3534536",
    "@referredType": "Attachment",
    "@type": "AttachmentRefOrValue"
  }
],
"marketSegment": [
  {
    "id": "1266",
    "href": "https://mycsp.com:8080/tmf-
api/productOfferingReferences/v5/marketSegment/1266",
    "name": "North Region",
    "@referredType": "MarketSegment",
    "@type": "MarketSegmentRef"
  }
],
"bundledProductOffering": [
],
"productOfferingRelationship": [
  {
    "id": "331",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/331",
    "relationshipType": "DependsOn",
    "validFor": {
      "startDateTime": "2020-09-23T16:42:23Z"
    },
    "role": "A-Role",
    "name": "Carrier Grade NAT",
    "@referredType": "ProductOffering",
    "@type": "ProductOfferingRelationship"
  }
],
"prodSpecCharValueUse": [
  {
    "name": "Number of Ports",
    "id": "3331",
    "description": "The total Number of Ports for this product",
    "valueType": "number",
    "minCardinality": 1,
    "maxCardinality": 1,
    "validFor": {
      "startDateTime": "2020-09-23T00:00:00Z",
      "endDateTime": "2021-09-23T00:00:00Z"
    }
  }
],
```

```

"@type": "ProductSpecificationCharacteristicValueUse",
"productSpecCharacteristicValue": [
    {
        "isDefault": true,
        "valueType": "number",
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2021-09-23T00:00:00Z"
        },
        "value": 8,
        "@type": "NumberCharacteristicValueSpecification"
    },
    {
        "isDefault": false,
        "valueType": "number",
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2021-09-23T00:00:00Z"
        },
        "value": 16,
        "@type": "NumberCharacteristicValueSpecification"
    }
],
"productSpecification": {
    "id": "9881",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
    "version": "1.1",
    "name": "Robotics999",
    "@referredType": "ProductSpecification",
    "@type": "ProductSpecificationRef"
}
}
],
"@type": "ProductOffering"
}

```

Update a Product Offering using json-patch

Request

```

PATCH /productOffering/{id}
Content-Type: application/json-patch+json

[
    {
        "op": "add",
        "path": "/place",
        "value": {
            "id": "9989",
            "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v5/geographicAddress/9989",
            "name": "New York",
            "@referredType": "GeographicAddress",
            "@type": "PlaceRef"
        }
    }
]

```

Response

```
200

{
    "id": "7655",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOffering/7655",
    "name": "Basic Firewall for Business",
    "description": "This product offering suggests a firewall service that can be
deployed in business customer premise.",
    "version": "3.0",
    "validFor": {
        "startDateTime": "2020-11-06T00:00:00Z",
        "endDateTime": "2021-11-06T00:00:00Z"
    },
    "lastUpdate": "2020-09-27T00:00:00Z",
    "lifecycleStatus": "Active",
    "isBundle": false,
    "isSellable": true,
    "statusReason": "Released for sale",
    "place": [
        {
            "id": "9979",
            "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v5/geographicAddress/9979",
            "name": "San Francisco Bay Area",
            "@referredType": "GeographicAddress",
            "@type": "PlaceRef"
        },
        {
            "id": "9989",
            "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v5/geographicAddress/9989",
            "name": "New York",
            "@referredType": "GeographicAddress",
            "@type": "PlaceRef"
        }
    ],
    "serviceLevelAgreement": {
        "id": "8082",
        "href": "https://mycsp.com:8080/tmf-api/slaManagement/v5/sla/8082",
        "name": "Gold SLA for Business",
        "@referredType": "ServiceLevelAgreement",
        "@type": "ServiceLevelAgreementRef"
    },
    "productSpecification": {
        "id": "9881",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
        "version": "1.1",
        "name": "Robotics999",
        "@referredType": "ProductSpecification",
        "@type": "ProductSpecificationRef"
    },
    "channel": [
        {
            "id": "4406",
            "href": "https://mycsp.com:8080/tmf-
api/salesChannelManagement/v5/channel/4406",
            "name": "Online Channel",
        }
    ]
}
```

```
        "@referredType": "SalesChannel",
        "@type": "ChannelRef"
    }
],
"serviceCandidate": {
    "id": "8167",
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceCandidate/8167",
    "version": "1.0",
    "name": "Mega Max",
    "@referredType": "ServiceCandidate",
    "@type": "ServiceCandidateRef"
},
"category": [
    {
        "id": "2646",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/2646",
        "version": "2.0",
        "name": "Cloud",
        "@referredType": "Category",
        "@type": "CategoryRef"
    }
],
"resourceCandidate": {
    "id": "8937",
    "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v5/resourceCandidate/8937",
    "name": "Mega Band",
    "@referredType": "ResourceCandidate",
    "@type": "ResourceCandidateRef"
},
"productOfferingTerm": [
    {
        "name": "New Client Condition",
        "description": "This product offering term is for new client at fix
duration of less than a year",
        "duration": {
            "amount": 12,
            "units": "Month"
        },
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2021-09-23T00:00:00Z"
        },
        "@type": "ProductOfferingTerm"
    }
],
"productOfferingPrice": [
    {
        "id": "1747",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1747",
        "name": "Recurring Monthly Price for Business Firewall",
        "@referredType": "ProductOfferingPrice",
        "@type": "ProductOfferingPrice"
    }
],
"agreement": [
    {
        "id": "5537",
        "href": "https://mycsp.com:8080/tmf-
api/agreementManagement/v5/agreement/5537",
        "name": "Business Firewall Agreement"
    }
]
```

```
        "name": "Moon",
        "@referredType": "Agreement",
        "@type": "AgreementRef"
    }
],
"attachment": [
{
    "description": "This attachment gives a block diagram of the firewall.",
    "href": "https://mycsp.com:8080/tmf-api/documentManagement/v5/attachment/22",
    "mimeType": "image/jpeg",
    "id": "22",
    "url": "https://mycsp.com:7070/docloader?docnum=3534536",
    "@referredType": "Attachment",
    "@type": "AttachmentRefOrValue"
}
],
"marketSegment": [
{
    "id": "1266",
    "href": "https://mycsp.com:8080/tmf-api/productOfferingReferences/v5/marketSegment/1266",
    "name": "North Region",
    "@referredType": "MarketSegment",
    "@type": "MarketSegmentRef"
}
],
"bundledProductOffering": [
],
"productOfferingRelationship": [
{
    "id": "331",
    "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/productOffering/331",
    "relationshipType": "DependsOn",
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z"
    },
    "role": "A-Role",
    "name": "Carrier Grade NAT",
    "@referredType": "ProductOffering",
    "@type": "ProductOfferingRelationship"
}
],
"prodSpecCharValueUse": [
{
    "name": "Number of Ports",
    "id": "3331",
    "description": "The total Number of Ports for this product",
    "valueType": "number",
    "minCardinality": 1,
    "maxCardinality": 1,
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2021-09-23T00:00:00Z"
    },
    "@type": "ProductSpecificationCharacteristicValueUse",
    "productSpecCharacteristicValue": [
{
        "isDefault": true,
        "valueType": "number",
        "validFor": {

```

```

        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2021-09-23T00:00:00Z"
    },
    "value": 8,
    "@type": "NumberCharacteristicValueSpecification"
},
{
    "isDefault": false,
    "valueType": "number",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2021-09-23T00:00:00Z"
    },
    "value": 16,
    "@type": "NumberCharacteristicValueSpecification"
}
],
"productSpecification": {
    "id": "9881",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
    "version": "1.1",
    "name": "Robotics999",
    "@referredType": "ProductSpecification",
    "@type": "ProductSpecificationRef"
}
}
],
"@type": "ProductOffering"
}

```

Update a Product Offering using json-patch-query

Request

```

PATCH /productOffering/{id}
Content-Type: application/json-patch-query+json

[
    {
        "op": "add",
        "path": "/place",
        "value": {
            "id": "9989",
            "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v5/geographicAddress/9989",
            "name": "New York",
            "@referredType": "GeographicAddress",
            "@type": "PlaceRef"
        }
    }
]

```

Response

200

```
{  
    "id": "7655",  
    "href": "https://mycsp.com:8080/tmf-  
api/productCatalogManagement/v5/productOffering/7655",  
    "name": "Basic Firewall for Business",  
    "description": "This product offering suggests a firewall service that can be  
deployed in business customer premise.",  
    "version": "3.0",  
    "validFor": {  
        "startDateTime": "2020-11-06T00:00:00Z",  
        "endDateTime": "2021-11-06T00:00:00Z"  
    },  
    "lastUpdate": "2020-09-27T00:00:00Z",  
    "lifecycleStatus": "Active",  
    "isBundle": false,  
    "isSellable": true,  
    "statusReason": "Released for sale",  
    "place": [  
        {  
            "id": "9979",  
            "href": "https://mycsp.com:8080/tmf-  
api/geographicAddressManagement/v5/geographicAddress/9979",  
            "name": "San Francisco Bay Area",  
            "@referredType": "GeographicAddress",  
            "@type": "PlaceRef"  
        },  
        {  
            "id": "9989",  
            "href": "https://mycsp.com:8080/tmf-  
api/geographicAddressManagement/v5/geographicAddress/9989",  
            "name": "New York",  
            "@referredType": "GeographicAddress",  
            "@type": "PlaceRef"  
        }  
    ],  
    "serviceLevelAgreement": {  
        "id": "8082",  
        "href": "https://mycsp.com:8080/tmf-api/slaManagement/v5/sla/8082",  
        "name": "Gold SLA for Business",  
        "@referredType": "ServiceLevelAgreement",  
        "@type": "ServiceLevelAgreementRef"  
    },  
    "productSpecification": {  
        "id": "9881",  
        "href": "https://mycsp.com:8080/tmf-  
api/productCatalogManagement/v5/productSpecification/9881",  
        "version": "1.1",  
        "name": "Robotics999",  
        "@referredType": "ProductSpecification",  
        "@type": "ProductSpecificationRef"  
    },  
    "channel": [  
        {  
            "id": "4406",  
            "href": "https://mycsp.com:8080/tmf-  
api/salesChannelManagement/v5/channel/4406",  
            "name": "Online Channel",  
            "@referredType": "SalesChannel",  
            "@type": "ChannelRef"  
        }  
    ],  
    "serviceCandidate": {  
        "id": "8167",  
    }  
}
```

```
        "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceCandidate/8167",
        "version": "1.0",
        "name": "Mega Max",
        "@referredType": "ServiceCandidate",
        "@type": "ServiceCandidateRef"
    },
    "category": [
        {
            "id": "2646",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/category/2646",
            "version": "2.0",
            "name": "Cloud",
            "@referredType": "Category",
            "@type": "CategoryRef"
        }
    ],
    "resourceCandidate": {
        "id": "8937",
        "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v5/resourceCandidate/8937",
        "name": "Mega Band",
        "@referredType": "ResourceCandidate",
        "@type": "ResourceCandidateRef"
    },
    "productOfferingTerm": [
        {
            "name": "New Client Condition",
            "description": "This product offering term is for new client at fix
duration of less than a year",
            "duration": {
                "amount": 12,
                "units": "Month"
            },
            "validFor": {
                "startDateTime": "2020-09-23T00:00:00Z",
                "endDateTime": "2021-09-23T00:00:00Z"
            },
            "@type": "ProductOfferingTerm"
        }
    ],
    "productOfferingPrice": [
        {
            "id": "1747",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1747",
            "name": "Recurring Monthly Price for Business Firewall",
            "@referredType": "ProductOfferingPrice",
            "@type": "ProductOfferingPrice"
        }
    ],
    "agreement": [
        {
            "id": "5537",
            "href": "https://mycsp.com:8080/tmf-
api/agreementManagement/v5/agreement/5537",
            "name": "Moon",
            "@referredType": "Agreement",
            "@type": "AgreementRef"
        }
    ],
    "attachment": [

```

```
{  
    "description": "This attachment gives a block diagram of the firewall.",  
  
    "href": "https://mycsp.com:8080/tmf-api/documentManagement/v5/attachment/22",  
    "mimeType": "image/jpeg",  
    "id": "22",  
    "url": "https://mycsp.com:7070/docloader?docnum=3534536",  
    "@referredType": "Attachment",  
    "@type": "AttachmentRefOrValue"  
}  
,  
"marketSegment": [  
    {  
        "id": "1266",  
        "href": "https://mycsp.com:8080/tmf-api/productOfferingReferences/v5/marketSegment/1266",  
        "name": "North Region",  
        "@referredType": "MarketSegment",  
        "@type": "MarketSegmentRef"  
    }  
,  
"bundledProductOffering": [  
],  
"productOfferingRelationship": [  
    {  
        "id": "331",  
        "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/productOffering/331",  
        "relationshipType": "DependsOn",  
        "validFor": {  
            "startDateTime": "2020-09-23T16:42:23Z"  
        },  
        "role": "A-Role",  
        "name": "Carrier Grade NAT",  
        "@referredType": "ProductOffering",  
        "@type": "ProductOfferingRelationship"  
    }  
,  
"prodSpecCharValueUse": [  
    {  
        "name": "Number of Ports",  
        "id": "3331",  
        "description": "The total Number of Ports for this product",  
        "valueType": "number",  
        "minCardinality": 1,  
        "maxCardinality": 1,  
        "validFor": {  
            "startDateTime": "2020-09-23T00:00:00Z",  
            "endDateTime": "2021-09-23T00:00:00Z"  
        },  
        "@type": "ProductSpecificationCharacteristicValueUse",  
        "productSpecCharacteristicValue": [  
            {  
                "isDefault": true,  
                "valueType": "number",  
                "validFor": {  
                    "startDateTime": "2020-09-23T00:00:00Z",  
                    "endDateTime": "2021-09-23T00:00:00Z"  
                },  
                "value": 8,  
                "@type": "NumberCharacteristicValueSpecification"  
            },  
        ]  
    }  
]
```

```
{  
    "isDefault": false,  
    "valueType": "number",  
    "validFor": {  
        "startDateTime": "2020-09-23T00:00:00Z",  
        "endDateTime": "2021-09-23T00:00:00Z"  
    },  
    "value": 16,  
    "@type": "NumberCharacteristicValueSpecification"  
},  
,  
"productSpecification": {  
    "id": "9881",  
    "href": "https://mycsp.com:8080/tmf-  
api/productCatalogManagement/v5/productSpecification/9881",  
    "version": "1.1",  
    "name": "Robotics999",  
    "@referredType": "ProductSpecification",  
    "@type": "ProductSpecificationRef"  
}  
}  
]  
,  
"@type": "ProductOffering"  
}
```

Deletes a ProductOffering

DELETE /productOffering/{id}

Description

This operation deletes a ProductOffering entity.

Usage samples

Here is an example of a request for deleting a Product Offering.

Request

```
DELETE /productOffering/{id}  
Content-Type: application/json  
  
{  
}
```

Response

```
204
```

Operations on ProductSpecification

Retrieves a ProductSpecification by ID

GET /productSpecification/{id}?fields=...

Description

This operation retrieves a ProductSpecification entity. 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 is an example of a request for retrieving a specific specification.

Request

```
GET /productSpecification/9881
Content-Type: application/json
```

Response

```
200

{
    "id": "9881",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
    "name": "Cisco Firepower NGFW",
    "brand": "Cisco",
    "productNumber": "CSC-340-NGFW",
    "description": "Powerful product that integrates with a firewall, including
intrusion prevention, advanced malware protection, cloud-based sandboxing, URL
filtering, endpoint protection, web gateway, email security, network traffic
analysis, network access control and CASB.",
    "isBundle": true,
    "lastUpdate": "2020-09-23T16:42:23Z",
    "lifecycleStatus": "Active",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2022-11-24T16:42:23Z"
    },
    "version": "2.0",
    "relatedParty": [
        {
            "role": "Owner",
            "@type": "RelatedPartyRefOrPartyRoleRef",
            "partyOrPartyRole": {
                "id": "1234",
                "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/partyRole/1234",
                "name": "Gustave Flaubert",
                "@type": "PartyRef",
                "@referredType": "Individual"
            }
        }
    ],
    "attachment": [
        ...
    ]
}
```

```
{  
    "id": "22",  
    "href": "https://mycsp.com:8080/tmf-  
api/documentManagement/v5/attachment/22",  
    "name": "Product Picture",  
    "mimeType": "image/jpeg",  
    "url": "https://mycsp.com:7070/docloader?docnum=774451234",  
    "@referredType": "Attachment",  
    "@type": "AttachmentRefOrValue"  
},  
{  
    "id": "33",  
    "href": "https://mycsp.com:8080/tmf-  
api/documentManagement/v5/attachment/22",  
    "name": "Product Manual",  
    "mimeType": "application/pdf",  
    "url": "https://mycsp.com:7070/docloader?docnum=774454321",  
    "@referredType": "Attachment",  
    "@type": "AttachmentRefOrValue"  
}  
,  
"bundledProductSpecification": [  
    {  
        "id": "15",  
        "href": "https://mycsp.com:8080/tmf-  
api/productCatalogManagement/v5/productSpecification/15",  
        "name": "URL Filter",  
        "@type": "BundledProductSpecification",  
        "lifecycleStatus": "Active"  
},  
    {  
        "id": "64",  
        "href": "https://mycsp.com:8080/tmf-  
api/productCatalogManagement/v5/productSpecification/64",  
        "name": "Malware Protector",  
        "@type": "BundledProductSpecification",  
        "lifecycleStatus": "Active"  
}  
,  
    "targetProductSchema": {  
        "@type": "Firewall",  
        "@schemaLocation": "https://mycsp.com:8080/tmf-  
api/schema/Product/Firewall.schema.json"  
    },  
    "productSpecificationRelationship": [  
        {  
            "id": "23",  
            "href": "https://mycsp.com:8080/tmf-  
api/productCatalogManagement/v5/productSpecification/23",  
            "relationshipType": "OptionalFor",  
            "validFor": {  
                "startDateTime": "2020-09-23T16:42:23Z"  
            },  
            "name": "DataPlan",  
            "role": "A-Item",  
            "@referredType": "ProductSpecification",  
            "@type": "ProductSpecificationRelationship"  
        }  
,  
        "serviceSpecification": [  
            {  
                "id": "22",  
                "href": "https://mycsp.com:8080/tmf-
```

```
api/serviceCatalogManagement/v5/serviceSpecification/22",
    "name": "Firewall",
    "version": "1.0",
    "@referredType": "ServiceSpecification",
    "@type": "ServiceSpecificationRef"
}
],
"resourceSpecification": [
{
    "id": "63",
    "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v5/resourceSpecification/63",
        "name": "Firewall Port",
        "version": "1.0",
        "@referredType": "PhysicalResourceSpecification",
        "@type": "ResourceSpecificationRef"
}
],
"productSpecCharacteristic": [
{
    "name": "Number of Ports",
    "description": "The total Number of Ports for this product",
    "valueType": "number",
    "configurable": true,
    "minCardinality": 1,
    "maxCardinality": 1,
    "isUnique": true,
    "@type": "CharacteristicSpecification",
    "charSpecRelationship": [
{
        "parentSpecificationId": "43",
        "parentSpecificationHref": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/43",
            "characteristicSpecificationId": "2",
            "relationshipType": "Dependency",
            "name": "Bandwidth",
            "validFor": {
                "startDateTime": "2020-09-23T16:42:23-04:00"
            },
            "@type": "CharacteristicSpecificationRelationship"
        }
    ],
    "characteristicValueSpecification": [
{
        "isDefault": true,
        "valueType": "number",
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2022-11-24T00:00:00Z"
        },
        "value": 8,
        "@type": "NumberCharacteristicValueSpecification"
},
{
        "isDefault": false,
        "valueType": "number",
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2022-11-24T00:00:00Z"
        },
        "value": 16,
        "@type": "NumberCharacteristicValueSpecification"
}
]
}
```

```

        {
            "isDefault": false,
            "valueType": "number",
            "validFor": {
                "startDateTime": "2020-09-23T00:00:00Z",
                "endDateTime": "2022-11-24T00:00:00Z"
            },
            "value": 24,
            "@type": "NumberCharacteristicValueSpecification"
        }
    ],
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z"
    }
},
{
    "name": "Color",
    "description": "Color of the Firewall housing",
    "valueType": "string",
    "configurable": true,
    "minCardinality": 1,
    "maxCardinality": 1,
    "extensible": true,
    "isUnique": true,
    "@type": "CharacteristicSpecification",
    "characteristicValueSpecification": [
        {
            "isDefault": true,
            "valueType": "string",
            "value": "Black",
            "@type": "StringCharacteristicValueSpecification"
        },
        {
            "isDefault": false,
            "valueType": "string",
            "value": "White",
            "@type": "StringCharacteristicValueSpecification"
        }
    ],
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z"
    }
}
],
"@type": "ProductSpecification"
}

```

List or find ProductSpecification objects

GET /productSpecification?fields=...

Description

This operation list ProductSpecification 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 is an example of a request for retrieving multiple product specifications.

Request

```
GET /productSpecification?relatedParty.partyOrPartyrole.id=1234
Content-Type: application/json
```

Response

```
200
[
  {
    "id": "9881",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
    "name": "Cisco Firepower NGFW",
    "brand": "Cisco",
    "productNumber": "CSC-340-NGFW",
    "description": "Powerful product that integrates with a firewall, including
intrusion prevention, advanced malware protection, cloud-based sandboxing, URL
filtering, endpoint protection, web gateway, email security, network traffic
analysis, network access control and CASB.",
    "isBundle": true,
    "lastUpdate": "2020-09-23T16:42:23Z",
    "lifecycleStatus": "Active",
    "validFor": [
      "startDateTime": "2020-09-23T00:00:00Z",
      "endDateTime": "2022-11-24T16:42:23Z"
    ],
    "version": "2.0",
    "relatedParty": [
      {
        "role": "Owner",
        "@type": "RelatedPartyRefOrPartyRoleRef",
        "partyOrPartyRole": {
          "id": "1234",
          "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/partyRole/1234",
          "name": "Gustave Flaubert",
          "@type": "PartyRef",
          "@referredType": "Individual"
        }
      }
    ],
    "attachment": [
      {
        "id": "22",
        "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
        "name": "Product Picture",
        "mimeType": "image/jpeg",
        "url": "https://mycsp.com:7070/docloader?docnum=774451234",
        "@referredType": "Attachment",
        "@type": "AttachmentRefOrValue"
      },
      {
        "id": "33",
        "href": "https://mycsp.com:8080/tmf-
```

```
api/documentManagement/v5/attachment/22",
    "name": "Product Manual",
    "mimeType": "application/pdf",
    "url": "https://mycsp.com:7070/docloader?docnum=774454321",
    "@referredType": "Attachment",
    "@type": "AttachmentRefOrValue"
}
],
"bundledProductSpecification": [
{
    "id": "15",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/15",
        "name": "URL Filter",
        "@type": "BundledProductSpecification",
        "@baseType": "",
        "lifecycleStatus": "Active"
},
{
    "id": "64",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/64",
        "name": "Malware Protector",
        "@type": "BundledProductSpecification",
        "@baseType": "",
        "lifecycleStatus": "Active"
}
],
"targetProductSchema": {
    "@type": "Firewall",
    "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Product/Firewall.schema.json"
},
"productSpecificationRelationship": [
{
    "id": "23",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/23",
        "relationshipType": "OptionalFor",
        "validFor": {
            "startDateTime": "2020-09-23T16:42:23Z"
        },
        "name": "DataPlan",
        "role": "A-Item",
        "@referredType": "ProductSpecification",
        "@type": "ProductSpecificationRelationship"
}
],
"serviceSpecification": [
{
    "id": "22",
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/22",
        "name": "Firewall",
        "version": "1.0",
        "@referredType": "ServiceSpecification",
        "@type": "ServiceSpecificationRef"
}
],
"resourceSpecification": [
{
    "id": "63",
    "href": "https://mycsp.com:8080/tmf-
```

```
api/resourceCatalogManagement/v5/resourceSpecification/63",
    "name": "Firewall Port",
    "version": "1.0",
    "@referredType": "PhysicalResourceSpecification",
    "@type": "ResourceSpecificationRef"
}
],
"productSpecCharacteristic": [
{
    "name": "Number of Ports",
    "description": "The total Number of Ports for this product",
    "valueType": "number",
    "configurable": true,
    "minCardinality": 1,
    "maxCardinality": 1,
    "isUnique": true,
    "@type": "CharacteristicSpecification",
    "charSpecRelationship": [
        {
            "parentSpecificationId": "43",
            "parentSpecificationHref": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/43",
            "characteristicSpecificationId": "2",
            "name": "Bandwidth",
            "validFor": {
                "startDateTime": "2020-09-23T16:42:23-04:00"
            },
            "@type": "CharacteristicSpecificationRelationship"
        }
    ],
    "characteristicValueSpecification": [
        {
            "isDefault": true,
            "valueType": "number",
            "validFor": {
                "startDateTime": "2020-09-23T00:00:00Z",
                "endDateTime": "2022-11-24T00:00:00Z"
            },
            "value": "8",
            "@type": "NumberCharacteristicValueSpecification"
        },
        {
            "isDefault": false,
            "valueType": "number",
            "validFor": {
                "startDateTime": "2020-09-23T00:00:00Z",
                "endDateTime": "2022-11-24T00:00:00Z"
            },
            "value": "16",
            "@type": "NumberCharacteristicValueSpecification"
        },
        {
            "isDefault": false,
            "valueType": "number",
            "validFor": {
                "startDateTime": "2020-09-23T00:00:00Z",
                "endDateTime": "2022-11-24T00:00:00Z"
            },
            "value": "24",
            "@type": "NumberCharacteristicValueSpecification"
        }
    ],
    "validFor": {

```

```
        "startDateTime": "2020-09-23T16:42:23Z"
    }
},
{
    "name": "Color",
    "description": "Color of the Firewall housing",
    "valueType": "string",
    "configurable": true,
    "minCardinality": 1,
    "maxCardinality": 1,
    "extensible": true,
    "isUnique": true,
    "@type": "CharacteristicSpecification",
    "characteristicValueSpecification": [
        {
            "isDefault": true,
            "valueType": "string",
            "value": "Black",
            "@type": "StringCharacteristicValueSpecification"
        },
        {
            "isDefault": false,
            "valueType": "string",
            "value": "White",
            "@type": "StringCharacteristicValueSpecification"
        }
    ],
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z"
    }
}
],
"@type": "ProductSpecification"
},
{
    "id": "5563",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/5563",
    "name": "Deep Packet Inspection",
    "brand": "HPE",
    "productNumber": "HPE-367-DPI",
    "description": "This product specification describes a Deep Packet
Inspection product that can be deployed in customer premise.",
    "isBundle": false,
    "lastUpdate": "2020-10-23T16:42:23Z",
    "lifecycleStatus": "In Design",
    "validFor": [
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2022-11-24T16:42:23Z"
    ],
    "version": "1.0",
    "relatedParty": [
        {
            "role": "Owner",
            "@type": "RelatedPartyRefOrPartyRoleRef",
            "partyOrPartyRole": {
                "id": "1234",
                "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/partyRole/1234",
                "name": "Gustave Flaubert",
                "@type": "PartyRef",
                "@referredType": "Individual"
            }
        }
    ]
}
```

```
        }
    ],
    "attachment": [
        {
            "id": "2017",
            "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/2017",
            "name": "Product Manual",
            "mimeType": "application/pdf",
            "url": "https://mycsp.com:7070/docloader?docnum=4168051665",
            "@referredType": "Attachment",
            "@type": "AttachmentRefOrValue"
        }
    ],
    "targetProductSchema": {
        "@type": "DPI",
        "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Product/Firewall.schema.json"
    },
    "serviceSpecification": [
        {
            "id": "5059",
            "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/5059",
            "name": "DPI Service",
            "version": "1.0",
            "@referredType": "ServiceSpecification",
            "@type": "ServiceSpecificationRef"
        }
    ],
    "productSpecCharacteristic": [
        {
            "name": "httpIncomingTraffic",
            "description": "DPI for http Incoming Traffic",
            "valueType": "string",
            "configurable": true,
            "minCardinality": 1,
            "maxCardinality": 1,
            "isUnique": true,
            "@type": "CharacteristicSpecification",
            "characteristicValueSpecification": [
                {
                    "isDefault": true,
                    "valueType": "string",
                    "validFor": {
                        "startDateTime": "2020-09-23T00:00:00Z",
                        "endDateTime": "2022-11-24T00:00:00Z"
                    },
                    "value": "enabled",
                    "@type": "StringCharacteristicValueSpecification"
                },
                {
                    "isDefault": false,
                    "valueType": "string",
                    "validFor": {
                        "startDateTime": "2020-09-23T00:00:00Z",
                        "endDateTime": "2022-11-24T00:00:00Z"
                    },
                    "value": "disabled",
                    "@type": "StringCharacteristicValueSpecification"
                }
            ],
            "validFor": {"startDateTime": "2020-09-23T16:42:23Z"}
        }
    ]
}
```

```

        },
        {
            "name": "httpIOutgoingTraffic",
            "description": "DPI for http Outgoing Traffic",
            "valueType": "string",
            "configurable": true,
            "minCardinality": 1,
            "maxCardinality": 1,
            "extensible": true,
            "isUnique": true,
            "@type": "CharacteristicSpecification",
            "characteristicValueSpecification": [
                {
                    "isDefault": false,
                    "valueType": "string",
                    "value": "enabled",
                    "@type": "StringCharacteristicValueSpecification"
                },
                {
                    "isDefault": true,
                    "valueType": "string",
                    "value": "disabled",
                    "@type": "StringCharacteristicValueSpecification"
                }
            ],
            "validFor": {
                "startDateTime": "2020-09-23T16:42:23Z"
            }
        }
    ],
    "@type": "ProductSpecification"
}
]

```

Creates a ProductSpecification

POST /productSpecification?fields=...

Description

This operation creates a ProductSpecification entity.

Mandatory Attributes

Mandatory Attributes	Rule
lastUpdate	
lifecycleStatus	
name	
@type	

Usage samples

Here is an example of a request for creating a specification.

Request

```
POST /productSpecification
Content-Type: application/json

{
    "id": "9881",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
    "name": "Cisco Firepower NGFW",
    "brand": "Cisco",
    "productNumber": "CSC-340-NGFW",
    "description": "Powerful product that integrates with a firewall, including intrusion prevention, advanced malware protection, cloud-based sandboxing, URL filtering, endpoint protection, web gateway, email security, network traffic analysis, network access control and CASB.",
    "isBundle": true,
    "lastUpdate": "2020-09-23T16:42:23Z",
    "lifecycleStatus": "Active",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2022-11-24T16:42:23Z"
    },
    "version": "1.0",
    "relatedParty": [
        {
            "role": "Owner",
            "@type": "RelatedPartyRefOrPartyRoleRef",
            "partyOrPartyRole": {
                "id": "1234",
                "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/partyRole/1234",
                "name": "Gustave Flaubert",
                "@type": "PartyRef",
                "@referredType": "Individual"
            }
        }
    ],
    "attachment": [
        {
            "id": "22",
            "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
            "name": "Product Picture",
            "mimeType": "image/jpeg",
            "url": "https://mycsp.com:7070/docloader?docnum=774451234",
            "@referredType": "Attachment",
            "@type": "AttachmentRef"
        },
        {
            "id": "33",
            "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
            "name": "Product Manual",
            "mimeType": "application/pdf",
            "url": "https://mycsp.com:7070/docloader?docnum=774454321",
            "@referredType": "Attachment",
            "@type": "AttachmentRef"
        }
    ],
    "bundledProductSpecification": [
        {
            "id": "9882",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/bundledProductSpecification/9882"
        }
    ]
}
```

```
        "id": "15",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/15",
        "name": "URL Filter",
        "@type": "BundledProductSpecification",
        "lifecycleStatus": "Active"
    },
    {
        "id": "64",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/64",
        "name": "Malware Protector",
        "@type": "BundledProductSpecification",
        "lifecycleStatus": "Active"
    }
],
"targetProductSchema": {
    "@type": "Firewall",
    "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Product/Firewall.schema.json"
},
"productSpecificationRelationship": [
    {
        "id": "23",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/23",
        "relationshipType": "OptionalFor",
        "validFor": {
            "startDateTime": "2020-09-23T16:42:23Z"
        },
        "name": "DataPlan",
        "role": "A-Item",
        "@referredType": "ProductSpecification",
        "@type": "ProductSpecificationRelationship"
    }
],
"serviceSpecification": [
    {
        "id": "22",
        "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/22",
        "name": "Firewall",
        "version": "1.0",
        "@referredType": "ServiceSpecification",
        "@type": "ServiceSpecificationRef"
    }
],
"resourceSpecification": [
    {
        "id": "63",
        "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v5/resourceSpecification/63",
        "name": "Firewall Port",
        "version": "1.0",
        "@referredType": "PhysicalResourceSpecification",
        "@type": "ResourceSpecificationRef"
    }
],
"productSpecCharacteristic": [
    {
        "name": "Number of Ports",
        "description": "The total Number of Ports for this product",
        "valueType": "number",
        "value": 1
    }
]
```

```
"configurable": true,
"minCardinality": 1,
"maxCardinality": 1,
"isRequired": true,
"@type": "CharacteristicSpecification",
"charSpecRelationship": [
    {
        "parentSpecificationId": "43",
        "parentSpecificationHref": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/43",
        "characteristicSpecificationId": "2",
        "relationshipType": "dependency",
        "name": "Bandwidth",
        "validFor": {
            "startDateTime": "2020-09-23T16:42:23-04:00"
        },
        "@type": "CharacteristicSpecificationRelationship"
    }
],
"characteristicValueSpecification": [
    {
        "isDefault": true,
        "valueType": "number",
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2022-11-24T00:00:00Z"
        },
        "value": "8",
        "@type": "NumberCharacteristicValueSpecification"
    },
    {
        "isDefault": false,
        "valueType": "number",
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2022-11-24T00:00:00Z"
        },
        "value": "16",
        "@type": "NumberCharacteristicValueSpecification"
    },
    {
        "isDefault": false,
        "valueType": "number",
        "validFor": {
            "startDateTime": "2020-09-23T00:00:00Z",
            "endDateTime": "2022-11-24T00:00:00Z"
        },
        "value": "24",
        "@type": "NumberCharacteristicValueSpecification"
    }
],
"validFor": {
    "startDateTime": "2020-09-23T16:42:23Z"
}
},
{
    "name": "Color",
    "description": "Color of the Firewall housing",
    "valueType": "string",
    "configurable": true,
    "minCardinality": 1,
    "maxCardinality": 1,
    "extensible": true,
```

```

    "isUnique": true,
    "@type": "CharacteristicSpecification",
    "characteristicValueSpecification": [
        {
            "isDefault": true,
            "valueType": "string",
            "value": "Black",
            "@type": "StringCharacteristicValueSpecification"
        },
        {
            "isDefault": false,
            "valueType": "string",
            "value": "White",
            "@type": "StringCharacteristicValueSpecification"
        }
    ],
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z"
    }
}
],
"@type": "ProductSpecification"
}

```

Response

```

201

{
    "id": "9881",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
    "name": "Cisco Firepower NGFW",
    "brand": "Cisco",
    "productNumber": "CSC-340-NGFW",
    "description": "Powerful product that integrates with a firewall, including
intrusion prevention, advanced malware protection, cloud-based sandboxing, URL
filtering, endpoint protection, web gateway, email security, network traffic
analysis, network access control and CASB.",
    "isBundle": true,
    "lastUpdate": "2020-09-23T16:42:23Z",
    "lifecycleStatus": "Active",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2022-11-24T16:42:23Z"
    },
    "version": "1.0",
    "relatedParty": [
        {
            "role": "Owner",
            "@type": "RelatedPartyRefOrPartyRoleRef",
            "partyOrPartyRole": {
                "id": "1234",
                "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/partyRole/1234",
                "name": "Gustave Flaubert",
                "@type": "PartyRef",
                "@referredType": "Individual"
            }
        }
    ]
}

```

```
],
"attachment": [
  {
    "id": "22",
    "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
    "name": "Product Picture",
    "mimeType": "image/jpeg",
    "url": "https://mycsp.com:7070/docloader?docnum=774451234",
    "@referredType": "Attachment",
    "@type": "AttachmentRefOrValue"
  },
  {
    "id": "33",
    "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
    "name": "Product Manual",
    "mimeType": "application/pdf",
    "url": "https://mycsp.com:7070/docloader?docnum=774454321",
    "@referredType": "Attachment",
    "@type": "AttachmentRefOrValue"
  }
],
"bundledProductSpecification": [
  {
    "id": "15",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/15",
    "name": "URL Filter",
    "@type": "BundledProductSpecification",
    "lifecycleStatus": "Active"
  },
  {
    "id": "64",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/64",
    "name": "Malware Protector",
    "@type": "BundledProductSpecification",
    "lifecycleStatus": "Active"
  }
],
"targetProductSchema": {
  "@type": "Firewall",
  "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Product/Firewall.schema.json"
},
"productSpecificationRelationship": [
  {
    "id": "23",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/23",
    "relationshipType": "OptionalFor",
    "validFor": {
      "startDateTime": "2020-09-23T16:42:23Z"
    },
    "name": "DataPlan",
    "role": "A-Item",
    "@referredType": "ProductSpecification",
    "@type": "ProductSpecificationRelationship"
  }
],
"serviceSpecification": [
  {

```

```
        "id": "22",
        "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/22",
        "name": "Firewall",
        "version": "1.0",
        "@referredType": "ServiceSpecification",
        "@type": "ServiceSpecificationRef"
    }
],
"resourceSpecification": [
{
    "id": "63",
    "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v5/resourceSpecification/63",
    "name": "Firewall Port",
    "version": "1.0",
    "@referredType": "PhysicalResourceSpecification",
    "@type": "ResourceSpecificationRef"
}
],
"productSpecCharacteristic": [
{
    "name": "Number of Ports",
    "description": "The total Number of Ports for this product",
    "valueType": "number",
    "configurable": true,
    "minCardinality": 1,
    "maxCardinality": 1,
    "isUnique": true,
    "@type": "CharacteristicSpecification",
    "charSpecRelationship": [
{
        "parentSpecificationId": "43",
        "parentSpecificationHref": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/43",
        "characteristicSpecificationId": "2",
        "name": "Bandwidth",
        "validFor": {
            "startDateTime": "2020-09-23T16:42:23-04:00"
        },
        "@type": "CharacteristicSpecificationRelationship"
    }
],
"characteristicValueSpecification": [
{
    "isDefault": true,
    "valueType": "number",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2022-11-24T00:00:00Z"
    },
    "value": "8",
    "@type": "NumberCharacteristicValueSpecification"
},
{
    "isDefault": false,
    "valueType": "number",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2022-11-24T00:00:00Z"
    },
    "value": "16",
    "@type": "NumberCharacteristicValueSpecification"
}
]
]
```

```

        },
        {
            "isDefault": false,
            "valueType": "number",
            "validFor": {
                "startDateTime": "2020-09-23T00:00:00Z",
                "endDateTime": "2022-11-24T00:00:00Z"
            },
            "value": "24",
            "@type": "NumberCharacteristicValueSpecification"
        }
    ],
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z"
    }
},
{
    "name": "Color",
    "description": "Color of the Firewall housing",
    "valueType": "string",
    "configurable": true,
    "minCardinality": 1,
    "maxCardinality": 1,
    "extensible": true,
    "isUnique": true,
    "@type": "CharacteristicSpecification",
    "characteristicValueSpecification": [
        {
            "isDefault": true,
            "valueType": "string",
            "value": "Black",
            "@type": "StringCharacteristicValueSpecification"
        },
        {
            "isDefault": false,
            "valueType": "string",
            "value": "White",
            "@type": "StringCharacteristicValueSpecification"
        }
    ],
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z"
    }
}
],
"@type": "ProductSpecification"
}

```

Here is an example of a request for creating a specification with intent

Request

```

POST /productSpecification
Content-Type: application/json

{
    "id": "9881",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
    "name": "Cisco Firepower NGFW",

```

```
"brand": "Cisco",
"productNumber": "CSC-340-NGFW",
"description": "Powerful product that integrates with a firewall, including intrusion prevention, advanced malware protection, cloud-based sandboxing, URL filtering, endpoint protection, web gateway, email security, network traffic analysis, network access control and CASB.",
"isBundle": true,
"lastUpdate": "2020-09-23T16:42:23Z",
"lifecycleStatus": "Active",
"validFor": {
  "startDateTime": "2020-09-23T00:00:00Z",
  "endDateTime": "2022-11-24T16:42:23Z"
},
"version": "1.0",
"relatedParty": [
  {
    "role": "Owner",
    "@type": "RelatedPartyRefOrPartyRoleRef",
    "partyOrPartyRole": {
      "id": "1234",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/v5/partyRole/1234",
      "name": "Gustave Flaubert",
      "@type": "PartyRef",
      "@referredType": "Individual"
    }
  }
],
"attachment": [
  {
    "id": "22",
    "href": "https://mycsp.com:8080/tmf-api/documentManagement/v5/attachment/22",
    "name": "Product Picture",
    "mimeType": "image/jpeg",
    "url": "https://mycsp.com:7070/docloader?docnum=774451234",
    "@referredType": "Attachment",
    "@type": "AttachmentRef"
  },
  {
    "id": "33",
    "href": "https://mycsp.com:8080/tmf-api/documentManagement/v5/attachment/22",
    "name": "Product Manual",
    "mimeType": "application/pdf",
    "url": "https://mycsp.com:7070/docloader?docnum=774454321",
    "@referredType": "Attachment",
    "@type": "AttachmentRef"
  }
],
"bundledProductSpecification": [
  {
    "id": "15",
    "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/productSpecification/15",
    "name": "URL Filter",
    "@type": "BundledProductSpecification",
    "lifecycleStatus": "Active"
  },
  {
    "id": "64",
    "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/productSpecification/64",
    "name": "Advanced Malware Protection"
  }
]
```

```
        "name": "Malware Protector",
        "@type": "BundledProductSpecification",
        "lifecycleStatus": "Active"
    }
],
"targetProductSchema": {
    "@type": "Firewall",
    "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Product/Firewall.schema.json"
},
"productSpecificationRelationship": [
    {
        "id": "23",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/23",
        "relationshipType": "OptionalFor",
        "validFor": {
            "startDateTime": "2020-09-23T16:42:23Z"
        },
        "name": "DataPlan",
        "role": "A-Item",
        "@referredType": "ProductSpecification",
        "@type": "ProductSpecificationRelationship"
    }
],
"serviceSpecification": [
    {
        "id": "22",
        "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/22",
        "name": "Firewall",
        "version": "1.0",
        "@referredType": "ServiceSpecification",
        "@type": "ServiceSpecificationRef"
    }
],
"resourceSpecification": [
    {
        "id": "63",
        "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v5/resourceSpecification/63",
        "name": "Firewall Port",
        "version": "1.0",
        "@referredType": "PhysicalResourceSpecification",
        "@type": "ResourceSpecificationRef"
    }
],
"intentSpecification": {
    "@type": "IntentSpecificationRef",
    "id": "EventLiveBroadcast_IntentSpec",
    "name": "EventLiveBroadcastIntentSpec",
    "@referredType": "IntentSpecification",
    "@href": "/intent/v5/IntentSpecification/EventLiveBroadcast_IntentSpec"
},
"@type": "ProductSpecification"
}
```

Response

201

```
{  
    "id": "9881",  
    "href": "https://mycsp.com:8080/tmf-  
api/productCatalogManagement/v5/productSpecification/9881",  
    "name": "Cisco Firepower NGFW",  
    "brand": "Cisco",  
    "productNumber": "CSC-340-NGFW",  
    "description": "Powerful product that integrates with a firewall, including  
intrusion prevention, advanced malware protection, cloud-based sandboxing, URL  
filtering, endpoint protection, web gateway, email security, network traffic  
analysis, network access control and CASB.",  
    "isBundle": true,  
    "lastUpdate": "2020-09-23T16:42:23Z",  
    "lifecycleStatus": "Active",  
    "validFor": {  
        "startDateTime": "2020-09-23T00:00:00Z",  
        "endDateTime": "2022-11-24T16:42:23Z"  
    },  
    "version": "1.0",  
    "relatedParty": [  
        {  
            "role": "Owner",  
            "@type": "RelatedPartyRefOrPartyRoleRef",  
            "partyOrPartyRole": {  
                "id": "1234",  
                "href": "https://mycsp.com:8080/tmf-  
api/partyManagement/v5/partyRole/1234",  
                "name": "Gustave Flaubert",  
                "@type": "PartyRef",  
                "@referredType": "Individual"  
            }  
        }  
    ],  
    "attachment": [  
        {  
            "id": "22",  
            "href": "https://mycsp.com:8080/tmf-  
api/documentManagement/v5/attachment/22",  
            "name": "Product Picture",  
            "mimeType": "image/jpeg",  
            "url": "https://mycsp.com:7070/docloader?docnum=774451234",  
            "@referredType": "Attachment",  
            "@type": "AttachmentRefOrValue"  
        },  
        {  
            "id": "33",  
            "href": "https://mycsp.com:8080/tmf-  
api/documentManagement/v5/attachment/22",  
            "name": "Product Manual",  
            "mimeType": "application/pdf",  
            "url": "https://mycsp.com:7070/docloader?docnum=774454321",  
            "@referredType": "Attachment",  
            "@type": "AttachmentRefOrValue"  
        }  
    ],  
    "bundledProductSpecification": [  
        {  
            "id": "15",  
            "href": "https://mycsp.com:8080/tmf-  
api/productCatalogManagement/v5/productSpecification/15",  
            "name": "URL Filter",  
            "@type": "BundledProductSpecification",  
        }  
    ]  
}
```

```
        "lifecycleStatus": "Active"
    },
    {
        "id": "64",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/64",
        "name": "Malware Protector",
        "@type": "BundledProductSpecification",
        "lifecycleStatus": "Active"
    }
],
"targetProductSchema": {
    "@type": "Firewall",
    "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Product/Firewall.schema.json"
},
"productSpecificationRelationship": [
    {
        "id": "23",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/23",
        "relationshipType": "OptionalFor",
        "validFor": {
            "startDateTime": "2020-09-23T16:42:23Z"
        },
        "name": "DataPlan",
        "role": "A-Item",
        "@referredType": "ProductSpecification",
        "@type": "ProductSpecificationRelationship"
    }
],
"serviceSpecification": [
    {
        "id": "22",
        "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/22",
        "name": "Firewall",
        "version": "1.0",
        "@referredType": "ServiceSpecification",
        "@type": "ServiceSpecificationRef"
    }
],
"resourceSpecification": [
    {
        "id": "63",
        "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v5/resourceSpecification/63",
        "name": "Firewall Port",
        "version": "1.0",
        "@referredType": "PhysicalResourceSpecification",
        "@type": "ResourceSpecificationRef"
    }
],
"intentSpecification": {
    "@type": "IntentSpecificationRef",
    "id": "EventLiveBroadcast_IntentSpec",
    "name": "EventLiveBroadcastIntentSpec",
    "@referredType": "IntentSpecification",
    "@href": "/intent/v5/IntentSpecification/EventLiveBroadcast_IntentSpec"
},
"@type": "ProductSpecification"
}
```

Updates partially a ProductSpecification

PATCH /productSpecification/{id}?fields=...

Description

This operation allows partial updates of a ProductSpecification 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

Non Patchable Attributes	Rule
href	
id	
lastUpdate	
@baseType	@baseType is immutable
@schemaLocation	@schemaLocation is immutable
@type	@type is immutable

Patchable Attributes	Rule
attachment	
brand	
bundledProductSpecification	
category	
description	
externalIdentifier	
intentSpecification	
isBundle	
lifecycleStatus	
name	
policy	
productNumber	
productSpecCharacteristic	
productSpecificationRelationship	
relatedParty	
resourceSpecification	

Patchable Attributes	Rule
serviceSpecification	
targetProductSchema	
validFor	
version	

Usage samples

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

Request

```
PATCH /productSpecification/{id}
Content-Type: application/merge-patch+json

{
    "version": "3.1",
    "validFor": {
        "startDateTime": "2020-11-24T00:00:00Z",
        "endDateTime": "2022-11-24T00:00:00Z"
    },
    "@type": "ProductSpecification"
}
```

Response

```
200

{
    "id": "9881",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
    "name": "Cisco Firepower NGFW",
    "brand": "Cisco",
    "productNumber": "CSC-340-NGFW",
    "description": "Powerful product that integrates with a firewall, including
intrusion prevention, advanced malware protection, cloud-based sandboxing, URL
filtering, endpoint protection, web gateway, email security, network traffic
analysis, network access control and CASB.",
    "isBundle": true,
    "lastUpdate": "2020-09-23T16:42:23Z",
    "lifecycleStatus": "Active",
    "version": "3.1",
    "validFor": {
        "startDateTime": "2020-11-24T00:00:00Z",
        "endDateTime": "2022-11-24T00:00:00Z"
    },
    "relatedParty": [
        {
            "role": "Owner",
            "@type": "RelatedPartyRefOrPartyRoleRef",
            "partyOrPartyRole": {
                "id": "1234",
                "name": "Cisco Systems, Inc."
            }
        }
    ]
}
```

```
        "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/partyRole/1234",
        "name": "Gustave Flaubert",
        "@type": "PartyRef",
        "@referredType": "Individual"
    }
}
],
"attachment": [
{
    "id": "22",
    "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
    "name": "Product Picture",
    "mimeType": "image/jpeg",
    "url": "https://mycsp.com:7070/docloader?docnum=774451234",
    "@referredType": "Attachment",
    "@type": "AttachmentRefOrValue"
},
{
    "id": "33",
    "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
    "name": "Product Manual",
    "mimeType": "application/pdf",
    "url": "https://mycsp.com:7070/docloader?docnum=774454321",
    "@referredType": "Attachment",
    "@type": "AttachmentRefOrValue"
}
],
"bundledProductSpecification": [
{
    "id": "15",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/15",
    "name": "URL Filter",
    "@type": "BundledProductSpecification",
    "@baseType": "",
    "lifecycleStatus": "Active"
},
{
    "id": "64",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/64",
    "name": "Malware Protector",
    "@type": "BundledProductSpecification",
    "@baseType": "",
    "lifecycleStatus": "Active"
}
],
"targetProductSchema": {
    "@type": "Firewall",
    "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Product/Firewall.schema.json"
},
"productSpecificationRelationship": [
{
    "id": "23",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/23",
    "relationshipType": "OptionalFor",
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z"
    }
}
]
```

```
        },
        "name": "DataPlan",
        "role": "A-Item",
        "@referredType": "ProductSpecification",
        "@type": "ProductSpecificationRelationship"
    }
],
"serviceSpecification": [
{
    "id": "22",
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/22",
    "name": "Firewall",
    "version": "1.0",
    "@referredType": "ServiceSpecification",
    "@type": "ServiceSpecificationRef"
}
],
"resourceSpecification": [
{
    "id": "63",
    "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v5/resourceSpecification/63",
    "name": "Firewall Port",
    "version": "1.0",
    "@referredType": "PhysicalResourceSpecification",
    "@type": "ResourceSpecificationRef"
}
],
"productSpecCharacteristic": [
{
    "name": "Number of Ports",
    "description": "The total Number of Ports for this product",
    "valueType": "number",
    "configurable": true,
    "minCardinality": 1,
    "maxCardinality": 1,
    "isUnique": true,
    "@type": "CharacteristicSpecification",
    "productSpecCharRelationship": [
{
        "parentSpecificationId": "43",
        "parentSpecificationHref": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/43",
        "characteristicSpecificationId": "2",
        "relationshipType": "Dependency",
        "name": "Bandwidth",
        "validFor": {
            "startDateTime": "2020-09-23T16:42:23-04:00"
        },
        "@type": "CharacteristicSpecificationRelationship"
    }
],
"characteristicValueSpecification": [
{
    "isDefault": true,
    "valueType": "number",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2022-11-24T00:00:00Z"
    },
    "value": 8,
    "@type": "NumberCharacteristicValueSpecification"
}
```

```
        },
        {
            "isDefault": false,
            "valueType": "number",
            "validFor": {
                "startDateTime": "2020-09-23T00:00:00Z",
                "endDateTime": "2022-11-24T00:00:00Z"
            },
            "value": 16,
            "@type": "NumberCharacteristicValueSpecification"
        },
        {
            "isDefault": false,
            "valueType": "number",
            "validFor": {
                "startDateTime": "2020-09-23T00:00:00Z",
                "endDateTime": "2022-11-24T00:00:00Z"
            },
            "value": 24,
            "@type": "NumberCharacteristicValueSpecification"
        }
    ],
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z"
    }
},
{
    "name": "Color",
    "description": "Color of the Firewall housing",
    "valueType": "string",
    "configurable": true,
    "minCardinality": 1,
    "maxCardinality": 1,
    "extensible": true,
    "isUnique": true,
    "@type": "CharacteristicSpecification",
    "characteristicValueSpecification": [
        {
            "isDefault": true,
            "valueType": "string",
            "value": "Black",
            "@type": "StringCharacteristicValueSpecification"
        },
        {
            "isDefault": false,
            "valueType": "string",
            "value": "White",
            "@type": "StringCharacteristicValueSpecification"
        }
    ],
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z"
    }
}
],
"@type": "ProductSpecification"
}
```

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

Request

```
PATCH /productSpecification/{id}
Content-Type: application/json

{
    "version": "3.1",
    "validFor": {
        "startDateTime": "2020-11-24T00:00:00Z",
        "endDateTime": "2022-11-24T00:00:00Z"
    },
    "@type": "ProductSpecification"
}
```

Response

```
200

{
    "id": "9881",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
    "name": "Cisco Firepower NGFW",
    "brand": "Cisco",
    "productNumber": "CSC-340-NGFW",
    "description": "Powerful product that integrates with a firewall, including
intrusion prevention, advanced malware protection, cloud-based sandboxing, URL
filtering, endpoint protection, web gateway, email security, network traffic
analysis, network access control and CASB.",
    "isBundle": true,
    "lastUpdate": "2020-09-23T16:42:23Z",
    "lifecycleStatus": "Active",
    "version": "3.1",
    "validFor": {
        "startDateTime": "2020-11-24T00:00:00Z",
        "endDateTime": "2022-11-24T00:00:00Z"
    },
    "relatedParty": [
        {
            "role": "Owner",
            "@type": "RelatedPartyRefOrPartyRoleRef",
            "partyOrPartyRole": {
                "id": "1234",
                "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/partyRole/1234",
                "name": "Gustave Flaubert",
                "@type": "PartyRef",
                "@referredType": "Individual"
            }
        }
    ],
    "attachment": [
        {
            "id": "22",
            "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
            "name": "Product Picture",
            "mimeType": "image/jpeg",
            "url": "https://mycsp.com:7070/docloader?docnum=774451234"
        }
    ]
}
```

```
        "@referredType": "Attachment",
        "@type": "AttachmentRefOrValue"
    },
    {
        "id": "33",
        "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
        "name": "Product Manual",
        "mimeType": "application/pdf",
        "url": "https://mycsp.com:7070/docloader?docnum=774454321",
        "@referredType": "Attachment",
        "@type": "AttachmentRefOrValue"
    }
],
"bundledProductSpecification": [
    {
        "id": "15",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/15",
        "name": "URL Filter",
        "@type": "BundledProductSpecification",
        "@baseType": "",
        "lifecycleStatus": "Active"
    },
    {
        "id": "64",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/64",
        "name": "Malware Protector",
        "@type": "BundledProductSpecification",
        "@baseType": "",
        "lifecycleStatus": "Active"
    }
],
"targetProductSchema": {
    "@type": "Firewall",
    "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Product/Firewall.schema.json"
},
"productSpecificationRelationship": [
    {
        "id": "23",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/23",
        "relationshipType": "OptionalFor",
        "validFor": {
            "startDateTime": "2020-09-23T16:42:23Z"
        },
        "name": "DataPlan",
        "role": "A-Item",
        "@referredType": "ProductSpecification",
        "@type": "ProductSpecificationRelationship"
    }
],
"serviceSpecification": [
    {
        "id": "22",
        "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/22",
        "name": "Firewall",
        "version": "1.0",
        "@referredType": "ServiceSpecification",
        "@type": "ServiceSpecificationRef"
    }
]
```

```
        }
    ],
    "resourceSpecification": [
        {
            "id": "63",
            "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v5/resourceSpecification/63",
            "name": "Firewall Port",
            "version": "1.0",
            "@referredType": "PhysicalResourceSpecification",
            "@type": "ResourceSpecificationRef"
        }
    ],
    "productSpecCharacteristic": [
        {
            "name": "Number of Ports",
            "description": "The total Number of Ports for this product",
            "valueType": "number",
            "configurable": true,
            "minCardinality": 1,
            "maxCardinality": 1,
            "isUnique": true,
            "@type": "CharacteristicSpecification",
            "productSpecCharRelationship": [
                {
                    "parentSpecificationId": "43",
                    "parentSpecificationHref": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/43",
                    "characteristicSpecificationId": "2",
                    "relationshipType": "Dependency",
                    "name": "Bandwidth",
                    "validFor": {
                        "startDateTime": "2020-09-23T16:42:23-04:00"
                    },
                    "@type": "CharacteristicSpecificationRelationship"
                }
            ],
            "characteristicValueSpecification": [
                {
                    "isDefault": true,
                    "valueType": "number",
                    "validFor": {
                        "startDateTime": "2020-09-23T00:00:00Z",
                        "endDateTime": "2022-11-24T00:00:00Z"
                    },
                    "value": 8,
                    "@type": "NumberCharacteristicValueSpecification"
                },
                {
                    "isDefault": false,
                    "valueType": "number",
                    "validFor": {
                        "startDateTime": "2020-09-23T00:00:00Z",
                        "endDateTime": "2022-11-24T00:00:00Z"
                    },
                    "value": 16,
                    "@type": "NumberCharacteristicValueSpecification"
                },
                {
                    "isDefault": false,
                    "valueType": "number",
                    "validFor": {
                        "startDateTime": "2020-09-23T00:00:00Z",
                        "endDateTime": "2022-11-24T00:00:00Z"
                    }
                }
            ]
        }
    ]
}
```

```

        "endDateTime": "2022-11-24T00:00:00Z"
    },
    "value": 24,
    "@type": "NumberCharacteristicValueSpecification"
}
],
"validFor": {
    "startDateTime": "2020-09-23T16:42:23Z"
}
},
{
    "name": "Color",
    "description": "Color of the Firewall housing",
    "valueType": "string",
    "configurable": true,
    "minCardinality": 1,
    "maxCardinality": 1,
    "extensible": true,
    "isUnique": true,
    "@type": "CharacteristicSpecification",
    "characteristicValueSpecification": [
        {
            "isDefault": true,
            "valueType": "string",
            "value": "Black",
            "@type": "StringCharacteristicValueSpecification"
        },
        {
            "isDefault": false,
            "valueType": "string",
            "value": "White",
            "@type": "StringCharacteristicValueSpecification"
        }
    ],
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z"
    }
}
],
"@type": "ProductSpecification"
}

```

Update a Product Specification using json-patch

Request

```

PATCH /productSpecification/{id}
Content-Type: application/json-patch+json

[
    {
        "op": "add",
        "path": "/relatedParty",
        "value": {
            "role": "Technical Expert",
            "@type": "RelatedPartyRefOrPartyRoleRef",
            "partyOrPartyRole": {
                "id": "4321",
                "href": "https://mycsp.com:8080/tmf-api/partyManagement/v5/partyRole/4321",
            }
        }
    }
]

```

```
        "name": "Jean Jones",
        "@type": "PartyRefOrPartyRoleRef",
        "@referredType": "PartyRole"
    }
}
]
```

Response

```
200

{
    "id": "9881",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
    "name": "Cisco Firepower NGFW",
    "brand": "Cisco",
    "productNumber": "CSC-340-NGFW",
    "description": "Powerful product that integrates with a firewall, including
intrusion prevention, advanced malware protection, cloud-based sandboxing, URL
filtering, endpoint protection, web gateway, email security, network traffic
analysis, network access control and CASB.",
    "isBundle": true,
    "lastUpdate": "2020-09-23T16:42:23Z",
    "lifecycleStatus": "Active",
    "version": "3.1",
    "validFor": {
        "startDateTime": "2020-11-24T00:00:00Z",
        "endDateTime": "2022-11-24T00:00:00Z"
    },
    "relatedParty": [
        {
            "role": "Owner",
            "@type": "RelatedPartyRefOrPartyRoleRef",
            "partyOrPartyRole": {
                "id": "1234",
                "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/partyRole/1234",
                "name": "Gustave Flaubert",
                "@type": "PartyRef",
                "@referredType": "Individual"
            }
        },
        {
            "role": "Technical Expert",
            "@type": "RelatedPartyRefOrPartyRoleRef",
            "partyOrPartyRole": {
                "id": "4321",
                "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/partyRole/4321",
                "name": "Jean Jones",
                "@type": "PartyRefOrPartyRoleRef",
                "@referredType": "PartyRole"
            }
        }
    ],
    "attachment": [
        {
            "id": "22",
            "name": "Attachment 1"
        }
    ]
}
```

```
        "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
        "name": "Product Picture",
        "mimeType": "image/jpeg",
        "url": "https://mycsp.com:7070/docloader?docnum=774451234",
        "@referredType": "Attachment"
    },
    {
        "id": "33",
        "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
        "name": "Product Manual",
        "mimeType": "application/pdf",
        "url": "https://mycsp.com:7070/docloader?docnum=774454321",
        "@referredType": "Attachment"
    }
],
"bundledProductSpecification": [
    {
        "id": "15",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/15",
        "name": "URL Filter",
        "@type": "BundledProductSpecification",
        "lifecycleStatus": "Active"
    },
    {
        "id": "64",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/64",
        "name": "Malware Protector",
        "@type": "BundledProductSpecification",
        "lifecycleStatus": "Active"
    }
],
"targetProductSchema": {
    "@type": "Firewall",
    "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Product/Firewall.schema.json"
},
"productSpecificationRelationship": [
    {
        "id": "23",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/23",
        "relationshipType": "OptionalFor",
        "validFor": {
            "startDateTime": "2020-09-23T16:42:23Z"
        },
        "name": "DataPlan",
        "role": "A-Item",
        "@referredType": "ProductSpecification",
        "@type": "ProductSpecificationRelationship"
    }
],
"serviceSpecification": [
    {
        "id": "22",
        "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/22",
        "name": "Firewall",
        "version": "1.0",
        "@referredType": "ServiceSpecification",
    }
]
```

```
        "@type": "ServiceSpecificationRef"
    }
],
"resourceSpecification": [
{
    "id": "63",
    "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v5/resourceSpecification/63",
    "name": "Firewall Port",
    "version": "1.0",
    "@referredType": "PhysicalResourceSpecification",
    "@type": "ResourceSpecificationRef"
}
],
"productSpecCharacteristic": [
{
    "name": "Number of Ports",
    "description": "The total Number of Ports for this product",
    "valueType": "number",
    "configurable": true,
    "minCardinality": 1,
    "maxCardinality": 1,
    "isUnique": true,
    "@type": "ProductSpecificationCharacteristic",
    "productSpecCharRelationship": [
{
        "parentSpecificationId": "43",
        "parentSpecificationHref": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/43",
        "characteristicSpecificationId": "2",
        "relationshipType": "Dependency",
        "name": "Bandwidth",
        "validFor": {
            "startDateTime": "2020-09-23T16:42:23-04:00"
        },
        "@type": "CharacteristicSpecificationRelationship"
    }
],
"characteristicValueSpecification": [
{
    "isDefault": true,
    "valueType": "number",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2022-11-24T00:00:00Z"
    },
    "value": 8,
    "@type": "NumberCharacteristicValueSpecification"
},
{
    "isDefault": false,
    "valueType": "number",
    "validFor": {
        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2022-11-24T00:00:00Z"
    },
    "value": 16,
    "@type": "NumberCharacteristicValueSpecification"
},
{
    "isDefault": false,
    "valueType": "number",
    "validFor": {

```

```

        "startDateTime": "2020-09-23T00:00:00Z",
        "endDateTime": "2022-11-24T00:00:00Z"
    },
    "value": 24,
    "@type": "NumberCharacteristicValueSpecification"
}
],
"validFor": {"startDateTime": "2020-09-23T16:42:23Z"}
},
{
    "name": "Color",
    "description": "Color of the Firewall housing",
    "valueType": "string",
    "configurable": true,
    "minCardinality": 1,
    "maxCardinality": 1,
    "extensible": true,
    "isUnique": true,
    "@type": "CharacteristicSpecification",
    "characteristicValueSpecification": [
        {
            "isDefault": true,
            "valueType": "string",
            "value": "Black",
            "@type": "StringCharacteristicValueSpecification"
        },
        {
            "isDefault": false,
            "valueType": "string",
            "value": "White",
            "@type": "StringCharacteristicValueSpecification"
        }
    ],
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z"
    }
}
],
"@type": "ProductSpecification"
}

```

Update a Product Specification using json-patch query

Request

```

PATCH /productSpecification/{id}
Content-Type: application/json-patch-query+json

[
    {
        "op": "replace",
        "path": "/productSpecCharacteristic/characteristicValueSpecification/isDefault?value=/productSpecCharacteristic/characteristicValueSpecification/Black",
        "value": false
    },
    {
        "op": "replace",
        "path": "/productSpecCharacteristic/characteristicValueSpecification/isDefault?value=/productSpecCharacteristic/characteristicValueSpecification/White",
        "value": true
    }
]

```

```
tSpecCharacteristic/characteristicValueSpecification/White",
    "value": true
}
]
```

Response

200

```
{
  "id": "9881",
  "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/9881",
  "name": "Cisco Firepower NGFW",
  "brand": "Cisco",
  "productNumber": "CSC-340-NGFW",
  "description": "Powerful product that integrates with a firewall, including
intrusion prevention, advanced malware protection, cloud-based sandboxing, URL
filtering, endpoint protection, web gateway, email security, network traffic
analysis, network access control and CASB.",
  "isBundle": true,
  "lastUpdate": "2020-09-23T16:42:23Z",
  "lifecycleStatus": "Active",
  "version": "3.1",
  "validFor": {
    "startDateTime": "2020-11-24T00:00:00Z",
    "endDateTime": "2022-11-24T00:00:00Z"
  },
  "relatedParty": [
    {
      "role": "Owner",
      "@type": "RelatedPartyRefOrPartyRoleRef",
      "partyOrPartyRole": {
        "id": "1234",
        "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/partyRole/1234",
        "name": "Gustave Flaubert",
        "@type": "PartyRef",
        "@referredType": "Individual"
      }
    },
    {
      "role": "Technical Expert",
      "@type": "RelatedPartyRefOrPartyRoleRef",
      "partyOrPartyRole": {
        "id": "4321",
        "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/partyRole/4321",
        "name": "Jean Jones",
        "@type": "PartyRefOrPartyRoleRef",
        "@referredType": "PartyRole"
      }
    }
  ],
  "attachment": [
    {
      "id": "22",
      "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
      "name": "Product Picture",
    }
  ]
}
```

```
        "mimeType": "image/jpeg",
        "url": "https://mycsp.com:7070/docloader?docnum=774451234",
        "@referredType": "Attachment"
    },
    {
        "id": "33",
        "href": "https://mycsp.com:8080/tmf-
api/documentManagement/v5/attachment/22",
        "name": "Product Manual",
        "mimeType": "application/pdf",
        "url": "https://mycsp.com:7070/docloader?docnum=774454321",
        "@referredType": "Attachment"
    }
],
"bundledProductSpecification": [
    {
        "id": "15",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/15",
        "name": "URL Filter",
        "@type": "BundledProductSpecification",
        "lifecycleStatus": "Active"
    },
    {
        "id": "64",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/64",
        "name": "Malware Protector",
        "@type": "BundledProductSpecification",
        "lifecycleStatus": "Active"
    }
],
"targetProductSchema": {
    "@type": "Firewall",
    "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Product/Firewall.schema.json"
},
"productSpecificationRelationship": [
    {
        "id": "23",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/23",
        "relationshipType": "OptionalFor",
        "validFor": {
            "startDateTime": "2020-09-23T16:42:23Z"
        },
        "name": "DataPlan",
        "role": "A-Item",
        "@referredType": "ProductSpecification",
        "@type": "ProductSpecificationRelationship"
    }
],
"serviceSpecification": [
    {
        "id": "22",
        "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/22",
        "name": "Firewall",
        "version": "1.0",
        "@referredType": "ServiceSpecification",
        "@type": "ServiceSpecificationRef"
    }
]
,
```

```
"resourceSpecification": [
    {
        "id": "63",
        "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v5/resourceSpecification/63",
        "name": "Firewall Port",
        "version": "1.0",
        "@referredType": "PhysicalResourceSpecification",
        "@type": "ResourceSpecificationRef"
    }
],
"productSpecCharacteristic": [
    {
        "name": "Number of Ports",
        "description": "The total Number of Ports for this product",
        "valueType": "number",
        "configurable": true,
        "minCardinality": 1,
        "maxCardinality": 1,
        "isUnique": true,
        "@type": "ProductSpecificationCharacteristic",
        "productSpecCharRelationship": [
            {
                "parentSpecificationId": "43",
                "parentSpecificationHref": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productSpecification/43",
                "characteristicSpecificationId": "2",
                "relationshipType": "Dependency",
                "name": "Bandwidth",
                "validFor": {
                    "startDateTime": "2020-09-23T16:42:23-04:00"
                },
                "@type": "CharacteristicSpecificationRelationship"
            }
        ],
        "characteristicValueSpecification": [
            {
                "isDefault": true,
                "valueType": "number",
                "validFor": {
                    "startDateTime": "2020-09-23T00:00:00Z",
                    "endDateTime": "2022-11-24T00:00:00Z"
                },
                "value": 8,
                "@type": "NumberCharacteristicValueSpecification"
            },
            {
                "isDefault": false,
                "valueType": "number",
                "validFor": {
                    "startDateTime": "2020-09-23T00:00:00Z",
                    "endDateTime": "2022-11-24T00:00:00Z"
                },
                "value": 16,
                "@type": "NumberCharacteristicValueSpecification"
            },
            {
                "isDefault": false,
                "valueType": "number",
                "validFor": {
                    "startDateTime": "2020-09-23T00:00:00Z",
                    "endDateTime": "2022-11-24T00:00:00Z"
                }
            }
        ]
    }
]
```

```

        "value": 24,
        "@type": "NumberCharacteristicValueSpecification"
    }
],
"validFor": {"startDateTime": "2020-09-23T16:42:23Z"}
},
{
    "name": "Color",
    "description": "Color of the Firewall housing",
    "valueType": "string",
    "configurable": true,
    "minCardinality": 1,
    "maxCardinality": 1,
    "extensible": true,
    "isUnique": true,
    "@type": "CharacteristicSpecification",
    "characteristicValueSpecification": [
        {
            "isDefault": false,
            "valueType": "string",
            "value": "Black",
            "@type": "StringCharacteristicValueSpecification"
        },
        {
            "isDefault": true,
            "valueType": "string",
            "value": "White",
            "@type": "StringCharacteristicValueSpecification"
        }
    ],
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z"
    }
}
],
"@type": "ProductSpecification"
}

```

Deletes a ProductSpecification

DELETE /productSpecification/{id}

Description

This operation deletes a ProductSpecification entity.

Usage samples

Here is an example of a request for deleting a Product Specification.

Request

```

DELETE /productSpecification/{id}
Content-Type: application/json

{
}

```

Response

```
204
```

Operations on ProductOfferingPrice

List or find ProductOfferingPrice objects

GET /productOfferingPrice?fields=...

Description

This operation list ProductOfferingPrice 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 is an example of a request for retrieving multiple prices.

Request

```
GET /productOfferingPrice?isBundle=false  
Content-Type: application/json
```

Response

```
200  
[  
  {  
    "id": "1747",  
    "href": "https://mycsp.com:8080/tmf-  
api/productCatalogManagement/v5/productOfferingPrice/1747",  
    "name": "Recurring Charge for Business Firewall",  
    "description": "This pricing describes the recurring charge for a firewall  
service that can be deployed in business customer premise.",  
    "version": "2.0",  
    "validFor": {  
      "startDateTime": "2020-09-22T00:00:00Z",  
      "endDateTime": "2021-09-22T00:00:00Z"  
    },  
    "priceType": "recurring",  
    "recurringChargePeriodType": "monthly",  
    "recurringChargePeriodLength": 1,  
    "lastUpdate": "2020-09-23T00:00:00Z",  
    "isBundle": false,  
    "lifecycleStatus": "Active",  
    "unitOfMeasure": {  
      "amount": 1,  
      "units": "Month"  
    },  
    "price": {  
      "amount": 100,  
      "currency": "EUR",  
      "rate": 1,  
      "type": "Fixed"  
    }  
  }  
]
```

```
        "unit": "EUR",
        "value": 50
    },
    "percentage": 0.0,
    "productOfferingTerm": [
        {
            "name": "12 Month",
            "description": "12 month contract",
            "duration": {
                "amount": 12,
                "units": "Month"
            },
            "validFor": {
                "startDateTime": "2020-09-22T16:42:23Z",
                "endDateTime": "2021-09-22T00:00:00Z"
            },
            "@type": "ProductOfferingTerm"
        }
    ],
    "place": [
        {
            "id": "2707",
            "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v5/geographicAddress/2707",
            "name": "San Francisco Bay Area",
            "@referredType": "GeographicAddress",
            "@type": "PlaceRef"
        }
    ],
    "policy": [
        {
            "@referredType": "Policy",
            "name": "PriceRuleNol",
            "id": "2503",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/policy/2503",
            "@type": "PolicyRef"
        }
    ],
    "pricingLogicAlgorithm": [
        {
            "id": "2777",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/PricingLogicAlgorithm/2777",
            "name": "RecurringRatingPLA",
            "description": "Algorithm that rates Recurring event",
            "plaSpecId": "2801",
            "validFor": {
                "startDateTime": "2020-09-22T16:42:23Z",
                "endDateTime": "2021-09-22T00:00:00Z"
            },
            "@type": "PricingLogicAlgorithm"
        }
    ],
    "tax": [
        {
            "taxAmount": {
                "unit": "EUR",
                "value": 10
            },
            "taxCategory": "VAT",
            "taxRate": 20.0,
            "@type": "TaxItem"
        }
    ]
]
```

```
        }
    ],
    "popRelationship": [
        {
            "id": "1741",
            "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1741",
            "relationshipType": "discountedBy",
            "validFor": {
                "startDateTime": "2020-09-23T16:42:23Z",
                "endDateTime": "2021-09-22T00:00:00Z"
            },
            "role": "A-Charge",
            "@referredType": "ProductOfferingPriceAlteration",
            "@type": "ProductOfferingPriceRelationship"
        }
    ],
    "@type": "ProductOfferingPrice"
},
{
    "id": "1741",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1741",
    "name": "discount for Business Firewall",
    "description": "This pricing describes the discount for a firewall service
that can be deployed in business customer premise.",
    "version": "1.0",
    "validFor": {
        "startDateTime": "2020-09-22T00:00:00Z",
        "endDateTime": "2021-09-22T00:00:00Z"
    },
    "priceType": "discount",
    "recurringChargePeriodType": "monthly",
    "recurringChargePeriodLength": 1,
    "lastUpdate": "2020-11-24T00:00:00Z",
    "isBundle": false,
    "lifecycleStatus": "Active",
    "unitOfMeasure": {
        "amount": 1,
        "units": "Month"
    },
    "applicationDuration": {
        "amount": 12,
        "units": "Month"
    },
    "price": {
    },
    "percentage": 10.0,
    "priority": 1,
    "productOfferingTerm": [
    ],
    "place": [
        {
            "id": "2707",
            "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v5/geographicAddress/2707",
            "name": "San Francisco Bay Area",
            "@referredType": "GeographicAddress",
            "@type": "PlaceRef"
        }
    ],
    "policy": [
    ]
}
```

```
        "@referredType": "Policy",
        "name": "PriceRuleNol",
        "id": "2503",
        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/policy/2503",
        "@type": "PolicyRef"
    },
],
"pricingLogicAlgorithm": [
],
"tax": [
],
"popRelationship": [
{
    "id": "2027",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/2027",
    "relationshipType": "relyOn",
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z",
        "endDateTime": "2021-09-22T00:00:00Z"
    },
    "role": "discountInstance",
    "@referredType": "ProductOfferingPriceAlterationTemplate",
    "@type": "ProductOfferingPriceRelationship"
}
],
"@type": "ProductOfferingPriceAlteration"
}
]
```

Retrieves a ProductOfferingPrice by ID

GET /productOfferingPrice/{id}?fields=...

Description

This operation retrieves a ProductOfferingPrice entity. 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 is an example of a request for retrieving a specific price.

Request

```
GET /productOfferingPrice/1747
Content-Type: application/json
```

Response

```
200
```

```
{  
    "id": "1747",  
    "href": "https://mycsp.com:8080/tmf-  
api/productCatalogManagement/v5/productOfferingPrice/1747",  
    "name": "Recurring Charge for Business Firewall",  
    "description": "This pricing describes the recurring charge for a firewall  
service that can be deployed in business customer premise.",  
    "version": "2.0",  
    "validFor": {  
        "startDateTime": "2020-09-22T00:00:00Z",  
        "endDateTime": "2021-09-22T00:00:00Z"  
    },  
    "priceType": "recurring",  
    "recurringChargePeriodType": "monthly",  
    "recurringChargePeriodLength": 1,  
    "lastUpdate": "2020-09-23T00:00:00Z",  
    "isBundle": false,  
    "lifecycleStatus": "Active",  
    "unitOfMeasure": {  
        "amount": 1,  
        "units": "Month"  
    },  
    "price": {  
        "unit": "EUR",  
        "value": 50  
    },  
    "percentage": 0.0,  
    "productOfferingTerm": [  
        {  
            "name": "12 Month",  
            "description": "12 month contract",  
            "duration": {  
                "amount": 12,  
                "units": "Month"  
            },  
            "validFor": {  
                "startDateTime": "2020-09-22T16:42:23Z",  
                "endDateTime": "2021-09-22T00:00:00Z"  
            },  
            "@type": "ProductOfferingTerm"  
        }  
    ],  
    "place": [  
        {  
            "id": "2707",  
            "href": "https://mycsp.com:8080/tmf-  
api/geographicAddressManagement/v5/geographicAddress/2707",  
            "name": "San Francisco Bay Area",  
            "@referredType": "GeographicAddress",  
            "@type": "PlaceRef"  
        }  
    ],  
    "policy": [  
        {  
            "@referredType": "Policy",  
            "name": "PriceRuleNo1",  
            "id": "2503",  
            "href": "https://mycsp.com:8080/tmf-  
api/productCatalogManagement/v5/policy/2503",  
            "@type": "PolicyRef"  
        }  
    ],  
    "pricingLogicAlgorithm": [  
]
```

```
{
  "id": "2777",
  "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/PricingLogicAlgorithm/2777",
  "name": "RecurringRatingPLA",
  "description": "Algorithm that rates Recurring event",
  "plaSpecId": "2801",
  "validFor": [
    {
      "startDateTime": "2020-09-22T16:42:23Z",
      "endDateTime": "2021-09-22T00:00:00Z"
    },
    "@type": "PricingLogicAlgorithm"
  ]
},
"tax": [
  {
    "taxAmount": {
      "unit": "EUR",
      "value": 10
    },
    "taxCategory": "VAT",
    "taxRate": 20.0,
    "@type": "TaxItem"
  }
],
"popRelationship": [
  {
    "id": "1741",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1741",
    "relationshipType": "discountedBy",
    "validFor": [
      {
        "startDateTime": "2020-09-23T16:42:23Z",
        "endDateTime": "2021-09-22T00:00:00Z"
      },
      "role": "A-Charge",
      "@referredType": "ProductOfferingPriceAlteration",
      "@type": "ProductOfferingPriceRelationship"
    ]
  },
  "@type": "ProductOfferingPrice"
}
}
```

Creates a ProductOfferingPrice

POST /productOfferingPrice?fields=...

Description

This operation creates a ProductOfferingPrice entity.

Mandatory Attributes

Mandatory Attributes	Rule
lastUpdate	
lifecycleStatus	
name	

Mandatory Attributes	Rule
priceType	
@type	

Usage samples

Here is an example of a request for creating a specific price.

Request

```
POST /productOfferingPrice
Content-Type: application/json

{
  "id": "1747",
  "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1747",
  "name": "Recurring Charge for Business Firewall",
  "description": "This pricing describes the recurring charge for a firewall
service that can be deployed in business customer premise.",
  "version": "1.0",
  "validFor": {
    "startDateTime": "2020-09-22T00:00:00Z",
    "endDateTime": "2021-09-22T00:00:00Z"
  },
  "priceType": "recurring",
  "recurringChargePeriodType": "monthly",
  "recurringChargePeriodLength": 1,
  "lastUpdate": "2020-09-23T00:00:00Z",
  "isBundle": false,
  "lifecycleStatus": "Active",
  "unitOfMeasure": {
    "amount": 1,
    "units": "Month"
  },
  "price": {
    "unit": "EUR",
    "value": 50
  },
  "percentage": 0,
  "productOfferingTerm": [
    {
      "name": "12 Month",
      "description": "12 month contract",
      "duration": {
        "amount": 12,
        "units": "Month"
      },
      "validFor": {
        "startDateTime": "2020-09-22T16:42:23Z",
        "endDateTime": "2021-09-22T00:00:00Z"
      },
      "@type": "ProductOfferingTerm"
    }
  ],
  "place": [
    {
      "id": "2707",
      "name": "Business Firewall"
    }
  ]
}
```

```
        "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v5/geographicAddress/2707",
        "name": "San Francisco Bay Area",
        "@referredType": "GeographicAddress",
        "@type": "PlaceRef"
    }
],
"policy": [
{
    "@referredType": "Policy",
    "name": "PriceRuleNo1",
    "id": "2503",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/policy/2503",
    "@type": "PolicyRef"
}
],
"pricingLogicAlgorithm": [
{
    "id": "2777",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/PricingLogicAlgorithm/2777",
    "name": "RecurringRatingPLA",
    "description": "Algorithm that rates Recurring event",
    "plaSpecId": "2801",
    "validFor": {
        "startDateTime": "2020-09-22T16:42:23Z",
        "endDateTime": "2021-09-22T00:00:00Z"
    },
    "@type": "PricingLogicAlgorithm"
}
],
"tax": [
{
    "taxAmount": {
        "unit": "EUR",
        "value": 10
    },
    "taxCategory": "VAT",
    "taxRate": 20,
    "@type": "TaxItem"
}
],
"popRelationship": [
{
    "id": "1741",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1741",
    "relationshipType": "discountedBy",
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z",
        "endDateTime": "2021-09-22T00:00:00Z"
    },
    "role": "A-Charge",
    "@referredType": "ProductOfferingPriceAlteration",
    "@type": "ProductOfferingPriceRelationship"
}
],
"@type": "ProductOfferingPrice"
}
```

Response

```
201

{
    "id": "1747",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1747",
    "name": "Recurring Charge for Business Firewall",
    "description": "This pricing describes the recurring charge for a firewall
service that can be deployed in business customer premise.",
    "version": "1.0",
    "validFor": {
        "startDateTime": "2020-09-22T00:00:00Z",
        "endDateTime": "2021-09-22T00:00:00Z"
    },
    "priceType": "recurring",
    "recurringChargePeriodType": "monthly",
    "recurringChargePeriodLength": 1,
    "lastUpdate": "2020-09-23T00:00:00Z",
    "isBundle": false,
    "lifecycleStatus": "Active",
    "unitOfMeasure": {
        "amount": 1,
        "units": "Month"
    },
    "price": {
        "unit": "EUR",
        "value": 50
    },
    "percentage": 0.0,
    "productOfferingTerm": [
        {
            "name": "12 Month",
            "description": "12 month contract",
            "duration": {
                "amount": 12,
                "units": "Month"
            },
            "validFor": {
                "startDateTime": "2020-09-22T16:42:23Z",
                "endDateTime": "2021-09-22T00:00:00Z"
            },
            "@type": "ProductOfferingTerm"
        }
    ],
    "place": [
        {
            "id": "2707",
            "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v5/geographicAddress/2707",
            "name": "San Francisco Bay Area",
            "@referredType": "GeographicAddress",
            "@type": "PlaceRef"
        }
    ],
    "policy": [
        {
            "@referredType": "Policy",
            "name": "PriceRuleNo1",
            "id": "2503",
            "version": "1.0"
        }
    ]
}
```

```

        "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/policy/2503",
        "@type": "PolicyRef"
    }
],
"pricingLogicAlgorithm": [
{
    "id": "2777",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/PricingLogicAlgorithm/2777",
    "name": "RecurringRatingPLA",
    "description": "Algorithm that rates Recurring event",
    "plaSpecId": "2801",
    "validFor": {
        "startDateTime": "2020-09-22T16:42:23Z",
        "endDateTime": "2021-09-22T00:00:00Z"
    },
    "@type": "PricingLogicAlgorithm"
}
],
"tax": [
{
    "taxAmount": {
        "unit": "EUR",
        "value": 10
    },
    "taxCategory": "VAT",
    "taxRate": 20.0,
    "@type": "TaxItem"
}
],
"popRelationship": [
{
    "id": "1741",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1741",
    "relationshipType": "discountedBy",
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z",
        "endDateTime": "2021-09-22T00:00:00Z"
    },
    "role": "A-Charge",
    "@referredType": "ProductOfferingPriceAlteration",
    "@type": "ProductOfferingPriceRelationship"
}
],
"@type": "ProductOfferingPrice"
}
]

```

Updates partially a ProductOfferingPrice

PATCH /productOfferingPrice/{id}?fields=...

Description

This operation allows partial updates of a ProductOfferingPrice 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

Non Patchable Attributes	Rule
href	
id	
lastUpdate	
@baseType	@baseType is immutable
@schemaLocation	@schemaLocation is immutable
@type	@type is immutable

Patchable Attributes	Rule
bundledPopRelationship	
description	
externalIdentifier	
isBundle	
lifecycleStatus	
name	
percentage	
place	
policy	
popRelationship	
price	
priceType	
pricingLogicAlgorithm	
prodSpecCharValueUse	
productOfferingTerm	
recurringChargePeriodLength	
recurringChargePeriodType	
tax	
unitOfMeasure	
validFor	
version	

Usage samples

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

Request

```
PATCH /productOfferingPrice/{id}
Content-Type: application/merge-patch+json

{
    "version": "2.0",
    "validFor": {
        "startDateTime": "2020-11-06T00:00:00Z",
        "endDateTime": "2021-11-06T00:00:00Z"
    },
    "@type": "ProductOfferingPrice"
}
```

Response

```
200

{
    "id": "1747",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1747",
    "name": "Recurring Charge for Business Firewall",
    "description": "This pricing describes the recurring charge for a firewall
service that can be deployed in business customer premise.",
    "version": "2.0",
    "validFor": {
        "startDateTime": "2020-11-06T00:00:00Z",
        "endDateTime": "2021-11-06T00:00:00Z"
    },
    "priceType": "recurring",
    "recurringChargePeriodType": "monthly",
    "recurringChargePeriodLength": 1,
    "lastUpdate": "2020-09-23T00:00:00Z",
    "isBundle": false,
    "lifecycleStatus": "Active",
    "unitOfMeasure": {
        "amount": 1,
        "units": "Month"
    },
    "price": {
        "unit": "EUR",
        "value": 50
    },
    "percentage": 0.0,
    "productOfferingTerm": [
        {
            "name": "12 Month",
            "description": "12 month contract",
            "duration": {
                "amount": 12,
                "units": "Month"
            },
            "validFor": {
                "startDateTime": "2020-09-22T16:42:23Z",
                "endDateTime": "2021-09-22T16:42:23Z"
            }
        }
    ]
}
```

```
        "endDateTime": "2021-09-22T00:00:00Z"
    },
    "@type": "ProductOfferingTerm"
}
],
"place": [
{
    "id": "2707",
    "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v5/geographicAddress/2707",
    "name": "San Francisco Bay Area",
    "@referredType": "GeographicAddress",
    "@type": "PlaceRef"
}
],
"policy": [
{
    "@referredType": "Policy",
    "name": "PriceRuleNo1",
    "id": "2503",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/policy/2503",
    "@type": "PolicyRef"
}
],
"pricingLogicAlgorithm": [
{
    "id": "2777",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/PricingLogicAlgorithm/2777",
    "name": "RecurringRatingPLA",
    "description": "Algorithm that rates Recurring event",
    "plaSpecId": "2801",
    "validFor": {
        "startDateTime": "2020-09-22T16:42:23Z",
        "endDateTime": "2021-09-22T00:00:00Z"
    },
    "@type": "PricingLogicAlgorithm"
}
],
"tax": [
{
    "taxAmount": {
        "unit": "EUR",
        "value": 10
    },
    "taxCategory": "VAT",
    "taxRate": 20.0,
    "@type": "TaxItem"
}
],
"popRelationship": [
{
    "id": "1741",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1741",
    "relationshipType": "discountedBy",
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z",
        "endDateTime": "2021-09-22T00:00:00Z"
    },
    "role": "A-Charge",
    "@referredType": "ProductOfferingPriceAlteration",
}
```

```
        "@type": "ProductOfferingPriceRelationship"
    }
],
"@type": "ProductOfferingPrice"
}
```

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

Request

```
PATCH /productOfferingPrice/{id}
Content-Type: application/json

{
    "version": "2.0",
    "validFor": {
        "startDateTime": "2020-11-06T00:00:00Z",
        "endDateTime": "2021-11-06T00:00:00Z"
    },
    "@type": "ProductOfferingPrice"
}
```

Response

```
200

{
    "id": "1747",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1747",
    "name": "Recurring Charge for Business Firewall",
    "description": "This pricing describes the recurring charge for a firewall
service that can be deployed in business customer premise.",
    "version": "2.0",
    "validFor": {
        "startDateTime": "2020-11-06T00:00:00Z",
        "endDateTime": "2021-11-06T00:00:00Z"
    },
    "priceType": "recurring",
    "recurringChargePeriodType": "monthly",
    "recurringChargePeriodLength": 1,
    "lastUpdate": "2020-09-23T00:00:00Z",
    "isBundle": false,
    "lifecycleStatus": "Active",
    "unitOfMeasure": {
        "amount": 1,
        "units": "Month"
    },
    "price": {
        "unit": "EUR",
        "value": 50
    },
    "percentage": 0.0,
    "productOfferingTerm": [
        {
            "name": "12 Month",
            "validFor": {
                "startDateTime": "2020-11-06T00:00:00Z",
                "endDateTime": "2021-11-06T00:00:00Z"
            }
        }
    ]
}
```

```
        "description": "12 month contract",
        "duration": {
            "amount": 12,
            "units": "Month"
        },
        "validFor": {
            "startDateTime": "2020-09-22T16:42:23Z",
            "endDateTime": "2021-09-22T00:00:00Z"
        },
        "@type": "ProductOfferingTerm"
    }
],
"place": [
{
    "id": "2707",
    "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v5/geographicAddress/2707",
    "name": "San Francisco Bay Area",
    "@referredType": "GeographicAddress",
    "@type": "PlaceRef"
}
],
"policy": [
{
    "@referredType": "Policy",
    "name": "PriceRuleNol",
    "id": "2503",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/policy/2503",
    "@type": "PolicyRef"
}
],
"pricingLogicAlgorithm": [
{
    "id": "2777",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/PricingLogicAlgorithm/2777",
    "name": "RecurringRatingPLA",
    "description": "Algorithm that rates Recurring event",
    "plaSpecId": "2801",
    "validFor": {
        "startDateTime": "2020-09-22T16:42:23Z",
        "endDateTime": "2021-09-22T00:00:00Z"
    },
    "@type": "PricingLogicAlgorithm"
}
],
"tax": [
{
    "taxAmount": {
        "unit": "EUR",
        "value": 10
    },
    "taxCategory": "VAT",
    "taxRate": 20.0,
    "@type": "TaxItem"
}
],
"popRelationship": [
{
    "id": "1741",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1741",
    "@type": "OfferingPrice"
}
]
```

```

        "relationshipType": "discountedBy",
        "validFor": {
            "startDateTime": "2020-09-23T16:42:23Z",
            "endDateTime": "2021-09-22T00:00:00Z"
        },
        "role": "A-Charge",
        "@referredType": "ProductOfferingPriceAlteration",
        "@type": "ProductOfferingPriceRelationship"
    }
],
"@type": "ProductOfferingPrice"
}

```

Update a Product Offering Price using json-patch

Request

```

PATCH /productOfferingPrice/{id}
Content-Type: application/json-patch+json

[
    {
        "op": "add",
        "path": "/place",
        "value": {
            "id": "2807",
            "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v5/geographicAddress/2807",
            "name": "San Francisco Bay Area",
            "@referredType": "GeographicAddress",
            "@type": "PlaceRef"
        }
    }
]

```

Response

```

200

{
    "id": "1747",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1747",
    "name": "Recurring Charge for Business Firewall",
    "description": "This pricing describes the recurring charge for a firewall
service that can be deployed in business customer premise.",
    "version": "2.0",
    "validFor": {
        "startDateTime": "2020-11-06T00:00:00Z",
        "endDateTime": "2021-11-06T00:00:00Z"
    },
    "priceType": "recurring",
    "recurringChargePeriodType": "monthly",
    "recurringChargePeriodLength": 1,
    "lastUpdate": "2020-09-23T00:00:00Z",
    "isBundle": false,
    "lifecycleStatus": "Active",
}

```

```
"unitOfMeasure": {
    "amount": 1,
    "units": "Month"
},
"price": {
    "unit": "EUR",
    "value": 50
},
"percentage": 0.0,
"productOfferingTerm": [
    {
        "name": "12 Month",
        "description": "12 month contract",
        "duration": {
            "amount": 12,
            "units": "Month"
        },
        "validFor": {
            "startDateTime": "2020-09-22T16:42:23Z",
            "endDateTime": "2021-09-22T00:00:00Z"
        },
        "@type": "ProductOfferingTerm"
    }
],
"place": [
    {
        "id": "2707",
        "href": "https://mycsp.com:8080/tmf-api/geographicAddressManagement/v5/geographicAddress/2707",
        "name": "San Francisco Bay Area",
        "@referredType": "GeographicAddress",
        "@type": "PlaceRef"
    },
    {
        "id": "2807",
        "href": "https://mycsp.com:8080/tmf-api/geographicAddressManagement/v5/geographicAddress/2807",
        "name": "San Francisco Bay Area",
        "@referredType": "GeographicAddress",
        "@type": "PlaceRef"
    }
],
"policy": [
    {
        "@referredType": "Policy",
        "name": "PriceRuleNol",
        "id": "2503",
        "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/policy/2503",
        "@type": "PolicyRef"
    }
],
"pricingLogicAlgorithm": [
    {
        "id": "2777",
        "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v5/PricingLogicAlgorithm/2777",
        "name": "RecurringRatingPLA",
        "description": "Algorithm that rates Recurring event",
        "plaSpecId": "2801",
        "validFor": {
            "startDateTime": "2020-09-22T16:42:23Z",
            "endDateTime": "2021-09-22T00:00:00Z"
        }
    }
]
```

```

        },
        "@type": "PricingLogicAlgorithm"
    }
],
"tax": [
{
    "taxAmount": {
        "unit": "EUR",
        "value": 10
    },
    "taxCategory": "VAT",
    "taxRate": 20.0,
    "@type": "TaxItem"
}
],
"popRelationship": [
{
    "id": "1741",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1741",
    "relationshipType": "discountedBy",
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z",
        "endDateTime": "2021-09-22T00:00:00Z"
    },
    "role": "A-Charge",
    "@referredType": "ProductOfferingPriceAlteration",
    "@type": "ProductOfferingPriceRelationship"
}
],
"@type": "ProductOfferingPrice"
}

```

Update a Product Offering Price using json-patch

Request

```

PATCH /productOfferingPrice/{id}
Content-Type: application/json-patch+json

[
{
    "op": "remove",
    "path": "/place?id=2807"
}
]

```

Response

```

200

{
    "id": "1747",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1747",
    "name": "Recurring Charge for Business Firewall",
    "description": "This pricing describes the recurring charge for a firewall"
}

```

```
service that can be deployed in business customer premise.",  
    "version": "2.0",  
    "validFor": {  
        "startDateTime": "2020-11-06T00:00:00Z",  
        "endDateTime": "2021-11-06T00:00:00Z"  
    },  
    "priceType": "recurring",  
    "recurringChargePeriodType": "monthly",  
    "recurringChargePeriodLength": 1,  
    "lastUpdate": "2020-09-23T00:00:00Z",  
    "isBundle": false,  
    "lifecycleStatus": "Active",  
    "unitOfMeasure": {  
        "amount": 1,  
        "units": "Month"  
    },  
    "price": {  
        "unit": "EUR",  
        "value": 50  
    },  
    "percentage": 0.0,  
    "productOfferingTerm": [  
        {  
            "name": "12 Month",  
            "description": "12 month contract",  
            "duration": {  
                "amount": 12,  
                "units": "Month"  
            },  
            "validFor": {  
                "startDateTime": "2020-09-22T16:42:23Z",  
                "endDateTime": "2021-09-22T00:00:00Z"  
            },  
            "@type": "ProductOfferingTerm"  
        }  
    ],  
    "place": [  
        {  
            "id": "2707",  
            "href": "https://mycsp.com:8080/tmf-  
api/geographicAddressManagement/v5/geographicAddress/2707",  
            "name": "San Francisco Bay Area",  
            "@referredType": "GeographicAddress",  
            "@type": "PlaceRef"  
        },  
    ],  
    "policy": [  
        {  
            "@referredType": "Policy",  
            "name": "PriceRuleNo1",  
            "id": "2503",  
            "href": "https://mycsp.com:8080/tmf-  
api/productCatalogManagement/v5/policy/2503",  
            "@type": "PolicyRef"  
        }  
    ],  
    "pricingLogicAlgorithm": [  
        {  
            "id": "2777",  
            "href": "https://mycsp.com:8080/tmf-  
api/productCatalogManagement/v5/PricingLogicAlgorithm/2777",  
            "name": "RecurringRatingPLA",  
            "description": "Algorithm that rates Recurring event",  
            "type": "PricingLogicAlgorithm"  
        }  
    ]  
}
```

```

    "plaSpecId": "2801",
    "validFor": {
        "startDateTime": "2020-09-22T16:42:23Z",
        "endDateTime": "2021-09-22T00:00:00Z"
    },
    "@type": "PricingLogicAlgorithm"
}
],
"tax": [
{
    "taxAmount": {
        "unit": "EUR",
        "value": 10
    },
    "taxCategory": "VAT",
    "taxRate": 20.0,
    "@type": "TaxItem"
}
],
"popRelationship": [
{
    "id": "1741",
    "href": "https://mycsp.com:8080/tmf-
api/productCatalogManagement/v5/productOfferingPrice/1741",
    "relationshipType": "discountedBy",
    "validFor": {
        "startDateTime": "2020-09-23T16:42:23Z",
        "endDateTime": "2021-09-22T00:00:00Z"
    },
    "role": "A-Charge",
    "@referredType": "ProductOfferingPriceAlteration",
    "@type": "ProductOfferingPriceRelationship"
}
],
"@type": "ProductOfferingPrice"
}
]

```

Deletes a ProductOfferingPrice

DELETE /productOfferingPrice/{id}

Description

This operation deletes a ProductOfferingPrice entity.

Usage samples

Here is an example of a request for deleting a Product Offering Price.

Request

```

DELETE /productOfferingPrice/{id}
Content-Type: application/json

{
}

```

Response

204

API NOTIFICATIONS

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

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

Register listener

POST /hub

Description

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

Behavior

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

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

Usage Samples

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

Request

```
POST /api/hub
Accept: application/json
{
  "callback": "http://in.listener.com"
}
```

Response

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

Unregister listener

DELETE /hub/{id}

Description

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

Behavior

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

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

Usage Samples

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

Request

```
DELETE /api/hub/42  
Accept: application/json
```

Response

```
204
```

Publish Event to listener

POST /client/listener

Description

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

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

Behavior

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

Usage Samples

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

Request

```
POST /client/listener

Accept: application/json

{
    "event": {
        EVENT BODY
    },
    "eventType": "EVENT_TYPE"
}
```

Response

```
201
```

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

Acknowledgements

Release History

Release Number	Date	Release led by:	Description
Version 2.2.0	27-Aug-2017	Kamal Maghsoudlou Ericsson kamal.maghsoudlou@ericsson.com	Miscellaneous corrections and clarifications Incorporated comments from API team review
Release 17.5.0	1-Nov-2017	Kamal Maghsoudlou kamal.maghsoudlou@ericsson.com	Published
Version 4.0.0	1-July-2019	Jonathan Goldberg Amdocs Jonathan.Goldberg@amdocs.com	Schema alignment for commerce APIs in release 19.0
Release 19.0.0	1-July-2019	Pierre Gauthier TM Forum pgauthier@tmforum.org	Published
Version 4.1.0	September 2020	Kamal Maghsoudlou Ericsson kamal.maghsoudlou@ericsson.com	<ul style="list-style-type: none"> Added PO to PO relationship, Applied RefOrValue pattern to embedded POP in PO Updated examples
Version 4.2.0	June 2022	Jonathan Goldberg Amdocs Jonathan.Goldberg@amdocs.com	Miscellaneous changes listed in https://projects.tmforum.org/jira/browse/AP-3898
Version 5.0.0	September 2023	Jonathan Goldberg Amdocs Jonathan.Goldberg@amdocs.com	Upgrade to V5 design patterns and OAS3

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