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Network as a Service (Naas) Management REST API Specification

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Executive Summary

The scope of this document is to define the API Component Suite in support of a set of Operational Domains exposing and managing “Network” Services. These services are referred to as Network as a Service (NaaS) and include all services offered from a service provider including connectivity, end points, media services, etc. An Operational Domain supports a set of functions and capabilities responsible for the complete lifecycle of services and resources within its domain, including exposure of services supported by SLAs, interfacing via standard TMF APIs with the BSS systems and other operational domains. The API set supports the control plane for the services and not the delivery of the service.

The first aim and objectives of the NaaS component suite is to set the API control plane contract between OSS/BSS (IT systems) and operational domains as well as between operational domains to operational domains.

Whilst the API standards in this document define the framework and common header information for exposed services, at this time the service details are to be defined by the individual operational domains.

Parallel work will focus on a Standard data model from a set of CSP top service priority. The result can be referenced, and feedback added in this document in future releases.

1. Introduction

This component suite covers the operations required to be exposed in order to provide the functionality required by Operational Domains interworking with OSS/BSS applications and/or other domains from one service provider or from 3rd parties. One of the key requirements is the re-use of an API functionality rather than using a large set of specific APIs. This also simplifies the number of APIs needed and reduces the initial and maintenance costs as suppliers typically charge on a per API basis.

The NaaS API component suite implements a subset of the proposed scenarios in HIP Management platform **TMF070B Advanced Platform Deployment Blueprints R17.5.1** section 8

- [8.2. Product Pre-Ordering](#)
- [8.3. Product Ordering and Activation and Configuration \(A&C\)](#)
- [8.4. SLA Violation Reporting and Dynamic Product Instance Inventory](#)
- [8.5. SLA Violation Correction](#)

The APIs:

- Will not be defining customer products or offers
- Will be implemented using the Hypermedia APIs with dynamic payloads that make the services self-descriptive wherever possible
- Will be operating on customer facing services or private services, the latter services only exposed towards other operational domains
- Will perform lifecycle actions to the expose network services (generally CFS)
- Communicate what the BSS needs back from the Network Services
- Will not be dealing with CRM, or Billing and will not have to care about a network function being virtualized or physical (That's the domain responsibility) unless it is mandatory (such as a service end point).

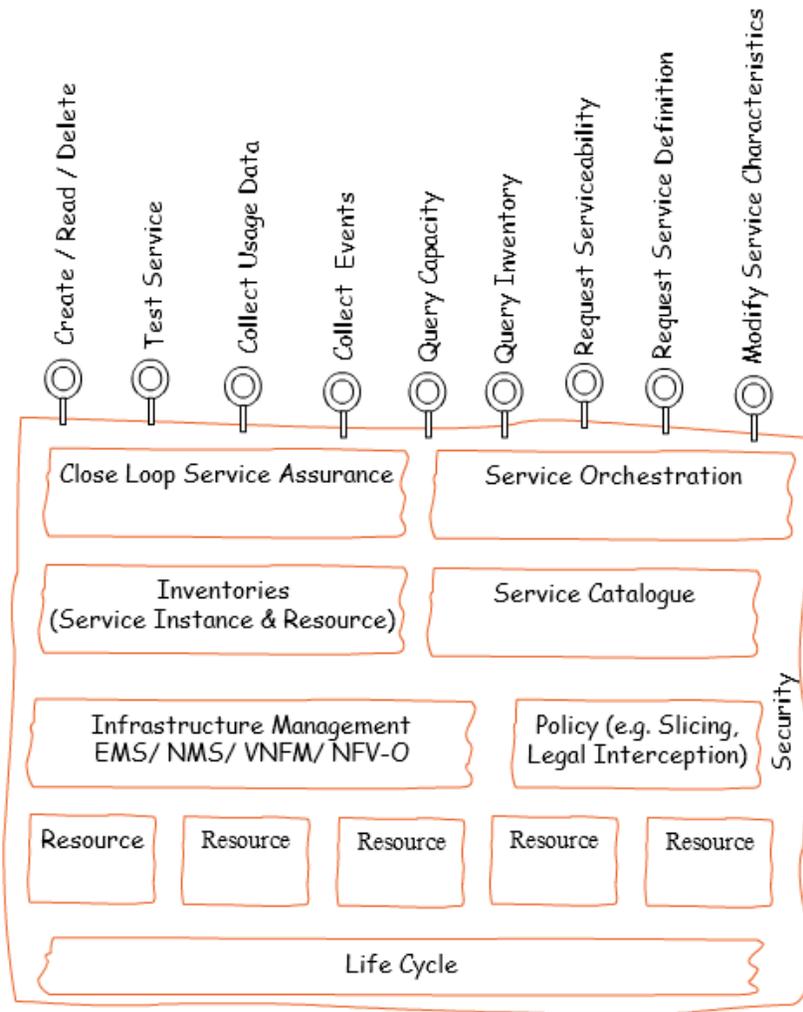


Figure 1. Operational Domain Management Functions and Capabilities

The NaaS API component suite supports the lifecycle functions required to manage the network capabilities exposed as Network as a Service and managed by operational domains.

2. Requirements and Use Cases

This section describes the functions that are needed to deliver Network as a Service.

While “service” can be the service specification or service instance, within this document the use of unqualified service will always mean service instance. Service specification will also be fully qualified.

A network service typically has a long-life span and can undergo numerous changes throughout its life. A service may be created, fail, be restored, be made inactive (maybe for non-payment), be made active again, fail, and be restored, etc. throughout its life. As such this standard does not try to provide all the possible ordering of actions against a service. The material is all the atomic actions as the ordering of the various actions are generally independent or the preconditions are documented. Similar, notifications are only explicitly mentioned in sections 3 and 4 when they originate autonomously from the operational domain. Notifications that are caused by API calls are not covered in section 3 and 4 as they are generally redundant (e.g., a POST call to create a service will cause a serviceCreationNotification and/or a monitor*ChangeNotification) as they simply document what the API call caused. Similarly, the link to a returned Monitor for long running transactions is generally not mentioned as this pattern is true for all long running transactions.

There is some inherent flexibility in the TMF Open API design to support different business models. One area where this flexibility is clear is whether the network exposes single services and service order processing is fully a BSS responsibility. Or the network may accept the full or partial service order and service order processing is a network responsibility. The decision drives the usage of TMF 641 and/or 640 and is at the discretion of each CSP.

2.1. Requirements

The NaaS API component suite includes APIs classified in 5 main lifecycle areas:

- Prospect to Order (P2O)
- Order to Activate (O2A)
- Trouble to Resolution (T2R)
- Usage to Payment (also referred to as U2C - Usage to Cash)
- Concept to Market
 - The output of service design process are the service specifications. The existence of the service specifications in the TMF Service Catalog (TMF633) is a pre-condition for this component suite standard

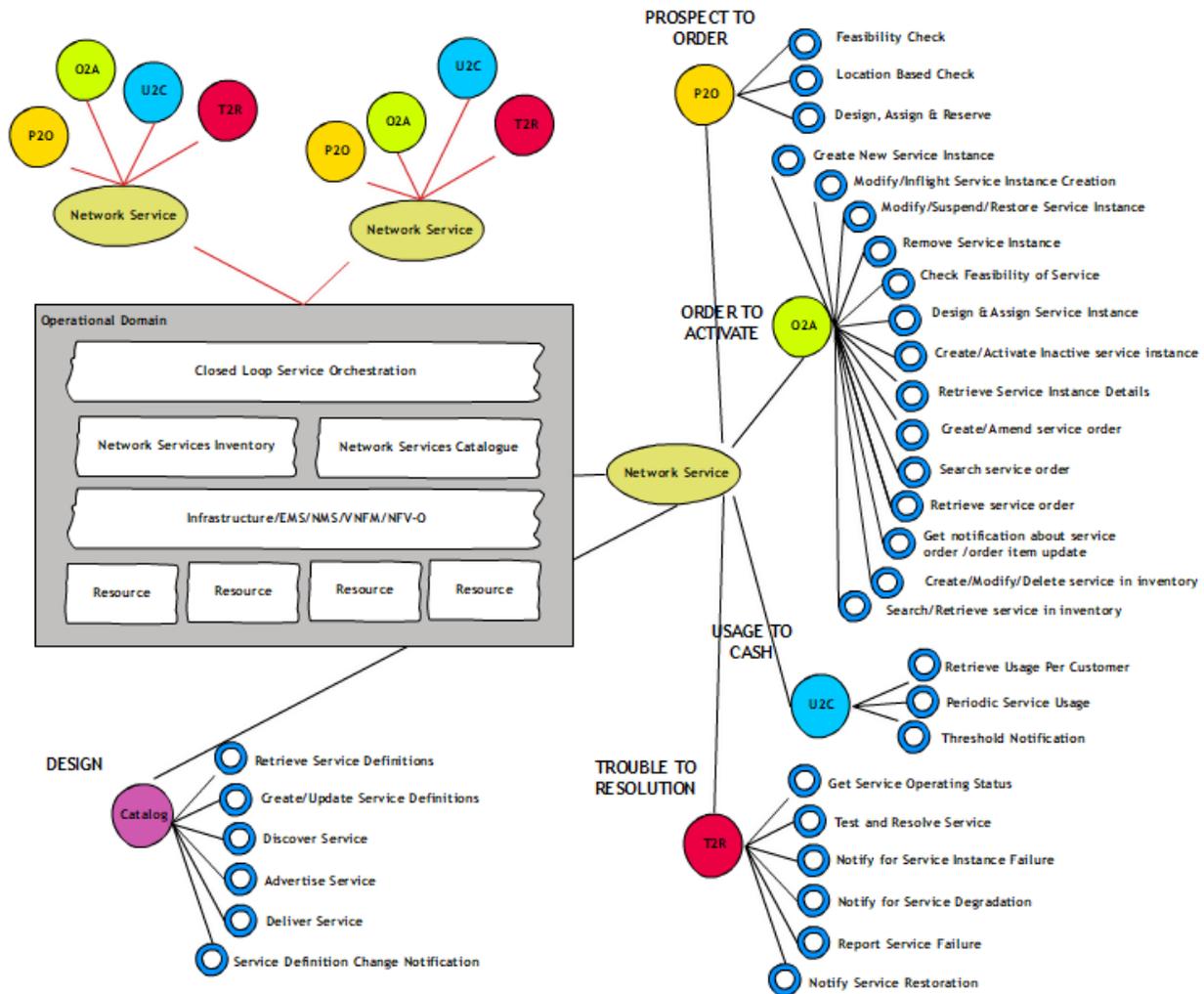


Figure 2. NaaS API component suite classified in the main lifecycle areas

Note as there is overlap between Prospect to Order and Order to Activate within the TMF standards, the Prospect to Order follows Order to Activate. This is simply to improve readability of this document.

2.1.1. Order to Activate

The order to activate functional area includes all activities to support the business/customer layer in delivering ordered services. This includes full lifecycle support for all network services.

Order to activate also includes any changes (inflight and post activation) along with life cycle management of the service.

2.1.2. Prospect to Order

The prospect to order process includes all activities supporting the business/customer layer in evaluating what products can be offered to a customer. This ranges from simple geographically based checks to see if a service is offered to fully designing and assigning all aspects of a service and reserving the resources to provide the service.

There are three main scenarios:

- Location based check. The check is fully automatic.
- Feasibility check. The complexity of this check ranges from fully automatic to extensive manual design. The results of a feasibility check are saved.
- Design, assign, and reserve. The service is fully designed and assigned. The underlying network resources are reserved. The results are saved.

2.1.3.Trouble to Resolution

The Trouble to Resolution functional area provides the business/customer layer with the operating status of service instances and the ability to initiate testing of service instances. This includes full lifecycle support for all network services to be supported for service assurance.

Operational Domain Management functions will not expose resource level functions (such as Performance Management and Fault Management) to the BSS domain or consumer systems as these functions will remain internal to the operational domain itself and will work primarily on information abstracted from the network layer. Operational Domains will not be responsible for processing Trouble ticket nor SLA, but they can send status to these applications when thresholds are crossed.

2.1.4.Usage to Cash

The usage to payment includes all activities supporting the business/customer layer in evaluating Usage Consumption for subscribed communication products. It also allows customers or users to be informed on usage and remaining credits available for the subscribed service.

There are three scenarios that need to be supported:

- Retrieval of Usage per customer/on request: - This can be a synchronous call to get the information and we can also anticipate that few systems might require an asynchronous behaviour to provide the usage consumption information. When such need arises, notification can be used to pass the usage information.
- Scheduled Service Usage Record for a service.
- Threshold Notification for Service Usage to indicate that a customer has already consumed X% of the allocated quota.

2.1.5.Service Catalog (Design Time)

Service Catalog provide a centralized repository of all the service definitions offered by an internal (or a partner) domain (s).

The Service Catalog Management allows the management of the entire lifecycle of the Service Catalog elements and the consultation of service catalog elements during several processes such as service activation, service assurance, etc.

During runtime, the service catalog is only used to retrieve service definitions i.e. specifications. During the design time, it is used to retrieve, create and update the service

specification. The concept to market activities of service design are not in the scope of this standard.

2.2. Use Cases

This section provides examples of how the most common business functions are implemented using the API standard.

2.2.1. Order to Activate Use Cases

The key order to activate business functions are:

- Create new service
- Monitor long running service creation process
- Modify inflight service creation
- Cancel inflight service creation
- Modify existing service
- Suspend service / restore service
- Remove service
- Check feasibility of a service
- Design and Assign a service and reserve resources
- Create an inactive service
- Activate an inactive service
- Search service
- Retrieve service details
- Create new service order
- Amend existing service order
- Search service order(s)
- Retrieve service order

2.2.2. Prospect to Order Use Cases

The key prospect order to activate business functions are:

- Location based check
- Feasibility check
- Design, assign, and reserve

The latter two are used during the prospect to order and order to activate business processes. For example, a feasibility check can be supporting the business processes such as configure, price and quote and used as part of evaluating alternative options for an order. From a network perspective, the process is the same. As such the Feasibility Check and the Design, Assign and Reserve process are identical to the discussion in the O2A section.

2.2.3. Trouble to Resolution Use Cases

Trouble to Resolution area can be sub-classified broadly into two main categories:

- Reactive T2R

- Proactive T2R

Reactive T2R process is when a consumer system reports a problem. Proactive T2R processes is notifying consumer system(s) when operational domain detects service problems.

2.2.4.Usage to Cash Use Cases

The key usage to cash business functions are:

- Retrieval of Usage per customer/on request for a Service
- Periodic Service Usage Record for a Service
- Threshold Notification for a Service

2.2.5.Service Catalog (Design Time)

The key Design Time business functions are:

- Retrieve Service Definitions (design and run time)
- Create Service Definitions *
- Update Service Definitions *
- Discover Services
- Advertise Services
- Deliver Services
- Service Definition Change Notification.

* Restricted to the operational domain providing the service.

3. Component Capabilities, Flows and Sequence Diagrams

3.1. Requirements to Functions

Requirement	Function
Order to Activate	<ul style="list-style-type: none"> • Create new service • Monitor long running service creation process • Modify inflight service creation • Cancel inflight service creation • Modify existing service • Suspend service / restore service • Remove service • Check feasibility of a service • Design and Assign a service and reserve resources • Create an inactive service • Activate an inactive service • Search service • Retrieve service details • Create new service order • Amend existing service order • Search service order(s) • Retrieve service order •
Prospect to Order	<ul style="list-style-type: none"> • Location based check • Feasibility check • Design, assign, and reserve
Trouble to Resolution	<ul style="list-style-type: none"> • Obtain existing Service Problem details • Create Service Problem • Modify / Update Service problem • Delete service problem that is no longer valid and was raised by consumer system earlier • Operational domain requesting additional information about ticket • Validate and Test service for reported problems by creating service test • Fetch Service test result on completion

Requirement	Function
	<ul style="list-style-type: none"> • Modify service test parameters • Creation of ticket proactively by domain • Identification of a notifiable SLA violation • Identification of service affecting performance issue • Identification of a notifiable service degradation or any major outage • Resolution or restoration of service
Usage to Cash	<ul style="list-style-type: none"> • Retrieval of Usage per customer/on request for a Service • Periodic Service Usage Record for a Service • Threshold Notification for a Service
Service Catalog	<ul style="list-style-type: none"> • Retrieve Service Definitions • Create Service Definitions • Update Service Definitions • Discover Services • Advertise Services • Deliver Services • Service Definition Change Notification.

Table 1. NaaS Requirements, Functions and associated APIs

3.2. Sequence Diagrams

The following diagrams are not exhaustive and are examples only.

3.2.1.O2A CreateService-Atomic-Async

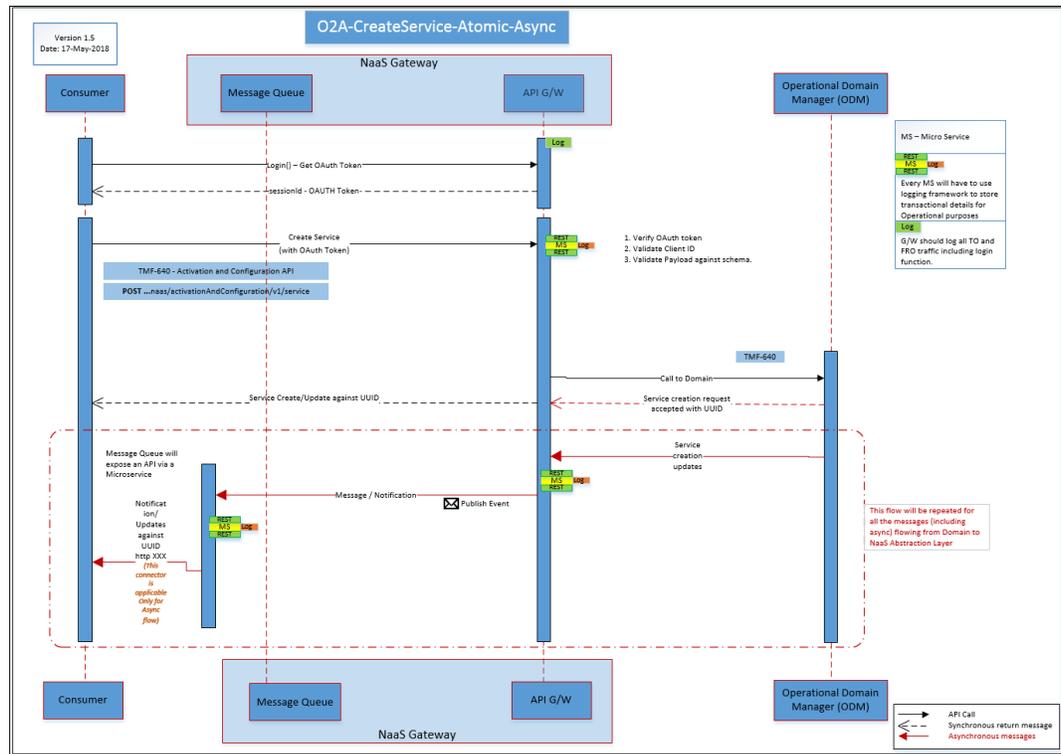


Figure 3. O2A Create Service Atomic Async Sequence diagram

3.2.2.O2A Modify Atomic Service

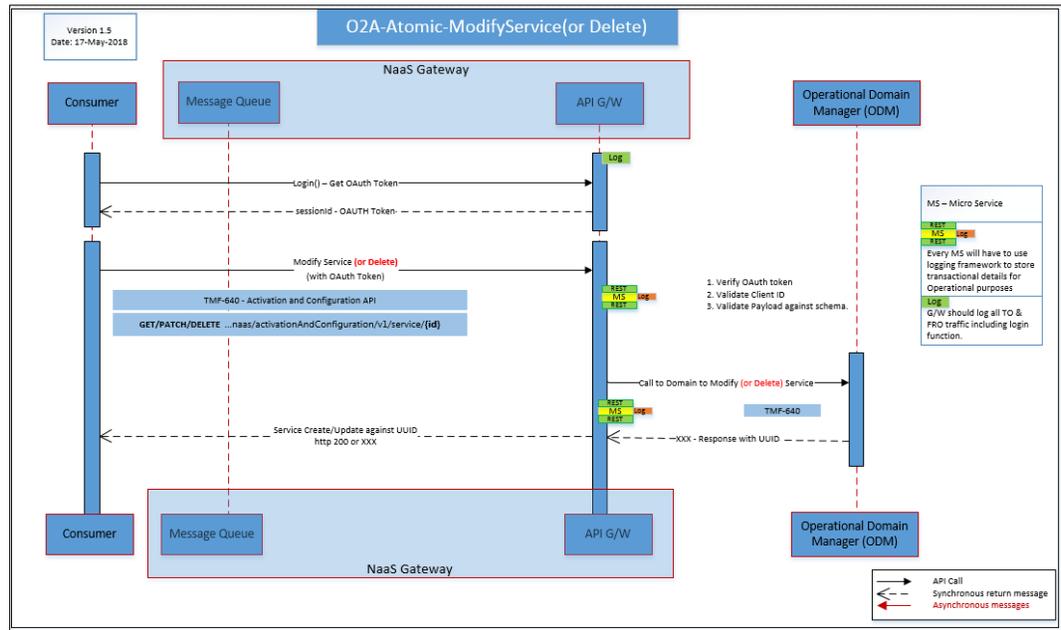


Figure 4. O2A Modify Service Atomic Sequence diagram

3.2.3.O2A – Manage Service Order

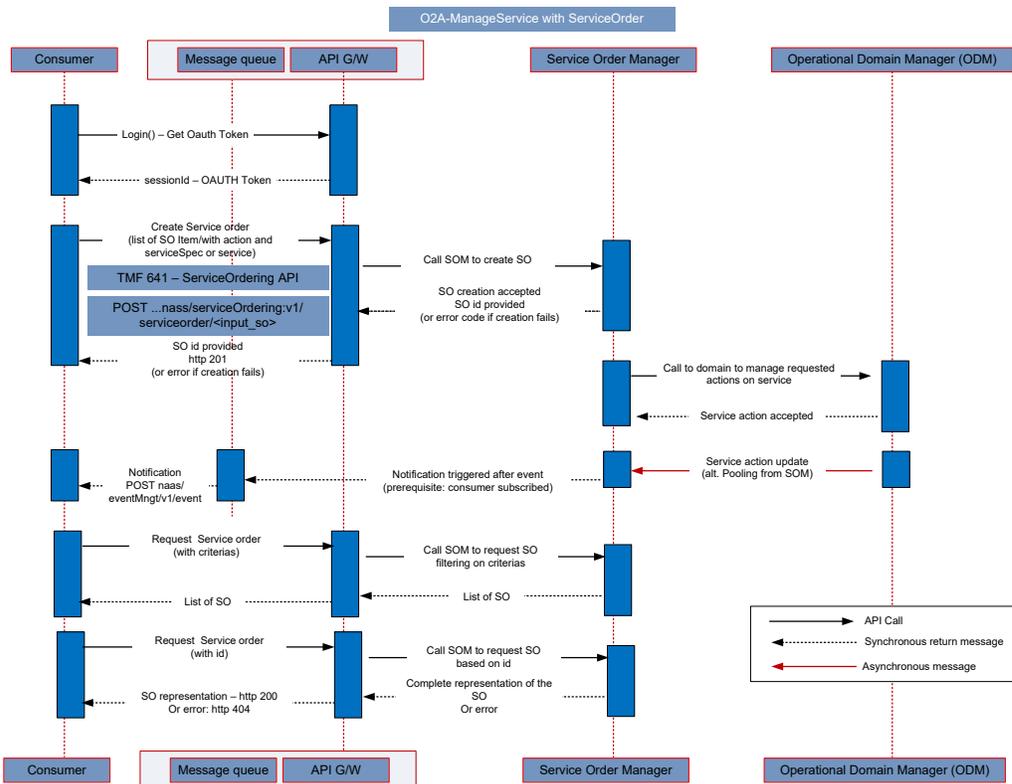


Figure 5. Manage Service order diagram

3.2.4. Trouble to Resolve – Reactive Report Service Problem - Sync

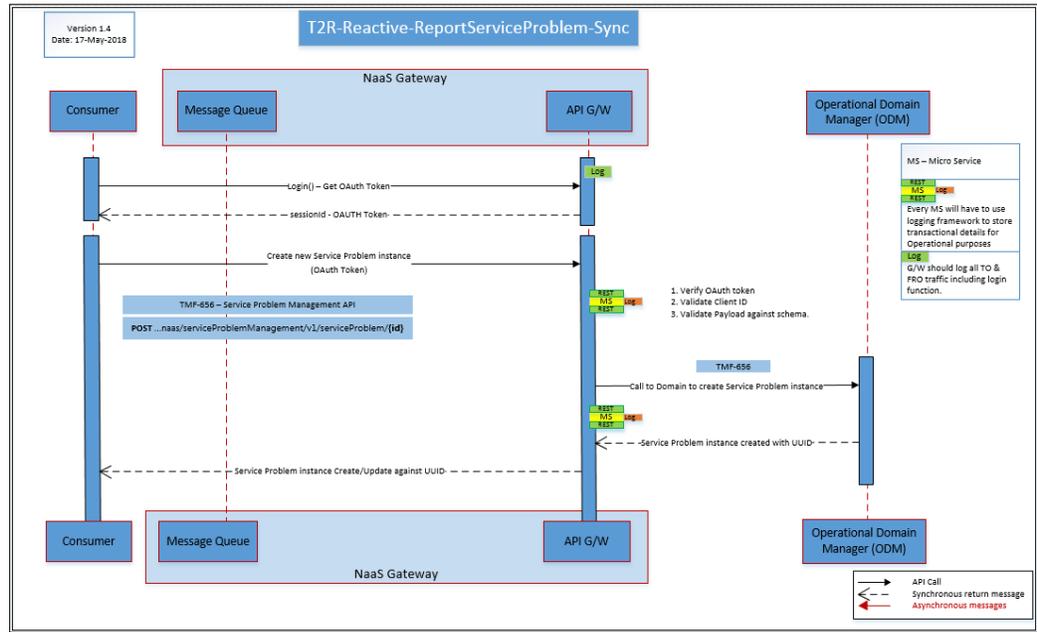


Figure 6. T2R - Reactive Report Service Problem - Sync

3.2.5. Trouble to Resolve – Reactive Update Service Problem – Sync

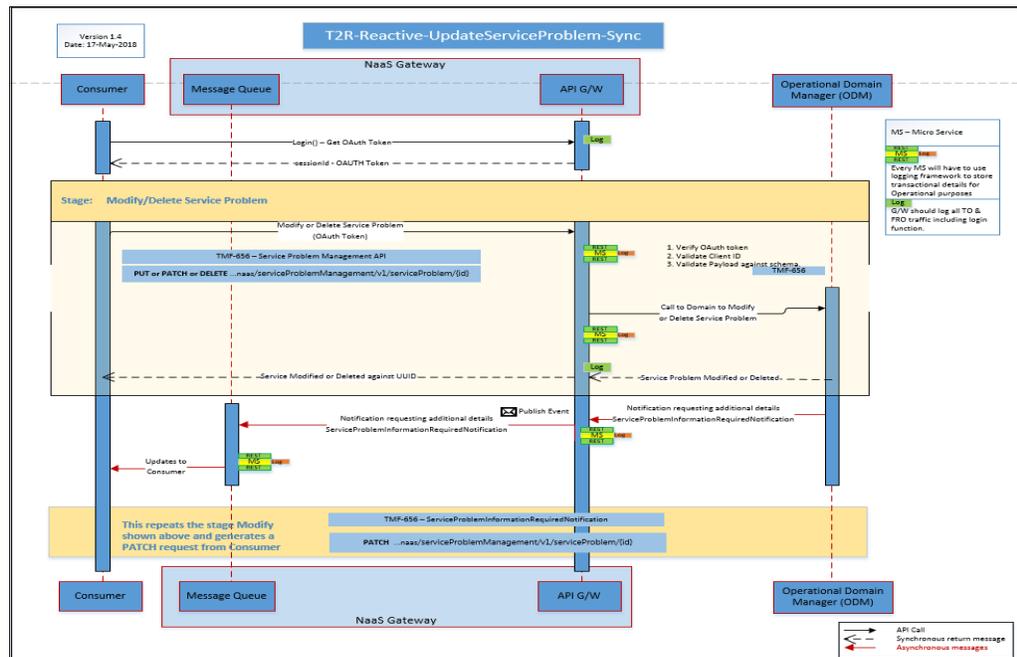


Figure 7. T2R - Reactive Update Service Problem - Sync

3.2.6. Trouble to Resolve – Proactive Obtain Service Problem Details – Async

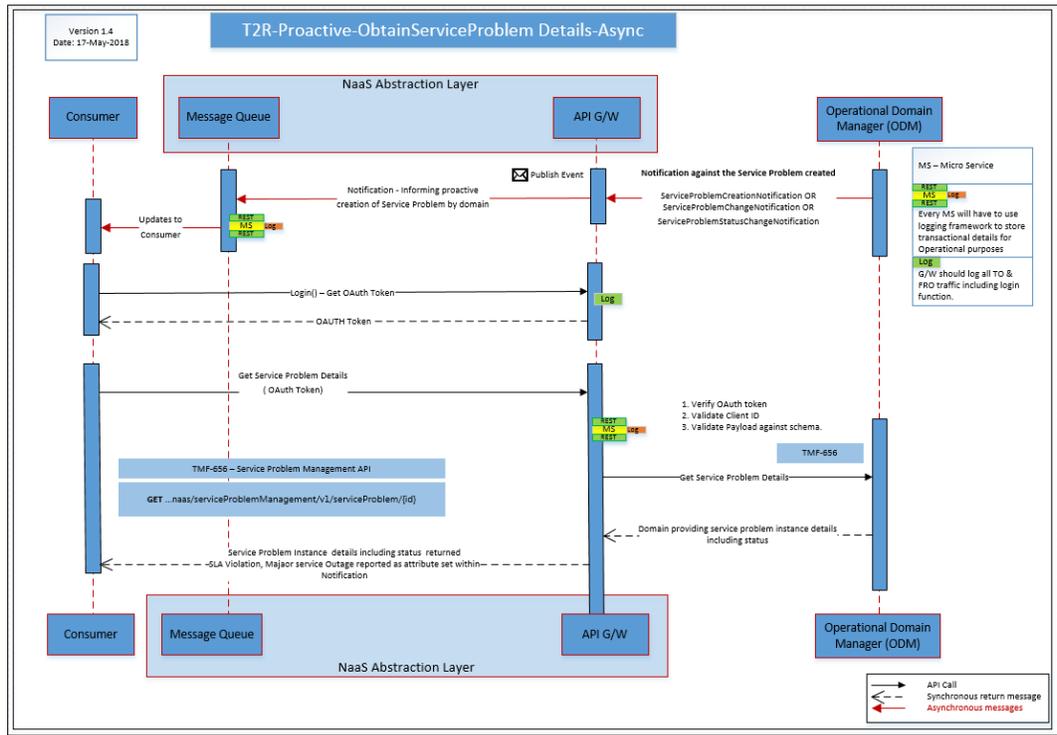


Figure 8. T2R – Proactive Obtain Service Problem Details – Async

3.2.7.U2C - Retrieval of Usage Record

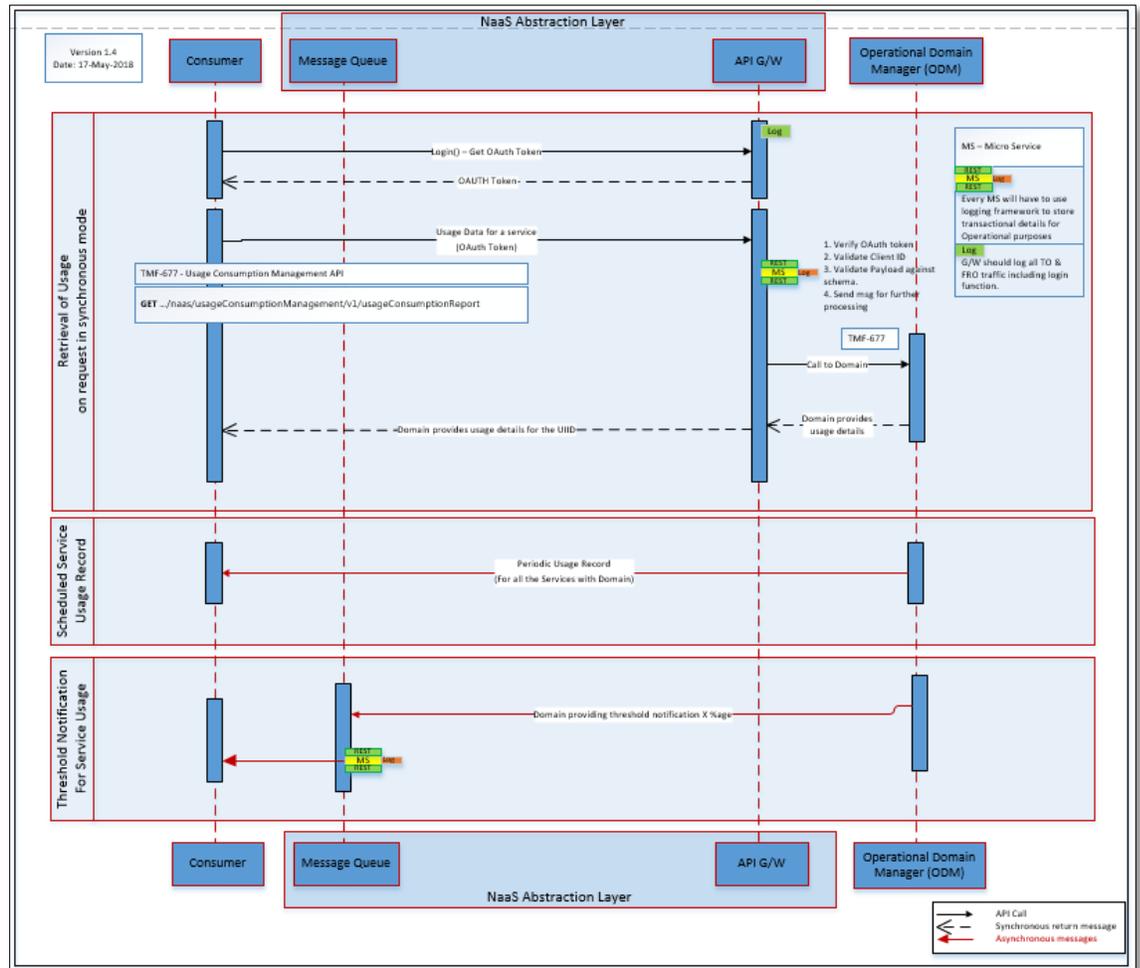


Figure 9. U2C – Retrieval of usage – Sync

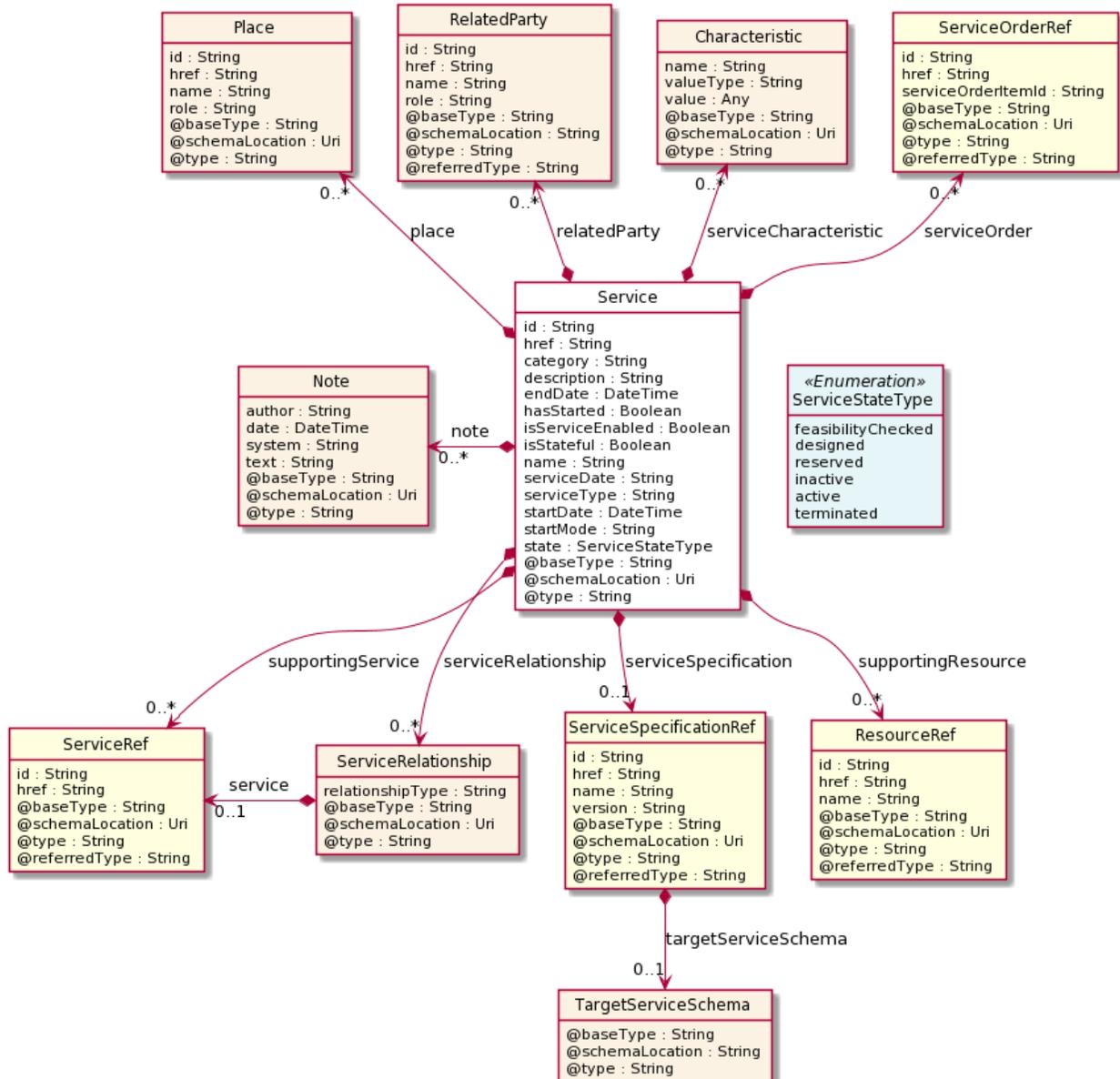
4. RESOURCE MODEL

4.3. Managed Entity and Task Resource Models

4.3.1. Service resource

Service is a base class for defining the Service hierarchy. All Services are characterized as either being possibly visible and usable by a Customer or not. This gives rise to the two subclasses of Service: CustomerFacingService and ResourceFacingService.

Resource model



Field descriptions

Service fields

- category A string. Is it a customer facing or resource facing service.
- description A string. Free-text description of the service.
- endDate A date time (DateTime). Date when the service ends.

hasStarted	A boolean. If TRUE, this Service has already been started.
href	A string. Reference of the service.
id	A string. Unique identifier of the service.
isServiceEnabled	A boolean. If FALSE, this particular Service has NOT been enabled for use.
isStateful	A boolean. If TRUE, this Service can be changed without affecting any other services.
name	A string. Name of the service.
note	A list of notes (Note [*]). A list of notes made on this service.
place	A list of places (Place [*]). A list of places related to this service, e.g. where the service is installed, a delivery address for equipment, etc.
relatedParty	A list of related parties (RelatedParty [*]). A list of related party references (RelatedParty [1..*]). A related party defines party or party role linked to a specific entity.
serviceCharacteristic	A list of characteristics (Characteristic [*]). A list of characteristics that characterize this service (ServiceCharacteristic [*]).
serviceDate	A string. Date when the service was created (whatever its status).
serviceOrder	A list of service order references (ServiceOrderRef [*]). A list of service orders related to this service.
serviceRelationship	A list of service relationships (ServiceRelationship [*]). A list of service relationships (ServiceRelationship [*]). Describes links with other service(s) in the inventory (useful for describing relies-on, relies-from between CFS for example).
serviceSpecification	A service specification reference (ServiceSpecificationRef). The specification from which this service was instantiated.
serviceType	A string. Business type of the service.
startDate	A date time (DateTime). Date when the service starts.
startMode	A string. This attribute is an enumerated integer that indicates how the Service is started, such as: 0: Unknown; 1: Automatically by the managed environment; 2: Automatically by the owning device; 3: Manually by the Provider of the Service; 4: Manually by a Customer of the Provider; 5: Any of the above.
state	A service state type (ServiceStateType). The life cycle state of the service, such as: feasibilityChecked, designed, reserved, active, inactive, terminated.
supportingResource	A list of resource references (ResourceRef [*]). A list of supporting resources (SupportingResource [*]). Note: only Service of type RFS can be associated with Resources.
supportingService	A list of service references (ServiceRef [*]). A list of supporting services (SupportingService [*]). A collection of services that support this service (bundling, link CFS to RFS).

Characteristic sub-resource

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

name	A string. Name of the characteristic.
value	An any (Any). The value of the characteristic.
valueType	A string. Data type of the value of the characteristic.

Note sub-resource

Extra information about a given entity.

author	A string. Author of the note.
date	A date time (DateTime). Date of the note.
system	A string. Describes the system from which the action related to this note was done.
text	A string. Text of the note.

Place sub-resource

Place reference. Place defines the places where the products are sold or delivered.

href	A string. Unique reference of the place.
id	A string. Unique identifier of the place.
name	A string. A user-friendly name for the place, such as [Paris Store], [London Store], [Main Home].
role	A string. Role of the place, such as: [home delivery], [shop retrieval]].

RelatedParty sub-resource

RelatedParty reference. A related party defines party or party role linked to a specific 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 entity name.
href	A string. Reference of the related party, could be a party reference or a party role reference.
id	A string. Unique identifier of a related party.
name	A string. Name of the related party.
role	A string. Role of the related party.

ServiceRelationship sub-resource

Describes links with services of the same category (useful for bundled services).

relationshipType	A string. The type of relationship (e.g. depends on, enables).
service	A service reference (ServiceRef). The service being referred to.

TargetServiceSchema sub-resource

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

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

ResourceRef relationship

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Reference of the supporting resource.
id	A string. Unique identifier of the supporting resource.
name	A string. Name of the resource supporting the service.

ServiceOrderRef relationship

Service Order reference. Useful to understand the which was the Service order through which the service was instantiated in the service inventory.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Reference of the Service Order.
id	A string. Unique identifier of the Service Order.
serviceOrderItemId	A string. Unique identifier of the Service Order Item within a service order, not populated if this is a reference to a service order.

ServiceRef relationship

Service reference, for when Service is used by other entities.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. reference of the service.
id	A string. Id of the service.

ServiceSpecificationRef relationship

Service specification reference: ServiceSpecification(s) required to realize a ProductSpecification.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Reference of the serviceSpecification.
id	A string. Unique identifier of the service specification.
name	A string. Name of the requiredServiceSpecification.
targetServiceSchema	A target service schema (TargetServiceSchema). A target service schema reference (TargetServiceSchemaRef). The reference object to the schema and type of target service which is described by service specification.
version	A string. Service specification version.

Json representation sample

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

```
{
  "id": "5351",
  "href": "https://mycsp.com:8080/tmf-api/ServiceActivationAndConfiguration/v3/service/5351",
  "serviceType": "Cloud",
  "state": "Active",
  "serviceDate": "2018-01-15T12:26:11.747Z",
  "startDate": "2018-01-15T12:26:11.747Z",
  "serviceCharacteristic": [
    {
      "name": "vCPE_IP",
      "valueType": "object",
      "value": {
        "@type": "IPAddress",
        "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Service/IPAddress.schema.json",
        "address": "193.218.236.21"
      }
    }
  ],
  "@type": "vCPE",
  "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Service/vCPE.schema.json",
}
```

```
"@baseType": "Service"
}
```

4.3.2. Service Catalog resource

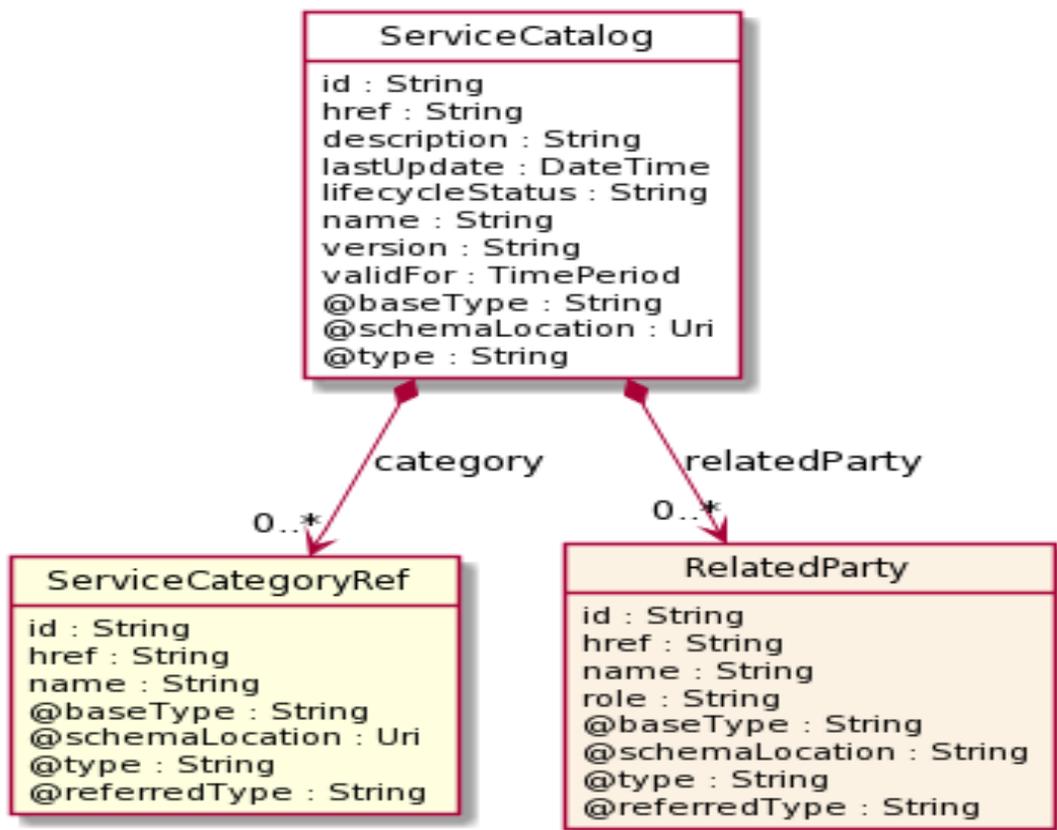
The root entity for service catalog management.

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

A service catalog typically includes name, description and time period that is valid for. It will have a list of ServiceCandidate catalog items. A ServiceCandidate is an entity that makes a ServiceSpecification available to a catalog.

A ServiceCandidate and its associated ServiceSpecification may be "published" - made visible - in any number of ServiceCatalogs, or in none.

Resource model



Field descriptions

ServiceCatalog fields

category	A list of service category references (ServiceCategoryRef [*]). List of service categories associated with this catalog.
description	A string. Description of this catalog.
href	A string. Unique reference of the service catalog.
id	A string. Unique identifier of the ServiceCatalog.
lastUpdate	A date time (DateTime). Date and time of the last update.
lifecycleStatus	A string. Used to indicate the current lifecycle status.
name	A string. Name of the service catalog.

relatedParty	A list of related parties (RelatedParty [*]). List of parties or party roles related to this category.
validFor	A time period. The period for which the service catalog is valid.
version	A string. ServiceCatalog version.

RelatedParty sub-resource

RelatedParty reference. A related party defines party or party role linked to a specific 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 entity name.
href	A string. Reference of the related party, could be a party reference or a party role reference.
id	A string. Unique identifier of a related party.
name	A string. Name of the related party.
role	A string. Role of the related party.

ServiceCategoryRef relationship

The (service) category resource is used to group service candidates in logical containers.

Categories can contain other categories.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Hypertext Reference of the category.
id	A string. Unique identifier of category.
name	A string. Name of the category.

Json representation sample

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

```
{
  "id": "3830",
  "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceCatalog/3830",
  "name": "Catalog Wholesale Business",
  "description": "This service catalog describes services that address the wholesale business segment.",
  "version": "1.0",
  "validFor": {
    "startDateTime": "2017-08-29T00:00",
    "endDateTime": "2018-03-25T00:00"
  },
  "lastUpdate": "2017-08-27T00:00",
  "lifecycleStatus": "Active",
  "relatedParty": [
    {
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/organization/3426",
      "id": "3426",
      "name": "Broadly Broad Ltd",
      "role": "vendor"
    }
  ],
  "category": [
    {
```

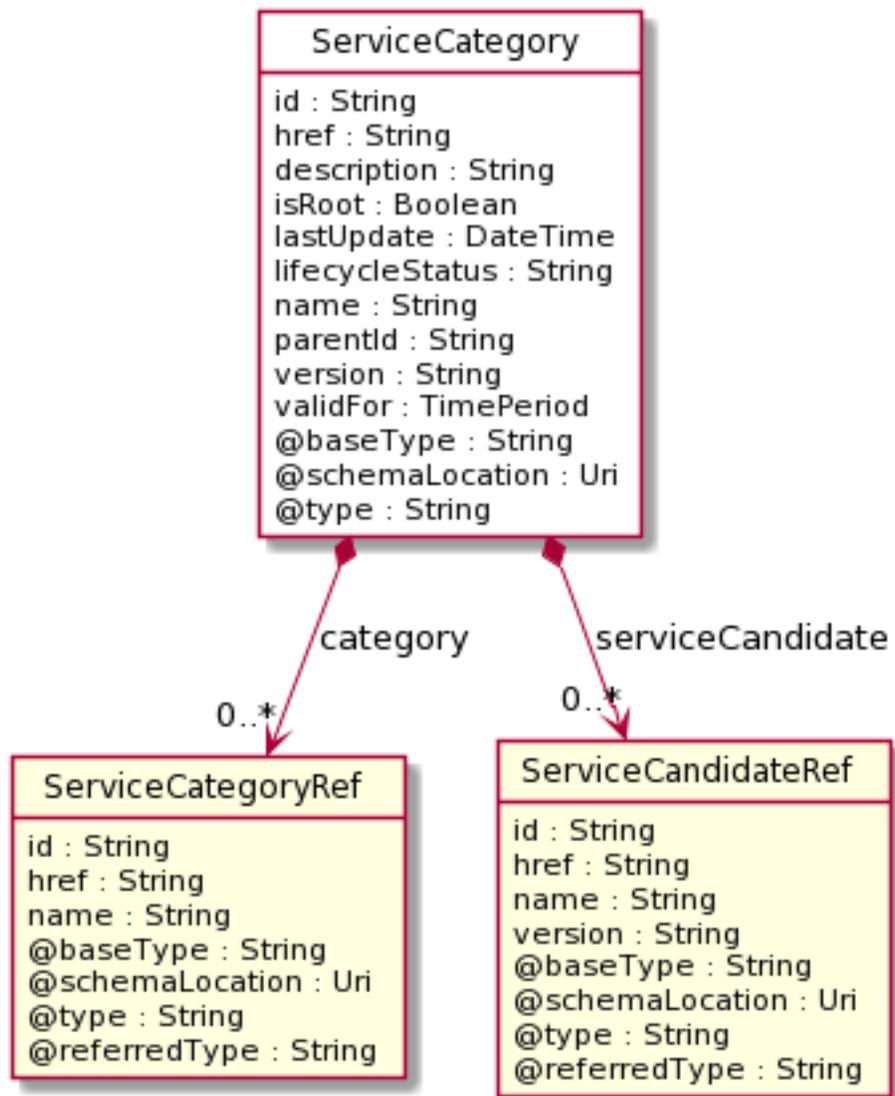
```

        "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/category/7752",
        "id": "7752",
        "name": "IoT"
    }
},
"@type": "ServiceCatalog",
"@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Service/ServiceCatalog.schema.json ",
"@baseType": "Catalog"
}
    
```

4.3.3. Service Category resource

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

Resource model



Field descriptions

ServiceCategory fields

category	A list of service category references (ServiceCategoryRef [*]). List of child categories in the tree for in this category.
description	A string. Description of the category.
href	A string. Reference of the category.
id	A string. Unique identifier of the category.
isRoot	A boolean. If true, this Boolean indicates that the category is a root of categories.
lastUpdate	A date time (DateTime). Date and time of the last update.
lifecycleStatus	A string. Used to indicate the current lifecycle status.
name	A string. Name of the category.
parentId	A string. Unique identifier of the parent category.
serviceCandidate	A list of service candidate references (ServiceCandidateRef [*]). List of service candidates associated with this category.
validFor	A time period. The period for which the category is valid.
version	A string. ServiceCategory version.

ServiceCandidateRef relationship

ServiceCandidate reference. ServiceCandidate is an entity that makes a ServiceSpecification available to a catalog.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Unique reference of the service candidate.
id	A string. Unique identifier of the service candidate.
name	A string. Name of the service candidate.
version	A string. Version of the service candidate.

ServiceCategoryRef relationship

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

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Hypertext Reference of the category.
id	A string. Unique identifier of category.
name	A string. Name of the category.

Json representation sample

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

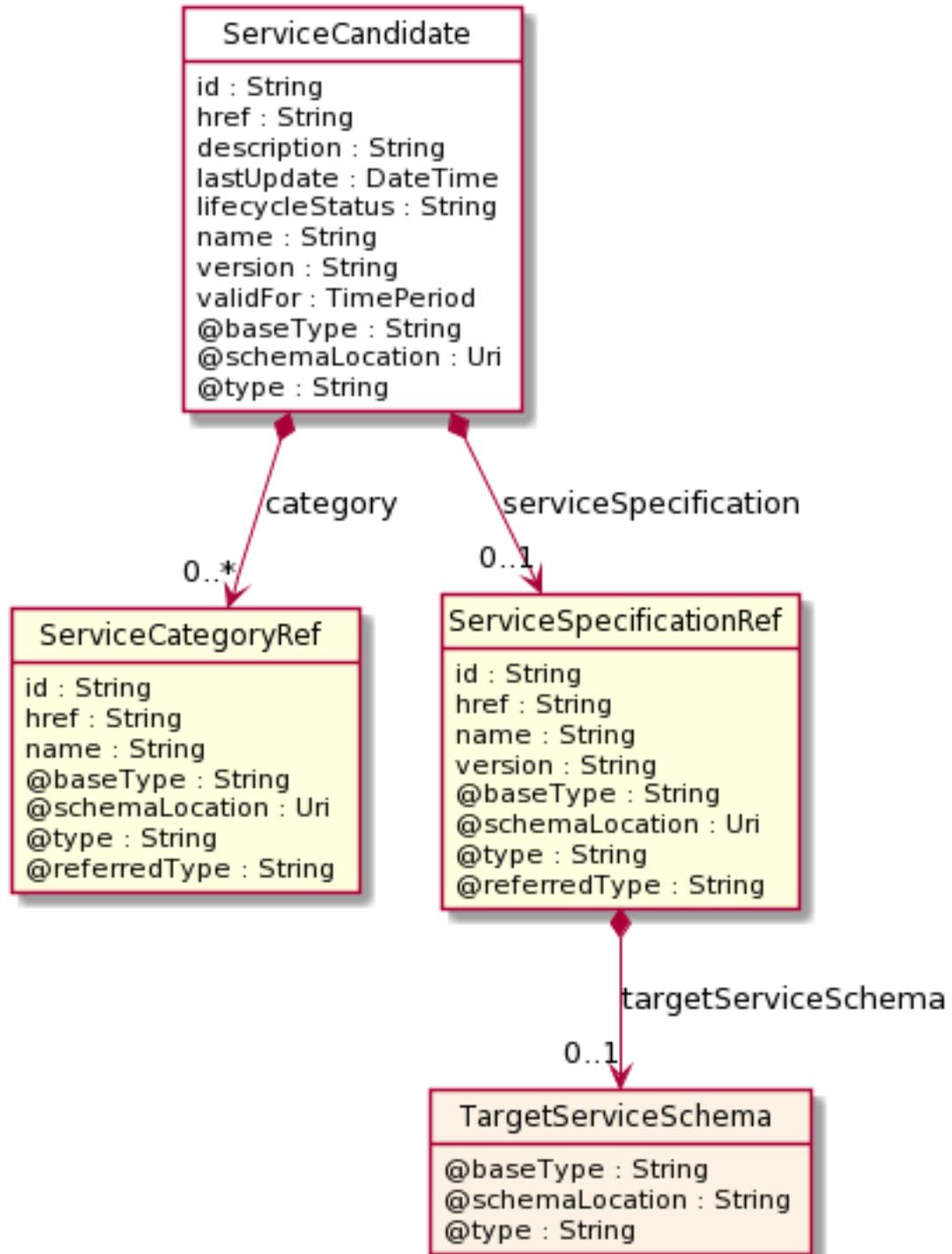
```
{
  "id": "1708",
  "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceCategory/1708",
  "name": "Cloud Services",
  "description": "A category to hold all available cloud service offers",
  "version": "1.0",
  "validFor": {
    "startDateTime": "2017-08-24T00:00",
    "endDateTime": "2018-03-25T00:00"
  },
  "lifecycleStatus": "Active",
  "lastUpdate": "2017-08-27T00:00",
  "isRoot": true,
  "serviceCandidate": [
    {
      "href": "https://mycsp.com:8080/tmf-
```

```
api/serviceCatalogManagement/v3/serviceCandidate/5850",
  "id": "5850",
  "name": "Speed Max",
  "version": "1.1",
  "@REFERRED_TYPE": "ServiceCandidate"
},
"category": [
  {
    "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/category/6086",
    "id": "6086",
    "name": "Cloud",
    "@REFERRED_TYPE": "ServiceCategory"
  }
],
"@type": "ServiceCategory",
"@SCHEMA_LOCATION": "https://mycsp.com:8080/tmf-api/schema/Service/ServiceCategory.schema.json",
"@baseType": "Category"
}
```

4.3.4. Service Candidate resource

ServiceCandidate is an entity that makes a service specification available to a catalog. A ServiceCandidate and its associated service specification may be published - made visible - in any number of service catalogs, or in none. One service specification can be composed of other service specifications.

Resource model



Field descriptions

ServiceCandidate fields

category	A list of service category references (ServiceCategoryRef [*]). List of categories for this candidate.
description	A string. Description of this REST resource.
href	A string. Hyperlink reference to this REST resource.
id	A string. Unique identifier of this REST resource.

lastUpdate	A date time (DateTime). Date and time of the last update of this REST resource.
lifecycleStatus	A string. Used to indicate the current lifecycle status of the service candidate.
name	A string. Name given to this REST resource.
serviceSpecification	A service specification reference (ServiceSpecificationRef). The service specification implied by this candidate.
validFor	A time period. The period for which this REST resource is valid.
version	A string. the version of service candidate.

TargetServiceSchema sub-resource

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

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

ServiceCategoryRef relationship

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

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Hypertext Reference of the category.
id	A string. Unique identifier of category.
name	A string. Name of the category.

ServiceSpecificationRef relationship

Service specification reference: ServiceSpecification(s) required to realize a ProductSpecification.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Reference of the serviceSpecification.
id	A string. Unique identifier of the service specification.
name	A string. Name of the requiredServiceSpecification.
targetServiceSchema	A target service schema (TargetServiceSchema). A target service schema reference (TargetServiceSchemaRef). The reference object to the schema and type of target service which is described by service specification.
version	A string. Service specification version.

Json representation sample

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

```
{
  "id": "4994",
  "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceCandidate/4994",
  "name": "TVServiceCandidate",
  "description": "This service candidate allows provision of TV service",
  "version": "2.1",
  "validFor": {
    "startDateTime": "2017-08-23T00:00",
    "endDateTime": "2018-03-25T00:00"
  },
  "lastUpdate": "2017-08-27T00:00",
  "lifecycleStatus": "Active",
}
```

```

    "category": [
      {
        "id": "5980",
        "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v3/serviceCategory/5980",
        "version": "3.2",
        "name": "TV"
      }
    ],
    "serviceSpecification": {
      "id": "9600",
      "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v3/serviceSpecification/9600",
      "version": "2.1",
      "name": "CFSS_TV",
      "@type": "CustomerFacingServiceSpecification"
    },
    "@type": "ServiceCandidate",
    "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/ServiceCandidate.schema.json ",
    "@baseType": ""
  }

```

4.3.5. Service Order resource

Field descriptions

ServiceOrder fields

category	A string. Used to categorize the order, useful for the OM system, such as: Broadband, TVOption.
completionDate	A date time (DateTime). Effective delivery date amended by the provider.
description	A string. A free-text description of the service order.
expectedCompletionDate	A date time (DateTime). Expected delivery date amended by the provider.
externalId	A string. ID given by the consumer to facilitate searches.
href	A string. Hyperlink to access the order.
id	A string. ID created on repository side.
note	A list of notes (Note [*]). Extra-information about the order; e.g. useful to add extra delivery information that could be useful for a human process.
notificationContact	A string. Contact attached to the order to send back information regarding this order.
orderDate	A date time (DateTime).
orderItem	A list of service order items (ServiceOrderItem [1..*]). A list of service order items to be processed by this order.
orderRelationship	A list of service order relationships (ServiceOrderRelationship [*]). A list of service orders related to this order (e.g. prerequisite, dependent on).

priority	A string. Can be used by consumers to prioritize orders in a Service Order Management system.
relatedParty	A list of related parties (RelatedParty [*]). A list of parties which are involved in this order and the role they are playing.
requestedCompletionDate	A date time (DateTime). Requested delivery date from the requestors perspective.
requestedStartDate	A date time (DateTime). Order start date wished by the requestor.
startDate	A date time (DateTime). Date when the order was started for processing.
state	A service order state type (ServiceOrderStateType). State of the order: described in the state-machine diagram.

Characteristic sub-resource

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

name	A string. Name of the characteristic.
value	An any (Any). The value of the characteristic.
valueType	A string. Data type of the value of the characteristic.

Note sub-resource

Extra information about a given entity.

author	A string. Author of the note.
date	A date time (DateTime). Date of the note.
system	A string. Describes the system from which the action related to this note was done.
text	A string. Text of the note.

Place sub-resource

Place reference. Place defines the places where the products are sold or delivered.

href	A string. Unique reference of the place.
id	A string. Unique identifier of the place.
name	A string. A user-friendly name for the place, such as [Paris Store], [London Store], [Main Home].
role	A string. Role of the place, such as: [home delivery], [shop retrieval]].

RelatedParty sub-resource

RelatedParty reference. A related party defines party or party role linked to a specific 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 entity name.
href	A string. Reference of the related party, could be a party reference or a party role reference.
id	A string. Unique identifier of a related party.
name	A string. Name of the related party.
role	A string. Role of the related party.

ServiceOrderItem sub-resource

action	A service order action type (ServiceOrderActionType). The action to be carried out on the Service. Can be: add, modify, delete, noChange.
appointment	An appointment reference (AppointmentRef). An appointment that was set up with a related party for this order item.
id	A string. Identifier of the individual line item.
orderItemRelationship	A list of service order item relationships (ServiceOrderItemRelationship [*]). A list of order items related to this order item.
service	A service restriction (ServiceRestriction). The Service to be acted on by the order item.
state	A service order state type (ServiceOrderStateType). State of the order item: described in the state machine diagram. This is the requested state.

ServiceOrderItemRelationship sub-resource

Linked service order item to the one containing this attribute.

id	A string. Unique identifier of a service order item.
relationshipType	A string. The type of related order item, can be: dependency if the order item needs to be not started until another order item is complete.

ServiceOrderRelationship sub-resource

Linked service order to the one containing this attribute.

@referredType	A string. The entity type of the related order.
href	A string. A hyperlink to the related order.
id	A string. The id of the related order.
relationshipType	A string. The type of related order, such as: [dependency] if the order needs to be [not started] until another order item is complete (a service order in this case) or [cross-ref] to keep track of the source order (a productOrder).

ServiceRelationship sub-resource

Describes links with services of the same category (useful for bundled services).

relationshipType	A string. The type of relationship (e.g. depends on, enables).
service	A service reference (ServiceRef). The service being referred to.

ServiceRestriction sub-resource

In the context of a service order and depending on the action requested (add/modify/delete/noChange) this data structure captures the configuration to apply to an existing subscribed service or to a new one.

category	A string. Is it a customer facing or resource facing service.
href	A string. Reference of the service.
id	A string. Unique identifier of the service.
name	A string. Name of the service.
place	A list of places (Place [*]). A list of places (Place [*]). Used to define a place useful for the service (for example a delivery geographical place).
relatedParty	A list of related parties (RelatedParty [*]). A list of related party references (RelatedParty [*]). A related party defines party or party role linked to a specific entity.

serviceCharacteristic	A list of characteristics (Characteristic [*]). A list of characteristics that characterize this service (ServiceCharacteristic [*]).
serviceRelationship	A list of service relationships (ServiceRelationship [*]). A list of service relationships (ServiceRelationship [*]). Describes links with other service(s) in the inventory (useful for describing relies-on, relies-from between CFS for example).
serviceSpecification	A service specification reference (ServiceSpecificationRef). The specification from which this service was instantiated.
serviceType	A string. Business type of the service.
state	A service state type (ServiceStateType). The life cycle state of the service, such as: [feasibilityChecked], [designed].
supportingResource	A list of resource references (ResourceRef [*]). A list of supporting resources (SupportingResource [*]). Note: only Service of type RFS can be associated with Resources.
supportingService	A list of service references (ServiceRef [*]). A list of supporting services (SupportingService [*]). A collection of services that support this service (bundling, link CFS to RFS).

TargetServiceSchema sub-resource

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

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

AppointmentRef relationship

Refers an appointment, such as a Customer presentation or internal meeting or site visit.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
description	A string. An explanatory text regarding the appointment made with a party.
href	A string. The reference of the appointment.
id	A string. The identifier of the referred appointment.

ResourceRef relationship

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Reference of the supporting resource.
id	A string. Unique identifier of the supporting resource.
name	A string. Name of the resource supporting the service.

ServiceRef relationship

Service reference, for when Service is used by other entities.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. reference of the service.
id	A string. Id of the service.

ServiceSpecificationRef relationship

Service specification reference: ServiceSpecification(s) required to realize a ProductSpecification.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Reference of the serviceSpecification.
id	A string. Unique identifier of the service specification.
name	A string. Name of the requiredServiceSpecification.
targetServiceSchema	A target service schema (TargetServiceSchema). A target service schema reference (TargetServiceSchemaRef). The reference object to the schema and type of target service which is described by service specification.
version	A string. Service specification version.

Json representation sample

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

```
{
  "id": "42",
  "href": "http://serverlocation:port/serviceOrderingManagement/v3/serviceOrder/42",
  "externalId": "OrangeBSS747",
  "priority": "1",
  "description": "Service order description",
  "category": "TMF resource illustration",
  "state": "acknowledged",
  "orderDate": "2018-01-12T09:37:40.508Z",
  "completionDate": "",
  "requestedStartDate": "2018-01-15T09:37:40.508Z",
  "requestedCompletionDate": "2018-01-15T09:37:40.508Z",
  "expectedCompletionDate": "2018-01-15T09:37:40.508Z",
  "startDate": "2018-01-12T09:37:40.508Z",
  "@type": "ServiceOrder",
  "note": [
    {
      "date": "2018-01-15T09:37:40.508Z",
      "author": "Jean Pontus",
      "text": "Some text"
    }
  ],
  "relatedParty": [
    {
      "id": "456",
      "href": "http://serverlocation:port/partyManagement/v3/party/456",
      "role": "requester",
      "name": "Jean Pontus",
      "@referredType": "Individual"
    }
  ],
  "orderItem": [
    {
      "id": "1",
      "action": "add",
      "state": "acknowledged",
      "service": {
        "@type": "vCPE",
        "@schemaLocation": "http://my.schemas/vCpe.schema.json",
        "state": "active",

```

```

    "serviceType": "CFS",
    "serviceCharacteristic": [
      {
        "name": "vCPE_IP",
        "valueType": "object",
        "value": {
          "@type": "IPAddress",
          "@schemaLocation": "http://my.schemas/IPAddress.schema.json",
          "vCPE_IP": "193.218.236.21"
        }
      }
    ],
    "serviceSpecification": {
      "@type": "ONAPServiceSpec",
      "@schemaLocation": "http://my.schemas/OnapServiceSpec.schema.json",
      "id": "12",
      "href": "http://.../serviceSpecification/12",
      "name": "vCPE",
      "version": "1",
      "invariantUUID": "456-852-357",
      "toscaModelURL": "http://...",
      "targetServiceSchema": {
        "@type": "vCPE",
        "@schemaLocation": "http://my.schemas/vCpe.schema.json"
      }
    }
  },
  {
    "id": "2",
    "action": "modify",
    "state": "acknowledged",
    "service": {
      "id": "456",
      "href": "http://serverlocation:port/serviceInventoryManagement/v3/service/456",
      "state": "active",
      "serviceType": "CFS",
      "serviceCharacteristic": [
        {
          "name": "Characteristic1",
          "value": "newValue"
        }
      ],
      "supportingResource": [
        {
          "id": "3456_DFG5-H690",
          "href": "http://...",
          "@referredType": "CloudResource"
        }
      ]
    }
  },
  {
    "id": "3",

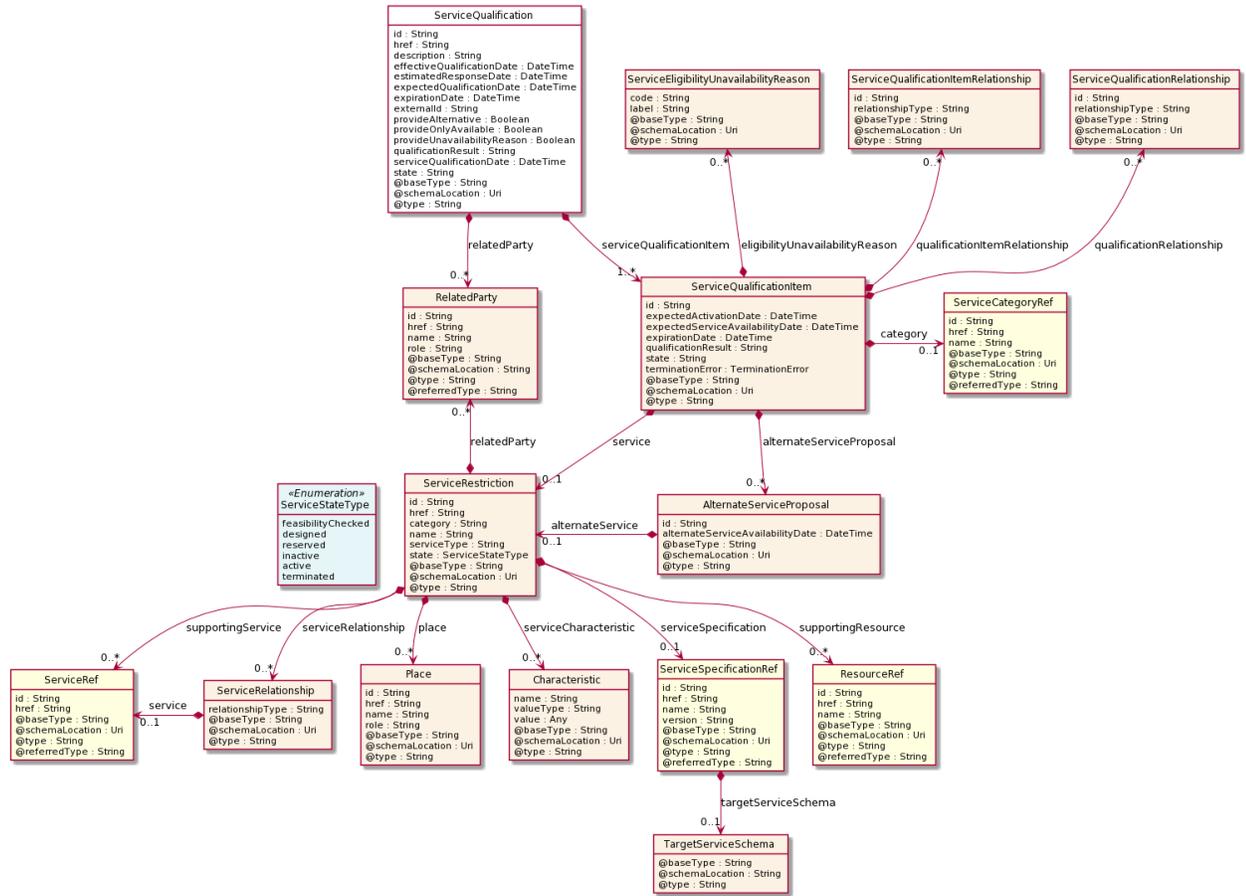
```

```
"action": "add",
"state": "acknowledged",
"service": {
  "state": "active",
  "serviceType": "CFS",
  "serviceRelationship": [
    {
      "relationshipType": "reliesOn",
      "service": {
        "href": "https://.../serviceManagement/v3/service/45",
        "id": "45"
      }
    }
  ],
  "serviceSpecification": {
    "id": "48",
    "href": "http://.../48",
    "name": "genericService48",
    "version": "2"
  }
},
{
  "id": "4",
  "action": "modify",
  "state": "acknowledged",
  "service": {
    "id": "12",
    "href": "http://serverlocation:port/serviceInventoryManagement/v3/service/12",
    "state": "inactive"
  }
}
]
```

4.3.6. Service Qualification resource

ServiceQualification is used to perform a technical eligibility. It allows to retrieve a list of services that are technically available in the context of the interaction (place, party, service characteristics, ...).

Resource model



Field descriptions

ServiceQualification fields

description	A string. Description of the serviceQualification.
effectiveQualificationDate	A date time (DateTime). Effective date to serviceQualification completion.
estimatedResponseDate	A date time (DateTime). Date when the requester expect to provide an answer for the qualification request.
expectedQualificationDate	A date time (DateTime). A date (DateTime). Deadline date when the requester expected a qualification answer.
expirationDate	A date time (DateTime). Date when the qualification response expires.
externalId	A string. Identifier provided by the requester.
href	A string. Hyperlink to access the serviceQualification.
id	A string. Unique identifier of the serviceQualification resource.
provideAlternative	A boolean. When the value is TRUE means that alternative solutions should be provided.
provideOnlyAvailable	A boolean. When the value is TRUE means that only available service must be listed in the response.

provideUnavailabilityReason	A boolean. When the value is TRUE means that unavailability reason are expected for non available service.
qualificationResult	A string. Qualification result for this serviceQualification. It could be: qualified (all qualification item are qualified), alternate (At least one item alternate and no item with unqualified), unqualified (At least one item unqualified).
relatedParty	A list of related parties (RelatedParty [*]). A list of related party references, defines party or party role linked to this request.
serviceQualificationDate	A date time (DateTime). Date when the serviceQualification was submitted.
serviceQualificationItem	A list of service qualification items (ServiceQualificationItem [1..*]).
state	A string. State of the serviceQualification (acknowledged, inProgress, terminatedWithError, done).

AlternateServiceProposal sub-resource

Alternate service proposal is used when the requested service is not available with characteristic and date asked for. An alternate proposal could be a distinct serviceSpecification close to requested one or same as requested but with a different activation date.

alternateService	A service restriction (ServiceRestriction). In the context of a service order and depending on the action requested (add/modify/delete/noChange) this data structure captures the configuration to apply to an existing subscribed service or to a new one.
alternateServiceAvailabilityDate	A date time (DateTime). Alternate availability date in case seller is not able to meet requested expected availability date for the service.
id	A string. Identifier of a alternate service proposal.

Characteristic sub-resource

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

name	A string. Name of the characteristic.
value	An any (Any). The value of the characteristic.
valueType	A string. Data type of the value of the characteristic.

Place sub-resource

Place reference. Place defines the places where the products are sold or delivered.

href	A string. Unique reference of the place.
id	A string. Unique identifier of the place.
name	A string. A user-friendly name for the place, such as [Paris Store], [London Store], [Main Home].
role	A string. Role of the place, such as: [home delivery], [shop retrieval]].

RelatedParty sub-resource

RelatedParty reference. A related party defines party or party role linked to a specific 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 entity name.
href	A string. Reference of the related party, could be a party reference or a party role reference.
id	A string. Unique identifier of a related party.
name	A string. Name of the related party.
role	A string. Role of the related party.

ServiceEligibilityUnavailabilityReason sub-resource

Reason for eligibility result if the ServiceQualification result is no (meaning the Service is not available).

code	A string. Unavailability reason code.
label	A string. Unavailability reason label.

ServiceQualificationItem sub-resource

A ServiceQualificationItem relates to a specific service being checked in a qualification operation.

alternateServiceProposal	A list of alternate service proposals (AlternateServiceProposal [*]). Alternate service proposal is used when the requested service is not available with characteristic and date asked for. An alternate proposal could be a distinct service Spec close to requested one or same as requested but with a different availability date.
category	A service category reference (ServiceCategoryRef). 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.
eligibilityUnavailabilityReason	A list of service eligibility unavailability reasons (ServiceEligibilityUnavailabilityReason [*]). A list of eligibility unavailability reasons (EligibilityUnavailabilityReason [*]). Reason for eligibility result if the serviceQualification result is no (meaning the service is not available).
expectedActivationDate	A date time (DateTime). The date when the service is expected to be activated.
expectedServiceAvailabilityDate	A date time (DateTime). Date when the requester looks for service availability.
expirationDate	A date time (DateTime). Date when the qualification item response expires.
id	A string. Id of the Service Qualification Item.
qualificationItemRelationship	A list of service qualification item relationships (ServiceQualificationItemRelationship [*]). A list of qualification item relationships used to

qualificationRelationship	describe relationship between serviceQualification item from the same serviceQualification. A list of service qualification relationships (ServiceQualificationRelationship [*]). Structure used to describe relationship between serviceQualification item from the same serviceQualification.
qualificationResult	A string. Qualification result for serviceQualification item. It could be: - qualified (request service are available), - unqualified (requested not available and not alternate available), - alternate (requested not available but proposal available).
service	A service restriction (ServiceRestriction). Configure the service characteristics (only configurable characteristics and necessary only if a non default value is selected) and/or identify the service that needs to be modified/deleted.
state	A string. State of the serviceQualification item (acknowledged, inProgress, terminatedWithError, done).
terminationError	A list of termination errors (TerminationError [*]). If qualificationItem has not been done properly this lists the error(s) that caused termination of the qualification.

ServiceQualificationItemRelationship sub-resource

Structure used to describe relationship between serviceQualification items from the same serviceQualification.

id	A string. Id of the serviceQualificationItem (from the same serviceQualificationItem).
relationshipType	A string. Type of relationship (ex: reliesOn, connectedTo, etc...).

ServiceQualificationRelationship sub-resource

id	A string. The id of the target qualification pointed to by this relationship.
relationshipType	A string. The type of relationship.

ServiceRelationship sub-resource

Describes links with services of the same category (useful for bundled services).

relationshipType	A string. The type of relationship (e.g. depends on, enables).
service	A service reference (ServiceRef). The service being referred to.

ServiceRestriction sub-resource

In the context of a service order and depending on the action requested (add/modify/delete/noChange) this data structure captures the configuration to apply to an existing subscribed service or to a new one.

category	A string. Is it a customer facing or resource facing service.
href	A string. Reference of the service.
id	A string. Unique identifier of the service.

name	A string. Name of the service.
place	A list of places (Place [*]). A list of places (Place [*]). Used to define a place useful for the service (for example a delivery geographical place).
relatedParty	A list of related parties (RelatedParty [*]). A list of related party references (RelatedParty [*]). A related party defines party or party role linked to a specific entity.
serviceCharacteristic	A list of characteristics (Characteristic [*]). A list of characteristics that characterize this service (ServiceCharacteristic [*]).
serviceRelationship	A list of service relationships (ServiceRelationship [*]). A list of service relationships (ServiceRelationship [*]). Describes links with other service(s) in the inventory (useful for describing relies-on, relies-from between CFS for example).
serviceSpecification	A service specification reference (ServiceSpecificationRef). The specification from which this service was instantiated.
serviceType	A string. Business type of the service.
state	A service state type (ServiceStateType). The life cycle state of the service, such as: [feasibilityChecked], [designed].
supportingResource	A list of resource references (ResourceRef [*]). A list of supporting resources (SupportingResource [*]). Note: only Service of type RFS can be associated with Resources.
supportingService	A list of service references (ServiceRef [*]). A list of supporting services (SupportingService [*]). A collection of services that support this service (bundling, link CFS to RFS).

TargetServiceSchema sub-resource

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

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

TerminationError sub-resource

This indicates an error that caused a qualificationItem to be terminated.

id	A string. Unique identifier of the termination error.
value	A string. Text to describe the termination error - for example: Unable to proceed to qualification because incomplete information provided.

ResourceRef relationship

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Reference of the supporting resource.
id	A string. Unique identifier of the supporting resource.
name	A string. Name of the resource supporting the service.

ServiceCategoryRef relationship

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

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Hypertext Reference of the category.
id	A string. Unique identifier of category.
name	A string. Name of the category.

ServiceRef relationship

Service reference, for when Service is used by other entities.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. reference of the service.
id	A string. Id of the service.

ServiceSpecificationRef relationship

Service specification reference: ServiceSpecification(s) required to realize a ProductSpecification.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Reference of the serviceSpecification.
id	A string. Unique identifier of the service specification.
name	A string. Name of the requiredServiceSpecification.
targetServiceSchema	A target service schema (TargetServiceSchema). A target service schema reference (TargetServiceSchemaRef). The reference object to the schema and type of target service which is described by service specification.
version	A string. Service specification version.

Json representation sample

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

```
{
  "description": "Maximum download/upload speed for access at an address",
  "effectiveQualificationDate": "2017-10-25T12:14:16.361Z",
  "estimatedResponseDate": "2017-10-25T12:13:16.361Z",
  "expectedQualificationDate": "2017-10-25T12:13:16.361Z",
  "expirationDate": "2017-11-25T12:13:16.361Z",
  "href": "https://mycsp.com:8080/tmf-
api/serviceQualificationManagement/v3/serviceQualification/5565",
  "id": "5565",
  "provideAlternative": true,
  "provideOnlyAvailable": false,
  "provideUnavailabilityReason": false,
  "serviceQualificationDate": "2017-10-25T12:13:16.361Z",
  "state": "done",
  "serviceQualificationItem": [
    {
      "id": "1",
      "qualificationResult": "qualified",
      "state": "done",
      "service": {
        "serviceSpecification": {
          "id": "111",
          "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v3/serviceSpecification/111",
          "name": "CFS_Access"
```

```

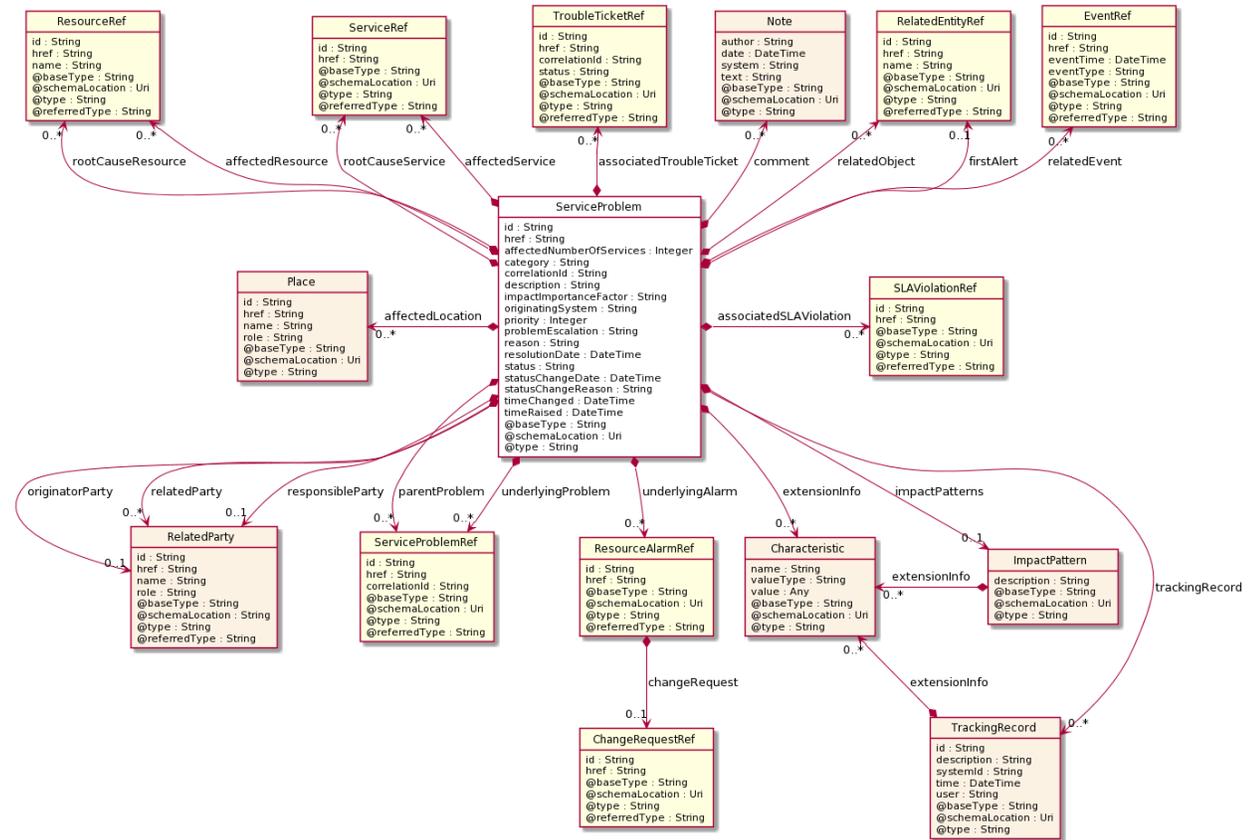
    },
    "serviceCharacteristic": [
      {
        "name": "downloadSpeed",
        "valueType": "object",
        "value": {
          "@type": "Bandwidth",
          "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/Bandwidth.schema.json",
          "speed": "300Mb/s"
        }
      },
      {
        "name": "uploadSpeed",
        "valueType": "object",
        "value": {
          "@type": "Bandwidth",
          "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/Bandwidth.schema.json",
          "speed": "100Mb/s"
        }
      }
    ],
    "place": [
      {
        "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v3/geographicAddress/25511",
        "id": "25511",
        "name": "160 de Versailles Avenue 75016 Paris France",
        "role": "installationAddress",
        "@type": "GeographicAddress"
      }
    ]
  },
  "expectedServiceAvailabilityDate": "2017-10-27T12:14:16.361Z",
  "expirationDate": "2017-11-25T12:13:16.361Z"
}
],
"relatedParty": [
  {
    "id": "14",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/14",
    "role": "requester",
    "name": "John Doe",
    "@REFERREDType": "Individual"
  }
],
"externalId": "SQ102",
"qualificationResult": "qualified",
"@baseType": "ServiceQualification",
"@type": "CFServiceQualification",
"@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/CFServiceQualification.schema.json"
}
}

```

4.3.7. Service Problem resource

The problem information for Middle B which is abstracted in the service layer from the issued event information by First B.

Resource model



Field descriptions

ServiceProblem fields

- affectedLocation A list of places (Place [*]). A list of the locations affected by the problem. At least one of affectedResource, affectedService or affectedLocation should be present.
- affectedNumberofServices An integer. Number of affected services.
- affectedResource A list of resource references (ResourceRef [*]). A list of the resources affected by the problem. At least one of affectedResource, affectedService or affectedLocation should be present.
- affectedService A list of service references (ServiceRef [*]). List of affected services. At least one of affectedResource, affectedService or affectedLocation should be present.
- associatedSLAViolation A list of s l a violation references (SLAViolationRef [*]). A List of SLA violations associated with this problem.
- associatedTroubleTicket A list of trouble ticket references (TroubleTicketRef [*]). A list of trouble tickets associated with this problem.

category	A string. Classifier for the problem. Settable. For example, this is used for distinguish the category of problem originator in [role].[category] format. Example: serviceProvider.declarer, supplier.Originated, system.Originated.
comment	A list of notes (Note [*]). A list of comments or notes made on the problem.
correlationId	A string. Additional identifier coming from an external system.
description	A string. Free form text describing the Service Problem.
extensionInfo	A list of characteristics (Characteristic [*]). A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.
firstAlert	A related entity reference (RelatedEntityRef). Indicates what first alerted the system to the problem. It is not the root cause of the Service Problem. Examples: Threshold crossing alert.
href	A string. Reference to the Service Problem.
id	A string. Identifier of the service problem.
impactImportanceFactor	A string. Impact Importance is characterized by an Impact Importance Factor: overall importance of the impact of all the affected services, e.g. 0 (zero impact) to 100 (worst impact). The Impact Importance is a calculated field which is set by the OSS determining the impact.
impactPatterns	An impact pattern (ImpactPattern). Define the patterns of impact (optional)- e.g. other service characteristics- Used when defining impact through another pattern than the predefined attributes.
originatingSystem	A string. Indicates where the problem was generated.
originatorParty	A related party (RelatedParty). Individual or organization that created the problem.
parentProblem	A list of service problem references (ServiceProblemRef [*]). The parent problem to which this problem is attached.
priority	An integer. An indication varying from 1 (highest) to 10 (lowest) of how important it is for the service provider to correct the Service Problem.
problemEscalation	A string. Indicates if this service problem has been escalated or not. Possible values are 0 to 10. A value of zero means no escalation. The meanings of values 1-10 are to be determined by the user of the interface, but they show increasing levels of escalation.
reason	A string. Free text or optionally structured text. It can be Unknown.

relatedEvent	A list of event references (EventRef [*]). List of events associated to this problem.
relatedObject	A list of related entity references (RelatedEntityRef [*]). List of objects associated to this problem.
relatedParty	A list of related parties (RelatedParty [*]). List of parties or party roles playing a role within the service problem.
resolutionDate	A date time (DateTime). Time the problem was resolved.
responsibleParty	A related party (RelatedParty). Individual or organization responsible for handling this problem.
rootCauseResource	A list of resource references (ResourceRef [*]). Resource(s) that are associated to the underlying service problems that are the Root Cause of this one if any (used only if applicable).
rootCauseService	A list of service references (ServiceRef [*]). Service(s) that are associated to the underlying service problems that are the Root Cause of this one if any (used only if applicable).
status	A string. The current status of the service problem. Possible values are Submitted, Rejected, Acknowledged, In Progress [Held, Pending], Resolved, Closed, and Cancelled.
statusChangeDate	A date time (DateTime). Time the problem was last status changed.
statusChangeReason	A string. The reason of state change.
timeChanged	A date time (DateTime). Time the problem was last changed.
timeRaised	A date time (DateTime). Time the problem was raised.
trackingRecord	A list of tracking records (TrackingRecord [*]). List of tracking records that allow the tracking of modifications on the problem. The tracking records should not be embedded in the problem to allow retrieving the problem without the tracking records.
underlyingAlarm	A list of resource alarm references (ResourceAlarmRef [*]). A list of alarms underlying this problem.
underlyingProblem	A list of service problem references (ServiceProblemRef [*]). A list of underlying problems. Relevant only if this problem is derived from other problems.

Characteristic sub-resource

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

name	A string. Name of the characteristic.
value	An any (Any). The value of the characteristic.
valueType	A string. Data type of the value of the characteristic.

ImpactPattern sub-resource

Define the patterns of impact (optional), such as other service characteristics- Used when defining impact through another pattern than the pre-defined attributes.

description	A string. Basic description of the impact pattern.
extensionInfo	A list of characteristics (Characteristic [*]). A generic list of any type of elements. Used for extensions or loose element encapsulation from other namespaces.

Note sub-resource

Extra information about a given entity.

author	A string. Author of the note.
date	A date time (DateTime). Date of the note.
system	A string. Describes the system from which the action related to this note was done.
text	A string. Text of the note.

Place sub-resource

Place reference. Place defines the places where the products are sold or delivered.

href	A string. Unique reference of the place.
id	A string. Unique identifier of the place.
name	A string. A user-friendly name for the place, such as [Paris Store], [London Store], [Main Home].
role	A string. Role of the place, such as: [home delivery], [shop retrieval]).

RelatedParty sub-resource

RelatedParty reference. A related party defines party or party role linked to a specific 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 entity name.
href	A string. Reference of the related party, could be a party reference or a party role reference.
id	A string. Unique identifier of a related party.
name	A string. Name of the related party.
role	A string. Role of the related party.

TrackingRecord sub-resource

Tracking records allow the tracking of modifications on the problem. The tracking records should not be embedded in the problem to allow retrieving the problem without the tracking records.

description	A string. Describes the action being done, such as: ack, clear.
extensionInfo	A list of characteristics (Characteristic [*]). A generic list of any type of elements. Used for vendor Extensions or loose element encapsulation from other namespaces.
id	A string. Identifier of the TrackingRecord.
systemId	A string. Describes the system Id from which the action was done.
time	A date time (DateTime). Describes the time at which the action was done.
user	A string. Describes the user doing the action.

ChangeRequestRef relationship

Reference to a Change Request.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. The reference link to the change request.
id	A string. The identifier of the change request.

EventRef relationship

Events linked with service problem.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
eventTime	A date time (DateTime). Time the event occurred.
eventType	A string. Type of the event.
href	A string. event reference.
id	A string. ID of the event.

RelatedEntityRef relationship

A reference to an entity, where the type of the entity is not known in advance.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. The hyperlink to access an entity.
id	A string. The identifier of an entity.
name	A string. The name of an entity.

ResourceAlarmRef relationship

A set of alarm ids identifying the alarms that are underlying this problem.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
changeRequest	A change request reference (ChangeRequestRef). Reference to a Change Request.
href	A string. Reference of the Alarm.
id	A string. Unique identifier of the Alarm.

ResourceRef relationship

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Reference of the supporting resource.
id	A string. Unique identifier of the supporting resource.
name	A string. Name of the resource supporting the service.

SLAViolationRef relationship

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

ServiceProblemRef relationship

@referredType	A string. The actual type of the target instance when needed for disambiguation.
correlationId	A string. Additional identifier coming from an external system.
href	A string. Reference of the Problem.
id	A string. Unique identifier of the Problem.

ServiceRef relationship

Service reference, for when Service is used by other entities.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. reference of the service.
id	A string. Id of the service.

TroubleTicketRef relationship

A trouble ticket represents a record used for reporting and managing the resolution of resource problems.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
correlationId	A string. Additional identifier coming from an external system.
href	A string. Reference of the trouble ticket.
id	A string. Unique identifier of the trouble ticket.
status	A string. The current status of the Trouble Ticket.

Json representation sample

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

```
{
  "id": "problemxxxx0000",
  "correlationId": "543251",
  "originatingSystem": "System_001",
  "category": "supplier.originated",
  "href": "https://mycsp.com:8080/tmf-
api/serviceProblemManagement/v3/serviceProblem/problemxxxx0000",
  "impactImportanceFactor": "0",
  "priority": "1",
  "description": "connection failure between Tokyo and Osaka",
  "problemEscalation": "0",
  "timeRaised": "2017-10-25T12:14:16.361Z",
  "timeChanged": "2017-10-30T12:13:16.361Z",
  "statusChangeDate": "2017-10-29T12:00:00.361Z",
  "statusChangeReason": "problem analysis has been completed in NP1",
  "resolutionDate": "2017-10-29T12:00:00.361Z",
  "status": "resolved",
  "reason": "Failure of resource NP1_Resource_1 in NP1",
  "affectedNumberOfServices": "2",
  "firstAlert": {
    "alertType": "TroubleTicket",
    "id": "NP1_TT_0000000",
    "href": "https://mycsp.com:8080/tmf-
api/troubleTicketManagement/v3/troubleTicket/NP1_TT_0000000"
  },
  "responsibleParty": {
    "role": "Supplier",
    "id": "NP1",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/NP1",
    "@referredType": "Organization"
  },
  "originatorParty": {
    "role": "Supplier",
    "id": "NP1",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/NP1",
    "@referredType": "Organization"
  }
}
```

```

"relatedParty": [
  {
    "role": "Supplier",
    "id": "NP1",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/NP1",
    "@referredType": "Organization"
  },
  {
    "role": "Partner",
    "id": "SP1",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/SP1",
    "@referredType": "Organization"
  },
  {
    "role": "Partner",
    "id": "SP3",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/SP3",
    "@referredType": "Organization"
  }
],
"affectedService": [
  {
    "id": "NP1_Tokyo_Osaka",
    "href": "https://mycsp.com:8080/tmf-
api/serviceInventoryManagement/v3/service/NW1_Tokyo_Osaka"
  },
  {
    "id": "NP1_Tokyo_xxxx",
    "href": "https://mycsp.com:8080/tmf-
api/serviceInventoryManagement/v3/service/NW1_Tokyo_xxxx"
  }
],
"affectedResource": [
  {
    "id": "NP1_RES_0001",
    "href": "https://mycsp.com:8080/tmf-
api/resourceInventoryManagement/v3/resource/NW1_RES_0001"
  }
],
"affectedLocation": [
  {
    "id": "Loc000000",
    "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v3/geographicAddress/Loc000000/",
    "name": "144 Main Street Tokyo 51663556",
    "role": "VPN Endpoint",
    "@type": "GeographicAddress"
  },
  {
    "id": "Loc000001",
    "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v3/geographicAddress/Loc000001/",
    "name": "351 Main Street Osaka 3546365",
    "role": "VPN Endpoint",
  }
]

```

```
    "@type": "GeographicAddress"
  }
],
"associatedTroubleTicket": [
  {
    "id": "NP1_TT_0000000",
    "href": "https://mycsp.com:8080/tmf-
api/troubleTicketManagement/v3/TroubleTicketRef/NP1_TT_0000000"
  }
],
"underlyingAlarm": [
  {
    "id": "NP1_A_0000000",
    "href": "https://mycsp.com:8080/tmf-
api/alarmManagement/v3/resourceAlarm/NP1_A_0000000",
    "@referredType": "ResourceAlarm"
  }
],
"associatedSLAViolation": [
  {
    "id": "NP1_SLA_0000000",
    "href": "https://mycsp.com:8080/tmf-
api/SLAManagement/v3/SLAViolationRef/NP1_SLA_0000000"
  }
],
"relatedEvent": [
  {
    "eventType": "prediction",
    "id": "prediction_0001",
    "href": "https://mycsp.com:8080/tmf-api/eventManagement/v3/event/prediction_0001",
    "eventTime": "2014-12-20T17:00:00Z"
  }
],
"relatedObject": [
  {
    "id": "product0001",
    "href": "https://mycsp.com:8080/tmf-
api/productInventoryManagement/v3/product/product0001",
    "@referredType": "Product"
  }
],
"rootCauseService": [
  {
    "id": "NP1_Tokyo_Osaka",
    "href": "https://mycsp.com:8080/tmf-
api/serviceInventoryManagement/v3/service/NW1_Tokyo_Osaka"
  }
],
"rootCauseResource": [
  {
    "id": "NP1_Resource_1",
    "href": "https://mycsp.com:8080/tmf-
api/resourceInventoryManagement/v3/resource/NP1_Resource_1"
  }
]
```

```

    ],
    "parentProblem": [
      {
        "id": "problemxxxx0001",
        "correlationId": "xxxxxxx",
        "href": "https://mycsp.com:8080/tmf-
api/serviceProblemManagement/v3/serviceProblem/problemxxxx0001"
      }
    ],
    "underlyingProblem": [
      {
        "id": "problemxxxx0001",
        "correlationId": "xxxxxxx",
        "href": "https://mycsp.com:8080/tmf-
api/serviceProblemManagement/v3/serviceProblem/problemxxxx0001"
      }
    ],
    "trackingRecord": [
      {
        "description": "yyy cleared the problem",
        "systemId": "xxxx",
        "time": "2014-12-20T17:00:00Z",
        "user": "NPUSER1",
        "id": "TR_xxxx",
        "extensionInfo": [
          {
            "name": "vendorComment",
            "valueType": "string",
            "value": "Watch out for the dog"
          }
        ]
      }
    ]
  },
  "comment": [
    {
      "author": {
        "id": "SPM_handler_01",
        "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/SPM_handler_01",
        "@referredType": "Individual"
      },
      "date": "2014-12-20T17:00:00Z",
      "systemId": "System_002",
      "text": "receive trouble ticket from NP1, and create this Service Problem"
    },
    {
      "author": {
        "id": "NP1_handler_11",
        "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/NP1_handler_11",
        "@referredType": "Individual"
      },
      "date": "2014-12-20T17:00:00Z",
      "systemId": "System_002",
      "text": "status changed to Progress-Held"
    }
  ]
}

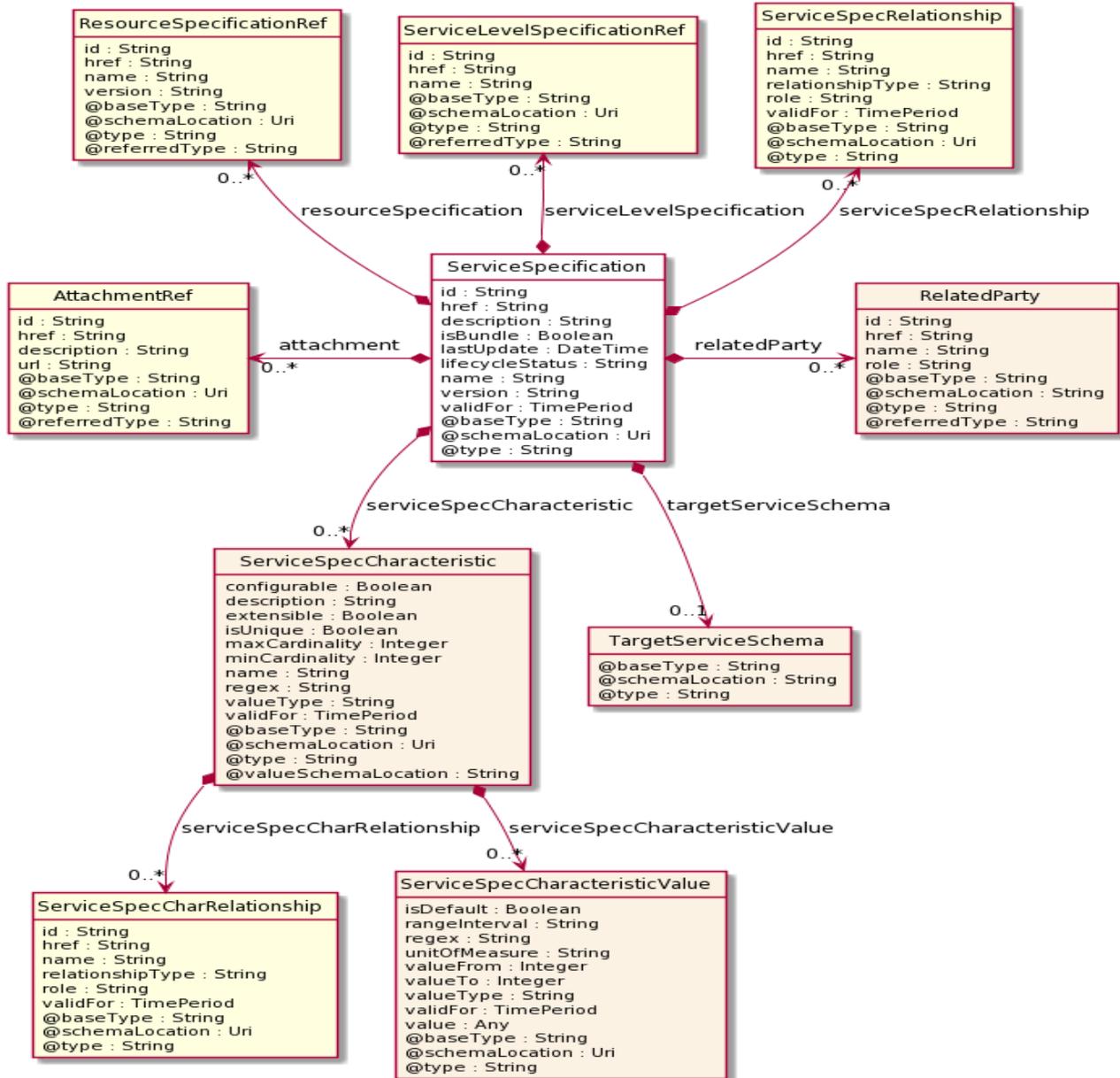
```

```
    ],
    "impactPatterns": {
      "description": "Many services are at risk in this problem",
      "extensionInfo": [
        {
          "name": "ImpactProbability",
          "valueType": "boolean",
          "value": true
        }
      ]
    },
    "extensionInfo": [
      {
        "name": "EstimatedCost",
        "valueType": "integer",
        "value": 20
      }
    ]
  }
}
```

4.3.8. Service Specification resource

ServiceSpecification is a class that offers characteristics to describe a type of service. Functionally, it acts as a template by which Services may be instantiated. By sharing the same specification, these services would therefore share the same set of characteristics.

Resource model



Field descriptions

ServiceSpecification fields

attachment	A list of attachment references (AttachmentRef [*]). A list of attachments (Attachment [*]). Complements the description of the specification through video, pictures...
description	A string. A narrative that explains in detail what the service specification is.
href	A string. Reference of the service specification.
id	A string. Unique identifier of the service specification.
isBundle	A boolean. isBundle determines whether a ServiceSpecification represents a single ServiceSpecification (false), or a bundle of ServiceSpecification (true).

lastUpdate	A date time (DateTime). Date and time of the last update of the service specification.
lifecycleStatus	A string. Used to indicate the current lifecycle status of the service specification.
name	A string. Name of the service specification.
relatedParty	A list of related parties (RelatedParty [*]). A list of related party references (RelatedParty [*]). A related party defines party or party role linked to a specific entity.
resourceSpecification	A list of resource specification references (ResourceSpecificationRef [*]). A list of resource specification references (ResourceSpecificationRef [*]). The ResourceSpecification is required for a service specification with type ResourceFacingServiceSpecification (RFSS).
serviceLevelSpecification	A list of service level specification references (ServiceLevelSpecificationRef [*]). A list of service level specifications related to this service specification, and which will need to be satisfiable for corresponding service instances; e.g. Gold, Platinum.
serviceSpecCharacteristic	A list of service spec characteristics (ServiceSpecCharacteristic [*]). A list of service spec characteristics (ServiceSpecCharacteristic [*]). This class represents the key features of this service specification.
serviceSpecRelationship	A list of service spec relationships (ServiceSpecRelationship [*]). A list of service specifications related to this specification, e.g. migration, substitution, dependency or exclusivity relationship.
targetServiceSchema	A target service schema (TargetServiceSchema). A target service schema reference (TargetServiceSchemaRef). The reference object to the schema and type of target service which is described by service specification.
validFor	A time period. The period for which the service specification is valid.
version	A string. Service specification version.
<u>RelatedParty sub-resource</u>	
RelatedParty reference. A related party defines party or party role linked to a specific 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 entity name.
href	A string. Reference of the related party, could be a party reference or a party role reference.

id	A string. Unique identifier of a related party.
name	A string. Name of the related party.
role	A string. Role of the related party.

ServiceSpecCharRelationship sub-resource

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

href	A string. Hyperlink reference to the target specification.
id	A string. Unique identifier of the target specification.
name	A string. Name of the target characteristic.
relationshipType	A string. Type of relationship such as aggregation, migration, substitution, dependency, exclusivity.
role	A string. The association role for this service specification.
validFor	A time period. The period for which the serviceSpecCharRelationship is valid.

ServiceSpecCharacteristic sub-resource

This class represents the key features of this service specification. For example, bandwidth is a characteristic of many different types of services; if bandwidth is a relevant characteristic (e.g., from the point-of-view of a Customer obtaining this Service via a Product) then bandwidth would be a ServiceSpecCharacteristic for that particular Service.

@valueSchemaLocation	A string. This (optional) field provides a link to the schema describing the value type.
configurable	A boolean. If true, the Boolean indicates that the serviceSpecCharacteristic is configurable.
description	A string. A narrative that explains in detail what the serviceSpecCharacteristic is.
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 an Entity.
isUnique	A boolean. An indicator that specifies if a value is unique for the specification. Possible values are; "unique while value is in effect" and "unique whether value is in effect or not".
maxCardinality	An integer. The maximum number of instances a CharacteristicValue can take on. For example, zero to five phone numbers in a group calling plan, where five is the value for the maxCardinality.
minCardinality	An integer. The minimum number of instances a CharacteristicValue can take on. For example, zero to five phone numbers in a group calling plan, where zero is the value for the minCardinality.
name	A string. A word, term, or phrase by which this characteristic specification is known and distinguished from other characteristic specifications.

regex	A string. A rule or principle represented in regular expression used to derive the value of a characteristic value.
serviceSpecCharRelationship	A list of service spec char relationships (ServiceSpecCharRelationship [*]). A list of service spec char relationships (ServiceSpecCharRelationship [*]). An aggregation, migration, substitution, dependency or exclusivity relationship between/among Specification Characteristics.
serviceSpecCharacteristicValue	A list of service spec characteristic values (ServiceSpecCharacteristicValue [*]). A list of service spec characteristic values (ServiceSpecCharacteristicValue [*]). A ServiceSpecCharacteristicValue object is used to define a set of attributes, each of which can be assigned to a corresponding set of attributes in a ServiceSpecCharacteristic object. The values of the attributes in the ServiceSpecCharacteristicValue object describe the values of the attributes that a corresponding ServiceSpecCharacteristic object can take on.
validFor	A time period. The period for which the serviceSpecCharacteristic is valid.
valueType	A string. A kind of value that the characteristic can take on, such as numeric, text and so forth.

ServiceSpecCharacteristicValue sub-resource

A ServiceSpecCharacteristicValue object is used to define a set of attributes, each of which can be assigned to a corresponding set of attributes in a ServiceSpecCharacteristic object. The values of the attributes in the ServiceSpecCharacteristicValue object describe the values of the attributes that a corresponding ServiceSpecCharacteristic object can take on.

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

valueType A string. A kind of value that the characteristic can take on, such as numeric, text, and so forth.

ServiceSpecRelationship sub-resource

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

href A string. Reference of the target serviceSpecification.
 id A string. Unique identifier of the target serviceSpecification.
 name A string. The name given to the target service specification instance.
 relationshipType A string. Type of relationship such as migration, substitution, dependency, exclusivity.
 role A string. The association role for this service specification.
 validFor A time period. The period for which the serviceSpecRelationship is valid.

TargetServiceSchema sub-resource

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

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

AttachmentRef relationship

Attachment reference. An attachment complements the description of an element (for instance a product) through video, pictures.

@referredType A string. The actual type of the target instance when needed for disambiguation.
 description A string. A narrative text describing the content of the attachment.
 href A string. URL serving as reference for the attachment resource.
 id A string. Unique-Identifier for this attachment.
 url A string. Link to the attachment media/content.

ResourceSpecificationRef relationship

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

@referredType A string. The actual type of the target instance when needed for disambiguation.
 href A string. Reference of the resource specification.
 id A string. Unique identifier of the resource specification.
 name A string. Name of the requiredResourceSpecification.
 version A string. Resource specification version.

ServiceLevelSpecificationRef relationship

A Service Level Specification represents a pre-defined or negotiated set of Service Level Objectives. In addition, certain consequences are associated with not meeting the Service Level Objectives. Service Level Agreements are expressed in terms of Service Level Specifications.

@referredType A string. The actual type of the target instance when needed for disambiguation.
 href A string. The hyperlink to access a service level specification.
 id A string. The identifier to a service level specification.
 name A string. The name of Service Level Specification.

Json representation sample

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

```
{
  "id": "7655",
  "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v3/serviceSpecification/7655",
  "name": "Firewall Service",
  "description": "This service specification describes a firewall service that can be deployed in
customer premise.",
  "version": "2.1",
  "validFor": {
    "startDateTime": "2017-08-23T00:00",
    "endDateTime": "2018-03-25T00:00"
  },
  "lastUpdate": "2017-08-27T00:00",
  "lifecycleStatus": "Active",
  "isBundle": false,
  "resourceSpecification": [
    {
      "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v3/resourceSpecification/42",
      "id": "42",
      "name": "Firewall",
      "version": "1.0",
      "@referredType": "ResourceFunctionSpec"
    }
  ],
  "attachment": [
    {
      "description": "This attachment gives a block diagram of the firewall.",
      "href": "https://mycsp.com:8080/tmf-api/documentManagement/v3/attachment/22",
      "id": "22",
      "url": "https://mycsp.com:7070/docloader?docnum=3534536"
    }
  ],
  "serviceSpecCharacteristic": [
    {
      "name": "OperatingSystem",
      "description": "This characteristic describes the operating system run by the service",
      "valueType": "string",
      "configurable": true,
      "validFor": {
        "startDateTime": "2017-08-12T00:00",
        "endDateTime": "2018-03-07T00:00"
      },
      "@valueSchemaLocation": "",
      "minCardinality": 0,
      "maxCardinality": 1,
      "isUnique": true,
      "regex": "",
      "extensible": false,
      "serviceSpecCharacteristicValue": [
        {
```

```

        "valueType": "string",
        "isDefault": true,
        "value": "Android KitKat",
        "validFor": {
            "startDateTime": "2017-08-06T00:00",
            "endDateTime": "2018-03-07T00:00"
        }
    },
    "serviceSpecCharRelationship": [
        {
            "relationshipType": "dependency",
            "role": "",
            "id": "4690",
            "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v3/serviceSpecificationCharacteristic/4690",
            "name": "OperatingSystem",
            "validFor": {
                "startDateTime": "2017-08-11T00:00",
                "endDateTime": "2018-03-07T00:00"
            }
        }
    ],
    "@type": "ServiceSpecCharacteristic",
    "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/ServiceSpecCharacteristic.schema.json"
},
{
    "name": "Scalability",
    "description": "Scalability parameters for this resource facing service spec ",
    "valueType": "CapabilityScalable",
    "configurable": true,
    "validFor": {
        "startDateTime": "2017-08-17T00:00",
        "endDateTime": "2018-03-12T00:00"
    },
    "@valueSchemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/CapabilityScalable.schema.json",
    "minCardinality": 0,
    "maxCardinality": 1,
    "isUnique": true,
    "regex": "",
    "extensible": true,
    "serviceSpecCharacteristicValue": [
        {
            "valueType": "object",
            "isDefault": true,
            "value": {
                "minInstances": 1,
                "maxInstances": 1000
            },
            "validFor": {
                "startDateTime": "2017-08-17T00:00",
                "endDateTime": "2018-03-12T00:00"
            }
        }
    ]
}

```

```

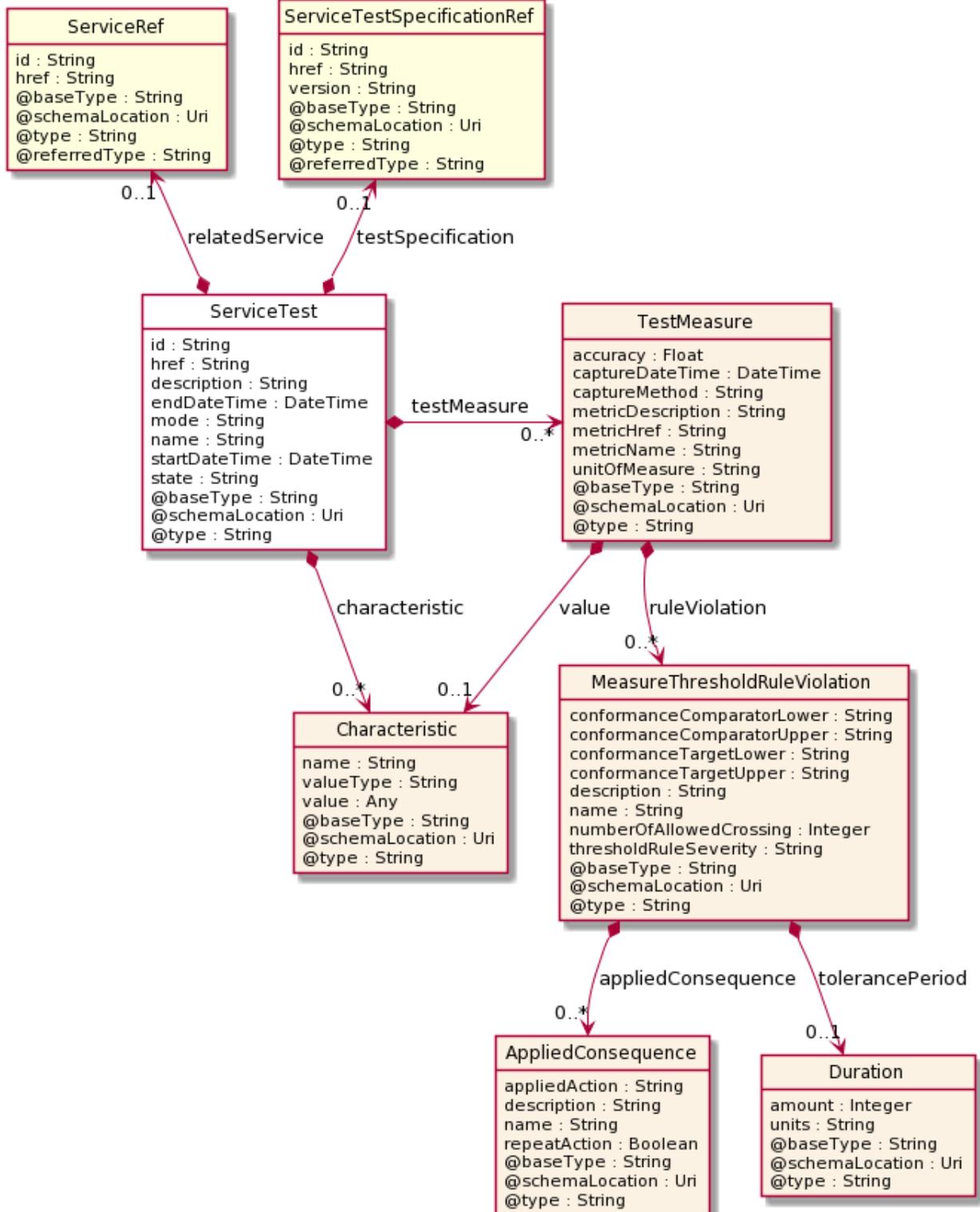
    },
    "@type": "CapabilityScalable",
    "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/CapabilityScalable.schema.json"
  }
],
"serviceSpecCharRelationship": [],
"@type": "ServiceSpecCharacteristic",
"@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/ServiceSpecCharacteristic.schema.json"
}
],
"relatedParty": [
  {
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/organization/3643",
    "id": "3643",
    "name": "Firewall Express",
    "role": "Supplier"
  }
],
"serviceSpecRelationship": [
  {
    "relationshipType": "dependency",
    "role": "dependent",
    "id": "5563",
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v3/serviceSpecification/5563",
    "name": "Points to the Deep Packet Inspection service on which this Firewall service depends",
    "validFor": {
      "startDateTime": "2017-08-25T00:00",
      "endDateTime": "2018-03-25T00:00"
    }
  }
],
"serviceLevelSpecification": [
  {
    "href": "https://mycsp.com:8080/tmf-
api/serviceQualityManagement/v3/serviceLevelSpecification/8899",
    "id": "8899",
    "name": "Platinum"
  }
],
"targetServiceSchema": {
  "@type": "RFS",
  "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Service/RFS.schema.json"
},
"@type": "ResourceFacingServiceSpecification",
"@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/ResourceFacingServiceSpecification.schema.json",
"@baseType": "ServiceSpecification"
}

```

4.3.9. Service Test resource

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

Resource model



Field descriptionsServiceTest fields

characteristic	A list of characteristics (Characteristic [*]). List of characteristics with values that define the test run.
description	A string. Description of the service test.
endTime	A date time (DateTime). The end date and time of the service test.
href	A string. Hyperlink to access the service test.
id	A string. The identifier of the service test.
mode	A string. An indication of whether the service test is running in "PROACTIVE" or "ONDEMAND" mode.
name	A string. The name of the service test.
relatedService	A service reference (ServiceRef). The actual service being tested.
startTime	A date time (DateTime). The start date and time of the service test.
state	A string. The actual state the service test is in.
testMeasure	A list of test measures (TestMeasure [*]). The results of the test in terms of the measured metrics.
testSpecification	A service test specification reference (ServiceTestSpecificationRef). The specification for this test.

AppliedConsequence sub-resource

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

appliedAction	A string. The action for a violated threshold. This could be a hyperlink to the action.
description	A string. A narrative that explains in detail what the consequence is.
name	A string. A word, term, or phrase by which Consequence is known and distinguished from other MetricDefMeasureConsequences.
repeatAction	A boolean. An indicator used to specify that a consequence should cease being applied if a value is in the same range as the previous value or continue being applied if a value is in the same range as the previous value. If the repeatAction is True, if the consequence is always applied as soon as the MetricMeasure value is in the range of values and if the repeatAction is False, the consequence is applied only if the previous MetricMeasure value was not in the same range.

Characteristic sub-resource

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

name	A string. Name of the characteristic.
value	An any (Any). The value of the characteristic.
valueType	A string. Data type of the value of the characteristic.

Duration sub-resource

A time interval in a given unit of time.

amount	An integer. Time interval (number of seconds, minutes, hours, etc.).
--------	--

units A string. Unit of time (seconds, minutes, hours, etc.).

MeasureThresholdRuleViolation sub-resource

A `MeasureThresholdRuleViolation` is a violation of a rule that defines the in the `MetricDefMeasureThresholdRule`.

<code>appliedConsequence</code>	A list of applied consequences (<code>AppliedConsequence</code> [*]). An <code>AppliedConsequence</code> defines the action (prescribed action or notification) to take when a <code>MeasureThresholdRuleViolation</code> occurs.
<code>conformanceComparatorLower</code>	A string. An operator that when applied on a value specifies whether a threshold is crossed or ceased to be crossed. This operator is used to compare with the <code>conformanceTargetLower</code> .
<code>conformanceComparatorUpper</code>	A string. An operator that when applied on a value specifies whether a threshold is crossed or ceased to be crossed. This operator is used to compare with the <code>conformanceTargetUpper</code> .
<code>conformanceTargetLower</code>	A string. A value used to determine if the threshold is crossed or ceases to be crossed. It represents the lower limit. The value should be less than the <code>conformanceTargetUpper</code> . The conformance comparators should also be logically defined so as to not lead to a logically impossible condition.
<code>conformanceTargetUpper</code>	A string. A value used to determine if the threshold is crossed or ceases to be crossed. It represents the Upper limit. The value should be greater than the <code>conformanceTargetLower</code> . The conformance comparators should also be logically defined so as to not lead to a logically impossible condition.
<code>description</code>	A string. Description for the <code>MetricDefMeasureThresholdRule</code> .
<code>name</code>	A string. Name for the <code>MetricDefMeasureThresholdRule</code> .
<code>numberOfAllowedCrossing</code>	An integer. The number of allowed crossing occurrences in reference to the <code>tolerancePeriod</code> without a consequence being initiated.
<code>thresholdRuleSeverity</code>	A string. A threshold can be generated in different severity levels. A crossing for each level may require a different condition and possibly trigger a different consequence.

tolerancePeriod	A duration (Duration). An interval of time of allowed crossing occurrences before a consequence being initiated.
-----------------	--

TestMeasure sub-resource

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

accuracy	A float. The number of digits of accuracy captured for associated Metrics.
captureDateTime	A date time (DateTime). The date and time that the metric was captured.
captureMethod	A string. The method used to capture the Metrics (This may be replaced by a set of entities similar to the Performance Monitoring Ref).
metricDescription	A string. Brief description of the metric.
metricHref	A string. Hyperlink to access a metric for detail information.
metricName	A string. The name of the metric.
ruleViolation	A list of measure threshold rule violations (MeasureThresholdRuleViolation [*]). A list of rules that were violated in this test measure.
unitOfMeasure	A string. The unit of measure for the metric values, such as meters, cubic yards, kilograms [ISO 1000].
value	A characteristic (Characteristic). The value of Metric in the test. This also could be a document to record all values captured during the service test.

ServiceRef relationship

Service reference, for when Service is used by other entities.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. reference of the service.
id	A string. Id of the service.

ServiceTestSpecificationRef relationship

The service test specification used by the service test.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Hyperlink to access a service test specification.
id	A string. Identifier of a service test specification.
version	A string. Version of a service test specification.

Json representation sample

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

```
{
  "href": "https://mycsp.com:8080/tmf-api/serviceTestManagement/v3/serviceTest/3112",
  "id": "3112",
  "description": "This service test is a simple one",
  "endDateTime": "2016-03-02T24:00:00",
  "mode": "PROACTIVE",
  "startDateTime": "2016-03-02T00:00:00",
  "state": "Completed",
  "relatedService": {
    "href": "https://mycsp.com:8080/tmf-api/serviceManagement/v3/service/21",
    "id": "21",
```

```

    "name": "gameService"
  },
  "testSpecification": {
    "href": "https://mycsp.com:8080/tmf-
api/serviceTestManagement/v3/serviceTestSpecification/22",
    "id": "22",
    "@referredType": "PerformanceTestSpecification"
  },
  "characteristic": [
    {
      "name": "number",
      "valueType": "integer",
      "value": 3
    },
    {
      "name": "restart",
      "valueType": "boolean",
      "value": true
    }
  ],
  "testMeasure": [
    {
      "accuracy": 0.0001,
      "captureDateTime": "2016-03-02T11:12:00",
      "captureMethod": "automatic capture by instrument",
      "metricDescription": "This is the flow speed in a service",
      "metricHref": "https://mycsp.com:8080/tmf-api/metricManagement/v3/metric/21",
      "metricName": "Flow speed",
      "unitOfMeasure": "A second",
      "value": {
        "valueType": "bits",
        "value": {
          "@type": "integer",
          "value": 3000
        }
      }
    }
  ],
  "ruleViolation": [
    {
      "conformanceTargetUpper": "2500",
      "conformanceComparatorUpper": "greater than ",
      "description": "This speed is greater than the target upper",
      "name": "tooMuchTraffic",
      "numberOfAllowedCrossing": 0,
      "thresholdRuleSeverity": "1",
      "appliedConsequence": [
        {
          "appliedAction": "sendWarning",
          "description": "send a warning to the system",
          "name": "sendWarning",
          "repeatAction": false
        },
        {
          "appliedAction": "generateReport",
          "description": "generate a waring report ",

```

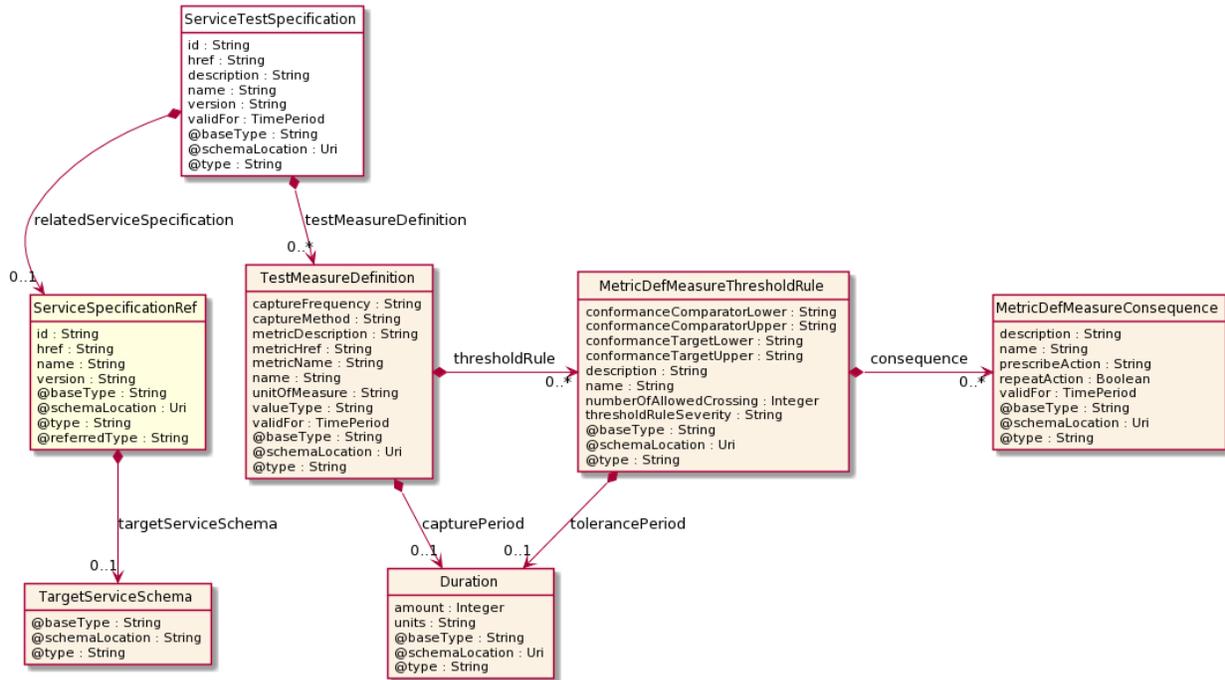
```

        "name": "generateReport",
        "repeatAction": false
    }
  ]
}
},
"@type": "PerformanceTest",
"@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/PerformanceTest.schema.json",
"@baseType": "ServiceTest"
}
    
```

4.3.10. Service Test Specification resource

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

Resource model



Field descriptions

ServiceTestSpecification fields

- description A string. Description of a service test specification.
- href A string. Hyperlink to access a service test specification.
- id A string. Identifier of a service test specification.
- name A string. Name of a service test specification.
- relatedServiceSpecification A service specification reference (ServiceSpecificationRef). The related service specification.
- testMeasureDefinition A list of test measure definitions (TestMeasureDefinition [*]). A list of definitions for

	the measurements for the test defined by this specification.
validFor	A time period. The period of time for which this specification is valid.
version	A string. Version of a service test specification.
<u>Duration sub-resource</u>	
A time interval in a given unit of time.	
amount	An integer. Time interval (number of seconds, minutes, hours, etc.).
units	A string. Unit of time (seconds, minutes, hours, etc.).
<u>MetricDefMeasureConsequence sub-resource</u>	
A MetricDefMeasureConsequence defines the action (prescribed action or notification) to take when a MetricDefMeasureThresholdRule is crossed.	
description	A string. A narrative that explains in detail what the consequence is.
name	A string. A word, term, or phrase by which a MetricDefMeasureConsequence is known and distinguished from other MetricDefMeasureConsequences.
prescribeAction	A string. Recommended remedy for a violated threshold. This could be the hyperlink to the action.
repeatAction	A boolean. An indicator used to specify that a consequence should cease being applied if a value is in the same range as the previous value or continue being applied if a value is in the same range as the previous value. If the repeatAction is True, if the consequence is always applied as soon as the MetricMeasure value is in the range of values and if the repeatAction is False, the consequence is applied only if the previous MetricMeasure value was not in the same range.
validFor	A time period. A valid duration of a thing.
<u>MetricDefMeasureThresholdRule sub-resource</u>	
A MetricDefMeasureThresholdRule is a rule that defines the condition (raise or clear) to achieve to apply consequences when a threshold is crossed or ceased to be crossed. It also defines the severity of the raise or clear of the threshold.	
conformanceComparatorLower	A string. An operator that when applied on a value specifies whether a threshold is crossed or ceased to be crossed. This operator is used to Service Test Management API REST Specification compare with the conformanceTargetLower.
conformanceComparatorUpper	A string. An operator that when applied on a value specifies whether a threshold is crossed or ceased to be crossed. This operator is used to compare with the conformanceTargetUpper.

conformanceTargetLower	A string. A value used to determine if the threshold is crossed or ceases to be crossed. It represents the lower limit. The value should be less than the conformanceTargetUpper. The conformance comparators should also be logically defined so as to not lead to a logically impossible condition.
conformanceTargetUpper	A string. A value used to determine if the threshold is crossed or ceases to be crossed. It represents the Upper limit. The value should be greater than the conformanceTargetLower. The conformance comparators should also be logically defined so as to not lead to a logically impossible condition.
consequence	A list of metric def measure consequences (MetricDefMeasureConsequence [*]). A list of consequences (actions, notifications) that will arise if the threshold is crossed.
description	A string. Description for the MetricDefMeasureThresholdRule .
name	A string. Name for the MetricDefMeasureThresholdRule .
numberOfAllowedCrossing	An integer. The number of allowed crossing occurrences in reference to the tolerancePeriod without a consequence being initiated.
thresholdRuleSeverity	A string. A threshold can be generated in different severity levels. A crossing for each level may require a different condition and possibly trigger a different consequence.
tolerancePeriod	A duration (Duration). An interval of time of allowed crossing occurrences before a consequence being initiated.

TargetServiceSchema sub-resource

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

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

TestMeasureDefinition sub-resource

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

captureFrequency	A string. The frequency of capture for the metric. Note: This may be replaced by a set of entities similar to the Performance Monitoring.
------------------	---

captureMethod	A string. The method used to capture the Metric. Note: This may be replaced by a set of entities similar to the Performance Monitoring.
capturePeriod	A duration (Duration). A period of the capture.
metricDescription	A string. Brief description of the metric.
metricHref	A string. Hyperlink to access a metric for detail information.
metricName	A string. The name of a metric that in the test measure.
name	A string. The name of the TestMeasureDefinition.
thresholdRule	A list of metric def measure threshold rules (MetricDefMeasureThresholdRule [*]). The rule(s) associated with the measure threshold.
unitOfMeasure	A string. Name of a service test specification.
validFor	A time period. The time period for which this definition is valid.
valueType	A string. A kind of value that the Metric value can take on, such as numeric, text, and so forth.

ServiceSpecificationRef relationship

Service specification reference: ServiceSpecification(s) required to realize a ProductSpecification.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Reference of the serviceSpecification.
id	A string. Unique identifier of the service specification.
name	A string. Name of the requiredServiceSpecification.
targetServiceSchema	A target service schema (TargetServiceSchema). A target service schema reference (TargetServiceSchemaRef). The reference object to the schema and type of target service which is described by service specification.
version	A string. Service specification version.

Json representation sample

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

```
{
  "description": "a service description",
  "href": "https://mycsp.com:8080/tmf-
api/serviceTestManagement/v3/serviceTestSpecification/12",
  "id": "12",
  "version": "1.0",
  "name": "monkey test",
  "validFor": {
    "endDateTime": "2017-03-01T00:00:00",
    "startDateTime": "2016-03-01T00:00:00"
  },
  "testMeasureDefinition": [
    {
      "captureFrequency": "once",
      "captureMethod": "automatic capture by instrument",
      "metricDescription": "This is the flow speed in a service",
      "metricHref": "https://mycsp.com:8080/tmf-api/metricManagement/v3/metric/21",
      "metricName": "Flow speed",
      "name": "Definition of Flow speed",
```

```

    "unitOfMeasure": "A second",
    "valueType": "bits",
    "capturePeriod": {
      "amount": "5",
      "units": "seconds"
    },
    "thresholdRule": [
      {
        "conformanceTargetUpper": "2500",
        "conformanceComparatorUpper": "greater than ",
        "description": "This speed is greater than the target upper",
        "name": "tooMuchTraffic",
        "numberOfAllowedCrossing": 0,
        "thresholdRuleSeverity": "1",
        "tolerancePeriod": {
          "amount": "15",
          "units": "minutes"
        },
        "consequence": [
          {
            "prescribeAction": "sendWarning",
            "description": "send a warning to the system",
            "name": "sendWarning",
            "repeatAction": false,
            "validFor": {
              "endDateTime": "2017-03-01T00:00:00",
              "startDateTime": "2016-03-01T00:00:00"
            }
          },
          {
            "prescribeAction": "generateReport",
            "description": "generate a waring report ",
            "name": "generateReport",
            "repeatAction": false,
            "validFor": {
              "endDateTime": "2017-03-01T00:00:00",
              "startDateTime": "2016-03-01T00:00:00"
            }
          }
        ]
      }
    ],
    "validFor": {
      "endDateTime": "2017-03-01T00:00:00",
      "startDateTime": "2016-03-01T00:00:00"
    }
  },
  "relatedServiceSpecification": {
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v3/serviceSpecification/31",
    "id": "31",
    "@referredType": "vCPEServiceSpecification"
  }
}

```

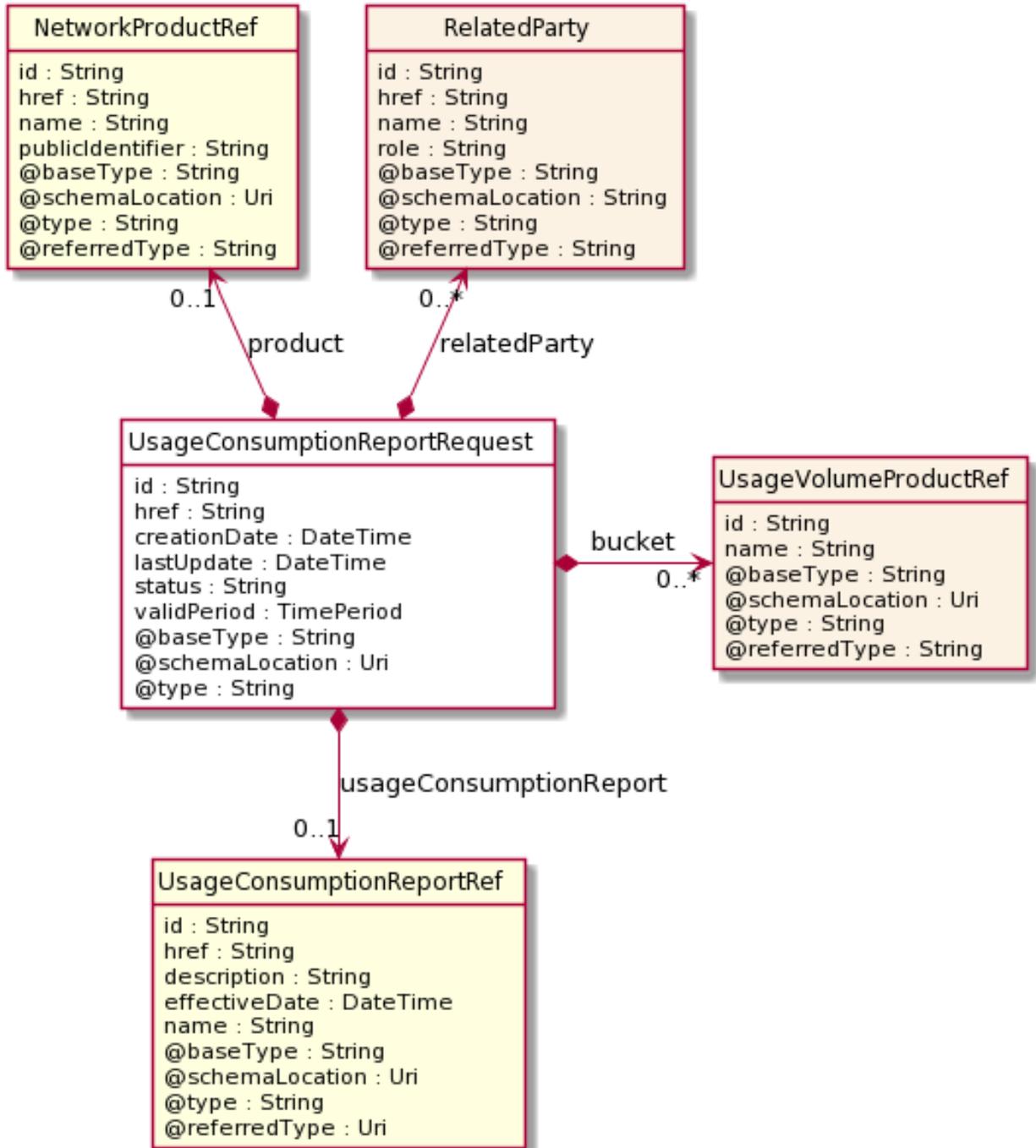
```

"@baseType": "ServiceTestSpecification",
"@type": "PerformanceTestSpecification",
"@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/service/PerformanceTestSpecification.schema.json"
}
    
```

4.3.11. Usage Consumption Report Request resource

An UsageConsumptionReportRequest allows to manage the calculation request of an usage consumption report.

Resource model



Field descriptionsUsageConsumptionReportRequest fields

bucket	A list of usage volume product references (UsageVolumeProductRef [*]). Reference of the buckets for which the usage consumption report is requested.
creationDate	A date time (DateTime). Date and time of the request creation.
href	A string. Reference of the usage consumption report request.
id	A string. Unique identifier of the usage consumption report request given by the server.
lastUpdate	A date time (DateTime). Date when the status was last changed.
product	A network product reference (NetworkProductRef). Network product reference for which the usage consumption report is requested.
relatedParty	A list of related parties (RelatedParty [*]). Reference and role of the related parties for which the usage consumption report is requested.
status	A string. Status of the usage consumption report request (InProgress or done).
usageConsumptionReport	An usage consumption report reference (UsageConsumptionReportRef). References of the usage consumption report (given when it has been calculated and the status of the request is done).
validPeriod	A time period. Validity period.

RelatedParty sub-resource

RelatedParty reference. A related party defines party or party role linked to a specific 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 entity name.
href	A string. Reference of the related party, could be a party reference or a party role reference.
id	A string. Unique identifier of a related party.
name	A string. Name of the related party.
role	A string. Role of the related party.

NetworkProductRef relationship

Reference of a product.

@referredType	A string. Generic attribute indicating the name of the class type of the referred resource entity.
href	A string. Reference to the network product.
id	A string. Unique identifier of the network product.
name	A string. Network product name.

publicIdentifier A string. Public number associated to the product (msisdn number for mobile line for example).

UsageConsumptionReportRef relationship

Reference of an usage consumption report.

description A string. Free short text describing the usage consumption report content.

effectiveDate A date time (DateTime). Date and time when the usage consumption report was calculated and generated.

href A string. Hyperlink to access the usage consumption report.

id A string. Unique identifier of the usage consumption report given by the server.

name A string. Usage consumption report name.

UsageVolumeProductRef relationship

Reference of a bucket.

@referredType A string. Generic attribute indicating the name of the class type of the referred resource entity.

id A string. Unique identifier of the bucket.

name A string. Bucket name.

Json representation sample

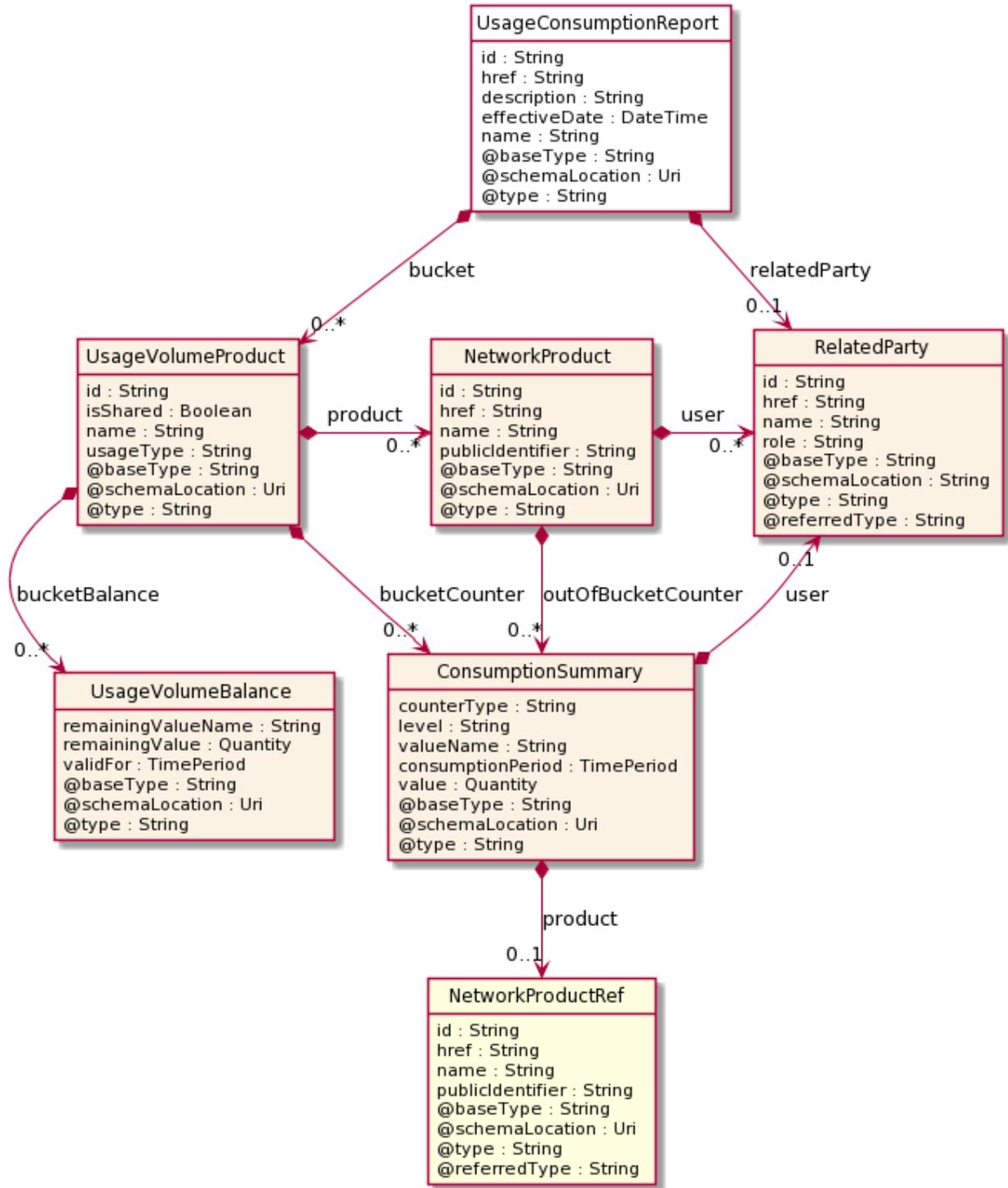
We provide below the json representation of an example of a 'UsageConsumptionReportRequest' resource object

```
{
  "id": "ucrreq001",
  "href": "https://serverRoot/tmf-
api/usageConsumption/usageConsumptionReportRequest/ucrreq001",
  "creationDate": "2018-03-15T:15:44:28",
  "status": "InProgress",
  "lastUpdate": "2018-03-15T:15:44:28",
  "product": {
    "publicIdentifier": "33601010101"
  }
}
```

4.3.12. Usage Consumption Report resource

An usage consumption report enables to know at a given point the balances and the consumption counters related to various buckets (SMS, Voice, Data for example). It could be calculated for a device identified by a public key (msisdn number for a mobile device for example or PSTN or VOIP number for a fix device), for a subscribed offer or option or for an user.

Resource model



Field descriptions

UsageConsumptionReport fields

- bucket A list of usage volume products (UsageVolumeProduct [*]).
- description Bucket(s) included in the offer or option subscribed.
- description A string. Free short text describing the usage consumption report content.

effectiveDate	A date time (DateTime). Date and time when the usage consumption report was calculated and generated.
href	A string. Hyperlink to access the usage consumption report. The report is calculated at the time of the request by the server. Generally, this report is not recorded by the server. If it is, an unique identifier of the usage consumption report is given by the server.
id	A string. The report is calculated at the time of the request by the server. Generally, this report is not recorded by the server. If it is, an unique identifier of the usage consumption report is given by the server.
name	A string. Usage consumption report name.
relatedParty	A related party (RelatedParty). RelatedParty reference. A related party defines party or party role linked to a specific entity.

ConsumptionSummary sub-resource

The consumption counters (called ConsumptionSummary in the SID model) detail for example the different kind of consumption done on the bucket.

consumptionPeriod	A time period. Consumption counter period between a start date time and an end date time. For prepaid bucket, the period of counters is between the start date of the bucket and the effective date of the usage consumption report generation. For postpaid bucket, the period of counters is between the last bill date and the effective date of the usage consumption report generation.
counterType	A string. Type of the consumption counter. We can give for example a counter of the used value for a bucket (counterType=used for example) or the value of the consumption done out of the bucket(s) (counterType=outOfBucket for example).
level	A string. Counter level. The counter can be given globally for the bucket or detailed by user or by network product for example in case of shared bucket.
product	A network product reference (NetworkProductRef). Public identifier associated to the product for which the consumption counter is detailed. If the level of the counter is global (i.e. concerning all the network products), the list of them is not specified. It can be found through the network products listed in the bucket sub-resource.
user	A related party (RelatedParty). Reference of the user for which the consumption counter is detailed. If the level of the counter is global (i.e. concerning all the users), the list of them is not specified. It can be found through the users listed in the network products of the bucket sub-resource.
value	A quantity (Quantity). Numeric value of the bucket counter in a given unit.
valueName	A string. Value of the counter in a formatted string used for display needs for example.

NetworkProduct sub-resource

An instantiated network product (specialization of a product) subscribed by a customer.

href	A string. Reference to the network product.
id	A string. Unique identifier of the network product.
name	A string. Network product name.
outOfBucketCounter	A list of consumption summaries (ConsumptionSummary [*]). Counters detailing usage consumption out of the buckets.
publicIdentifier	A string. Public number associated to the network product (msisdn number for mobile line for example).
user	A list of related parties (RelatedParty [*]). References of the users of the network product.

Quantity sub-resource

An amount in a given unit.

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

RelatedParty sub-resource

RelatedParty reference. A related party defines party or party role linked to a specific 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 entity name.
href	A string. Reference of the related party, could be a party reference or a party role reference.
id	A string. Unique identifier of a related party.
name	A string. Name of the related party.
role	A string. Role of the related party.

UsageVolumeBalance sub-resource

The balance (called UsageVolumeBalance in the SID model) defines the remaining allowed product usage quantity in terms of volume, time, currency or events. It corresponds to the initial allowed usage quantity minus the usage consumed on the bucket.

remainingValue	A quantity (Quantity). Numeric remaining value for the bucket given in the unit (for example 1.9). This numeric value could be used for calculation for example.
remainingValueName	A string. Remaining value in a formatted string for the bucket given in the balance unit (for example 1.9 Gb). This formatted string could be used for display needs for example.
validFor	A time period. Balance period between a start date time and an end date time. For prepaid bucket, the period of the balance is between the effective date of the usage consumption report generation and the end date of the bucket. For postpaid bucket, the period of the balance is between the effective date of the usage consumption report generation and the next bill date.

UsageVolumeProduct sub-resource

A bucket (called UsageVolumeProduct in the SID model) represents a quantity of usage, as 2 hours national calls or 50 sms for example. It could be either a quantity or an amount in a

currency (i.e. It could represent a fixed number of SMS, MMS, minutes of calls, quantity of data, number of events as well as a specific amount in a given currency). It requires one or more network products from which usages will debit the bucket.

bucketBalance	A list of usage volume balances (UsageVolumeBalance [*]). The balance (called UsageVolumeBalance in the SID model) defines the remaining allowed product usage quantity in terms of volume, time, currency or events. It corresponds to the initial allowed usage quantity minus the usage consumed on the bucket.
bucketCounter	A list of consumption summaries (ConsumptionSummary [*]). The consumption counters (called ConsumptionSummary in the SID model) detail for example the different kind of consumption done on the bucket.
id	A string. Unique identifier of the bucket.
isShared	A boolean. True if the bucket is shared between several devices or users.
name	A string. Bucket name.
product	A list of network products (NetworkProduct [*]). An instantiated network product (specialization of a product) subscribed by a customer.
usageType	A string. Type of usage concerned by the bucket, such as voice, sms, data.

NetworkProductRef relationship

Reference of a product.

@referredType	A string. Generic attribute indicating the name of the class type of the referred resource entity.
href	A string. Reference to the network product.
id	A string. Unique identifier of the network product.
name	A string. Network product name.
publicIdentifier	A string. Public number associated to the product (msisdn number for mobile line for example).

Json representation sample

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

```
{
  "id": "ucr0001",
  "href": "https://serverRoot/tmf-api/usageConsumption/usageConsumptionReport/ucr0001",
  "name": "Usage consumption report ucr0001",
  "description": "Usage consumption Report for Kate smartphone",
  "effectiveDate": "2018-03-15T:15:44:28",
  "bucket": [
    {
      "id": "bkt001",
      "name": "Main offer - data",
      "usageType": "data",
      "isShared": false,
      "product": [
        {
          "id": "product1",
          "name": "Kate smartphone",
```

```
"publicIdentifier": "33601010101",
"user": [
  {
    "id": "usr1",
    "name": "Kate",
    "role": "user",
    "@referredType": "individual"
  }
],
"outOfBucketCounter": [
  {
    "counterType": "outOfBucket",
    "level": "global",
    "value": {
      "amount": 20.0,
      "units": "USD"
    },
    "valueName": "20 USD",
    "consumptionPeriod": {
      "startDateTime": "2018-03-01T:00:00:00",
      "endDateTime": "2018-03-15T:00:00:00"
    }
  }
]
},
"bucketBalance": [
  {
    "remainingValue": {
      "amount": 1.8,
      "units": "Go"
    },
    "remainingValueName": "it remains 1.8 Go",
    "validFor": {
      "startDateTime": "2018-03-15T:00:00:00",
      "endDateTime": "2018-03-30T:00:00:00"
    }
  }
],
"bucketCounter": [
  {
    "counterType": "used",
    "level": "global",
    "value": {
      "amount": 1.2,
      "units": "Go"
    },
    "valueName": "1.2 Go used",
    "consumptionPeriod": {
      "startDateTime": "2018-03-01T:00:00:00",
      "endDateTime": "2018-03-15T:00:00:00"
    }
  }
]
```

```

    },
    {
      "id": "bkt002",
      "name": "Main offer - national voice",
      "usageType": "national voice",
      "isShared": false,
      "product": [
        {
          "id": "product1",
          "name": "Kate smartphone",
          "publicIdentifier": "33601010101",
          "user": [
            {
              "id": "usr1",
              "name": "Kate",
              "role": "user",
              "@referredType": "individual"
            }
          ]
        }
      ]
    },
    "bucketBalance": [
      {
        "remainingValue": {
          "amount": 80.0,
          "units": "mins"
        },
        "remainingValueName": "it remains 80 minutes",
        "validFor": {
          "startDateTime": "2018-03-15T:00:00:00",
          "endDateTime": "2018-03-30T:00:00:00"
        }
      }
    ],
    "bucketCounter": [
      {
        "counterType": "used",
        "level": "global",
        "value": {
          "amount": 40.0,
          "units": "mins"
        },
        "valueName": "40 mins used",
        "consumptionPeriod": {
          "startDateTime": "2018-03-01T:00:00:00",
          "endDateTime": "2018-03-15T:00:00:00"
        }
      }
    ]
  },
  {
    "id": "bkt003",
    "name": "Main offer - sms",
    "usageType": "sms",

```

```
"isShared": false,
"product": [
  {
    "id": "product1",
    "name": "Kate smartphone",
    "publicIdentifier": "33601010101",
    "user": [
      {
        "id": "usr1",
        "name": "Kate",
        "role": "user",
        "@referredType": "individual"
      }
    ]
  }
],
"bucketBalance": [
  {
    "remainingValue": {
      "amount": 95.0,
      "units": "sms"
    },
    "remainingValueName": "it remains 95 sms",
    "validFor": {
      "startDateTime": "2018-03-15T:00:00:00",
      "endDateTime": "2018-03-30T:00:00:00"
    }
  }
],
"bucketCounter": [
  {
    "counterType": "used",
    "level": "global",
    "value": {
      "amount": 25.0,
      "units": "sms"
    },
    "valueName": "25 sms used",
    "consumptionPeriod": {
      "startDateTime": "2018-03-01T:00:00:00",
      "endDateTime": "2018-03-15T:00:00:00"
    }
  }
]
},
{
  "id": "bkt004",
  "name": "Option Canada/USA - voice",
  "usageType": "voice",
  "isShared": false,
  "product": [
    {
      "id": "product1",
      "name": "Kate smartphone",
```

```
    "publicIdentifier": "33601010101",
    "user": [
      {
        "id": "usr1",
        "name": "Kate",
        "role": "user",
        "@referredType": "individual"
      }
    ]
  },
  "bucketBalance": [
    {
      "remainingValue": {
        "amount": 10.0,
        "units": "mins"
      },
      "remainingValueName": "it remains 10 minutes",
      "validFor": {
        "startDateTime": "2018-03-15T:00:00:00",
        "endDateTime": "2018-03-30T:00:00:00"
      }
    }
  ],
  "bucketCounter": [
    {
      "counterType": "used",
      "level": "global",
      "value": {
        "amount": 20.0,
        "units": "mins"
      },
      "valueName": "20 mins used",
      "consumptionPeriod": {
        "startDateTime": "2018-03-01T:00:00:00",
        "endDateTime": "2018-03-15T:00:00:00"
      }
    }
  ]
},
{
  "id": "bkt005",
  "name": "Option Canada/USA - sms",
  "usageType": "sms",
  "isShared": false,
  "product": [
    {
      "id": "product1",
      "name": "Kate smartphone",
      "publicIdentifier": "33601010101",
      "user": [
        {
          "id": "usr1",
          "name": "Kate",
```

```
        "role": "user",
        "@referredType": "individual"
      }
    ]
  },
  "bucketBalance": [
    {
      "remainingValue": {
        "amount": 0.0,
        "units": "sms"
      },
      "remainingValueName": "Sms bucket exhausted",
      "validFor": {
        "startDateTime": "2018-03-15T:00:00:00",
        "endDateTime": "2018-03-30T:00:00:00"
      }
    }
  ],
  "bucketCounter": [
    {
      "counterType": "used",
      "level": "global",
      "value": {
        "amount": 10.0,
        "units": "sms"
      },
      "valueName": "10 sms used",
      "consumptionPeriod": {
        "startDateTime": "2018-03-01T:00:00:00",
        "endDateTime": "2018-03-15T:00:00:00"
      }
    }
  ]
}
]
```

4.3.13. Import Job resource

Represents a task used to import resources from a file.

Resource model

ImportJob
id : String href : String completionDate : DateTime contentType : String creationDate : DateTime errorLog : String path : String status : String url : String @baseType : String @schemaLocation : Uri @type : String

Field descriptionsImportJob fields

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

Json representation sample

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

```
{
  "completionDate": "2017-08-27T00:02",
  "contentType": "application/json",
  "creationDate": "2017-08-27T00:00",
  "errorLog": "http://my-platform/daily/logging/errors.log",
  "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/importJob/7497",
  "id": "7497",
  "path": "/warning/system",
  "status": "completed",
  "url": "https://my-platform/daily/job/NHCFD6"
}
```

4.3.14. Export Job resource

Represents a task used to export resources to a file.

Resource model

ExportJob
id : String
href : String
completionDate : DateTime
contentType : String
creationDate : DateTime
errorLog : String
path : String
query : String
status : String
url : String
@baseType : String
@schemaLocation : Uri
@type : String

Field descriptionsExportJob fields

completionDate	A date time (DateTime). Data at which the job was completed.
contentType	A string. The format of the exported data.
creationDate	A date time (DateTime). Date at which the job was created.
errorLog	A string. Reason for failure.
href	A string. Reference of the export job.
id	A string. Identifier of the export job.
path	A string. URL of the root resource acting as the source for streaming content to the file specified by the export job.
query	A string. Used to scope the exported data.
status	A string. Status of the export job (not started, running, succeeded, failed).
url	A string. URL of the file containing the data to be exported.

Json representation sample

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

```
{
  "completionDate": "2017-08-27T00:02",
  "contentType": "application/json",
  "creationDate": "2017-08-27T00:00",
  "errorLog": "http://my-platform/daily/logging/errors.log",
  "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/exportJob/1866",
  "id": "1866",
  "path": "/warning/system",
  "query": "advancedCatalog",
  "status": "completed",
  "url": "https://my-platform/daily/job/EHC6D6"
}
```

4.4. Notification Resource Models

36 notifications are defined for this API

Notifications related to Service:

- ServiceCreateEvent
- ServiceAttributeValueChangeEvent
- ServiceStateChangeEvent
- ServiceBatchEvent
- ServiceDeleteEvent

Notifications related to ServiceCatalog:

- ServiceCatalogCreateEvent
- ServiceCatalogChangeEvent
- ServiceCatalogBatchEvent
- ServiceCatalogDeleteEvent

Notifications related to ServiceCategory:

- ServiceCategoryCreateEvent
- ServiceCategoryChangeEvent
- ServiceCategoryDeleteEvent

Notifications related to ServiceCandidate:

- ServiceCandidateCreateEvent
- ServiceCandidateChangeEvent
- ServiceCandidateDeleteEvent

Notifications related to ServiceOrder:

- ServiceOrderCreateEvent
- ServiceOrderAttributeValueChangeEvent
- ServiceOrderStateChangeEvent
- ServiceOrderDeleteEvent

Notifications related to ServiceQualification:

- ServiceQualificationCreateEvent
- ServiceQualificationChangeEvent
- ServiceQualificationDeleteEvent

Notifications related to ServiceProblem:

- ServiceProblemCreateEvent
- ServiceProblemStateChangeEvent
- ServiceProblemAttributeValueChangeEvent
- ServiceProblemInformationRequiredEvent

Notifications related to ServiceSpecification:

- ServiceSpecificationCreateEvent
- ServiceSpecificationChangeEvent
- ServiceSpecificationDeleteEvent

Notifications related to ServiceTest:

- ServiceTestCreateEvent
- ServiceTestAttributeValueChangeEvent
- ServiceTestDeleteEvent

Notifications related to ServiceTestSpecification:

- ServiceTestSpecificationCreateEvent
- ServiceTestSpecificationAttributeValueChangeEvent
- ServiceTestSpecificationDeleteEvent

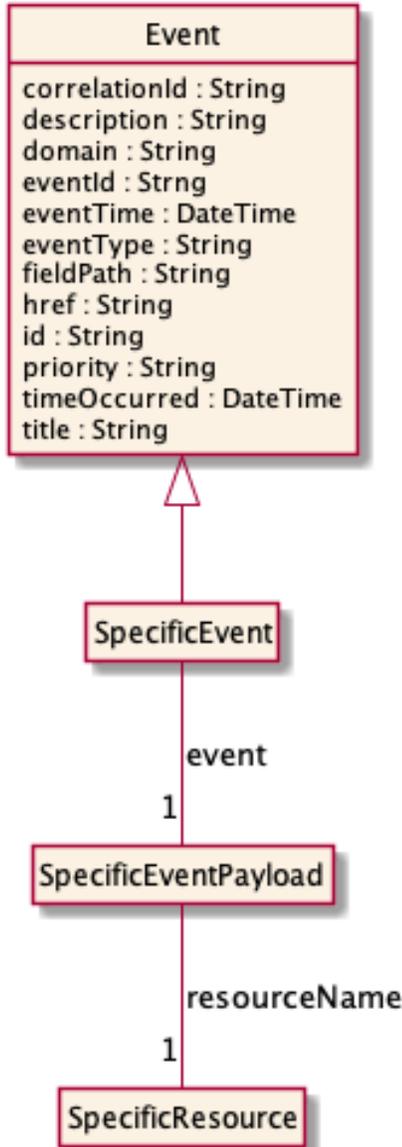
Notifications related to UsageConsumptionReportRequest:

- UsageConsumptionReportRequestStateChangeEvent

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).



4.4.1. Service Create Event

Notification ServiceCreateEvent case for resource Service

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceCreateEvent",
  "event": {
    "service" :
      {-- SEE Service RESOURCE SAMPLE --}
  }
}

```

4.4.2. Service Attribute Value Change Event

Notification ServiceAttributeValueChangeEvent case for resource Service

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceAttributeValueChangeEvent",
  "event": {
    "service" :
      {-- SEE Service RESOURCE SAMPLE --}
  }
}

```

4.4.3. Service State Change Event

Notification ServiceStateChangeEvent case for resource Service

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceStateChangeEvent",
  "event": {
    "service" :
      {-- SEE Service RESOURCE SAMPLE --}
  }
}

```

4.4.4. Service Batch Event

Notification ServiceBatchEvent case for resource Service

Json representation sample

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

```

{
  "eventId":"00001",

```

```

    "eventTime":"2015-11-16T16:42:25-04:00",
    "eventType":"ServiceBatchEvent",
    "event": {
      "service" :
        {-- SEE Service RESOURCE SAMPLE --}
    }
  }
}

```

4.4.5. Service Delete Event

Notification ServiceDeleteEvent case for resource Service

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceDeleteEvent",
  "event": {
    "service" :
      {-- SEE Service RESOURCE SAMPLE --}
  }
}

```

4.4.6. Service Catalog Create Event

Notification ServiceCatalogCreateEvent case for resource ServiceCatalog

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceCatalogCreateEvent",
  "event": {
    "serviceCatalog" :
      {-- SEE ServiceCatalog RESOURCE SAMPLE --}
  }
}

```

4.4.7. Service Catalog Change Event

Notification ServiceCatalogChangeEvent case for resource ServiceCatalog

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceCatalogChangeEvent",
  "event": {
    "serviceCatalog" :
      {-- SEE ServiceCatalog RESOURCE SAMPLE --}
  }
}

```

4.4.8. Service Catalog Batch Event

Notification ServiceCatalogBatchEvent case for resource ServiceCatalog

Json representation sample

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

```

{
  "eventId": "00001",
  "eventTime": "2015-11-16T16:42:25-04:00",
  "eventType": "ServiceCatalogBatchEvent",
  "event": {
    "serviceCatalog":
      {-- SEE ServiceCatalog RESOURCE SAMPLE --}
  }
}

```

4.4.9. Service Catalog Delete Event

Notification ServiceCatalogDeleteEvent case for resource ServiceCatalog

Json representation sample

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

```

{
  "eventId": "00001",
  "eventTime": "2015-11-16T16:42:25-04:00",
  "eventType": "ServiceCatalogDeleteEvent",
  "event": {
    "serviceCatalog":
      {-- SEE ServiceCatalog RESOURCE SAMPLE --}
  }
}

```

4.4.10. Service Category Create Event

Notification ServiceCategoryCreateEvent case for resource ServiceCategory

Json representation sample

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

```

{
  "eventId": "00001",
  "eventTime": "2015-11-16T16:42:25-04:00",
  "eventType": "ServiceCategoryCreateEvent",
  "event": {
    "serviceCategory":
      {-- SEE ServiceCategory RESOURCE SAMPLE --}
  }
}

```

4.4.11. Service Category Change Event

Notification ServiceCategoryChangeEvent case for resource ServiceCategory

Json representation sample

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

```

{
  "eventId": "00001",

```

```

    "eventTime":"2015-11-16T16:42:25-04:00",
    "eventType":"ServiceCategoryChangeEvent",
    "event": {
      "serviceCategory" :
        {-- SEE ServiceCategory RESOURCE SAMPLE --}
    }
  }
}

```

4.4.12. Service Category Delete Event

Notification ServiceCategoryDeleteEvent case for resource ServiceCategory

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceCategoryDeleteEvent",
  "event": {
    "serviceCategory" :
      {-- SEE ServiceCategory RESOURCE SAMPLE --}
  }
}

```

4.4.13. Service Candidate Create Event

Notification ServiceCandidateCreateEvent case for resource ServiceCandidate

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceCandidateCreateEvent",
  "event": {
    "serviceCandidate" :
      {-- SEE ServiceCandidate RESOURCE SAMPLE --}
  }
}

```

4.4.14. Service Candidate Change Event

Notification ServiceCandidateChangeEvent case for resource ServiceCandidate

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceCandidateChangeEvent",
  "event": {
    "serviceCandidate" :
      {-- SEE ServiceCandidate RESOURCE SAMPLE --}
  }
}

```

4.4.15. Service Candidate Delete Event

Notification ServiceCandidateDeleteEvent case for resource ServiceCandidate

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceCandidateDeleteEvent",
  "event": {
    "serviceCandidate" :
      {-- SEE ServiceCandidate RESOURCE SAMPLE --}
  }
}

```

4.4.16. Service Order Create Event

Notification ServiceOrderCreateEvent case for resource ServiceOrder

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceOrderCreateEvent",
  "event": {
    "serviceOrder" :
      {-- SEE ServiceOrder RESOURCE SAMPLE --}
  }
}

```

4.4.17. Service Order Attribute Value Change Event

Notification ServiceOrderAttributeValueChangeEvent case for resource ServiceOrder

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceOrderAttributeValueChangeEvent",
  "event": {
    "serviceOrder" :
      {-- SEE ServiceOrder RESOURCE SAMPLE --}
  }
}

```

4.4.18. Service Order State Change Event

Notification ServiceOrderStateChangeEvent case for resource ServiceOrder

Json representation sample

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

```

{
  "eventId":"00001",

```

```

    "eventTime":"2015-11-16T16:42:25-04:00",
    "eventType":"ServiceOrderStateChangeEvent",
    "event": {
      "serviceOrder" :
        {-- SEE ServiceOrder RESOURCE SAMPLE --}
    }
  }
}

```

4.4.19. Service Order Delete Event

Notification ServiceOrderDeleteEvent case for resource ServiceOrder

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceOrderDeleteEvent",
  "event": {
    "serviceOrder" :
      {-- SEE ServiceOrder RESOURCE SAMPLE --}
  }
}

```

4.4.20. Service Qualification Create Event

Notification ServiceQualificationCreateEvent case for resource ServiceQualification

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceQualificationCreateEvent",
  "event": {
    "serviceQualification" :
      {-- SEE ServiceQualification RESOURCE SAMPLE --}
  }
}

```

4.4.21. Service Qualification Change Event

Notification ServiceQualificationChangeEvent case for resource ServiceQualification

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceQualificationChangeEvent",
  "event": {
    "serviceQualification" :
      {-- SEE ServiceQualification RESOURCE SAMPLE --}
  }
}

```

4.4.22. Service Qualification Delete Event

Notification ServiceQualificationDeleteEvent case for resource ServiceQualification

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceQualificationDeleteEvent",
  "event": {
    "serviceQualification" :
      {-- SEE ServiceQualification RESOURCE SAMPLE --}
  }
}

```

4.4.23. Service Problem Create Event

Notification ServiceProblemCreateEvent case for resource ServiceProblem

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceProblemCreateEvent",
  "event": {
    "serviceProblem" :
      {-- SEE ServiceProblem RESOURCE SAMPLE --}
  }
}

```

4.4.24. Service Problem State Change Event

Notification ServiceProblemStateChangeEvent case for resource ServiceProblem

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceProblemStateChangeEvent",
  "event": {
    "serviceProblem" :
      {-- SEE ServiceProblem RESOURCE SAMPLE --}
  }
}

```

4.4.25. Service Problem Attribute Value Change Event

Notification ServiceProblemAttributeValueChangeEvent case for resource ServiceProblem

Json representation sample

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

```

{
  "eventId":"00001",

```

```

    "eventTime":"2015-11-16T16:42:25-04:00",
    "eventType":"ServiceProblemAttributeValueChangeEvent",
    "event": {
      "serviceProblem" :
        {-- SEE ServiceProblem RESOURCE SAMPLE --}
    }
  }
}

```

4.4.26. Service Problem Information Required Event

Notification ServiceProblemInformationRequiredEvent case for resource ServiceProblem

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceProblemInformationRequiredEvent",
  "event": {
    "serviceProblem" :
      {-- SEE ServiceProblem RESOURCE SAMPLE --}
  }
}

```

4.4.27. Service Specification Create Event

Notification ServiceSpecificationCreateEvent case for resource ServiceSpecification

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceSpecificationCreateEvent",
  "event": {
    "serviceSpecification" :
      {-- SEE ServiceSpecification RESOURCE SAMPLE --}
  }
}

```

4.4.28. Service Specification Change Event

Notification ServiceSpecificationChangeEvent case for resource ServiceSpecification

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceSpecificationChangeEvent",
  "event": {
    "serviceSpecification" :
      {-- SEE ServiceSpecification RESOURCE SAMPLE --}
  }
}

```

4.4.29. Service Specification Delete Event

Notification ServiceSpecificationDeleteEvent case for resource ServiceSpecification

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceSpecificationDeleteEvent",
  "event": {
    "serviceSpecification" :
      {-- SEE ServiceSpecification RESOURCE SAMPLE --}
  }
}

```

4.4.30. Service Test Create Event

Notification ServiceTestCreateEvent case for resource ServiceTest

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceTestCreateEvent",
  "event": {
    "serviceTest" :
      {-- SEE ServiceTest RESOURCE SAMPLE --}
  }
}

```

4.4.31. Service Test Attribute Value Change Event

Notification ServiceTestAttributeValueChangeEvent case for resource ServiceTest

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceTestAttributeValueChangeEvent",
  "event": {
    "serviceTest" :
      {-- SEE ServiceTest RESOURCE SAMPLE --}
  }
}

```

4.4.32. Service Test Delete Event

Notification ServiceTestDeleteEvent case for resource ServiceTest

Json representation sample

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

```

{
  "eventId":"00001",

```

```

    "eventTime":"2015-11-16T16:42:25-04:00",
    "eventType":"ServiceTestDeleteEvent",
    "event": {
      "serviceTest" :
        {-- SEE ServiceTest RESOURCE SAMPLE --}
    }
  }
}

```

4.4.33. Service Test Specification Create Event

Notification ServiceTestSpecificationCreateEvent case for resource ServiceTestSpecification

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceTestSpecificationCreateEvent",
  "event": {
    "serviceTestSpecification" :
      {-- SEE ServiceTestSpecification RESOURCE SAMPLE --}
  }
}

```

4.4.34. Service Test Specification Attribute Value Change Event

Notification ServiceTestSpecificationAttributeValueChangeEvent case for resource ServiceTestSpecification

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceTestSpecificationAttributeValueChangeEvent",
  "event": {
    "serviceTestSpecification" :
      {-- SEE ServiceTestSpecification RESOURCE SAMPLE --}
  }
}

```

4.4.35. Service Test Specification Delete Event

Notification ServiceTestSpecificationDeleteEvent case for resource ServiceTestSpecification

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"ServiceTestSpecificationDeleteEvent",
  "event": {
    "serviceTestSpecification" :
      {-- SEE ServiceTestSpecification RESOURCE SAMPLE --}
  }
}

```

```
}
```

4.4.36. Usage Consumption Report Request State Change Event

Notification UsageConsumptionReportRequestStateChangeEvent case for resource UsageConsumptionReportRequest

Json representation sample

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

```
{
  "eventId": "00001",
  "eventTime": "2015-11-16T16:42:25-04:00",
  "eventType": "UsageConsumptionReportRequestStateChangeEvent",
  "event": {
    "usageConsumptionReportRequest":
      {-- SEE UsageConsumptionReportRequest RESOURCE SAMPLE --}
  }
}
```

5. API OPERATIONS

Remember the following Uniform Contract:

Operation on Entities	Uniform API Operation	Description
Query Entities	GET Resource	GET must be used to retrieve a representation of a resource.
Create Entity	POST Resource	POST must be used to create a new resource
Partial Update of an Entity	PATCH Resource	PATCH must be used to partially update a resource
Complete Update of an Entity	PUT Resource	PUT must be used to completely update a resource identified by its resource URI
Remove an Entity	DELETE Resource	DELETE must be used to remove a resource
Execute an Action on an Entity	POST on TASK Resource	POST must be used to execute Task Resources
Other Request Methods	POST on TASK Resource	GET and POST must not be used to tunnel other request methods.

Filtering and attribute selection rules are described in the TMF REST Design Guidelines. Notifications are also described in a subsequent section.

5.5. Operations on Service

5.5.1. List services

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

Description

This operation list service entities.

Attribute selection is enabled for all first level attributes.

Filtering may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving Service resources.

Request
GET /tmf-api/naas/v3/service Accept: application/json
Response
200 <pre>[{ "id": "5351", "href": "https://mycsp.com:8080/tmf-api/ServiceActivationAndConfiguration/v3/service/5351", "serviceType": "Cloud", "state": "Active", "serviceDate": "2018-01-15T12:26:11.747Z", "startDate": "2018-01-15T12:26:11.747Z", "serviceCharacteristic": [{ "name": "vCPE_IP", "valueType": "object", "value": { "@type": "IPAddress", "@schemaLocation": "https://mycsp.com:8080/tmf- api/schema/Service/IPAddress.schema.json", "address": "193.218.236.21" } }], "@type": "vCPE", "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Service/vCPE.schema.json", "@baseType": "Service" }]</pre>

5.5.2. Retrieve service

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

Description

This operation retrieves a service entity.

Attribute selection is enabled for all first level attributes.

Filtering on sub-resources may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving a Service resource.

Request
<pre>GET /tmf-api/naas/v3/service/5351 Accept: application/json</pre>
Response
<pre>200 { "id": "5351", "href": "https://mycsp.com:8080/tmf-api/ServiceActivationAndConfiguration/v3/service/5351", "serviceType": "Cloud", "state": "Active", "serviceDate": "2018-01-15T12:26:11.747Z", "startDate": "2018-01-15T12:26:11.747Z", "serviceCharacteristic": [{ "name": "vCPE_IP", "valueType": "object", "value": { "@type": "IPAddress", "@schemaLocation": "https://mycsp.com:8080/tmf- api/schema/Service/IPAddress.schema.json", "address": "193.218.236.21" } }], "@type": "vCPE", "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Service/vCPE.schema.json", "@baseType": "Service" }</pre>

5.5.3.Create service

POST /service

Description

This operation creates a service entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a Service, including any possible rule conditions and applicable default values. Notice that it is up to an implementer to add additional mandatory attributes.

Mandatory Attributes	Rule
state	
serviceSpecification.id	

Non Mandatory Attributes	Rule
category	
description	
endDate	
hasStarted	
isServiceEnabled	
isStateful	
name	
note	
place	
relatedParty	
serviceCharacteristic	
serviceDate	
serviceOrder	
serviceRelationship	
serviceSpecification	
serviceType	
startDate	
startMode	
supportingResource	
supportingService	

Usage Samples

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

Request
POST /tmf-api/naas/v3/service Content-Type: application/json <pre>{ "state": "Active" }</pre>

Response
201
<pre>{ "id": "5351", "href": "https://mycsp.com:8080/tmf-api/ServiceActivationAndConfiguration/v3/service/5351", "state": "Active" }</pre>

5.5.4.Patch service

PATCH /service/{id}

Description

This operation allows partial updates of a service entity. Support of json/merge (<https://tools.ietf.org/html/rfc7386>) is mandatory, support of json/patch (<http://tools.ietf.org/html/rfc5789>) is optional.

Note: If the update operation yields to the creation of sub-resources or relationships, the same rules concerning mandatory sub-resource attributes and default value settings in the POST operation applies to the PATCH operation. Hence these tables are not repeated here.

Patchable and Non Patchable Attributes

The tables below provide the list of patchable and non patchable attributes, including constraint rules on their usage.

Patchable Attributes	Rule
category	
description	
endDate	
hasStarted	
isServiceEnabled	
isStateful	
name	
note	
place	
relatedParty	
serviceCharacteristic	
serviceDate	
serviceOrder	
serviceSpecification	
serviceType	
startDate	
startMode	
state	
supportingResource	
supportingService	

Non Patchable Attributes	Rule
id	
href	
serviceRelationship	

Usage Samples

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

Request
PATCH /tmf-api/naas/v3/service/5351 Content-Type: application/merge-patch+json <pre>{ "name": "new name" }</pre>
Response
200 <pre>{ "id": "5351", "href": "https://mycsp.com:8080/tmf-api/ServiceActivationAndConfiguration/v3/service/5351", "serviceType": "Cloud", "state": "Active", "serviceDate": "2018-01-15T12:26:11.747Z", "startDate": "2018-01-15T12:26:11.747Z", "serviceCharacteristic": [{ "name": "vCPE_IP", "valueType": "object", "value": { "@type": "IPAddress", "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Service/IPAddress.schema.json", "address": "193.218.236.21" } }], "@type": "vCPE", "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Service/vCPE.schema.json", "@baseType": "Service", "name": "new name" }</pre>

5.5.5.Delete service

DELETE /service/{id}

Description

This operation deletes a service entity.

Usage Samples

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

Request
DELETE /tmf-api/naas/v3/service/42
Response
204

5.6. Operations on Service Catalog**5.6.1. List service catalogs**

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

Description

This operation list service catalog entities.

Attribute selection is enabled for all first level attributes.

Filtering may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving ServiceCatalog resources.

Request
GET /tmf-api/naas/v3/serviceCatalog Accept: application/json
Response
200 [{ "id": "3830", "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceCatalog/3830", "name": "Catalog Wholesale Business", "description": "This service catalog describes services that address the wholesale business segment.", "version": "1.0", "validFor": { "startDateTime": "2017-08-29T00:00", "endDateTime": "2018-03-25T00:00" }, "lastUpdate": "2017-08-27T00:00", "lifecycleStatus": "Active", "relatedParty": [{ "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/organization/3426", "id": "3426", "name": "Broadly Broad Ltd", "role": "vendor" }] }

```

    }
  ],
  "category": [
    {
      "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/category/7752",
      "id": "7752",
      "name": "IoT"
    }
  ],
  "@type": "ServiceCatalog",
  "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/ServiceCatalog.schema.json ",
  "@baseType": "Catalog"
}
]

```

5.6.2.Retrieve service catalog

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

Description

This operation retrieves a service catalog entity.

Attribute selection is enabled for all first level attributes.

Filtering on sub-resources may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving a ServiceCatalog resource.

Request
GET /tmf-api/naas/v3/serviceCatalog/3830 Accept: application/json
Response
200 <pre> { "id": "3830", "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceCatalog/3830", "name": "Catalog Wholesale Business", "description": "This service catalog describes services that address the wholesale business segment.", "version": "1.0", "validFor": { "startDateTime": "2017-08-29T00:00", "endDateTime": "2018-03-25T00:00" }, "lastUpdate": "2017-08-27T00:00", "lifecycleStatus": "Active", "relatedParty": [{ "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/organization/3426", "id": "3426", </pre>

```

        "name": "Broadly Broad Ltd",
        "role": "vendor"
    }
],
"category": [
    {
        "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/category/7752",
        "id": "7752",
        "name": "IoT"
    }
],
"@type": "ServiceCatalog",
"@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Service/ServiceCatalog.schema.json ",
"@baseType": "Catalog"
}
    
```

5.6.3. Create service catalog

POST /serviceCatalog

Description

This operation creates a service catalog entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a ServiceCatalog, including any possible rule conditions and applicable default values. Notice that it is up to an implementer to add additional mandatory attributes.

Mandatory Attributes	Rule
name	

Non Mandatory Attributes	Rule
category	
description	
lastUpdate	
lifecycleStatus	
relatedParty	
validFor	
version	

Usage Samples

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

Request
POST /tmf-api/naas/v3/serviceCatalog Content-Type: application/json {

<pre> "name": "Catalog Wholesale Business" } </pre>
Response
<pre> 201 { "id": "3830", "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceCatalog/3830", "name": "Catalog Wholesale Business" } </pre>

5.6.4.Patch service catalog

PATCH /serviceCatalog/{id}

Description

This operation allows partial updates of a service catalog entity. Support of json/merge (<https://tools.ietf.org/html/rfc7386>) is mandatory, support of json/patch (<http://tools.ietf.org/html/rfc5789>) is optional.

Note: If the update operation yields to the creation of sub-resources or relationships, the same rules concerning mandatory sub-resource attributes and default value settings in the POST operation applies to the PATCH operation. Hence these tables are not repeated here.

Patchable and Non Patchable Attributes

The tables below provide the list of patchable and non patchable attributes, including constraint rules on their usage.

Patchable Attributes	Rule
category	
description	
lifecycleStatus	
name	
relatedParty	
validFor	
version	

Non Patchable Attributes	Rule
id	
href	
lastUpdate	

Usage Samples

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

Request
<pre> PATCH /tmf-api/naas/v3/serviceCatalog/3830 Content-Type: application/merge-patch+json { </pre>

<pre> "name": "new name" } </pre>
Response
<pre> 200 { "id": "3830", "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceCatalog/3830", "name": "new name", "description": "This service catalog describes services that address the wholesale business segment.", "version": "1.0", "validFor": { "startDateTime": "2017-08-29T00:00", "endDateTime": "2018-03-25T00:00" }, "lastUpdate": "2017-08-27T00:00", "lifecycleStatus": "Active", "relatedParty": [{ "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/organization/3426", "id": "3426", "name": "Broadly Broad Ltd", "role": "vendor" }], "category": [{ "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/category/7752", "id": "7752", "name": "IoT" }], "@type": "ServiceCatalog", "@schemaLocation": "https://mycsp.com:8080/tmf- api/schema/Service/ServiceCatalog.schema.json ", "@baseType": "Catalog" } </pre>

5.6.5.Delete service catalog

DELETE /serviceCatalog/{id}

Description

This operation deletes a service catalog entity.

Usage Samples

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

Request
DELETE /tmf-api/naas/v3/serviceCatalog/42

Response
204

5.7. Operations on Service Category

5.7.1. List service categories

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

Description

This operation list service category entities.

Attribute selection is enabled for all first level attributes.

Filtering may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving ServiceCategory resources.

Request
GET /tmf-api/naas/v3/serviceCategory Accept: application/json
Response
200 [{ "id": "1708", "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceCategory/1708", "name": "Cloud Services", "description": "A category to hold all available cloud service offers", "version": "1.0", "validFor": { "startDateTime": "2017-08-24T00:00", "endDateTime": "2018-03-25T00:00" }, "lifecycleStatus": "Active", "lastUpdate": "2017-08-27T00:00", "isRoot": true, "serviceCandidate": [{ "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceCandidate/5850", "id": "5850", "name": "Speed Max", "version": "1.1", "@referredType": "ServiceCandidate" }] }]

```

"category": [
  {
    "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/category/6086",
    "id": "6086",
    "name": "Cloud",
    "@referredType": "ServiceCategory"
  }
],
"@type": "ServiceCategory",
"@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/ServiceCategory.schema.json",
"@baseType": "Category"
}
]

```

5.7.2.Retrieve service category

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

Description

This operation retrieves a service category entity.

Attribute selection is enabled for all first level attributes.

Filtering on sub-resources may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving a ServiceCategory resource.

Request
GET /tmf-api/naas/v3/serviceCategory/1708 Accept: application/json
Response
200 <pre> { "id": "1708", "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceCategory/1708", "name": "Cloud Services", "description": "A category to hold all available cloud service offers", "version": "1.0", "validFor": { "startDateTime": "2017-08-24T00:00", "endDateTime": "2018-03-25T00:00" }, "lifecycleStatus": "Active", "lastUpdate": "2017-08-27T00:00", "isRoot": true, "serviceCandidate": [{ "href": "https://mycsp.com:8080/tmf- api/serviceCatalogManagement/v3/serviceCandidate/5850", "id": "5850", </pre>

```

        "name": "Speed Max",
        "version": "1.1",
        "@REFERREDTYPE": "ServiceCandidate"
    }
],
"category": [
    {
        "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/category/6086",
        "id": "6086",
        "name": "Cloud",
        "@REFERREDTYPE": "ServiceCategory"
    }
],
"@type": "ServiceCategory",
"@SCHEMALOCATION": "https://mycsp.com:8080/tmf-api/schema/Service/ServiceCategory.schema.json",
"@BASETYPE": "Category"
}
    
```

5.7.3. Create service category

POST /serviceCategory

Description

This operation creates a service category entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a ServiceCategory, including any possible rule conditions and applicable default values. Notice that it is up to an implementer to add additional mandatory attributes.

Mandatory Attributes	Rule
name	

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

Usage Samples

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

Request
POST /tmf-api/naas/v3/serviceCategory Content-Type: application/json

<pre>{ "name": "Cloud Services" }</pre>
Response
<pre>201 { "id": "1708", "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceCategory/1708", "name": "Cloud Services" }</pre>

5.7.4. Patch service category

PATCH /serviceCategory/{id}

Description

This operation allows partial updates of a service category entity. Support of json/merge (<https://tools.ietf.org/html/rfc7386>) is mandatory, support of json/patch (<http://tools.ietf.org/html/rfc5789>) is optional.

Note: If the update operation yields to the creation of sub-resources or relationships, the same rules concerning mandatory sub-resource attributes and default value settings in the POST operation applies to the PATCH operation. Hence these tables are not repeated here.

Patchable and Non Patchable Attributes

The tables below provide the list of patchable and non patchable attributes, including constraint rules on their usage.

Patchable Attributes	Rule
category	
description	
isRoot	
lifecycleStatus	
name	
parentId	
serviceCandidate	
validFor	
version	

Non Patchable Attributes	Rule
id	
href	
lastUpdate	

Usage Samples

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

Request
PATCH /tmf-api/naas/v3/serviceCategory/1708 Content-Type: application/merge-patch+json <pre>{ "name": "new name" }</pre>
Response
200 <pre>{ "id": "1708", "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceCategory/1708", "name": "new name", "description": "A category to hold all available cloud service offers", "version": "1.0", "validFor": { "startDateTime": "2017-08-24T00:00", "endDateTime": "2018-03-25T00:00" }, "lifecycleStatus": "Active", "lastUpdate": "2017-08-27T00:00", "isRoot": true, "serviceCandidate": [{ "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceCandidate/5850", "id": "5850", "name": "Speed Max", "version": "1.1", "@referredType": "ServiceCandidate" }], "category": [{ "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/category/6086", "id": "6086", "name": "Cloud", "@referredType": "ServiceCategory" }], "@type": "ServiceCategory", "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Service/ServiceCategory.schema.json", "@baseType": "Category" }</pre>

5.7.5.Delete service category

DELETE /serviceCategory/{id}

Description

This operation deletes a service category entity.

Usage Samples

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

Request
DELETE /tmf-api/naas/v3/serviceCategory/42
Response
204

5.8. Operations on Service Candidate

5.8.1. List service candidates

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

Description

This operation list service candidate entities.

Attribute selection is enabled for all first level attributes.

Filtering may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving ServiceCandidate resources.

Request
GET /tmf-api/naas/v3/serviceCandidate Accept: application/json
Response
200 [{ "id": "4994", "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceCandidate/4994", "name": "TVServiceCandidate", "description": "This service candidate allows provision of TV service", "version": "2.1", "validFor": { "startDateTime": "2017-08-23T00:00", "endDateTime": "2018-03-25T00:00" }, "lastUpdate": "2017-08-27T00:00", "lifecycleStatus": "Active", "category": [{ "id": "5980", "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceCategory/5980",

```

        "version": "3.2",
        "name": "TV"
    }
  ],
  "serviceSpecification": {
    "id": "9600",
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v3/serviceSpecification/9600",
    "version": "2.1",
    "name": "CFSS_TV",
    "@type": "CustomerFacingServiceSpecification"
  },
  "@type": "ServiceCandidate",
  "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/ServiceCandidate.schema.json ",
  "@baseType": ""
}
]

```

5.8.2.Retrieve service candidate

GET

`/serviceCandidate/{id}?fields=...&{filtering}`

Description

This operation retrieves a service candidate entity.

Attribute selection is enabled for all first level attributes.

Filtering on sub-resources may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving a ServiceCandidate resource.

Request
GET /tmf-api/naas/v3/serviceCandidate/4994 Accept: application/json
Response
200 <pre> { "id": "4994", "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceCandidate/4994", "name": "TVServiceCandidate", "description": "This service candidate allows provision of TV service", "version": "2.1", "validFor": { "startDateTime": "2017-08-23T00:00", "endDateTime": "2018-03-25T00:00" }, "lastUpdate": "2017-08-27T00:00", "lifecycleStatus": "Active", </pre>

```

"category": [
  {
    "id": "5980",
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v3/serviceCategory/5980",
    "version": "3.2",
    "name": "TV"
  }
],
"serviceSpecification": {
  "id": "9600",
  "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v3/serviceSpecification/9600",
  "version": "2.1",
  "name": "CFSS_TV",
  "@type": "CustomerFacingServiceSpecification"
},
"@type": "ServiceCandidate",
"@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/ServiceCandidate.schema.json ",
"@baseType": ""
}
    
```

5.8.3. Create service candidate

POST /serviceCandidate

Description

This operation creates a service candidate entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a ServiceCandidate, including any possible rule conditions and applicable default values. Notice that it is up to an implementer to add additional mandatory attributes.

Mandatory Attributes	Rule
name	

Non Mandatory Attributes	Rule
category	
description	
lastUpdate	
lifecycleStatus	
serviceSpecification	
validFor	
version	

Usage Samples

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

Request

<pre> POST /tmf-api/naas/v3/serviceCandidate Content-Type: application/json { "name": "TVServiceCandidate" } </pre>
Response
<pre> 201 { "id": "4994", "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceCandidate/4994", "name": "TVServiceCandidate" } </pre>

5.8.4. Patch service candidate

PATCH /serviceCandidate/{id}

Description

This operation allows partial updates of a service candidate entity. Support of json/merge (<https://tools.ietf.org/html/rfc7386>) is mandatory, support of json/patch (<http://tools.ietf.org/html/rfc5789>) is optional.

Note: If the update operation yields to the creation of sub-resources or relationships, the same rules concerning mandatory sub-resource attributes and default value settings in the POST operation applies to the PATCH operation. Hence these tables are not repeated here.

Patchable and Non Patchable Attributes

The tables below provide the list of patchable and non patchable attributes, including constraint rules on their usage.

Patchable Attributes	Rule
category	
description	
lifecycleStatus	
name	
serviceSpecification	
validFor	
version	

Non Patchable Attributes	Rule
id	
href	
lastUpdate	

Usage Samples

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

Request
PATCH /tmf-api/naas/v3/serviceCandidate/4994 Content-Type: application/merge-patch+json <pre>{ "name": "new name" }</pre>
Response
200 <pre>{ "id": "4994", "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceCandidate/4994", "name": "new name", "description": "This service candidate allows provision of TV service", "version": "2.1", "validFor": { "startDateTime": "2017-08-23T00:00", "endDateTime": "2018-03-25T00:00" }, "lastUpdate": "2017-08-27T00:00", "lifecycleStatus": "Active", "category": [{ "id": "5980", "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceCategory/5980", "version": "3.2", "name": "TV" }], "serviceSpecification": { "id": "9600", "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceSpecification/9600", "version": "2.1", "name": "CFSS_TV", "@type": "CustomerFacingServiceSpecification" }, "@type": "ServiceCandidate", "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Service/ServiceCandidate.schema.json", "@baseType": "" }</pre>

5.8.5.Delete service candidate

DELETE /serviceCandidate/{id}

Description

This operation deletes a service candidate entity.

Usage Samples

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

Request
DELETE /tmf-api/naas/v3/serviceCandidate/42
Response
204

5.9. Operations on Service Order

5.9.1. List service orders

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

Description

This operation list service order entities.

Attribute selection is enabled for all first level attributes.

Filtering may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving ServiceOrder resources.

Request
GET /tmf-api/naas/v3/serviceOrder Accept: application/json
Response
200 [{ "id": "42", "href": "http://serverlocation:port/serviceOrderingManagement/v3/serviceOrder/42", "externalId": "OrangeBSS747", "priority": "1", "description": "Service order description", "category": "TMF resource illustration", "state": "acknowledged", "orderDate": "2018-01-12T09:37:40.508Z", "completionDate": "", "requestedStartDate": "2018-01-15T09:37:40.508Z", "requestedCompletionDate": "2018-01-15T09:37:40.508Z", "expectedCompletionDate": "2018-01-15T09:37:40.508Z", "startDate": "2018-01-12T09:37:40.508Z", "@type": "ServiceOrder", "note": [{

```

    "date": "2018-01-15T09:37:40.508Z",
    "author": "Jean Pontus",
    "text": "Some text"
  }
],
"relatedParty": [
  {
    "id": "456",
    "href": "http://serverlocation:port/partyManagement/v3/party/456",
    "role": "requester",
    "name": "Jean Pontus",
    "@referredType": "Individual"
  }
],
"orderItem": [
  {
    "id": "1",
    "action": "add",
    "state": "acknowledged",
    "service": {
      "@type": "vCPE",
      "@schemaLocation": "http://my.schemas/vCpe.schema.json",
      "state": "active",
      "serviceType": "CFS",
      "serviceCharacteristic": [
        {
          "name": "vCPE_IP",
          "valueType": "object",
          "value": {
            "@type": "IPAddress",
            "@schemaLocation": "http://my.schemas/IPAddress.schema.json",
            "vCPE_IP": "193.218.236.21"
          }
        }
      ]
    }
  }
],
"serviceSpecification": {
  "@type": "ONAPServiceSpec",
  "@schemaLocation": "http://my.schemas/OnapServiceSpec.schema.json",
  "id": "12",
  "href": "http://.../serviceSpecification/12",
  "name": "vCPE",
  "version": "1",
  "invariantUUID": "456-852-357",
  "toscaModelURL": "http://...",
  "targetServiceSchema": {
    "@type": "vCPE",
    "@schemaLocation": "http://my.schemas/vCpe.schema.json"
  }
}
}
},
{
  "id": "2",

```

```

    "action": "modify",
    "state": "acknowledged",
    "service": {
      "id": "456",
      "href": "http://serverlocation:port/serviceInventoryManagement/v3/service/456",
      "state": "active",
      "serviceType": "CFS",
      "serviceCharacteristic": [
        {
          "name": "Characteristic1",
          "value": "newValue"
        }
      ],
      "supportingResource": [
        {
          "id": "3456_DFG5-H690",
          "href": "http://...",
          "@referredType": "CloudResource"
        }
      ]
    }
  },
  {
    "id": "3",
    "action": "add",
    "state": "acknowledged",
    "service": {
      "state": "active",
      "serviceType": "CFS",
      "serviceRelationship": [
        {
          "relationshipType": "reliesOn",
          "service": {
            "href": "https://.../serviceManagement/v3/service/45",
            "id": "45"
          }
        }
      ]
    },
    "serviceSpecification": {
      "id": "48",
      "href": "http://.../48",
      "name": "genericService48",
      "version": "2"
    }
  }
},
{
  "id": "4",
  "action": "modify",
  "state": "acknowledged",
  "service": {
    "id": "12",
    "href": "http://serverlocation:port/serviceInventoryManagement/v3/service/12",

```

```

        "state": "inactive"
      }
    }
  ]
}
]

```

5.9.2. Retrieve service order

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

Description

This operation retrieves a service order entity.

Attribute selection is enabled for all first level attributes.

Filtering on sub-resources may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving a ServiceOrder resource.

Request
GET /tmf-api/naas/v3/serviceOrder/42 Accept: application/json
Response
200 <pre> { "id": "42", "href": "http://serverlocation:port/serviceOrderingManagement/v3/serviceOrder/42", "externalId": "OrangeBSS747", "priority": "1", "description": "Service order description", "category": "TMF resource illustration", "state": "acknowledged", "orderDate": "2018-01-12T09:37:40.508Z", "completionDate": "", "requestedStartDate": "2018-01-15T09:37:40.508Z", "requestedCompletionDate": "2018-01-15T09:37:40.508Z", "expectedCompletionDate": "2018-01-15T09:37:40.508Z", "startDate": "2018-01-12T09:37:40.508Z", "@type": "ServiceOrder", "note": [{ "date": "2018-01-15T09:37:40.508Z", "author": "Jean Pontus", "text": "Some text" }], "relatedParty": [{ "id": "456", "href": "http://serverlocation:port/partyManagement/v3/party/456", </pre>

```

        "role": "requester",
        "name": "Jean Pontus",
        "@referredType": "Individual"
    }
},
"orderItem": [
    {
        "id": "1",
        "action": "add",
        "state": "acknowledged",
        "service": {
            "@type": "vCPE",
            "@schemaLocation": "http://my.schemas/vCpe.schema.json",
            "state": "active",
            "serviceType": "CFS",
            "serviceCharacteristic": [
                {
                    "name": "vCPE_IP",
                    "valueType": "object",
                    "value": {
                        "@type": "IPAddress",
                        "@schemaLocation": "http://my.schemas/IPAddress.schema.json",
                        "vCPE_IP": "193.218.236.21"
                    }
                }
            ]
        }
    },
    {
        "serviceSpecification": {
            "@type": "ONAPServiceSpec",
            "@schemaLocation": "http://my.schemas/OnapServiceSpec.schema.json",
            "id": "12",
            "href": "http://.../serviceSpecification/12",
            "name": "vCPE",
            "version": "1",
            "invariantUUID": "456-852-357",
            "toscaModelURL": "http://...",
            "targetServiceSchema": {
                "@type": "vCPE",
                "@schemaLocation": "http://my.schemas/vCpe.schema.json"
            }
        }
    }
},
{
    "id": "2",
    "action": "modify",
    "state": "acknowledged",
    "service": {
        "id": "456",
        "href": "http://serverlocation:port/serviceInventoryManagement/v3/service/456",
        "state": "active",
        "serviceType": "CFS",
        "serviceCharacteristic": [
            {

```

```

        "name": "Characteristic1",
        "value": "newValue"
      }
    ],
    "supportingResource": [
      {
        "id": "3456_DFG5-H690",
        "href": "http://...",
        "@referredType": "CloudResource"
      }
    ]
  }
},
{
  "id": "3",
  "action": "add",
  "state": "acknowledged",
  "service": {
    "state": "active",
    "serviceType": "CFS",
    "serviceRelationship": [
      {
        "relationshipType": "reliesOn",
        "service": {
          "href": "https://.../serviceManagement/v3/service/45",
          "id": "45"
        }
      }
    ]
  },
  "serviceSpecification": {
    "id": "48",
    "href": "http://.../48",
    "name": "genericService48",
    "version": "2"
  }
}
},
{
  "id": "4",
  "action": "modify",
  "state": "acknowledged",
  "service": {
    "id": "12",
    "href": "http://serverlocation:port/serviceInventoryManagement/v3/service/12",
    "state": "inactive"
  }
}
]
}

```

5.9.3. Create service order

POST /serviceOrder

Description

This operation creates a service order entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a ServiceOrder, including any possible rule conditions and applicable default values. Notice that it is up to an implementer to add additional mandatory attributes.

Mandatory Attributes	Rule
orderItem	

Non Mandatory Attributes	Rule
category	
completionDate	
description	
expectedCompletionDate	
externalId	
note	
notificationContact	
orderDate	
orderRelationship	
priority	
relatedParty	
requestedCompletionDate	
requestedStartDate	
startDate	
state	

Additional Rules

The following table provides additional rules indicating mandatory fields in sub-resources or relationships when creating a ServiceOrder resource.

Context	Mandatory Sub-Attributes
orderItem	id, action, service
relatedParty	name, role

The following pre-conditions apply for this operation.

Pre-conditions
When creating a service order (post) an order item should not have the state field valorized

Usage Samples

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

Request
POST /tmf-api/naas/v3/serviceOrder Content-Type: application/json <pre>{ "orderItem": [</pre>

```

    {
      "id": "1",
      "action": "add",
      "state": "acknowledged",
      "service": {
        "@type": "vCPE",
        "@schemaLocation": "http://my.schemas/vCpe.schema.json",
        "state": "active",
        "serviceType": "CFS",
        "serviceCharacteristic": [
          {
            "name": "vCPE_IP",
            "valueType": "object",
            "value": {
              "@type": "IPAddress",
              "@schemaLocation": "http://my.schemas/IPAddress.schema.json",
              "vCPE_IP": "193.218.236.21"
            }
          }
        ],
        "serviceSpecification": {
          "@type": "ONAPServiceSpec",
          "@schemaLocation": "http://my.schemas/OnapServiceSpec.schema.json",
          "id": "12",
          "href": "http://.../serviceSpecification/12",
          "name": "vCPE",
          "version": "1",
          "invariantUUID": "456-852-357",
          "toscaModelURL": "http://...",
          "targetServiceSchema": {
            "@type": "vCPE",
            "@schemaLocation": "http://my.schemas/vCpe.schema.json"
          }
        }
      }
    },
    {
      "id": "2",
      "action": "modify",
      "state": "acknowledged",
      "service": {
        "id": "456",
        "href": "http://serverlocation:port/serviceInventoryManagement/v3/service/456",
        "state": "active",
        "serviceType": "CFS",
        "serviceCharacteristic": [
          {
            "name": "Characteristic1",
            "value": "newValue"
          }
        ],
        "supportingResource": [

```

```

        "id": "3456_DFG5-H690",
        "href": "http://...",
        "@referredType": "CloudResource"
      }
    ]
  },
  {
    "id": "3",
    "action": "add",
    "state": "acknowledged",
    "service": {
      "state": "active",
      "serviceType": "CFS",
      "serviceRelationship": [
        {
          "relationshipType": "reliesOn",
          "service": {
            "href": "https://.../serviceManagement/v3/service/45",
            "id": "45"
          }
        }
      ],
      "serviceSpecification": {
        "id": "48",
        "href": "http://.../48",
        "name": "genericService48",
        "version": "2"
      }
    }
  },
  {
    "id": "4",
    "action": "modify",
    "state": "acknowledged",
    "service": {
      "id": "12",
      "href": "http://serverlocation:port/serviceInventoryManagement/v3/service/12",
      "state": "inactive"
    }
  }
]
}

```

Response

201

```

{
  "id": "42",
  "href": "http://serverlocation:port/serviceOrderingManagement/v3/serviceOrder/42",
  "orderItem": [
    {

```

```

    "id": "1",
    "action": "add",
    "state": "acknowledged",
    "service": {
      "@type": "vCPE",
      "@schemaLocation": "http://my.schemas/vCpe.schema.json",
      "state": "active",
      "serviceType": "CFS",
      "serviceCharacteristic": [
        {
          "name": "vCPE_IP",
          "valueType": "object",
          "value": {
            "@type": "IPAddress",
            "@schemaLocation": "http://my.schemas/IPAddress.schema.json",
            "vCPE_IP": "193.218.236.21"
          }
        }
      ],
      "serviceSpecification": {
        "@type": "ONAPServiceSpec",
        "@schemaLocation": "http://my.schemas/OnapServiceSpec.schema.json",
        "id": "12",
        "href": "http://.../serviceSpecification/12",
        "name": "vCPE",
        "version": "1",
        "invariantUUID": "456-852-357",
        "toscaModelURL": "http://...",
        "targetServiceSchema": {
          "@type": "vCPE",
          "@schemaLocation": "http://my.schemas/vCpe.schema.json"
        }
      }
    }
  },
  {
    "id": "2",
    "action": "modify",
    "state": "acknowledged",
    "service": {
      "id": "456",
      "href": "http://serverlocation:port/serviceInventoryManagement/v3/service/456",
      "state": "active",
      "serviceType": "CFS",
      "serviceCharacteristic": [
        {
          "name": "Characteristic1",
          "value": "newValue"
        }
      ],
      "supportingResource": [
        {
          "id": "3456_DFG5-H690",

```

```

        "href": "http://...",
        "@referredType": "CloudResource"
    }
  ]
}
},
{
  "id": "3",
  "action": "add",
  "state": "acknowledged",
  "service": {
    "state": "active",
    "serviceType": "CFS",
    "serviceRelationship": [
      {
        "relationshipType": "reliesOn",
        "service": {
          "href": "https://.../serviceManagement/v3/service/45",
          "id": "45"
        }
      }
    ],
    "serviceSpecification": {
      "id": "48",
      "href": "http://.../48",
      "name": "genericService48",
      "version": "2"
    }
  }
},
{
  "id": "4",
  "action": "modify",
  "state": "acknowledged",
  "service": {
    "id": "12",
    "href": "http://serverlocation:port/serviceInventoryManagement/v3/service/12",
    "state": "inactive"
  }
}
]
}

```

5.9.4. Patch service order

PATCH /serviceOrder/{id}

Description

This operation allows partial updates of a service order entity. Support of json/merge (<https://tools.ietf.org/html/rfc7386>) is mandatory, support of json/patch (<http://tools.ietf.org/html/rfc5789>) is optional.

Note: If the update operation yields to the creation of sub-resources or relationships, the same rules concerning mandatory sub-resource attributes and default value settings in the POST operation applies to the PATCH operation. Hence these tables are not repeated here.

Patchable and Non Patchable Attributes

The tables below provide the list of patchable and non patchable attributes, including constraint rules on their usage.

Patchable Attributes	Rule
category	
description	
expectedCompletionDate	
note	
notificationContact	
orderItem	
orderRelationship	
relatedParty	
requestedCompletionDate	
requestedStartDate	
startDate	

Non Patchable Attributes	Rule
id	
href	
externalId	
priority	
state	
orderDate	
completionDate	
orderItem.id	
orderItem.action	
orderItem.state	

Additional Rules

The following pre-conditions apply for this operation.

Pre-conditions
When creating a service order (post) an order item should not have the state field valorized

Usage Samples

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

Request
PATCH /tmf-api/naas/v3/serviceOrder/42 Content-Type: application/merge-patch+json <pre>{ "name": "new name" }</pre>

}
Response
<pre> 200 { "id": "42", "href": "http://serverlocation:port/serviceOrderingManagement/v3/serviceOrder/42", "externalId": "OrangeBSS747", "priority": "1", "description": "Service order description", "category": "TMF resource illustration", "state": "acknowledged", "orderDate": "2018-01-12T09:37:40.508Z", "completionDate": "", "requestedStartDate": "2018-01-15T09:37:40.508Z", "requestedCompletionDate": "2018-01-15T09:37:40.508Z", "expectedCompletionDate": "2018-01-15T09:37:40.508Z", "startDate": "2018-01-12T09:37:40.508Z", "@type": "ServiceOrder", "note": [{ "date": "2018-01-15T09:37:40.508Z", "author": "Jean Pontus", "text": "Some text" }], "relatedParty": [{ "id": "456", "href": "http://serverlocation:port/partyManagement/v3/party/456", "role": "requester", "name": "Jean Pontus", "@referredType": "Individual" }], "orderItem": [{ "id": "1", "action": "add", "state": "acknowledged", "service": { "@type": "vCPE", "@schemaLocation": "http://my.schemas/vCpe.schema.json", "state": "active", "serviceType": "CFS", "serviceCharacteristic": [{ "name": "vCPE_IP", "valueType": "object", "value": { "@type": "IPAddress", </pre>

```

        "@schemaLocation": "http://my.schemas/IPAddress.schema.json",
        "vCPE_IP": "193.218.236.21"
    }
}
],
"serviceSpecification": {
    "@type": "ONAPServiceSpec",
    "@schemaLocation": "http://my.schemas/OnapServiceSpec.schema.json",
    "id": "12",
    "href": "http://.../serviceSpecification/12",
    "name": "vCPE",
    "version": "1",
    "invariantUUID": "456-852-357",
    "toscaModelURL": "http://...",
    "targetServiceSchema": {
        "@type": "vCPE",
        "@schemaLocation": "http://my.schemas/vCpe.schema.json"
    }
}
}
},
{
    "id": "2",
    "action": "modify",
    "state": "acknowledged",
    "service": {
        "id": "456",
        "href": "http://serverlocation:port/serviceInventoryManagement/v3/service/456",
        "state": "active",
        "serviceType": "CFS",
        "serviceCharacteristic": [
            {
                "name": "Characteristic1",
                "value": "newValue"
            }
        ],
        "supportingResource": [
            {
                "id": "3456_DFG5-H690",
                "href": "http://...",
                "@REFERREDType": "CloudResource"
            }
        ]
    }
},
{
    "id": "3",
    "action": "add",
    "state": "acknowledged",
    "service": {
        "state": "active",
        "serviceType": "CFS",
        "serviceRelationship": [

```

```

        {
          "relationshipType": "reliesOn",
          "service": {
            "href": "https://.../serviceManagement/v3/service/45",
            "id": "45"
          }
        },
        "serviceSpecification": {
          "id": "48",
          "href": "http://.../48",
          "name": "genericService48",
          "version": "2"
        }
      },
      {
        "id": "4",
        "action": "modify",
        "state": "acknowledged",
        "service": {
          "id": "12",
          "href": "http://serverlocation:port/serviceInventoryManagement/v3/service/12",
          "state": "inactive"
        }
      }
    ],
    "name": "new name"
  }
}

```

5.9.5.Delete service order

DELETE /serviceOrder/{id}

Description

This operation deletes a service order entity.

Usage Samples

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

Request
DELETE /tmf-api/naas/v3/serviceOrder/42
Response
204

5.10. Operations on Service Qualification

5.10.1. List service qualifications

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

Description

This operation list service qualification entities.

Attribute selection is enabled for all first level attributes.

Filtering may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving ServiceQualification resources.

Request
<pre>GET /tmf-api/naas/v3/serviceQualification Accept: application/json</pre>
Response
<pre>200 [{ "description": "Maximum download/upload speed for access at an address", "effectiveQualificationDate": "2017-10-25T12:14:16.361Z", "estimatedResponseDate": "2017-10-25T12:13:16.361Z", "expectedQualificationDate": "2017-10-25T12:13:16.361Z", "expirationDate": "2017-11-25T12:13:16.361Z", "href": "https://mycsp.com:8080/tmf- api/serviceQualificationManagement/v3/serviceQualification/5565", "id": "5565", "provideAlternative": true, "provideOnlyAvailable": false, "provideUnavailabilityReason": false, "serviceQualificationDate": "2017-10-25T12:13:16.361Z", "state": "done", "serviceQualificationItem": [{ "id": "1", "qualificationResult": "qualified", "state": "done", "service": { "serviceSpecification": { "id": "111", "href": "https://mycsp.com:8080/tmf- api/serviceCatalogManagement/v3/serviceSpecification/111", "name": "CFS_Access" }, "serviceCharacteristic": [{ "name": "downloadSpeed", "valueType": "object", "value": { "@type": "Bandwidth", "@schemaLocation": "https://mycsp.com:8080/tmf- api/schema/Service/Bandwidth.schema.json", "speed": "300Mb/s" } }] } }] }]</pre>

```

    },
    {
      "name": "uploadSpeed",
      "valueType": "object",
      "value": {
        "@type": "Bandwidth",
        "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/Bandwidth.schema.json",
        "speed": "100Mb/s"
      }
    }
  ],
  "place": [
    {
      "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v3/geographicAddress/25511",
      "id": "25511",
      "name": "160 de Versailles Avenue 75016 Paris France",
      "role": "installationAddress",
      "@type": "GeographicAddress"
    }
  ]
},
"expectedServiceAvailabilityDate": "2017-10-27T12:14:16.361Z",
"expirationDate": "2017-11-25T12:13:16.361Z"
}
],
"relatedParty": [
  {
    "id": "14",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/14",
    "role": "requester",
    "name": "John Doe",
    "@referredType": "Individual"
  }
],
"externalId": "SQ102",
"qualificationResult": "qualified",
"@baseType": "ServiceQualification",
"@type": "CFServiceQualification",
"@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/CFServiceQualification.schema.json"
}
]

```

5.10.2. Retrieve service qualification

GET

/serviceQualification/{id}?fields=...&{filtering}

Description

This operation retrieves a service qualification entity.

Attribute selection is enabled for all first level attributes.

Filtering on sub-resources may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving a ServiceQualification resource.

Request
<pre>GET /tmf-api/naas/v3/serviceQualification/5565 Accept: application/json</pre>
Response
<pre>200 { "description": "Maximum download/upload speed for access at an address", "effectiveQualificationDate": "2017-10-25T12:14:16.361Z", "estimatedResponseDate": "2017-10-25T12:13:16.361Z", "expectedQualificationDate": "2017-10-25T12:13:16.361Z", "expirationDate": "2017-11-25T12:13:16.361Z", "href": "https://mycsp.com:8080/tmf- api/serviceQualificationManagement/v3/serviceQualification/5565", "id": "5565", "provideAlternative": true, "provideOnlyAvailable": false, "provideUnavailabilityReason": false, "serviceQualificationDate": "2017-10-25T12:13:16.361Z", "state": "done", "serviceQualificationItem": [{ "id": "1", "qualificationResult": "qualified", "state": "done", "service": { "serviceSpecification": { "id": "111", "href": "https://mycsp.com:8080/tmf- api/serviceCatalogManagement/v3/serviceSpecification/111", "name": "CFS_Access" }, "serviceCharacteristic": [{ "name": "downloadSpeed", "valueType": "object", "value": { "@type": "Bandwidth", "@schemaLocation": "https://mycsp.com:8080/tmf- api/schema/Service/Bandwidth.schema.json", "speed": "300Mb/s" } }] } }] }</pre>

```

        "name": "uploadSpeed",
        "valueType": "object",
        "value": {
            "@type": "Bandwidth",
            "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/Bandwidth.schema.json",
            "speed": "100Mb/s"
        }
    },
    "place": [
        {
            "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v3/geographicAddress/25511",
            "id": "25511",
            "name": "160 de Versailles Avenue 75016 Paris France",
            "role": "installationAddress",
            "@type": "GeographicAddress"
        }
    ]
},
"expectedServiceAvailabilityDate": "2017-10-27T12:14:16.361Z",
"expirationDate": "2017-11-25T12:13:16.361Z"
}
],
"relatedParty": [
    {
        "id": "14",
        "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/14",
        "role": "requester",
        "name": "John Doe",
        "@referredType": "Individual"
    }
],
"externalId": "SQ102",
"qualificationResult": "qualified",
"@baseType": "ServiceQualification",
"@type": "CFServiceQualification",
"@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/CFServiceQualification.schema.json"
}

```

5.10.3. Create service qualification

POST /serviceQualification

Description

This operation creates a service qualification entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a ServiceQualification, including any possible rule conditions and applicable default values. Notice that it is up to an implementer to add additional mandatory attributes.

Mandatory Attributes	Rule
serviceQualificationItem	

Non Mandatory Attributes	Rule
description	
effectiveQualificationDate	
estimatedResponseDate	
expectedQualificationDate	
expirationDate	
externalId	
provideAlternative	
provideOnlyAvailable	
provideUnavailabilityReason	
qualificationResult	
relatedParty	
serviceQualificationDate	
state	

Usage Samples

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

Request
POST /tmf-api/naas/v3/serviceQualification Content-Type: application/json <pre> { "serviceQualificationItem": [{ "id": "1", "qualificationResult": "qualified", "state": "done", "service": { "serviceSpecification": { "id": "111", "href": "https://mycsp.com:8080/tmf- api/serviceCatalogManagement/v3/serviceSpecification/111", "name": "CFS_Access" }, "serviceCharacteristic": [{ "name": "downloadSpeed", "valueType": "object", }] } }] } </pre>

```

        "value": {
            "@type": "Bandwidth",
            "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/Bandwidth.schema.json",
            "speed": "300Mb/s"
        }
    },
    {
        "name": "uploadSpeed",
        "valueType": "object",
        "value": {
            "@type": "Bandwidth",
            "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/Bandwidth.schema.json",
            "speed": "100Mb/s"
        }
    }
],
"place": [
    {
        "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v3/geographicAddress/25511",
        "id": "25511",
        "name": "160 de Versailles Avenue 75016 Paris France",
        "role": "installationAddress",
        "@type": "GeographicAddress"
    }
]
},
"expectedServiceAvailabilityDate": "2017-10-27T12:14:16.361Z",
"expirationDate": "2017-11-25T12:13:16.361Z"
}
]
}

```

Response

```

201

{
    "href": "https://mycsp.com:8080/tmf-
api/serviceQualificationManagement/v3/serviceQualification/5565",
    "id": "5565",
    "serviceQualificationItem": [
        {
            "id": "1",
            "qualificationResult": "qualified",
            "state": "done",
            "service": {
                "serviceSpecification": {
                    "id": "111",
                    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v3/serviceSpecification/111",

```

```

        "name": "CFS_Access"
      },
      "serviceCharacteristic": [
        {
          "name": "downloadSpeed",
          "valueType": "object",
          "value": {
            "@type": "Bandwidth",
            "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/Bandwidth.schema.json",
            "speed": "300Mb/s"
          }
        },
        {
          "name": "uploadSpeed",
          "valueType": "object",
          "value": {
            "@type": "Bandwidth",
            "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/Bandwidth.schema.json",
            "speed": "100Mb/s"
          }
        }
      ],
      "place": [
        {
          "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v3/geographicAddress/25511",
          "id": "25511",
          "name": "160 de Versailles Avenue 75016 Paris France",
          "role": "installationAddress",
          "@type": "GeographicAddress"
        }
      ]
    },
    "expectedServiceAvailabilityDate": "2017-10-27T12:14:16.361Z",
    "expirationDate": "2017-11-25T12:13:16.361Z"
  }
]
}

```

5.10.4. Patch service qualification

PATCH /serviceQualification/{id}

Description

This operation allows partial updates of a service qualification entity. Support of json/merge (<https://tools.ietf.org/html/rfc7386>) is mandatory, support of json/patch (<http://tools.ietf.org/html/rfc5789>) is optional.

Note: If the update operation yields to the creation of sub-resources or relationships, the same rules concerning mandatory sub-resource attributes and default value settings in the POST operation applies to the PATCH operation. Hence these tables are not repeated here.

Patchable and Non Patchable Attributes

The tables below provide the list of patchable and non patchable attributes, including constraint rules on their usage.

Patchable Attributes	Rule
description	
effectiveQualificationDate	
estimatedResponseDate	
expectedQualificationDate	
expirationDate	
externalId	
provideAlternative	
provideOnlyAvailable	
provideUnavailabilityReason	
qualificationResult	
relatedParty	
serviceQualificationDate	
serviceQualificationItem	
state	

Non Patchable Attributes	Rule
id	
href	

Usage Samples

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

Request
PATCH /tmf-api/naas/v3/serviceQualification/5565 Content-Type: application/merge-patch+json <pre>{ "name": "new name" }</pre>
Response
200 <pre>{ "description": "Maximum download/upload speed for access at an address", "effectiveQualificationDate": "2017-10-25T12:14:16.361Z", "estimatedResponseDate": "2017-10-25T12:13:16.361Z", "expectedQualificationDate": "2017-10-25T12:13:16.361Z", "expirationDate": "2017-11-25T12:13:16.361Z", "href": "https://mycsp.com:8080/tmf- api/serviceQualificationManagement/v3/serviceQualification/5565", "id": "5565", "provideAlternative": true, "provideOnlyAvailable": false, }</pre>

```

"provideUnavailabilityReason": false,
"serviceQualificationDate": "2017-10-25T12:13:16.361Z",
"state": "done",
"serviceQualificationItem": [
  {
    "id": "1",
    "qualificationResult": "qualified",
    "state": "done",
    "service": {
      "serviceSpecification": {
        "id": "111",
        "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v3/serviceSpecification/111",
        "name": "CFS_Access"
      },
      "serviceCharacteristic": [
        {
          "name": "downloadSpeed",
          "valueType": "object",
          "value": {
            "@type": "Bandwidth",
            "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/Bandwidth.schema.json",
            "speed": "300Mb/s"
          }
        },
        {
          "name": "uploadSpeed",
          "valueType": "object",
          "value": {
            "@type": "Bandwidth",
            "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/Bandwidth.schema.json",
            "speed": "100Mb/s"
          }
        }
      ]
    },
    "place": [
      {
        "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v3/geographicAddress/25511",
        "id": "25511",
        "name": "160 de Versailles Avenue 75016 Paris France",
        "role": "installationAddress",
        "@type": "GeographicAddress"
      }
    ]
  },
  "expectedServiceAvailabilityDate": "2017-10-27T12:14:16.361Z",
  "expirationDate": "2017-11-25T12:13:16.361Z"
}
],
"relatedParty": [

```

```

    {
      "id": "14",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/14",
      "role": "requester",
      "name": "John Doe",
      "@referredType": "Individual"
    }
  ],
  "externalId": "SQ102",
  "qualificationResult": "qualified",
  "@baseType": "ServiceQualification",
  "@type": "CFServiceQualification",
  "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/CFServiceQualification.schema.json",
  "name": "new name"
}

```

5.10.5. Delete service qualification

DELETE /serviceQualification/{id}

Description

This operation deletes a service qualification entity.

Usage Samples

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

Request
DELETE /tmf-api/naas/v3/serviceQualification/42
Response
204

5.11. Operations on Service Problem

5.11.1. List service problems

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

Description

This operation list service problem entities.

Attribute selection is enabled for all first level attributes.

Filtering may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving ServiceProblem resources.

Request
GET /tmf-api/naas/v3/serviceProblem Accept: application/json

Response

200

```
[
{
  "id": "problemxxxx0000",
  "correlationId": "543251",
  "originatingSystem": "System_001",
  "category": "supplier.Originated",
  "href": "https://mycsp.com:8080/tmf-
api/serviceProblemManagement/v3/serviceProblem/problemxxxx0000",
  "impactImportanceFactor": "0",
  "priority": "1",
  "description": "connection failure between Tokyo and Osaka",
  "problemEscalation": "0",
  "timeRaised": "2017-10-25T12:14:16.361Z",
  "timeChanged": "2017-10-30T12:13:16.361Z",
  "statusChangeDate": "2017-10-29T12:00:00.361Z",
  "statusChangeReason": "problem analysis has been completed in NP1",
  "resolutionDate": "2017-10-29T12:00:00.361Z",
  "status": "resolved",
  "reason": "Failure of resource NP1_Resource_1 in NP1",
  "affectedNumberOfServices": "2",
  "firstAlert": {
    "alertType": "TroubleTicket",
    "id": "NP1_TT_0000000",
    "href": "https://mycsp.com:8080/tmf-
api/troubleTicketManagement/v3/troubleTicket/NP1_TT_0000000"
  },
  "responsibleParty": {
    "role": "Supplier",
    "id": "NP1",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/NP1",
    "@referredType": "Organization"
  },
  "originatorParty": {
    "role": "Supplier",
    "id": "NP1",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/NP1",
    "@referredType": "Organization"
  },
  "relatedParty": [
    {
      "role": "Supplier",
      "id": "NP1",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/NP1",
      "@referredType": "Organization"
    },
    {
      "role": "Partner",
      "id": "SP1",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/SP1",

```

```
    "@referredType": "Organization"
  },
  {
    "role": "Partner",
    "id": "SP3",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/SP3",
    "@referredType": "Organization"
  }
],
"affectedService": [
  {
    "id": "NP1_Tokyo_Osaka",
    "href": "https://mycsp.com:8080/tmf-
api/serviceInventoryManagement/v3/service/NW1_Tokyo_Osaka"
  },
  {
    "id": "NP1_Tokyo_xxxx",
    "href": "https://mycsp.com:8080/tmf-
api/serviceInventoryManagement/v3/service/NW1_Tokyo_xxxx"
  }
],
"affectedResource": [
  {
    "id": "NP1_RES_0001",
    "href": "https://mycsp.com:8080/tmf-
api/resourceInventoryManagement/v3/resource/NW1_RES_0001"
  }
],
"affectedLocation": [
  {
    "id": "Loc000000",
    "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v3/geographicAddress/Loc000000/",
    "name": "144 Main Street Tokyo 51663556",
    "role": "VPN Endpoint",
    "@type": "GeographicAddress"
  },
  {
    "id": "Loc000001",
    "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v3/geographicAddress/Loc000001/",
    "name": "351 Main Street Osaka 3546365",
    "role": "VPN Endpoint",
    "@type": "GeographicAddress"
  }
],
"associatedTroubleTicket": [
  {
    "id": "NP1_TT_0000000",
    "href": "https://mycsp.com:8080/tmf-
api/troubleTicketManagement/v3/TroubleTicketRef/NP1_TT_000000"
  }
],
]
```

```
"underlyingAlarm": [
  {
    "id": "NP1_A_0000000",
    "href": "https://mycsp.com:8080/tmf-
api/alarmManagement/v3/resourceAlarm/NP1_A_0000000",
    "@referredType": "ResourceAlarm"
  }
],
"associatedSLAViolation": [
  {
    "id": "NP1_SLA_0000000",
    "href": "https://mycsp.com:8080/tmf-
api/SLAManagement/v3/SLAViolationRef/NP1_SLA_0000000"
  }
],
"relatedEvent": [
  {
    "eventType": "prediction",
    "id": "prediction_0001",
    "href": "https://mycsp.com:8080/tmf-api/eventManagement/v3/event/prediction_0001",
    "eventTime": "2014-12-20T17:00:00Z"
  }
],
"relatedObject": [
  {
    "id": "product0001",
    "href": "https://mycsp.com:8080/tmf-
api/productInventoryManagement/v3/product/product0001",
    "@referredType": "Product"
  }
],
"rootCauseService": [
  {
    "id": "NP1_Tokyo_Osaka",
    "href": "https://mycsp.com:8080/tmf-
api/serviceInventoryManagement/v3/service/NW1_Tokyo_Osaka"
  }
],
"rootCauseResource": [
  {
    "id": "NP1_Resource_1",
    "href": "https://mycsp.com:8080/tmf-
api/resourceInventoryManagement/v3/resource/NP1_Resource_1"
  }
],
"parentProblem": [
  {
    "id": "problemxxxx0001",
    "correlationId": "xxxxxxx",
    "href": "https://mycsp.com:8080/tmf-
api/serviceProblemManagement/v3/serviceProblem/problemxxxx0001"
  }
],
```

```

"underlyingProblem": [
  {
    "id": "problemxxxx0001",
    "correlationId": "xxxxxxx",
    "href": "https://mycsp.com:8080/tmf-
api/serviceProblemManagement/v3/serviceProblem/problemxxxx0001"
  }
],
"trackingRecord": [
  {
    "description": "yyy cleared the problem",
    "systemId": "xxxx",
    "time": "2014-12-20T17:00:00Z",
    "user": "NPUSER1",
    "id": "TR_xxxx",
    "extensionInfo": [
      {
        "name": "vendorComment",
        "valueType": "string",
        "value": "Watch out for the dog"
      }
    ]
  }
],
"comment": [
  {
    "author": {
      "id": "SPM_handler_01",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/SPM_handler_01",
      "@referredType": "Individual"
    },
    "date": "2014-12-20T17:00:00Z",
    "systemId": "System_002",
    "text": "receive trouble ticket from NP1, and create this Service Problem"
  },
  {
    "author": {
      "id": "NP1_handler_11",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/NP1_handler_11",
      "@referredType": "Individual"
    },
    "date": "2014-12-20T17:00:00Z",
    "systemId": "System_002",
    "text": "status changed to Progress-Held"
  }
],
"impactPatterns": {
  "description": "Many services are at risk in this problem",
  "extensionInfo": [
    {
      "name": "ImpactProbability",
      "valueType": "boolean",
      "value": true
    }
  ]
}

```

```

    }
  ]
},
"extensionInfo": [
  {
    "name": "EstimatedCost",
    "valueType": "integer",
    "value": 20
  }
]
}
]

```

5.11.2. Retrieve service problem

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

Description

This operation retrieves a service problem entity.

Attribute selection is enabled for all first level attributes.

Filtering on sub-resources may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving a ServiceProblem resource.

Request
GET /tmf-api/naas/v3/serviceProblem/problemxxxx0000 Accept: application/json
Response
200 <pre> { "id": "problemxxxx0000", "correlationId": "543251", "originatingSystem": "System_001", "category": "supplier.originated", "href": "https://mycsp.com:8080/tmf- api/serviceProblemManagement/v3/serviceProblem/problemxxxx0000", "impactImportanceFactor": "0", "priority": "1", "description": "connection failure between Tokyo and Osaka", "problemEscalation": "0", "timeRaised": "2017-10-25T12:14:16.361Z", "timeChanged": "2017-10-30T12:13:16.361Z", "statusChangeDate": "2017-10-29T12:00:00.361Z", "statusChangeReason": "problem analysis has been completed in NP1", "resolutionDate": "2017-10-29T12:00:00.361Z", "status": "resolved", "reason": "Failure of resource NP1_Resource_1 in NP1", "affectedNumberOfServices": "2", </pre>

```
"firstAlert": {
  "alertType": "TroubleTicket",
  "id": "NP1_TT_0000000",
  "href": "https://mycsp.com:8080/tmf-
api/troubleTicketManagement/v3/troubleTicket/NP1_TT_0000000"
},
"responsibleParty": {
  "role": "Supplier",
  "id": "NP1",
  "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/NP1",
  "@referredType": "Organization"
},
"originatorParty": {
  "role": "Supplier",
  "id": "NP1",
  "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/NP1",
  "@referredType": "Organization"
},
"relatedParty": [
  {
    "role": "Supplier",
    "id": "NP1",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/NP1",
    "@referredType": "Organization"
  },
  {
    "role": "Partner",
    "id": "SP1",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/SP1",
    "@referredType": "Organization"
  },
  {
    "role": "Partner",
    "id": "SP3",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/SP3",
    "@referredType": "Organization"
  }
],
"affectedService": [
  {
    "id": "NP1_Tokyo_Osaka",
    "href": "https://mycsp.com:8080/tmf-
api/serviceInventoryManagement/v3/service/NW1_Tokyo_Osaka"
  },
  {
    "id": "NP1_Tokyo_xxxx",
    "href": "https://mycsp.com:8080/tmf-
api/serviceInventoryManagement/v3/service/NW1_Tokyo_xxxx"
  }
],
"affectedResource": [
  {
    "id": "NP1_RES_0001",
```

```

    "href": "https://mycsp.com:8080/tmf-
api/resourceInventoryManagement/v3/resource/NW1_RES_0001"
  }
],
"affectedLocation": [
  {
    "id": "Loc000000",
    "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v3/geographicAddress/Loc000000/",
    "name": "144 Main Street Tokyo 51663556",
    "role": "VPN Endpoint",
    "@type": "GeographicAddress"
  },
  {
    "id": "Loc000001",
    "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v3/geographicAddress/Loc000001/",
    "name": "351 Main Street Osaka 3546365",
    "role": "VPN Endpoint",
    "@type": "GeographicAddress"
  }
],
"associatedTroubleTicket": [
  {
    "id": "NP1_TT_0000000",
    "href": "https://mycsp.com:8080/tmf-
api/troubleTicketManagement/v3/TroubleTicketRef/NP1_TT_000000"
  }
],
"underlyingAlarm": [
  {
    "id": "NP1_A_0000000",
    "href": "https://mycsp.com:8080/tmf-
api/alarmManagement/v3/resourceAlarm/NP1_A_000000",
    "@REFERREDType": "ResourceAlarm"
  }
],
"associatedSLAViolation": [
  {
    "id": "NP1_SLA_0000000",
    "href": "https://mycsp.com:8080/tmf-
api/SLAManagement/v3/SLAViolationRef/NP1_SLA_000000"
  }
],
"relatedEvent": [
  {
    "eventType": "prediction",
    "id": "prediction_0001",
    "href": "https://mycsp.com:8080/tmf-api/eventManagement/v3/event/prediction_0001",
    "eventTime": "2014-12-20T17:00:00Z"
  }
],
"relatedObject": [

```

```

    {
      "id": "product0001",
      "href": "https://mycsp.com:8080/tmf-
api/productInventoryManagement/v3/product/product0001",
      "@referredType": "Product"
    }
  ],
  "rootCauseService": [
    {
      "id": "NP1_Tokyo_Osaka",
      "href": "https://mycsp.com:8080/tmf-
api/serviceInventoryManagement/v3/service/NW1_Tokyo_Osaka"
    }
  ],
  "rootCauseResource": [
    {
      "id": "NP1_Resource_1",
      "href": "https://mycsp.com:8080/tmf-
api/resourceInventoryManagement/v3/resource/NP1_Resource_1"
    }
  ],
  "parentProblem": [
    {
      "id": "problemxxxx0001",
      "correlationId": "xxxxxxx",
      "href": "https://mycsp.com:8080/tmf-
api/serviceProblemManagement/v3/serviceProblem/problemxxxx0001"
    }
  ],
  "underlyingProblem": [
    {
      "id": "problemxxxx0001",
      "correlationId": "xxxxxxx",
      "href": "https://mycsp.com:8080/tmf-
api/serviceProblemManagement/v3/serviceProblem/problemxxxx0001"
    }
  ],
  "trackingRecord": [
    {
      "description": "yyy cleared the problem",
      "systemId": "xxx",
      "time": "2014-12-20T17:00:00Z",
      "user": "NPUSER1",
      "id": "TR_xxxx",
      "extensionInfo": [
        {
          "name": "vendorComment",
          "valueType": "string",
          "value": "Watch out for the dog"
        }
      ]
    }
  ]
},

```

```

"comment": [
  {
    "author": {
      "id": "SPM_handler_01",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/SPM_handler_01",
      "@referredType": "Individual"
    },
    "date": "2014-12-20T17:00:00Z",
    "systemId": "System_002",
    "text": "receive trouble ticket from NP1, and create this Service Problem"
  },
  {
    "author": {
      "id": "NP1_handler_11",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/NP1_handler_11",
      "@referredType": "Individual"
    },
    "date": "2014-12-20T17:00:00Z",
    "systemId": "System_002",
    "text": "status changed to Progress-Held"
  }
],
"impactPatterns": {
  "description": "Many services are at risk in this problem",
  "extensionInfo": [
    {
      "name": "ImpactProbability",
      "valueType": "boolean",
      "value": true
    }
  ]
},
"extensionInfo": [
  {
    "name": "EstimatedCost",
    "valueType": "integer",
    "value": 20
  }
]
}

```

5.11.3. Create service problem

POST /serviceProblem

Description

This operation creates a service problem entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a ServiceProblem, including any possible rule conditions and applicable default values. Notice that it is up to an implementer to add additional mandatory attributes.

Mandatory Attributes	Rule
----------------------	------

category	
priority	
description	
reason	
originatorParty	

Non Mandatory Attributes	Rule
affectedLocation	
affectedNumberOfServices	
affectedResource	
affectedService	
associatedSLAViolation	
associatedTroubleTicket	
comment	
correlationId	
extensionInfo	
firstAlert	
impactImportanceFactor	
impactPatterns	
originatingSystem	
parentProblem	
problemEscalation	
relatedEvent	
relatedObject	
relatedParty	
resolutionDate	
responsibleParty	
rootCauseResource	
rootCauseService	
status	
statusChangeDate	
statusChangeReason	
timeChanged	
timeRaised	
trackingRecord	
underlyingAlarm	
underlyingProblem	

Usage Samples

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

Request
POST /tmf-api/naas/v3/serviceProblem Content-Type: application/json { "category": "supplier.Originated",

<pre> "priority": "1", "description": "connection failure between Tokyo and Osaka", "reason": "Failure of resource NP1_Resource_1 in NP1", "originatorParty": { "role": "Supplier", "id": "NP1", "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/NP1", "@REFERREDType": "Organization" } } </pre>
<p>Response</p>
<pre> 201 { "id": "problemxxxx0000", "category": "supplier.originated", "href": "https://mycsp.com:8080/tmf- api/serviceProblemManagement/v3/serviceProblem/problemxxxx0000", "priority": "1", "description": "connection failure between Tokyo and Osaka", "reason": "Failure of resource NP1_Resource_1 in NP1", "originatorParty": { "role": "Supplier", "id": "NP1", "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/NP1", "@REFERREDType": "Organization" } } </pre>

5.11.4. Patch service problem

PATCH /serviceProblem/{id}

Description

This operation allows partial updates of a service problem entity. Support of json/merge (<https://tools.ietf.org/html/rfc7386>) is mandatory, support of json/patch (<http://tools.ietf.org/html/rfc5789>) is optional.

Note: If the update operation yields to the creation of sub-resources or relationships, the same rules concerning mandatory sub-resource attributes and default value settings in the POST operation applies to the PATCH operation. Hence these tables are not repeated here.

Patchable and Non Patchable Attributes

The tables below provide the list of patchable and non patchable attributes, including constraint rules on their usage.

Patchable Attributes	Rule
affectedLocation	
affectedNumberOfServices	
affectedResource	
affectedService	

Patchable Attributes	Rule
associatedSLAViolation	
associatedTroubleTicket	
category	
comment	
description	
extensionInfo	
impactImportanceFactor	
impactPatterns	
originatorParty	
parentProblem	
priority	
problemEscalation	
reason	
relatedEvent	
relatedObject	
relatedParty	
resolutionDate	
responsibleParty	
rootCauseResource	
rootCauseService	
status	
statusChangeDate	
statusChangeReason	
timeChanged	
underlyingAlarm	
underlyingProblem	

Non Patchable Attributes	Rule
correlationId	
firstAlert	
href	
id	
originatingSystem	
timeRaised	
trackingRecord	

Usage Samples

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

```

Request
PATCH /tmf-api/naas/v3/serviceProblem/problemxxxx0000
Content-Type: application/merge-patch+json

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

Response

200

```

{
  "id": "problemxxxx0000",
  "correlationId": "543251",
  "originatingSystem": "System_001",
  "category": "supplier.Originated",
  "href": "https://mycsp.com:8080/tmf-
api/serviceProblemManagement/v3/serviceProblem/problemxxxx0000",
  "impactImportanceFactor": "0",
  "priority": "1",
  "description": "connection failure between Tokyo and Osaka",
  "problemEscalation": "0",
  "timeRaised": "2017-10-25T12:14:16.361Z",
  "timeChanged": "2017-10-30T12:13:16.361Z",
  "statusChangeDate": "2017-10-29T12:00:00.361Z",
  "statusChangeReason": "problem analysis has been completed in NP1",
  "resolutionDate": "2017-10-29T12:00:00.361Z",
  "status": "resolved",
  "reason": "Failure of resource NP1_Resource_1 in NP1",
  "affectedNumberOfServices": "2",
  "firstAlert": {
    "alertType": "TroubleTicket",
    "id": "NP1_TT_0000000",
    "href": "https://mycsp.com:8080/tmf-
api/troubleTicketManagement/v3/troubleTicket/NP1_TT_0000000"
  },
  "responsibleParty": {
    "role": "Supplier",
    "id": "NP1",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/NP1",
    "@referredType": "Organization"
  },
  "originatorParty": {
    "role": "Supplier",
    "id": "NP1",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/NP1",
    "@referredType": "Organization"
  },
  "relatedParty": [
    {
      "role": "Supplier",
      "id": "NP1",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/NP1",
      "@referredType": "Organization"
    },
    {
      "role": "Partner",
      "id": "SP1",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/SP1",

```

```
    "@referredType": "Organization"
  },
  {
    "role": "Partner",
    "id": "SP3",
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/SP3",
    "@referredType": "Organization"
  }
],
"affectedService": [
  {
    "id": "NP1_Tokyo_Osaka",
    "href": "https://mycsp.com:8080/tmf-
api/serviceInventoryManagement/v3/service/NW1_Tokyo_Osaka"
  },
  {
    "id": "NP1_Tokyo_xxxx",
    "href": "https://mycsp.com:8080/tmf-
api/serviceInventoryManagement/v3/service/NW1_Tokyo_xxxx"
  }
],
"affectedResource": [
  {
    "id": "NP1_RES_0001",
    "href": "https://mycsp.com:8080/tmf-
api/resourceInventoryManagement/v3/resource/NW1_RES_0001"
  }
],
"affectedLocation": [
  {
    "id": "Loc000000",
    "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v3/geographicAddress/Loc000000/",
    "name": "144 Main Street Tokyo 51663556",
    "role": "VPN Endpoint",
    "@type": "GeographicAddress"
  },
  {
    "id": "Loc000001",
    "href": "https://mycsp.com:8080/tmf-
api/geographicAddressManagement/v3/geographicAddress/Loc000001/",
    "name": "351 Main Street Osaka 3546365",
    "role": "VPN Endpoint",
    "@type": "GeographicAddress"
  }
],
"associatedTroubleTicket": [
  {
    "id": "NP1_TT_000000",
    "href": "https://mycsp.com:8080/tmf-
api/troubleTicketManagement/v3/TroubleTicketRef/NP1_TT_000000"
  }
],
]
```

```
"underlyingAlarm": [
  {
    "id": "NP1_A_0000000",
    "href": "https://mycsp.com:8080/tmf-
api/alarmManagement/v3/resourceAlarm/NP1_A_0000000",
    "@referredType": "ResourceAlarm"
  }
],
"associatedSLAViolation": [
  {
    "id": "NP1_SLA_0000000",
    "href": "https://mycsp.com:8080/tmf-
api/SLAManagement/v3/SLAViolationRef/NP1_SLA_0000000"
  }
],
"relatedEvent": [
  {
    "eventType": "prediction",
    "id": "prediction_0001",
    "href": "https://mycsp.com:8080/tmf-api/eventManagement/v3/event/prediction_0001",
    "eventTime": "2014-12-20T17:00:00Z"
  }
],
"relatedObject": [
  {
    "id": "product0001",
    "href": "https://mycsp.com:8080/tmf-
api/productInventoryManagement/v3/product/product0001",
    "@referredType": "Product"
  }
],
"rootCauseService": [
  {
    "id": "NP1_Tokyo_Osaka",
    "href": "https://mycsp.com:8080/tmf-
api/serviceInventoryManagement/v3/service/NW1_Tokyo_Osaka"
  }
],
"rootCauseResource": [
  {
    "id": "NP1_Resource_1",
    "href": "https://mycsp.com:8080/tmf-
api/resourceInventoryManagement/v3/resource/NP1_Resource_1"
  }
],
"parentProblem": [
  {
    "id": "problemxxxx0001",
    "correlationId": "xxxxxxx",
    "href": "https://mycsp.com:8080/tmf-
api/serviceProblemManagement/v3/serviceProblem/problemxxxx0001"
  }
],
]
```

```

"underlyingProblem": [
  {
    "id": "problemxxxx0001",
    "correlationId": "xxxxxxx",
    "href": "https://mycsp.com:8080/tmf-
api/serviceProblemManagement/v3/serviceProblem/problemxxxx0001"
  }
],
"trackingRecord": [
  {
    "description": "yyy cleared the problem",
    "systemId": "xxxx",
    "time": "2014-12-20T17:00:00Z",
    "user": "NPUSER1",
    "id": "TR_xxxx",
    "extensionInfo": [
      {
        "name": "vendorComment",
        "valueType": "string",
        "value": "Watch out for the dog"
      }
    ]
  }
],
"comment": [
  {
    "author": {
      "id": "SPM_handler_01",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/SPM_handler_01",
      "@REFERREDType": "Individual"
    },
    "date": "2014-12-20T17:00:00Z",
    "systemId": "System_002",
    "text": "receive trouble ticket from NP1, and create this Service Problem"
  },
  {
    "author": {
      "id": "NP1_handler_11",
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/party/NP1_handler_11",
      "@REFERREDType": "Individual"
    },
    "date": "2014-12-20T17:00:00Z",
    "systemId": "System_002",
    "text": "status changed to Progress-Held"
  }
],
"impactPatterns": {
  "description": "Many services are at risk in this problem",
  "extensionInfo": [
    {
      "name": "ImpactProbability",
      "valueType": "boolean",
      "value": true
    }
  ]
}

```

```

    }
  ]
},
"extensionInfo": [
  {
    "name": "EstimatedCost",
    "valueType": "integer",
    "value": 20
  }
],
"name": "new name"
}

```

5.11.5. Delete service problem

DELETE /serviceProblem/{id}

Description

This operation deletes a service problem entity.

Usage Samples

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

Request
DELETE /tmf-api/naas/v3/serviceProblem/42
Response
204

5.12. Operations on Service Specification

5.12.1. List service specifications

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

Description

This operation list service specification entities.

Attribute selection is enabled for all first level attributes.

Filtering may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving ServiceSpecification resources.

Request
GET /tmf-api/naas/v3/serviceSpecification Accept: application/json
Response
200
[

```

{
  "id": "7655",
  "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v3/serviceSpecification/7655",
  "name": "Firewall Service",
  "description": "This service specification describes a firewall service that can be deployed in
customer premise.",
  "version": "2.1",
  "validFor": {
    "startDateTime": "2017-08-23T00:00",
    "endDateTime": "2018-03-25T00:00"
  },
  "lastUpdate": "2017-08-27T00:00",
  "lifecycleStatus": "Active",
  "isBundle": false,
  "resourceSpecification": [
    {
      "href": "https://mycsp.com:8080/tmf-
api/resourceCatalogManagement/v3/resourceSpecification/42",
      "id": "42",
      "name": "Firewall",
      "version": "1.0",
      "@referredType": "ResourceFunctionSpec"
    }
  ],
  "attachment": [
    {
      "description": "This attachment gives a block diagram of the firewall.",
      "href": "https://mycsp.com:8080/tmf-api/documentManagement/v3/attachment/22",
      "id": "22",
      "url": "https://mycsp.com:7070/docloader?docnum=3534536"
    }
  ],
  "serviceSpecCharacteristic": [
    {
      "name": "OperatingSystem",
      "description": "This characteristic describes the operating system run by the service",
      "valueType": "string",
      "configurable": true,
      "validFor": {
        "startDateTime": "2017-08-12T00:00",
        "endDateTime": "2018-03-07T00:00"
      },
      "@valueSchemaLocation": "",
      "minCardinality": 0,
      "maxCardinality": 1,
      "isUnique": true,
      "regex": "",
      "extensible": false,
      "serviceSpecCharacteristicValue": [
        {
          "valueType": "string",
          "isDefault": true,

```

```

        "value": "Android KitKat",
        "validFor": {
            "startDateTime": "2017-08-06T00:00",
            "endDateTime": "2018-03-07T00:00"
        }
    },
    "serviceSpecCharRelationship": [
        {
            "relationshipType": "dependency",
            "role": "",
            "id": "4690",
            "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v3/serviceSpecificationCharacteristic/4690",
            "name": "OperatingSystem",
            "validFor": {
                "startDateTime": "2017-08-11T00:00",
                "endDateTime": "2018-03-07T00:00"
            }
        }
    ],
    "@type": "ServiceSpecCharacteristic",
    "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/ServiceSpecCharacteristic.schema.json"
},
{
    "name": "Scalability",
    "description": "Scalability parameters for this resource facing service spec ",
    "valueType": "CapabilityScalable",
    "configurable": true,
    "validFor": {
        "startDateTime": "2017-08-17T00:00",
        "endDateTime": "2018-03-12T00:00"
    },
    "@valueSchemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/CapabilityScalable.schema.json",
    "minCardinality": 0,
    "maxCardinality": 1,
    "isUnique": true,
    "regex": "",
    "extensible": true,
    "serviceSpecCharacteristicValue": [
        {
            "valueType": "object",
            "isDefault": true,
            "value": {
                "minInstances": 1,
                "maxInstances": 1000
            },
            "validFor": {
                "startDateTime": "2017-08-17T00:00",
                "endDateTime": "2018-03-12T00:00"
            }
        }
    ],
}

```

```

        "@type": "CapabilityScalable",
        "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/CapabilityScalable.schema.json"
    }
],
    "serviceSpecCharRelationship": [],
    "@type": "ServiceSpecCharacteristic",
    "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/ServiceSpecCharacteristic.schema.json"
}
],
"relatedParty": [
    {
        "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/organization/3643",
        "id": "3643",
        "name": "Firewall Express",
        "role": "Supplier"
    }
],
"serviceSpecRelationship": [
    {
        "relationshipType": "dependency",
        "role": "dependent",
        "id": "5563",
        "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v3/serviceSpecification/5563",
        "name": "Points to the Deep Packet Inspection service on which this Firewall service depends",
        "validFor": {
            "startDateTime": "2017-08-25T00:00",
            "endDateTime": "2018-03-25T00:00"
        }
    }
],
"serviceLevelSpecification": [
    {
        "href": "https://mycsp.com:8080/tmf-
api/serviceQualityManagement/v3/serviceLevelSpecification/8899",
        "id": "8899",
        "name": "Platinum"
    }
],
"targetServiceSchema": {
    "@type": "RFS",
    "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Service/RFS.schema.json"
},
"@type": "ResourceFacingServiceSpecification",
"@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/ResourceFacingServiceSpecification.schema.json",
"@baseType": "ServiceSpecification"
}
]

```

5.12.2. Retrieve service specification**GET****/serviceSpecification/{id}?fields=...&{filtering}****Description**

This operation retrieves a service specification entity.

Attribute selection is enabled for all first level attributes.

Filtering on sub-resources may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving a ServiceSpecification resource.

Request
GET /tmf-api/naas/v3/serviceSpecification/7655 Accept: application/json
Response
200 <pre>{ "id": "7655", "href": "https://mycsp.com:8080/tmf- api/serviceCatalogManagement/v3/serviceSpecification/7655", "name": "Firewall Service", "description": "This service specification describes a firewall service that can be deployed in customer premise.", "version": "2.1", "validFor": { "startDateTime": "2017-08-23T00:00", "endDateTime": "2018-03-25T00:00" }, "lastUpdate": "2017-08-27T00:00", "lifecycleStatus": "Active", "isBundle": false, "resourceSpecification": [{ "href": "https://mycsp.com:8080/tmf- api/resourceCatalogManagement/v3/resourceSpecification/42", "id": "42", "name": "Firewall", "version": "1.0", "@referredType": "ResourceFunctionSpec" }], "attachment": [{ "description": "This attachment gives a block diagram of the firewall.", "href": "https://mycsp.com:8080/tmf-api/documentManagement/v3/attachment/22", "id": "22", "url": "https://mycsp.com:7070/docloader?docnum=3534536" }] }</pre>

```

    }
  ],
  "serviceSpecCharacteristic": [
    {
      "name": "OperatingSystem",
      "description": "This characteristic describes the operating system run by the service",
      "valueType": "string",
      "configurable": true,
      "validFor": {
        "startDateTime": "2017-08-12T00:00",
        "endDateTime": "2018-03-07T00:00"
      },
      "@valueSchemaLocation": "",
      "minCardinality": 0,
      "maxCardinality": 1,
      "isUnique": true,
      "regex": "",
      "extensible": false,
      "serviceSpecCharacteristicValue": [
        {
          "valueType": "string",
          "isDefault": true,
          "value": "Android KitKat",
          "validFor": {
            "startDateTime": "2017-08-06T00:00",
            "endDateTime": "2018-03-07T00:00"
          }
        }
      ]
    },
    {
      "relationshipType": "dependency",
      "role": "",
      "id": "4690",
      "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceSpecificationCharacteristic/4690",
      "name": "OperatingSystem",
      "validFor": {
        "startDateTime": "2017-08-11T00:00",
        "endDateTime": "2018-03-07T00:00"
      }
    }
  ],
  "@type": "ServiceSpecCharacteristic",
  "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Service/ServiceSpecCharacteristic.schema.json"
},
{
  "name": "Scalability",
  "description": "Scalability parameters for this resource facing service spec ",
  "valueType": "CapabilityScalable",
  "configurable": true,
  "validFor": {

```

```

        "startDateTime": "2017-08-17T00:00",
        "endDateTime": "2018-03-12T00:00"
    },
    "@valueSchemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/CapabilityScalable.schema.json",
    "minCardinality": 0,
    "maxCardinality": 1,
    "isUnique": true,
    "regex": "",
    "extensible": true,
    "serviceSpecCharacteristicValue": [
        {
            "valueType": "object",
            "isDefault": true,
            "value": {
                "minInstances": 1,
                "maxInstances": 1000
            },
            "validFor": {
                "startDateTime": "2017-08-17T00:00",
                "endDateTime": "2018-03-12T00:00"
            },
            "@type": "CapabilityScalable",
            "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/CapabilityScalable.schema.json"
        }
    ],
    "serviceSpecCharRelationship": [],
    "@type": "ServiceSpecCharacteristic",
    "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/ServiceSpecCharacteristic.schema.json"
}
],
"relatedParty": [
    {
        "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/organization/3643",
        "id": "3643",
        "name": "Firewall Express",
        "role": "Supplier"
    }
],
"serviceSpecRelationship": [
    {
        "relationshipType": "dependency",
        "role": "dependent",
        "id": "5563",
        "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v3/serviceSpecification/5563",
        "name": "Points to the Deep Packet Inspection service on which this Firewall service depends",
        "validFor": {
            "startDateTime": "2017-08-25T00:00",
            "endDateTime": "2018-03-25T00:00"
        }
    }
]
}

```

```

    }
  ],
  "serviceLevelSpecification": [
    {
      "href": "https://mycsp.com:8080/tmf-
api/serviceQualityManagement/v3/serviceLevelSpecification/8899",
      "id": "8899",
      "name": "Platinum"
    }
  ],
  "targetServiceSchema": {
    "@type": "RFS",
    "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Service/RFS.schema.json"
  },
  "@type": "ResourceFacingServiceSpecification",
  "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/ResourceFacingServiceSpecification.schema.json",
  "@baseType": "ServiceSpecification"
}

```

5.12.3. Create service specification

POST /serviceSpecification

Description

This operation creates a service specification entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a ServiceSpecification, including any possible rule conditions and applicable default values. Notice that it is up to an implementer to add additional mandatory attributes.

Mandatory Attributes	Rule
name	

Non Mandatory Attributes	Rule
attachment	
description	
isBundle	
lastUpdate	
lifecycleStatus	
relatedParty	
resourceSpecification	
serviceLevelSpecification	
serviceSpecCharacteristic	
serviceSpecRelationship	
targetServiceSchema	
validFor	
version	

Usage Samples

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

Request
POST /tmf-api/naas/v3/serviceSpecification Content-Type: application/json <pre>{ "name": "Firewall Service" }</pre>
Response
201 <pre>{ "id": "7655", "href": "https://mycsp.com:8080/tmf- api/serviceCatalogManagement/v3/serviceSpecification/7655", "name": "Firewall Service" }</pre>

5.12.4. Patch service specification

PATCH /serviceSpecification/{id}

Description

This operation allows partial updates of a service specification entity. Support of json/merge (<https://tools.ietf.org/html/rfc7386>) is mandatory, support of json/patch (<http://tools.ietf.org/html/rfc5789>) is optional.

Note: If the update operation yields to the creation of sub-resources or relationships, the same rules concerning mandatory sub-resource attributes and default value settings in the POST operation applies to the PATCH operation. Hence these tables are not repeated here.

Patchable and Non Patchable Attributes

The tables below provide the list of patchable and non patchable attributes, including constraint rules on their usage.

Patchable Attributes	Rule
attachment	
description	
isBundle	
lifecycleStatus	
name	
relatedParty	
resourceSpecification	
serviceLevelSpecification	
serviceSpecCharacteristic	
serviceSpecRelationship	
targetServiceSchema	
validFor	

version	
---------	--

Non Patchable Attributes	Rule
id	
href	
lastUpdate	

Usage Samples

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

Request
<pre> PATCH /tmf-api/naas/v3/serviceSpecification/7655 Content-Type: application/merge-patch+json { "name": "new name" } </pre>
Response
<pre> 200 { "id": "7655", "href": "https://mycsp.com:8080/tmf- api/serviceCatalogManagement/v3/serviceSpecification/7655", "name": "new name", "description": "This service specification describes a firewall service that can be deployed in customer premise.", "version": "2.1", "validFor": { "startDateTime": "2017-08-23T00:00", "endDateTime": "2018-03-25T00:00" }, "lastUpdate": "2017-08-27T00:00", "lifecycleStatus": "Active", "isBundle": false, "resourceSpecification": [{ "href": "https://mycsp.com:8080/tmf- api/resourceCatalogManagement/v3/resourceSpecification/42", "id": "42", "name": "Firewall", "version": "1.0", "@referredType": "ResourceFunctionSpec" }], "attachment": [{ "description": "This attachment gives a block diagram of the firewall.", </pre>

```

    "href": "https://mycsp.com:8080/tmf-api/documentManagement/v3/attachment/22",
    "id": "22",
    "url": "https://mycsp.com:7070/docloader?docnum=3534536"
  }
],
"serviceSpecCharacteristic": [
  {
    "name": "OperatingSystem",
    "description": "This characteristic describes the operating system run by the service",
    "valueType": "string",
    "configurable": true,
    "validFor": {
      "startDateTime": "2017-08-12T00:00",
      "endDateTime": "2018-03-07T00:00"
    },
    "@valueSchemaLocation": "",
    "minCardinality": 0,
    "maxCardinality": 1,
    "isUnique": true,
    "regex": "",
    "extensible": false,
    "serviceSpecCharacteristicValue": [
      {
        "valueType": "string",
        "isDefault": true,
        "value": "Android KitKat",
        "validFor": {
          "startDateTime": "2017-08-06T00:00",
          "endDateTime": "2018-03-07T00:00"
        }
      }
    ]
  },
  {
    "relationshipType": "dependency",
    "role": "",
    "id": "4690",
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v3/serviceSpecificationCharacteristic/4690",
    "name": "OperatingSystem",
    "validFor": {
      "startDateTime": "2017-08-11T00:00",
      "endDateTime": "2018-03-07T00:00"
    }
  }
],
"@type": "ServiceSpecCharacteristic",
"@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/ServiceSpecCharacteristic.schema.json"
},
{
  "name": "Scalability",
  "description": "Scalability parameters for this resource facing service spec ",

```

```

    "valueType": "CapabilityScalable",
    "configurable": true,
    "validFor": {
      "startDateTime": "2017-08-17T00:00",
      "endDateTime": "2018-03-12T00:00"
    },
    "@valueSchemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/CapabilityScalable.schema.json",
    "minCardinality": 0,
    "maxCardinality": 1,
    "isUnique": true,
    "regex": "",
    "extensible": true,
    "serviceSpecCharacteristicValue": [
      {
        "valueType": "object",
        "isDefault": true,
        "value": {
          "minInstances": 1,
          "maxInstances": 1000
        },
        "validFor": {
          "startDateTime": "2017-08-17T00:00",
          "endDateTime": "2018-03-12T00:00"
        },
        "@type": "CapabilityScalable",
        "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/CapabilityScalable.schema.json"
      }
    ],
    "serviceSpecCharRelationship": [],
    "@type": "ServiceSpecCharacteristic",
    "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/ServiceSpecCharacteristic.schema.json"
  }
},
"relatedParty": [
  {
    "href": "https://mycsp.com:8080/tmf-api/partyManagement/v3/organization/3643",
    "id": "3643",
    "name": "Firewall Express",
    "role": "Supplier"
  }
],
"serviceSpecRelationship": [
  {
    "relationshipType": "dependency",
    "role": "dependent",
    "id": "5563",
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v3/serviceSpecification/5563",
    "name": "Points to the Deep Packet Inspection service on which this Firewall service depends",
    "validFor": {

```

```

        "startDateTime": "2017-08-25T00:00",
        "endDateTime": "2018-03-25T00:00"
      }
    }
  ],
  "serviceLevelSpecification": [
    {
      "href": "https://mycsp.com:8080/tmf-
api/serviceQualityManagement/v3/serviceLevelSpecification/8899",
      "id": "8899",
      "name": "Platinum"
    }
  ],
  "targetServiceSchema": {
    "@type": "RFS",
    "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Service/RFS.schema.json"
  },
  "@type": "ResourceFacingServiceSpecification",
  "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/ResourceFacingServiceSpecification.schema.json",
  "@baseType": "ServiceSpecification"
}

```

5.12.5. Delete service specification

DELETE /serviceSpecification/{id}

Description

This operation deletes a service specification entity.

Usage Samples

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

Request
DELETE /tmf-api/naas/v3/serviceSpecification/42
Response
204

5.13. Operations on Service Test

5.13.1. List service tests

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

Description

This operation list service test entities.

Attribute selection is enabled for all first level attributes.

Filtering may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving ServiceTest resources.

Request
GET /tmf-api/naas/v3/serviceTest Accept: application/json
Response
<pre> 200 [{ "href": "https://mycsp.com:8080/tmf-api/serviceTestManagement/v3/serviceTest/3112", "id": "3112", "description": "This service test is a simple one", "endTime": "2016-03-02T24:00:00", "mode": "PROACTIVE", "startTime": "2016-03-02T00:00:00", "state": "Completed", "relatedService": { "href": "https://mycsp.com:8080/tmf-api/serviceManagement/v3/service/21", "id": "21", "name": "gameService" }, "testSpecification": { "href": "https://mycsp.com:8080/tmf- api/serviceTestManagement/v3/serviceTestSpecification/22", "id": "22", "@referredType": "PerformanceTestSpecification" }, "characteristic": [{ "name": "number", "valueType": "integer", "value": 3 }, { "name": "restart", "valueType": "boolean", "value": true }], "testMeasure": [{ "accuracy": 0.0001, "captureDateTime": "2016-03-02T11:12:00", "captureMethod": "automatic capture by instrument", "metricDescription": "This is the flow speed in a service", "metricHref": "https://mycsp.com:8080/tmf-api/metricManagement/v3/metric/21", "metricName": "Flow speed", "unitOfMeasure": "A second", "value": { "valueType": "bits", "value": { </pre>

```

        "@type": "integer",
        "value": 3000
      }
    },
    "ruleViolation": [
      {
        "conformanceTargetUpper": "2500",
        "conformanceComparatorUpper": "greater than ",
        "description": "This speed is greater than the target upper",
        "name": "tooMuchTraffic",
        "numberOfAllowedCrossing": 0,
        "thresholdRuleSeverity": "1",
        "appliedConsequence": [
          {
            "appliedAction": "sendWarning",
            "description": "send a warning to the system",
            "name": "sendWarning",
            "repeatAction": false
          },
          {
            "appliedAction": "generateReport",
            "description": "generate a waring report ",
            "name": "generateReport",
            "repeatAction": false
          }
        ]
      }
    ]
  }
]
},
"@type": "PerformanceTest",
"@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/PerformanceTest.schema.json",
"@baseType": "ServiceTest"
}
]

```

5.13.2. Retrieve service test

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

Description

This operation retrieves a service test entity.

Attribute selection is enabled for all first level attributes.

Filtering on sub-resources may be available depending on the compliance level supported by an implementation.

Usage Samples

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

Request

```

GET /tmf-api/naas/v3/serviceTest/3112
Accept: application/json

```

Response

200

```

{
  "href": "https://mycsp.com:8080/tmf-api/serviceTestManagement/v3/serviceTest/3112",
  "id": "3112",
  "description": "This service test is a simple one",
  "endDateTime": "2016-03-02T24:00:00",
  "mode": "PROACTIVE",
  "startDateTime": "2016-03-02T00:00:00",
  "state": "Completed",
  "relatedService": {
    "href": "https://mycsp.com:8080/tmf-api/serviceManagement/v3/service/21",
    "id": "21",
    "name": "gameService"
  },
  "testSpecification": {
    "href": "https://mycsp.com:8080/tmf-
api/serviceTestManagement/v3/serviceTestSpecification/22",
    "id": "22",
    "@referredType": "PerformanceTestSpecification"
  },
  "characteristic": [
    {
      "name": "number",
      "valueType": "integer",
      "value": 3
    },
    {
      "name": "restart",
      "valueType": "boolean",
      "value": true
    }
  ],
  "testMeasure": [
    {
      "accuracy": 0.0001,
      "captureDateTime": "2016-03-02T11:12:00",
      "captureMethod": "automatic capture by instrument",
      "metricDescription": "This is the flow speed in a service",
      "metricHref": "https://mycsp.com:8080/tmf-api/metricManagement/v3/metric/21",
      "metricName": "Flow speed",
      "unitOfMeasure": "A second",
      "value": {
        "valueType": "bits",
        "value": {
          "@type": "integer",
          "value": 3000
        }
      }
    },
    {
      "ruleViolation": [
        {

```

```

        "conformanceTargetUpper": "2500",
        "conformanceComparatorUpper": "greater than ",
        "description": "This speed is greater than the target upper",
        "name": "tooMuchTraffic",
        "numberOfAllowedCrossing": 0,
        "thresholdRuleSeverity": "1",
        "appliedConsequence": [
          {
            "appliedAction": "sendWarning",
            "description": "send a warning to the system",
            "name": "sendWarning",
            "repeatAction": false
          },
          {
            "appliedAction": "generateReport",
            "description": "generate a waring report ",
            "name": "generateReport",
            "repeatAction": false
          }
        ]
      }
    ]
  }
},
"@type": "PerformanceTest",
"@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/PerformanceTest.schema.json",
"@baseType": "ServiceTest"
}

```

5.13.3. Create service test
POST /serviceTest

Description

This operation creates a service test entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a ServiceTest, including any possible rule conditions and applicable default values. Notice that it is up to an implementer to add additional mandatory attributes.

Mandatory Attributes	Rule
name	
relatedService	
testSpecification	

Non Mandatory Attributes	Rule
characteristic	
description	
endDateTime	
mode	
startDateTime	

state	
testMeasure	

Usage Samples

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

Request
POST /tmf-api/naas/v3/serviceTest Content-Type: application/json <pre>{ "relatedService": { "href": "https://mycsp.com:8080/tmf-api/serviceManagement/v3/service/21", "id": "21", "name": "gameService" }, "testSpecification": { "href": "https://mycsp.com:8080/tmf- api/serviceTestManagement/v3/serviceTestSpecification/22", "id": "22", "@REFERREDType": "PerformanceTestSpecification" } }</pre>
Response
201 <pre>{ "href": "https://mycsp.com:8080/tmf-api/serviceTestManagement/v3/serviceTest/3112", "id": "3112", "relatedService": { "href": "https://mycsp.com:8080/tmf-api/serviceManagement/v3/service/21", "id": "21", "name": "gameService" }, "testSpecification": { "href": "https://mycsp.com:8080/tmf- api/serviceTestManagement/v3/serviceTestSpecification/22", "id": "22", "@REFERREDType": "PerformanceTestSpecification" } }</pre>

5.13.4. Patch service test**PATCH /serviceTest/{id}****Description**

This operation allows partial updates of a service test entity. Support of json/merge (<https://tools.ietf.org/html/rfc7386>) is mandatory, support of json/patch (<http://tools.ietf.org/html/rfc5789>) is optional.

Note: If the update operation yields to the creation of sub-resources or relationships, the same rules concerning mandatory sub-resource attributes and default value settings in the POST operation applies to the PATCH operation. Hence these tables are not repeated here.

Patchable and Non Patchable Attributes

The tables below provide the list of patchable and non patchable attributes, including constraint rules on their usage.

Patchable Attributes	Rule
characteristic	
description	
endDateTime	
mode	
name	
relatedService	
startDateTime	
state	
testMeasure	
testSpecification	

Non Patchable Attributes	Rule
href	
id	

Usage Samples

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

Request
<pre>PATCH /tmf-api/naas/v3/serviceTest/3112 Content-Type: application/merge-patch+json { "name": "new name" }</pre>
Response
<pre>200 { "href": "https://mycsp.com:8080/tmf-api/serviceTestManagement/v3/serviceTest/3112", "id": "3112", "description": "This service test is a simple one", "endDateTime": "2016-03-02T24:00:00", "mode": "PROACTIVE", "startDateTime": "2016-03-02T00:00:00", "state": "Completed", "relatedService": { "href": "https://mycsp.com:8080/tmf-api/serviceManagement/v3/service/21", "id": "21",</pre>

```

    "name": "gameService"
  },
  "testSpecification": {
    "href": "https://mycsp.com:8080/tmf-
api/serviceTestManagement/v3/serviceTestSpecification/22",
    "id": "22",
    "@REFERREDType": "PerformanceTestSpecification"
  },
  "characteristic": [
    {
      "name": "number",
      "valueType": "integer",
      "value": 3
    },
    {
      "name": "restart",
      "valueType": "boolean",
      "value": true
    }
  ],
  "testMeasure": [
    {
      "accuracy": 0.0001,
      "captureDateTime": "2016-03-02T11:12:00",
      "captureMethod": "automatic capture by instrument",
      "metricDescription": "This is the flow speed in a service",
      "metricHref": "https://mycsp.com:8080/tmf-api/metricManagement/v3/metric/21",
      "metricName": "Flow speed",
      "unitOfMeasure": "A second",
      "value": {
        "valueType": "bits",
        "value": {
          "@type": "integer",
          "value": 3000
        }
      }
    }
  ],
  "ruleViolation": [
    {
      "conformanceTargetUpper": "2500",
      "conformanceComparatorUpper": "greater than ",
      "description": "This speed is greater than the target upper",
      "name": "tooMuchTraffic",
      "numberOfAllowedCrossing": 0,
      "thresholdRuleSeverity": "1",
      "appliedConsequence": [
        {
          "appliedAction": "sendWarning",
          "description": "send a warning to the system",
          "name": "sendWarning",
          "repeatAction": false
        },
        {
          "appliedAction": "generateReport",

```

```

        "description": "generate a waring report ",
        "name": "generateReport",
        "repeatAction": false
    }
  ]
}
],
"@type": "PerformanceTest",
"@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/Service/PerformanceTest.schema.json",
"@baseType": "ServiceTest",
"name": "new name"
}

```

5.13.5. Delete service test

DELETE /serviceTest/{id}

Description

This operation deletes a service test entity.

Usage Samples

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

Request
DELETE /tmf-api/naas/v3/serviceTest/42
Response
204

5.14. Operations on Service Test Specification

5.14.1. List service test specifications

GET

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

Description

This operation list service test specification entities.

Attribute selection is enabled for all first level attributes.

Filtering may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving ServiceTestSpecification resources.

Request
GET /tmf-api/naas/v3/serviceTestSpecification Accept: application/json

Response

200

```
[
  {
    "description": "a service description",
    "href": "https://mycsp.com:8080/tmf-
api/serviceTestManagement/v3/serviceTestSpecification/12",
    "id": "12",
    "version": "1.0",
    "name": "monkey test",
    "validFor": {
      "endDateTime": "2017-03-01T00:00:00",
      "startDateTime": "2016-03-01T00:00:00"
    },
    "testMeasureDefinition": [
      {
        "captureFrequency": "once",
        "captureMethod": "automatic capture by instrument",
        "metricDescription": "This is the flow speed in a service",
        "metricHref": "https://mycsp.com:8080/tmf-api/metricManagement/v3/metric/21",
        "metricName": "Flow speed",
        "name": "Definition of Flow speed",
        "unitOfMeasure": "A second",
        "valueType": "bits",
        "capturePeriod": {
          "amount": "5",
          "units": "seconds"
        },
        "thresholdRule": [
          {
            "conformanceTargetUpper": "2500",
            "conformanceComparatorUpper": "greater than ",
            "description": "This speed is greater than the target upper",
            "name": "tooMuchTraffic",
            "numberOfAllowedCrossing": 0,
            "thresholdRuleSeverity": "1",
            "tolerancePeriod": {
              "amount": "15",
              "units": "minutes"
            },
            "consequence": [
              {
                "prescribeAction": "sendWarning",
                "description": "send a warning to the system",
                "name": "sendWarning",
                "repeatAction": false,
                "validFor": {
                  "endDateTime": "2017-03-01T00:00:00",
                  "startDateTime": "2016-03-01T00:00:00"
                }
              }
            ]
          }
        ]
      }
    ],
  },
],
```

```

        {
          "prescribeAction": "generateReport",
          "description": "generate a warning report ",
          "name": "generateReport",
          "repeatAction": false,
          "validFor": {
            "endDateTime": "2017-03-01T00:00:00",
            "startDateTime": "2016-03-01T00:00:00"
          }
        }
      ]
    },
    "validFor": {
      "endDateTime": "2017-03-01T00:00:00",
      "startDateTime": "2016-03-01T00:00:00"
    }
  }
},
"relatedServiceSpecification": {
  "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/serviceSpecification/31",
  "id": "31",
  "@referredType": "vCPEServiceSpecification"
},
"@baseType": "ServiceTestSpecification",
"@type": "PerformanceTestSpecification",
"@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/service/PerformanceTestSpecification.schema.json"
}
]

```

5.14.2. Retrieve service test specification

GET

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

Description

This operation retrieves a service test specification entity.

Attribute selection is enabled for all first level attributes.

Filtering on sub-resources may be available depending on the compliance level supported by an implementation.

Usage Samples

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

Request
GET /tmf-api/naas/v3/serviceTestSpecification/12 Accept: application/json
Response

```
200

{
  "description": "a service description",
  "href": "https://mycsp.com:8080/tmf-
api/serviceTestManagement/v3/serviceTestSpecification/12",
  "id": "12",
  "version": "1.0",
  "name": "monkey test",
  "validFor": {
    "endDateTime": "2017-03-01T00:00:00",
    "startDateTime": "2016-03-01T00:00:00"
  },
  "testMeasureDefinition": [
    {
      "captureFrequency": "once",
      "captureMethod": "automatic capture by instrument",
      "metricDescription": "This is the flow speed in a service",
      "metricHref": "https://mycsp.com:8080/tmf-api/metricManagement/v3/metric/21",
      "metricName": "Flow speed",
      "name": "Definition of Flow speed",
      "unitOfMeasure": "A second",
      "valueType": "bits",
      "capturePeriod": {
        "amount": "5",
        "units": "seconds"
      },
    },
    "thresholdRule": [
      {
        "conformanceTargetUpper": "2500",
        "conformanceComparatorUpper": "greater than ",
        "description": "This speed is greater than the target upper",
        "name": "tooMuchTraffic",
        "numberOfAllowedCrossing": 0,
        "thresholdRuleSeverity": "1",
        "tolerancePeriod": {
          "amount": "15",
          "units": "minutes"
        },
      },
      "consequence": [
        {
          "prescribeAction": "sendWarning",
          "description": "send a warning to the system",
          "name": "sendWarning",
          "repeatAction": false,
          "validFor": {
            "endDateTime": "2017-03-01T00:00:00",
            "startDateTime": "2016-03-01T00:00:00"
          }
        },
        {
          "prescribeAction": "generateReport",
          "description": "generate a waring report ",

```

```

        "name": "generateReport",
        "repeatAction": false,
        "validFor": {
            "endDateTime": "2017-03-01T00:00:00",
            "startDateTime": "2016-03-01T00:00:00"
        }
    }
]
},
"validFor": {
    "endDateTime": "2017-03-01T00:00:00",
    "startDateTime": "2016-03-01T00:00:00"
}
},
"relatedServiceSpecification": {
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v3/serviceSpecification/31",
    "id": "31",
    "@referredType": "vCPEServiceSpecification"
},
"@baseType": "ServiceTestSpecification",
"@type": "PerformanceTestSpecification",
"@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/service/PerformanceTestSpecification.schema.json"
}
}

```

5.14.3. Create service test specification

POST /serviceTestSpecification

Description

This operation creates a service test specification entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a ServiceTestSpecification, including any possible rule conditions and applicable default values.

Notice that it is up to an implementer to add additional mandatory attributes.

Mandatory Attributes	Rule
name	
relatedServiceSpecification	

Non Mandatory Attributes	Rule
description	
testMeasureDefinition	
validFor	
version	

Usage Samples

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

Request
<pre> POST /tmf-api/naas/v3/serviceTestSpecification Content-Type: application/json { "name": "monkey test", "relatedServiceSpecification": { "href": "https://mycsp.com:8080/tmf- api/serviceCatalogManagement/v3/serviceSpecification/31", "id": "31", "@REFERREDType": "vCPEServiceSpecification" } } </pre>
Response
<pre> 201 { "href": "https://mycsp.com:8080/tmf- api/serviceTestManagement/v3/serviceTestSpecification/12", "id": "12", "name": "monkey test", "relatedServiceSpecification": { "href": "https://mycsp.com:8080/tmf- api/serviceCatalogManagement/v3/serviceSpecification/31", "id": "31", "@REFERREDType": "vCPEServiceSpecification" } } </pre>

5.14.4. Patch service test specification

PATCH /serviceTestSpecification/{id}

Description

This operation allows partial updates of a service test specification entity. Support of json/merge (<https://tools.ietf.org/html/rfc7386>) is mandatory, support of json/patch (<http://tools.ietf.org/html/rfc5789>) is optional.

Note: If the update operation yields to the creation of sub-resources or relationships, the same rules concerning mandatory sub-resource attributes and default value settings in the POST operation applies to the PATCH operation. Hence these tables are not repeated here.

Patchable and Non Patchable Attributes

The tables below provide the list of patchable and non patchable attributes, including constraint rules on their usage.

Patchable Attributes	Rule
description	
name	
relatedServiceSpecification	

testMeasureDefinition	
version	

Non Patchable Attributes	Rule
href	
id	
validFor	

Usage Samples

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

Request
PATCH /tmf-api/naas/v3/serviceTestSpecification/12 Content-Type: application/merge-patch+json <pre>{ "name": "new name" }</pre>
Response
200 <pre>{ "description": "a service description", "href": "https://mycsp.com:8080/tmf-api/serviceTestManagement/v3/serviceTestSpecification/12", "id": "12", "version": "1.0", "name": "new name", "validFor": { "endTime": "2017-03-01T00:00:00", "startTime": "2016-03-01T00:00:00" }, "testMeasureDefinition": [{ "captureFrequency": "once", "captureMethod": "automatic capture by instrument", "metricDescription": "This is the flow speed in a service", "metricHref": "https://mycsp.com:8080/tmf-api/metricManagement/v3/metric/21", "metricName": "Flow speed", "name": "Definition of Flow speed", "unitOfMeasure": "A second", "valueType": "bits", "capturePeriod": { "amount": "5", "units": "seconds" }, "thresholdRule": [{ "conformanceTargetUpper": "2500",</pre>

```

        "conformanceComparatorUpper": "greater than ",
        "description": "This speed is greater than the target upper",
        "name": "tooMuchTraffic",
        "numberOfAllowedCrossing": 0,
        "thresholdRuleSeverity": "1",
        "tolerancePeriod": {
            "amount": "15",
            "units": "minutes"
        },
        "consequence": [
            {
                "prescribeAction": "sendWarning",
                "description": "send a warning to the system",
                "name": "sendWarning",
                "repeatAction": false,
                "validFor": {
                    "endDateTime": "2017-03-01T00:00:00",
                    "startDateTime": "2016-03-01T00:00:00"
                }
            },
            {
                "prescribeAction": "generateReport",
                "description": "generate a waring report ",
                "name": "generateReport",
                "repeatAction": false,
                "validFor": {
                    "endDateTime": "2017-03-01T00:00:00",
                    "startDateTime": "2016-03-01T00:00:00"
                }
            }
        ]
    },
    "validFor": {
        "endDateTime": "2017-03-01T00:00:00",
        "startDateTime": "2016-03-01T00:00:00"
    }
},
"relatedServiceSpecification": {
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v3/serviceSpecification/31",
    "id": "31",
    "@referredType": "vCPEServiceSpecification"
},
"@baseType": "ServiceTestSpecification",
"@type": "PerformanceTestSpecification",
"@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/service/PerformanceTestSpecification.schema.json"
}

```

5.14.5. Delete service test specification

DELETE /serviceTestSpecification/{id}

Description

This operation deletes a service test specification entity.

Usage Samples

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

Request
DELETE /tmf-api/naas/v3/serviceTestSpecification/42
Response
204

5.15. Operations on Usage Consumption Report Request**5.15.1. List usage consumption report requests****GET**

`/usageConsumptionReportRequest?fields=...&{filtering}`

Description

This operation list usage consumption report request entities.

Attribute selection is enabled for all first level attributes.

Filtering may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving UsageConsumptionReportRequest resources.

Request
GET /tmf-api/naas/v3/usageConsumptionReportRequest Accept: application/json
Response
200 [{ "id": "ucrreq001", "href": "https://serverRoot/tmf-api/usageConsumption/usageConsumptionReportRequest/ucrreq001", "creationDate": "2018-03-15T:15:44:28", "status": "InProgress", "lastUpdate": "2018-03-15T:15:44:28", "product": { "publicIdentifier": "33601010101" } }]

5.15.2. Retrieve usage consumption report request

GET

/usageConsumptionReportRequest/{id}?fields=...&{filtering}

Description

This operation retrieves an usage consumption report request entity. Attribute selection is enabled for all first level attributes. Filtering on sub-resources may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving a UsageConsumptionReportRequest resource.

Request
GET /tmf-api/naas/v3/usageConsumptionReportRequest/ucrreq001 Accept: application/json
Response
200 <pre>{ "id": "ucrreq001", "href": "https://serverRoot/tmf- api/usageConsumption/usageConsumptionReportRequest/ucrreq001", "creationDate": "2018-03-15T:15:44:28", "status": "InProgress", "lastUpdate": "2018-03-15T:15:44:28", "product": { "publicIdentifier": "33601010101" } }</pre>

5.15.3. Create usage consumption report request

POST /usageConsumptionReportRequest

Description

This operation creates an usage consumption report request entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a UsageConsumptionReportRequest, including any possible rule conditions and applicable default values. Notice that it is up to an implementer to add additional mandatory attributes.

Mandatory Attributes	Rule
Non Mandatory Attributes	Rule
bucket	
creationDate	
lastUpdate	
product	

relatedParty	
status	
usageConsumptionReport	
validPeriod	

Usage Samples

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

Request
<pre>POST /tmf-api/naas/v3/usageConsumptionReportRequest Content-Type: application/json {}</pre>
Response
<pre>201 { "id": "ucrreq001", "href": "https://serverRoot/tmf- api/usageConsumption/usageConsumptionReportRequest/ucrreq001" }</pre>

5.15.4. Delete usage consumption report request**DELETE /usageConsumptionReportRequest/{id}****Description**

This operation deletes an usage consumption report request entity.

Usage Samples

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

Request
<pre>DELETE /tmf-api/naas/v3/usageConsumptionReportRequest/42</pre>
Response
<pre>204</pre>

5.16. Operations on Usage Consumption Report**5.16.1. List usage consumption reports****GET****/usageConsumptionReport?fields=...&{filtering}****Description**

This operation list usage consumption report entities.
 Attribute selection is enabled for all first level attributes.
 Filtering may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving UsageConsumptionReport resources.

Request
GET /tmf-api/naas/v3/usageConsumptionReport Accept: application/json
Response
200 <pre>[{ "id": "ucr0001", "href": "https://serverRoot/tmf-api/usageConsumption/usageConsumptionReport/ucr0001", "name": "Usage consumption report ucr0001", "description": "Usage consumption Report for Kate smartphone", "effectiveDate": "2018-03-15T:15:44:28", "bucket": [{ "id": "bkt001", "name": "Main offer - data", "usageType": "data", "isShared": false, "product": [{ "id": "product1", "name": "Kate smartphone", "publicIdentifier": "33601010101", "user": [{ "id": "usr1", "name": "Kate", "role": "user", "@referredType": "individual" }] }, { "counterType": "outOfBucket", "level": "global", "value": { "amount": 20.0, "units": "USD" }, "valueName": "20 USD", "consumptionPeriod": { "startDateTime": "2018-03-01T:00:00:00",</pre>

```
        "endDateTime": "2018-03-15T:00:00:00"
      }
    }
  ]
},
"bucketBalance": [
  {
    "remainingValue": {
      "amount": 1.8,
      "units": "Go"
    },
    "remainingValueName": "it remains 1.8 Go",
    "validFor": {
      "startDateTime": "2018-03-15T:00:00:00",
      "endDateTime": "2018-03-30T:00:00:00"
    }
  }
],
"bucketCounter": [
  {
    "counterType": "used",
    "level": "global",
    "value": {
      "amount": 1.2,
      "units": "Go"
    },
    "valueName": "1.2 Go used",
    "consumptionPeriod": {
      "startDateTime": "2018-03-01T:00:00:00",
      "endDateTime": "2018-03-15T:00:00:00"
    }
  }
]
},
{
  "id": "bkt002",
  "name": "Main offer - national voice",
  "usageType": "national voice",
  "isShared": false,
  "product": [
    {
      "id": "product1",
      "name": "Kate smartphone",
      "publicIdentifier": "33601010101",
      "user": [
        {
          "id": "usr1",
          "name": "Kate",
          "role": "user",
          "@referredType": "individual"
        }
      ]
    }
  ]
}
```

```

    }
  ],
  "bucketBalance": [
    {
      "remainingValue": {
        "amount": 80.0,
        "units": "mins"
      },
      "remainingValueName": "it remains 80 minutes",
      "validFor": {
        "startDateTime": "2018-03-15T:00:00:00",
        "endDateTime": "2018-03-30T:00:00:00"
      }
    }
  ],
  "bucketCounter": [
    {
      "counterType": "used",
      "level": "global",
      "value": {
        "amount": 40.0,
        "units": "mins"
      },
      "valueName": "40 mins used",
      "consumptionPeriod": {
        "startDateTime": "2018-03-01T:00:00:00",
        "endDateTime": "2018-03-15T:00:00:00"
      }
    }
  ]
},
{
  "id": "bkt003",
  "name": "Main offer - sms",
  "usageType": "sms",
  "isShared": false,
  "product": [
    {
      "id": "product1",
      "name": "Kate smartphone",
      "publicIdentifier": "33601010101",
      "user": [
        {
          "id": "usr1",
          "name": "Kate",
          "role": "user",
          "@referredType": "individual"
        }
      ]
    }
  ]
},
  "bucketBalance": [
    {

```

```
        "remainingValue": {
          "amount": 95.0,
          "units": "sms"
        },
        "remainingValueName": "it remains 95 sms",
        "validFor": {
          "startDateTime": "2018-03-15T:00:00:00",
          "endDateTime": "2018-03-30T:00:00:00"
        }
      }
    ],
    "bucketCounter": [
      {
        "counterType": "used",
        "level": "global",
        "value": {
          "amount": 25.0,
          "units": "sms"
        },
        "valueName": "25 sms used",
        "consumptionPeriod": {
          "startDateTime": "2018-03-01T:00:00:00",
          "endDateTime": "2018-03-15T:00:00:00"
        }
      }
    ]
  },
  {
    "id": "bkt004",
    "name": "Option Canada/USA - voice",
    "usageType": "voice",
    "isShared": false,
    "product": [
      {
        "id": "product1",
        "name": "Kate smartphone",
        "publicIdentifier": "33601010101",
        "user": [
          {
            "id": "usr1",
            "name": "Kate",
            "role": "user",
            "@referredType": "individual"
          }
        ]
      }
    ]
  }
],
"bucketBalance": [
  {
    "remainingValue": {
      "amount": 10.0,
      "units": "mins"
    },
  },
]
```

```
        "remainingValueName": "it remains 10 minutes",
        "validFor": {
          "startDateTime": "2018-03-15T:00:00:00",
          "endDateTime": "2018-03-30T:00:00:00"
        }
      },
    ],
    "bucketCounter": [
      {
        "counterType": "used",
        "level": "global",
        "value": {
          "amount": 20.0,
          "units": "mins"
        },
        "valueName": "20 mins used",
        "consumptionPeriod": {
          "startDateTime": "2018-03-01T:00:00:00",
          "endDateTime": "2018-03-15T:00:00:00"
        }
      }
    ]
  },
  {
    "id": "bkt005",
    "name": "Option Canada/USA - sms",
    "usageType": "sms",
    "isShared": false,
    "product": [
      {
        "id": "product1",
        "name": "Kate smartphone",
        "publicIdentifier": "33601010101",
        "user": [
          {
            "id": "usr1",
            "name": "Kate",
            "role": "user",
            "@referredType": "individual"
          }
        ]
      }
    ]
  },
  "bucketBalance": [
    {
      "remainingValue": {
        "amount": 0.0,
        "units": "sms"
      },
      "remainingValueName": "Sms bucket exhausted",
      "validFor": {
        "startDateTime": "2018-03-15T:00:00:00",
        "endDateTime": "2018-03-30T:00:00:00"
      }
    }
  ]
}
```

```

    }
  },
  "bucketCounter": [
    {
      "counterType": "used",
      "level": "global",
      "value": {
        "amount": 10.0,
        "units": "sms"
      },
      "valueName": "10 sms used",
      "consumptionPeriod": {
        "startDateTime": "2018-03-01T:00:00:00",
        "endDateTime": "2018-03-15T:00:00:00"
      }
    }
  ]
}
]
}
]

```

5.16.2. Retrieve usage consumption report

GET

`/usageConsumptionReport/{id}?fields=...&{filtering}`

Description

This operation retrieves an usage consumption report entity.

Attribute selection is enabled for all first level attributes.

Filtering on sub-resources may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving a UsageConsumptionReport resource.

Request
GET /tmf-api/naas/v3/usageConsumptionReport/ucr0001 Accept: application/json
Response
200 <pre> { "id": "ucr0001", "href": "https://serverRoot/tmf-api/usageConsumption/usageConsumptionReport/ucr0001", "name": "Usage consumption report ucr0001", "description": "Usage consumption Report for Kate smartphone", "effectiveDate": "2018-03-15T:15:44:28", "bucket": [</pre>

```
{
  "id": "bkt001",
  "name": "Main offer - data",
  "usageType": "data",
  "isShared": false,
  "product": [
    {
      "id": "product1",
      "name": "Kate smartphone",
      "publicIdentifier": "33601010101",
      "user": [
        {
          "id": "usr1",
          "name": "Kate",
          "role": "user",
          "@referredType": "individual"
        }
      ],
      "outOfBucketCounter": [
        {
          "counterType": "outOfBucket",
          "level": "global",
          "value": {
            "amount": 20.0,
            "units": "USD"
          },
          "valueName": "20 USD",
          "consumptionPeriod": {
            "startDateTime": "2018-03-01T:00:00:00",
            "endDateTime": "2018-03-15T:00:00:00"
          }
        }
      ]
    }
  ],
  "bucketBalance": [
    {
      "remainingValue": {
        "amount": 1.8,
        "units": "Go"
      },
      "remainingValueName": "it remains 1.8 Go",
      "validFor": {
        "startDateTime": "2018-03-15T:00:00:00",
        "endDateTime": "2018-03-30T:00:00:00"
      }
    }
  ],
  "bucketCounter": [
    {
      "counterType": "used",
      "level": "global",
      "value": {
```

```

        "amount": 1.2,
        "units": "Go"
    },
    "valueName": "1.2 Go used",
    "consumptionPeriod": {
        "startDateTime": "2018-03-01T:00:00:00",
        "endDateTime": "2018-03-15T:00:00:00"
    }
}
]
},
{
    "id": "bkt002",
    "name": "Main offer - national voice",
    "usageType": "national voice",
    "isShared": false,
    "product": [
        {
            "id": "product1",
            "name": "Kate smartphone",
            "publicIdentifier": "33601010101",
            "user": [
                {
                    "id": "usr1",
                    "name": "Kate",
                    "role": "user",
                    "@referredType": "individual"
                }
            ]
        }
    ]
},
"bucketBalance": [
    {
        "remainingValue": {
            "amount": 80.0,
            "units": "mins"
        },
        "remainingValueName": "it remains 80 minutes",
        "validFor": {
            "startDateTime": "2018-03-15T:00:00:00",
            "endDateTime": "2018-03-30T:00:00:00"
        }
    }
],
"bucketCounter": [
    {
        "counterType": "used",
        "level": "global",
        "value": {
            "amount": 40.0,
            "units": "mins"
        },
        "valueName": "40 mins used",
    }
]
}

```

```

        "consumptionPeriod": {
            "startDateTime": "2018-03-01T:00:00:00",
            "endDateTime": "2018-03-15T:00:00:00"
        }
    }
],
},
{
    "id": "bkt003",
    "name": "Main offer - sms",
    "usageType": "sms",
    "isShared": false,
    "product": [
        {
            "id": "product1",
            "name": "Kate smartphone",
            "publicIdentifier": "33601010101",
            "user": [
                {
                    "id": "usr1",
                    "name": "Kate",
                    "role": "user",
                    "@referredType": "individual"
                }
            ]
        }
    ]
},
],
"bucketBalance": [
    {
        "remainingValue": {
            "amount": 95.0,
            "units": "sms"
        },
        "remainingValueName": "it remains 95 sms",
        "validFor": {
            "startDateTime": "2018-03-15T:00:00:00",
            "endDateTime": "2018-03-30T:00:00:00"
        }
    }
],
"bucketCounter": [
    {
        "counterType": "used",
        "level": "global",
        "value": {
            "amount": 25.0,
            "units": "sms"
        },
        "valueName": "25 sms used",
        "consumptionPeriod": {
            "startDateTime": "2018-03-01T:00:00:00",
            "endDateTime": "2018-03-15T:00:00:00"
        }
    }
]
}

```

```
    }
  ]
},
{
  "id": "bkt004",
  "name": "Option Canada/USA - voice",
  "usageType": "voice",
  "isShared": false,
  "product": [
    {
      "id": "product1",
      "name": "Kate smartphone",
      "publicIdentifier": "33601010101",
      "user": [
        {
          "id": "usr1",
          "name": "Kate",
          "role": "user",
          "@referredType": "individual"
        }
      ]
    }
  ]
},
"bucketBalance": [
  {
    "remainingValue": {
      "amount": 10.0,
      "units": "mins"
    },
    "remainingValueName": "it remains 10 minutes",
    "validFor": {
      "startDateTime": "2018-03-15T:00:00:00",
      "endDateTime": "2018-03-30T:00:00:00"
    }
  }
],
"bucketCounter": [
  {
    "counterType": "used",
    "level": "global",
    "value": {
      "amount": 20.0,
      "units": "mins"
    },
    "valueName": "20 mins used",
    "consumptionPeriod": {
      "startDateTime": "2018-03-01T:00:00:00",
      "endDateTime": "2018-03-15T:00:00:00"
    }
  }
]
},
{
```

```

    "id": "bkt005",
    "name": "Option Canada/USA - sms",
    "usageType": "sms",
    "isShared": false,
    "product": [
      {
        "id": "product1",
        "name": "Kate smartphone",
        "publicIdentifier": "33601010101",
        "user": [
          {
            "id": "usr1",
            "name": "Kate",
            "role": "user",
            "@referredType": "individual"
          }
        ]
      }
    ],
    "bucketBalance": [
      {
        "remainingValue": {
          "amount": 0.0,
          "units": "sms"
        },
        "remainingValueName": "Sms bucket exhausted",
        "validFor": {
          "startDateTime": "2018-03-15T:00:00:00",
          "endDateTime": "2018-03-30T:00:00:00"
        }
      }
    ],
    "bucketCounter": [
      {
        "counterType": "used",
        "level": "global",
        "value": {
          "amount": 10.0,
          "units": "sms"
        },
        "valueName": "10 sms used",
        "consumptionPeriod": {
          "startDateTime": "2018-03-01T:00:00:00",
          "endDateTime": "2018-03-15T:00:00:00"
        }
      }
    ]
  }
}

```

5.16.3. Delete usage consumption report

DELETE /usageConsumptionReport/{id}

Description

This operation deletes an usage consumption report entity.

Usage Samples

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

Request
DELETE /tmf-api/naas/v3/usageConsumptionReport/42
Response
204

5.17. Operations on Import Job**5.17.1. List import jobs**

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

Description

This operation list import job entities.

Attribute selection is enabled for all first level attributes.

Filtering may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving ImportJob resources.

Request
GET /tmf-api/naas/v3/importJob Accept: application/json
Response
200 [{ "completionDate": "2017-08-27T00:02", "contentType": "application/json", "creationDate": "2017-08-27T00:00", "errorLog": "http://my-platform/daily/logging/errors.log", "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/importJob/7497", "id": "7497", "path": "/warning/system", "status": "completed", "url": "https://my-platform/daily/job/NHCFD6" }]

5.17.2. Retrieve import job

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

Description

This operation retrieves an import job entity.
 Attribute selection is enabled for all first level attributes.
 Filtering on sub-resources may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving a ImportJob resource.

Request
GET /tmf-api/naas/v3/importJob/7497 Accept: application/json
Response
200 <pre>{ "completionDate": "2017-08-27T00:02", "contentType": "application/json", "creationDate": "2017-08-27T00:00", "errorLog": "http://my-platform/daily/logging/errors.log", "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/importJob/7497", "id": "7497", "path": "/warning/system", "status": "completed", "url": "https://my-platform/daily/job/NHCFD6" }</pre>

5.17.3. Create import job

POST /importJob

Description

This operation creates an import job entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a ImportJob, including any possible rule conditions and applicable default values. Notice that it is up to an implementer to add additional mandatory attributes.

Mandatory Attributes	Rule
url	

Non Mandatory Attributes	Rule
completionDate	
contentType	
creationDate	
errorLog	
path	
status	

Usage Samples

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

Request
<pre>POST /tmf-api/naas/v3/importJob Content-Type: application/json { "url": "https://my-platform/daily/job/NHCFD6" }</pre>
Response
<pre>201 { "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/importJob/7497", "id": "7497", "url": "https://my-platform/daily/job/NHCFD6" }</pre>

5.17.4. Delete import job**DELETE /importJob/{id}****Description**

This operation deletes an import job entity.

Usage Samples

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

Request
<pre>DELETE /tmf-api/naas/v3/importJob/42</pre>
Response
<pre>204</pre>

5.18. Operations on Export Job**5.18.1. List export jobs****GET /exportJob?fields=...&{filtering}****Description**

This operation list export job entities.

Attribute selection is enabled for all first level attributes.

Filtering may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving ExportJob resources.

Request
GET /tmf-api/naas/v3/exportJob Accept: application/json
Response
200 [{ "completionDate": "2017-08-27T00:02", "contentType": "application/json", "creationDate": "2017-08-27T00:00", "errorLog": "http://my-platform/daily/logging/errors.log", "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/exportJob/1866", "id": "1866", "path": "/warning/system", "query": "advancedCatalog", "status": "completed", "url": "https://my-platform/daily/job/EHCFD6" }]

5.18.2. Retrieve export job

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

Description

This operation retrieves an export job entity.

Attribute selection is enabled for all first level attributes.

Filtering on sub-resources may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving a ExportJob resource.

Request
GET /tmf-api/naas/v3/exportJob/1866 Accept: application/json
Response
200 { "completionDate": "2017-08-27T00:02", "contentType": "application/json", "creationDate": "2017-08-27T00:00", "errorLog": "http://my-platform/daily/logging/errors.log", "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/exportJob/1866", "id": "1866", "path": "/warning/system",

```

    "query": "advancedCatalog",
    "status": "completed",
    "url": "https://my-platform/daily/job/EHCFD6"
  }

```

5.18.3. Create export job

POST /exportJob

Description

This operation creates an export job entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a ExportJob, including any possible rule conditions and applicable default values. Notice that it is up to an implementer to add additional mandatory attributes.

Mandatory Attributes	Rule
url	

Non Mandatory Attributes	Rule
completionDate	
contentType	
creationDate	
errorLog	
path	
query	
status	

Usage Samples

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

Request
POST /tmf-api/naas/v3/exportJob Content-Type: application/json <pre> { "url": "https://my-platform/daily/job/EHCFD6" } </pre>
Response
201 <pre> { "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v3/exportJob/1866", "id": "1866", "url": "https://my-platform/daily/job/EHCFD6" } </pre>

5.18.4. Delete export job

DELETE /exportJob/{id}

Description

This operation deletes an export job entity.

Usage Samples

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

Request
DELETE /tmf-api/naas/v3/exportJob/42
Response
204

6. 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.

6.19. Register listener POST /hub

Description

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

Behavior

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

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

Usage Samples

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

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

6.20. 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

6.21. 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 <pre>{ "event": { EVENT BODY }, "eventType": "EVENT_TYPE" }</pre>

Response
201

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

6.1. Notification Tables

API Name	Notifications
Activation and Configuration API	serviceCreationNotification serviceValueChangeNotification serviceStateChangeNotification serviceDeletionNotification monitorCreationNotification monitorValueChangeNotification monitorStateChangeNotification monitorDeletionNotification
Service Ordering API	ServiceOrderCreateNotification ServiceOrderAttributeValueChangeNotification ServiceOrderStateChangeNotification ServiceOrderDeleteNotification
Service Inventory API	ServiceCreateNotification ServiceAttributeValueChangeNotification ServiceStateChangeNotification ServiceBatchNotification ServiceDeleteNotification
Service Catalog API	ServiceCandidateCreationNotification ServiceCandidateRemoveNotification ServiceSpecificationCreationNotification ServiceSpecificationRemoveNotification
Service Qualification API	ServiceQualificationStateChangeNotification
Usage Consumption Management API	UsageConsumptionReportRequestStateChange
Trouble to Resolution API	<p>serviceProblemManagement</p> ServiceProblemCreationNotification ServiceProblemStatusChangeNotification ServiceProblemChangeNotification serviceProblemInformationRequiredNotification
	<p>serviceTest</p> ServiceTestCreationNotification ServiceTestAttributeValueChangeNotification ServiceTestRemoveNotification
	<p>serviceTestSpecification</p> ServiceTestSpecificationCreationNotification ServiceTestSpecificationAttributeValueChangeNotification

API Name	Notifications
	ServiceTestSpecificationRemoveNotification

Table 2. NaaS API notifications

7. Administrative Appendix

This Appendix provides additional background material about the TM Forum and this document. In general, sections may be included or omitted as desired, however a Document History must always be included.

7.2. Appendix A: References

Reference	Description	Source	Brief Use Summary

7.3. Document History

7.3.1. Version History

Version Number	Date Modified	Modified by:	Description of changes
0.1	28-Mar-2018	Johanne Mayer	first issue of document
1.0	02-May-2018	Johanne Mayer	Updated followed feedback
1.1	06-May-2018	Johanne Mayer, Pierre Gauthier, Ludovic Robert	Addition of Service Order API, update to the API table
1.2	12-Jun-2018	Johanne Mayer, Corey Clinger	Updated document to include API team review feedback
1.3	14-Jun-2018	Johanne Mayer	Removed reference to ONAP extAPI as per comment request.
1.4	03-Oct-2018	Johanne Mayer	Removed references to TMF 641 and Service ordering operational functions
1.5	10-Oct-2018	Corey Clinger Johanne Mayer	Added Monitor query and events. Formatting corrections Remove service order functions from Figure 2.
1.6	03-Jan-2019	Adrienne Walcott Derek Flexer	Convert to recent TM Forum branding
1.7	13-Mar-2019	Abdul Majid Hussain, Varun Nair	Major updates as below <ul style="list-style-type: none"> • Updated URI formats • Added flow diagram for MSC • Added/updated use case for MSC • Added section 7.5 to track the reference API and its versions
1.8	29-Aug-2019	Johanne Mayer	Addition of TMF641 service ordering and TMF638 service inventory APIs Updated all API information to align with 18.5 versions

Version Number	Date Modified	Modified by:	Description of changes
			Removal of section 7.5 since all APIs are aligned with 18.5
1.9	9-Sep-2019	Henrique Rodrigues	Compilation of tooling generated and handed edited documents
3.0	22-Nov-2019	Alan Pope	First version of the NaaS API component suite published.

7.3.2 Release History

Production Release Status	Date Modified	Modified by:	Description of changes
Pre-production	22-Nov-2019	Alan Pope	First version of the NaaS API component suite published.

7.4. Acknowledgments

This document was prepared by the members of the TM Forum Open API team:

- Johanne Mayer, Telstra
- Corey Clinger, Telstra
- Abdul Majid Hussain, Telstra
- Varun Nair, Telstra
- Pierre Gauthier, TM Forum
- Ludovic Robert, Orange
- Dave Milham, TM Forum
- Steve Harrop, Vodafone

Additional input was provided by the following people:

API Governance Group, TM Forum (review, comments, explanations)