

# TM Forum Specification

## Service Qualification Management API User Guide

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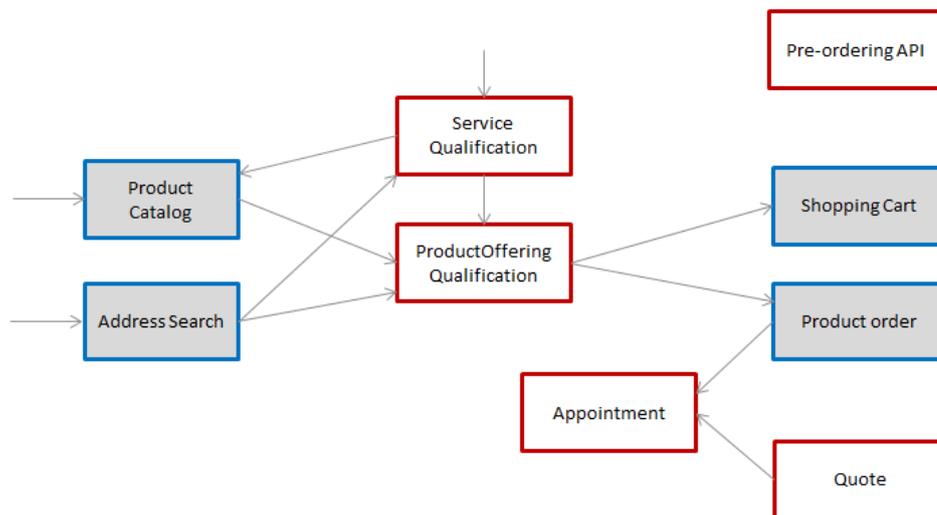
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## Introduction

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

In the Open Digital Economy where multiple actors (SDPs, CSPs, ...) may be involved with the delivery of an end-to-end service, those actors need to collaborate and interact with the customer as needed.

Following diagram shows ServiceQualification API within pre-ordering API package:



Service Qualification API is one of Pre-Ordering Management API Family. Service Qualification API goal is to provide service technical eligibility in the context of the interaction. This API allows to:

- Request a specific service (of an array of service) eligibility providing as an input configured service. The resource `checkServiceQualification` is used for this purpose. The requester will provide an array of service qualification item and expect to have a qualification result for each one of them. In the response, the API will provide qualification result but also:
  - Eligibility unavailability reason (if any)
  - Alternate service proposal (if any).
- Look for retrieving service available depending on criteria providing in the request – The main UC is to provide a service category and a place for example and get in the response all available service. In the request the requested provided `searchCriteria(s)` – in response requester get this search criteria plus an array of `ServiceQualificationItem` for each service available. Note that if no service are available, no error will be triggered and no `ServiceQualificationItem` will be in the answer (only `searchCriteria` are in the response)

Because the API allows describing service from the inventory, it is also possible to use it to retrieve service available to complete existing service for both resources.

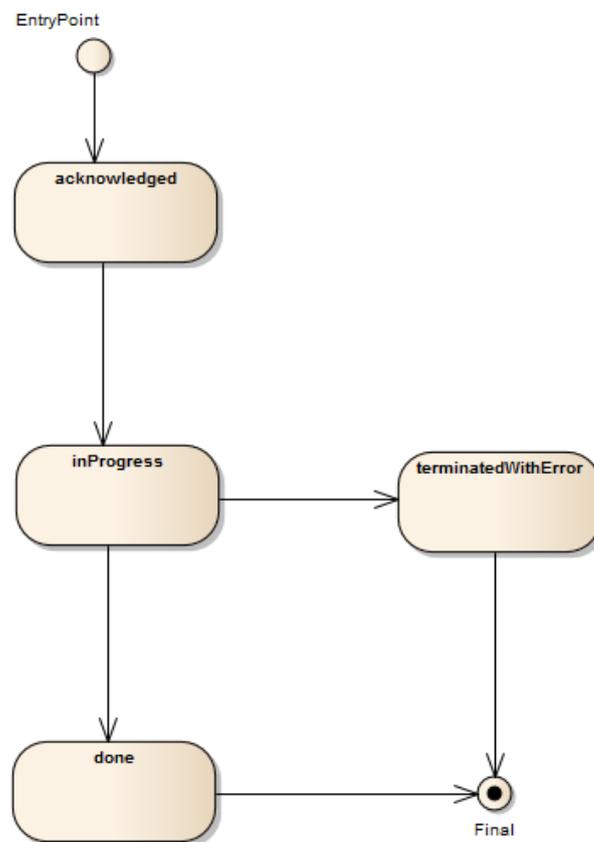
This API did not trigger any modification on the service in the inventory – in particular the service state is not changed (no shift to `eligibilityCheck`)

In the request, for both resources, the following attributes could be filled:

- service, serviceSpecification, category or service characteristics will be indicated (at least one is mandatory),
- relatedParty, for which the qualification must be done,
- place, where the customer wants his service,
- expected qualification date.

## Lifecycle

The state machine specifying the typical state change transitions is provided below. This is standard task based resource lifecycle:



## SAMPLE USE CASES

To provide some use-cases:

For checkServiceQualification:

- Check if we can deliver a 4k TV service at a specified address
- Check if we can deliver new IP TV service at the same location of an existing and active Access service (i.e. without explicitly specifying address but using service relationship)
- Check if we can upgrade the download speed of an existing and active service from 100 Mb/s to 600Mb/s

For queryServiceQualification:

- Retrieve a list of service specification – from a service category - available at a given place
- Retrieve a list of service specification connectable to an existing service

## Support of polymorphism and extension patterns

Support of polymorphic collections and types and schema based extension is provided by means of a list of generic meta-attributes that we describe below. Polymorphism in collections occurs when entities inherit from base entities, for instance a ServiceEligibility and TechnicalEligibility inheriting properties from the abstract CheckServiceQualification entity.

Generic support of polymorphism and pattern extensions is described in the TMF API Guidelines v3.0 Part 2 document.

The @type attribute provides a way to represent the actual class type of an entity. For example, within a list of CheckServiceQualification instances some may be instances of ServiceEligibility where other could be instances of TechnicalEligibility. The @type gives this information. All resources and sub-resources of this API have a @type attributes that can be provided when this is useful.

The @referredType can be used within reference entities (like for instance a CheckServiceQualificationRef object) to explicitly denote the actual entity type of the referred class. Notice that in reference entities the @type, when used, denotes the class type of the reference itself, such as ServiceEligibilityRef or TechnicalEligibilityRef, and not the class type of the referred object. However, since reference classes are rarely sub-classed, @type is generally not useful in reference objects.

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

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

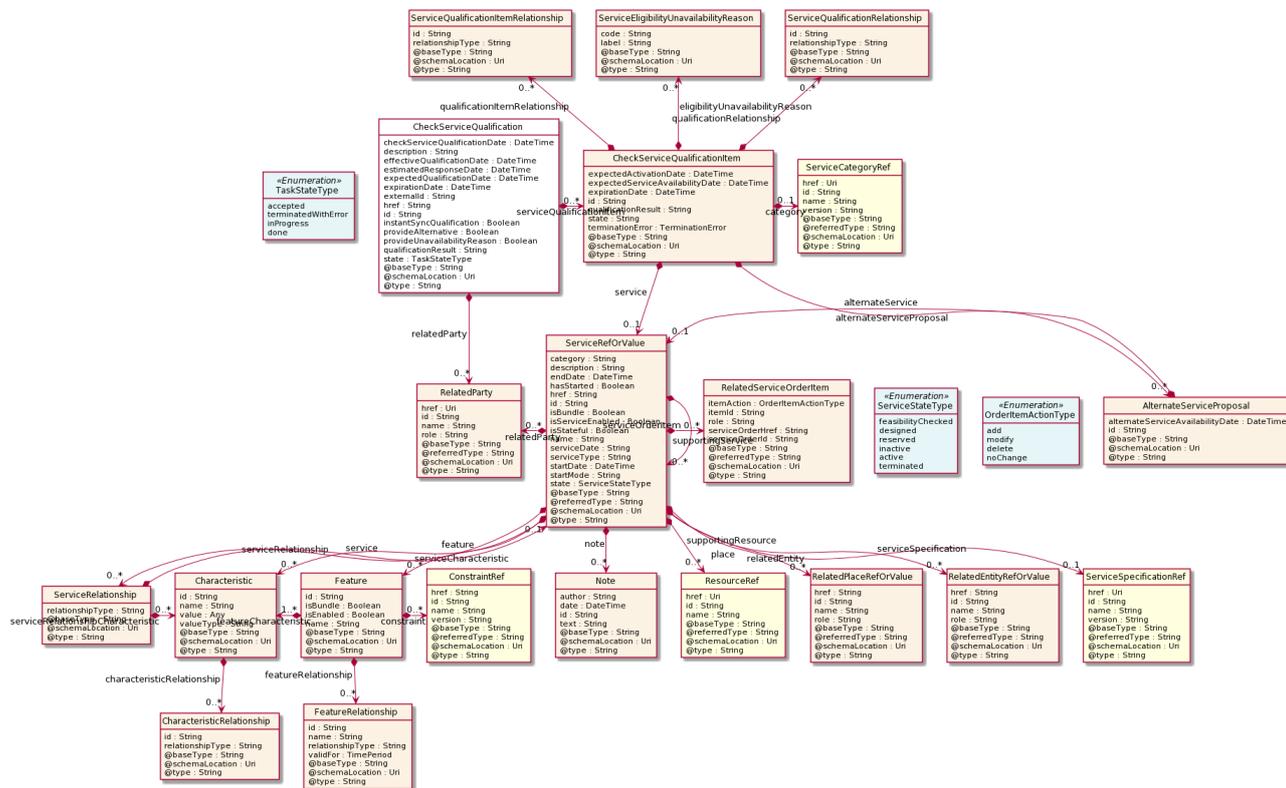
# RESOURCE MODEL

## Managed Entity and Task Resource Models

### Check Service Qualification resource

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

### Resource model



### Field descriptions

#### CheckServiceQualification 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.
instantSyncQualification	A boolean. An indicator which when the value is "true" means that requester expects to get qualification result immediately in the response. If the indicator is true then the response code of 200 indicates the operation is successful otherwise a task is created with a response 201.
checkServiceQualificationDate	A date time (DateTime). Date when the serviceQualification was submitted.
provideAlternative	A boolean. When the value is TRUE means that alternative solutions should be provided.
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).
serviceQualificationItem	A list of check service qualification items (CheckServiceQualificationItem [*]). A list of service qualification items.
relatedParty	A list of related parties (RelatedParty [*]). A list of related party references, defines party or party role linked to this request.
state	A task state type (TaskStateType). 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 ref or value (ServiceRefOrValue). A Service to be created defined by value or existing defined by reference. The polymorphic attributes @type, @schemaLocation & @referredType are related to the Service entity and not the RelatedServiceRefOrValue class itself.
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.

@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
characteristicRelationship	A list of characteristic relationships (CharacteristicRelationship [*]). Another Characteristic that is related to the current Characteristic;
id	A string. Unique identifier of the characteristic.
name	A string. Name of the characteristic.
value	An any (Any). The value of the characteristic.
valueType	A string. Data type of the value of the characteristic.

#### CharacteristicRelationship sub-resource

Another Characteristic that is related to the current Characteristic;

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

#### CheckServiceQualificationItem sub-resource

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

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.
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.
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).

qualificationItemRelationship	A list of service qualification item relationships (ServiceQualificationItemRelationship [*]). A list of qualification item relationships used to describe relationship between serviceQualification item from the same serviceQualification.
qualificationRelationship	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).
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.
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.
service	A service ref or value (ServiceRefOrValue). 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.

Feature sub-resource

Configuration feature.

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

FeatureRelationship sub-resource

Configuration feature.

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

#### Note sub-resource

Extra information about a given entity.

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

#### RelatedEntityRefOrValue sub-resource

A reference to an entity, where the type of the entity is not known in advance. A related entity defines a entity described by reference or by value linked to a specific entity. The polymorphic attributes @type, @schemaLocation & @referredType are related to the Entity and not the RelatedEntityRefOrValue class itself.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
name	A string. Name of the related entity.
href	A string. Reference of the related entity.
id	A string. Unique identifier of a related entity.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
role	A string.

#### RelatedParty sub-resource

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

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

name	A string. Name of the related entity.
href	An uri (Uri). Hyperlink reference.
id	A string. unique identifier.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
role	A string. Role played by the related party.

#### RelatedPlaceRefOrValue sub-resource

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

@referredType	A string. The actual type of the target instance when needed for disambiguation.
name	A string. A user-friendly name for the place, such as [Paris Store], [London Store], [Main Home].
href	A string. Unique reference of the place.
id	A string. Unique identifier of the place.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
role	A string.

#### RelatedServiceOrderItem sub-resource

RelatedServiceOrderItem (a ServiceOrder item) .The service order item which triggered service creation/change/termination.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
itemAction	An order item action type (OrderItemActionType). Action of the order item for this service.
itemId	A string. Identifier of the order item where the service was managed.

role A string. role of the service order item for this service.

serviceOrderHref A string. Reference of the related entity.

serviceOrderId A string. Unique identifier of a related entity.

#### 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.

#### 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.

#### ServiceRefOrValue sub-resource

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

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

name A string. Name of the service.

href A string. Reference of the service.

id A string. Unique identifier of the service.

@baseType A string. When sub-classing, this defines the super-class.

@schemaLocation An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.

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

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.
isBundle	A boolean. If true, the service is a ServiceBundle which regroup a service hierachy. If false, the service is a 'atomic' service (hierachy leaf).
isServiceEnabled	A boolean. If FALSE and hasStarted is FALSE, this particular Service has NOT been enabled for use - if FALSE and hasStarted is TRUE then the service has failed.
isStateful	A boolean. If TRUE, this Service can be changed without affecting any other services.
serviceDate	A string. Date when the service was created (whatever its status).
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.
feature	A list of features (Feature [*]). A list of features associated with this service.
note	A list of notes (Note [*]). A list of notes made on this service.
place	A list of related place ref or values (RelatedPlaceRefOrValue [*]). A list of places (Place [*]). Used to define a place useful for the service (for example a geographical place whre the service is installed).
relatedEntity	A list of related entity ref or values (RelatedEntityRefOrValue [*]). A list of related entity in relationship with this service.
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 [*]).
serviceOrderItem	A list of related service order items (RelatedServiceOrderItem [*]). A list of service order items 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.
serviceSpecification	A service specification reference (ServiceSpecificationRef). The specification from

	which this service was instantiated.
state	A service state type (ServiceStateType). The life cycle state of the service, such as designed, reserved, active, etc...
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 ref or values (ServiceRefOrValue [*]). A list of supporting services (SupportingService [*]). A collection of services that support this service (bundling, link CFS to RFS).

ServiceRelationship sub-resource

relationshipType	A string.
service	A service ref or value (ServiceRefOrValue). A Service to be created defined by value or existing defined by reference. The polymorphic attributes @type, @schemaLocation & @referredType are related to the Service entity and not the RelatedServiceRefOrValue class itself.
serviceRelationshipCharacteristic	A list of characteristics (Characteristic [*]). Describes a given characteristic of an object or entity through a name/value pair.

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.

ConstraintRef relationship

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

@referredType	A string. The (class) type of the referred constraint.
href	A string. Hyperlink reference to the target constraint.
id	A string. reference id to the target constraint.
name	A string. Name given to the constraint.
version	A string. constraint version.

ResourceRef relationship

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

#### 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.
name	A string. Name of the related entity.
href	An uri (Uri). Hyperlink reference.
id	A string. unique identifier.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
version	A string. Category version.

#### 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.
name	A string. Name of the related entity.
href	An uri (Uri). Hyperlink reference.
id	A string. unique identifier.
@baseType	A string. When sub-classing, this defines the super-class.

@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
version	A string. Service specification version.

### Json representation sample

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

```
{
  "id": "44",
  "href": "http://serverlocation:port/serviceQualificationManagement/v4/checkServiceQualification/456",
  "checkServiceQualificationDate": "2020-04-10T19:20:39.239Z",
  "description": "check service qualification illustration",
  "effectiveQualificationDate": "2020-04-11T15:20:39.239Z",
  "expectedQualificationDate": "2020-04-11T15:20:39.239Z",
  "expirationDate": "2020-04-24T19:20:39.239Z",
  "externalId": "CSQ1",
  "provideAlternative": true,
  "provideUnavailabilityReason": true,
  "instantSyncQualification": false,
  "qualificationResult": "alternate",
  "relatedParty": [
    {
      "id": "456",
      "href": "http://serverlocation:port/partyManagement/v4/party/456",
      "name": "Jean Pontus",
      "role": "Buyer contact",
      "@type": "RelatedParty",
      "@referredType": "Individual"
    }
  ],
  "serviceQualificationItem": [
    {
      "id": "1",
      "expectedActivationDate": "2020-04-16T19:20:39.239Z",
      "expectedServiceAvailabilityDate": "2020-04-11T19:20:39.239Z",
      "expirationDate": "2020-04-24T19:20:39.239Z",
      "qualificationResult": "alternate",
      "state": "done",
      "alternateServiceProposal": [
        {
          "id": "1",
          "alternateServiceAvailabilityDate": "2020-04-15T19:20:39.239Z",
          "alternateService": {
            "serviceCharacteristic": [
              {
                "id": "1",
                "name": "BroadcastQuality",
                "valueType": "string",
                "value": "HD",
                "@type": "ServiceCharacteristic"
              }
            ]
          }
        }
      ]
    }
  ]
}
```

```

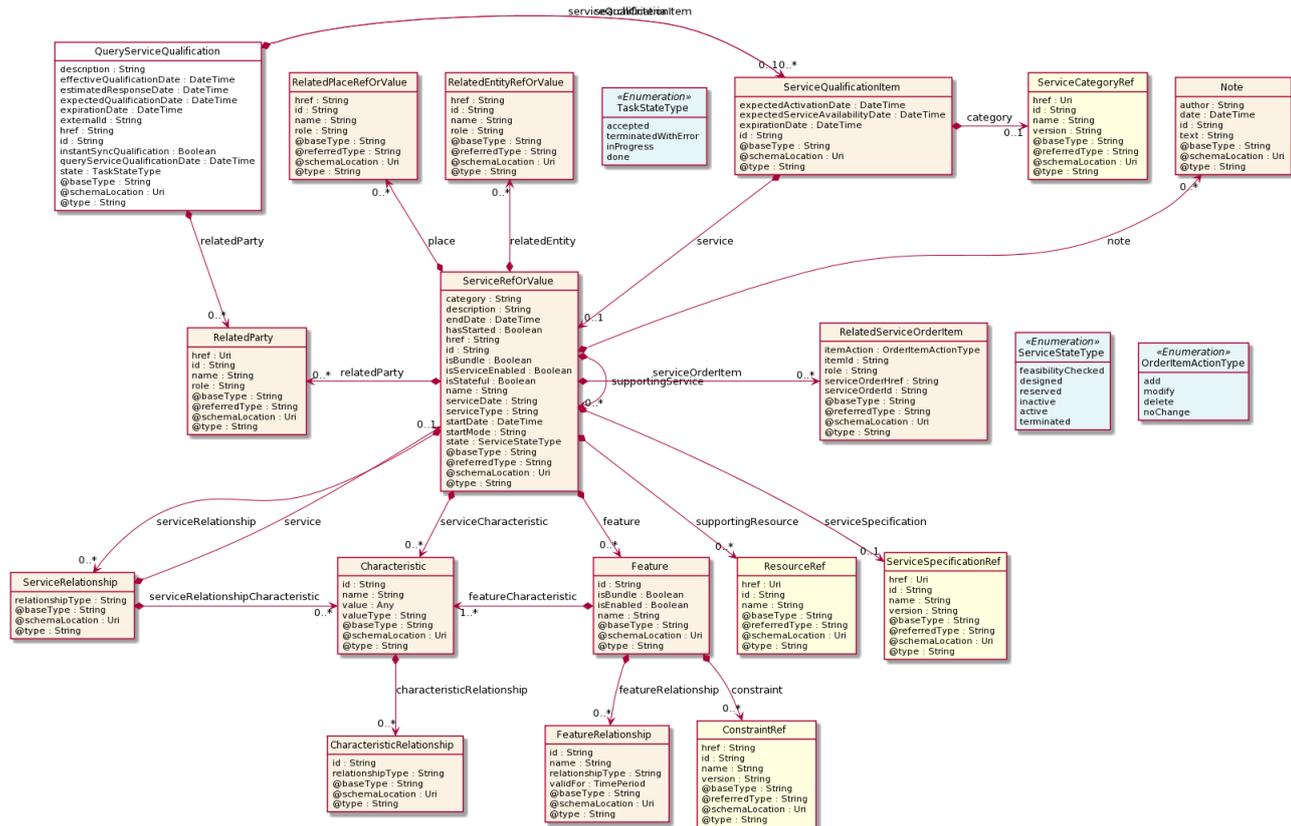
    ],
    "serviceSpecification": {
      "id": "23",
      "href": "string",
      "name": "TVAccess",
      "@type": "ServiceSpecification"
    },
    "@type": "Service"
  },
  "@type": "AlternateServiceProposal"
}
],
"eligibilityUnavailabilityReason": [
  {
    "code": "26-001",
    "label": "not enough bandwidth at this place",
    "@baseType": "string",
    "@schemaLocation": "string",
    "@type": "string"
  }
],
"service": {
  "place": [
    {
      "id": "11",
      "href": "http://serverlocation:port/geographicSiteManagement/v4/geographicSite/11",
      "name": "Jean Pontus home",
      "role": "Installation place",
      "@referredType": "GeographicSite"
    }
  ],
  "serviceCharacteristic": [
    {
      "id": "1",
      "name": "BroadcastQuality",
      "valueType": "string",
      "value": "4K"
    }
  ],
  "serviceSpecification": {
    "id": "23",
    "href": "string",
    "name": "TVAccess",
    "@type": "ServiceSpecification"
  },
  "@type": "Service"
},
"@type": "ServiceQualificationItem"
}
],
"state": "done",
"@type": "CheckServiceQualification"
}

```

## Query Service Qualification resource

QueryServiceQualification is used to retrieve a list of services that are technically available in the context of the interaction (place, party, service characteristics, ...).

### Resource model



### Field descriptions

#### QueryServiceQualification 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.
instantSyncQualification	A boolean. An indicator which when the value is "true" means that requester expects to get qualification result immediately in the response. If the indicator is true then the response code of 200 indicates the operation is successful otherwise a task is created with a response 201.
queryServiceQualificationDate	A date time (DateTime). Date when the serviceQualification was submitted.
searchCriteria	A service qualification item (ServiceQualificationItem). Search structure to retrieve eligible service specification.
serviceQualificationItem	A list of service qualification items (ServiceQualificationItem [*]).
relatedParty	A list of related parties (RelatedParty [*]). A list of related party references, defines party or party role linked to this request.
state	A task state type (TaskStateType). State of the serviceQualification (acknowledged, inProgress, terminatedWithError, done).

#### Characteristic sub-resource

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

@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
characteristicRelationship	A list of characteristic relationships (CharacteristicRelationship [*]). Another Characteristic that is related to the current Characteristic;
id	A string. Unique identifier of the characteristic.
name	A string. Name of the characteristic.
value	An any (Any). The value of the characteristic.
valueType	A string. Data type of the value of the characteristic.

#### CharacteristicRelationship sub-resource

Another Characteristic that is related to the current Characteristic;

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

Feature sub-resource

Configuration feature.

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

FeatureRelationship sub-resource

Configuration feature.

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

Note sub-resource

Extra information about a given entity.

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

RelatedEntityRefOrValue sub-resource

A reference to an entity, where the type of the entity is not known in advance. A related entity defines a entity described by reference or by value linked to a specific entity. The polymorphic attributes @type, @schemaLocation & @referredType are related to the Entity and not the RelatedEntityRefOrValue class itself.

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

name	A string. Name of the related entity.
href	A string. Reference of the related entity.
id	A string. Unique identifier of a related entity.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
role	A string.

RelatedParty sub-resource

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

@referredType	A string. The actual type of the target instance when needed for disambiguation.
name	A string. Name of the related entity.
href	An uri (Uri). Hyperlink reference.
id	A string. unique identifier.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
role	A string. Role played by the related party.

RelatedPlaceRefOrValue sub-resource

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

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

@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
role	A string.

#### RelatedServiceOrderItem sub-resource

RelatedServiceOrderItem (a ServiceOrder item) .The service order item which triggered service creation/change/termination.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
itemAction	An order item action type (OrderItemActionType). Action of the order item for this service.
itemId	A string. Identifier of the order item where the service was managed.
role	A string. role of the service order item for this service.
serviceOrderHref	A string. Reference of the related entity.
serviceOrderId	A string. Unique identifier of a related entity.

#### ServiceQualificationItem sub-resource

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

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.
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.
service	A service ref or value (ServiceRefOrValue). 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.

#### ServiceRefOrValue sub-resource

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

@referredType	A string. The actual type of the target instance when needed for disambiguation.
name	A string. Name of the service.
href	A string. Reference of the service.
id	A string. Unique identifier of the service.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
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.
isBundle	A boolean. If true, the service is a ServiceBundle which regroup a service hierachy. If false, the service is a 'atomic' service (hierachy leaf).
isServiceEnabled	A boolean. If FALSE and hasStarted is FALSE, this particular Service has NOT been enabled for use - if FALSE and hasStarted is TRUE then the service has failed.
isStateful	A boolean. If TRUE, this Service can be changed without affecting any other services.
serviceDate	A string. Date when the service was created (whatever its status).
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.
feature	A list of features (Feature [*]). A list of feature associated with this service.
note	A list of notes (Note [*]). A list of notes made on this service.
place	A list of related place ref or values (RelatedPlaceRefOrValue [*]). A list of places (Place

[\*]). Used to define a place useful for the service (for example a geographical place where the service is installed).

relatedEntity	A list of related entity ref or values (RelatedEntityRefOrValue [*]). A list of related entity in relationship with this service.
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 [*]).
serviceOrderItem	A list of related service order items (RelatedServiceOrderItem [*]). A list of service order items 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.
serviceSpecification	A service specification reference (ServiceSpecificationRef). The specification from which this service was instantiated.
state	A service state type (ServiceStateType). The life cycle state of the service, such as designed, reserved, active, etc...
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 ref or values (ServiceRefOrValue [*]). A list of supporting services (SupportingService [*]). A collection of services that support this service (bundling, link CFS to RFS).

#### ServiceRelationship sub-resource

relationshipType	A string.
service	A service ref or value (ServiceRefOrValue). A Service to be created defined by value or existing defined by reference. The polymorphic attributes @type, @schemaLocation & @referredType are related to the Service entity and not the RelatedServiceRefOrValue class itself.
serviceRelationshipCharacteristic	A list of characteristics (Characteristic [*]). Describes a given characteristic of an object or entity through a name/value pair.

#### ConstraintRef relationship

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

@referredType	A string. The (class) type of the referred constraint.
href	A string. Hyperlink reference to the target constraint.
id	A string. reference id to the target constraint.
name	A string. Name given to the constraint.
version	A string. constraint version.

ResourceRef relationship

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

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.
name	A string. Name of the related entity.
href	An uri (Uri). Hyperlink reference.
id	A string. unique identifier.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
version	A string. Category version.

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.
name	A string. Name of the related entity.
href	An uri (Uri). Hyperlink reference.
id	A string. unique identifier.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
version	A string. Service specification version.

**Json representation sample**

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

```
{
  "id": "54",
  "href": "http://serverlocation:port/serviceQualificationManagement/v4/queryServiceQualification/54",
  "description": "Query Service Qualification Illustration - 2 serviceSpec available at this place for this category",
  "effectiveQualificationDate": "2020-04-13T13:51:41.218Z",
  "estimatedResponseDate": "2020-04-13T14:00:00.218Z",
  "expectedQualificationDate": "2020-04-13T13:51:41.218Z",
  "expirationDate": "2020-04-15T13:51:41.218Z",
  "externalId": "QSQ-456",
  "instantSyncQualification": true,
  "queryServiceQualificationDate": "2020-04-13T13:51:41.218Z",
  "relatedParty": [
    {
      "id": "456",
      "href": "http://serverlocation:port/partyManagement/v4/party/456",
      "name": "Jean Pontus",
      "role": "Buyer contact",
      "@type": "RelatedParty",
      "@referredType": "Individual"
    }
  ],
  "searchCriteria": {
    "id": "1",
    "category": {
      "id": "1",
      "href": "http://serverlocation:port/serviceCatalogManagement/v4/category/1",
      "name": "Fiber Access",
      "@type": "Category"
    }
  }
}
```

```
"service": {
  "place": [
    {
      "role": "Installation Place",
      "@type": "GeographicAddress",
      "city": "San Francisco",
      "postcode": "94121",
      "streetName": "25th",
      "streetType": "Avenue",
      "streetNr": "437",
      "geographicAddress": [
        {
          "levelType": "floor",
          "levelNumber": "3"
        }
      ]
    }
  ]
},
"@type": "SearchCriteria"
},
"serviceQualificationItem": [
  {
    "id": "1",
    "service": {
      "serviceSpecification": {
        "id": "78",
        "href": "http://serverlocation:port/serviceCatalogManagement/v4/serviceSpecification/78",
        "name": "X-Fiber Service",
        "@type": "ServiceSpecification"
      },
      "@type": "Service"
    },
    "@type": "ServiceQualificationItem"
  },
  {
    "id": "2",
    "service": {
      "serviceSpecification": {
        "id": "87",
        "href": "http://serverlocation:port/serviceCatalogManagement/v4/serviceSpecification/87",
        "name": "Standard Fiber Service",
        "@type": "ServiceSpecification"
      },
      "@type": "Service"
    },
    "@type": "ServiceQualificationItem"
  }
],
"state": "done",
"@type": "QueryServiceQualification"
}
```

A CheckServiceQualification is used to check a configured service eligibility (or a list of configured services). Each service qualification requests an item (one item per service). A qualification result is provided in response for each item. Requested could ask for unavailability reason and/or for alternate proposal (in case the service requested is not available).

## SECOND resource

A Query Service Qualification is used to retrieve a list of service eligible in a given request provided by requester (via searchCriteria structure). Each available service is described using the service qualification item. If not service available – no item is retrieved.

## Notification Resource Models

8 notifications are defined for this API

Notifications related to CheckServiceQualification:

- CheckServiceQualificationCreateEvent
- CheckServiceQualificationAttributeValueChangeEvent
- CheckServiceQualificationStateChangeEvent
- CheckServiceQualificationDeleteEvent
- CheckServiceQualificationInformationRequiredEvent

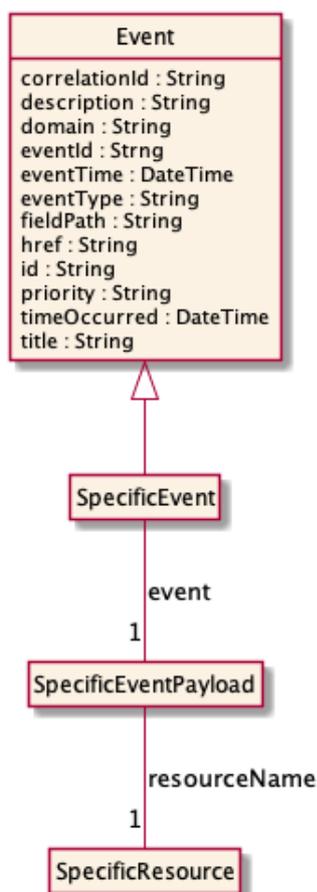
Notifications related to QueryServiceQualification:

- QueryServiceQualificationCreateEvent
- QueryServiceQualificationStateChangeEvent
- QueryServiceQualificationDeleteEvent

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).



### Check Service Qualification Create Event

Notification CheckServiceQualificationCreateEvent case for resource CheckServiceQualification

#### Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"CheckServiceQualificationCreateEvent",
  "event": {
    "checkServiceQualification" :
      {-- SEE CheckServiceQualification RESOURCE SAMPLE --}
  }
}

```

### Check Service Qualification Attribute Value Change Event

Notification CheckServiceQualificationAttributeValueChangeEvent case for resource CheckServiceQualification

#### Json representation sample

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

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

### Check Service Qualification State Change Event

Notification CheckServiceQualificationStateChangeEvent case for resource CheckServiceQualification

#### Json representation sample

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

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

### Check Service Qualification Delete Event

Notification CheckServiceQualificationDeleteEvent case for resource CheckServiceQualification

#### Json representation sample

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

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

## Check Service Qualification Information Required Event

Notification CheckServiceQualificationInformationRequiredEvent case for resource CheckServiceQualification

### Json representation sample

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

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

## Query Service Qualification Create Event

Notification QueryServiceQualificationCreateEvent case for resource QueryServiceQualification

### Json representation sample

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

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

## Query Service Qualification State Change Event

Notification QueryServiceQualificationStateChangeEvent case for resource QueryServiceQualification

### Json representation sample

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

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

```
"event": {
  "queryServiceQualification" :
    [-- SEE QueryServiceQualification RESOURCE SAMPLE --]
}
```

## Query Service Qualification Delete Event

Notification QueryServiceQualificationDeleteEvent case for resource QueryServiceQualification

### Json representation sample

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

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

## API OPERATIONS

Remember the following Uniform Contract:

Operation on Entities	Uniform API Operation	Description
Query Entities	GET Resource	GET must be used to retrieve a representation of a resource.
Create Entity	POST Resource	POST must be used to create a new resource
Partial Update of an Entity	PATCH Resource	PATCH must be used to partially update a resource
Remove an Entity	DELETE Resource	DELETE must be used to remove a resource

Filtering and attribute selection rules are described in the TMF REST Design Guidelines Part 1 document.

Notifications are also described in a subsequent section.

### Operations on Check Service Qualification

#### List check service qualifications

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

#### Description

This operation list check 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 all the CheckServiceQualification that were completed.

<b>Request</b>
<pre>GET /tmf- api/serviceQualificationManagement/v4/checkServiceQualification?fields=id,description,expectedQualificationDate,qualificationResult&amp;state=done Accept: application/json</pre>
<b>Response</b>
<pre>200  [   {     "id": "48",     "description": "check service qualification for IP",     "expectedQualificationDate": "2020-04-11T14:23:33.239Z",     "qualificationResult": "qualified"   },   {     "id": "44",     "description": "check service qualification illustration",     "expectedQualificationDate": "2020-04-11T15:20:39.239Z",     "qualificationResult": "alternate"   },   {     "id": "41",     "description": "check service qualification for an UNI access",     "expectedQualificationDate": "2020-04-11T17:10:39.239Z",     "qualificationResult": "qualified"   } ]</pre>

### Retrieve check service qualification

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

#### Description

This operation retrieves a check 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.



```

        "id": "1",
        "name": "BroadcastQuality",
        "valueType": "string",
        "value": "HD",
        "@type": "ServiceCharacteristic"
      }
    ],
    "serviceSpecification": {
      "id": "23",
      "href": "http://serverlocation:port/ServiceCatalog/v4/serviceSpecification/23",
      "name": "TVAccess",
      "@type": "ServiceSpecification"
    },
    "@type": "Service"
  },
  "@type": "AlternateServiceProposal"
}
],
"eligibilityUnavailabilityReason": [
  {
    "code": "26-001",
    "label": "not enough bandwidth at this place"
  }
],
"service": {
  "place": [
    {
      "id": "11",
      "href": "http://serverlocation:port/geographicSiteManagement/v4/geographicSite/11",
      "name": "Jean Pontus home",
      "role": "Installation place",
      "@referredType": "GeographicSite"
    }
  ],
  "serviceCharacteristic": [
    {
      "id": "1",
      "name": "BroadcastQuqlity",
      "valueType": "string",
      "value": "4K"
    }
  ],
  "serviceSpecification": {
    "id": "23",
    "href": "http://serverlocation:port/serviceCatalog/v4/serviceSpecification/23",
    "name": "TVAccess",
    "@type": "ServiceSpecification"
  },
  "@type": "Service"
},
"@type": "ServiceQualificationItem"
}
],
"state": "done",
"@type": "CheckServiceQualification"

```

```
}

```

## Create check service qualification

### POST /checkServiceQualification

#### Description

This operation creates a check service qualification entity.

#### Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a CheckServiceQualification, 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	
instantSyncQualification	
checkServiceQualificationDate	
provideAlternative	
provideUnavailabilityReason	
qualificationResult	
relatedParty	
state	

#### Usage Samples

Here's a sample of a request for creating a CheckServiceQualification resource. We use the 'fields' parameter to restrict the numbers of attributes returned in the response.

Request
POST /tmf-api/serviceQualificationManagement/v4/checkServiceQualification Content-Type: application/json  <pre>{   "description": "check service qualification illustration",   "expectedQualificationDate": "2020-04-11T15:20:39.239Z",</pre>

```

"externalId": "CSQ1",
"provideAlternative": true,
"instantSyncQualification": false,
"provideUnavailabilityReason": true,
"relatedParty": [
  {
    "id": "456",
    "href": "http://serverlocation:port/partyManagement/v4/party/456",
    "name": "Jean Pontus",
    "role": "Buyer contact",
    "@type": "RelatedParty",
    "@referredType": "Individual"
  }
],
"serviceQualificationItem": [
  {
    "id": "1",
    "expectedServiceAvailabilityDate": "2020-04-11T19:20:39.239Z",
    "service": {
      "place": [
        {
          "id": "11",
          "href": "http://serverlocation:port/geographicSiteManagement/v4/geographicSite/11",
          "name": "Jean Pontus home",
          "role": "Installation place",
          "@referredType": "GeographicSite"
        }
      ],
      "serviceCharacteristic": [
        {
          "id": "1",
          "name": "BroadcastQuality",
          "valueType": "string",
          "value": "4K"
        }
      ],
      "serviceSpecification": {
        "id": "23",
        "href": "http://serverlocation:port/serviceCatalog/v4/serviceSpecification/23",
        "name": "TVAccess",
        "@type": "ServiceSpecification"
      },
      "@type": "Service"
    },
    "@type": "ServiceQualificationItem"
  }
],
"@type": "CheckServiceQualification"
}

```

**Response**

201

```
{
  "id": "44",
  "href": "http://serverlocation:port/serviceQualificationManagement/v4/checkServiceQualification/456",
  "checkServiceQualificationDate": "2020-04-10T19:20:39.239Z",
  "description": "check service qualification illustration",
  "expectedQualificationDate": "2020-04-11T15:20:39.239Z",
  "externalId": "CSQ1",
  "provideAlternative": true,
  "provideUnavailabilityReason": true,
  "instantSyncQualification": false,
  "qualificationResult": "unqualified",
  "relatedParty": [
    {
      "id": "456",
      "href": "http://serverlocation:port/partyManagement/v4/party/456",
      "name": "Jean Pontus",
      "role": "Buyer contact",
      "@type": "RelatedParty",
      "@referredType": "Individual"
    }
  ],
  "serviceQualificationItem": [
    {
      "id": "1",
      "expectedServiceAvailabilityDate": "2020-04-11T19:20:39.239Z",
      "qualificationResult": "unqualified",
      "state": "accepted",
      "service": {
        "place": [
          {
            "id": "11",
            "href": "http://serverlocation:port/geographicSiteManagement/v4/geographicSite/11",
            "name": "Jean Pontus home",
            "role": "Installation place",
            "@referredType": "GeographicSite"
          }
        ],
        "serviceCharacteristic": [
          {
            "id": "1",
            "name": "BroadcastQuality",
            "valueType": "string",
            "value": "4K"
          }
        ],
        "serviceSpecification": {
          "id": "23",
          "href": "http://serverlocation:port/serviceCatalog/v4/serviceSpecification/23",
          "name": "TVAccess",
          "@type": "ServiceSpecification"
        },
        "@type": "Service"
      },
      "@type": "ServiceQualificationItem"
    }
  ]
}
```

```

    }
  ],
  "state": "accepted",
  "@type": "CheckServiceQualification"
}

```

## Patch check service qualification

### PATCH /checkServiceQualification/{id}

#### Description

This operation allows partial updates of a check 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	
instantSyncQualification	
provideAlternative	
provideUnavailabilityReason	
qualificationResult	
serviceQualificationItem	
relatedParty	
state	

Non Patchable Attributes	Rule
id	
href	
checkServiceQualificationDate	

#### Usage Samples

Here's an example of a request for patching a CheckServiceQualification resource (created via previous POST) with change on following attributes: externalId and expectedQualificationDate value

### Request

PATCH /tmf-api/serviceQualificationManagement/v4/checkServiceQualification/42

Content-Type: application/merge-patch+json

```
{
  "id": "44",
  "checkServiceQualificationDate": "2020-04-10T19:20:39.239Z",
  "description": "check service qualification illustration",
  "expectedQualificationDate": "2020-04-15T15:20:39.239Z",
  "externalId": "CSQ1-001",
  "provideAlternative": true,
  "provideUnavailabilityReason": true,
  "instantSyncQualification": false,
  "relatedParty": [
    {
      "id": "456",
      "href": "http://serverlocation:port/partyManagement/v4/party/456",
      "name": "Jean Pontus",
      "role": "Buyer contact",
      "@type": "RelatedParty",
      "@referredType": "Individual"
    }
  ],
  "serviceQualificationItem": [
    {
      "id": "1",
      "expectedServiceAvailabilityDate": "2020-04-11T19:20:39.239Z",
      "service": {
        "place": [
          {
            "id": "11",
            "href": "http://serverlocation:port/geographicSiteManagement/v4/geographicSite/11",
            "name": "Jean Pontus home",
            "role": "Installation place",
            "@referredType": "GeographicSite"
          }
        ]
      },
      "serviceCharacteristic": [
        {
          "id": "1",
          "name": "BroadcastQuality",
          "valueType": "string",
          "value": "4K"
        }
      ],
      "serviceSpecification": {
        "id": "23",
        "href": "string",
        "name": "TVAccess",
        "@type": "ServiceSpecification"
      }
    }
  ]
}
```

```

    },
    "@type": "Service"
  },
  "@type": "ServiceQualificationItem"
}
],
"@type": "CheckServiceQualification"
}

```

## Response

200

```

{
  "id": "44",
  "href": "http://serverlocation:port/serviceQualificationManagement/v4/checkServiceQualification/456",
  "checkServiceQualificationDate": "2020-04-10T19:20:39.239Z",
  "description": "check service qualification illustration",
  "expectedQualificationDate": "2020-04-15T15:20:39.239Z",
  "externalId": "CSQ1-001",
  "provideAlternative": true,
  "provideUnavailabilityReason": true,
  "instantSyncQualification": false,
  "qualificationResult": "unqualified",
  "relatedParty": [
    {
      "id": "456",
      "href": "http://serverlocation:port/partyManagement/v4/party/456",
      "name": "Jean Pontus",
      "role": "Buyer contact",
      "@type": "RelatedParty",
      "@referredType": "Individual"
    }
  ],
  "serviceQualificationItem": [
    {
      "id": "1",
      "expectedServiceAvailabilityDate": "2020-04-11T19:20:39.239Z",
      "qualificationResult": "unqualified",
      "state": "acknowledged",
      "service": {
        "place": [
          {
            "id": "11",
            "href": "http://serverlocation:port/geographicSiteManagement/v4/geographicSite/11",
            "name": "Jean Pontus home",
            "role": "Installation place",
            "@referredType": "GeographicSite"
          }
        ]
      }
    }
  ],
  "serviceCharacteristic": [
    {
      "id": "1",

```

```
        "name": "BroadcastQuality",
        "valueType": "string",
        "value": "4K"
      }
    ],
    "serviceSpecification": {
      "id": "23",
      "href": "string",
      "name": "TVAccess",
      "@type": "ServiceSpecification"
    },
    "@type": "Service"
  },
  "@type": "ServiceQualificationItem"
}
],
"state": "acknowledged",
"@type": "CheckServiceQualification"
}
```

### Delete check service qualification

**DELETE** /checkServiceQualification/{id}

#### Description

This operation deletes a check service qualification entity.

#### Usage Samples

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

<b>Request</b>
DELETE /tmf-api/serviceQualificationManagement/v4/checkServiceQualification/44
<b>Response</b>
204

## Operations on Query Service Qualification

### List query service qualifications

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

#### Description

This operation list query 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 a list of query service qualification request(s). The given criteria is the query service qualification state (done).

Request
GET /tmf-api/serviceQualificationManagement/v4/queryServiceQualification?fields=id,externalId,effectiveQualificationDate,expirationDate&state=done Accept: application/json
Response
200 <pre>[   {     "id": "48",     "externalId": "check service qualification for IP",     "effectiveQualificationDate": "2020-04-11T14:23:33.239Z",     "expirationDate": "2020-04-14T14:23:33.239Z"   },   {     "id": "44",     "externalId": "check service qualification illustration",     "effectiveQualificationDate": "2020-04-12T14:23:33.239Z",     "expirationDate": "2020-04-15T14:23:33.239Z"   } ]</pre>

**Retrieve query service qualification****GET** /queryServiceQualification/{id}?fields=...&{filtering}**Description**

This operation retrieves a query 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 query service qualification request retrieval. The given criteria is the query service qualification request cancel id 79.

Request
GET /tmf-api/serviceQualificationManagement/v4/queryServiceQualification/54 Accept: application/json
Response
200  <pre>{   "id": "54",   "href": "http://serverlocation:port/serviceQualificationManagement/v4/queryServiceQualification/54",   "description": "Query Service Qualification Illustration - 2 serviceSpec available at this place for this category",   "effectiveQualificationDate": "2020-04-13T13:51:41.218Z",   "estimatedResponseDate": "2020-04-13T14:00:00.218Z",   "expectedQualificationDate": "2020-04-13T13:51:41.218Z",   "expirationDate": "2020-04-15T13:51:41.218Z",   "externalId": "QSQ-456",   "instantSyncQualification": false,   "queryServiceQualificationDate": "2020-04-13T13:51:41.218Z",   "relatedParty": [     {       "id": "456",       "href": "http://serverlocation:port/partyManagement/v4/party/456",       "name": "Jean Pontus",       "role": "Buyer contact",       "@type": "RelatedParty",       "@referredType": "Individual"     }   ],   "searchCriteria": {     "id": "1",     "category": {</pre>

```
"id": "1",
"href": "http://serverlocation:port/serviceCatalogManagement/v4/category/1",
"name": "Fiber Access",
"@type": "Category"
},
"service": {
  "place": [
    {
      "role": "Installation Place",
      "@type": "GeographicAddress",
      "city": "San Francisco",
      "postcode": "94121",
      "streetName": "25th",
      "streetType": "Avenue",
      "streetNr": "437",
      "geographicAddress": [
        {
          "levelType": "floor",
          "levelNumber": "3"
        }
      ]
    }
  ]
},
"@type": "SearchCriteria"
},
"serviceQualificationItem": [
  {
    "id": "1",
    "service": {
      "serviceSpecification": {
        "id": "78",
        "href": "http://serverlocation:port/serviceCatalogManagement/v4/serviceSpecification/78",
        "name": "X-Fiber Service",
        "@type": "ServiceSpecification"
      },
      "@type": "Service"
    },
    "@type": "ServiceQualificationItem"
  },
  {
    "id": "2",
    "service": {
      "serviceSpecification": {
        "id": "87",
        "href": "http://serverlocation:port/serviceCatalogManagement/v4/serviceSpecification/87",
        "name": "Standard Fiber Service",
        "@type": "ServiceSpecification"
      },
      "@type": "Service"
    },
    "@type": "ServiceQualificationItem"
  }
],
"state": "done",
```

```

"@type": "QueryServiceQualification"
}

```

## Create query service qualification

### POST /queryServiceQualification

#### Description

This operation creates a query service qualification entity.

#### Mandatory and Non Mandatory Attributes

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

Non Mandatory Attributes	Rule
description	
effectiveQualificationDate	
estimatedResponseDate	
expectedQualificationDate	
expirationDate	
externalId	
instantSyncQualification	
queryServiceQualificationDate	
serviceQualificationItem	
relatedParty	
state	

#### Usage Samples

Here's an example of a request for a query service qualification - the resulting queryServiceQualification request is 55. For illustration propose the service qualification is not done synchronously (state is accepted)

#### Request

```

POST /tmf-api/serviceQualificationManagement/v4/queryServiceQualification
Content-Type: application/json

```

```

{
  "description": "Query Service Qualification POST Illustration",
  "expectedQualificationDate": "2020-04-13T13:51:41.218Z",
  "instantSyncQualification": false,

```

```

"externalId": "QSQ-456",
"relatedParty": [
  {
    "id": "456",
    "href": "http://serverlocation:port/partyManagement/v4/party/456",
    "name": "Jean Pontus",
    "role": "Buyer contact",
    "@type": "RelatedParty",
    "@referredType": "Individual"
  }
],
"searchCriteria": {
  "id": "1",
  "category": {
    "id": "1",
    "href": "http://serverlocation:port/serviceCatalogManagement/v4/category/1",
    "name": "Fiber Access",
    "@type": "Category"
  },
  "service": {
    "place": [
      {
        "role": "Installation Place",
        "@type": "GeographicAddress",
        "city": "San Francisco",
        "postcode": "94121",
        "streetName": "25th",
        "streetType": "Avenue",
        "streetNr": "437",
        "geographicAddress": [
          {
            "levelType": "floor",
            "levelNumber": "3"
          }
        ]
      }
    ]
  }
},
"@type": "SearchCriteria"
},
"@type": "QueryServiceQualification"
}

```

**Response**

201

```

{
  "id": "55",
  "href": "http://serverlocation:port/serviceQualificationManagement/v4/queryServiceQualification/55",
  "description": "Query Service Qualification POST Illustration",
  "estimatedResponseDate": "2020-04-13T14:00:00.218Z",
  "expectedQualificationDate": "2020-04-13T13:51:41.218Z",

```

```
"externalId": "QSQ-456",
"instantSyncQualification": false,
"queryServiceQualificationDate": "2020-04-13T13:51:41.218Z",
"relatedParty": [
  {
    "id": "456",
    "href": "http://serverlocation:port/partyManagement/v4/party/456",
    "name": "Jean Pontus",
    "role": "Buyer contact",
    "@type": "RelatedParty",
    "@referredType": "Individual"
  }
],
"searchCriteria": {
  "id": "1",
  "category": {
    "id": "1",
    "href": "http://serverlocation:port/serviceCatalogManagement/v4/category/1",
    "name": "Fiber Access",
    "@type": "Category"
  },
  "service": {
    "place": [
      {
        "role": "Installation Place",
        "@type": "GeographicAddress",
        "city": "San Francisco",
        "postcode": "94121",
        "streetName": "25th",
        "streetType": "Avenue",
        "streetNr": "437",
        "geographicAddress": [
          {
            "levelType": "floor",
            "levelNumber": "3"
          }
        ]
      }
    ]
  }
},
"@type": "SearchCriteria"
},
"state": "accepted",
"@type": "QueryServiceQualification"
}
```

**Patch query service qualification****PATCH /queryServiceQualification/{id}****Description**

This operation allows partial updates of a query 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	
instantSyncQualification	
searchCriteria	
serviceQualificationItem	
relatedParty	
state	

Non Patchable Attributes	Rule
id	
href	
queryServiceQualificationDate	

**Usage Samples**

Here's an example of a request for patching a QueryServiceQualification resource (created via previous POST) with change on the address (24th instead of 25th and 2nd floor instead of 3rd).

Request
PATCH /tmf-api/serviceQualificationManagement/v4/queryServiceQualification/42 Content-Type: application/merge-patch+json

```

{
  "id": "55",
  "description": "Query Service Qualification POST Illustration",
  "expectedQualificationDate": "2020-04-13T13:51:41.218Z",
  "externalId": "QSQ-456",
  "relatedParty": [
    {
      "id": "456",
      "href": "http://serverlocation:port/partyManagement/v4/party/456",
      "name": "Jean Pontus",
      "role": "Buyer contact",
      "@type": "RelatedParty",
      "@referredType": "Individual"
    }
  ],
  "searchCriteria": {
    "id": "1",
    "category": {
      "id": "1",
      "href": "http://serverlocation:port/serviceCatalogManagement/v4/category/1",
      "name": "Fiber Access",
      "@type": "Category"
    },
    "service": {
      "place": [
        {
          "role": "Installation Place",
          "@type": "GeographicAddress",
          "city": "San Francisco",
          "postcode": "94121",
          "streetName": "24th",
          "streetType": "Avenue",
          "streetNr": "437",
          "geographicAddress": [
            {
              "levelType": "floor",
              "levelNumber": "2"
            }
          ]
        }
      ]
    }
  },
  "@type": "SearchCriteria"
},
"@type": "QueryServiceQualification"
}

```

**Response**

200

```

{
  "id": "55",

```

```
"href": "http://serverlocation:port/serviceQualificationManagement/v4/queryServiceQualification/55",
"description": "Query Service Qualification POST Illustration",
"estimatedResponseDate": "2020-04-13T14:00:00.218Z",
"expectedQualificationDate": "2020-04-13T13:51:41.218Z",
"externalId": "QSQ-456",
"instantSyncQualification": false,
"queryServiceQualificationDate": "2020-04-13T13:51:41.218Z",
"relatedParty": [
  {
    "id": "456",
    "href": "http://serverlocation:port/partyManagement/v4/party/456",
    "name": "Jean Pontus",
    "role": "Buyer contact",
    "@type": "RelatedParty",
    "@referredType": "Individual"
  }
],
"searchCriteria": {
  "id": "1",
  "category": {
    "id": "1",
    "href": "http://serverlocation:port/serviceCatalogManagement/v4/category/1",
    "name": "Fiber Access",
    "@type": "Category"
  },
  "service": {
    "place": [
      {
        "role": "Installation Place",
        "@type": "GeographicAddress",
        "city": "San Francisco",
        "postcode": "94121",
        "streetName": "24th",
        "streetType": "Avenue",
        "streetNr": "437",
        "geographicAddress": [
          {
            "levelType": "floor",
            "levelNumber": "2"
          }
        ]
      }
    ]
  }
},
"@type": "SearchCriteria"
},
"state": "accepted",
"@type": "QueryServiceQualification"
}
```

## Delete query service qualification

```
DELETE /queryServiceQualification/{id}
```

### Description

This operation deletes a query service qualification entity.

### Usage Samples

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

<b>Request</b>
DELETE /tmf-api/serviceQualificationManagement/v4/queryServiceQualification/54
<b>Response</b>
204

## API NOTIFICATIONS

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

It is assumed that the Pub/Sub uses the Register and UnRegister mechanisms described in the REST Guidelines part 1. Refer to the guidelines for more details.

### Register listener

#### POST /hub

##### Description

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

##### Behavior

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

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

##### Usage Samples

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

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

## Unregister listener

**DELETE** /hub/{id}

### Description

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

### Behavior

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

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

### Usage Samples

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

<b>Request</b>
DELETE /api/hub/42 Accept: application/json
<b>Response</b>
204

## Publish Event to listener

**POST** /client/listener

### Description

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

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

### Behavior

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

### Usage Samples

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

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

For detailed examples on the general TM Forum notification mechanism, see the TMF REST Design Guidelines Part 1 document.

# Acknowledgements

## Version History

Release Number	Date	Release led by:	Description
Release 1.0	15/04/2016	Pierre Gauthier TM Forum <a href="mailto:pgauthier@tmforum.org">pgauthier@tmforum.org</a> Takayuki Nakamura NTT <a href="mailto:nakamura.takayuki@nttcom.jp">nakamura.takayuki@nttcom.jp</a> Ludovic Robert Orange <a href="mailto:Ludovic.robert@orange.com">Ludovic.robert@orange.com</a>	First release of the document
Release 2.0	02/10/2017	Mariano Belaunde Orange <a href="mailto:mariano.belaunde@orange.com">mariano.belaunde@orange.com</a> Ludovic Robert Orange <a href="mailto:Ludovic.robert@orange.com">Ludovic.robert@orange.com</a>	Generated from API Data Model.. +update to comply with API new pattern + AP 910 feedbacks + MEF change requests redistribution to TMF
Release 18.0.0 Version 3.0.1	05-Jan-2018	Ludovic Robert Orange <a href="mailto:Ludovic.robert@orange.com">Ludovic.robert@orange.com</a> Sophie Bouleau Orange <a href="mailto:Sophie.bouleau@orange.com">Sophie.bouleau@orange.com</a>	Alignment with ProductOfferingQualification API
Release 18.5.0	13-Jan-2019	Jonathan Goldberg Amdocs <a href="mailto:Jonathan.Goldberg@amdcs.com">Jonathan.Goldberg@amdcs.com</a>	Schema alignment for NaaS APIs
Version 4.0.0	28-May-2020	Ludovic Robert Orange <a href="mailto:Ludovic.robert@orange.com">Ludovic.robert@orange.com</a>	Split in 2 resources (checkServiceQualification & queryServiceQualification) Align with 4.0 patterns

## Release History

Release Number	Date	Release led by:	Description
Pre-production	28-May-2020	Ludovic Robert Orange <a href="mailto:Ludovic.robert@orange.com">Ludovic.robert@orange.com</a>	Split in 2 resources (checkServiceQualification & queryServiceQualification) Align with 4.0 patterns

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