Frameworx Specification

Service Qualification API REST Specification

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NOTICE

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INTRODUCTION

Service Qualification API is One of Pre-Ordering Management API Family. Service Qualification API goal is to provide service availability at Customer location.

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.

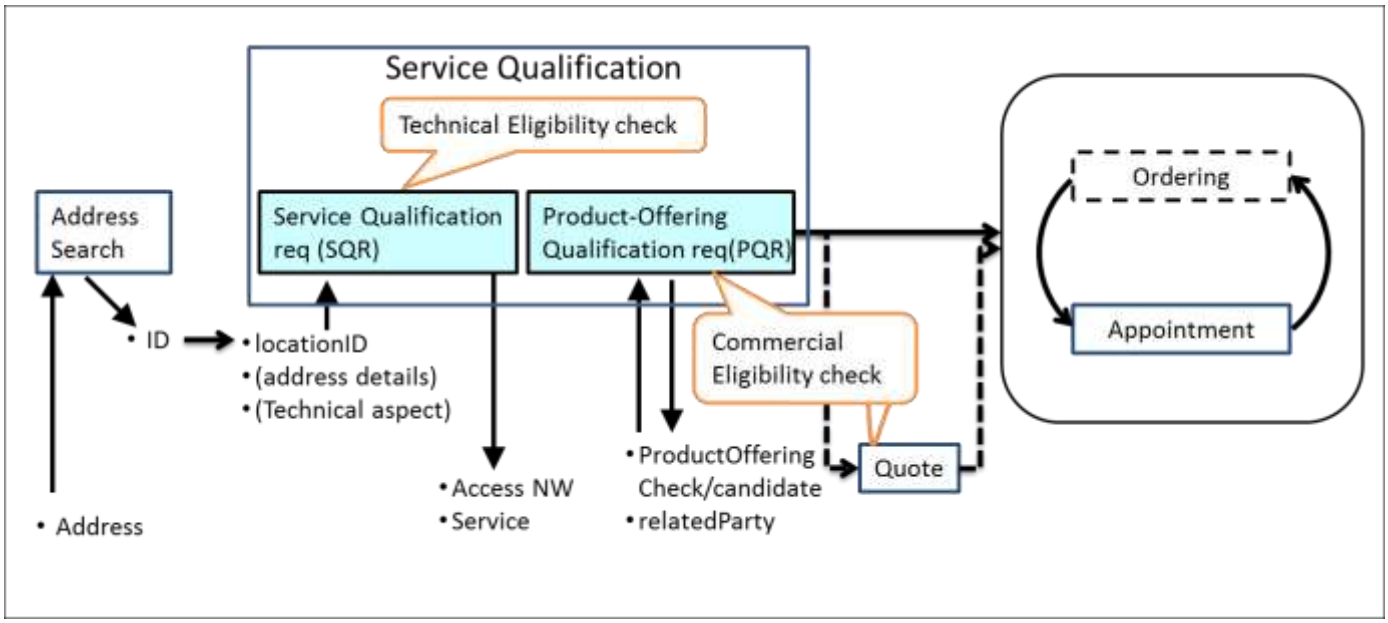
ServiceQualification API operation checks are modeled as requests:

- serviceQualification request checks technical eligibility (serviceQualification resource),

- productOfferingQualification request checks commercial Eligibility. (productOfferingQualification resource)

Change diagram Taka Action #1

Spell Check + Format Andreas #2



serviceQualification task

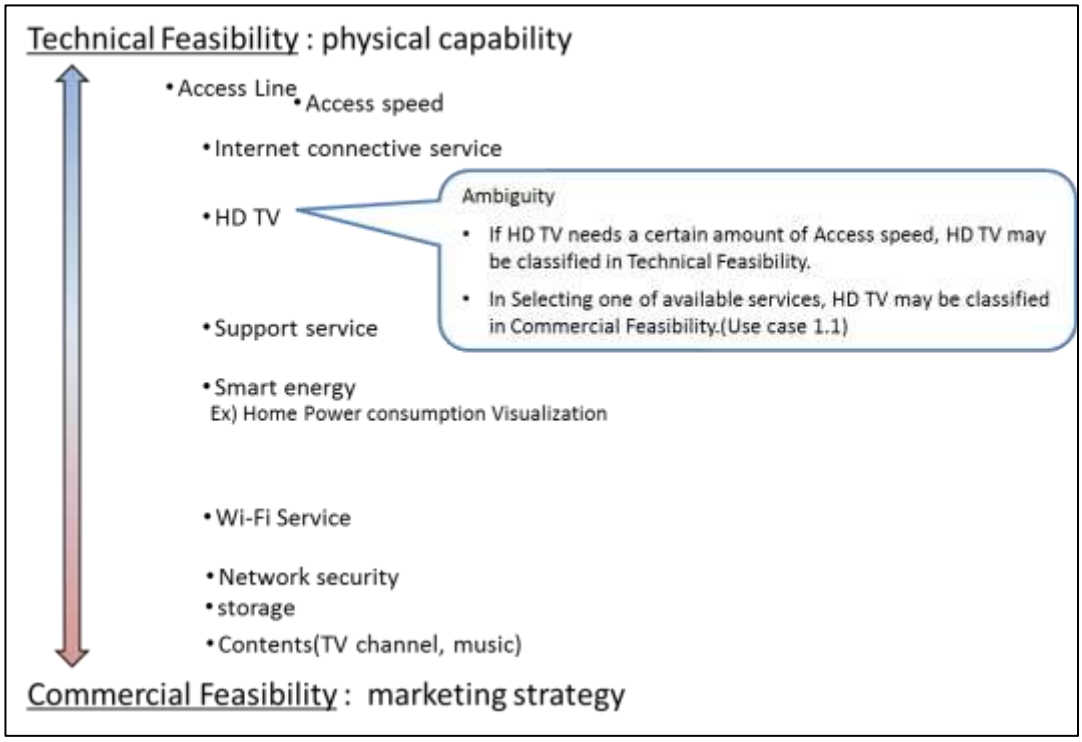
– Check if a location (identified by address) is within the service footprint (i.e. within a serving area) and the type of service technology available at the location (i.e. access technology like Fiber, Wireless or Interim Satellite but also sensor data feed or utility service, HDTV availability), where detail response indicates technical parameters of service (e.g. bandwidth, data feed interval and accuracy, pipe diameter for water, etc).

- Intended for use cases where the “middle B[1]” (retail ISP, reseller, etc) is not concerned about the product offering, but only about the service parameters.
- Allows for asynchronous responses via notification hub for checks that take longer.
- Should allow for serviceQualificationRequest for all types of services in a generic way, not only communication service access. If a telecom is sent a serviceQualificationRequest it will respond with the network access technology and parameters available at the location. If an electricity supplier is sent a request, it will respond with the options on electritity (volts?) available at the location, when a water utility is sent a request, it will respond with service parameters available at the location (pipe diameter, pressure,)

productOfferingQualification task

- Check if a given product offering can be delivered to a specific location (identified by address).
- Provide available product offering options if a specific product is not requested/given Synchronous responses only
- Is about product offering level eligibility, where the “middle B” (reseller, etc) is not primarily concerned about technical parameters, but about product offering availability at location.

Depending on the way to describe “Product “, it may be classified in either technical feasibility or commercial feasibility.



[1] middle B as in B2B2X business scenarios, cf TM Forum B2B2X Partnering Guidebook

SAMPLE USE CASES

The following table maps out the use cases.

UC	description
1	A 'new' **customer** is browsing operator internet services webpage and **wish to see** which **offers** he is **eligible** with his current address. The **system retrieves** the **list of offers** technically eligible **with characteristics and configuration**.
1.1	Configuration could be detailed and for example the **customer** is **informed** that he is **eligible for** ADSL, TV online but he cannot have both TV HD and Multi-Screen TV options (just **one of these**).
2	A 'new' **customer** is interested for FTTH service – he **asks** to SP sale representative about **FTTH** service at his current address. Thus **system indicate** he is **eligible to FTTH** and he will have a **xx Mo/s speed** for download and yy for upload.
2.2	Alternative: the address is **ok for FTTH** service but from a strictly technical point of view the operator **FTTH center box** have **not enough space** to plug a new connection. The **Sale** representative is able to **inform** the customer that he will be **eligible to FTTH in 8 week**
3	A **customer wishes to enjoy HDTV.** He asks to SP sale representative. He is **eligible** but he **has to change** his **access** offer.
3.1	Alternative: **Access is ok** but system checks that he is currently using an outdated TV decoder and he has to **upgrade** his **TV box** to enjoy HD.
4	A **customer askes for TV on internet.** An eligibility **check** is triggered and should check not only the **TV channel** provided **by the SP** but also the additionally **TV channels availability** at the customer address (even if they not directly provided by the SP).
5	A **customer** is moving to a new address – a **check** must be done at this new **address** and the **SP** sale representative is able to **inform** the customer if: • he will be **able to keep** current offer at his new address • he **should downgrade** his services because current ones are not technically feasible at the new address • he can keep but also he is **eligible to** an **upgrade** and benefit for example to a FTTH broadband at his new address.
6	A **TV channel provider** wants to sell a set of channel for a customer. He will ask for the customer **broadband company** [API provider] and an **access id** (email address for example). He will use this information with this POST /serviceQualificationRequest api to be able to **retrieve** information on customer

	access capabilities (and check if the customer will be able to get his service from the service point).
7	A **MVNO/other provider** who use provider network will call this api to be able to **check capabilities** for one prospect. With this api he will have all technical information and he should have to apply his own commercial rules to make a proposal to this customer. This UC could be a mandatory one for contractual reason where network is still owned by legacy Telco Company but they have to open it for competitors.
8	this api could be used in **internal channel** to be able to check technical **capabilities** without any commercial filter. It could be useful in some customer support UC.
9	A customer wishes to enjoy different products over multiple accesses. For example: HD TV, internet by fiber and phone service on ADSL. Customer is interested on the commercial offering and not on technical aspects so she calls to a sales representative for that.

RESOURCE MODEL

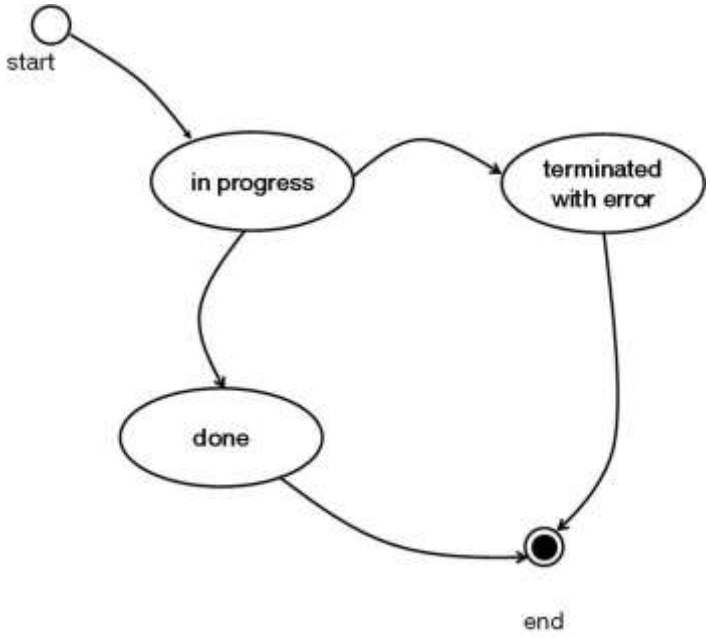
Managed Entity and Task Resource Models

Service Qualification API has 2 Resources

serviceQualification Task resource for knowing the allowed services based on specific criterions such as location, access network id and service properties

productOfferingQualification Task resource for knowing the product offering based on specific criterions such as location, related party and product offering properties

Service or product qualification tasks have a qualificationState. This is the state of the qualification request. Here is the state machine diagram for a qualification. Each qualification states are described in the tab below.



qualification State	Significance
InProgress	The qualification is progressing– the supplier has not yet make the qualification request. The qualification is in progress until all the information had been collected.
Done	The qualification has been done and the result is available in the qualification resource. The qualification is done if all the information had been collected successfully.
Terminated withError	The qualification has been done but there are some errors and result could be incomplete. The qualification is TerminatedWithError if all the information had not been collected successfully or if any other conditions preventing the execution of the tasks occurs.

4 Examples of the JSON representation of Service Qualification:

For Service Qualification at a specific location 1 of Address ID, Address description, geoCode and publicKey should be provided.

You can provide an address conformant with the Address API Resource.

If you work with the address as below you can either provide the {id,href}, the address description (all properties except id href and geocode), or just the geocode.

Either Address or PublicKey.


```
{
 "id": "7660828",
 "href": "addresses/7660828",
 "streetNr": "225",
 "streetNrSuffix": "B",
 "streetNrLast": "",
 "streetNrLastSuffix": "",
 "streetName": "Strathmore",
 "streetType": "Terrace",
 "streetSuffix": "",
 "postcode": "5004",
 "locality": "Brighton",
 "city": "Brighton",
 "stateOrProvince": "SA",
 "country": "Australia",
 "geoCode": {
    "latitude": "1.430937",
    "longitude": "43.597208",
    "geographicDatum": "WGS84"
 }
```

}

1) Address id for location info
2) Address discription for location info
3) Geocode for location info
4) Public-key for location info

Service provider execute service qualification request with location information to get technical eligibility that is network access speed, available service list.

1) ServiceQualification with Address id for location info


```
{
   "id": "42",
   "href": "http::..//serviceQualification/42",
   "interactionDate": "20160201 10:00",
   "provideAlternative": "No",
   "provideOnlyEligible": "Yes",
   "description": "exmple of a qualification task",
   "eligibilityDate": "20160201 10:00",
   "qualificationState": "InProgress",
   "address": {
      "id": "12345678",
      "href": "https://www.google.ca/maps/dir/''/google+map+montreal+place+ville+marie/@45.5014452,-73.6393962,12z/data=!3m1!4b1!4m8!4m7!1m0!1m5!1m1!1s0x4cc91a4498f8f3db:0xa2760b4a779d61d3!2m2!1d-73.5693564!2d45.5014666"
   },
   "physicalTerminationPoint": [
      {"accessType": "ADSL"},
      {"accessType": "Fiber"}
   ],
   "serviceQualificationItem": [
      {
         "service": {
            "id": "string",
            "href": "string",
            "name": "string",
            "serviceCharacteristic": [{
               "name": "string",
               "value": "string"
            }],
```

```
      "serviceSpecification": {
        "id": "2222",
        "href": "https://serviceSpecification/ADSL",
        "serviceCategoryId": "TVservice",
        "serviceSpecificationCharacteristic": [
          {
            "id": "2211",
            "name": "upstreamSpeed",
            "valuefrom": "10KBPS",
            "valueto": "1MBPS"
          },
          {
            "id": "2212",
            "name": "downstreamSpeed",
            "valuefrom": "100KBPS",
            "valueto": "6MBPS"
          }
        ]
      }
    },
    "availability": "available",
    "serviceabilityDate": "20160201 10:00"
  },
  {
    "service": {
      "id": "string",
      "href": "string",
      "name": "string",
      "serviceCharacteristic": [{
        "name": "string",
        "value": "string"
      }],
      "serviceSpecification": {
        "id": "2222",
        "href": "https://serviceSpecification/ADSL",
        "serviceCategoryId": "TVservice",
        "serviceSpecificationCharacteristic": [
          {
            "id": "2211",
            "name": "upstreamSpeed",
            "valuefrom": "10KBPS",
            "valueto": "1MBPS"
          },
```

```
                {
                   "id": "2212",
                   "name": "downstreamSpeed",
                   "valuefrom": "100KBPS",
                   "valueto": "6MBPS"
                }
             ]
          }
       },
       "availability": "available",
       "serviceabilityDate": "20160201 10:00"
    }
  ]
}
```


2) Address discription for location info


```
{
  "id": "42",
  "href": "http::..//serviceQualification/42",
  "interactionDate": "20160201 10:00",
  "provideAlternative": "No",
  "provideOnlyEligible": "Yes",
  "description": "exmple of a qualification task",
  "eligibilityDate": "20160201 10:00",
  "qualificationState": "InProgress",
  "address": {
    "streetNr": "1",
    "streetName": "ville Marie",
    "city": "montreal",
    "stateOrProvince": "Quebec",
    "country": "Canada "
  },
  "physicalTerminationPoint": [
    {"accessType": "ADSL"},
    {"accessType": "Fiber"}
  ],
  "serviceQualificationItem": [
    {
      "service": {
        "id": "string",
        "href": "string",
```

```
        "name": "string",
        "serviceCharacteristic": [{
          "name": "string",
          "value": "string"
        }],
        "serviceSpecification": {
          "id": "2222",
          "href": "https://serviceSpecification/ADSL",
          "serviceCategoryId": "TVservice",
          "serviceSpecificationCharacteristic": [
            {
              "id": "2211",
              "name": "upstreamSpeed",
              "valuefrom": "10KBPS",
              "valueto": "1MBPS"
            },
            {
              "id": "2212",
              "name": "downstreamSpeed",
              "valuefrom": "100KBPS",
              "valueto": "6MBPS"
            }
          ]
        }
      },
      "availability": "available",
      "serviceabilityDate": "20160201 10:00"
    },
    {
      "service": {
        "id": "string",
        "href": "string",
        "name": "string",
        "serviceCharacteristic": [{
          "name": "string",
          "value": "string"
        }],
        "serviceSpecification": {
          "id": "2222",
          "href": "https://serviceSpecification/ADSL",
          "serviceCategoryId": "TVservice",
          "serviceSpecificationCharacteristic": [
            {
```

```
                    "id": "2211",
                    "name": "upstreamSpeed",
                    "valuefrom": "10KBPS",
                    "valueto": "1MBPS"
                },
                {
                    "id": "2212",
                    "name": "downstreamSpeed",
                    "valuefrom": "100KBPS",
                    "valueto": "6MBPS"
                }
            ]
        }
      },
      "availability": "available",
      "serviceabilityDate": "20160201 10:00"
    }
  ]
}
```


3) Geocode for location info


```
{
  "id": "42",
  "href": "http::..//serviceQualification/42",
  "interactionDate": "20160201 10:00",
  "provideAlternative": "No",
  "provideOnlyEligible": "Yes",
  "description": "exmple of a qualification request",
  "eligibilityDate": "20160201 10:00",
  "qualificationState": "InProgress",
    "address": {
   "geocode": {
    "latitude": "73.6393962",
    "longitude": "45.5014452"
  }},
  "physicalTerminationPoint": [
    {"accessType": "ADSL"},
    {"accessType": "Fiber"}
  ],
```

```
"serviceQualificationItem": [
  {
    "service": {
      "id": "string",
      "href": "string",
      "name": "string",
      "serviceCharacteristic": [{
        "name": "string",
        "value": "string"
      }],
      "serviceSpecification": {
        "id": "2222",
        "href": "https://serviceSpecification/ADSL",
        "serviceCategoryId": "TVservice",
        "serviceSpecificationCharacteristic": [
          {
            "id": "2211",
            "name": "upstreamSpeed",
            "valuefrom": "10KBPS",
            "valueto": "1MBPS"
          },
          {
            "id": "2212",
            "name": "downstreamSpeed",
            "valuefrom": "100KBPS",
            "valueto": "6MBPS"
          }
        ]
      }
    },
    "availability": "available",
    "serviceabilityDate": "20160201 10:00"
  },
  {
    "service": {
      "id": "string",
      "href": "string",
      "name": "string",
      "serviceCharacteristic": [{
        "name": "string",
        "value": "string"
      }],
      "serviceSpecification": {
```

```
            "id": "2222",
            "href": "https://serviceSpecification/ADSL",
            "serviceCategoryId": "TVservice",
            "serviceSpecificationCharacteristic": [
              {
                "id": "2211",
                "name": "upstreamSpeed",
                "valuefrom": "10KBPS",
                "valueto": "1MBPS"
              },
              {
                "id": "2212",
                "name": "downstreamSpeed",
                "valuefrom": "100KBPS",
                "valueto": "6MBPS"
              }
            ]
          }
        },
        "availability": "available",
        "serviceabilityDate": "20160201 10:00"
      }
  ]
}
```


4) Public-key for location info


```
{
  "id": "42",
  "href": "http::..//serviceQualification/42",
  "interactionDate": "20160201 10:00",
  "provideAlternative": "No",
  "provideOnlyEligible": "Yes",
  "description": "exmple of a qualification request",
  "eligibilityDate": "20160201 10:00",
  "qualificationState": "InProgress",
  "publicKey": "public-Key_ 00000000",
  "physicalTerminationPoint": [
```

```
    {"accessType": "ADSL"},
    {"accessType": "Fiber"}
  ],
  "serviceQualificationItem": [
    {
      "service": {
        "id": "string",
        "href": "string",
        "name": "string",
        "serviceCharacteristic": [{
          "name": "string",
          "value": "string"
        }],
        "serviceSpecification": {
          "id": "2222",
          "href": "https://serviceSpecification/ADSL",
          "serviceCategoryId": "TVservice",
          "serviceSpecificationCharacteristic": [
            {
              "id": "2211",
              "name": "upstreamSpeed",
              "valuefrom": "10KBPS",
              "valueto": "1MBPS"
            },
            {
              "id": "2212",
              "name": "downstreamSpeed",
              "valuefrom": "100KBPS",
              "valueto": "6MBPS"
            }
          ]
        }
      },
      "availability": "available",
      "serviceabilityDate": "20160201 10:00"
    },
    {
      "service": {
        "id": "string",
        "href": "string",
        "name": "string",
        "serviceCharacteristic": [{
          "name": "string",
```

```
            "value": "string"
          }],
          "serviceSpecification": {
            "id": "2222",
            "href": "https://serviceSpecification/ADSL",
            "serviceCategoryId": "TVservice",
            "serviceSpecificationCharacteristic": [
              {
                "id": "2211",
                "name": "upstreamSpeed",
                "valuefrom": "10KBPS",
                "valueto": "1MBPS"
              },
              {
                "id": "2212",
                "name": "downstreamSpeed",
                "valuefrom": "100KBPS",
                "valueto": "6MBPS"
              }
            ]
          }
        },
        "availability": "available",
        "serviceabilityDate": "20160201 10:00"
      }
    ]
}
```


Fields Description

Table Need to be updated Ludovic ?

ServiceQualification

Field	Description
id	Unique identifier for Interaction.
eligibilityDate	The Date requested eligibility
address	
type	Type of place
td	Unique identifier for Place

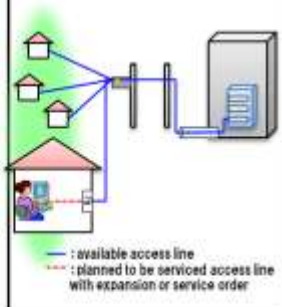
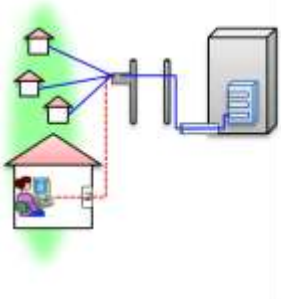
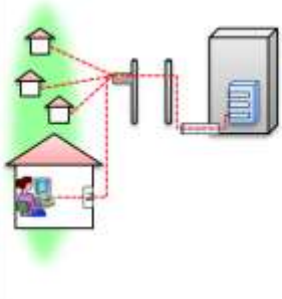
Field	Description
href	Reference of a place (for instance in google map)
address description	Address description
streetNr	number identifying a specific property on a public street. It may be combined with streetNrLast for ranged addresses
streetNrSuffix	the first street number suffix
streetName	the name of the street or other street type
streetType	alley, avenue, boulevard, brae, crescent, drive, highway, lane, terrace, parade, place, tarn, way, wharf ?
streetSuffix	A modifier denoting a relative direction
city	the City that the address is in
locality	"An area of defined or undefined boundaries within a local authority or other legislatively defined area, usually rural or semi rural in nature." [ANZLIC-STREET], or a suburb "a bounded locality within a city, town or shire principally of urban character " [ANZLIC-STREET]
postcode	A descriptor for a postal delivery area, used to speed and simplify the delivery of mail
stateOrProvince	the State or Province that the address is in
country	the Country that the address is in
geoCode	Geographic code
latitude	Latitude
longitude	Longitude
geographicDatum	Geocoding referential
publicKey	a landline number or an internet access id
serviceSpecification	Requested service specification
id	Unique identifier for serviceSpecification
serviceCharacteristic	
id	Servicecharactristic for requested service
value	serviceCharacteristic value for requested service
serviceCategory	
id	Unique identifier for serviceCategory
provideAlternative	if this flag I set to Yes - the API will retrieve closest value available for this same service
provideOnlyEligible	used to restrict API response to only available services. If this flag is set to No the API will provide both positive and negative eligibility results.
terminationError	if qualification has not been done properly we indicate there termination error
id	
value	Unique identifier for terminationError

Field	Description
id	Unique identifier for Interaction.

Field	Description
eligibilityDate	
address	
type	Type of place
id	Unique identifier for Place
href	Reference of a place (for instance in google map)
publicKey	a landline number or an internet access id
physicalResource	Array of physical resource for multiple access NW
physicalTerminationPoint	Logical resource for multiple access NW
accessType	Access Technology Type: ADSL, VDSL, fiber
serviceSpecification	Service specification for qualification service
id	Unique identifier for Service specification
serviceCategoryId	Category id for requested service
serviceSpecificationCharacteristic	Characteristic for requested service
id	Unique identifier for
value	
serviceQualification	services with a specific eligibility check will be listed there with technical eligibility result
qualificationResult	Technical eligibility result: service availability status which explain below
comment	Comment for technical eligibility result
qualificationResultDate	qualification judgement date
terminationError	if qualification has not been done properly we indicate there termination error
id	Unique identifier for terminationError
value	

Table 1 Service Qualification field description

Serviceability status may be represented the following table.

Serviceability status	Serviceable		Not serviceable	
	existing	shortfall	planned	Not planned
Image				
outline	Serviceable. drop and NTD in place.	Serviceable. no drop or NTD in place.	Planned to be serviced in the future (boundary status isn't 'In Service' yet)	Not plan to be serviceable this area.

serviceable-shortfall is include updating access NW.

substatus are captured via notation i.e serviceable.existing etc…

In the case that the service provider or broker responding to the request already knows about an upcoming change in the serviceability status, it is intended that the response is sent as a collection of the about results, listing both the current and the future valid response with its state and a matching eligibility date.

PRODUCT-OFFERING QUALIFICATION RESOURCE

Example of the JSON representation of Product-Offering Qualification:

Service provider execute Product-Offering Qualification task to get the customer location Feasibility include Commercial and Technical eligibility.


```
{
   "id": "42",
   "href": "http::..//productOfferingQualification/42",
   "interactionDate": "20160201 10:00",
   "description": "exmple of a qualification task",
   "eligibilityDate": "20160201 10:00",
   "qualificationState": "InProgress",
   "productInventoryId": "ADSL_locate_No",
   "provideOnlyAvailable": "No",
   "provideUnavailabilityReason": "Yes",
   "partyId": "service_provider_0001",
   "channel": "web store",
   "address": {"id": "12345678"},
   "productOfferingQualificationItem": [
     {
       "productOffering": {
         "id": "42",
         "href": "http: //serverlocation: port/catalogManagement/productOffering/42",
         "category": {"id": "TVservice with Internet Play"},
         "product": {
           "productSpecification": {
             "id": "13",
             "href": "http://serverlocation:port/catalogManagement/productSpecification/13",
             "version": "2.0",
             "name": "specification product 1"
           },
```

```
            "productCharacteristic": [{
              "id": "downstreamspeed",
              "value": "10MBPS"
            }]
          }
        },
        "orderFeasibilityCheck": {"eligibilityResult": "available"}
      },
      {
        "productOffering": {
          "id": "42",
          "href": "http: //serverlocation: port/catalogManagement/productOffering/42",
          "category": {"id": "TVservice with Internet Play"},
          "product": {
            "productSpecification": {
              "id": "13",
              "href": "http://serverlocation:port/catalogManagement/productSpecification/13",
              "version": "2.0",
              "name": "specification product 1"
            },
            "productCharacteristic": [{
              "id": "downstreamspeed",
              "value": "6MBPS"
            }]
          }
        },
        "orderFeasibilityCheck": {
          "eligibilityResult": "unavailable",
          "eligibilityUnavailablityReason": [{
            "code": "UNAVAILABLE-300",
            "label": "need more bandwidth"
          }]
        }
      }
    ]
}
```


For each resource in your model fill the following table.

Fields Description

ProductOfferingQualification

Field	Description
partyId	Unique identifier for party
channel	Channel
productInventoryId	Product Inventory ID for commercial eligibility
address	
id	Unique identifier for Place
href	Reference of a place (for instance in google map)
address description	Address description
streetNr	number identifying a specific property on a public street. It may be combined with streetNrLast for ranged addresses
streetNrSuffix	the first street number suffix
streetName	the name of the street or other street type
streetType	alley, avenue, boulevard, brae, crescent, drive, highway, lane, terrace, parade, place, tarn, way, wharf ?
streetSuffix	A modifier denoting a relative direction
city	the City that the address is in
locality	"An area of defined or undefined boundaries within a local authority or other legislatively defined area, usually rural or semi rural in nature." [ANZLIC-STREET], or a suburb "a bounded locality within a city, town or shire principally of urban character " [ANZLIC-STREET]
postcode	A descriptor for a postal delivery area, used to speed and simplify the delivery of mail
stateOrProvince	the State or Province that the address is in
country	the Country that the address is in
geoCode	Geographic code
latitude	Latitude
longitude	Longitude
geographicDatum	Geocoding referential
publicKey	a landline number or an internet access id
productOfferingSpecification	Requested product-offering specification
id	Unique identifier of product-offering specification
productOfferingCategory	Requested product-offering category
id	Unique identifier of product-offering category
productOfferingCharacteristic	A characteristic quality or distinctive feature of a product-Offering
id	Unique identifier of productOfferingCharacteristic
value	
provideOnlyAvailable	If this flag is set to No the API will provide both positive and negative availability results.
provideUnavailabilityReason	add in the API the rational for not-authorized productOffering. The rationales for non-authorized are described in the eligibilityUnvailabilityReason structure in the response.

Field	Description
productOfferingSpecification	
id	ID of the top level productOffering
productOfferingCategoryId	Unique identifier for productOfferingCategory

Field	Description
productCharacteristic	
id	Unique identifier for productCharacteristic
value	The value for productCharacteristic in this productOffering
orderFeasibilityCheck	Commercial and Technical eligibility result for this offer:
eligibilityResult	Eligibility result for this offer
eligibilityUnavailabilityReason	reason for eligibility result if the offer was unavailable
code	Unavailable reason code
label	Unavailable reason label
terminationError	if qualification has not been done properly we indicate there termination error
id	Unique identifier for termination error
value	

For each resource in the API provide a UML model:

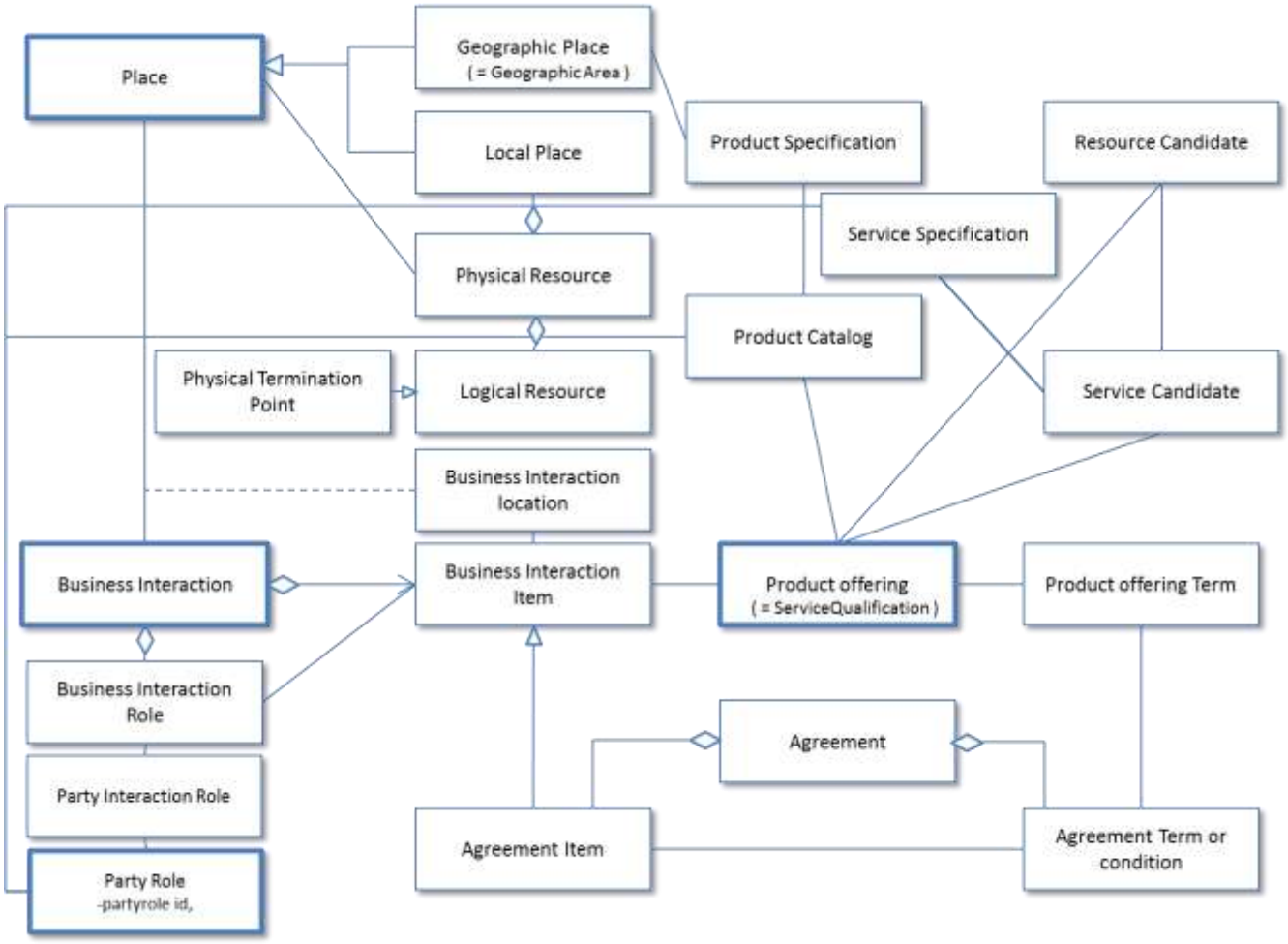


Figure 1 – Service Qualification resource model TAKA do update to reflect real

Event Models

The Service Qualification API supports a single event called QualificationStateChange Notification. This event is used to track the qualificationState of a service or product offering qualification.


```
{
   "event": {

   "id": "42",
   "href": "http::..//productOfferingQualification/42",
   "interactionDate": "20160201 10:00",
   "description": "exmple of a qualification task",
   "eligibilityDate": "20160201 10:00",
   "qualificationState": "Done",
   "productInventoryId": "ADSL_locate_No",
   "provideOnlyAvailable": "No",
   "provideUnavailabilityReason": "Yes",
   "partyId": "service provider A",
   "channel": "web store",
   "address": {"id": "12345678"},
   "productOfferingQualificationItem": [{
      "productOffering": {
         "id": "42",
         "href": "http: //serverlocation: port/catalogManagement/productOffering/42",
         "category": {"id": "TVservice with Internet Play"},
         "product": {
            "productSpecification": {
               "id": "13",
               "href": "http://serverlocation:port/catalogManagement/productSpecification/13",
               "version": "2.0",
               "name": "TVservice with Internet Play"
            },
            "productCharacteristic": [
               {
                  "id": "upstreamspeed",
                  "value": "1 MBPS"
               },
               {
                  "id": "downstreamspeed",
                  "value": "6 MBPS"
               }
```

```
            ]
          }
        },
        "orderFeasibilityCheck": {"eligibilityResult": "available"}
    }]
}

}

    },
    "eventType": "QualificationStateChange"
}
```

API OPERATION TEMPLATES

For every single of operation on the entities use the following templates and provide sample REST requests and responses.

Remember that the following Uniform Contract rules must be used:

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.

GET /api/serviceQualification/{ID}/?{filter_and attribute selection}

Description:

This operation is used to retrieve current serviceQualification tasks.

GET operation use if location id is created at other API/system.

Behavior:

- Return status codes
  - 200 OK – the request was successful
  - 400 Bad Request – error, for example to cover these functional error cases:
    - Location is not exist

REQUEST

```
GET /api/serviceQualification/42
Accept: application/json
```

RESPONSE

```
200
Content-Type: application/json

{
   "id": "42",
   "href": "http::..//serviceQualification/42",
   "interactionDate": "20160201 10:00",
   "provideAlternative": "No",
   "provideOnlyEligible": "Yes",
   "description": "exmple of a qualification task",
   "eligibilityDate": "20160201 10:00",
   "qualificationState": "Done",
   "address": {
      "href": "https://www.google.ca/maps/dir/''/google+map+montreal+place+ville+marie/@45.5014452,-
73.6393962,12z/data=!3m1!4b1!4m8!4m7!1m0!1m5!1m1!1s0x4cc91a4498f8f3db:0xa2760b4a779d61d3!
2m2!1d-73.5693564!2d45.5014666"
   },

   "physicalTerminationPoint": [
      {"accessType": "ADSL"},

   ],
```

```
  "serviceQualificationItem": [
    {
      "service": {
        "serviceCharacteristic": [{
          "name": " upstreamSpeed ",
          "value": "15KBPS"
        }],
        "serviceSpecification": {
          "id": "ADSL",
          "href": "https://serviceSpecification/ADSL",
          "serviceCategoryId": "internetService",
        },
          "serviceSpecificationCharacteristic": [
            {
              "id": "2211",
              "name": "upstreamSpeed",
              "valuefrom": "10KBPS",
              "valueto": "1MBPS"
            },
            {
              "id": "2212",
              "name": "downstreamSpeed",
              "valuefrom": "100KBPS",
              "valueto": "6MBPS"
            }
          ]


      },
      "availability": "available",
      "serviceabilityDate": "20160201 10:00"
    },
      "availability": "available",
      "serviceabilityDate": "20160201 10:00"
    }
  ]
}
```

POST /api/serviceQualification

Description :

This operation creates a Task to provide technical Eligibility that is what service is available or when the service is available.

Partner used this API to notice service availability Partner's customer.

POST operation use if location id is create at this operation.

Attribute name	Mandatory	Default	Rule
Id	N	Blank	1.1.1.1.1 Should not be filled in the request. This Id is provided by the API supplier
eligibilityDate	N	Today	1.1.1.1.2 Date when the service eligibility should be checked
Address	N		Address info need one from any address representations
Address description	N		Address info need one from any address representations
geoCode	N		Address info need one from any address representations
publicKey	N		publicKey is used to identify network access point where the serviceQualification has to be done
serviceSpecification	N		serviceSpecification is used to restrict eligibility check to only thi(these) serviceSpecification(s)
serviceCharacteristic	N		used to specify minimum characteristic value to be assessed – example: Internet access with a download speed at least equals to 20 Mb/s.

serviceCategory	N		same as serviceSpecification but with specificCategory: restrict the scope of the assessed service (only those of this category)
provideAlternative	N	“No”	if this flag I set to Yes - the API will retrieve closest value available for this same service Example: requester ask for a broadband access with a download speed at least equals to 20 Mb/s – if only 12 M/bs is available and provideAlternative is set to Yes, the API will provide this alternative information (20 Mb/s not available but 12 is)
provideOnlyEligible	N	“Yes”	If this flag is set to No the API will provide both positive and negative eligibility results

Behavior:

- Return status codes
  - 201 OK – the request was successful
  - 400 Bad Request – error, for example to cover these functional error cases:
    - Location is not exist

Use case:

3 Examples for a Specific Service

– with Location
– with Location and Physical Characteristics
– with Service Specification and Characteristics

We assume requests are synchronous (i.e. responses are sent synchronously)

1) Can a service be provided at a specific location with the specified characteristics?

REQUEST

```
POST /api/serviceQualification
Accept: application/json

{
  “address” : {
    “href” : “https://www.google.ca/maps/dir/''/google+map+montreal+place+ville+marie/@45.5014452,-73.6393962,12z/data=!3m1!4b1!4m8!4m7!1m0!1m5!1m1!1s0x4cc91a4498f8f3db:0xa2760b4a779d61d3!2m2!1d-73.5693564!2d45.5014666”
   },
"provideAlternative": "No",
   "provideOnlyEligible": "Yes",
   "description": "example of a qualification task",
   "eligibilityDate": "20160201 10:00",
"serviceQualificationItem": [
      {
         "service": {
            "serviceCharacteristic": [{
               "name": " upstreamSpeed ",
               "value": "15KBPS"
            }],
            "serviceSpecification": {
               "id": "ADSL",
               "href": "https://serviceSpecification/ADSL",
               "serviceCategoryId": "internetService",
            }
         },
      }]



}
```

RESPONSE

```
201
Content-Type: application/json

{
   "id": "42",
   "href": "http::..//serviceQualification/42",
   "interactionDate": "20160201 10:00",
   "provideAlternative": "No",
   "provideOnlyEligible": "Yes",
```

```
  "description": "exmple of a qualification task",
  "eligibilityDate": "20160201 10:00",
  "qualificationState": "Done",
  "address": {
    "href": "https://www.google.ca/maps/dir/''/google+map+montreal+place+ville+marie/@45.5014452,-73.6393962,12z/data=!3m1!4b1!4m8!4m7!1m0!1m5!1m1!1s0x4cc91a4498f8f3db:0xa2760b4a779d61d3!2m2!1d-73.5693564!2d45.5014666"
  },

  "physicalTerminationPoint": [
    {"accessType": "ADSL"},

  ],
  "serviceQualificationItem": [
    {
      "service": {
        "serviceCharacteristic": [{
          "name": " upstreamSpeed ",
          "value": "15KBPS"
        }],
        "serviceSpecification": {
          "id": "ADSL",
          "href": "https://serviceSpecification/ADSL",
          "serviceCategoryId": "internetService",
          "serviceSpecificationCharacteristic": [
            {
              "id": "2211",
              "name": "upstreamSpeed",
              "valuefrom": "10KBPS",
              "valueto": "1MBPS"
            },
            {
              "id": "2212",
              "name": "downstreamSpeed",
              "valuefrom": "100KBPS",
              "valueto": "6MBPS"
            }
          ]



        }
      },
      "availability": "available",
      "serviceabilityDate": "20160201 10:00"
    },
      "availability": "available",
      "serviceabilityDate": "20160201 10:00"
    }
  ]
```

```
}
```

2) can the access NW be provided at a specific location

REQUEST

POST /api/serviceQualificationRequest
Accept: application/json


```
{
   "id": "42",
   "interactionDate": "20160201 10:00",
   "provideAlternative": "Yes",
   "provideOnlyEligible": "Yes",
   "description": "exmple of a qualification task",
   "eligibilityDate": "20160201 10:00",
    "address": {"href":
"https://www.google.ca/maps/dir/"/google+map+montreal+place+ville+marie/@45.5014452,-
73.6393962,12z/data=!3m1!4b1!4m8!4m7!1m0!1m5!1m1!1s0x4cc91a4498f8f3db:0xa2760b4a779d61d3!
2m2!1d-73.5693564!2d45.5014666"},
   "serviceQualificationItem": [{"service": {
      "serviceCharacteristic": [{
         "name": "downstreamspeed",
         "value": "10 Mbps"
      }],
      "serviceSpecification": {
         " id": " FiberAccess ",
         "href": "http://serviceSpecification/FiberAccess",
         "serviceCategoryId": "FiberAccess"
      }
   }}]
}
```


RESPONSE

201

Content-Type: application/json


```
{
   "id": "42",
   "href": "http::..//serviceQualification/42",
   "interactionDate": "20160201 10:00",
   "provideAlternative": "Yes",
   "provideOnlyEligible": "Yes",
   "description": "exmple of a qualification task",
```

```
  "eligibilityDate": "20160201 10:00",
  "qualificationState": "InProgress",
  "address": {"href":
"https://www.google.ca/maps/dir/"/google+map+montreal+place+ville+marie/@45.5014452,-
73.6393962,12z/data=!3m1!4b1!4m8!4m7!1m0!1m5!1m1!1s0x4cc91a4498f8f3db:0xa2760b4a779d61d3!
2m2!1d-73.5693564!2d45.5014666"},
  "serviceQualificationItem": [{
    "service": {

      "serviceSpecification": {
        " id": "2233",
        "href": "http://serviceSpecification/FiberAccess",
        "serviceCategoryId": "FiberAccess",
        },


    },

     "alternativeService" [

      “service” {
       "serviceCharacteristic": [{
        "name": "downstreamspeed",
        "value": "5 Mbps"
       }],
       "serviceSpecification": {
        " id": "2233",
        "href": "http://serviceSpecification/FiberAccess",
        "serviceCategoryId": "FiberAccess",

          "serviceSpecificationCharacteristic": [
            {
              "id": "2211",
              "name": "upstreamSpeed",
              "valuefrom": "10KBPS",
              "valueto": ".5MBPS"
            },
            {
              "id": "2212",
              "name": "downstreamSpeed",
              "valuefrom": "50KBPS",
              "valueto": "3MBPS"
            }
          ]



        }
    }],
```

```
      "availability": "available-shortfall",
      "serviceabilityDate": "20160201 10:00"
   }]
}
```


3) can the specific service be provided at a specific location (asking for specific characteristics but not specific service type (no specification is provided DSL or Fiber)

REQUEST

POST /api/serviceQualification

Accept: application/json


```
{
   "id": "42",
   "interactionDate": "20160201 10:00",
   "provideAlternative": "No",
   "provideOnlyEligible": "Yes",
   "description": "exmple of a qualification task",
   "eligibilityDate": "20160201 10:00",
   "address": {"href":
"https://www.google.ca/maps/dir/"/google+map+montreal+place+ville+marie/@45.5014452,-
73.6393962,12z/data=!3m1!4b1!4m8!4m7!1m0!1m5!1m1!1s0x4cc91a4498f8f3db:0xa2760b4a779d61d3!
2m2!1d-73.5693564!2d45.5014666"},
   "serviceQualificationItem": [{"service": {"serviceCharacteristic": [
      {
         "name": "upstreamSpeed",
         "value": "1Mbps"
      },
      {
         "name": "downstreamSpeed",
         "value": "100Mbps"
      }
   ]}}]
}
```


RESPONSE

201

Content-Type: application/json


```
{
```

```
   "id": "42",
   "interactionDate": "20160201 10:00",
   "provideAlternative": "No",
   "provideOnlyEligible": "Yes",
   "description": "exmple of a qualification task",
   "eligibilityDate": "20160201 10:00",
   "physicalTerminationPoint": [
      {"accessType": "ADSL"},
      {"accessType": "Fiber"}
   ],
   "address": {"href":
"https://www.google.ca/maps/dir/"/google+map+montreal+place+ville+marie/@45.5014452,-
73.6393962,12z/data=!3m1!4b1!4m8!4m7!1m0!1m5!1m1!1s0x4cc91a4498f8f3db:0xa2760b4a779d61d3!
2m2!1d-73.5693564!2d45.5014666"},
   "serviceQualificationItem": [
      {
         "service": {
{"serviceCharacteristic": [
      {
         "name": "upstreamSpeed",
         "value": "1Mbps"
      },
      {
         "name": "downstreamSpeed",
         "value": "100Mbps"
      }
   ],


"serviceSpecification": {
            "id": "ADSL",
            "href": "https://serviceSpecification/ADSL",
            "serviceCategoryId": "internetService",
         }},
         "availability": "available",
         "serviceabilityDate": "20160201 10:00"
      },
      {
         "service": {"serviceSpecification": {
            "id": "FiberService",
            "href": "https://serviceSpecification/FiberService",
            "serviceCategoryId": "Fiber"
         }},
         "availability": "available",
         "serviceabilityDate": "20160201 10:00"
      }
   ]
}
```

POST /api/productOfferingQualification

Description:

This operation is used to provide commercial eligibility from interaction contextual information (addresses, parties, channel) immediately.

i.e Product Offerings (and constraints on ProductOffering pricing).

This operation execute for offering check.

Attribute name	Mandatory	Default	Rule
Id	N	Blank	Should not be filled in the request. This Id is provided by the API supplier
eligibilityDate	N	Today	Date when the productOffering eligibility should be checked
RelatedParty	N		1.1.1.1.3 Used to perform specific commercial eligibility based on party properties: specific productOffering are only sold through specific retaillers, specific productOfferings are only available for specific customers.
channel	N		1.1.1.1.4 Used to filter productOffering available only for this channel (e.g offering only available on web channel)

Attribute name	Mandatory	Default	Rule
productInventoryId	N		If a productInventoryID is provided the API will provide only productOfferings compatible with this product.
address	N		the address is used to retrieve productOffering only available at this place
Address description	N		same as above
geoCode	N		same as above
publicKey	N		same as productInventoryID -> used to retrieve compatible productOffering to customer already owned products (and identified through this public key)
productOfferingSpecification	N		used to filter eligibility to this/these productOfferingSpecification(s)
productOfferingCategory	N		same a previous: restrict API scope to a productOfferingCategory
productCharacteristic	N		used to specify characteristic for assessed productOferings
provideOnlyAvailable	N	“Yes”	If this flag is set to No the API will provide both positive and negative eligibility results
provideUnavailabilityReason	N	“No”	This flag is used to add the rational for not-authorized productOffering.

Behavior:

- Return status codes
  - 201 OK – the request was successful
  - 400 Bad Request – error, for example to cover these functional error cases:

- Location does not exist

Use case:

Following example is to check commercial eligibility.

Request asks “what product can run through specific service provider”.

REQUEST

POST /api/productOfferingQualification
Accept: application/json
Content-Type: application/json


```
{
  "provideOnlyAvailable": "No",
  "provideUnavailabilityReason": "Yes",
 "channel": "web store",

  "product": {
   “id” : “ADSL_locate_No-#42”,
   “href” : “http..////inventory/ ADSL_locate_No-#42”
  }
  "relatedParty":[

   {

     "role":"customer",

     "id":"345221",

     "href":"http://serverlocation:port/partyManagement/customer/345221",

     "name":"John Doe"

   },
```

```
    {

      "role":"csp",

      "id":"4563",

      "href":"http://serverlocation:port/partnerManagement/partner/4563"
"name":"x service provider"



    }

  ],    "address": {"id": "12345678"},
   "productOfferingQualificationItem": [
{"productOffering": {"category": {"id": "TV Service with Internet play"}}}]
}
```


RESPONSE

201
Content-Type: application/json


```
{
   "id": "42",
   "href": "http::..//productOfferingQualification/42",
   "interactionDate": "20160201 10:00",
   "description": "exmple of a qualification task",
   "eligibilityDate": "20160201 10:00",
   "qualificationState": "Done",
   "product":  {
    “id” : “ADSL_locate_No-#42”,
    “href” :  “http..////inventory/ ADSL_locate_No-#42”
   } ,
"relatedParty":[
```

```
    {

      "role":"customer",

      "id":"345221",

      "href":"http://serverlocation:port/partyManagement/customer/345221",

      "name":"John Doe"

    },

    {

      "role":"csp",

      "id":"4563",

      "href":"http://serverlocation:port/partnerManagement/partner/4563"
"name":"x service provider"



    }
  "provideOnlyAvailable": "No",
  "provideUnavailabilityReason": "Yes",
  "channel": "web store",
  "address": {"id": "12345678"},
  "productOfferingQualificationItem": [{
    "productOffering": {
      "id": "42",
      "href": "http: //serverlocation: port/catalogManagement/productOffering/42",
      "category": {"id": "TVservice with Internet Play"},
      "product": {
        "productSpecification": {
          "id": "13",
```

```
            "href": "http://serverlocation:port/catalogManagement/productSpecification/13",
            "version": "2.0",
            "name": "TVservice with Internet Play"
         },
         "productCharacteristic": [
            {
               "id": "upstreamspeed",
               "value": "1 MBPS"
            },
            {
               "id": "downstreamspeed",
               "value": "6 MBPS"
            }
         ]
      }
   },
   "orderFeasibilityCheck": {"eligibilityResult": "available"}
}]
}
```


GET /api/productOfferingQualification/{ID}/?{filter_and attribute selection}

Description:

This operation is used to retrieve current serviceQualification tasks.

GET operation use if location id is created at other API/system.

Behavior:

- Return status codes
  - 200 OK – the request was successful
  - 400 Bad Request – error, for example to cover these functional error cases:
    - Location is not exist

Use case:

Following example is to check commercial eligibility.

Request asks “can these product run through specific service provider”.

REQUEST

GET /api/productOfferingQualification/42
Accept: application/json

RESPONSE

200
Content-Type: application/json


```
{
   "id": "42",
   "href": "http::..//productOfferingQualification/42",
   "interactionDate": "20160201 10:00",
   "description": "exmple of a qualification task",
   "eligibilityDate": "20160201 10:00",
   "qualificationState": "Done",
   "product":  {
    “id” : “ADSL_locate_No-#42”,
    “href” :  “http..////inventory/ ADSL_locate_No-#42”
   } ,
"relatedParty":[

    {

      "role":"customer",

      "id":"345221",

      "href":"http://serverlocation:port/partyManagement/customer/345221",

      "name":"John Doe"

    },

    {
```

```
        "role":"csp",

        "id":"4563",

        "href":"http://serverlocation:port/partnerManagement/partner/4563"
"name":"x service provider"



    }

  "provideOnlyAvailable": "No",
  "provideUnavailabilityReason": "Yes",
  "channel": "web store",
  "address": {"id": "12345678"},
  "productOfferingQualificationItem": [{
    "productOffering": {
      "id": "42",
      "href": "http: //serverlocation: port/catalogManagement/productOffering/42",
      "category": {"id": "TVservice with Internet Play"},
      "product": {
        "productSpecification": {
          "id": "13",
          "href": "http://serverlocation:port/catalogManagement/productSpecification/13",
          "version": "2.0",
          "name": "TVservice with Internet Play"
        },
        "productCharacteristic": [
          {
            "id": "upstreamspeed",
            "value": "1 MBPS"
          },
          {
            "id": "downstreamspeed",
            "value": "6 MBPS"
          }
        ]
      }
```

```
    },
    "orderFeasibilityCheck": {"eligibilityResult": "available"}
  }]
}
```

API NOTIFICATION

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.

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

UNREGISTER LISTENER DELETE HUB/{ID}

Description:

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

Behavior:

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

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

REQUEST
DELETE /api/hub/{id} Accept: application/json
RESPONSE
204

PUBLISH {EVENTTYPE} POST /LISTENER

Description:

Provide the Event description

Behavior:

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

REQUEST

POST /client/listener
Accept: application/json

```
{

   "event": {

   EVENT BODY
         },
   "eventType": "eventType"
}
```

ACKNOWLEDGMENTS

VERSION HISTORY

Version Number	Date	Modified by	Description
Version 1.0.0	15/04/2016	Pierre Gauthier TM Forum	Final version
Version 1.0.1	17/06/2016	Alicja Kawecki TM Forum	Updated cover; minor formatting/style corrections prior to publishing for Fx16
Version 2.0.0	15/05/2016	Pierre Gauthier TM Forum	Updates for Fx16
Version 2.0.1	17/06/2016	Alicja Kawecki TM Forum	Updated cover; formatting/style corrections prior to publishing for Fx16
Version 2.0.2	04/10/2016	Alicja Kawecki TM Forum	Updated cover and Notice to reflect TM Forum Approved status

RELEASE HISTORY

Release Number	Date	Release led by:	Description
Release 1.0	04/15/2013	Pierre Gauthier TM Forum pgauthier@tmforum.org	First Release of Draft Version of the Document.
Release 1.1			Updated for use in the Paris Spec Jam – and rebranded.

CONTRIBUTORS TO DOCUMENT

This document was prepared by members of the TM Forum API Program team.