Working Draft 1.0

API Developer Guide

Serviceability Management

October 2018

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1. List of Contributing Members

The following members of MEF participated in the development of this document and have requested to be included in this list.

Member Company

Table 1 – Contributing Member Companies

2. Abstract

This API Guide is intended to help software developers to implement the MEF Site API, the MEF Address API, and the MEF Product Offering Qualification API. The API swagger is available on the MEF GitHub. This document covers the following topics:

- Site, Address, and Product Offering Qualification API Resource Models
- Product Offering Qualification Resource Lifecycle
- Product Offering Qualification API Notifications
- Geographic Address, Address Validation, Site, and Product Offering Qualifications JSON Representations
- Description of all API Operations

3. Scope

The scope of this API guide covers the following Serviceability functions:

- Retrieval of a geographic address
- Validating an address.
- Retrieving Site instances based upon a filter of Site attributes
- Retrieving a specific Site instance based upon a Site identifier
- Determining if service can be delivered to a specific customer site within a Partner's domain, based upon a Product Offering Qualification (POQ)
- Retrieving Product Offering Qualification instances based upon a filter of POQ attributes
- Retrieving a specific Product Offering Qualification instance based upon a POQ identifier

4. Compliance and Assumptions

4.1 Product Offering Qualification API

a) Restricted access sites (e.g., Carrier-owned) shall not be under consideration when determining serviceability of a given location.
b) Product Offering Qualification API may or may not use the previously validated Address id from the Address Validation API call or Site id from the Site API call.
c) Quote/Pricing data will not be supported under the POQ API (Quote is managed in another API).
d) Product Offering Qualification is not expected to reserve or guarantee resources.
e) In the "installation interval" in the POQ response, "Business" hours or days reflect Seller's perspective.
f) Seller may have alternatives in parameters beyond what Buyer has requested in the Input (e.g., CoS, Diversity/Protection).

4.2 Site API

a) Site API may or may not use the previously validated Address id from the Address Validation API call or may also take the Address input directly.

4.3 Address API

a) When handling ambiguous, or in-sufficient data, as input, multiple/alternative addresses may be returned.

b) Address API should be able to handle addresses for new development area where a postal address is yet to be assigned. In this case, a geographic (lat/long) or referenced address is recommended.

c) Address Validation shall expect to validate the physical location (either postal address or no postal location, like cell-tower in a field), but the validation specific to either building or at a suite level at a physical location is left to the Seller's discretion, due to variations in the diverse types of Buildings & Products.

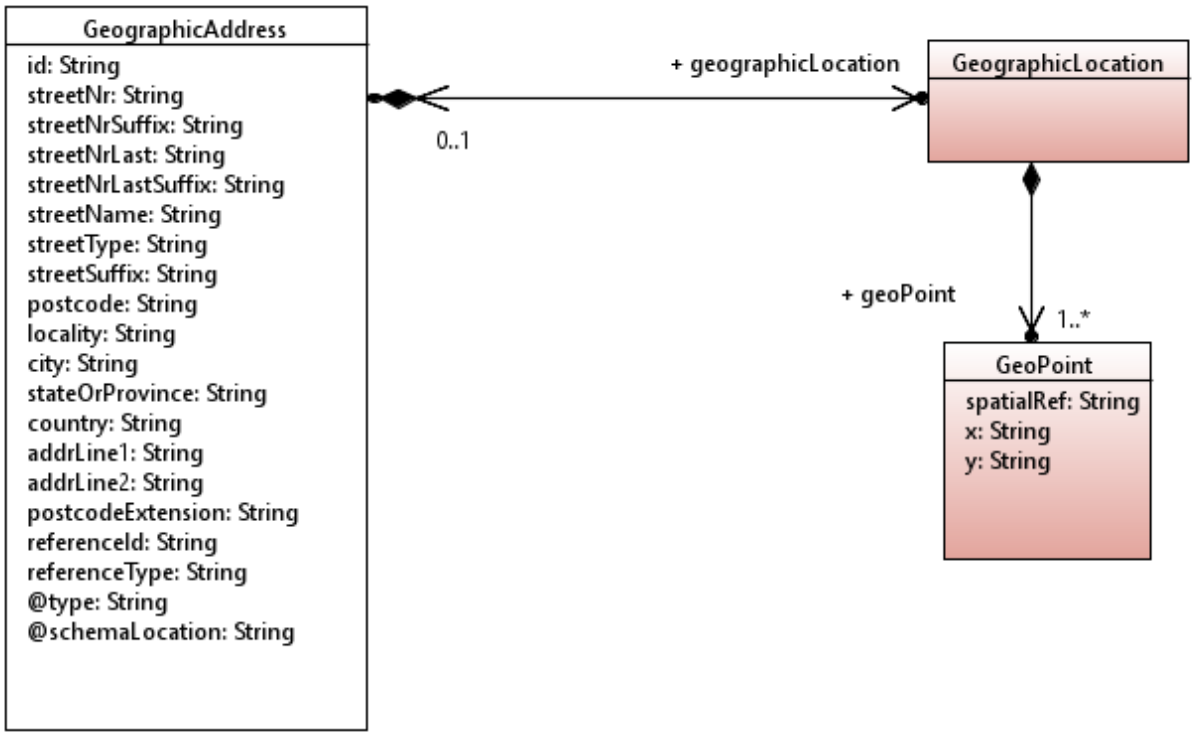
d) The maximum number of suggested alternative addresses to be returned will be determined by the Seller.

158 # 5. Resource Models

159 ## 5.1 Geographic Address Resource Model

160 The Geographic Address REST resource model is as follows:

161



162

163 Figure 1 – GeographicAddress Resource Model

164

165 Color coding scheme:

166 • White box: API main resource

167 • Pink box: API sub resource(s)

168 • Green Boxes : API related/referred resource(s)

169

5.2 Address Validation Resource Model

The Address Validation REST resource model is as follows:

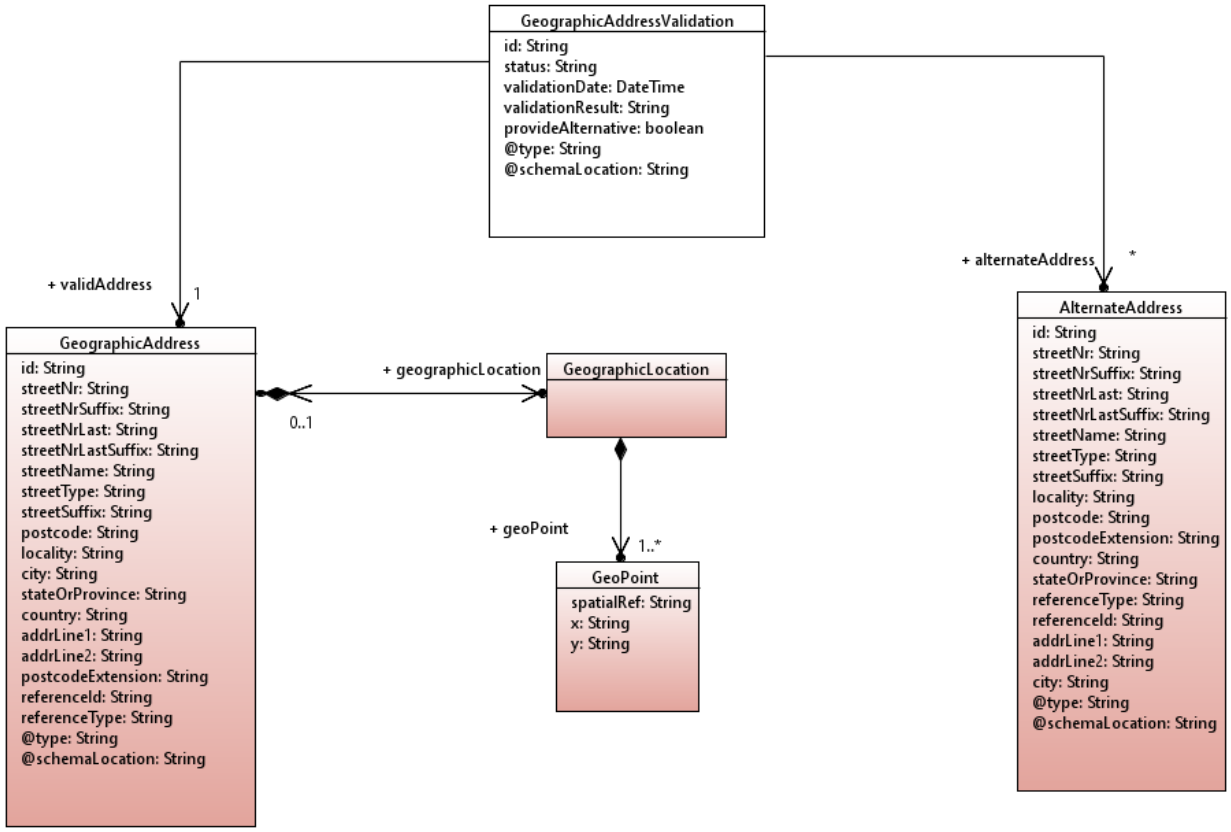


Figure 2 – AddressValidation Resource Model

Color coding scheme:

- White box: API main resource
- Pink box: API sub resource(s)
- Green Boxes : API related/referred resource(s)

5.3 Site Resource Model

The Site REST resource model is as follows:

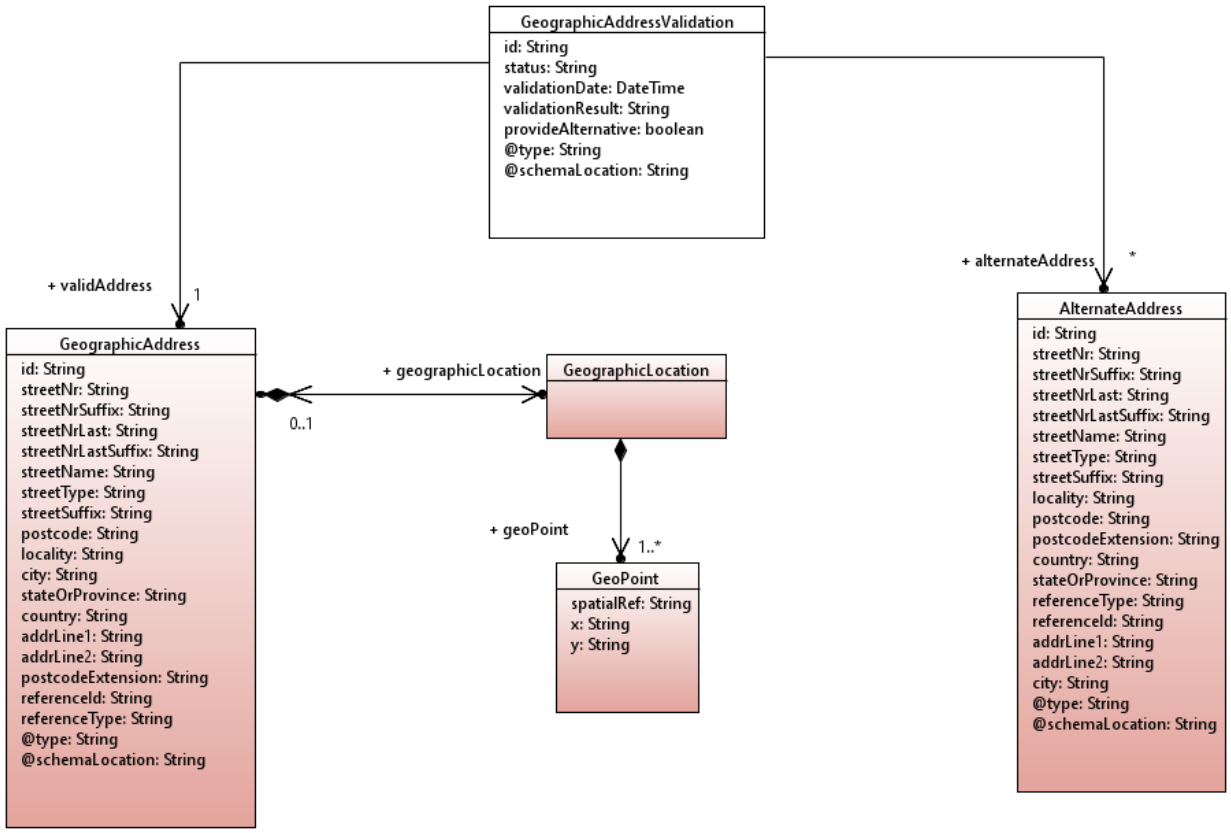


Figure 3 – Site Resource Model

Color coding scheme:

- White box: API main resource
- Pink box: API sub resource(s)
- Green Boxes : API related/referred resource(s)

5.4 Product Offering Qualification Resource Model

The Product Offering Qualification REST resource model is as follows:

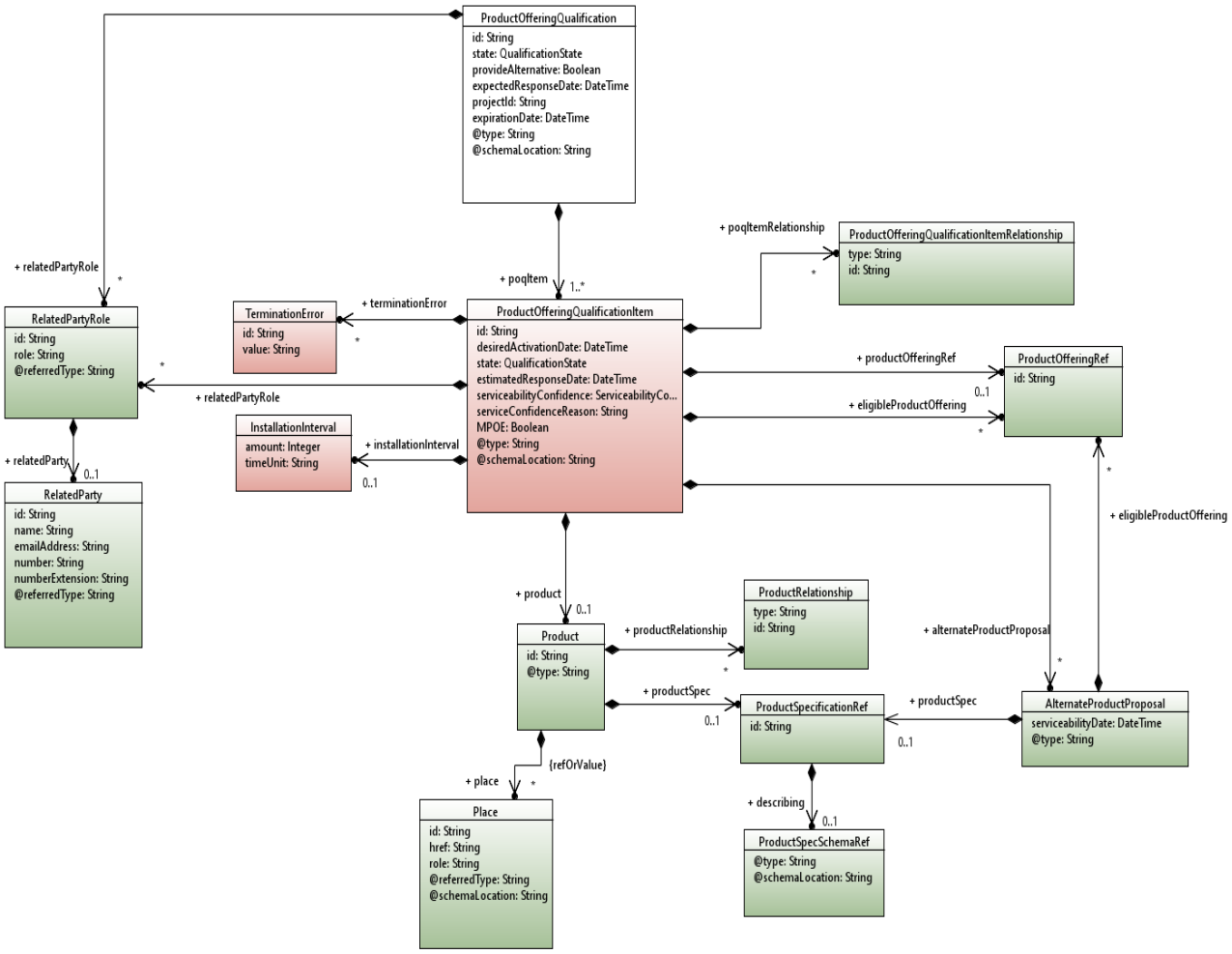


Figure 3 – Product Offering Qualification Resource Model

Color coding scheme:

- White box: API main resource
- Pink box: API sub resource(s)
- Green Boxes : API related/referred resource(s)

6. State Diagrams

6.1 Product Offering Qualification State Machine

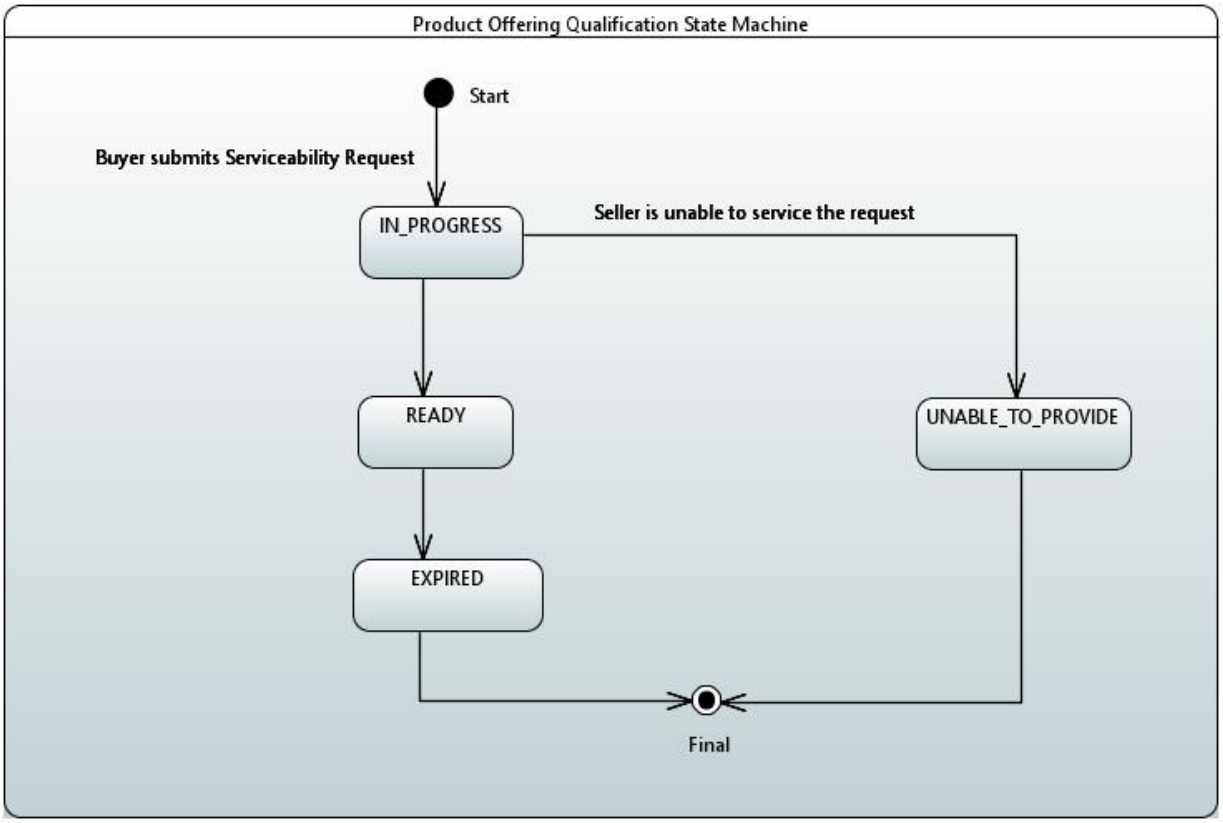


Figure 5 – Product Offering Qualification State Machine

The definitions of the various states are as follows:

State	Description
IN_PROGRESS	The IN_PROGRESS state is when the serviceability request (product offering qualification) is currently in the hands of the Seller.
READY	The READY state is where the product offering qualification has been internally approved by the Seller and sent to the Buyer.
EXPIRED	The Product Offering Qualification has expired.
UNABLE_TO_PROVIDE	This state is set by the Seller when he is unable to provide a product offering qualification.

Table 2 – Product Offering Qualification State Values

6.2 Product Offering Qualification Item State Machine

The Product Offering Qualification Item state diagram is shown below. The state diagram captures various states that the POQ Item goes through in its lifecycle. The specific states are managed by the Seller based on its processing and/or based on Buyer's action.

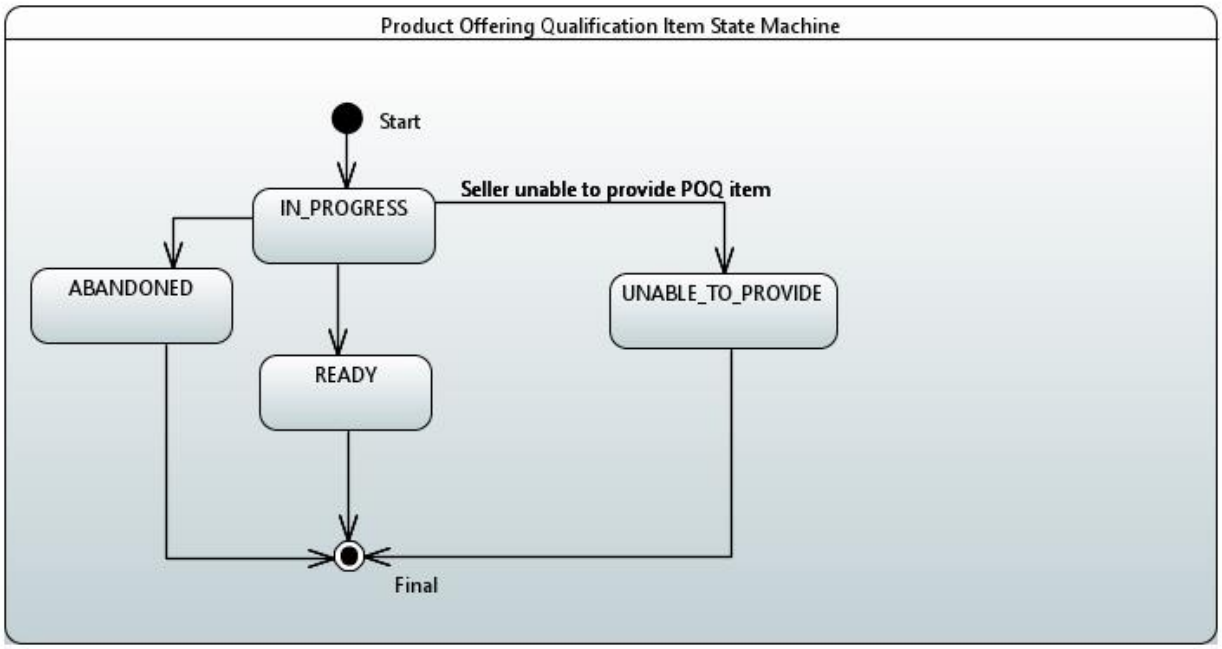


Figure 4 - Product Offering Qualification Item State Machine

The definitions of the various product offering qualification item states are as follows:

State	Description
IN_PROGRESS	The IN_PROGRESS state is when the POQ item is currently in the hands of the SP. The POQ item is under construction and should need more information.
UNABLE_TO_PROVIDE	The UNABLE_TO_PROVIDE state is set on a quote item when the seller cannot provide a product offering qualification for this item.
READY	The READY state is where the POQ item has been internally approved by the Seller.
ABANDONED	The ABANDONED state is applied to POQ items that are in an IN_PROGRESS state when the POQ is moved to a terminal state other than READY.

Table 3 – Product Offering Qualification Item State Values

7. Notifications

The following notifications are supported in this API:

- productOfferingQualificationCreationNotification
- productOfferingQualificationStateChangeNotification
- productOfferingQualificationAttributeChangeNotification

In order to receive a Notification, a Buyer needs

- to subscribe to a notification
- to provide an Event API in order to allow the Seller to POST notifications to him.

7.1 Subscribe to notifications

By doing the following request the Buyer will subscribe to productOfferingQualification state change notifications for his Product Offering Qualifications:

```
POST serverRoot/api/mef/productOfferingQualificationManagement/v1/hub
Accept: application/json
{
        "callback": "http://in.listener.com",
        "query": "eventType = productOfferingQualificationChangeNotification"
}
```

In yellow, this is the address where the Buyer wants to receive the Product Offering Qualification state change notifications.

The response will be:

```
201
{
        "id": "42",
        "callback": "http://in.listener.com",
        "query": "eventType =
productOfferingQualificationStateChangeNotification"
}
```

Note: 42 is the id of a hub resource not a productOfferingQualification id

The Seller provides GET and DELETE operations on a hub resource in order to allow the Buyer to retrieve his hubs and delete any of them if necessary:

```
GET serverRoot/api/mef/productOfferingQualificationManagement/v1/hub
Accept: application/json
```

The API will provide a list of your hubs as in the following example:

```
[
        {
                "id": "42",
                "query":
"eventType=productOfferingQualificationStateChangeNotification",
                "callback": " http://in.listener.com "
        },
        {
                "id": "98",
                "query":
"eventType=productOfferingQualificationAttributeValueChangeNotification",
                "callback": " http://in.listener.com "
        }
]
```

If the Buyer does not want any more notifications for Product Offering Qualification attribute value change:

```
DELETE serverRoot/api/mef/productOfferingQualificationManagement/v1/hub /98
Accept: application/json
```

7.2 Receive Notification

Now that the Buyer has subscribed to notifications for product offering qualification state change for example, let's suppose that a product offering qualification was posted and processed by the Seller. Now let's suppose the product offering qualification state changes. The Seller will POST an Event to the Buyer:

```
POST {callback URL}
{
        "eventType":
"PRODUCT_OFFERING_QUALIFICATION_STATE_CHANGE_NOTIFICATIONn",
        "eventTime": "2014-09-27T05:46:25.0Z",
        "eventId": "92445",
        "event": {
                "productOfferingQualification": {
                        "id": "456987"
                }
        }
}
```

The Buyer will respond with a standard answer with HTTP 201 and event id.

```
201
{
        "id": "123"
}
```

8. JSON Representation Samples

8.1 Geographic Address

The following is a JSON representation of an example of a 'GeographicAddress' resource object.


```
{
        "id": "9090",
        "streetNr": "225",
        "streetNrSuffix": "B",
        "streetName": " Strathmore",
        "streetType": "Terrace",
        "postcode": "5004",
        "city": "Brighton",
        "stateOrProvince": "SA",
        "country": "Australia",
        "geographicLocation": {
                "geoPoint": [
                        {
                                "spatialRef": "WGS84",
                                "x": " 1.430937",
                                "y": " 43.597208"
                        }
                ]
        },
        "@type": "FieldedAddress"
}
```


8.2 Geographic Address Validation

The following are JSON representations of an example of a 'GeographicAddressValidation' resource object ‘qualified’. This qualification result is provided in the attribute `validationResult`

Exhibit 1: Result of validation is successful


```
{
        "id": "125",
        "status": "done",
        "validationDate": "2017-07-11T13:58:24.975Z",
        "validationResult": "SUCCESS",
        "provideaAlternative": true,
        "validAddress": {
                "id": "78963",
                "streetNr": "60",
                "streetName": "Spear",
                "postcode": "94106",
                "city": "San Francisco",
                "stateOrProvince": "CA",
                "country": "US",
                "@type": "FieldedAddress",
                "@schemaLocation": "{MEF Address
Location/FieldedAddress.json"
```

```
            }
}
```

Exhibit 2: Result of validation is partially successful … several addresses match.

Note: Alternate addresses are provided because in the request the submitter sets provideAlternative to true (if false no alternate address is provided)

```
{
        "id": "126",
        "status": "done",
        "validationDate": "2017-07-11T13:58:24.975Z",
        "validationResult": "PARTIAL",
        "provideaAlternative": true,
        "validAddress": {
                "streetNr": "60",
                "streetName": "Spear",
                "postcode": "94106",
                "city": "San Francisco",
                "stateOrProvince": "CA",
                "country": "US",
                "@type": "FieldedAddress",
                "@schemaLocation": " http://wiki.mef.net/pages/..."
        },
        "alternateAddress": [
                {
                        "id": "456987",
                        "streetNr": "60",
                        "streetNrSuffix": "A",
                        "streetName": "Spear",
                        "streetType": "Street",
                        "postcode": "94105",
                        "city": "san Francisco",
                        "stateOrProvince": "CA",
                        "country": "US",
                        "@type": "FieldedAddress",
                        "@schemaLocation": " http://wiki.mef.net/pages/..."
                },
                {
                        "id": "499999",
                        "streetNr": "60",
                        "streetNrSuffix": "B",
                        "streetName": "Spare",
                        "streetType": "Street",
                        "postcode": "94105",
                        "city": "san Francisco",
                        "stateOrProvince": "CA",
                        "country": "US",
                        "@type": "FieldedAddress",
                        "@schemaLocation": " http://wiki.mef.net/pages/..."
                }
        ]
}
```


317 Exhibit 3: Result of validation is failure – no geographic address matches and no alternative is
318 found

```
{
        "id": "127",
        "status": "done",
        "validationDate": "2017-07-11T13:58:24.975Z",
        "validationResult": "FAILS",
        "provideaAlternative": true,
        "validAddress": {
                "id": "78963",
                "streetNr": "60",
                "streetName": "Speart",
                "postcode": "94108",
                "city": "San Francicoso",
                "stateOrProvince": "CA",
                "country": "US",
                "@type": "FieldedAddress",
                "@schemaLocation": " http://wiki.mef.net/pages/..."
        }
}
```


8.3 Geographic Site Resource

The following is a JSON representation of an example of a 'GeographicSite' resource object.

```
{
        "id": "456",
        "description": "Orange equipment in Plano, TX",
        "status": "EXISTING",
        "geographicAddress": {
                "id": "123",
                "streetNr": "45",
                "streetName": "Powell",
                "streetType": "Avenue",
                "city": "Plano",
                "postcode": "54369",
                "stateOrProvince": "TX",
                "country": "US",
                "geographicSubAddress": {
                        "id": "17",
                        "levelNumber": "17",
                        "buildingName": "Beltre Building"
                },
                "@type": "FieldedAddress",
                "@schemaLocation": "http://wiki.mef.net/pages/..."
        },
        "siteName": "Orange Plano",
        "siteCompanyName": "A&M Lease Company",
        "siteCustomerName": "Air France",
        "additionnalSiteInformation": "No comment",
        "@type": "GeographicSite"
}
```


8.4 Product Offering Qualification

The following is a JSON representation of an example of a 'ProductOfferingQualification' resource object.

This example illustrates a ProductOfferingQualification representation (not the POST Request) for new UNI+E-Line

In this example:

- TopBuyer Inc. organization is the buyer
- AwesomeEthernetCompany is the seller
- Buyer did not ask for instantSyncQualification but desires the request to be completed before October 19th, 2018, 12:20am – Seller provided the product offering qualification by October 19th, 2018, 10:34am – the POQ is valid till October 25th, 2018
- The POQItem 1 covers the UNI qualification
    - This item refers to the UNI description provided in the MEF Git Hub
    - The UNI requested place is defined by an addressId (#9090) (This is the geographicAddress illustrated above)
    - UNI Site contact related party roles is provided
    - The result for this POQ item is green
- The orderItem 2 covers the E-Line ordering
    - This item refers to the E-Line description provided in the MEF Git Hub
    - Via the productRelationship the E-Line link to the ENNI is provided.

341 - Via ProductOfferingQualificationItemRelationship the UNI qualified in
342 POQItem1 is used in this E-Line.
343 - The result for this POQ item is green

344

```
{
        "id": "12",
        "href":
"serverRoot/api/mef/productOfferingQualificationManagement/v1/productOffering
Qualification/12",
        "instantSyncQualification": false,
        "state": "READY",
        "provideAlternative": false,
        "requestedResponseDate": "2018-10-19T12:20:48.330Z",
        "expectedResponseDate": "2018-10-19T12:20:48.330Z",
        "effectiveQualificationCompletionDate": "2018-10-19T10:34:49.345Z",
        "expirationDate": "2018-10-25T12:20:48.330Z",
        "projectId": "12-123-2017",
        "relatedPartyRole": [
                {
                        "role": "Buyer",
                        "relatedParty": {
                                "name": "TopBuyer Inc.",
                                "number": "4698521478",
                                "@referredType": "organization"
                        }
                },
                {
                        "role": "Seller",
                        "relatedParty": {
                                "name": "AwesomeEthernetCompany",
                                "number": "+33 54 67 87 64",
                                "@referredType": "organization"
                        }
                },
                {
                        "role": "Buyer ProductOfferingQualification Contact",
                        "relatedParty": {
                                "name": "Jean Pontus",
                                "number": "415 465 7666",
                                "numberExtension": "00",
                                "emailAddress": "jean.pontus@mef.net",
                                "@referredType": "individual"
                        }
                }
        ],
        "productOfferingQualificationItem": [
                {
                        "id": "1",
                        "state": "COMPLETED",
                        "MPOE": true,
                        "serviceabilityConfidence": "GREEN",
                        "serviceConfidenceReason": "checked by Siva himself",
                        "installationInterval": {
                                "amount": 5,
                                "timeUnit": "HOURS"
                        },
                        "desiredActivationDate": "2018-10-25T12:00:00.000Z",
                        "product": {
                                "productSpecificationRef": {
                                        "id": " UNISpec ",
                                        "describing": {
```

```
                                                "@type": "UNIspec",
                                                "@schemaLocation": "{MEF Product
Spec Location/UNISpec "
                                        }
                                },
                                "<<": "This is where product characteristic
values would be given",
                                "accessTechnology": "DSL",
                                "interfaceType": "OPTICAL",
                                "physicalLayer": "10GBASE-SW"
                        },
                        "relatedParty": [
                                {
                                        "name": "Jessie",
                                        "role": "UNI Site Contact",
                                        "numberExtension": "+972",
                                        "number": "4758978555",
                                        "emailAddress": "Jessie@ airfrance.com"
                                }
                        ],
                        "geographicAddress": [
                                {
                                        "id": "9090",
                                        "href":
"serverRoot/api/mef/geographicAddressManagement/v1/geographicaddress/9090",
                                        "role": "UNI Site",
                                        "@referredType": "GeographicAddress"
                                }
                        ]
                },
                {
                        "id": "2",
                        "desiredActivationDate": "2018-10-25T12:00:00.000Z",
                        "state": "COMPLETED",
                        "serviceabilityConfidence": "GREEN",
                        "serviceConfidenceReason": "ENNI checked",
                        "installationInterval": {
                                "amount": 1,
                                "timeUnit": "DAYS"
                        },
                        "product": {
                                "productSpecificationRef": {
                                        "id": "eLineSpec",
                                        "describing": {
                                                "@type": "eLineSpec",
                                                "@schemaLocation": "{MEF Product
Spec Location/accessELineSpec "
                                        },
                                        "productRelationship": [
                                                {
                                                        "type": "RELIES_ON",
                                                        "product": {
                                                                "id": "ENNI67H"
                                                        }
                                                }
                                        ]
                                }
```

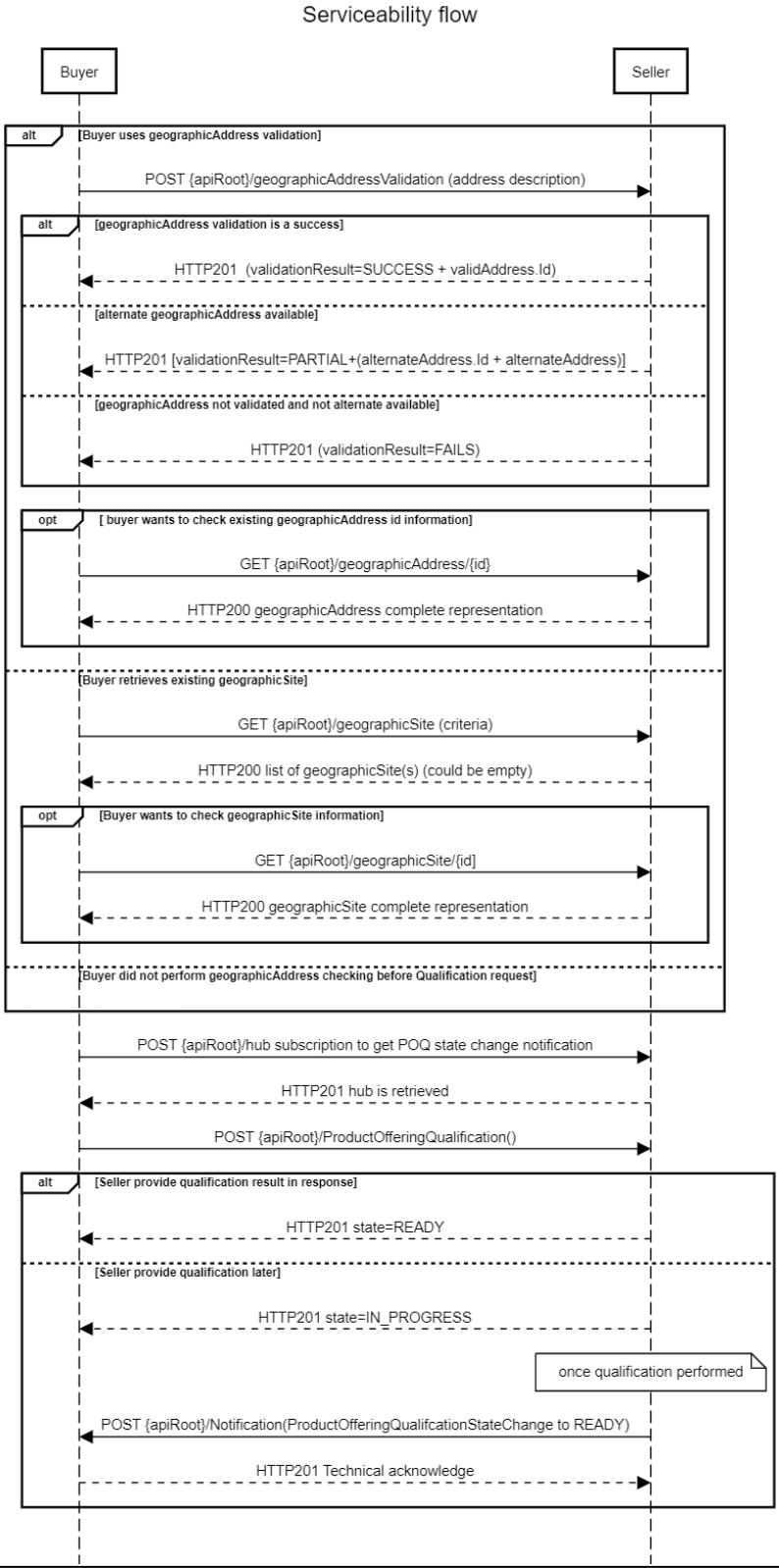
```
                        },
                        "<<": "This is where product characteristic values
would be given.",
                        "mtuSize": 1522,
                        "colorForwardingEnabled": true,
                        "productOfferingQualificationItemRelationship": [
                                {
                                        "type": "RELIES_ON",
                                        "id": "1"
                                }
                        ]
                }
        ]
}
```


345

346

9. API Interactions

9.1 Sequence Diagram



9.2 Operations

9.2.1 Retrieve Geographic Address

`GET serverRoot/api/mef/geographicAddressManagement/v1//geographicAddress/{id}`

Description

This operation is used to retrieve a geographic address entity.

Behavior

- Returns HTTP/1.1 status code 200 if the request was successful

Otherwise:

401	Unauthorized
403	Forbidden
404	Not Found
405	Method Not Allowed
408	Request Time-out

Usage Sample

Request:

```
GET serverRoot/api/mef/geographicAddressManagement/v1/geographicAddress/9090
Accept: application/json
```

Response:

```
{
        "id": "9090",
        "streetNr": "225",
        "streetNrSuffix": "B",
        "streetName": " Strathmore",
        "streetType": "Terrace",
        "postcode": "5004",
        "city": "Brighton",
        "stateOrProvince": "SA",
        "country": "Australia",
        "geographicLocation": {
                "geoPoint": [
                        {
                                "spatialRef": "WGS84",
                                "x": "1.430937",
                                "y": "43.597208"
                        }
                ]
        },
        "@type": "FieldedAddress",
        "@schemaLocation": " http://wiki.mef.net/pages/..."
}
```


9.2.2 Create Geographic Address Validation

`POST serverRoot/api/mef/geographicAddressManagement/v1/addressValidation`

Description

This operation creates a geographic address validation entity

Behavior

- Standard 201 response if address validation entity is created

Otherwise:

400	Bad Request
401	Unauthorized
403	Forbidden
405	Method Not Allowed
408	Request Time-out
422	Unprocessable entity

Note:

This API could be used only in a synchronous context. The API Supplier will provide on the fly the requested information in the POST response.

The validAddress structure is used in the POST request by the buyer to enter the address to be validated. This validAddress is expected in the response even if the address is not validated (validation fails).

Usage Sample

Request:

```
POST serverRoot/api/mef/geographicAddressManagement/v1/addressValidation
Content-Type: application/json
{
        "provideAlternative": true,
        "validAddress": {
                "streetNr": "60",
                "streetName": "Spear",
                "postcode": "94106",
                "city": "San Francisco",
                "stateOrProvince": "CA",
                "country": "US"
        }
}
```

Response:

```
201
{
        "id": "125",
        "status": "done",
        "validationDate": "2017-07-11T13:58:24.975Z",
        "validationResult": "partial",
        "provideAlternative": true,
        "validAddress": {
                "id": "78963",
                "streetNr": "60",
                "streetName": "Spear",
                "postcode": "94106",
                "city": "San Francisco",
                "stateOrProvince": "CA",
                "country": "US",
                "@type": "FieldedAddress"
        }
}
```

9.2.3 Retrieve Geographic Sites

```
GET
serverRoot/api/mef/geographicAddressManagement/v1/geographicSite?{filtering}
```

Description

This operation is used to retrieve geographic site(s) corresponding to search criteria.

The response will provide a geographic site summary.

Only the following attributes can be used as search criteria.

- status
- siteCompanyName
- siteCustomerName
- geographicAddress.streetNr
- geographicAddress.streetName
- geographicAddress.streetType
- geographicAddress.city
- geographicAddress.postcode
- geographicAddress.country

Only the following attributes will be retrieved in a summary view:

- id
- status
- siteCustomerName
- siteCompanyName
- geographicAddress.streetNr
- geographicAddress.streetName
- geographicAddress.streetType
- geographicAddress.city
- geographicAddress.postcode
- geographicAddress.country

Behavior

- Returns HTTP/1.1 status code 200 if the request was successful

Otherwise:

400	Bad Request
401	Unauthorized
403	Forbidden
405	Method Not Allowed
408	Request Time-out
422	Unprocessable entity 422 is used for returning: **Too many records retrieved - please restrict requested parameter value(s)**

410 **Usage Sample**

411 **Request:**

```
GET
serverRoot/api/mef/siteManagement/v1/site?state=EXISTING&city=Paris&siteCusto
merName=Bank of America&country=France
Accept: application/json
```

412 **Response:**

```
200
[
        {
                "id": "10",
                "status": "EXISTING",
                "siteCompanyName": "Régie Française des Batiments",
                "siteCustomerName": "Bank of America",
                "geographicAddress": {
                        "streetNr": "45",
                        "streetName": "Champs-Elysées",
                        "streetType": "Avenue",
                        "city": "Paris",
                        "postcode": "75002",
                        "country": "France"
                }
        },
        {
                "id": "986",
                "siteName": " BOA Paris Montparnasse ",
                "status": "EXISTING",
                "siteCompanyName": " BOA Paris Tour Montparnasse ",
                "siteCustomerName": " Bank of America ",
                "geographicAddress": {
                        "streetNr": "1",
                        "streetName": "Montparnasse",
                        "streetType": "Avenue",
                        "city": "Paris",
                        "postcode": "75006",
                        "country": "France"
                }
        }
]
```

413

414 9.2.4 Retrieve a Single Site by Site Identifier

415 `GET serverRoot/api/mef/siteManagement/v1/site/{id}`

416 **Description**

417 This operation is used to retrieve a site entity.

418 **Behavior**

419 • Returns HTTP/1.1 status code 200 if the request was successful

420 Otherwise:

400	Bad Request
401	Unauthorized
403	Forbidden
405	Method Not Allowed
408	Request Time-out

421 **Usage Sample**

422 **Request:**

```
GET serverRoot/api/mef/siteManagement/v1/site/456
Accept: application/json
```

423

424 Response:

```
{
        "id": "456",
        "siteName": "Orange Plano",
        "description": "Orange equipment in Plano, TX",
        "status": "EXISTING",
        "geographicAddress": {
                "id": "123",
                "streetNr": "45",
                "streetName": "Powell",
                "streetType": "Avenue",
                "city": "Plano",
                "postcode": "54369",
                "stateOrProvince": "TX",
                "country": "US",
                "geographicSubAddress": {
                        "id": "17",
                        "levelNumber": "17",
                        "buildingName": "Beltre Building"
                },
                "postCodeExtension": "77"
        },
        "siteCompanyName": "A&M Lease Company",
        "siteCustomerName": "Air France",
        "additionnalSiteInformation": "No comment",
        "@type": "MEFSite"
}
```


9.2.5 Retrieve a Single Product Offering Qualification by Identifier

`GET /productOfferingQualification/{id}`

Description

This operation is used to retrieve a ProductOfferingQualification entity.

Behavior

- Returns HTTP/1.1 status code 200 if the request was successful

Otherwise:

400	Bad Request
401	Unauthorized
403	Forbidden
404	Not Found
405	Method Not Allowed
408	Request Time-out

433 **Usage Sample**

434 Same UC than JSON representation provided above

435 **Request:**

```
GET /productOfferingQualificationManagement/productOfferingQualification/12
Accept: application/json
```

436 **Response:**

```
{
        "id": "12",
        "href":
"serverRoot/api/mef/productOfferingQualificationManagement/v1/productOffering
Qualification/12",
        "instantSyncQualification": false,
        "state": "READY",
        "provideAlternative": false,
        "requestedResponseDate": "2018-10-19T12:20:48.330Z",
        "expectedResponseDate": "2018-10-19T12:20:48.330Z",
        "effectiveQualificationCompletionDate": "2018-10-19T10:34:49.345Z",
        "expirationDate": "2018-10-25T12:20:48.330Z",
        "projectId": "12-123-2017",
        "relatedPartyRole": [
                {
                        "role": "Buyer",
                        "relatedParty": {
                                "name": "TopBuyer Inc.",
                                "number": "4698521478",
                                "@referredType": "organization"
                        }
                },
                {
                        "role": "Seller",
                        "relatedParty": {
                                "name": "AwesomeEthernetCompany",
                                "number": "+33 54 67 87 64",
                                "@referredType": "organization"
                        }
                },
                {
                        "role": "Buyer ProductOfferingQualification Contact",
                        "relatedParty": {
                                "name": "Jean Pontus",
                                "number": "415 465 7666",
                                "numberExtension": "00",
                                "emailAddress": "jean.pontus@mef.net",
                                "@referredType": "individual"
                        }
                }
        ],
        "productOfferingQualificationItem": [
                {
                        "id": "1",
                        "state": "COMPLETED",
                        "MPOE": true,
                        "serviceabilityConfidence": "GREEN",
                        "serviceConfidenceReason": "checked by Siva himself",
                        "installationInterval": {
                                "amount": 5,
                                "timeUnit": "HOURS"
                        },
                        "desiredActivationDate": "2018-10-25T12:00:00.000Z",
                        "product": {
                                "productSpecificationRef": {
                                        "id": " UNISpec ",
                                        "describing": {
```

```
                                                "@type": "UNIspec",
                                                "@schemaLocation": "{MEF Product
Spec Location}/UNISpec "
                                        }
                                },
                                "<<": "This is where product characteristic
values would be given.",
                                "accessTechnology": "DSL",
                                "interfaceType": "OPTICAL",
                                "physicalLayer": "10GBASE-SW"
                        },
                        "relatedParty": [
                                {
                                        "name": "Jessie",
                                        "role": "UNI Site Contact",
                                        "numberExtension": "+972",
                                        "number": "4758978555",
                                        "emailAddress": "Jessie@ airfrance.com"
                                }
                        ],
                        "geographicAddress": [
                                {
                                        "id": "9090",
                                        "href":
"serverRoot/api/mef/geographicAddressManagement/v1/geographicaddress/9090",
                                        "role": "UNI Site",
                                        "@referredType": "GeographicAddress"
                                }
                        ]
                },
                {
                        "id": "2",
                        "desiredActivationDate": "2018-10-25T12:00:00.000Z",
                        "state": "COMPLETED",
                        "serviceabilityConfidence": "GREEN",
                        "serviceConfidenceReason": "ENNI checked",
                        "installationInterval": {
                                "amount": 1,
                                "timeUnit": "DAYS"
                        },
                        "product": {
                                "productSpecificationRef": {
                                        "id": "eLineSpec",
                                        "describing": {
                                                "@type": "eLineSpec",
                                                "@schemaLocation": "{MEF Product
Spec Location/accessELineSpec "
                                        },
                                        "productRelationship": [
                                                {
                                                        "type": "RELIES_ON",
                                                        "product": {
                                                                "id": "ENNI67H"
                                                        }
                                                }
                                        ]
                                }
```

```
                        },
                        "<<": "This is where product characteristic values
would be given.",
                        "mtuSize": 1522,
                        "colorForwardingEnabled": true,
                        "productOfferingQualificationItemRelationship": [
                                {
                                        "type": "RELIES_ON",
                                        "id": "1"
                                }
                        ]
                }
        ]
}
```

437

438 ### 9.2.6 Retrieve Product Offering Qualifications

439 `GET`
440 `serverRoot/api/mef/productOfferingqualificationManagement/v1/productOfferingQ`
441 `ualification?{filtering}`

442 **Description**

443 This operation is used to retrieve ProductOfferingQualification(s) corresponding to search
444 criteria.

445 Only the following attributes can be used as search criteria.

446 • state
447 • expectedResponseDate
448 • projectId

449 Only following attributes will be retrieved in a summary view:

450 • id
451 • state
452 • expectedResponseDate
453 • projectId

454 **Behavior**

455 • Returns HTTP/1.1 status code 200 if the request was successful

456 Otherwise:

400	Bad Request

401	Unauthorized
403	Forbidden
405	Method Not Allowed
408	Request Time-out
422	Unprocessable entity 422 is used for returning: **Too many records retrieved - please restrict requested parameter value(s)**

457 **Usage Sample**

458 **Request:**

```
GET
rootServer/api/mef/productOfferingQualificationManagement/v1/productOfferingQ
ualification?projectId=Air France
Accept: application/json
```

459

460 **Response:**

```
200
[
        {
                "id": "145",
                "state": "EXPIRED",
                "expectedResponseDate": "2017-07-20",
                "projectId": " Air France "
        },
        {
                "id": "123",
                "state": "READY",
                "expectedResponseDate": "2017-07-25",
                "projectId": " Air France "
        },
        {
                "id": "214",
                "state": "READY",
                "expectedResponseDate": "2017-08-02",
                "projectId": " Air France "
        },
        {
                "id": "12",
                "state": "IN_PROGRESS",
                "expectedResponseDate": "2016-09-25",
                "projectId": " Air France "
        }
]
```

9.2.7 Create Product Offering Qualification

```
POST serverRoot/mef/api/productOfferingQualificationManagement/v1/
productOfferingQualification
```

Description

This operation creates a product offering qualification entity.

Behavior

- Standard 201 response if product order created

Otherwise:

400	Bad Request
401	Unauthorized
403	Forbidden
405	Method Not Allowed
408	Request Time-out
422	Unprocessable entity (see below)

Specific business errors will be encapsulated in HTTP Response 422 Unprocessable entity:

- 100: A relatedParty – at productOfferingQualification level – with a role 'Buyer' must be provided
- 101: A least a productOffering OR a productSpecification OR a Product must be provided for a POQItem

Note:

This API could be used in a synchronous or asynchronous context. If the Buyer wants to have a sync qualification, he has to set instantSyncQualification to true.

If the Seller is able – on the fly – to provide the requested information, it is provided in the POST response. If not, when the Seller performs the qualification he will trigger a notification to the Buyer (assuming the Buyer has subscribed to receive notifications) to let him know that the productOfferingQualification is READY. If the Buyer did not subscribe to notifications, the Buyer has to poll at expectedCompletionDate time to get the qualification results.

This API could also be used to qualify change on an existing product. In this case the product.id must be filled with the inventory seller id for the product (retrievable through the inventory API). The instantiated productSpec characteristic value is the targeted one. This UC is not illustrated in the JSON of this guide.

Usage Sample

487 **Request:**

```
{
        "instantSyncQualification": false,
        "provideAlternative": false,
        "requestedResponseDate": "2018-10-19T12:20:48.330Z",
        "projectId": "12-123-2017",
        "relatedPartyRole": [
                {
                        "role": "Buyer",
                        "relatedParty": {
                                "name": "TopBuyer Inc.",
                                "number": "4698521478",
                                "@referredType": "organization"
                        }
                },
                {
                        "role": "Seller",
                        "relatedParty": {
                                "name": "AwesomeEthernetCompany",
                                "number": "+33 54 67 87 64",
                                "@referredType": "organization"
                        }
                },
                {
                        "role": "Buyer ProductOfferingQualification Contact",
                        "relatedParty": {
                                "name": "Jean Pontus",
                                "number": "415 465 7666",
                                "numberExtension": "00",
                                "emailAddress": "jean.pontus@mef.net",
                                "@referredType": "individual"
                        }
                }
        ],
        "productOfferingQualificationItem": [
                {
                        "id": "1",
                        "MPOE": true,
                        "serviceabilityConfidence": "GREEN",
                        "serviceConfidenceReason": "checked by Siva himself",
                        "installationInterval": {
                                "amount": 5,
                                "timeUnit": "HOURS"
                        },
                        "desiredActivationDate": "2018-10-25T12:00:00.000Z",
                        "product": {
                                "productSpecificationRef": {
                                        "id": " UNISpec ",
                                        "describing": {
                                                "@type": "UNIspec",
                                                "@schemaLocation": "{MEF Product
Spec Location}/UNISpec "
                                        }
                                },
                                "<<": "This is where product spec
characteristic values would be given",
                                "accessTechnology": "DSL",
                                "interfaceType": "OPTICAL",
```

```
                                "physicalLayer": "10GBASE-SW"
                        },
                        "relatedParty": [
                                {
                                        "name": "Jessie",
                                        "role": "UNI Site Contact",
                                        "numberExtension": "+972",
                                        "number": "4758978555",
                                        "emailAddress": "Jessie@ airfrance.com"
                                }
                        ],
                        "geographicAddress": [
                                {
                                        "id": "9090",
                                        "href":
"serverRoot/api/mef/geographicAddressManagement/v1/geographicaddress/9090",
                                        "role": "UNI Site",
                                        "@referredType": "GeographicAddress"
                                }
                        ]
                },
                {
                        "id": "2",
                        "desiredActivationDate": "2018-10-25T12:00:00.000Z",
                        "serviceabilityConfidence": "GREEN",
                        "serviceConfidenceReason": "ENNI checked",
                        "installationInterval": {
                                "amount": 1,
                                "timeUnit": "DAYS"
                        },
                        "product": {
                                "productSpecificationRef": {
                                        "id": "eLineSpec",
                                        "describing": {
                                                "@type": "eLineSpec",
                                                "@schemaLocation": "{MEF Product
Spec Location}/accessELineSpec "
                                        },
                                        "productRelationship": [
                                                {
                                                        "type": "RELIES_ON",
                                                        "product": {
                                                                "id": "ENNI67H"
                                                        }
                                                }
                                        ]
                                }
                        },
                        "<<": "This is where product spec characteristic values
would be given ",
                        "mtuSize": 1522,
                        "colorForwardingEnabled": true,
                        "productOfferingQualificationItemRelationship": [
                                {
                                        "type": "RELIES_ON",
                                        "id": "1"
                                }
```

```
                        ]
                    }
            ]
}
```

488 **Response:**

```
201
{
  "id": "12"
….
///complete productOfferingQualification representation //

}
```

489

10. Appendix – Product Specification Management in the API

The productOfferingQualification API is product-agnostic. The product specification information is managed with an API extension pattern. This pattern allows distinguishing 2 types of data:

- Catalog information: What are the product specification attributes? What is the attribute format? What is the cardinality of each attribute? In case of a predefined list, what are the values?
- Qualification-instantiated productSpec description: What are the attributes values for this productOffering qualification? These values should be filled accordingly to catalog information.

The pattern to describe the data is described in the following 3 steps:

Step 1: Identifying the productSpec

Basically, let's assume a productOfferingQualifcationItem is describing the productOffering Qualifcation of a productSpecification .

The first thing is to identify this productSpecification for the seller by means of an *identifier* (this id is the catalog id of the productSpec for the seller). This id should have been communicated by the seller to the buyer during the on-boarding process between the service provider and the partner (or on-the-fly accessible with a catalog API).

Then we need to provide additional information to retrieve catalog information used to describe this productSpec:

- @type – This is the type of productSpec as defined in the MEF. In the example, id and @type have same value but nothing prevents a service provider to have id AZ45hT7 as a productSpec knows a UNISpec in the MEF.
- @schemaLocation describes a URL … and this URL targets the MEF server. Following this URL we have a JSON describing the productSpec. We have there the catalog view of the product spec

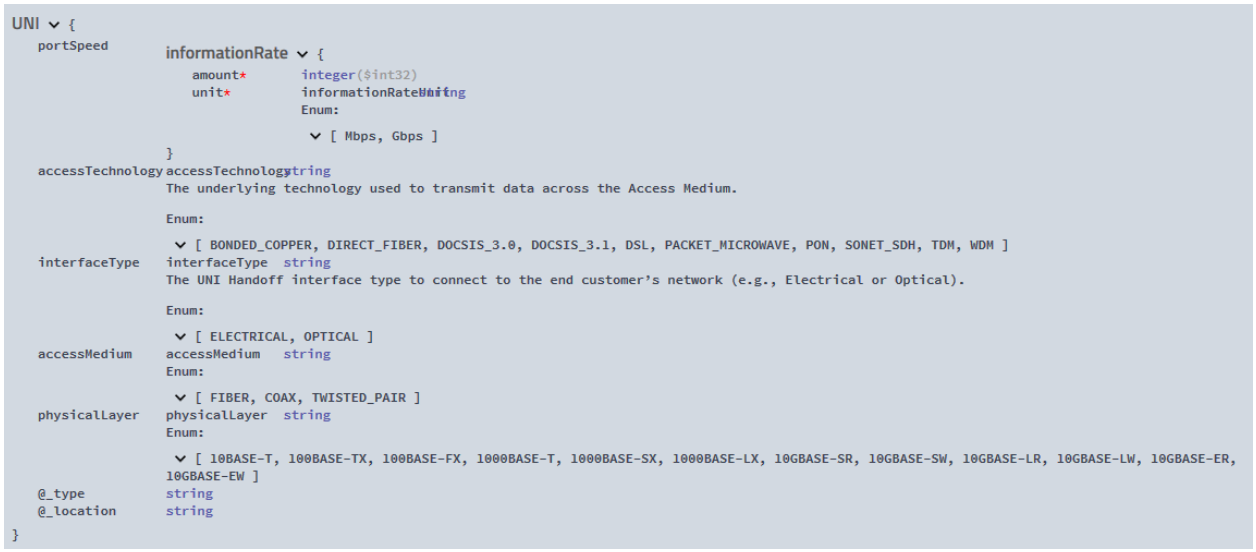
- @baseType – is an additional information (optional) to indicate the productSpec category type

@type and @schemaLocation are mandatory information to be filled in the order item.

Step 2: Getting the productSpec description

If we follow the link indicated in the @schemaLocation we reach a JSON file stored in the MEF server where the serviceability productSpec catalog description is available. The buyer uses this description to describe the qualification and describe the 'to-be-qualified' product.

We have the following information for the UNI Spec:



We note also there that we have @type and @location attributes. These attributes could be optionally used by a service provider to enrich the productSpec with additional attribute specific to this service provider. Use of this extension must be agreed during the on-boarding process between the service provider and the partner.

Step 3: Describing the 'to-be-qualified' productSpec

The buyer uses the productSpec Description (step 2) to describe the instance of the 'to-be-qualified' productSpec. This description is done in a straightforward way with the list of attributes and values directly described in the product structure (described in Orange below).

```
"productOfferingQualificationItem":[
  {
    "id":"1",
    "desiredActivationDate":"2017-07-20",
    "product":{
      "productSpecificationRef":{
        "id":" UNISpec ",
        "describing":{
          "@type":"UNISPEC",
          "@schemaLocation":" http://mef/productSpec/qualification/UNISpec "
        },
        "portSpeed":{
          "amount":10,
          "unit":"Mbps"
        },
        "accessTechnology":"DIRECT_FIBER",
        "interfaceType":"ELECTRICAL",
        "accessMedium":"FIBER"
      }
```

534

535