TM Forum Specification

Geographic Address Management API REST Specification

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NOTICE

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INTRODUCTION

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

The Geographic Address Management API provides a standardized client interface to an Address management system.

It allows looking for worldwide addresses.

It can also be used to validate geographic address data, to be sure that it corresponds to a real geographic address.

Finally, it can be used to look for a geographic address by: searching an area as a start (city, town …), then zooming on the streets of this area, and finally listing all the street segments (numbers) in a street.

SAMPLE USE CASES

Reader will find example of use cases using Usage API in "Open Digital Business Scenarios and Use Cases" document.

RESOURCE MODEL

Managed Entity and Task Resource Models

GEOGRAPHIC ADDRESS RESOURCE

Structured textual way of describing how to find a Property in an urban area (country properties are often defined differently).

International address format compliance: The data model included in this API corresponds to the UrbanPropertyAddress Class defined in SID (under Common Business Entities Domain::Location ABE::Geographic Place ABE::Geographic Address ABE), that can be extended (as it is in SID) to other classes such as JapanesePropertyAddress, AustralianPropertyAddress that can include specific elements in the data model.

Formatted address compliance: in a same way that all international address, formatted address could be managed with @type and @schemaLocation extension pattern.

Resource model
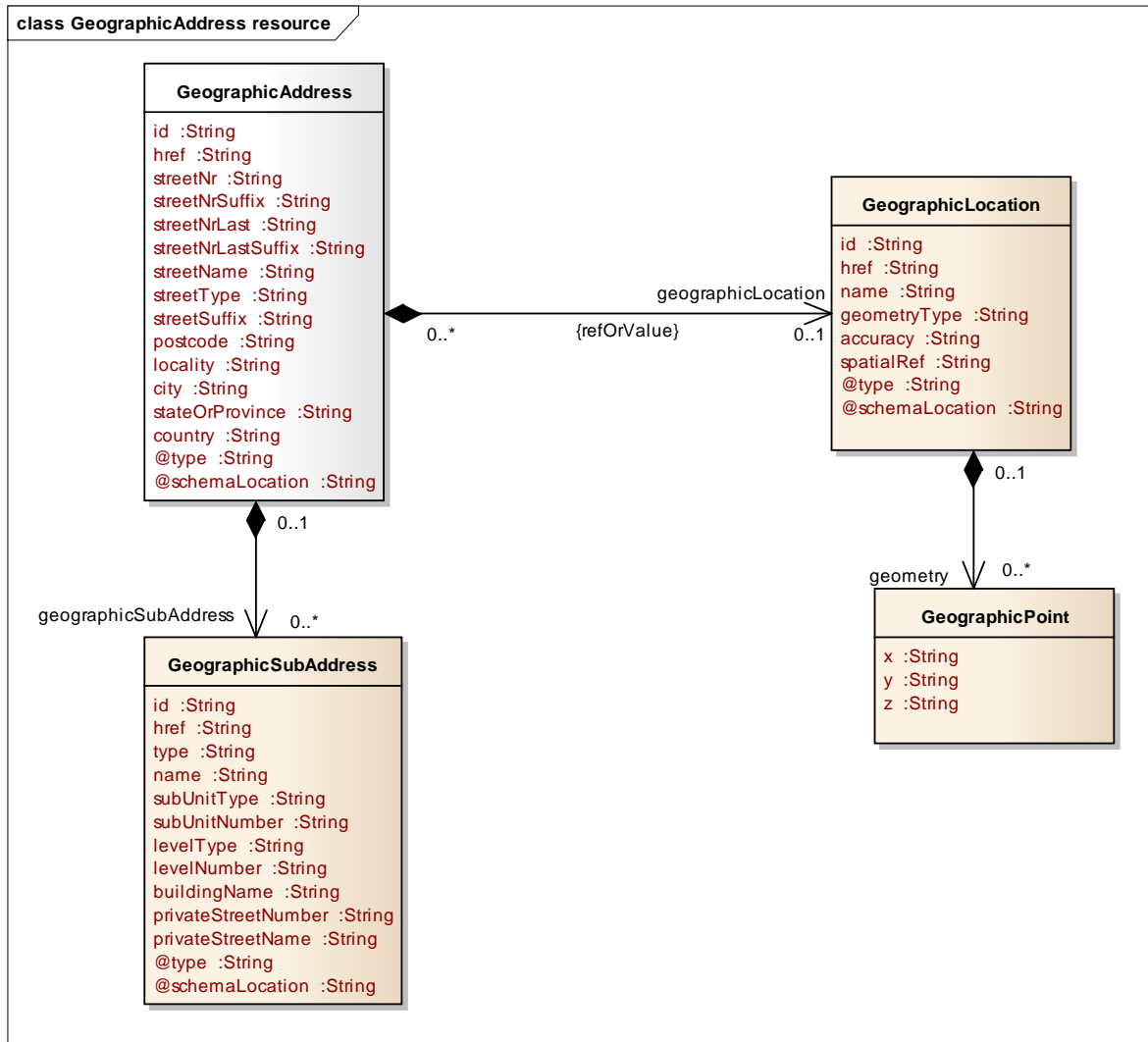
Lifecycle

No state machine for the resources detailed in this API

Field descriptions

Address fields

Field	Description
id	A string. Unique identifier of the geographic address.
href	A string. An URI used to access to the geographic address resource.
streetNr	A string. Number identifying a specific property on a public street. It may be combined with streetNrLast for ranged addresses.
streetNrSuffix	A string. The first street number suffix.
streetNrLast	A string. Last number in a range of street numbers allocated to a property.
streetNrLastSuffix	A string. Last street number suffix for a ranged address.
streetName	A string. Name of the street or other street type.

Field	Description
streetType	A string. Alley, avenue, boulevard, brae, crescent, drive, highway, lane, terrace, parade, place, tarn, way, wharf.
streetSuffix	A string. A modifier denoting a relative direction.
postcode	A string. Descriptor for a postal delivery area, used to speed and simplify the delivery of mail (also known as zipcode).
locality	A string. "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 " [ANZLICSTREET].
city	A string. City that the geographic address is in.
stateOrProvince	A string. The State or Province that the geographic address is in.
country	A string. Country that the geographic address is in.
@type	A string. Indicates the type of the resource. Here can be 'UrbanPropertyAddress', 'FormattedAddress', 'JapanesePropertyAddress' , 'AustralianPropertyAddress', etc…
@schemaLocation	A string. A Link to the schema describing this REST Resource. The resource described 'UrbanPropertyAddress' but a schema could be used for other property address description.
geographicLocation	A geographic location reference or description. It allows describing through coordinate(s) a point, a line or a space.
geographicSubAddress	A list of geographic sub addresses (GeographicSubAddress [*]). Representation of a GeographicSubAddress It is used for addressing within a property in an urban area (country properties are often defined differently). It may refer to a building, a building cluster, or a floor of a multistory building.

GeographicLocation sub-resource

A geographicLocation allows referring a geographicLocation through an id, or, describing through coordinate(s) a point, a line or a space.

Field	Description
id	A string. Unique Identifier of a GeographicLocation.
href	A string. href of the GeographicLocation.
name	A string. Name of a GeographicLocation.
geometryType	A string. Type allows describing Geographic Location form: it could be a point, a line, a polygon, a cylinder, etc....
accuracy	A string. Accuracy of the coordinate specified.
spatialRef	A string. Geocoding referential.
@type	A string. Indicates the type of resource
@schemaLocation	A string. A link to the schema describing this REST Resource
geometry	A list of geographic points (GeographicPoint [*]). A GeographicPoint defines a geographic point through coordinates.

GeographicPoint sub-resource

A GeographicPoint defines a geographic point through coordinates.

Field	Description
x	A string. x coordinate (usually latitude).
y	A string. y coordinate (usually longitude).
z	A string. z coordinate (usually elevation).

Note about multiple geographicPoint: The multiple points refer to the possibility that an address is not defined only by a single point (typically coordinates) but by the boundary defined by a set of points defining the area that forms the shape of the place defined by that address. Since most of the cases a single point would be enough (coordinates), it may be helpful to also define an optional element to define the coordinates when the geometry is not to be used.

GeographicSubAddress sub-resource

Representation of GeographicSubAddress
It is used for addressing within a property in an urban area (country properties are often defined differently). It may refer to a building, a building cluster, or a floor of a multistory building.

Field	Description
id	A string. Unique Identifier of the geographicSubAddress.
href	A string. Href of the geographicSubAddress.
type	A string. Type of geographicSubAddress: it can be a subunit or a private street.
name	A string. Name of the geographicSubAddress to identify it with a meaningful identification.
subUnitType	A string. The type of subunit e.g.BERTH, FLAT, PIER, SUITE, SHOP, TOWER, UNIT, WHARF.
subUnitNumber	A string. The discriminator used for the subunit often just a simple number e.g. FLAT 5, may also be a range.
levelType	A string. Describes level types within a building.
levelNumber	A string. Used where a level type may be repeated e.g. BASEMENT 1, BASEMENT 2.
buildingName	A string. Allows for buildings that have well-known names.
privateStreetNumber	A string. Private streets numbers internal to a private street.
privateStreetName	A string. Private streets internal to a property (e.g. a university) may have internal names that are not recorded by the land title office.
@type	A string. Type of the resource for this subAdress
@schemaLocation	A string. A link to the schema describing this REST Resource

Json representation sample

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

```
{
    "id": "9090",
    "href": "https://host:port/location/geographicAddress/9090",
    "streetNr": "225",
    "streetNrSuffix": "B",
    "streetNrLast": "",
    "streetNrLastSuffix": "",
    "streetName": " Strathmore",
    "streetType": "Terrace",
```

```
      "streetSuffix": "",
      "postcode": "5004",
      "locality": "Brighton.",
      "city": "Brighton",
      "stateOrProvince": "SA",
      "country": "Australia",
      "@type": "UrbanPropertyAddress ",
      "geographicLocationRefOrValue":[
    {
       "id": "3251",
       "href": "https://host:port/location/geographicLocation/3251"
    },
    {
       "id": "4164",
       "href": "https://host:port/location/geographicLocation/4164",
       "name": "ExactPlace",
       "geometryType": "point",
       "accuracy": "",
       "spatialRef": "WGS84",
       "@type": "GeographicLocation",
       "geometry": [
         {
            "x": " 1.430937",
            "y": " 43.597208",
            "z": ""
         }
       ]
     }
    ],
    "geographicSubAddress": [
      {
        "id": "3833",
        "href": "https://host:port/location/geographicSubAddress/3833",
        "type": "SubUnit",
        "name": "Flat 39",
        "subUnitType": "flat",
        "subUnitNumber": "39",
        "levelType": "floor",
        "levelNumber": "3",
        "buildingName": "Jean Pontus Building",
        "privateStreetNumber": "",
        "privateStreetName": "",
        "@type": "GeographicSubAddress"
      }
    ]
}
```

GEOGRAPHIC ADDRESS VALIDATION RESOURCE

This resource is used to manage geographic address validation request and response.

Resource model
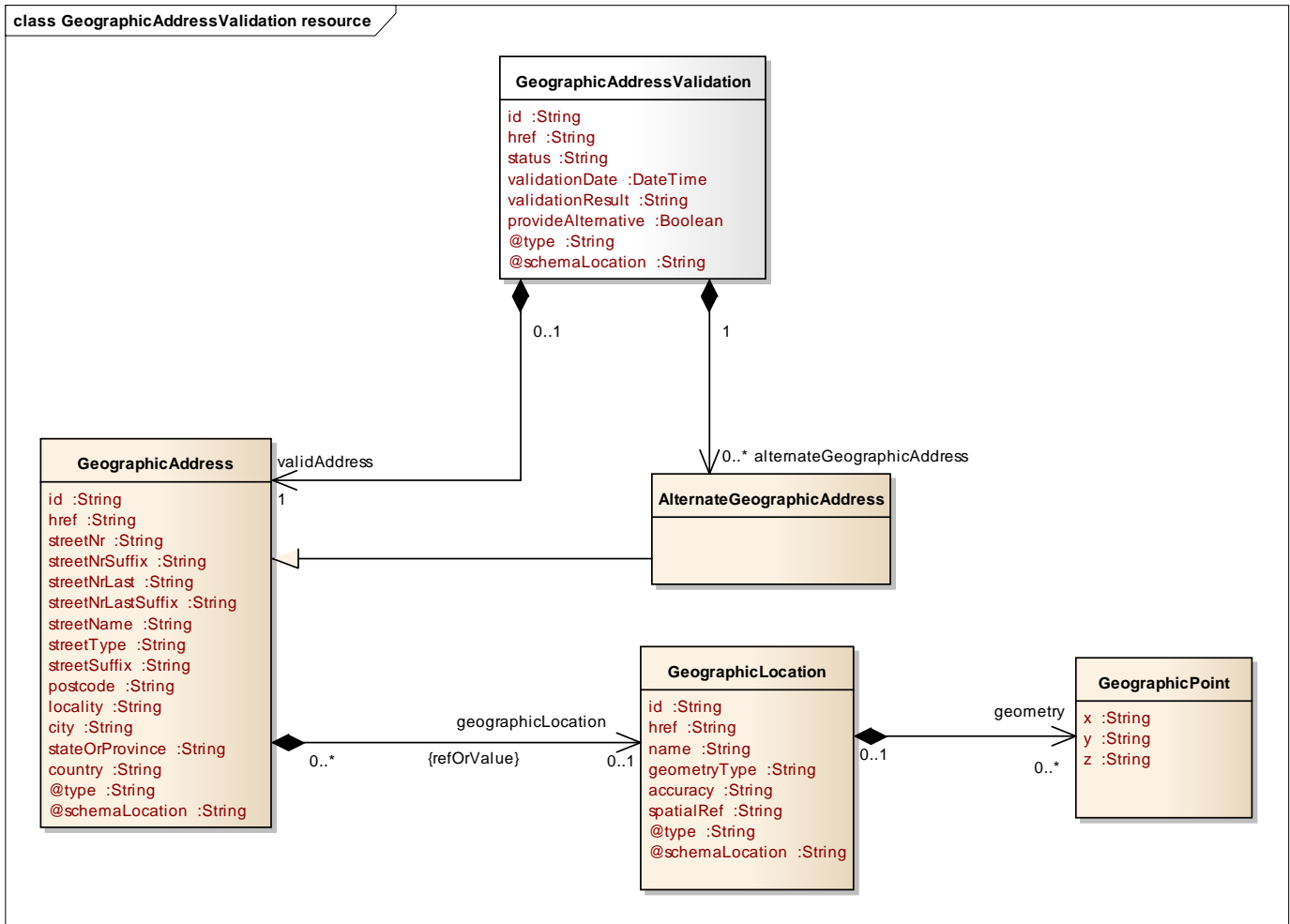
Lifecycle

The geographic address validation lifecycle is tracked by mean of the state field. Typical lifecycle values are: Rejected, in Progress, Done, and Terminated with Error. The state machine specifying the typical state change transitions is provided below.
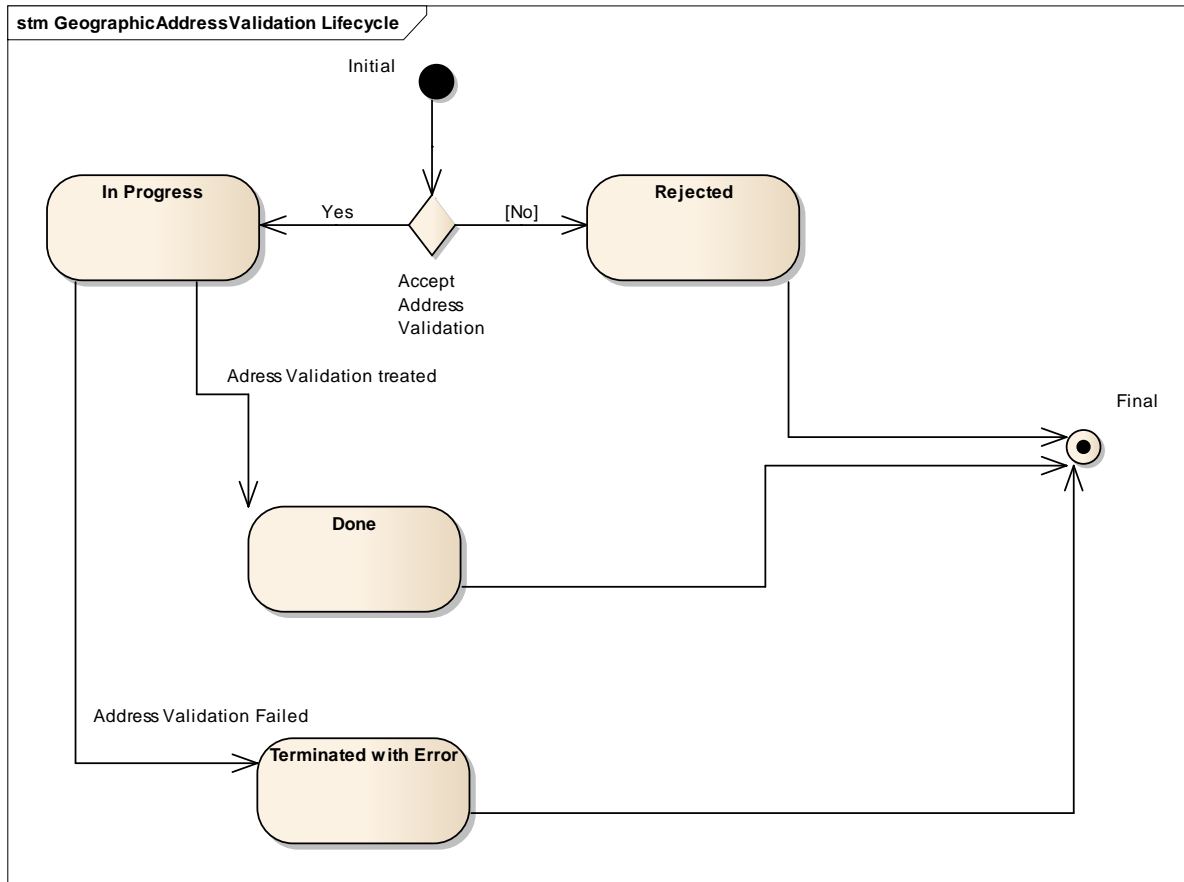
Status	Description
Rejected	Geographic Address validation request is rejected – data provided in the request do not fit API structure
In Progress	Geographic Address validation has begun and it is in progress
Done	Validation has been done and the result could be a success, partial (several addresses match criteria) or a fail (no address matches)
Terminated with Error	Geographic Address validation has not been done correctly and no response is provided. This status does not mean a 'fail' status

Field descriptions

GeographicAddressValidation fields

Field	Description
id	A string. Unique identifier of the Geographic Address Validation.
href	A string. An URI used to access to the geographic address validation resource.
status	A string. Status of the geographic address validation (inProgress, terminatedWithErrror, done).
validationDate	A date time (DateTime). Date when the geographic address validation is performed.
validationResult	A string. Result of the geographic address validation (success, partial, fail).

Field	Description
provideAlternative	A boolean. Indicators provided by the requester to specify if alternate geographic addresses must be provided in case of partial or fail result.
@type	A string. Indicates the type of the resource.
@schemaLocation	A string. Link to schema describing this REST resource.
alternateGeographicAddress	A list of alternate geographic addresses (AlternateGeographicAddress [*]).
validAddress	An address (Address). Structured textual way of describing how to find a Property in an urban area (country properties are often defined differently).

GeographicAddress sub-resource

Structured textual way of describing how to find a Property in an urban area (country properties are often defined differently).

The expected API behavior is the following

1. API requester describes an address - or a part of it - in the GeographicAddress 'validAddress' structure. With provideAlternative flag, requester indicates if he's expecting to get alternate address proposition if there is not an exact match with the input attributes.
2. A geographic address validation is performed based on this information – 3 possible outputs:
    a. Exactly **one** address fits the request criteria. The validationResult is '**success**'. The address is completely described in the response under validAddress structure (it could value more attributes than described in the request)
    b. More than on addresses match the requested criteria. The validationResult is '**partial**'. The response – if provideAlternative flag was set to yes - provide all geographic addresses matching the criteria within alternateAddress structure. Nothing is provided in the response under validAddress structure.
    c. None address match the criteria. The validationResult is '**fails**. The response could provide 'close' addresses within alternateAddress structure if provideAlternative flag was set to yes. Nothing is provided in the response under validAddress structure

It is important to note that all these outputs (2a/2b/2c) trigger an addressValidation status change to 'done' and not 'Termination with Error'. This later is used only if API provider is not able to perform an address validation.

Note: Address corresponds to SID UrbanPropertyAddress.

Field	Description
id	A string. Unique identifier of the geographic address.
href	A string. An URI used to access to the geographic address resource.
streetNr	A string. Number identifying a specific property on a public street. It may be combined with streetNrLast for ranged addresses.
streetNrSuffix	A string. The first street number suffix.
streetNrLast	A string. Last number in a range of street numbers allocated to a property.
streetNrLastSuffix	A string. Last street number suffix for a ranged address.
streetName	A string. Name of the street or other street type.

Field	Description
streetType	A string. Alley, avenue, boulevard, brae, crescent, drive, highway, lane, terrace, parade, place, tarn, way, wharf .
streetSuffix	A string. A modifier denoting a relative direction.
postcode	A string. Descriptor for a postal delivery area, used to speed and simplify the delivery of mail (also known as zipcode).
locality	A string. "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" [ANZLICSTREET].
city	A string. City that the address is in.
stateOrProvince	A string. the State or Province that the address is in.
country	A string. Country that the address is in.
@type	A string. Indicates the type of the resource. Here can be 'UrbanPropertyAddress', 'JapanesePropertyAddress' , 'AustralianPropertyAddress', etc…
@schemaLocation	A string. A Link to the schema describing this REST Resource. The resource described 'UrbanPropertyAddress' but a schema could be used for other property address description.
geographicLocationRef	A geo location reference (GeographicLocationRef).
geographicLocation	A geo location (GeographicLocation). A GeographicLocation allows describing through coordinate(s) a point, a line or a space.
geographicSubAddress	A list of sub addresses (GeographicSubAddress [*]). Representation of GeographicSubAddress It is used for addressing within a property in an urban area (country properties are often defined differently). It may refer to a building, a building cluster, or a floor of a multistory building.

AlternateGeographicAddress sub-resource

Field	Description
id	A string. Unique identifier of the geographic address.
href	A string. An URI used to access to the geographic address resource.
streetNr	A string. Number identifying a specific property on a public street. It may be combined with streetNrLast for ranged addresses.
streetNrSuffix	A string. The first street number suffix.
streetNrLast	A string. Last number in a range of street numbers allocated to a property.
streetNrLastSuffix	A string. Last street number suffix for a ranged address.
streetName	A string. Name of the street or other street type.
streetType	A string. alley, avenue, boulevard, brae, crescent, drive, highway, lane, terrace, parade, place, tarn, way, wharf .
streetSuffix	A string. A modifier denoting a relative direction.
postcode	A string. Descriptor for a postal delivery area, used to speed and simplify the delivery of mail (also known as zipcode).
locality	A string. "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" [ANZLICSTREET].
city	A string. City that the address is in.

Field	Description
stateOrProvince	A string. the State or Province that the address is in.
country	A string. Country that the address is in.
@type	A string. Indicates the type of the resource. Here can be 'UrbanPropertyAddress', 'JapanesePropertyAddress', 'AustralianPropertyAddress', etc…
@schemaLocation	A string. A Link to the schema describing this REST Resource. The resource described 'UrbanPropertyAddress' but a schema could be used for other property address description.
geographicLocation	A geo location (GeographicLocation). A GeographicLocation allows describing through coordinate(s) a point, a line or a space.
geographicSubAddress	A list of sub addresses (GeographicSubAddress [*]). Representation of a GeographicSubAddress It is used for addressing within a property in an urban area (country properties are often defined differently). It may refer to a building, a building cluster, or a floor of a multistory building.

GeographicLocation sub-resource

A GeographicLocation allows describing through coordinate(s) a point, a line or a space.

Field	Description
id	A string. Unique Identifier of a GeographicLocation.
href	A string. href of the GeographicLocation.
name	A string. Name of a GeographicLocation.
geometryType	A string. Type allows describing Geolocation form: it could be a point, a line, a polygon, a cylinder, etc....
accuracy	A string. Accuracy of the coordinate specified.
spatialRef	A string. Geocoding referential.
@type	A string. Indicates the type of resource
@schemaLocation	A string. A link to the schema describing this REST Resource
geometry	A list of geo points (GeographicPoint [*]). A GeographicPoint defines a geographic point through coordinates.

GeographicPoint sub-resource

A GeographicPoint defines a geographic point through coordinates.

Field	Description
x	A string. x coordinate (usually latitude).
y	A string. y coordinate (usually longitude).
z	A string. z coordinate (usually elevation).

GeographicSubAddress sub-resource

Representation of a GeographicSubAddress
It is used for addressing within a property in an urban area (country properties are often defined differently). It may refer to a building, a building cluster, or a floor of a multistory building.

Field	Description
id	A string. Unique Identifier of the geographicSubAddress.
href	A string. Href of the geographicSubAddress.
type	A string. Type of geographicSubAddress : it can be a subunit or a private street.
name	A string. Name of the geographicSubAddress to identify it with a meaningful identification.
subUnitType	A string. The type of subunit e.g.BERTH, FLAT, PIER, SUITE, SHOP, TOWER, UNIT, WHARF.
subUnitNumber	A string. The discriminator used for the subunit often just a simple number e.g. FLAT 5, may also be a range.
levelType	A string. Describes level types within a building.
levelNumber	A string. Used where a level type may be repeated e.g. BASEMENT 1, BASEMENT 2.
buildingName	A string. Allows for buildings that have well-known names.
privateStreetNumber	A string. Private streets numbers internal to a private street.
privateStreetName	A string. Private streets internal to a property (e.g. a university) may have internal names that are not recorded by the land title office.
@type	A string. Type of the resource for thus subResource
@schemaLocation	A string. A link to the schema describing this REST Resource

Json representation sample

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

```
{
    "id": "8315",
    "href": "https://host:port/location/geographicAddressValidation/8315",
    "status": "done",
    "validationDate": "2017-05-03T00:00",
    "validationResult": "partial.",
    "provideAlternative": true,
    "@type": "UrbanPropertyValidationAddress "
    "validAddress": {
        "id": "",
        "href": "",
        "streetNr": "56",
        "streetNrSuffix": "",
        "streetNrLast": ".",
        "streetNrLastSuffix": "",
        "streetName": "Pontus",
        "streetType": "Alley",
        "streetSuffix": "Doctor",
        "postcode": "45002",
        "locality": " San Pedro ",
        "city": " San Pedro ",
        "stateOrProvince": "",
        "country": "Ivory Coast",
        "@type": "UrbanPropertyAddress "
    },
    "alternateGeographicAddress": [
        {
```

```
      "id": "9912",
      "href": "https://host:port/location/geographicAddress/9912",
      "streetNr": "56",
      "streetNrSuffix": "A",
      "streetNrLast": "",
      "streetNrLastSuffix": ".",
      "streetName": "Pontus",
      "streetType": "Alley",
      "streetSuffix": "",
      "postcode": "45002",
      "locality": "San Pedro",
      "city": " San Pedro.",
      "stateOrProvince": "",
      "country": "Ivory Coast",
      "@type": "UrbanPropertyAddress "
      "geographicLocationRefOrValue": {
        "id": "9597",
        "href": "https://host:port/location/geographicLocation/9597"
      },
      {
      "id": "9998",
      "href": "https://host:port/location/geographicAddress/9998",
      "streetNr": "56",
      "streetNrSuffix": "B",
      "streetNrLast": "",
      "streetNrLastSuffix": ".",
      "streetName": "Pontus",
      "streetType": "Alley",
      "streetSuffix": "Doctor",
      "postcode": "45002",
      "locality": "San Pedro",
      "city": " San Pedro.",
      "stateOrProvince": "",
      "country": "Ivory Coast",
      "@type": "UrbanPropertyAddress "
      "geographicLocationRefOrValue": {
        "id": "9200",
        "href": "https://host:port/location/geographicLocation/9200"
      }
    }
  ]
}
```
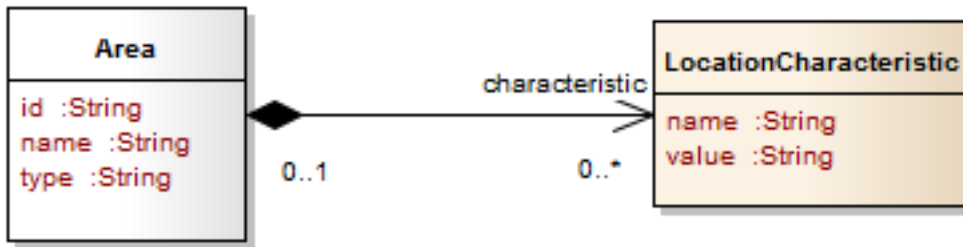
AREA RESOURCE

Area corresponds to a geographic area as a city, a locality, a district, etc.

This resource is optional.

Resource model

Lifecycle

No state machine for the resources detailed in this API

Field descriptions

Area fields

Field	Description
id	A string. Unique identifier of an Area.
name	A string. The defined name of the municipality.
type	A string. SUBURB, LOCALITY, CITY, TOWN, BOROUGH, ...
characteristic	A list of location characteristics (LocationCharacteristic [*]). Name/value pairs, used to extra characterized the Area (e.g. if a standard set has been defined for the GeographicArea type, etc.).

LocationCharacteristic sub-resource

Name/value pairs, used to extra characterized the Area (e.g. if a standard set has been defined for the GeographicArea type, etc.).

Field	Description
name	A string.
value	A string.

Json representation sample

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

```
{
  "id": "5309",
  "name": "Marseille",
  "type": "City",
  "characteristic": [
    [
      {
        "name": "NationalCityCode",
        "value": "13"
      },
```

```
        {
          "name": " aWayOfCodingCityInTheCountry",
          "value": "64"
        }
      ]
    ]
  }
```

STREET RESOURCE

A street is a road in a city or locality that has buildings that are usually close together along one or both sides.

This resource is optional.

Lifecycle

No state machine for the resources detailed in this API

Resource model
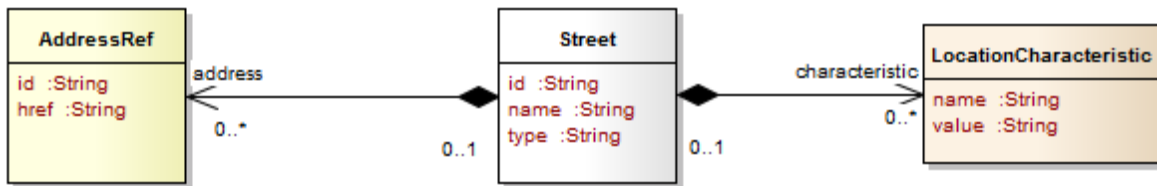
Field descriptions

Street fields

Field	Description
id	A string. Unique identifier of the Street.
name	A string. The defined name of the street.
type	A string. Alley, avenue, etc..
address	A list of address references (AddressRef [*]).
characteristic	A list of location characteristics (LocationCharacteristic [*]). Name/value pairs, used to extra characterized the Street

LocationCharacteristic sub-resource

Name/value pairs, used to extra characterized the Area (e.g. if a standard
code set has been defined for the GeographicArea type, etc.).

Field	Description
name	A string.
value	A string.

AddressRef relationship

Field	Description
id	A string.
href	A string.

Json representation sample

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

```
{
  "id": "6737",
  "name": "Professeur Pontus",
  "type": "avenue",
  "address": [
    {
      "id": "7477",
      "href": "https://host:port/location/geographicAddress/7477"
    }
  ],
  "characteristic": [
    [
      {
        "name": " aWayOfCodingStreetsInTheCountry",
        "value": "336985"
      },
    ]
  ]
}
```

STREET SEGMENT RESOURCE

StreetSegment corresponds to a part of a given street referenced by a number (22) or a set of number (22-24). Sometimes a suffix is added.
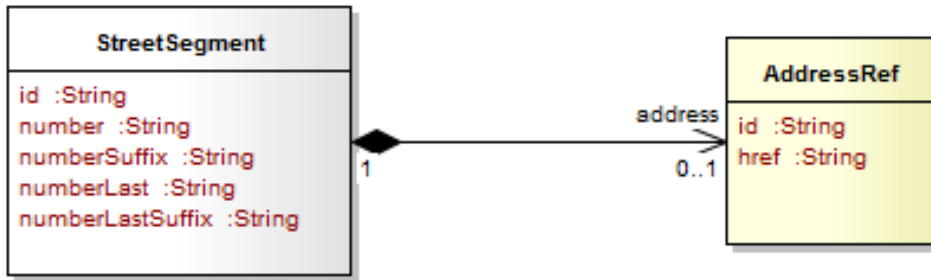
This level can represent an entire address, which is accessible through hyperlinking.

This resource is optional.

Lifecycle

No state machine for the resources detailed in this API

Resource model

Field descriptions

StreetSegment fields

Field	Description
id	A string. Unique identifier of the Street Segment.
number	A string. Number identifying a specific property on a public street. It may be combined with streetNrLast for ranged addresses.
numberSuffix	A string. The first street number suffix.
numberLast	A string. The last number in a range of street numbers allocated to a property.
numberLastSuffix	A string. The last street number suffix for a ranged address.
address	An address reference (AddressRef).

GeographicAddressRef relationship

Field	Description
id	A string.
href	A string.

Json representation sample

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

```
{
  "id": "7758",
  "number": "22",
  "numberSuffix": "",
  "numberLast": "",
  "numberLastSuffix": "",
  "geographicAddress": {
    "id": "4590",
    "href": "https://host:port/location/geographicAddress/4590"
  }
}
```

Notification Resource Models

3 notifications are defined for this API

Notifications related to GeographicAddressValidation:
- GeographicAddressValidationCreationNotification
- GeographicAddressValidationStateChangeNotification
- AGeographicddressValidationRemoveNotification

The notification structures for all notifications in this API follow the pattern depicted by the figure below.
A notification resource (depicted by "SpecificNotification" placeholder) is a sub class of a generic Notification structure containing an id of the event occurrence (eventId), an event timestamp (eventTime), and the name of the notification resource (eventType).
This notification structure owns an event structure ("SpecificEvent" placeholder) linked to the resource concerned by the notification using the resource name as access field ("resourceName" placeholder).
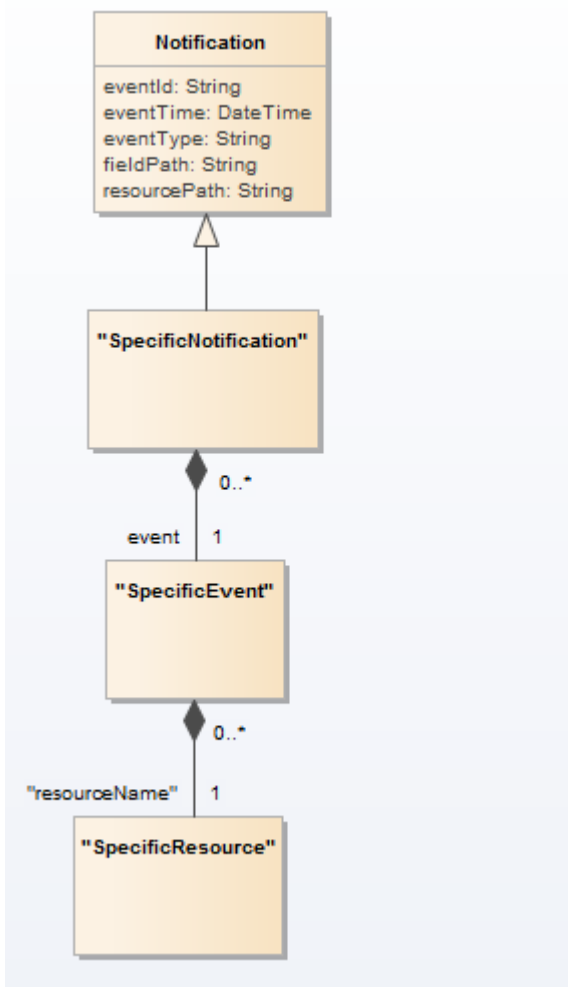
GEOGRAPHIC ADDRESS VALIDATION CREATION NOTIFICATION

Notification sent when a new GeographicAddressValidation resource is created.

Json representation sample

We provide below the json representation of an example of an 'GeographicAddressValidationCreationNotification' notification object

```
{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"GeographicAddressValidationCreationNotification",
   "event": {
     "geographicAddressValidation" :
        {-- SEE GeographicAddressValidation RESOURCE SAMPLE --}
   }
}
```

GEOGRAPHIC ADDRESS VALIDATION STATE CHANGE NOTIFICATION

Notification sent when changing the state of a GeographicAddressValidation resource.

Json representation sample

We provide below the json representation of an example of an 'GeographicAddressValidationStateChangeNotification' notification object

```
{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"GeographicAddressValidationStateChangeNotification",
   "event": {
     "geographicAddressValidation" :
        {-- SEE GeographicAddressValidation RESOURCE SAMPLE --}
   }
}
```

GEOGRAPHIC ADDRESS VALIDATION REMOVE NOTIFICATION

Notification sent when removing an GeographicAddressValidation resource.

Json representation sample

We provide below the json representation of an example of an 'GeographicAddressValidationRemoveNotification' notification object

```
{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"GeographicAddressValidationRemoveNotification",
   "event": {
     "geographicAddressValidation" :
        {-- SEE GeographicAddressValidation RESOURCE SAMPLE --}
   }
```

```
}
```

API OPERATIONS

Remember the following Uniform Contract:

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

OPERATIONS ON GEOGRAPHIC ADDRESS

LIST ADDRESSES

GET /geographicAddress?{fields=attributes}&{filtering expression}&.fullText={fullTextSearch}&.fuzzy={true/false}

Description

This operation is used to retrieve an address corresponding to search criteria.

Filtering is allowed on all attributes. See example below.
Attribute selection is possible for all attributes. Providing filtering criteria is mandatory to avoid too many answers retrieved. See example below:

- Geographic location reference
- streetNr+streetName+postcode+country
- streetNr+streetName+(city or locality)+country
- interval of streetNr+streetName+streetType +(city or locality)+country

This list is not exhaustive.

Two special search fields can also be used:

- ".fullText" : which can be used for full text searches, for example when you have a single text area
to capture address search info
- ".fuzzy" : which can be used for approximate searches (sounds like, etc.)

Behavior :

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

Usage Samples

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

Request
GET /api/geographicAddress?geoCode.latitude=1.296349&geoCode.longitude=43.717627 Accept: application/json

Response
200 Content-Type: application/json

```
[
{
     "id":"7513180",
     "href":" https://host:port/location/geographicAddress/7513180",
     "streetNr": "29",
     "streetName": "Rambeau",
     "streetType": "Rue",
     "city": "Merville",
     "postcode": "31330",
     "country": "France",
     "@type": "UrbanPropertyAddress ",
     "geographicLocationRefOrValue": {
      "id": "4774",
       "href": "https://host:port/location/geographicLocation/4774",
      "name": "ExactPlace",
      "geometryType": "point",
      "accuracy": "",
      "spatialRef": "WGS84",
      "@type": "GeographicLocation"
      "geometry": [
       {
         "x": " 1.430937",
         "y": " 43.597208",
         "z": ""
       }
      ]
   },
}
]
```

RETRIEVE GEOGRAPHIC ADDRESS

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

Description

This operation retrieves a geographic address entity using its unique ID. This ID should be retrieve either using the address completion process (cf. completion), or in another API of the ecosystem (party, appointment, etc.)

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

Behavior:
- Returns HTTP/1.1 status code 200 if the request was successful
- Returns HTTP/1.1 status code 404 (Not found) if the address does not exist

Usage Samples

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

Request
GET /geographicAddressManagement/geographicAddress/9090 Accept: application/json

Response

200
 	
``
{
  "id": "9090",
  "href": "https://host:port/location/geographicAddress/9090",
  "streetNr": "14",
  "streetNrSuffix": "B",
  "streetNrLast": "a string ...",
  "streetNrLastSuffix": "",
  "streetName": "Rambeau",
  "streetType": "Rue",
  "streetSuffix": "",
  "postcode": "13339",
  "locality": "Fontvieille",
  "city": " Fontvieille",
  "stateOrProvince": "",
  "country": "France",
  "@type": "UrbanPropertyAddress "
  "geographicLocationRefOrValue": {
    "id": "3251",
    "href": "https://host:port/location/geographicLocation/3251"
  },
}
``

RETRIEVE GEOGRAPHICSUBADDRESS

GET
/address/{id}/geographicSubAddress?fields=...&{filtering}

Description

This operation can be used to retrieve sub-addresses of a geographic address.

Here below an example to list all flats existing in a building at a specific address.

Behavior:

- Returns HTTP/1.1 status code 200 if the request was successful
- Returns HTTP/1.1 status code 204 (No Content) if the address with the given {id} does not exist

Usage Samples

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

Request
GET /api/geographicAddressManagement/7660828/geographicSubAddress?type=flat Accept: application/json

Response

200
 	
[
{
  "id": "784993003",
  "name": "Flat 1",
  "subUnitType": "flat",
  "subUnitNumber": "1",
  "levelType": "floor",
  "levelNumber": "1",
  "buildingName": "",
  "privateStreetNumber": "",
  "privateStreetName": "",
  "@type": "UrbanPropertyAddress "
},
{
  "id": "784993004",
  "name": "Flat 2",
  "subUnitType": "flat",
  "subUnitNumber": "2",
  "levelType": "floor",
  "levelNumber": "1",
  "buildingName": "",
  "privateStreetNumber": "",
  "privateStreetName": ""
  "@type": "UrbanPropertyAddress ",
},
{
  "id": "784993005",
  "name": "Flat 3",
  "subUnitType": "flat",
  "subUnitNumber": "3",
  "levelType": "floor",
  "levelNumber": "2",
  "buildingName": "",
  "privateStreetNumber": "",
  "privateStreetName": "",
  "@type": "UrbanPropertyAddress "
}

```
]
```

OPERATIONS ON GEOGRAPHIC ADDRESS VALIDATION

RETRIEVE ADDRESS VALIDATION

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

Description

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

Usage Samples

Here's an example of a request for retrieving a geographicAddressValidation resource with a success result – only validAddress information are presents.

Request
GET /geographicAddressManagement/geographicAddressValidation/8315 Accept: application/json
Response

200
 	
{
  "id": "8315",
  "href": "https://host:port/location/geographicAddressValidation/8315",
  "status": "done",
  "validationDate": "2017-05-03T00:00",
  "validationResult": "success",
  "provideAlternative": true,
  "validAddress": {
    "id": "1960",
    "href": "https://host:port/location/geographicAddress/1960",
    "streetNr": "14",
    "streetName": "Denfert-Rocherault",
    "streetType": "rue",
    "postcode": "69004",

```
      "locality": "Lyon",
      "city": "Lyon",
      "stateOrProvince": "Rhone",
      "country": "France",
      "@type": "UrbanPropertyAddress "
      "geographicLocationRefOrValue": {
        "id": "7200",
        "href": "https://host:port/location/geographicLocation/7200"
      }
    }
}
```

Here's an example of a request for retrieving a GeographicAddressValidation resource with a fail result and provideAlternative flag set to no:

Request
GET /geographicAddressManagement/geographicAddressValidation/8316 Accept: application/json
Response

200
 	
{
  "id": "8316",
  "href": "https://host:port/location/geographicAddressValidation/8316",
  "status": "done",
  "validationDate": "2017-05-03T00:00",
  "validationResult": "success",
  "provideAlternative": false,
}

Here's an example of a request for retrieving a GeographicAddressValidation resource with a partial result:

Request
GET /geographicAddressManagement/geographicAddressValidation/8318 Accept: application/json
Response

```
200

{
  "id": "8318",
  "href": "https://host:port/location/geographicAddressValidation/8318",
  "status": "done",
  "validationDate": "2017-05-03T00:00",
  "validationResult": "partial",
  "provideAlternative": true,
  "alternateAddress": [
    {
    "id": "1960",
    "href": "https://host:port/location/geographicAddress/1960",
    "streetNr": "2",
    "streetName": "Denfert-Rocheraut",
    "streetType": "rue",
    "postcode": "69004",
    "locality": "Lyon",
    "city": "Lyon",
    "stateOrProvince": "Rhone",
    "country": "France",
    "@type": "UrbanPropertyAddress ",
    "geographicLocationReforValue": {
      "id": "7200",
      "href": "https://host:port/location/geographicLocation/7200"
    }
  },
  {
    "id": "8965",
    "href": "https://host:port/location/geographicAddress/8965",
    "streetNr": "4",
    "streetName": "Denfert-Rocheraut",
    "streetType": "rue",
    "postcode": "69004",
    "locality": "Lyon",
    "city": "Lyon",
    "stateOrProvince": "Rhone",
    "country": "France"
    "@type": "UrbanPropertyAddress ",
    "geographicLocationRefOrValue": {
      "id": "7204",
      "href": "https://host:port/location/geographicLocation/7204"
    }
  },
  {
    "id": "7854",
    "href": "https://host:port/location/geographicAddress/7854",
    "streetNr": "6",
    "streetName": "Denfert-Rocheraut",
    "streetType": "rue",
    "postcode": "69004",
    "locality": "Lyon",
    "city": "Lyon",
```

```
        "stateOrProvince": "Rhone",
        "country": "France",
        "@type": "UrbanPropertyAddress "
        "geographicLocationRefOrValue": {
          "id": "7263",
          "href": "https://host:port/location/geographicLocation/7263"
        }
    },
    {
        "id": "1236",
        "href": "https://host:port/location/geographicAddress/1236",
        "streetNr": "8",
        "streetName": "Denfert-Rocheraut",
        "streetType": "rue",
        "postcode": "69004",
        "locality": "Lyon",
        "city": "Lyon",
        "stateOrProvince": "Rhone",
        "country": "France",
        "@type": "UrbanPropertyAddress "
        "geographicLocationRefOrValue": {
          "id": "8523",
          "href": "https://host:port/location/geographicLocation/8523"
        }
    },

}
```

CREATE GEOGRAPHIC ADDRESS VALIDATION

POST /geographicAddressValidation

Description

This operation creates a geographic address validation entity.

Mandatory and Non Mandatory Attributes

Usage Samples

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

Request

```
POST /geographicAddressManagement/geographicAddressValidation
Content-Type: application/json

{
  "provideAlternative": true,
  "validAddress": [
    {
    "streetName": "Denfert-Rocheraut",
    "streetType": "rue",
    "postcode": "69004",
    "city": "Lyon",
    "stateOrProvince": "Rhone",
    "country": "France",
    "@type": "UrbanPropertyAddress "
  }
}
```

Response

```
201

{
  "id": "8318",
  "href": "https://host:port/location/geographicAddressValidation/8318"
}
```

PATCH ADDRESS VALIDATION

`PATCH /geographicAddressValidation/{id}`

Note: this operation is available only to ADMIN API users

Description

This operation allows partial updates of an address validation entity. Support of json/merge (https://tools.ietf.org/html/rfc7386) is mandatory; support of json/patch (http://tools.ietf.org/html/rfc5789) is optional.

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

Patchable and Non Patchable Attributes

The tables below provide the list of patchable and non-patchable attributes, including constraint rules on their usage.
Notice that patching is possible only for 'admin' API users.

Patchable Attributes	Rule
status	
validationResult	
alternateGeographicAddress	
validAddress	

Non Patchable Attributes	Rule
id	
href	
validationDate	
provideAlternative	

Additional Rules

The following pre-conditions apply for this operation.

Pre-conditions
PATCH allowed if status is still inProgress

Usage Samples

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

Request

PATCH /geographicAddressManagement/geographicAddressValidation/8315
Content-Type: application/merge-patch+json

```
{
    "status": "done"
}
```

Response

```
201

{
    "id": "8315",
    "href": "https://host:port/location/geographicAddressValidation/8315",
    "status": "done",
    "validationDate": "2017-05-03T00:00",
    "validationResult": "success",
    "provideAlternative": true,
    "validAddress": {
        "id": "1960",
        "href": "https://host:port/location/geographicAddress/1960",
        "streetNr": "48",
```

```
    "streetName": "Keiser",
    "streetType": "Rue",
    "postcode": "33000",
    "locality": "Bordeaux",
    "country": "France",
    "@type": "UrbanPropertyAddress "
    "geographicLocationRefOrValue": {
      "id": "7200",
      "href": "https://host:port/location/geographicLocation/7200"
    },
}
```

DELETE ADDRESS VALIDATION

DELETE /geographicAddressValidation/{id}

Note: this operation is available only to ADMIN API users

Description

This operation deletes a geographic address validation entity.

Usage Samples

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

Request
DELETE /geographicAddressManagement/geographicAddressValidation/42

Response
204

OPERATIONS ON AREA

All operations on AREA are optional

LIST AREAS

GET /area?fields=...&{filtering}&.fuzzy={true/false}

Description

This operation is the first step of an address completion process, allowing retrieving geographic areas:

- Step 1: I look for a geographic area (city, locality, district, etc.) using its name
- Step 2: I look for the streets inside this geographic area
- Step 3: I get all the street segments (numbers) existing in the street

Filtering is allowed on all attributes. See example below.
Attribute selection is possible for all attributes. See example below.

A special search field can also be used:

- ".fuzzy" : which can be used for approximate searches (sounds like, etc.)

Behavior:

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

Usage Samples

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

Request
GET api/area?name=Kensington&fields=id,name,type Accept: application-json
Response
200 [{ "id": "7660828", "name": "Royal Borough of Kensington and Chelsea", "type": "borough" }, { "id": "7660855", "name": "North Kensington", "type": "district" }, { "id": "7660821", "name": "South Kensington", "type": "district" }, { "id": "7660834", "name": "Kensington", "type": "district"

```
}
]
```

OPERATIONS ON STREET

All operations on STREET are optional

LIST STREETS

GET /street?fields=...&{filtering}&.fuzzy={true/false}

Description

This operation is the second step of an address completion process, allowing retrieving streets:

- Step 1: I look for a geographic area (city, locality, district, etc.) using its name
- Step 2: I look for the streets inside this geographic area
- Step 3: I get all the street segments (numbers) existing in the street

Filtering is allowed on all attributes. See example below.
Attribute selection is possible for all attributes. See example below.

A special search field can also be used:

- ".fuzzy" : which can be used for approximate searches (sounds like, etc.)

Behavior:

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

Usage Samples

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

Request
GET api/street?name=Cromwell&area.id=7660821&fields=id,name,type Accept: application/json
Response
200 [{   "id":"2173322",

```
  "type":"Road",
  "name":"Cromwell"
},
{
  "id":"2173323",
  "type":"Place",
  "name":"Cromwell"
},
{
  "id":"2173324",
  "type":"Mews",
  "name":"Cromwell"
}
]
```

OPERATIONS ON STREET SEGMENT

All operations on STREET SEGMENT are optional

LIST STREET SEGMENTS

GET /street/{id}/streetSegment

Description

This operation is the last step of an address completion process, allowing retrieving numbers in a street:

- Step 1: I look for a geographic area (city, locality, district, etc.) using its name
- Step 2: I look for the streets inside this geographic area
- Step 3: I get all the street segments (numbers) existing in the street

Behavior:

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

Usage Samples

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

Request
GET /street/217896/streetSegment Accept: application/json
Response

```
200

[
{
  "id":"21733233",
  "number":"3",
  " geographicAddress ":{
    "href":"geographicAddress/217332332",
    "id":"217332332"
  }
},
{
  "id":"21733234",
  "number":"4",
  " geographicAddress ":{
    "href":" geographicAddress /217332342",
    "id":"217332342"
  }
},
etc.
]
```

API NOTIFICATIONS

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

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

REGISTER LISTENER

POST /hub

Description

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

Behavior

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

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

Usage Samples

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

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

Usage Samples

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

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

PUBLISH EVENT TO LISTENER

POST /client/listener

Description

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

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

Behavior

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

Usage Samples

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

Request

POST /client/listener
Accept: application/json
 	
{
  "event": {
      EVENT BODY
    },
  "eventType": "EVENT_TYPE"
}

Response
201

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

tmforum

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