



## *Frameworkx Specification*

# Usage Management API REST Specification

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## INTRODUCTION

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

The usage API provides standardized mechanism for usage management such as creation, update, retrieval, import and export of a collection of usages.

Usage API manages both rated and non-rated usages.

For example, Usage API allows a service provider:

- To retrieve usage generated by a partner service platform in order to rate it
- To provide rated usages to a partner for consumption follow up purpose

Usage API manages usage resource:

- A usage represents an event that is of billing system's interest and can have charges applied to it. It is comprised of characteristics, which define all attributes known for a particular type of usage
- Main usage attributes are its identifier, date, type, type related specification, characteristics (name and value), status, related parties and rating related information (date, amount, taxes, etc.)

Usage API performs the following operations on usage:

- Retrieval of a usage or a collection of usages depending on filter criteria
- Partial update of a usage or of a collection of usages
- Creation of a usage
- Export of a collection of usages
- Import of a collection of usages

## 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

#### Status attribute:

The status attribute is used by a state machine through the different lifecycle stages for the usage records. Valid status values are:

| Status code | Description                                      |   |
|-------------|--|---|
| received    | Newly injected into the target system            |   |
| rejected    | Rejected for validation error or similar reasons |   |
| recycled    | Resubmitted after error correction               |   |
| guided      | Identified with customer and product references  |   |
| rated       | Rated  | From this status on, the ratedProductUsage collection will have a value |
| rerate      | Marked for re-rating                             |   |
| billed      | Billed for customer invoice                      |   |

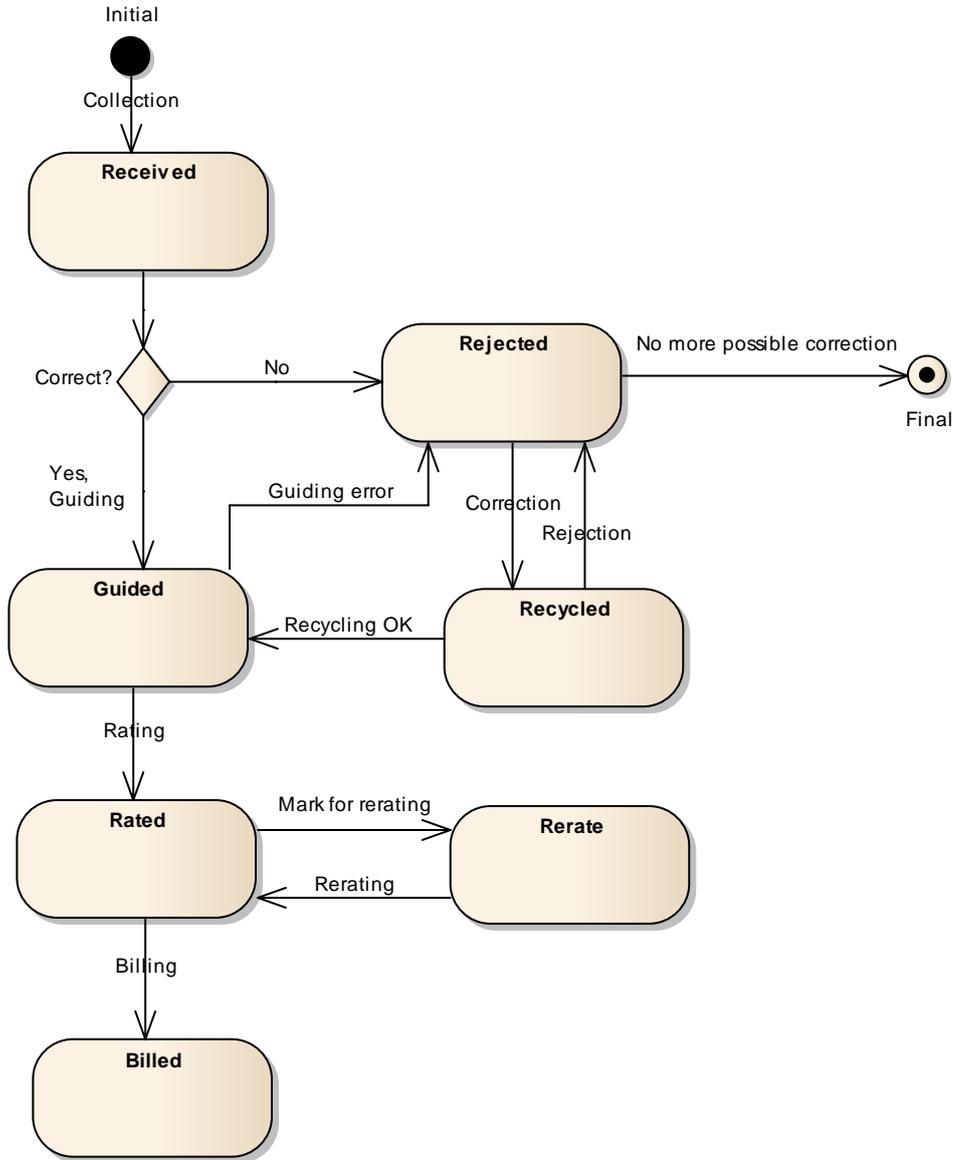


Figure 1: State machine diagram for status attribute on usage

## USAGE RESOURCE

Usage: an occurrence of employing a Product, Service, or Resource for its intended purpose, which is of interest to the business and can have charges applied to it. It is comprised of characteristics, which represent attributes of usage.

Below is a representation of the Usage resource in JSON format (cloud usage).

```
{
  "id": "15",
  "href": " http://serverlocation:port/usageManagement/usage/15",
  "date": "2013-04-19T16:42:23-04:00",
  "type": "CloudCpuUsage",
  "description": "Description for individual usage content",
  "status": "rated",
  "usageSpecification": {
    "id": "234",
    "href": "http://serverlocation:port/usageManagement/usageSpecification/234",
    "name": "Cloud CPU usage specification"
  },
  "usageCharacteristic": [
    {
      "name": "poolNumber",
      "value": "1"
    }, {
      "name": "characteristicType",
      "value": "Reserved"
    }, {
      "name": "value",
      "value": "2"
    }, {
      "name": "unit",
      "value": "GHZ"
    }
  ],
  "relatedParty": [{
    "role": "customer",
    "id": "1",
    "href": "http://serverlocation:port/partyManagement/organization/1"
  }],
  "ratedProductUsage": [
    {
      "ratingDate": "2013-04-19T16:42:23-04:00",
      "usageRatingTag": "Usage",
      "isBilled": "False",
      "ratingAmountType": "Total",
      "taxIncludedRatingAmount": "12.00",
      "taxExcludedRatingAmount": "10.00",
    }
  ]
}
```

```
        "taxRate": "20",
        "isTaxExempt": "false",
        "offerTariffType": "Normal",
        "bucketValueConvertedInAmount": "",
        "currencyCode": "EUR",
        "productRef":
"http://serverlocation:port/catalogManagement/productSpecification/345"
    }
}
}
```

Below is a representation of the Usage resource in JSON format (voice usage).

```
{
  "id": "1234",
  "href": " http://serverlocation:port/usageManagement/usage/1234",
  "date": "2013-04-19T16:42:23-04:00",
  "type": "VOICE",
  "description": "Description for individual usage content",
  "status": "rated",
  "usageSpecification": {
    "id": "22",
    "href": "http://serverlocation:port/usageManagement/usageSpecification/22",
    "name": "Voice usage specification"
  },
  "usageCharacteristic": [
    {
      "name": "originatingCountryCode",
      "value": "43"
    }, {
      "name": "originatingNumber",
      "value": "676123456789"
    }, {
      "name": "destinationCountryCode",
      "value": "49"
    }, {
      "name": "destinationNumber",
      "value": "170123456789"
    }
  ]
}
```

```
    }, {
      "name": "duration",
      "value": "20"
    }, {
      "name": "unit",
      "value": "SEC"
    }, {
      "name": "startDateTime",
      "value": "2013-04-19T16:42:23-04:00"
    }, {
      "name": "endDateTime",
      "value": "2013-04-19T16:42:23-04:00"
    }
  ],
  "relatedParty": [
    {
      "role": "serviceProvider",
      "id": "1",
      "href": "http://serverlocation:port/partyManagement/organization/1"
    }, {
      "role": "customer",
      "id": "45",
      "ref": "http://serverlocation:port/partyManagement/individual/45"
    }
  ],
  "ratedProductUsage": [
    {
      "ratingDate": "2013-04-19T16:42:23-04:00",
      "usageRatingTag": "Usage",
      "ratingAmountType": "Total",
      "taxIncludedRatingAmount": "12.00",
      "taxExcludedRatingAmount": "10.00",
      "taxRate": "20",
      "isTaxExempt": "false",
      "offerTariffType": "Normal",
      "bucketValueConvertedInAmount": "",
      "currencyCode": "EUR"
    }
  ]
}
```

---

## USAGE SPECIFICATION RESOURCE

UsageSpecification: A detailed description of a usage event that are of interest to the business and can have charges applied to it. It is comprised of characteristics, which define all attributes known for a particular type of usage.

Below is a representation of the UsageSpecification resource in JSON format for cloud (CPU rated).

```
{
  "id": "234",
  "href": "http://serverlocation:port/usageManagement/usageSpecification/234",
  "name": "cloudCpuSpec",
  "description": "Spec for cloud CPU usage",
  "validFor": {
    "startDateTime": "2013-04-19T16:42:23-04:00",
    "endDateTime": "2099-06-19T00:00:00-04:00"
  },
  "usageSpecCharacteristic": [
    {
      "name": "poolNumber",
      "description": "the number of the pool",
      "configurable": "true",
      "usageSpecCharacteristicValue": [
        {
          "valueType": "number",
          "default": "false",
          "value": "",
          "valueFrom": "0",
          "valueTo": ""
        }
      ]
    }, {
      "name": "characteristicType",
      "description": "sub-type of the characteristic",
      "configurable": "true",
```

```
"usageSpecCharacteristicValue": [
  {
    "valueType": "string",
    "default": "false",
    "value": "Reserved",
    "valueFrom": "",
    "valueTo": ""
  }, {
    "valueType": "string",
    "default": "false",
    "value": "Reserved Gold",
    "valueFrom": "",
    "valueTo": ""
  }, {
    "valueType": "string",
    "default": "false",
    "value": "Reserved Silver",
    "valueFrom": "",
    "valueTo": ""
  }, {
    "valueType": "string",
    "default": "false",
    "value": "Reserved Bronze",
    "valueFrom": "",
    "valueTo": ""
  }, {
    "valueType": "string",
    "default": "false",
    "value": "Burst",
    "valueFrom": "",
    "valueTo": ""
  }
], {
  "name": "value",
  "description": "value of the usage specified by the unit",
  "configurable": "true",
  "usageSpecCharacteristicValue": [
    {
      "valueType": "number",
```

```

        "default": "false",
        "value": "",
        "valueFrom": "0",
        "valueTo": ""
    }
]
}, {
    "name": "unit",
    "description": "unit of measure",
    "configurable": "true",
    "usageSpecCharacteristicValue": [
        {
            "valueType": "string",
            "default": "false",
            "value": "GHz",
            "valueFrom": "",
            "valueTo": ""
        }, {
            "valueType": "string",
            "default": "false",
            "value": "Number of vCPU",
            "valueFrom": "",
            "valueTo": ""
        }
    ]
}
]
}
}

```

JSON representation of the usage specification for voice:

```

{
    "id": "22",
    "href": "http://serverlocation:port/usageManagement/usageSpecification/22",
    "name": "VoiceSpec",
    "description": "Spec for voice calls usage",
    "validFor": {

```

```
        "startDateTime": "2013-04-19T16:42:23-04:00",
        "endDateTime": "2099-06-19T00:00:00-04:00"
    },
    "usageSpecCharacteristic": [
        {
            "name": "originatingCountryCode",
            "description": "country code of the caller",
            "configurable": "true",
            "usageSpecCharacteristicValue": [
                {
                    "valueType": "number",
                    "default": "false",
                    "value": "",
                    "valueFrom": "",
                    "valueTo": ""
                }
            ]
        }, {
            "name": "originatingNumber",
            "description": "phone number of the caller",
            "configurable": "true",
            "usageSpecCharacteristicValue": [
                {
                    "valueType": "string",
                    "default": "false",
                    "value": "",
                    "valueFrom": "",
                    "valueTo": ""
                }
            ]
        }, {
            "name": "destinationCountryCode",
            "description": "country code of the called party",
            "configurable": "true",
            "usageSpecCharacteristicValue": [
                {
                    "valueType": "number",
                    "default": "false",
                    "value": "",
                    "valueFrom": "",
```

```
        "valueTo": ""
      }
    ]
  }, {
    "name": "destinationNumber",
    "description": "phone number of the called party",
    "configurable": "true",
    "usageSpecCharacteristicValue": [
      {
        "valueType": "string",
        "default": "false",
        "value": "",
        "valueFrom": "",
        "valueTo": ""
      }
    ]
  }, {
    "name": "duration",
    "description": "duration of the call",
    "configurable": "true",
    "usageSpecCharacteristicValue": [
      {
        "valueType": "number",
        "default": "false",
        "value": "",
        "valueFrom": "0",
        "valueTo": ""
      }
    ]
  }, {
    "name": "unit",
    "description": "unit of the duration",
    "configurable": "true",
    "usageSpecCharacteristicValue": [
      {
        "valueType": "number",
        "default": "false",
        "value": "SEC",
        "valueFrom": "",
        "valueTo": ""
      }
    ]
  }
]
```

```

    }
  ], {
    "name": "startDateTime",
    "description": "startdate and starttime of the call",
    "configurable": "true",
    "usageSpecCharacteristicValue": [
      {
        "valueType": "dateTime",
        "default": "false",
        "value": "",
        "valueFrom": "",
        "valueTo": ""
      }
    ]
  }, {
    "name": "endDateTime",
    "description": "enddate and endtime of the call",
    "configurable": "true",
    "usageSpecCharacteristicValue": [
      {
        "valueType": "dateTime",
        "default": "false",
        "value": "",
        "valueFrom": "",
        "valueTo": ""
      }
    ]
  }
]
}

```

### Field Descriptions :

RatedProductUsage: An occurrence of employing a product for its intended purpose with all rating details.

| Field                        | Description   |
|------------------------------|---|
| bucketValueConvertedInAmount | Monetary value of bucket  |
| currencyCode                 | A string used as a code for specifying the currency associated to the given amounts. The ISO4217 norm uses 3 letters to define the currency (for example USD for US dollar or EUR for Euro) |

|                         |  |
|-------------------------|--|
| isBilled                | Boolean indicating if usage have been billed or not  |
| isTaxExempt             | Indicates if the rated amount is exempt of tax   |
| offerTariffType         | Type of tariff applied   |
| productRef              | Reference of product specification   |
| ratingAmountType        | Type of amount   |
| ratingDate              | Date of usage rating   |
| taxExcludedRatingAmount | All taxes excluded rated amount  |
| taxIncludedRatingAmount | All taxes included rated amount  |
| taxRate                 | Tax rate   |
| usageRatingTag          | Tag value : 'usage' : the usage is always rated outside a usage bundle<br>'included usage' : the usage is rated inside a usage bundle<br>'non included usage' : the usage bundle is exhausted. The usage is rated outside the usage bundle |

RelatedParty: Defines party or partyRole linked to a specific entity.

| Field    | Description  |
|----------|--|
| href     | Reference of the relatedParty, could be a party reference or a partyRole reference |
| Id       | Unique identifier of the related party   |
| name     | Name of the related party  |
| role     | Role of the related party  |
| validFor | The period for which the related party is linked to the entity                     |

Usage:An occurrence of employing a Product, Service, or Resource for its intended purpose, which is of interest to the business and can have charges applied to it. It is comprised of characteristics, which represent attributes of usage.

| Field       | Description             |
|-------------|-------------------------|
| date        | Date of usage           |
| description | Description of usage    |
| href        | Reference of usage      |
| id          | Usage unique identifier |
| status      | Status of usage         |
| type        | Type of usage           |

UsageCharacteristic: Provides the value of a given characteristic.

| Field | Description   |
|-------|---|
| name  | The name of the usage characteristic.                 |
| value | A discrete value that the characteristic can take on. |

UsageSpecification: A detailed description of a usage event that are of interest to the business and can have charges applied to it. It is comprised of characteristics, which define all attributes known for a particular type of usage.

| Field       | Description   |
|-------------|---|
| description | A narrative that explains in detail what the usage specification is |
| href        | Reference of usage specification                                    |
| id          | Usage specification unique identifier                               |
| name        | The name of the usage specification.                                |

|          |   |
|----------|---|
| validFor | The period for which the usage specification is valid |
|----------|---|

UsageSpecCharacteristic: A detailed description of an attribute that defines a particular type of usage, described by its name, category, type, presence and a set of allowed values

| Field        | Description  |
|--------------|--|
| configurable | Boolean indicating if usageSpecCharacteristic is configurable or not               |
| description  | A narrative that explains in detail what the usage specification characteristic is |
| name         | The name of the usage specification characteristic                                 |

UsageSpecCharacteristicValue: A value that can be assigned to a UsageSpecCharacteristic.

| Field     | Description   |
|-----------|---|
| default   | Indicates if the value is the default value for a characteristic                          |
| value     | A narrative that explains in detail what the usage specification characteristic is        |
| valueType | A kind of value that the characteristic can take on, such as numeric, text, and so forth. |
| valueFrom | The low range value that a characteristic can take on                                     |
| valueTo   | The upper range value that a characteristic can take on.                                  |

UML model:

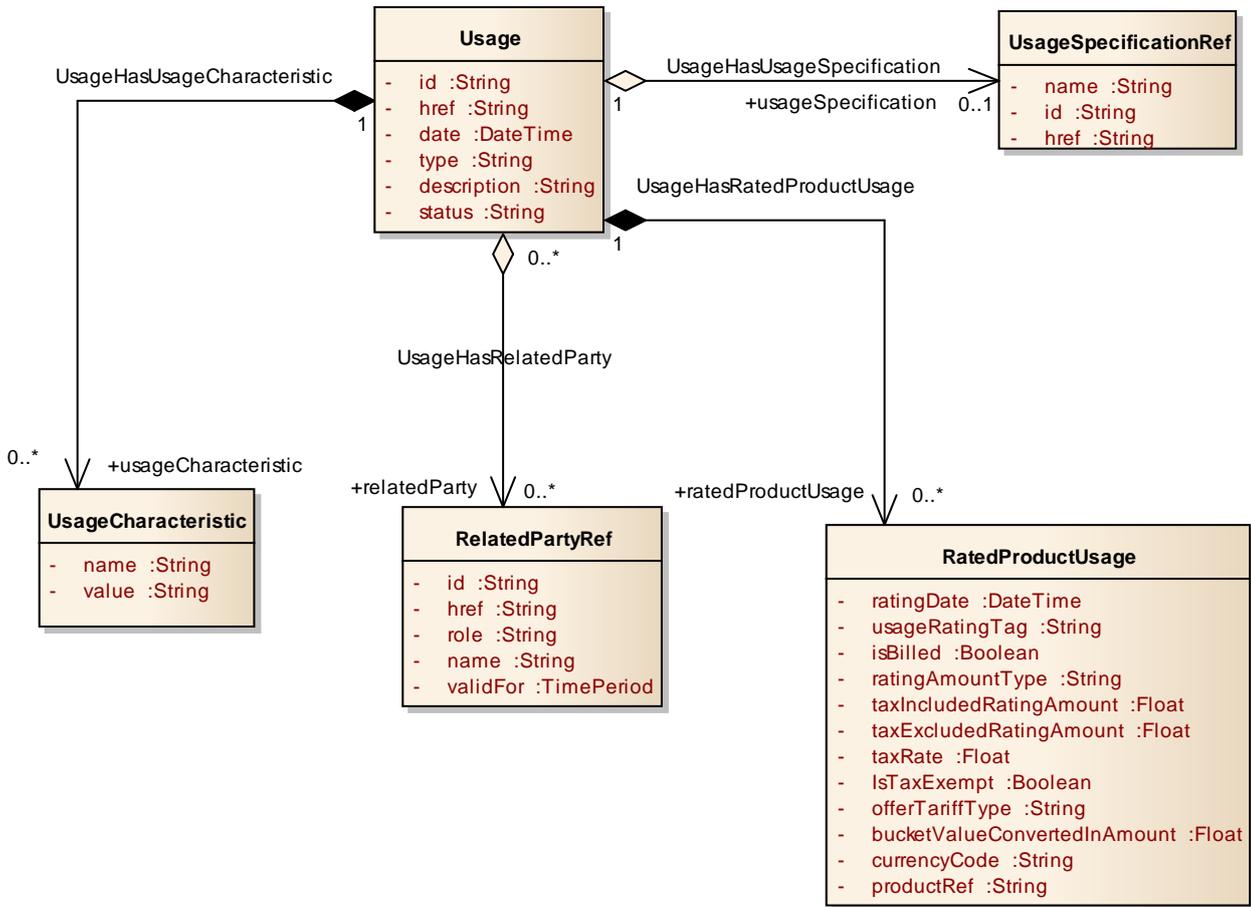


Figure 2 Usage resource model

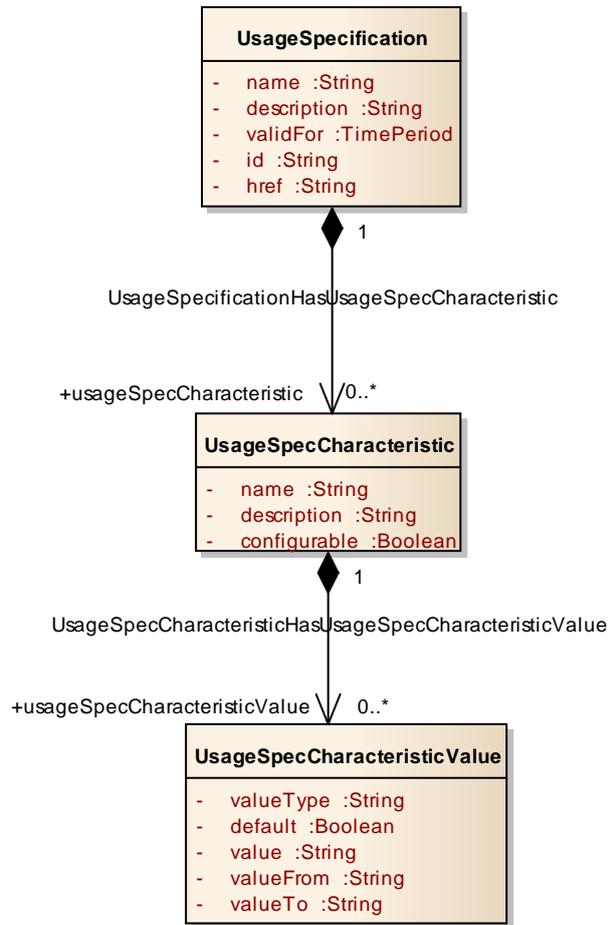


Figure 3 UsageSpecification resource model

EXPORT JOB RESOURCE

An ExportJob resource represents a TASK used to export resources to a File

The ExportJob resource supports the following properties:

| Attribute name | Description   |
|----------------|---|
| query          | Used to scope the exported data (identical to GET filter construct using target ID as base)<br>"query": "type=usage &version=2.0" |

|                |   |
|----------------|---|
| path           | URL of the root resource acting as the source for streaming content to the file specified by the ExportJob<br><br>../partyManagement/individual   |
| content-type   | The format of the exported data .By default “application/json”  |
| status         | notstarted, running, succeeded, failed  |
| url            | URL of the File containing the data to be exported<br><br>a file URL, which is of the form<br><br>file://host/path<br><br>where host is the fully qualified domain name of the system on which the path is accessible, and path is a hierarchical directory path of the form directory/directory/.../name |
| completionDate | Date at which the Job was completed.  |
| creationDate   | Date at which the Job was created.  |
| errorLog       | Reason for Failure  |

### JSON representation of an ExportJob

```
{
  "id": "54",
  "href": "http://api/usageManagement/exportJob/54",
  "status": "running",
  "path": "usageManagement/",
  "content-type": "application/json",
  "errorLog": "",
  "creationDate": "2013-04-19T16:42:23-04:00",
  "completionDate": "2013-04-21T16:42:23-04:00",
  "url": "ftp://ftp.myUsage.com/usage/54"
}
```

### UML Model:

| ExportJob   |
|---|
| <ul style="list-style-type: none"> <li>- id :String</li> <li>- href :String</li> <li>- query :String</li> <li>- path :String</li> <li>- contentType :String</li> <li>- status :String</li> <li>- url :String</li> <li>- completionDate :DateTime</li> <li>- creationDate :DateTime</li> <li>- errorLog :String</li> </ul> |

## IMPORT JOB RESOURCE

An ImportJob resource represent a TASK used to import resources from a File

The ImportJob resource supports the following properties:

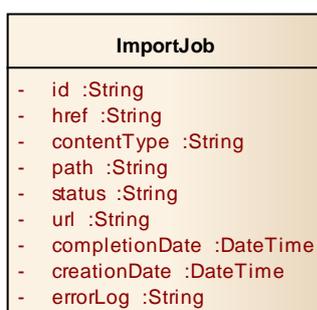
| Attribute name | Description   |
|----------------|---|
| content-type   | The format of the imported data. By default "application/json"  |
| path           | URL of the root resource where the content of the file specified by the ImportJob must be applied<br><br>../partyManagement/individual  |
| status         | notstarted, running, succeeded, failed  |
| url            | URL of the File containing the data to be imported<br><br>a file URL, which is of the form<br><br>file://host/path<br><br>where host is the fully qualified domain name of the system on which the path is accessible, and path is a hierarchical directory path of the form directory/directory/.../name |

|                |  |
|----------------|--|
| completionDate | Date at which the Job was completed.   |
| creationDate   | Date at which the Job was created.     |
| errorLog       | Reason for Failure if status is failed |

### JSON representation of an ImportJob

```
{
  "id": "54",
  "href": "http://api/usageManagement/importJob/54",
  "status": "completed",
  "path": "usageManagement/",
  "content-type": "application/json",
  "errorLog": "",
  "creationDate": "2013-04-19T16:42:23-04:00",
  "completionDate": "2013-04-21T16:42:23-04:00",
  "url": "ftp://ftp.myUsage.com/usage/54"
}
```

### UML Model:

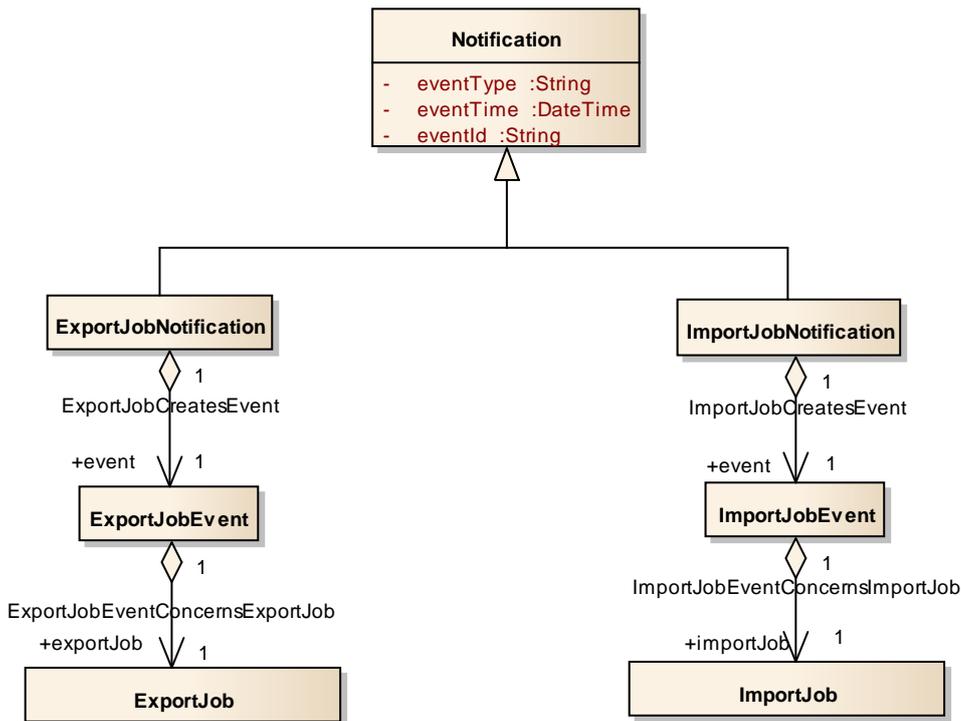


## Notification Resource Models

2 notification event types are defined :

1. ImportJobCompletionNotification
2. ExportJobCompletionNotification

UML Model:



Event: ExportJobCompletionNotification

```

{
  "eventType": "ExportJobCompletionNotification",
  "eventTime": "2014-09-27T05:46:25.0Z",
  "eventId": "1154278",
  "event": { "exportJob": {
    "id": "54",
    "href": "http://api/usageManagement/exportJob/54",
    "status": "succeeded",
    "path": "usageManagement/",
    "content-type": "application/json",
    "errorLog": "",
    "creationDate": "2013-04-19T16:42:23-04:00",
    "completionDate": "2013-04-21T16:42:23-04:00",
  }}
}
  
```

```
"url": "ftp://ftp.myUsage.com/usageManagement/54.json"
  }}
}
```

### Event: ImportJobCompletionNotification

```
{
  "eventType": "ImportJobCompletionNotification",
  "eventTime": "2014-09-27T05:46:25.0Z",
  "eventId": "1154278",
  "event": {

"importJob": {
  "id": "54",
  "href": "http://api/usageManagement/importJob/54",
  "status": "succeeded",
  "path": "usageManagement/",
  "content-type": "application/json",
  "errorLog": "",
  "creationDate": "2013-04-19T16:42:23-04:00",
  "completionDate": "2013-04-21T16:42:23-04:00",
  "url": "ftp://ftp.myUsage.com/usageManagement/54.json"
  }}
}
```

## API OPERATION TEMPLATES

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

Remember that the following Uniform Contract rules must be used :

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

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

Notifications are also described in a subsequent section.

GET /usageManagement/usage/{ID}

The resource is used to retrieve the usage entities.

Filtering is allowed on all attributes.

Attribute selection is possible for all attributes.

GET /usageManagement/usage/{ID}/{attributeSelector}?{filtering expression}

**Example REQUEST**

```
GET /usageManagement/usage/1234/fields=date,usageType,usageDescription
Accept: application/json
```

**Example RESPONSE**

```
200
Content-Type: application/json
{
  "id": "1234",
  "href": " http://serverlocation:port/usageManagement/usage/1234",
  "date": "2013-05-31T09:00:00+00:01",
  "type": "VOICE",
  "description": "Description for individual usage content"
}
```

**Example REQUEST B**

```
GET
/usageManagement/usage/?fields=date,usageType,status,ratedProductUsage.taxIncludedRatingAmount&
ratedProductUsage.taxIncludedRatingAmount.gt=10
Accept: application/json
```

**Example RESPONSE B**

```
200
Content-Type: application/json
{
  "id": "1234",
  "href": " http://serverlocation:port/usageManagement/usage/1234",
  "date": " 2013-04-19T16:42:23-04:00",
  "type": "VOICE",
  "status": "rated",
  "ratedProductUsage": [
    {

```

```

    "taxIncludedRatingAmount": "12.00"
  }
]
}

```

All standard error codes apply.

GET /usageManagement/usageSpecification/{ID}

The resource is used to retrieve the usage specification entities.

Filtering is allowed on all attributes.

Attribute selection is possible for all attributes.

GET  
usageManagement/usageSpecification/{ID}?{attributeSelector}&{attributeFilter} **Example REQUEST**

GET usageManagement/usageSpecification/22  
Accept: application/json

**Example RESPONSE**

```

200
Content-Type: application/json
{
  "id": "234",
  "href": " http://serverlocation:port/usageManagement/usageSpecification/234",
  "name": "CloudCpuSpec",
  "description": "Spec for cloud CPU usage",
  "validFor": {
    "startDateTime": "2013-04-19T16:42:23-04:00",
    "endDateTime": "2099-06-19T00:00:00-04:00"
  },
  "usageSpecCharacteristic": [
    {
      "name": "poolNumber",
      "description": "the number of the pool",
      "configurable": "true",
      "usageSpecCharacteristicValue": [
        {
          "valueType": "number",
          "default": "false",
          "value": "",
          "valueFrom": "0",

```

```

        "valueTo": ""
    }
]
}, {
    "name": "characteristicType",
    "description": "sub-type of the characteristic",
    "configurable": "true",
    "usageSpecCharacteristicValue": [
        {
            "valueType": "string",
            "default": "false",
            "value": "Reserved",
            "valueFrom": "",
            "valueTo": ""
        }, {
            "valueType": "string",
            "default": "false",
            "value": "Reserved Gold",
            "valueFrom": "",
            "valueTo": ""
        }, {
            "valueType": "string",
            "default": "false",
            "value": "Reserved Silver",
            "valueFrom": "",
            "valueTo": ""
        }, {
            "valueType": "string",
            "default": "false",
            "value": "Reserved Bronze",
            "valueFrom": "",
            "valueTo": ""
        }, {
            "valueType": "string",
            "default": "false",
            "value": "Burst",
            "valueFrom": "",
            "valueTo": ""
        }
    ]
}, {
    "name": "value",
    "description": "value of the usage specified by the unit",
    "configurable": "true",
    "usageSpecCharacteristicValue": [
        {
            "valueType": "number",

```

```

        "default": "false",
        "value": "",
        "valueFrom": "0",
        "valueTo": ""
    }
  ], {
    "name": "unit",
    "description": "unit of measure",
    "configurable": "true",
    "usageSpecCharacteristicValue": [
      {
        "valueType": "string",
        "default": "false",
        "value": "GHz",
        "valueFrom": "",
        "valueTo": ""
      }, {
        "valueType": "string",
        "default": "false",
        "value": "Number of vCPU",
        "valueFrom": "",
        "valueTo": ""
      }
    ]
  }
]
}

```

**Example REQUEST B**

GET usageManagement/usageSpecification/?name="cloudCpuSpec"  
 Accept: application/json

**Example RESPONSE B**

200  
 Content-Type: application/json

(same as above)

All standard error codes apply.

## POST /USAGEMANAGEMENT/USAGE

The resource is used to create usage entities.

POST without specifying the ID of the usage record must result in the system generating the ID for the usage record (typical). In a specific case, the ID can also be included in the POST (optional)

Attribute selection is possible for all attributes.

POST /usageManagement/usage/{ID}/{attributeSelector}

| Attribute name      | Mandatory | Default                 | Rule  |
|---------------------|-----------|-------------------------|---|
| id                  | N         | Automatically generated | If not given, the id is generated by the system. It is also possible to add an ID in the POST request, which is then used     |
| href                | N         | Automatically generated | If not given, the href is generated by the system. It is also possible to add an href in the POST request, which is then used |
| date                | Y         |                         |   |
| type                | Y         |                         |   |
| description         | N         |                         |   |
| usageSpecification  | N         |                         |   |
| usageCharacteristic | N         |                         |   |
| status              | N         | “received”              |   |
| relatedParty        | N         |                         |   |
| ratedProductUsage   | N         |                         |   |

## Rules:

| Rule name           | Rule/Pre Condition/Side Effects/Post Conditions  |
|---------------------|--|
| usageCharacteristic | name and value are mandatory   |
| relatedParty        | role and party are mandatory<br>startDateTime is not mandatory but has a default value -> it is set to sysdate by default  |
| ratedProductUsage   | When a usage record is created with a status of rated or billed, the following attributes are mandatory:<br><br>"ratingDate", "taxIncludedRatingAmount",<br>"taxExcludedRatingAmount", "taxRate", "currencyCode ",<br>"productRef"                                       |
| ratedProductUsage   | When a usage record is created with a status of rated or billed, the following default values apply:<br><br>"usageRatingTag": "Usage",<br><br>"isBilled": "False",<br><br>"ratingAmountType": "Total",<br><br>"isTaxExempt": "false",<br><br>"offerTariffType": "Normal" |

## Create a usage

| REQUEST   |
|---|
| POST usageManagement/usage<br>Content-type: application/json<br><br><pre>{   "date": "2013-04-19T16:42:23-04:00",   "type": "VOICE",   "description": "Description for individual usage content",   "status": "rated",   "usageSpecification": {     "id": "22",     "href": "http://serverlocation:port/usageManagement/usageSpecification/22",     "name": "Voice usage specification"   } },</pre> |

```
"usageCharacteristic": [
  {
    "name": "originatingCountryCode",
    "value": "43"
  }, {
    "name": "originatingNumber",
    "value": "676123456789"
  }, {
    "name": "destinationCountryCode",
    "value": "49"
  }, {
    "name": "destinationNumber",
    "value": "170123456789"
  }, {
    "name": "duration",
    "value": "20"
  }, {
    "name": "unit",
    "value": "SEC"
  }, {
    "name": "startDateTime",
    "value": "2013-04-19T16:42:23-04:00"
  }, {
    "name": "endDateTime",
    "value": "2013-04-19T16:42:23-04:00"
  }
],
"relatedParty": [
  {
    "role": "serviceProvider",
    "id": "1",
    "href": "http://serverlocation:port/partyManagement/organization/1"
  }, {
    "role": "customer",
    "id": "45",
    "ref": "http://serverlocation:port/partyManagement/individual/45"
  }
],
"ratedProductUsage": [
  {
    "ratingDate": "2013-04-19T16:42:23-04:00",
    "usageRatingTag": "Usage",
    "ratingAmountType": "Total",
    "taxIncludedRatingAmount": "12.00",
    "taxExcludedRatingAmount": "10.00",
    "taxRate": "20",
    "isTaxExempt": "false",
```

|   |
|---|
| <pre> "offerTariffType": "Normal", "bucketValueConvertedInAmount": "", "currencyCode": "EUR" } ] } </pre> |
| <b>RESPONSE</b>   |
| 201<br>Content-Type: application/json<br><br><b>WHOLE RECORD with ID, href</b>                            |

### POST usageManagement/usageSpecification/

The resource is used to create usage specification entities.

Attributes:

| Attribute name | Mandatory | Default                 | Rule  |
|----------------|-----------|-------------------------|---|
| id             | N         | Automatically generated | If not given, the id is generated by the system. It is also possible to add an ID in the POST request, which is then used     |
| href           | N         | Automatically generated | If not given, the href is generated by the system. It is also possible to add an href in the POST request, which is then used |
| name           | N         |                         |   |
| description    | N         |                         |   |
| validFor       | N         |                         |   |

|                         |   |  |  |
|-------------------------|---|--|--|
| usageSpecCharacteristic | N |  |  |
|-------------------------|---|--|--|

| Rule name                    | Rule/Pre Condition/Side Effects/Post Conditions     |
|------------------------------|---|
| usageSpecCharacteristic      | name and usageSpecCharacteristicValue are mandatory |
| usageSpecCharacteristicValue | valueType is mandatory                              |

### Example REQUEST

POST usageManagement/usageSpecification/  
Accept: application/json

```
{
  "id": "22",
  "href": "http://serverlocation:port/usageManagement/usageSpecification/22",
  "name": "VoiceSpec",
  "description": "Spec for voice calls usage",
  "validFor": {
    "startDateTime": "2013-04-19T16:42:23-04:00",
    "endDateTime": "2099-06-19T00:00:00-04:00"
  },
  "usageSpecCharacteristic": [
    {
      "name": "originatingCountryCode",
      "description": "country code of the caller",
      "configurable": "true",
      "usageSpecCharacteristicValue": [
        {
          "valueType": "number",
          "default": "false",
          "value": "",
          "valueFrom": "",
          "valueTo": ""
        }
      ]
    }, {
      "name": "originatingNumber",
      "description": "phone number of the caller",
      "configurable": "true",

```

```

    "usageSpecCharacteristicValue": [
      {
        "valueType": "string",
        "default": "false",
        "value": "",
        "valueFrom": "",
        "valueTo": ""
      }
    ]
  }, {
    "name": "destinationCountryCode",
    "description": "country code of the called party",
    "configurable": "true",
    "usageSpecCharacteristicValue": [
      {
        "valueType": "number",
        "default": "false",
        "value": "",
        "valueFrom": "",
        "valueTo": ""
      }
    ]
  }, {
    "name": "destinationNumber",
    "description": "phone number of the called party",
    "configurable": "true",
    "usageSpecCharacteristicValue": [
      {
        "valueType": "string",
        "default": "false",
        "value": "",
        "valueFrom": "",
        "valueTo": ""
      }
    ]
  }, {
    "name": "duration",
    "description": "duration of the call",
    "configurable": "true",
    "usageSpecCharacteristicValue": [
      {
        "valueType": "number",
        "default": "false",
        "value": "",
        "valueFrom": "0",
        "valueTo": ""
      }
    ]
  }

```

```

    ], {
      "name": "unit",
      "description": "unit of the duration",
      "configurable": "true",
      "usageSpecCharacteristicValue": [
        {
          "valueType": "number",
          "default": "false",
          "value": "SEC",
          "valueFrom": "",
          "valueTo": ""
        }
      ]
    }, {
      "name": "startDateTime",
      "description": "startdate and starttime of the call",
      "configurable": "true",
      "usageSpecCharacteristicValue": [
        {
          "valueType": "dateTime",
          "default": "false",
          "value": "",
          "valueFrom": "",
          "valueTo": ""
        }
      ]
    }, {
      "name": "endDateTime",
      "description": "enddate and endtime of the call",
      "configurable": "true",
      "usageSpecCharacteristicValue": [
        {
          "valueType": "dateTime",
          "default": "false",
          "value": "",
          "valueFrom": "",
          "valueTo": ""
        }
      ]
    }
  ]
}

```

**Example RESPONSE**

201

Content-Type: application/json  
(whole record, including ID,href)

## PATCH USAGEMANAGEMENT/USAGE

The resource is used to modify usage entities.

PATCH /usageManagement/usage/{ID}/?{filtering expression}

### Attributes and Rules

| Attribute name      | Patchable | Rule |
|---------------------|-----------|------|
| id                  | N         |      |
| href                | N         |      |
| date                | Y         |      |
| type                | Y         |      |
| description         | Y         |      |
| usageSpecification  | Y         |      |
| usageCharacteristic | Y         |      |
| status              | Y         |      |
| relatedParty        | Y         |      |
| ratedProductUsage   | Y         |      |

| Rule name           | Rule/Pre Condition/Side Effects/Post Conditions  |
|---------------------|--|
| usageCharacteristic | Name and value are mandatory   |
| relatedParty        | Role and party are mandatory<br>startDateTime is not mandatory but has a default value -> it is set to sysdate by default  |
| ratedProductUsage   | When a usage record is created with a status of rated or billed, the following attributes are mandatory:<br><br>"ratingDate", "taxIncludedRatingAmount",<br>"taxExcludedRatingAmount", "taxRate",<br>"currencyCode ", "productRef"                       |
| ratedProductUsage   | When a usage record is created with a status of rated or billed, the following default values apply:<br><br>"usageRatingTag": "Usage",<br>"isBilled": "False",<br>"ratingAmountType": "Total",<br>"isTaxExempt": "false",<br>"offerTariffType": "Normal" |

## Modify a usage

| REQUEST A – “rate” a single usage record  |
|---|
| PATCH usageManagement/usage/1234/<br>Content-type: application/json<br><br><pre> {   "status": "rated",   "ratedProductUsage": [     {       "ratingDate": "2013-04-19T16:42:23-04:00",       "taxIncludedRatingAmount": 22.00,       "taxExcludedRatingAmount": 20.00,       "taxRate": 10,     }   ] }           </pre> |

|  |
|--|
| <pre> }   ]     "currencyCode": "CAD"   } </pre>                       |
| <b>RESPONSE</b>  |
| 201<br>Content-Type: application/json<br><br>WHOLE RECORD including ID |

## DELETE USAGEMANAGEMENT/USAGESPECIFICATION

The resource is used to DELETE a usage specification entity.

DELETE /usageManagement/usageSpecification/ID/

Delete a usage specification

Deletion of usage specifications is only allowed by specifying the ID in the URL, deleting a single usage specification.

If DELETE is implemented at all, a check must be implemented that verifies that no usage records exist in the system that depend on the usage specification to be deleted – otherwise a 409 (Conflict) HTTP error code should be sent.

|   |
|---|
| <b>REQUEST</b>  |
| DELETE usageManagement/usageSpecification/1234/<br>Content-type: application/json |
| <b>RESPONSE</b>   |
| 200<br>Content-Type: application/json   |

## POST USAGEMANAGEMENT/IMPORTJOB

ImportJob Tasks are created as resources.

The ImportJob is attached to the URL of the root resource where the content of the file specified by the ImportJob will be applied.

For example to apply the content of the import file located at <ftp://ftp.myUsage.com/usage/54> to the usageManagement root.

| REQUEST   |
|---|
| POST ../usageManagement/importJob<br>Content-type: application/json<br><br><pre>{   "url": "ftp://ftp.myUsage.com/usage/54" }</pre>   |
| RESPONSE  |
| 201<br>Content-Type: application/json<br>Location: ../usageManagement/importJob/54<br><br><pre>{   "id": "54",   "href": "http://api.usageManagement/importJob/54",   "status": "running",   "path": "usageManagement/",   "content-type": "application/json",   "errorLog": "",   "creationDate": "2013-04-19T16:42:23-04:00",   "url": "ftp://ftp.myUsage.com/usage/54" }</pre> |

## POST USAGEMANAGEMENT/EXPORTJOB

ExportJob Tasks are created as resources.

The ExportJob is attached to a specific resource acting as the root for the collection of resources to be streamed to a File.

For example:

| REQUEST   |
|---|
| POST ../usageManagement/exportJob<br>Content-type: application/json<br><br>{<br>}   |
| RESPONSE  |
| 201<br>Content-Type: application/json<br>Location: ../usageManagement/exportJob/54<br><br>{<br>"id": "54",<br>"href": "http://api/usageManagement/exportJob/54",<br>"status": "running",<br>"path": "usageManagement/",<br>"content-type": "application/json",<br>"errorLog": "",<br>"creationDate": "2013-04-19T16:42:23-04:00",<br>"completionDate": "2013-04-21T16:42:23-04:00",<br>"url": "ftp://ftp.myUsage.com/usage/54"<br>} |

## GET USAGEMANAGEMENT/EXPORTJOB

ExportJob resources can be found under the API/exportJob collection and may be retrieved using the normal GET constructs.

For example:

| REQUEST   |
|---|
| GET ../usageManagement/exportJob/54<br>Content-type: application/json<br><br>{<br>} |

| RESPONSE  |
|---|
| 200<br>Content-Type: application/json<br><pre>{   "id": "54",   "href": "http://api/usageManagement/exportJob/54",   "status": "running",   "path": "usageManagement/",   "content-type": "application/json",   "errorLog": "",   "creationDate": "2013-04-19T16:42:23-04:00",   "completionDate": "2013-04-21T16:42:23-04:00",   "url": "ftp://ftp.myUsage.com/usage/54" }</pre> |

## GET USAGEMANAGEMENT/IMPORTJOB

ImportJob resources can be found under the API/importJob collection and may be retrieved using the normal GET constructs.

For example:

| REQUEST   |
|---|
| GET ../usageManagement/importJob/54<br>Content-type: application/json<br><pre>{ }</pre>   |
| RESPONSE  |
| 200<br>Content-Type: application/json<br><pre>{   "id": "54",   "href": "http://api/usageManagement/importJob/54",   "status": "running",   "path": "usageManagement/", }</pre> |

```
"content-type": "application/json",  
"errorLog": "",  
"creationDate": "2013-04-19T16:42:23-04:00",  
"completionDate": "2013-04-21T16:42:23-04:00",  
"url": "ftp://ftp.myUsage.com/usage/54"  
}
```

## API NOTIFICATION TEMPLATES

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.

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

### UNREGISTER LISTENER DELETE HUB/{ID}

Description :

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

## Behavior :

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

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

|  |
|--|
| <b>REQUEST</b>                                   |
| DELETE /api/hub/{id}<br>Accept: application/json |
| <b>RESPONSE</b>                                  |
| 204  |

## PUBLISH {EVENTTYPE} POST /LISTENER

## Description :

Provide the Event description

## Behavior :

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

|  |
|--|
| <b>REQUEST</b>   |
| POST /client/listener<br>Accept: application/json  |
| <pre>{   "eventType": "EventType",   "eventTime": "2014-09-27T05:46:25.0Z",   "eventId": "1562231",   "event":   {     <b>EVENT BODY</b>   } }</pre> |
| <b>RESPONSE</b>  |

201  
Content-Type: application/json

Example see TMF REST Design Guidelines.

## RELEASE HISTORY

| Release Number | Date       | Release led by:  | Description  |
|----------------|------------|--|--|
| Release 1.0    | 03/06/2014 | Andreas Polz<br>Infonova<br><a href="mailto:andreas.polz@infonova.com">andreas.polz@infonova.com</a> | Mature Draft of Spec developed during the SpecJAM sessions in Vienna, March 4-6 <sup>th</sup> , 2014 |
| Release 1.1    |            |  | Updated for use in ....  |

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