Frameworx Specification

Usage Management API REST Specification

TMF635

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NOTICE

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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	
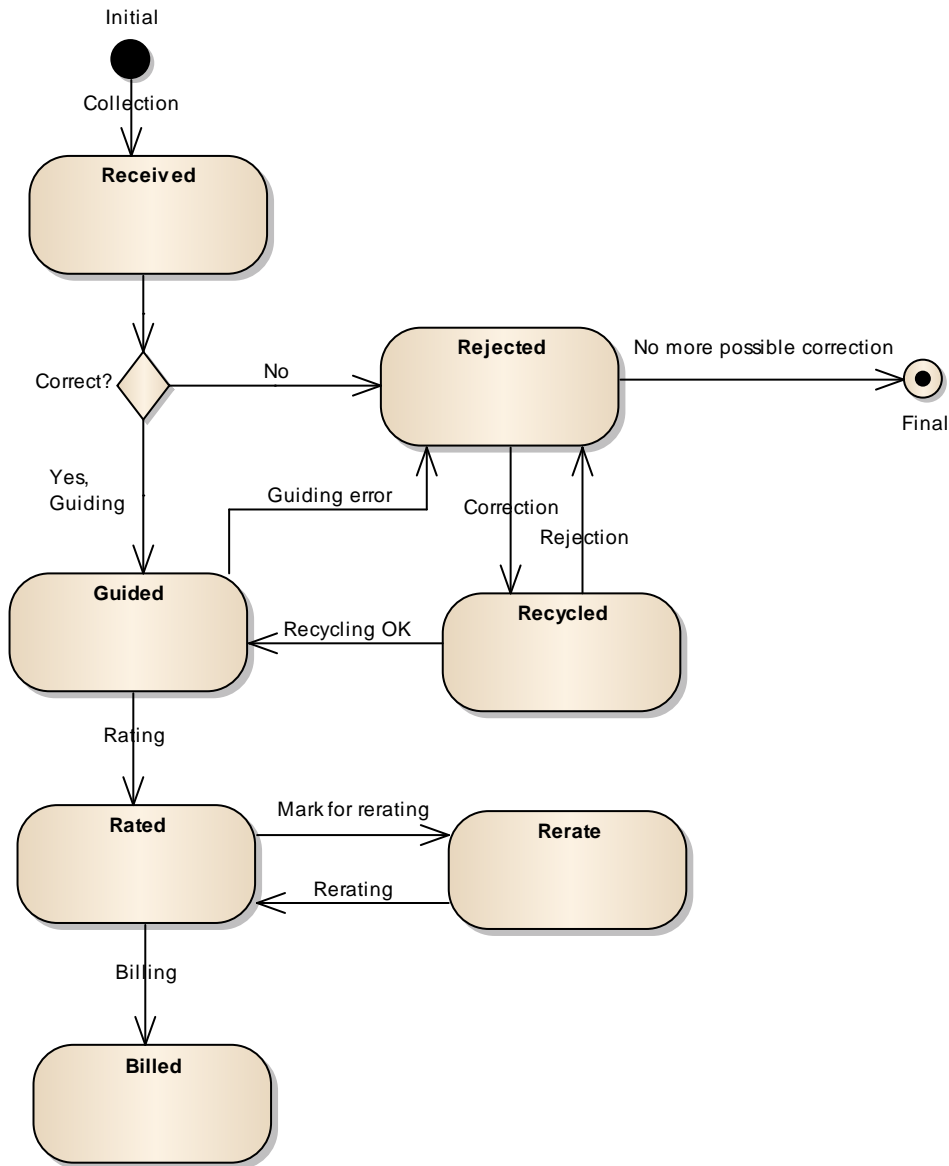
Figure 1: State machine diagram for status attribute on usage

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).

```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",
```

```json
                                "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:

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

```json
            "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": "",
```

```json
                                        "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 'included usage' : the usage is rated inside a usage bundle '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:
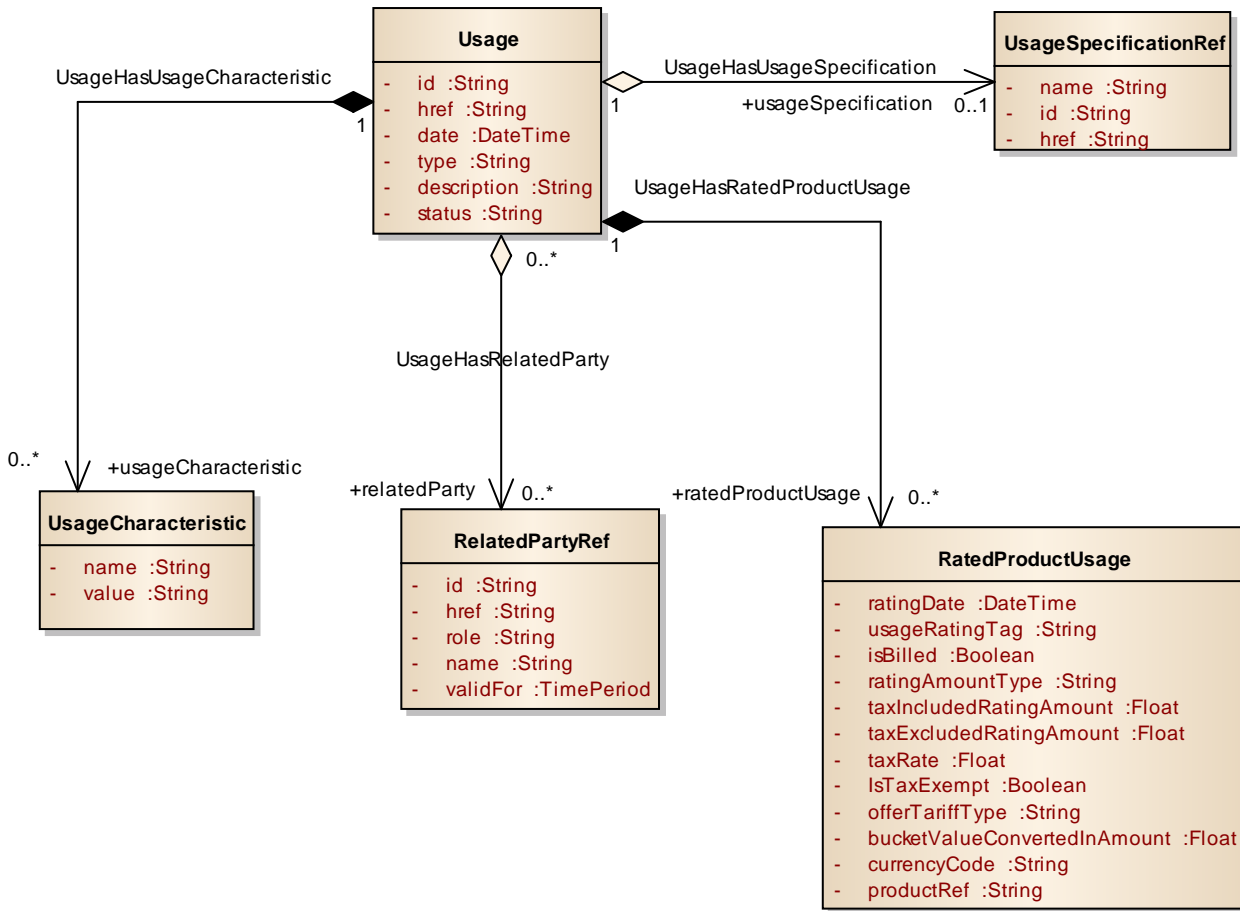
Figure 2 Usage resource model
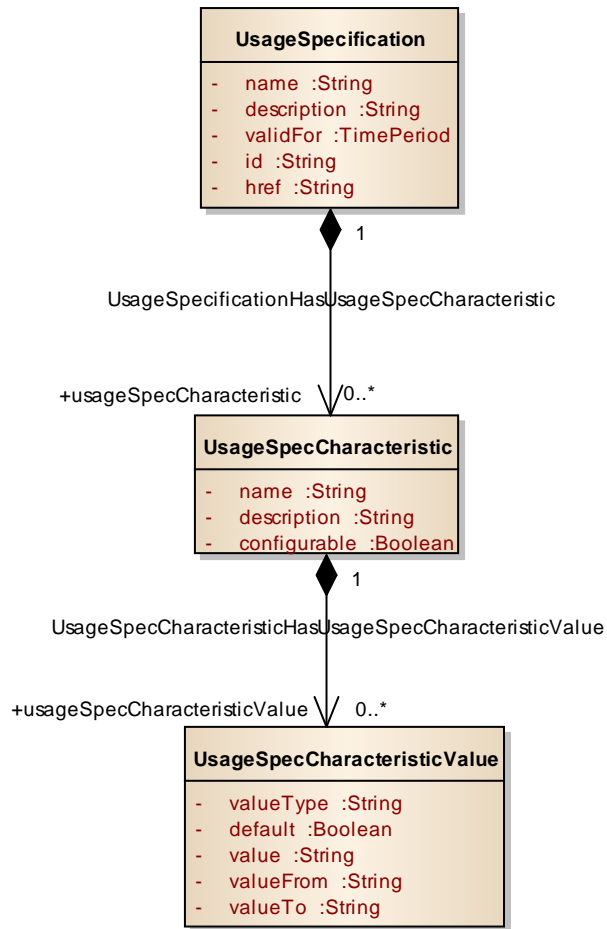
Figure 3 UsageSpecification resource model

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) "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 ../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 a file URL, which is of the form file://host/path 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

- id :String
- href :String
- query :String
- path :String
- contentType :String
- status :String
- url :String
- completionDate :DateTime
- creationDate :DateTime
- errorLog :String

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 ../partyManagement/individual
status	notstarted, running, succeeded, failed
url	URL of the File containing the data to be imported a file URL, which is of the form file://host/path 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:

ImportJob

- id :String
- href :String
- contentType :String
- path :String
- status :String
- url :String
- completionDate :DateTime
- creationDate :DateTime
- errorLog :String
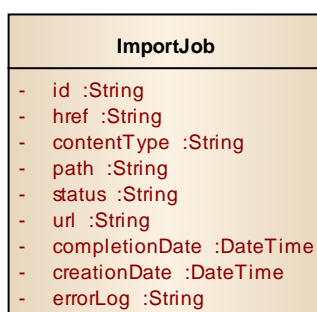
Notification Resource Models

2 notification event types are defined :

1. ImportJobCompletionNotification
2. ExportJobCompletionNotification

UML Model:
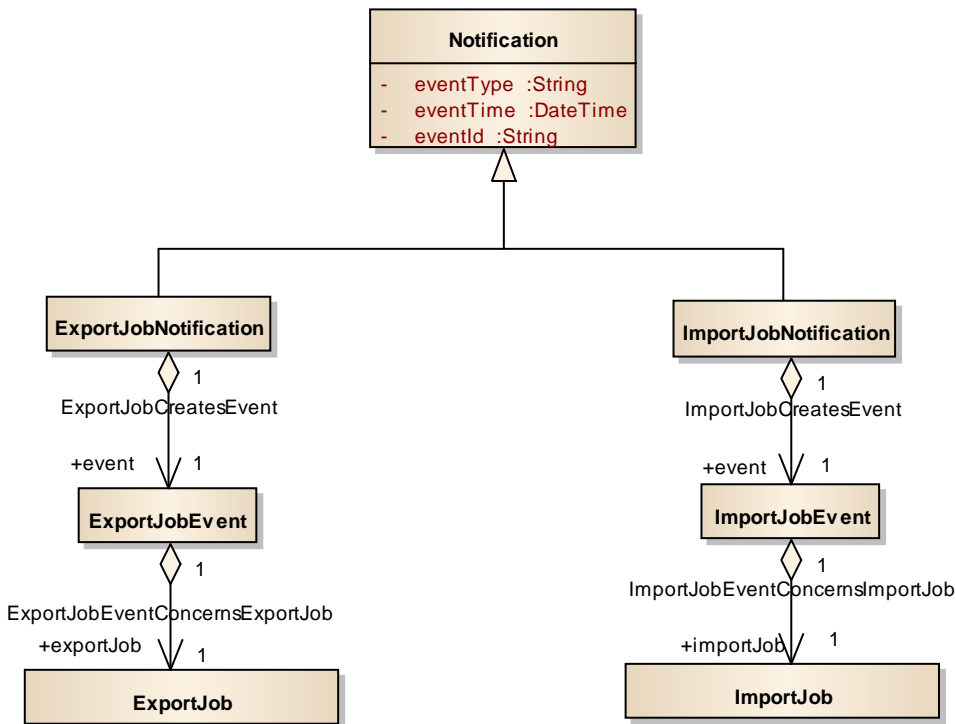
Event: ExportJobCompletionNotification

```
{
  "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
/usageManagementi/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",
```

```json
                                          "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 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: "ratingDate", "taxIncludedRatingAmount", "taxExcludedRatingAmount, "taxRate", "currencyCode ", "productRef"
ratedProductUsage	When a usage record is created with a status of rated or billed, the following default values apply: "usageRatingTag": "Usage", "isBilled": "False", "ratingAmountType": "Total", "isTaxExempt": "false", "offerTariffType": "Normal"

Create a usage

REQUEST

POST usageManagement/usage
Content-type: application/json
 	
{   "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"
            }
        ]
}
```

RESPONSE

201
Content-Type: application/json

WHOLE RECORD with ID, href

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 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: "ratingDate", "taxIncludedRatingAmount", "taxExcludedRatingAmount, "taxRate", "currencyCode ", "productRef"
ratedProductUsage	When a usage record is created with a status of rated or billed, the following default values apply: "usageRatingTag": "Usage", "isBilled": "False", "ratingAmountType": "Total", "isTaxExempt": "false", "offerTariffType": "Normal"

Modify a usage

REQUEST A – "rate" a single usage record

```
PATCH usageManagement/usage/1234/
Content-type: application/json

{
        "status": "rated",
        "ratedProductUsage": [
                {
                        "ratingDate": "2013-04-19T16:42:23-04:00",
                        "taxIncludedRatingAmount": 22.00,
                        "taxExcludedRatingAmount": 20.00,
```

```
                    "taxRate": 10,
                    "currencyCode": "CAD"
            }
      ]
}
```

RESPONSE

201
Content-Type: application/json

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.

REQUEST

DELETE usageManagement/usageSpecification/1234/
Content-type: application/json

RESPONSE

200
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
Content-type: application/json

{
"url": "ftp://ftp.myUsage.com/usage/54"

}

RESPONSE

201
Content-Type: application/json
Location: ../usageManagement/importJob/54

{
    "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"

    }

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
Content-type: application/json
 	
{
}

RESPONSE

201
Content-Type: application/json
Location: ../usageManagement/exportJob/54
 	
{
    "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"
  }

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
Content-type: application/json
 	
{
}

RESPONSE

```
200
Content-Type: application/json

{
    "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"
  }
```

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
Content-type: application/json

{
}
```

RESPONSE

```
200
Content-Type: application/json

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

UNREGISTER LISTENER DELETE HUB/{ID}

Description :

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

Behavior :

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

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

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

PUBLISH {EVENTTYPE} POST /LISTENER

Description :

Provide the Event description

Behavior :

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

REQUEST

POST /client/listener
Accept: application/json
 	
{
     "eventType": "EventType",
     "eventTime": "2014-09-27T05:46:25.0Z",
     "eventId": "1562231",
     "event":
     {
  EVENT BODY
     }
}

RESPONSE

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 Infonova andreas.polz@infonova.com	Mature Draft of Spec developed during the SpecJAM sessions in Vienna, March 4-6th, 2014
Release 1.1			Updated for use in ….

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