



## *TM Forum Specification*

# Prepay Balance Management API REST Specification

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## INTRODUCTION

The following document is the specification of the REST API for Prepay Balance Management. It includes the model definition as well as all available operations for prepay balance management.

Prepay users pay fees before using services. Therefore, the users must have sufficient balance to use these services.

A bucket is understood in this API as an entity that keeps track of the balance available to use services. Every bucket will measure balance in different units, it can be monetary or non-monetary (e.g.: number of sms that are available, number of GB of data available, ...)

Users can pass credit between different balance buckets, therefore transferring balance from one bucket to another.

Operators can provide multiple recharge channels to top up these buckets to increase balance to use services.

When a customer acquires a product offered by a service provider, as part of the fulfillment while creating an instance of the product acquired by the customer, a set of bucket entities are created to measure the balance for the different services that are part of the product (e.g.: voice, data and sms buckets are created as part of a instantiation of a "mobile line" product).

In order to identify uniquely the bucket and perform operations over it (recharge, reserve, ...), it is possible to use the combination of the identifier of the product and the type of service whose balance is being measured, or directly the internal identifier of the bucket that is created under the product if this is known by the consumer performing the operations.

In some implementations the identifier of the product matches (or can be related 1-to-1) the value assigned to one of the resources that are created under the product, such as a telephone number, an MSISDN, an IP address, an IMSI, ... or any other. If the consumer performing the operations is only aware of this resource identifier (or commercial identifier of the product) instead of the internal identifier of the product it is possible to address to this as product identifier, provided that the server can relate 1-to-1 this resource id to the internal product id that was instantiated when fulfilling the order subscribed by the customer.

The entity that owns the product under which the buckets are created and keeps the financial relation with the service provider is a customer account.

The main root path in this API, as represented in the API OPERATION TEMPLATES below is defined as **/host:port/balancemanagement/v1/** but as an optional approach, for implementations requiring to apply specific authorization policies based on the request URI, it is contemplated the option to include the reference to the product impacted (or the commercial identifier of the product) within the root path, becoming **/host:port/balancemanagement/v1/product/{productId}/**.

Where {productId} refers to either the internal identifier of the product instantiated or the commercial identifier (typically based on a resource such as themsisdn) associated to the internal product identifier. The example of operations section contemplates both scenarios.

The following is the list of resources that are associated to a given product (referenced by a commercial id such as an msisn or an internal product id)

- **BucketBalances:** A set of balance storages called buckets (or wallets) keeping track of the available credit to use a specific service (an **AccumulatedBalance**) keeps record of the remaining credit for an aggregation of individual buckets.
- **BalanceTopupRequests:** A set of records for each one of the recharge operations requested to be processed
- **BalanceTransferRequests:** A set of records for each one of the balance transfer operations requested to be processed



- **BalanceAdjustmentRequests:** A set of records for each one of the balance adjustment operations requested to be processed
- **BalanceActivity:** A track of record for the balance related operations (recharge, transfer, adjustment) performed
- **BalanceReserveRequests:** A set of records for each one of the balance Reserve operations requested to be processed
- **BalanceUnreserveRequests:** A set of records for each one of the balance Unreserve operations requested to be processed
- **BalanceDeductRequests:** A set of records for each one of the balance deduction operations requested to be processed

Prepay API manages the balance, recharge (top-up), transfer, reserve, unreserve, deduct and balance adjustment resources

Prepay API performs the following operations

- **On a bucket balance resource**
  - o Retrieve the remaining credit information on a bucket for a given product (individual or aggregated).
  - o Retrieve the list of balance-related operations performed over a given product.
- **On a BalanceTopup requests collection resource**
  - o Retrieve information about all the top-up operations stored in the server filtered by some criteria.
  - o Perform a new top up operation (recharge)
- **On a BalanceTopup request individual resource**
  - o Retrieve detailed information about a top-up operation previously processed by the server.
- **On a BalanceTopup request status resource**
  - o Retrieve the current and historic status information about a top-up operation previously processed by the server.
  - o Modify the current status information about a top-up.
- **On a BalanceTransfer requests collection resource**
  - o Perform a new transfer operation
  - o Retrieve information about all the transfer operations stored in the server filtered by some criteria
- **On a BalanceTransfer request individual resource**
  - o Retrieve detailed information about a transfer operation previously processed by the server
- **On a BalanceTransfer request status resource**
  - o Retrieve the current and historic status information about a transfer operation previously processed by the server.
  - o Modify the current status information about a transfer.
- **On a BalanceAdjustment requests collection resource**
  - o Retrieve information about all the adjustments stored in the server filtered by some criteria.
  - o Perform a new adjustment operation
- **On a BalanceAdjustment request individual resource**

- Retrieve detailed information about a balance adjustment operation previously processed by the server.
- **On a BalanceReserve requests individual resource**
  - Reserve the account balance currently processed by the server.
- **On a BalanceUnreserve requests individual resource**
  - Unreserve operation on the account balance
- **On a BalanceDeduct requests individual resource**
  - Deduct the account balance currently processed by the server.

## SAMPLE USE CASES

This section includes a set of main use cases that can be performed with this API. Additional use cases can be generated using the operations and resources defined in this specification.

### Use Case 1: Customer top-ups a given amount to an account

#### Description

The main purpose of this use case is the modification of the remaining balance for a given product, identified by a commercial Id such as an MSISDN or an internal product identifier.

#### Main Actors

- The top-up requestor
- The affected product (identified by a product identifier such as an MSISDN or an internal identifier)

#### Use Case Steps

- i. The requestor makes use of any of the available channels in order to initiate a new top-up operation
- ii. The Operator receives a top-up creation request with indication of the following minimum information
  - a. Channel used
  - b. Requestor identifier
  - c. Recharged subscriber identifier
  - d. Type of bucket to be recharged (a preconfigured value which determines the wallet in which the recharge is done) in case there are multiple independents balance storages per subscriber, such as national-voice, roaming-voice, promotional-voice, data, ....
  - e. Amount to be recharged
- iii. The operator confirms that the requestor is authorized to perform the recharge action over the specific affected subscriber. This could be based on just the requestor identifier or via a more sophisticated token-based authorization mechanisms
- iv. The top-up operation is processed and the balance resource for the bucket is augmented accordingly with the amount indicated. The new amount will be valid for the time defined in the request or by a default value defined in the system
- v. The requestor is informed of the successful outcome

#### Example of API Usage in the Context of the Use Case

The following API interactions support the use case:

- The requestor, via a user interface appropriate for the corresponding channel, consumes the service offered by the server over Topup resource to perform a new top-up.

#### Success Outcome

After completion of these API interactions, the corresponding balance resource for the impacted bucket and the affected product will be added the amount indicated in the request, to be used for prepay services.

## Use Case 2: Customer transfers credit to another account

### Description

The main purpose of this use case is the transfer of part of the amount from one bucket, identified by a commercial Id such as an MSISDN and a service type to a different bucket.

### Main Actors

- The transfer requestor
- The transferring bucket (identified by a commercial identifier such as an MSISDN or an internal identifier and a service type)
- The receiving bucket (identified by a commercial identifier such as an MSISDN or an internal identifier and a service type)

### Use Case Steps

- i. The requestor makes use of any of the available channels in order to initiate a new transfer operation
- ii. The Operator receives a transfer request with indication of the following minimum information
  - a. Channel used
  - b. Requestor identifier
  - c. Transferring subscriber identifier
  - d. Receiving subscriber identifier
  - e. Type of bucket to be recharged (a preconfigured value which determines the wallet in which the recharge is done) in case there are multiple independents balance storages per subscriber, such as national-voice, roaming-voice, promotional-voice, data, ....
  - f. Amount to be transferred
- iii. The operator confirms that the requestor is authorized to perform the recharge action over the specific transferring subscriber. This could be based on just the requestor identifier or via a more sophisticated token-based authorization mechanisms
- iv. The transfer operation is processed, then the balance resource for the receiving bucket is augmented and the balance resource for the transferring bucket is reduced accordingly with the amount indicated. The new amount will be valid for the time defined in the request or by a default value defined in the system
- v. The requestor is informed of the successful outcome

### Example of API Usage in the Context of the Use Case

The following API interactions support the use case:

- The requestor, via a user interface appropriate for the corresponding channel, consumes the service offered by the Transfer resource to perform a new transfer operation.

---

## Success Outcome

After completion of these API interactions, the corresponding balance resources for the impacted buckets will be modified, adding the amount indicated in the request to the receiving bucket and removing it from the transferring bucket, to be used for prepay services.

### Use Case 3: A requestor requests to reserve balance

---

## Description

The main purpose of this use case is the reserve the balance for a given bucket, identified by a commercial identifier such as an MSISDN or an internal identifier and a service type.

---

## Main Actors

- The reserve requestor
- The affected bucket (identified by a commercial identifier such as an MSISDN or an internal identifier and a service type)

---

## Use Case Steps

- i. The requestor makes use of any of the available channels in order to initiate a balance reserve request
- ii. The Operator receives a balance reserve request with indication of the following minimum information
  - a. Requestor identifier
  - b. Subscriber identifier
  - c. Type of wallet to be reserved (in case there are multiple independents balance storage, wallets, per subscriber)
  - d. Amount to reserve
- iii. The Operator confirms that the requestor is authorized to perform the balance reserve action over the specific affected subscriber. This could be based on just the requestor identifier or via a more sophisticated token-based authorization mechanisms
- iv. The balance reserve operation is processed and the balance resource for the wallet is reserved accordingly. The reserved amount *will not be available to be used to pay for other prepay services* for the time defined in the request or by a default value defined in the system
- v. The requestor is informed of the successful outcome

---

## Example of API Usage in the Context of the Use Case

The following API interactions support the use case:

- The reserve requestor, via a user interface appropriate for the corresponding channel, consumes the service offered by the server over balance reserve resource to perform a balance reserve.

---

## Success Outcome

After completion of these API interactions, the corresponding balance resource for the impacted wallet and the affected product will be reserved, therefore reserved on a specific amount within the balance that will not be possible to be used for other prepay services unless the reserve is reverted, to be used for prepay services.

## Use Case 4: A requestor requests to deduct from balance

### Description

The main purpose of this use case is the deduction of the remaining balance for a given bucket, identified by a commercial identifier such as an MSISDN or an internal identifier and a service type.

### Main Actors

- The deduct requestor (an OTT or a service provider)
- The affected bucket (identified by a commercial identifier such as an MSISDN or an internal identifier and a service type)

### Use Case Steps

- i. The requestor makes use of any of the available channels in order to initiate a balance deduction request from Reserved balance or balance directly.
- ii. The operator receives a balance deduction request with indication of the following minimum information
  - a. Requestor identifier
  - b. Subscriber identifier
  - c. Type of wallet to be deducted (in case there are multiple independents balance storage, wallets, per subscriber)
  - d. Amount to deduct
- iii. The operator confirms that the requestor is authorized to perform the balance deduction action over the specific affected subscriber. This could be based on just the requestor identifier or via a more sophisticated token-based authorization mechanisms
- iv. The balance deduction operation is processed and the balance resource for the wallet is deducted accordingly with the amount indicated. The remaining amount of reserved will be unreserved in the balance account.
- v. The requestor is informed of the successful outcome

### Example of API Usage in the Context of the Use Case

The following API interactions support the use case:

- The deduct requestor, via a user interface appropriate for the corresponding channel, consumes the service offered by the server over balance deduction resource to perform a new balance deduction.

### Success Outcome

After completion of these API interactions, the corresponding balance resource for the impacted wallet and the affected product will indicate after deducting the previously reserved amount on a wallet, the wallet balance will be adjusted so that the reduced new balance is left to be used for prepay services.

## RESOURCE MODEL

### BUCKETBALANCE RESOURCE

The BucketBalance resource represents and tracks the amount remained or owed for a certain type of service by certain customer. The balance is associated to a specific product or reference to a product (i.e.: a commercial id such as an msidn) and a service type. This resource covers the main attributes defined in class CustomerAccountBalance defined in SID (validFor, remainedAmount).

```
{
  "id": "11",
  "href": "/balancemanagement/v1/bucket/11",
  "name": "promotional voice",
  "description": "This bucket holds the amount offered for free",
  "bucketType": "promotional-voice",
  "remainedAmount": {
    "amount": 5.1,
    "units": "EUR"
  },
  "validFor": {
    "startDateTime": "10-02-2016",
    "endDateTime": "10-12-2016"
  },
  "status": "active",
  "product": [{
    "id": "PRD1",
    "href": "/productInventory/v1/product/PRD1"
  }],
  "partyAccount": {
    "id": "ACC1",
    "href": "/accountmanagement/v1/account/ACC1"
  },
  "realizingResource": [{
    "id": "RSRC1",
    "href": "/resourceInventory/v1/resource/PRD1"
  }],
  "relatedParty": [{
    "id": "cst1",
    "href": "http://server:port/AccountManagement/customer/cst1",
    "role": "customer",
    "name": "John Doe"
  }]
}
```

### FIELD DESCRIPTIONS

Element	Type	Mandatory in API messages	Description
id	string	Yes in response to query	Unique Identifier within the server for the bucket



Element	Type	Mandatory in API messages	Description
href	anyURI	Yes in response to query	A resource URI pointing to the resource in the OB that stores the detailed information for the bucket
name	string	No	Friendly name to identify the bucket
description	string	No	Text describing the contents of the balance managed by the bucket
bucketType	string	Yes in response to query	Type of prepay balance bucket (e.g.: promotion, deposit, bonus, data, voice, or any other service type ...)
validFor	TimePeriodType	Yes in response to query	The period for which the balance in the bucket is valid
status	string	Yes in response to query	Status for the balance (active, expired, suspended)
product	Array of ProductRef	Yes in response to query  (No if implicit in request URI path)	A reference to the product whose consumption is managed by the bucket. This is an array to allow scenarios where a given bucket is shared between different products.
partyAccount	PartyAccountRef	No	A reference to the account that owns the bucket
relatedParty	Array of RelatedPartyRef	No	Used to provide information about any other entity with relation to the balance, for instance to define customer hierarchy for the balance (e.g.: customerId, userId, ...)
realizingResource	Array of RealizingResourceRef	No	A reference to the resource that realizes a product. This is an array to allow scenarios where a given bucket is shared between different resources.
remainedAmount	QuantityType	No	Amount remained in the bucket

Element	Type	Mandatory in API messages	Description
reservedAmount	QuantityType	No	indicate the reserved amount on the bucket

**ProductRef:** link to the resource that holds information about the product that is linked to the bucket balance

Field	Description
<b>id</b>	Unique identifier for the product entity
<b>href</b>	A resource URI pointing to the resource in the OB that stores the product information
<b>name</b>	Name of the product

**PartyAccountRef:** link to the resource that holds information about the account that owns the bucket

Field	Description
<b>id</b>	Unique identifier for the account entity
<b>href</b>	A resource URI pointing to the resource in the OB that stores the account information
<b>name</b>	Name of the account

**RelatedPartyRef:** link to the resource that holds information about another entity (customer, user, other party account) with relationship to the bucket

Field	Description
<b>id</b>	Unique identifier for the account entity
<b>href</b>	A resource URI pointing to the resource in the OB that stores the account information
<b>name</b>	Name of the account
<b>role</b>	Role describing the relationship with the related element

**RealizingResourceRef:** link to the resource that holds realizes the product that is linked to the bucket balance

Field	Description
<b>id</b>	Unique identifier for the resource entity
<b>href</b>	A resource URI pointing to the location storing the resource information
<b>name</b>	Name of the resource
<b>@type</b>	Indicates the type of resource
<b>value</b>	The resource value that can be used to identify a resource with a public key (e.g.: a tel nr, an msisdn)

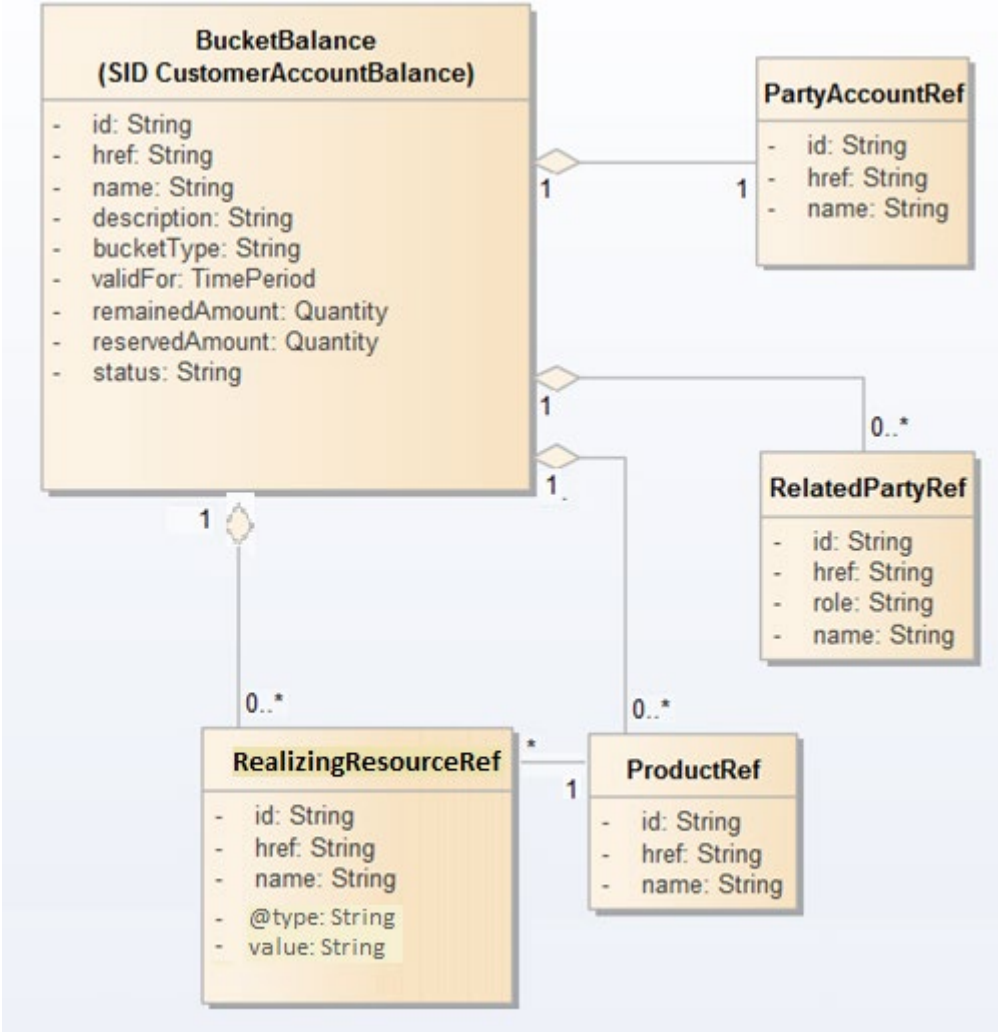


Figure 1 BucketBalance resource model

Notice that resource model defines a 0..\* relationship between a bucket and a product referring that it would be possible to have a bucket without a product in order to support non-nominal scenarios where an implementation manages this case. The nominal scenario is to have a bucket to be created as part of the instantiation of a product, since a bucket is an entity that measures something that needs to be measured (e.g.: to charge for) regarding the usage of a product, therefore a bucket always has a product and is a subentity of that product . The special case referred (bucket without product) could be the case where a customer that still has money left in his bucket (e.g.: voice bucket for a mobile line) deregisters from the product (mobile line) hence the product is removed but the bucket still is left until the money is transferred to another entity to reconcile with the customer.

ACCUMULATEDBALANCE RESOURCE

The AccumulatedBalance resource represents and tracks the aggregated amount remained or owed in certain account which is owned by certain customer for a set of buckets. This is an optional resource that may be useful to allow a consumer understand the specific balance for a given service/product, aggregating all the buckets that hold balance for that service (e.g.: acquired by the customer, offered for free as a promotion by the operator, granted by another customer, ....) without requesting one by one the balance in all the buckets and then perform the addition.

The use of operations on this resource assumes that the server manages the aggregation of balances for multiple buckets as independent entities and the consumer understands these independent entities

and what buckets they are aggregating. For instance a server may create two voice buckets at the instantiation of a given mobile-line product, one for promotional voice (time offered for free by the service provider) and another one for purchased voice (paid by the customer). In order to understand the aggregated balance for voice (both promotional and purchased), the consumer can request the balance for each bucket and perform the addition at its side or it can request in one single call the accumulated balance for voice, provided that the server manages as independent entity the accumulated balance for the referred to buckets as a voice accumulated balance.

```
{
  "name": "voice balance",
  "description": "This aggregates the balance from all voice buckets ",
  "totalBalance": {
    "amount": 15,
    "units": "EUR"
  },
  "bucket": [{
    "id": "BCKTVOICEPAYED11",
    "href": "/balancemanagement/v1/bucket/BCKTVOICEPAYED11"
  }, {
    "id": "BCKTVOICEPROMO11",
    "href": "/balancemanagement/v1/bucket/BCKTVOICEPROMO11"
  }],
  "product": [{
    "id": "PRD1",
    "href": "/productInventory/v1/product/PRD1"
  }],
  "partyAccount": {
    "id": "ACC1",
    "href": "/accountmanagement/v1/account/ACC1"
  },
  "relatedParty": [{
    "id": "cst1",
    "href": "http://server:port/AccountManagement/customer/cst1",
    "role": "customer",
    "name": "John Doe"
  }
]}
```

## FIELD DESCRIPTIONS

Element	Type	Mandatory in API messages	Description
name	string	Yes in response to query	Friendly name to identify the aggregated balance
description	string	No	Text describing the contents of the aggregated balance

Element	Type	Mandatory in API messages	Description
totalBalance	QuantityType	Yes in response to query	Aggregated for a set of prepay balance buckets associated to the product
bucket	Array of BucketBalanceRef	Yes in response	A reference to the buckets involved in the aggregation
product	Array of ProductRef	Yes in response to query  (No if implicit in request URI path)	A reference to the product whose consumption is managed by the bucket . This is an array to allow scenarios where a buckets are shared between different products
partyAccount	PartyAccountRef	No	A reference to the account that owns the buckets aggregated
relatedParty	Array of RelatedPartyRef	No	Used to provide information about any other entity with relation to the balance, for instance to define customer hierarchy for the balance (e.g.: customerId, userId, ...)

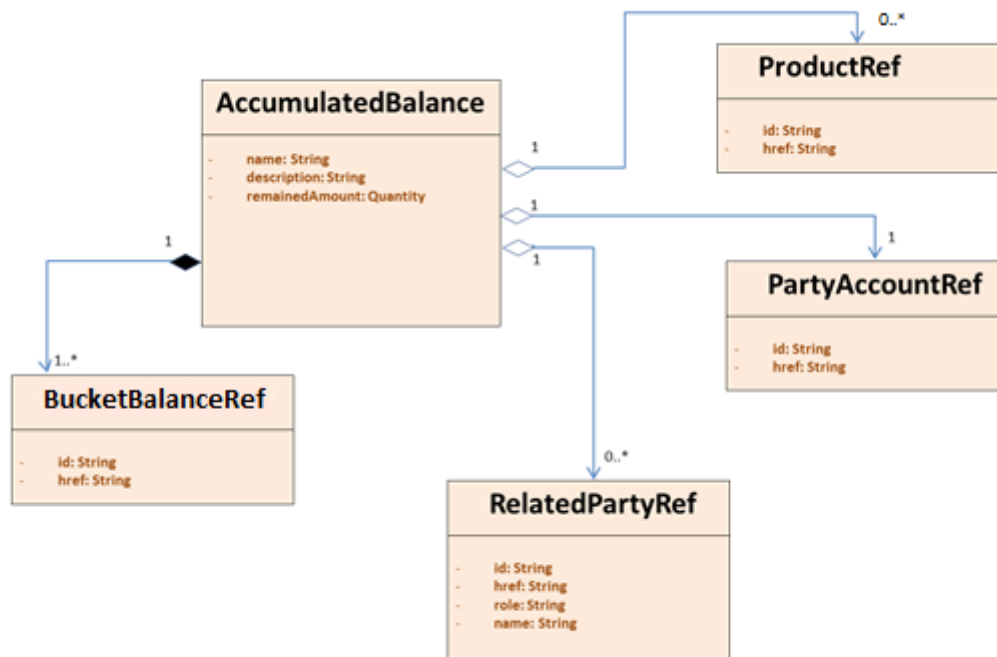
**BucketBalanceRef:** link to the resource that holds bucket balance information

Field	Description
id	Unique identifier for the bucket entity
href	A resource URI pointing to the resource in the OB that stores the balance information for a bucket

**ProductRef:** link to the resource that holds information about the product that is linked to the aggregated balance (see definition previously in the document)

**PartyAccountRef:** link to the resource that holds information about the account that owns the aggregated balance (see definition previously in the document)

**RelatedPartyRef:** link to the resource that holds information about another entity (customer, user, other party account) with relationship to the accumulated balance (see definition previously in the document)



**Figure 2 AccumulatedBalance resource model**

## BALANCETOPUPREQUEST RESOURCE

The BalanceTopUp resource is a detailed description of a recharge operation requested over a bucket (defined by a specific product or reference to a product (i.e.: a commercial id such as an msidn) and a service type)

```

{
  "id": "top1",
  "href": "/balancemanagement/v1/balanceTopup/top1",
  "type": "voice",
  "description": "description",
  "channel": {
    "id": "channell1",
    "href": "http://server:port/channel/channell1",
    "name": "retail"
  },
  "requestor": {
    "id": "osidfuosid",
    "href": "http://server:port/partyManagement/user/osidfuosid",
    "role": "user",
    "name": "John Recharger"
  },
  "amount": {
    "units": "EUR",
    "amount": 10
  },
  "isAutoTopup": false,
  "paymentMethod": {
    "id": "5",
  
```

```

    "href": "http://servr:port/payMentMethod/v1/payMentMethod/5",
    "name": "Main credit card"
  },
  "validFor": {
    "startDateTime": "10-02-2016",
    "endDateTime": "10-12-2016"
  },
  "requestedDate": "10-02-2016",
  "confirmationDate": "10-02-2016",
  "status": "confirmed",
  "product": {
    "id": "PRD1",
    "href": "/productInventory/v1/product/PRD1"
  },
  "relatedParty": [{
    "id": "c1",
    "href": "http://server:port/partyManagement/customer/c1",
    "role": "customer",
    "name": "John Doe"
  }
]
}

```

## FIELD DESCRIPTIONS

Element	Type	Mandatory in API messages	Description
id	string	Yes in response	Unique Identifier within the server for the recharge operation request
href	anyURI	Yes in response	A resource URI pointing to the resource in the OB that stores the detailed information. This is typically the resource url to retrieve individual top-up operation details
type	string	Yes in request and response	A preconfigured value that describes a TopUp type which determines the prepay balance bucket in which the top-up is done (national-voice, roaming-voice, promotional-voice, data, ....)
description	string	No	Description of the recharge operation
channel	ChannelRef (id, href, name)	Yes in request and response	Indicator for the channel used to request the top-up operation.  Structure including at least attribute "name"

Element	Type	Mandatory in API messages	Description
requestor	RelatedPartyRef (id, href, role, name)	No	Identifier for the user/customer/entity that performs the top-up action  This can be used to indicate the identifier of an agent that performs the operation on behalf of a user via a customer service channel  Structure including at least attributes "role" and "name"
amount	QuantityType	Yes in request and response	Amount (can be monetary or non-monetary) to be recharged in the bucket
isAutoTopup	Boolean	Yes	Indicates if the topup requested is an autotopup (to be processed periodically)
recurringPeriod	String	No  Yes if isAutoTopUp set to TRUE	For autotopup indicates the periodicity for the recharge operation (monthly, weekly, ...)
nrOfPeriods	Integer	No	For autotopup indicates the number of occurrences of the period the recharge operation must be executed. If not included then no limit is set to stop the execution of the topup every period
paymentMethod	PaymentMethodRefOrValue (id, href, name, type, details)	No	Payment method used for the recharge operation (e.g.: cash, credit card, ...)  Structure including at least attribute "name"  Notice that the use of a voucher can be managed as a specific methodtype, where the voucher code can be passed as value.



Element	Type	Mandatory in API messages	Description
voucher	string	No	<p>Identifier for the voucher when the topup can be performed by this means (referenced by a voucher based payment mean)</p> <p>This attribute is left in this release to keep compatibility with previous version and for implementations that do not relay on paymentMethods.</p> <p>A voucher can be managed as a specific methodtype, where he voucher code can be passed as value.</p>
validFor	TimePeriodType	Yes in response	The period defined for the recharged amount to be part of the prepay balance. This could be used to define expiration times to remove balance not consumed.
requestedDate	dateTime	Yes in response	Date when the top-up request was received in the server
confirmationDate	dateTime	Yes in response	Date when the top-up was confirmed in the server
status	String	Yes in response	<p>Status of the top-up operation</p> <p>Supported values are:</p> <ul style="list-style-type: none"> <li>- confirmed</li> <li>- cancelled</li> <li>- in progress</li> </ul>
product	ProductRef	Yes in request (if no implicit in request URI)	A reference to the product related to the bucket that is impacted by the balance related operation
bucket	BucketBalanceRef	No	A reference to the bucket impacted by the request. This is used in scenarios where the requestor knows beforehand the bucket that is going to be impacted instead of just referring to the commercial identifier of the impacted product and the type of bucket created under that product

Element	Type	Mandatory in API messages	Description
partyAccount	PartyAccountRef	No	A reference to the account that owns the bucket impacted by the balance related operation
relatedParty	Array of RelatedPartyRef	No	Used to provide information about any other entity with relation to the operation

**ChannelRef:** link to the resource that holds information about the channel used to initiate the topup operation request

Field	Description
id	Unique identifier for the channel entity
href	A resource URI pointing to the resource in the OB that stores the channel information
name	Name of the channel

**PaymentMethodRefOrValue:** link to the resource that holds information about the payment mean used to complete the operation

Field	Description
id	Unique identifier for the payment mode entity
href	A resource URI pointing to the resource in the OB that stores the payment mode information
name	Name of the payment method
type	Type of payment method (bankcard, voucher, ...)
details	Structure with the parameters defining the payment method. The list of parameters depends on the type of payment method

**ProductRef:** link to the resource that holds information about the product that is linked to the bucket impacted by the operation (see definition previously in the document)

**BucketBalanceRef:** link to the resource that holds information about the bucket impacted by the request. This is used in scenarios where the requestor knows beforehand the bucket that is going to be impacted instead of just referring to the commercial identifier of the impacted product and the type of bucket created under that product

Field	Description
id	Unique identifier for the impacted bucket entity
href	A resource URI pointing to the resource in the OB that stores the bucket information

**PartyAccountRef:** link to the resource that holds information about the account that owns the bucket impacted by the operation (see definition previously in the document)

**RelatedPartyRef:** link to the resource that holds information about another entity (customer, user, other party account) with relationship to the bucket impacted by the operation (see definition previously in the document)

**BalanceTopupStatus:** Structure including specific information about change of status for the topup operation

Field	Description
status	Current status of the operation request
statusChangeDate	Date in which the latest change of status was requested

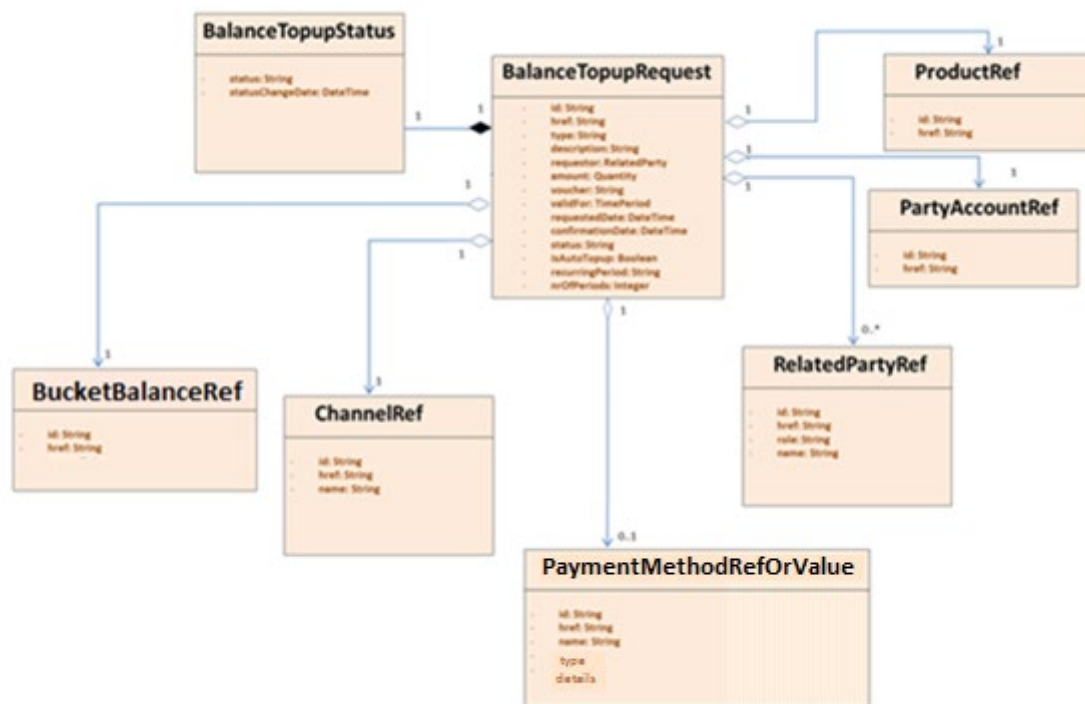


Figure 3 BalanceTopupRequest resource model

## BALANCETRANSFERREQUEST RESOURCE

The BalanceTransfer resource is a detailed description of credit transfer operation requested between two buckets (reference to products owned by customers and consuming credit when using a service).

```
{
  "id": "01",
  "href": "/balancemanagement/v1/balanceTransfer/01",
  "type": "roaming voice",
  "description": "type",
  "reason": "text for reason of balance transfer",
  "channel": {
    "id": "channell1",
    "href": "http://server:port/channel/channell1",
    "name": "retail"
  },
  "requestor": {
```

```

    "id": "osidfuosid",
    "href": "http://server:port/partyManagement/user/osidfuosid",
    "role": "user",
    "name": "John Recharger"
  },
  "targetId": "+1456789",
  "receiver": {
    "id": "sdfsd",
    "href": "http://srvr:port/AccountManagement/account/sdfsd",
    "role": "billing account",
    "name": "account sdfsd"
  },
  "amount": {
    "units": "EUR",
    "amount": 10
  },
  "transferCost": {
    "units": "EUR",
    "amount": 11
  },
  "costOwner": "originator",
  "requestedDate": "10-02-2016",
  "confirmationDate": "10-02-2016",
  "status": "confirmed",
  "product": {
    "id": "PRD1",
    "href": "/productInventory/v1/product/PRD1"
  },
  "relatedParty": [{
    "id": "c1",
    "href": "http://server:port/partyManagement/customer/c1",
    "role": "customer",
    "name": "John Doe"
  }]
}

```

## BALANCE TRANSFER FIELD DESCRIPTIONS

Element	Type	Mandatory	Description
id	string	Yes in response	Unique Identifier within the server for the balance transfer operation request.
href	anyURI	Yes in response	A resource URI pointing to the resource in the OB that stores the detailed information. This is typically the resource url to retrieve individual transfer operation details
type	string	Yes in request and response	A preconfigured value that describes a Transfer type which determines the prepay balance bucket in which the transfer is done (national-voice, roaming-voice, promotional-voice, data, ....)

Element	Type	Mandatory	Description
description	string	No	Description of the transfer operation
reason	string	Yes in request and response	Text describing the reason for the adjustment
channel	ChannelRef (id, href, name)	Yes in request and response	Indicator for the channel used to request the transfer operation.  Structure including at least attribute "name"
requestor	RelatedPartyRef (id, href, role, name)	No	Identifier for the user/customer/entity that performs the transfer action  This can be used to indicate the identifier of an agent that performs the operation on behalf of a user via a customer service channel  Structure including at least attributes "role" and "name"
targetId	string	Yes in request and response	Identifier for the entity that receives the transfer (reference to a product via a commercial identifier such as an msisdn that relates to an internal product id)
targetType	string	No	Intended for scenarios where the transfer is done from one bucket type to another (from voice to data).  A preconfigured value that describes a Transfer type which determines the prepay balance bucket in which the transfer is done
receiver	RelatedPartyRef (id, href, role, name)	No	Identifier for the user/customer/entity that receives the transfer action when it is required to indicate additional customer hierarchy information regarding the entity receiving the balance transfer  Structure including at least attributes "role" and "name"

Element	Type	Mandatory	Description
amount	QuantityType	Yes in request and response	Amount (can be monetary or non-monetary) to be transferred
transferCost	QuantityType	No	Associated cost to be charged for the transfer operation (can be monetary or non-monetary)
costOwner	string	No	Indicates the entity responsible to assume the cost of the transfer operation  Supported values are:  <ul style="list-style-type: none"> <li>- originator</li> <li>- receiver</li> </ul>
requestedDate	dateTime	Yes in response	Date when the transfer request was received in the server
confirmationDate	dateTime	Yes in response	Date when the transfer was confirmed in the server
status	String	Yes in response	Status of the top-up.  Supported values are:  <ul style="list-style-type: none"> <li>- confirmed</li> <li>- cancelled</li> <li>- in progress</li> </ul>
product	ProductRef	Yes in request (if no implicit in request URI)	A reference to the product related to the bucket that is impacted by the balance related operation
bucket	BucketBalanceRef	No	A reference to the bucket impacted by the request. This is used in scenarios where the requestor knows beforehand the bucket that is going to be impacted instead of just referring to the commercial identifier of the impacted product and the type of bucket created under that product
partyAccount	PartyAccountRef	No	A reference to the account that owns the bucket impacted by the balance related operation

Element	Type	Mandatory	Description
relatedParty	Array of RelatedPartyRef	No	Used to provide information about any other entity with relation to the operation

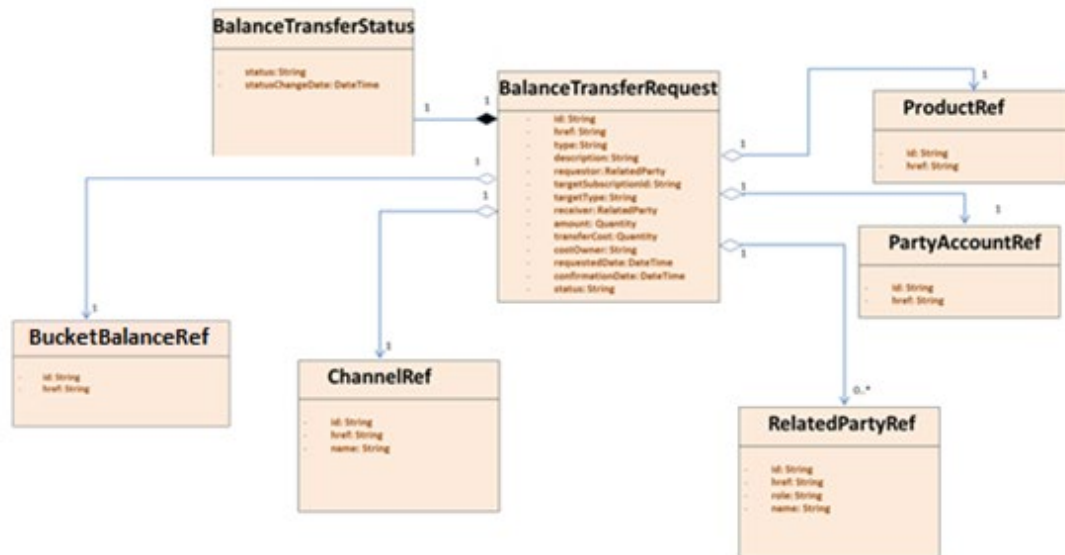


Figure 4 BalanceTransferRequest resource model

**ChannelRef:** link to the resource that holds information about the channel used to initiate the transfer operation request

Field	Description
<b>id</b>	Unique identifier for the channel entity
<b>href</b>	A resource URI pointing to the resource in the OB that stores the channel information
<b>name</b>	Name of the channel

**ProductRef:** link to the resource that holds information about the product that is linked to the bucket impacted by the operation (see definition previously in the document)

**BucketBalanceRef:** link to the resource that holds information about the bucket impacted by the request. This is used in scenarios where the requestor knows beforehand the bucket that is going to be impacted instead of just referring to the commercial identifier of the impacted product and the type of bucket created under that product (see definition previously in the document)

**PartyAccountRef:** link to the resource that holds information about the account that owns the bucket impacted by the operation (see definition previously in the document)

**RelatedPartyRef:** link to the resource that holds information about another entity (customer, user, other party account) with relationship to the bucket impacted by the operation (see definition previously in the document)

**BalanceTransferStatus:** Structure including specific information about change of status for the transfer operation

Field	Description
<b>status</b>	Current status of the operation request
<b>statusChangeDate</b>	Date in which the latest change of status was requested

## BALANCEADJUSTMENTREQUEST RESOURCE

The BalanceAdjustment resource is a detailed description of credit adjustment operation performed on a given bucket (defined by a specific product or reference to a product (i.e.: a commercial id such as an msisdn) and a service type)

```
{
  "id": "A1",
  "href": "/balancemanagement/v1/balanceAdjustment/A1",
  "type": "voice",
  "description": "description text",
  "reason": "text for reason of adjustment",
  "requestor": {
    "id": "AGENT1",
    "href": "http://server:port/partyManagement/agent/AGENT1",
    "role": "agent",
    "name": "Agent Adjuster "
  },
  "amount": {
    "units": "EUR",
    "amount": 10
  },
  "validFor": {
    "startDateTime": "10-02-2016",
    "endDateTime": "10-12-2016"
  },
  "requestedDate": "10-02-2016",
  "product": {
    "id": "PRD1",
    "href": "/productInventory/v1/product/PRD1"
  }
}
```

## FIELD DESCRIPTIONS

Element	Type	Mandatory in API messages	Description
id	string	Yes in response	Unique Identifier within the server for the balance adjustment operation request



Element	Type	Mandatory in API messages	Description
href	anyURI	Yes in response	A resource URI pointing to the resource in the OB that stores the detailed information. This is typically the resource url to retrieve individual top-up operation details
type	string	Yes in request and response	A preconfigured value that describes a TopUp type which determines the prepay balance bucket in which the top-up is done (national-voice, roaming-voice, promotional-voice, data, ....)
description	string	No	Description of the recharge operation
reason	string	Yes in request and response	Text describing the reason for the adjustment
requestor	RelatedPartyRef (id, href, role, name)	No	Identifier for the user/customer/entity that performs the adjustment action.  This can be used to indicate the identifier of an agent that performs the operation on behalf of a user via a customer service channel  Structure including at least attributes "role" and "name"
amount	QuantityType	Yes in request and response	Amount (can be monetary or non-monetary) to be recharged in the bucket. It could refer to positive (increment) or negative (decrement) values
validFor	TimePeriodType	No	The period defined for the adjusted amount to be part of the prepay balance. This could be used to define expiration times to remove balance not consumed.
requestedDate	dateTime	Yes in response	Date when the top-up request was received in the server

Element	Type	Mandatory in API messages	Description
product	ProductRef	Yes in request (if no implicit in request URI)	A reference to the product related to the bucket that is impacted by the balance related operation
bucket	BucketBalanceRef	No	A reference to the bucket impacted by the request. This is used in scenarios where the requestor knows beforehand the bucket that is going to be impacted instead of just referring to the commercial identifier of the impacted product and the type of bucket created under that product
partyAccount	PartyAccountRef	No	A reference to the account that owns the bucket impacted by the balance related operation
relatedParty	Array of RelatedPartyRef	No	Used to provide information about any other entity with relation to the operation

**ProductRef:** link to the resource that holds information about the product that is linked to the bucket impacted by the operation (see definition previously in the document)

**BucketBalanceRef:** link to the resource that holds information about the bucket impacted by the request. This is used in scenarios where the requestor knows beforehand the bucket that is going to be impacted instead of just referring to the commercial identifier of the impacted product and the type of bucket created under that product (see definition previously in the document)

**PartyAccountRef:** link to the resource that holds information about the account that owns the bucket impacted by the operation (see definition previously in the document)

**RelatedPartyRef:** link to the resource that holds information about another entity (customer, user, other party account) with relationship to the bucket impacted by the operation (see definition previously in the document)

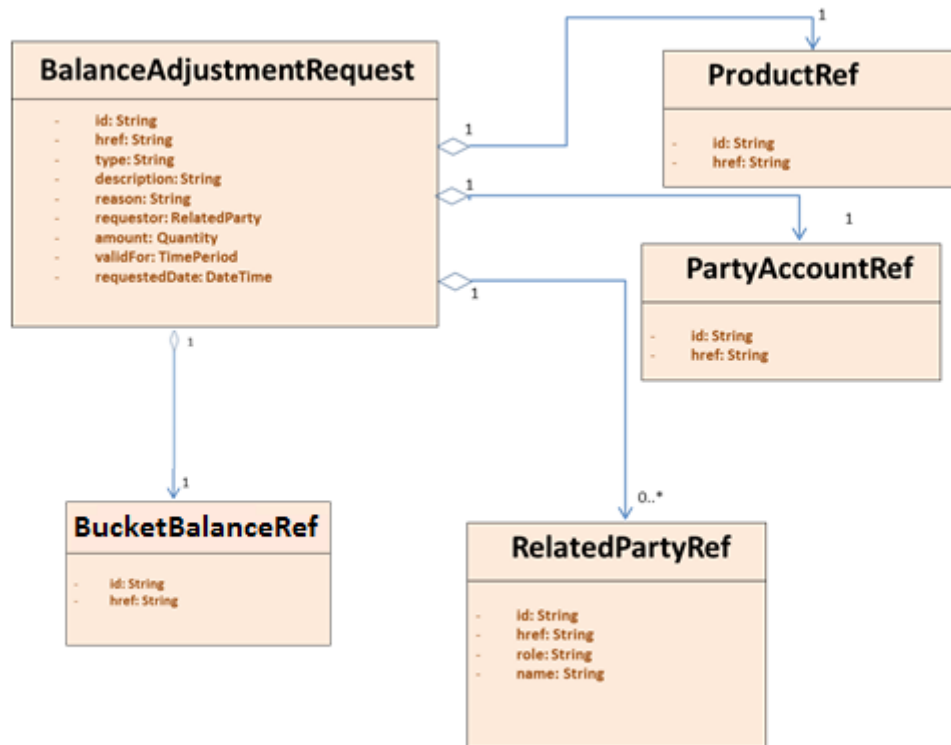


Figure 5 BalanceAdjustmentRequest resource model

## BALANCEACTIVITY RESOURCE

The BalanceActivity resource is a detailed description of a specific balance-related action that has happened over a given bucket balance. Typically a recharge/transfer/adjustment request creates one activity, but a request for an auto-topup operation actually triggers multiple periodic balance-related activities.

```

{
  "type": "transfer",
  "date": "10-02-2016",
  "action": {
    "id": "TRNSF11",
    "href": "/balancemanagement/v1/balanceTransfer/TRNSF11"
  },
  "amount": {
    "units": "EUR",
    "amount": 10
  },
  "bucketBalance": {
    "id": "BCKT11",
    "href": "/balancemanagement/v1/bucket/BCKT11"
  }
  "amountBefore": {
    "units": "EUR",
    "amount": 10.3
  },
  "amountAfter": {
    "units": "EUR",
    "amount": 20.3
  },
  "product": {

```

```

    "id": "PRD1",
    "href": "/productInventory/v1/product/PRD1"
  }
}

```

## FIELD DESCRIPTIONS

Element	Type	Mandatory in API messages	Description
type	String	Yes in response to query	A preconfigured value that describes a type of balance-related performed (topup, transfer, adjustment)
date	dateTime	Yes in response to query	Date when the balance related operation took place
action	BalanceActionRequestRef	Yes in response to query	A reference to the balance-related operation that triggered the action
amount	QuantityType	Yes in response to query	Amount (can be monetary or non-monetary) that was involved in the balance operation
bucketBalance	BucketBalanceRef	Yes in response to query	A reference to the bucket involved in the balance-related operation
amountBefore	QuantityType	No	Remained amount in the bucket involved in the operation before it took place
amountAfter	QuantityType	No	Remained amount in the bucket involved in the operation after it took place
product	ProductRef	Yes in response to query  (No if implicit in request URI path)	A reference to the product related to the bucket that is impacted by the balance activity
partyAccount	PartyAccountRef	No	A reference to the account that owns the bucket impacted by the balance activity

Element	Type	Mandatory in API messages	Description
relatedParty	Array of RelatedPartyRef	No	Used to provide information about any other entity with relation to the balance activity

**BalanceActionRequestRef:** link to the resource that holds balance-related request information

Field	Description
id	Unique identifier for the balance related action request
href	A resource URI pointing to the resource in the OB that stores the request information for the balance-related action

**BucketBalanceRef:** link to the resource that holds bucket balance information

Field	Description
id	Unique identifier for the bucket entity
href	A resource URI pointing to the resource in the OB that stores the balance information for a bucket

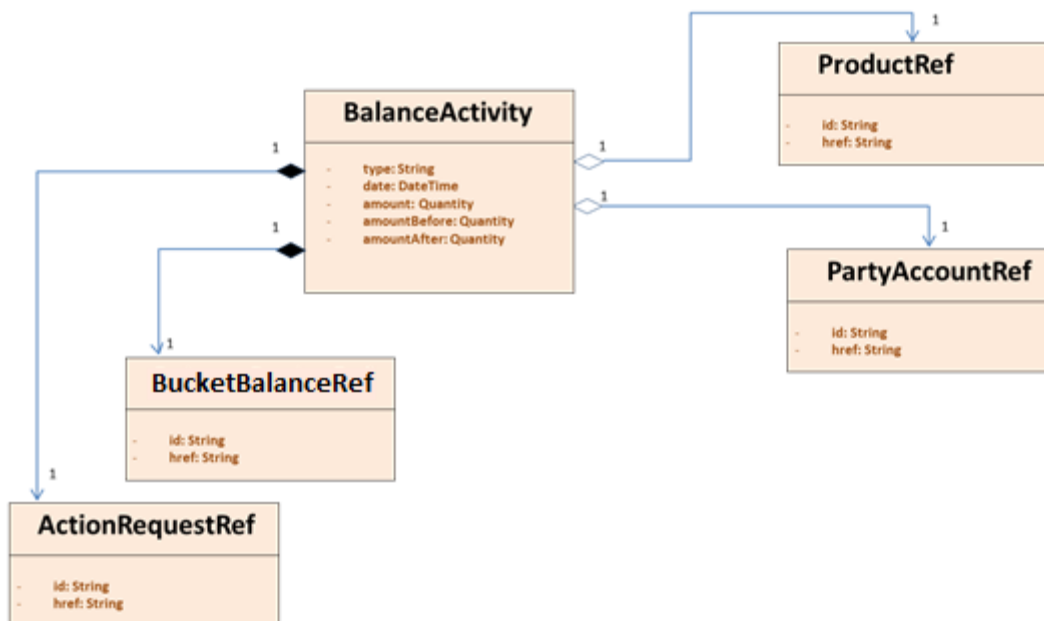


Figure 6 BalanceActivity resource model

**BALANCERESERVEREQUEST RESOURCE**

The Balance Reserve Operation resource is a detailed description of a balance reserve operation requested over a bucket (defined by a specific product or reference to a product (i.e.: a commercial id such as an msisdn) and a service type)

```

{
  "id": "20161020000001",
  "href": "/balancemanagement/v1/balanceReserve/20161020000001",
  "type": "voice",
  "description": "This interface is used for balance reservation",
  "requestor": {
    "id": "wechat",
    "href": "http://server:port/partyManagement/user/wechat",
    "role": "app",
    "name": "wechatbag"
  },
  "reservedAmount": {
    "units": "EUR",
    "amount": 10
    "precision": "00"
  },
  "remainedAmount": {
    "units": "EUR",
    "amount": 20
    "precision": "00"
  },
  "validFor": {
    "startDateTime": "10-02-2016",
    "endDateTime": "10-12-2016"
  },
  "requestedDate": "10-02-2016",
  "confirmationDate": "10-02-2016",
  "status": "0000: Success ",
  "product": {
    "id": "PRD1",
    "href": "/productInventory/v1/product/PRD1"
  },
  "partyAccount": {
    "id": "ACC1",
    "type": "2000"
    "href": "/accountmanagement/v1/account/ACC1"
  },
  "relatedParty": {
    "id": "1386409xxxx",
    "href":
"http://server:port/partyManagement/customer/1386409xxxx",
    "role": "customer",
    "name": "John Doe"
  },
  "isAutoDeduct": false
}

```

## FIELD DESCRIPTIONS

Element	Type	Mandatory in API messages	Description
id	string	Yes in request	Unique Identifier within the server for the reserve operation request

Element	Type	Mandatory in API messages	Description
href	string	Yes in request	A resource URI pointing to the resource in the OB that stores the detailed information about a reserve
type	string	No	A preconfigured value that describes a reserve type which determines the prepay balance bucket in which the reserve is done (national-voice, roaming-voice, promotional-voice, data, ....)
description	string	No	Description of the reserve operation
requestor	RelatedPartyRef (id, href, role, name)	No	Identifier for the user/customer/entity that performs the reserve action  This can be used to indicate the identifier of an app that performs the operation on behalf of a user via a customer service channel  Structure including at least attributes "role" and "name"
reservedAmount	QuantityType	Yes in request	Amount (can be monetary or non-monetary) to be reserved in the bucket
remainedAmount	QuantityType	No	Amount (can be monetary or non-monetary) to be remained in the bucket
isAutoDeduct	Boolean	No	Indicates if the reserved balance is auto deducted after a time period
validFor	TimePeriodType	No	The period defined for the reserved amount. If reserve expires, the amount reserved will be deduct or unreserve by the value of isAutoDeduct parameter
requestedDate	dateTime	No	Date when the reserve request was received in the server

Element	Type	Mandatory in API messages	Description
confirmationDate	dateTime	No	Date when the reserve was confirmed in the server
status	String	No	<p>Status of the reserve operation</p> <p>The value includes operation result code and result description. Value format is as : "result code": "result code description", supported values are:</p> <ul style="list-style-type: none"> <li>- 0000: Success;</li> <li>- 0001: Message header checksum error, such as security check error, operator error, channel error, etc.</li> <li>- 0002: parameter range check error, such as not enter the business logic, but the field type, length, range check, the relationship between the parameters of the business association checksum</li> <li>- 0003: user information check error, such as account, user, customer information related checksum error</li> <li>- 0004: system internal error, such as system data error, system exception, etc.</li> <li>- 0005: service information check error, such as specific service information check error</li> <li>- 0006: user information check error, such as repeat operation</li> <li>- 0007: account information verification error, such as the balance is not enough</li> <li>- 9999: system other errors, can not be classified into the above</li> </ul>
product	ProductRef	No	A reference to the product related to the bucket that is impacted by the balance related operation



Element	Type	Mandatory in API messages	Description
bucket	BucketBalanceRef	No	A reference to the bucket impacted by the request. This is used in scenarios where the requestor knows beforehand the bucket that is going to be impacted instead of just referring to the commercial identifier of the impacted product and the type of bucket created under that product
partyAccount	PartyAccountRef	No	A reference to the account that owns the bucket impacted by the balance related operation
relatedParty	RelatedPartyRef	No	Used to provide information about any other entity with relation to the operation

**ProductRef:** link to the resource that holds information about the product that is linked to the aggregated balance (see definition previously in the document)

**PartyAccountRef:** link to the resource that holds information about the account that owns the aggregated balance (see definition previously in the document)

**RelatedPartyRef:** link to the resource that holds information about another entity (customer, user, other party account) with relationship to the accumulated balance (see definition previously in the document)

**BucketBalanceRef:** link to the resource that holds information about the bucket impacted by the request. This is used in scenarios where the requestor knows beforehand the bucket that is going to be impacted instead of just referring to the commercial identifier of the impacted product and the type of bucket created under that product (see definition previously in the document)

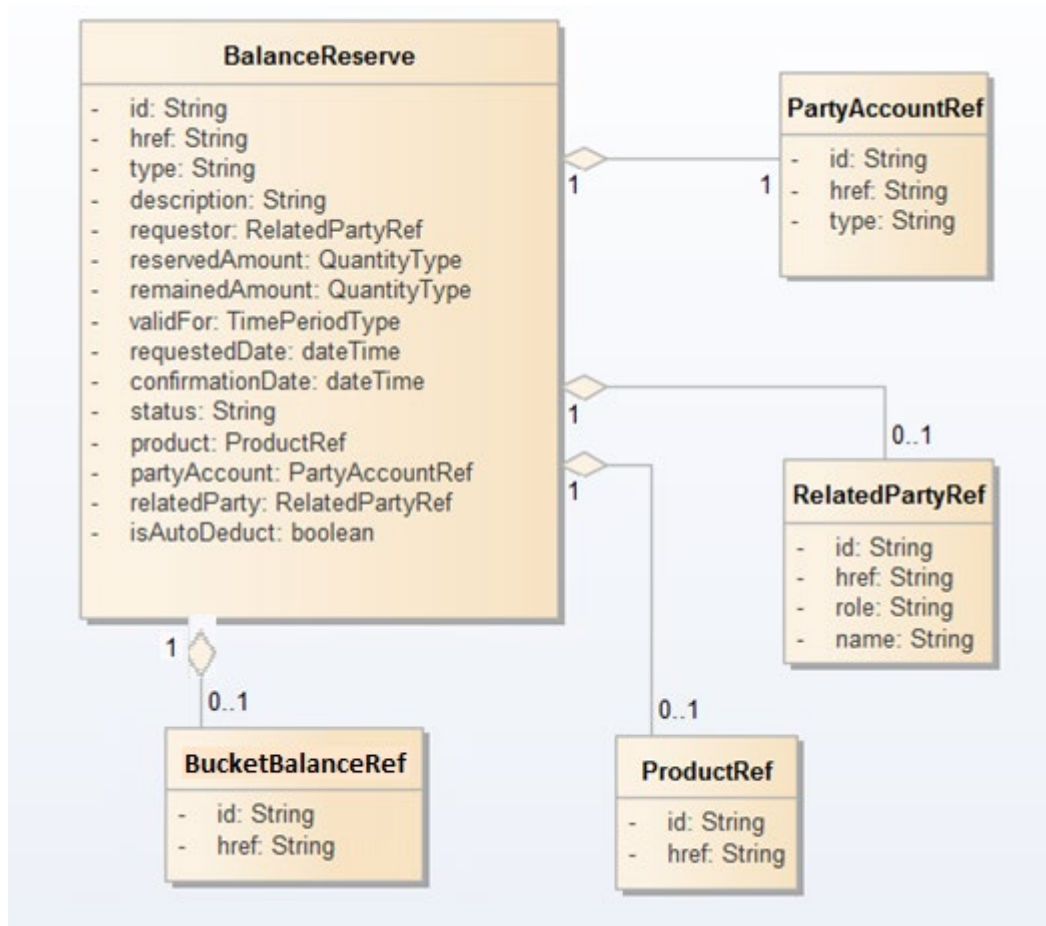


Figure 7 BalanceReserveRequest resource model

## BALANCEUNRESERVEREQUEST RESOURCE

The Balance Unreserve Operation resource is a detailed description of a balance unreserve operation requested over a product

```

{
  "id": "20161020000002",
  "href": "/balancemanagement/v1/balanceUnreserve/20161020000002",
  "description": "This interface is used for rollback balance
reservation",
  "requestor": {
    "id": "wechat",
    "href": "http://server:port/partyManagement/user/wechat",
    "role": "app",
    "name": "wechatbag"
  },
  "requestedDate": "10-02-2016",
  "status": "0000: Success ",
  "product": {
    "id": "PRD1",
    "href": "/productInventory/v1/product/PRD1"
  },
  "relatedParty": {
    "id": "1386409xxxx",
    "href":
"http://server:port/partyManagement/customer/1386409xxxx",
    "role": "customer",
  }
}
  
```

```

    "name": "John Doe"
  },
  "balanceReserve":{
    "id":"20161020000001",
    "href":"/balancemanagement/v1/balanceReserve/20161020000001"
  },
}

```

## FIELD DESCRIPTIONS

Element	Type	Mandatory in API messages	Description
id	string	Yes in request	Unique Identifier within the server for the unreserve operation request
href	string	Yes in request	A resource URI pointing to the resource in the OB that stores the detailed information about a unreserve
description	string	No	Description of the unreserve operation
requestor	RelatedPartyRef (id, href, role, name)	No	Identifier for the user/customer/entity that performs the unreserve action  This can be used to indicate the identifier of an app that performs the operation on behalf of a user via a customer service channel  Structure including at least attributes "role" and "name"
requestedDate	dateTime	No	Date when the unreserve request was received in the server

Element	Type	Mandatory in API messages	Description
status	String	No	<p>Status of the unreserve operation</p> <p>The value includes operation result code and result description. Value format is as : "result code":result code description", supported values are:</p> <ul style="list-style-type: none"> <li>- 0000: Success;</li> <li>- 0001: Message header checksum error, such as security check error, operator error, channel error, etc.</li> <li>- 0002: parameter range check error, such as not enter the business logic, but the field type, length, range check, the relationship between the parameters of the business association checksum</li> <li>- 0003: user information check error, such as account, user, customer information related checksum error</li> <li>- 0004: system internal error, such as system data error, system exception, etc.</li> <li>- 0005: service information check error, such as specific service information check error</li> <li>- 0006: user information check error, such as repeat operation</li> <li>- 0007: account information verification error, such as the balance is not enough</li> <li>- 9999: system other errors, can not be classified into the above</li> </ul>
product	ProductRef	No	A reference to the product related to the bucket that is impacted by the balance related operation

Element	Type	Mandatory in API messages	Description
bucket	BucketBalanceRef	No	A reference to the bucket impacted by the request. This is used in scenarios where the requestor knows beforehand the bucket that is going to be impacted instead of just referring to the commercial identifier of the impacted product and the type of bucket created under that product
relatedParty	,RelatedPartyRef	No	Used to provide information about any other entity with relation to the operation
balanceReserve	BalanceReserveRef (id,href,...)	Yes in request	A reference to the balancereserve that identifies the balance reserve operation

**ProductRef:** link to the resource that holds information about the product that is linked to the aggregated balance (see definition previously in the document)

**BucketBalanceRef:** link to the resource that holds information about the bucket bucket impacted by the request. This is used in scenarios where the requestor knows beforehand the bucket that is going to be impacted instead of just referring to the commercial identifier of the impacted product and the type of bucket created under that product (see definition previously in the document)

**RelatedPartyRef:** link to the resource that holds information about another entity (customer, user, other party account) with relationship to the accumulated balance (see definition previously in the document)

**BalanceReserveRef:** link to the resource that holds reserved balance information

Field	Description
id	Unique identifier for the balancereserve entity
href	A resource URI pointing to the resource in the OB that stores the reserve balance information for a bucket

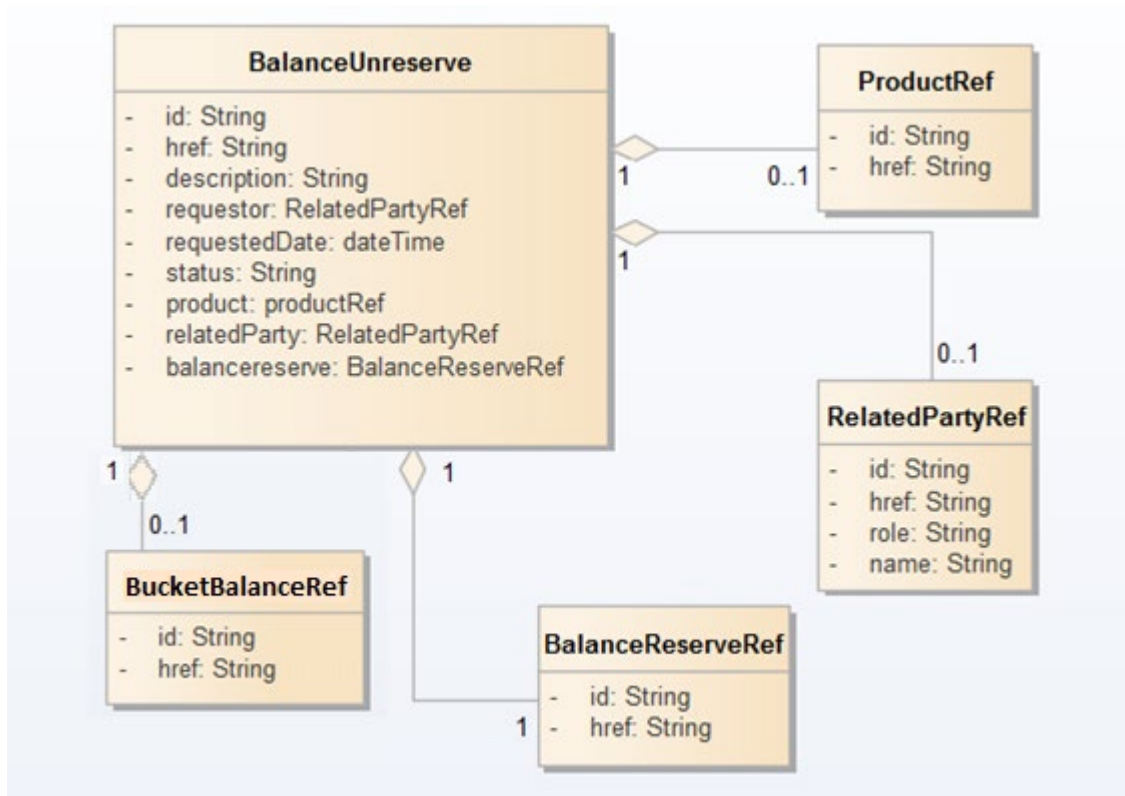


Figure 8 BalanceUnreserveRequest resource model

## BALANCEDUCTREQUEST RESOURCE

The Balance Deduct task resource is a detailed description of deduction operation. If balanceReserve Resource ID is contained in the deduct request message, the reserved balance will be performed deduct operation (if part of the reserved balance is deducted, the remaining amount will be released); if balanceReserve Resource ID is not contained in the deduct request message, the balance will be deducted directly.

```

{
  "id": "20161020000003",
  "href": "/balancemanagement/v1/balanceDeduct/20161020000003",
  "type": "voice",
  "description": "This interface is used for balance deduct",
  "reason": "text for reason of balance deduct",
  "requestor": {
    "id": "wechat",
    "href": "http://server:port/partyManagement/user/wechat",
    "role": "app",
    "name": "wechatbag"
  },
  "requestedDate": "10-02-2016",
  "confirmationDate": "10-02-2016",
  "status": "0000: Success ",
  "product": {
    "id": "PRD1",
    "href": "/productInventory/v1/product/PRD1"
  },
  "partyAccount": {
    "id": "ACC1",
    "type": "2000",
    "href": "/accountmanagement/v1/account/ACC1"
  }
}
  
```

```

    },
    "relatedParty": {
      "id": "1386409xxxx",
      "href":
    "http://server:port/partyManagement/customer/1386409xxxx",
      "role": "customer",
      "name": "John Doe"
    },
    "balanceReserve": {
      "id": "20161020000001",
      "href": "/balancemanagement/v1/balanceReserve/20161020000001"
    }
  }
}

```

## FIELD DESCRIPTIONS

Element	Type	Mandatory in API messages	Description
id	string	Yes in request	Unique Identifier within the server for the deduction operation request
href	String	Yes in request	A resource URI pointing to the resource in the OB that stores the detailed information about a deduction
type	string	No	A preconfigured value that describes a deduct type which determines the prepay balance bucket in which the deduct is done (national-voice, roaming-voice, promotional-voice, data, ....)
description	string	No	Description of the deduct operation
reason	string	No	Text describing the reason for the deduction
deductAmount	QuantityType	No	Amount (can be monetary or non-monetary) to be deducted, if balancereserve ID is not Null, the operation is based on balancereserve resource; otherwise, the operation deducts directly amount given.

Element	Type	Mandatory in API messages	Description
requestor	RelatedPartyRef (id, href, role, name)	No	Identifier for the user/customer/entity that performs the deduct action  This can be used to indicate the identifier of an app that performs the operation on behalf of a user via a customer service channel  Structure including at least attributes "role" and "name"
requestedDate	dateTime	No	Date when the deduction request was received in the server
confirmationDate	dateTime	No	Date when the deduction was confirmed in the server



Element	Type	Mandatory in API messages	Description
status	String	No	<p>Status of the deduction operation</p> <p>The value includes operation result code and result description. Value format is as : "result code": "result code description", supported values are:</p> <ul style="list-style-type: none"> <li>- 0000: Success;</li> <li>- 0001: Message header checksum error, such as security check error, operator error, channel error, etc.</li> <li>- 0002: parameter range check error, such as not enter the business logic, but the field type, length, range check, the relationship between the parameters of the business association checksum</li> <li>- 0003: user information check error, such as account, user, customer information related checksum error</li> <li>- 0004: system internal error, such as system data error, system exception, etc.</li> <li>- 0005: service information check error, such as specific service information check error</li> <li>- 0006: user information check error, such as repeat operation</li> <li>- 0007: account information verification error, such as the balance is not enough</li> <li>- 9999: system other errors, can not be classified into the above</li> </ul>
product	ProductRef	No	A reference to the product related to the bucket that is impacted by the balance related operation

Element	Type	Mandatory in API messages	Description
bucket	BucketBalanceRef	No	A reference to the bucket impacted by the request. This is used in scenarios where the requestor knows beforehand the bucket that is going to be impacted instead of just referring to the commercial identifier of the impacted product and the type of bucket created under that product
partyAccount	PartyAccountRef	No	A reference to the account that owns the bucket impacted by the balance related operation
relatedParty	RelatedPartyRef	No	Used to provide information about any other entity with relation to the operation
balancereserve	BalanceReserveRef (id,href)	Yes	A reference to the balanceReserve that identifies the balance reserve operation

**ProductRef:** link to the resource that holds information about the product that is linked to the aggregated balance (see definition previously in the document)

**BucketBalanceRef:** link to the resource that holds information about the bucket impacted by the request. This is used in scenarios where the requestor knows beforehand the bucket that is going to be impacted instead of just referring to the commercial identifier of the impacted product and the type of bucket created under that product (see definition previously in the document)

**PartyAccountRef:** link to the resource that holds information about the account that owns the aggregated balance (see definition previously in the document)

**RelatedPartyRef:** link to the resource that holds information about another entity (customer, user, other party account) with relationship to the accumulated balance (see definition previously in the document)

**BalanceReserveRef:** link to the resource that holds reserved balance information

Field	Description
id	Unique identifier for the balancereserve entity
href	A resource URI pointing to the resource in the OB that stores the reserve balance information for a bucket

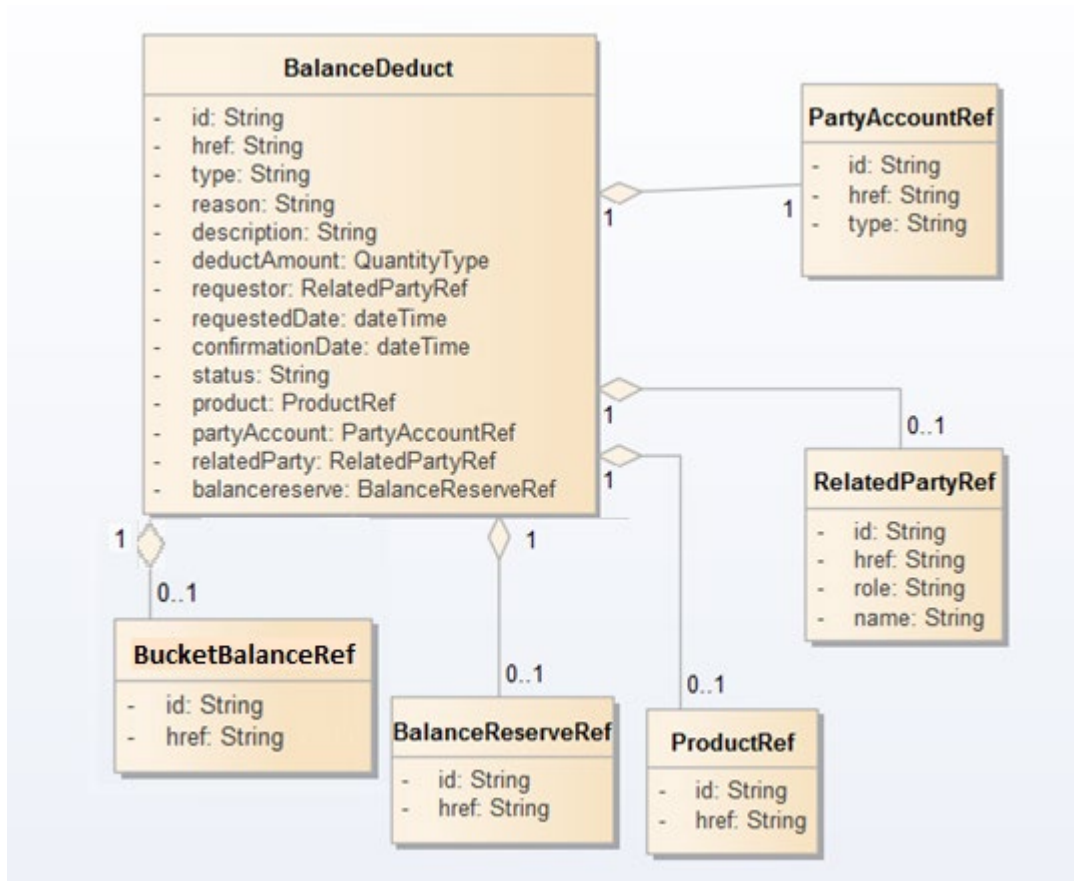


Figure 9 BalanceDeductRequest resource model

## Notification Resources Models

The following notifications are defined for this API

Notifications related to BucketBalance:

- BucketBalanceChangeNotification

Notifications related to BalanceActivity:

- BalanceActivityChangeNotification

Notifications related to BalanceTopupRequest:

- BalanceTopupCreationNotification
- BalanceTopupChangeNotification
- BalanceTopupCancelNotification

Notifications related to BalanceTransferRequest:

- BalanceTransferCreationNotification
- BalanceTransferChangeNotification

- BalanceTransferCancelNotification

Notifications related to BalanceAdjustmentRequest:

- BalanceAdjustmentCreationNotification

Notifications related to BalanceReserveRequest:

- BalanceReserveCreationNotification

Notifications related to BalanceUnreserveRequest:

- BalanceUnreserveCreationNotification

Notifications related to BalanceDeductRequest:

- BalanceDeductCreationNotification

---

## BUCKET BALANCE CHANGE NOTIFICATION

Notification sent when the amount or the validity of a bucket balance has changed.

### Json representation sample

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

```
{
  "eventId":"00001",
  "eventTime":"2016-11-16T16:42:25-04:00",
  "eventType":"BalanceChangeNotification",
  "event": {
    "bucketBalance" :
      [-- SEE BucketBalance RESOURCE SAMPLE --]
  }
}
```

---

## BALANCE ACTIVITY CHANGE NOTIFICATION

Notification sent when a new balance-activity is performed (a recharge, a transfer or a balance adjustment).

### Json representation sample

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

```
{
  "eventId":"00001",
  "eventTime":"2016-11-16T16:42:25-04:00",
```

```

"eventType":"BalanceActivityChangeNotification",
"event": {
  "balanceActivity" :
    {-- SEE BalanceActivity RESOURCE SAMPLE --}
}
}

```

---

## BALANCE TOPUP CREATION NOTIFICATION

Notification sent when a new topup operation (i.e.: recharge) has been requested.

### Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2016-11-16T16:42:25-04:00",
  "eventType":"BalanceTopupCreationNotification",
  "event": {
    " balanceTopupRequest " :
      {-- SEE BalanceTopupRequest RESOURCE SAMPLE --}
  }
}

```

---

## BALANCE TOPUP CHANGE NOTIFICATION

Notification sent when the definition of a previous topup request has been modified.

### Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2016-11-16T16:42:25-04:00",
  "eventType":"BalanceTopupChangeNotification",
  "event": {
    " balanceTopupRequest " :
      {-- SEE BalanceTopupRequest RESOURCE SAMPLE --}
  }
}

```

---

## BALANCE TOPUP CANCEL NOTIFICATION

Notification sent when a previous topup operation has been cancelled (status set to cancelled).

### Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2016-11-16T16:42:25-04:00",
  "eventType":"BalanceTopupChangeNotification",
  "event": {
    " balanceTopupRequest " :
      {-- SEE BalanceTopupRequest RESOURCE SAMPLE --}
  }
}

```

---

## BALANCE TRANSFER CREATION NOTIFICATION

Notification sent when a new balance transfer operation has been requested.

### Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2016-11-16T16:42:25-04:00",
  "eventType":"BalanceTransferCreationNotification",
  "event": {
    " balanceTransferRequest " :
      {-- SEE BalanceTransferRequest RESOURCE SAMPLE --}
  }
}

```

---

## BALANCE TRANSFER CHANGE NOTIFICATION

Notification sent when the definition of a previous balance transfer request has been modified.

### Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2016-11-16T16:42:25-04:00",
  "eventType":"BalanceTransferChangeNotification",
  "event": {
    " balanceTransferRequest " :
      {-- SEE BalanceTransferRequest RESOURCE SAMPLE --}
  }
}

```

---

## BALANCE TRANSFER CANCEL NOTIFICATION

Notification sent when a previous balance transfer operation has been cancelled (status set to cancelled).

### Json representation sample

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

```
{
  "eventId":"00001",
  "eventTime":"2016-11-16T16:42:25-04:00",
  "eventType":"BalanceTransferChangeNotification",
  "event": {
    " balanceTransferRequest " :
      {-- SEE BalanceTransferRequest RESOURCE SAMPLE --}
  }
}
```

---

## BALANCE ADJUSTMENT CREATION NOTIFICATION

Notification sent when a new balance adjustment operation has been requested.

### Json representation sample

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

```
{
  "eventId":"00001",
  "eventTime":"2016-11-16T16:42:25-04:00",
  "eventType":"BalanceAdjustmentCreationNotification",
  "event": {
    " balanceAdjustmentRequest " :
      {-- SEE BalanceAdjustmentRequest RESOURCE SAMPLE --}
  }
}
```

---

## BALANCE RESERVE CREATION NOTIFICATION

Notification sent when a new balance Reserve operation has been requested.

### Json representation sample

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

```
{
  "eventId":"00001",
  "eventTime":"2016-11-16T16:42:25-04:00",
  "eventType":"BalanceReserveCreationNotification",
  "event": {
    " balanceReserveRequest " :
      {-- SEE BalanceReserveRequest RESOURCE SAMPLE --}
  }
}
```

---

## BALANCE UNRESERVE CREATION NOTIFICATION

Notification sent when a new balance Unreserve operation has been requested.

### Json representation sample

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

```
{
  "eventId":"00001",
  "eventTime":"2016-11-16T16:42:25-04:00",
  "eventType":" BalanceUnreserveCreationNotification ",
  "event": {
    " balanceUnreserveRequest " :
      {-- SEE BalanceUnreserveRequest RESOURCE SAMPLE --}
  }
}
```

---

### BALANCE DEDUCT CREATION NOTIFICATION

Notification sent when a new balance Deduct operation has been requested.

### Json representation sample

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

```
{
  "eventId":"00001",
  "eventTime":"2016-11-16T16:42:25-04:00",
  "eventType":"BalancedeductCreationNotification",
  "event": {
    " balanceDeductRequest " :
      {-- SEE BalanceDeductRequest RESOURCE SAMPLE --}
  }
}
```



## API OPERATION TEMPLATES

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

The main root path in this API, as represented in the API OPERATION TEMPLATES below is defined as **/host:port/balancemanagement/v1/** but as an optional approach, for implementations requiring to apply specific authorization policies based on the request URI, it is contemplated the option to include the reference to the product impacted (or the commercial identifier of the product) within the root path, becoming **/host:port/balancemanagement/v1/product/{productId}/**.

Where {productId} refers to either the internal identifier of the product instantiated or the commercial identifier (typically based on a resource such as themsisdn) associated to the internal product identifier. The example of operations section contemplates both scenarios.

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  For reconciliation processes
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

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

### BALANCEBUCKETS RESOURCE

#### GET /balancemanagement/v1/bucket

Description:

The Application invokes this operation to retrieve balance information stored in the server that can be filtered for specific criteria.

Behavior:

Status Code	Description
200	Balance information was returned successfully
400	Request Error
500	The server encountered an unexpected condition which prevented it from fulfilling the request
Other	The server may use other HTTP error status codes to reflect the error, the client must be processed in accordance with the error messages in other HTTP specification.

The example below is the query of the buckets associated to a specific product (or commercial id reference to a product) showing the attributes within the Balance resource model that may be included in the query response.

REQUEST
GET https://{serverRoot}/balancemanagement/v1/bucket?product.id=12345 Content-type: application/json
RESPONSE
200 Content-Type: application/json  <pre>[   {     "id": "11",     "href": "/balancemanagement/v1/bucket/11",     "name": "promotional voice",     "description": "This bucket holds the amount offered free",     "bucketType": "promotionalvoice",     "remainedAmount": {       "amount": 5.0,       "units": "EUR"     },     "validFor": {       "startDateTime": "10-02-2016",       "endDateTime": "10-12-2016"     },     "status": "active",     "product": {       "id": "12345",       "href": "/productInventory/v1/product/12345"     }   },   {     "id": "12",     "href": "/balancemanagement/v1/bucket/12",     "name": "acquired voice",     "description": "This bucket holds the amount paid for",     "bucketType": "payedvoice",     "remainedAmount": {       "amount": 25.7,</pre>

```

        "units": "EUR"
      },
      "validFor": {
        "startDateTime": "10-01-2016",
        "endDateTime": "10-01-2017"
      },
      "status": "active",
      "product": {
        "id": "12345",
        "href": "/productInventory/v1/product/12345"
      }
    }
  ]

```

The example below shows the optional case for implementations where the identifier of the product (or commercial id reference to a product) is included in the path of the request URI.

REQUEST
GET https://{serverRoot}/balancemanagement/v1/product/12345/bucket Content-type: application/json
RESPONSE
200 Content-Type: application/json  <pre> ]   {     "id": "11",     "href": "/balancemanagement/v1/bucket/11",     "name": "promotional voice",     "description": "This bucket holds the amount offered free",     "bucketType": "promotionalvoice",     "remainedAmount": {       "amount": 5.0,       "units": "EUR"     },     "validFor": {       "startDateTime": "10-02-2016",       "endDateTime": "10-12-2016"     },     "status": "active"   }, {     "id": "12",     "href": "/balancemanagement/v1/bucket/12",     "name": "acquired voice",     "description": "This bucket holds the amount payed for",     "bucketType": "payedvoice",     "remainedAmount": {       "amount": 25.7,       "units": "EUR"     },     "validFor": {       "startDateTime": "10-01-2016",       "endDateTime": "10-01-2017"     }   } </pre>

```

    },
    "status": "active"
  }
]

```

The example below includes the optional case where the identifier of the product (or commercial id reference to a product) is included in the request URI and only buckets for a specific type are requested.

REQUEST
GET https://{serverRoot}/balancemanagement/v1/product/12345/bucket?bucketType=promotionalvoice Content-type: application/json
RESPONSE
200 Content-Type: application/json  <pre> [   {     "id": "11",     "href": "/balancemanagement/v1/bucket/11",     "name": "promotion-voice",     "description": "This bucket holds the amount offered free",     "bucketType": "promotionalvoice",     "remainedAmount": {       "amount": 5,       "units": "EUR"     },     "validFor": {       "startDateTime": "10-02-2016",       "endDateTime": "10-12-2016"     },     "status": "active"   } ]           </pre>

## GET /balancemanagement/v1/bucket/{bucketId}

### Description:

The Application invokes this operation to retrieve balance information stored in the server for a specific bucket.

### Behavior:

Status Code	Description
200	Balance information was returned successfully
400	Request Error
500	The server encountered an unexpected condition which prevented it from fulfilling the request
Other	The server may use other HTTP error status codes to reflect the error, the client must be processed in accordance with the error messages in other HTTP specification.

The example below includes the attributes within the Balance resource model that may be included in the query response.

REQUEST
<pre>GET https://{serverRoot}/balancemanagement/v1/buckets/11 Content-type: application/json</pre>
RESPONSE
<pre>200 Content-Type: application/json  {   "id": "11",   "href": "/balancemanagement/v1/bucket/11",   "name": "promotion-voice",   "description": "This bucket holds the amount offered free",   "bucketType": "promotionalvoice",   "remainedAmount": {     "amount": 5,     "units": "EUR"   },   "validFor": {     "startDateTime": "10-02-2016",     "endDateTime": "10-12-2016"   },   "status": "active",   "product": {     "id": "12345",     "href": "/productInventory/v1/product/12345"   } }</pre>

The example below shows the optional case for implementations where the identifier of the product is included in the path of the request URI addressing API resources

REQUEST

```
GET https://{serverRoot}/balancemanagement/v1/product/12345/bucket/11
Content-type: application/json
```

**RESPONSE**

```
200
Content-Type: application/json

{
  "buckets":{
    "id": "11",
    "href":"/balancemanagement/v1/bucket/11",
    "name":"promotionalvoice",
    "description":"This bucket holds the amount offered free",
    "bucketType": "promotionalvoice",
    "remainedAmount": {
      "amount": 5,
      "units": "EUR"
    },
    "validFor": {
      "startDateTime": "10-02-2016",
      "endDateTime": "10-12-2016"
    },
    "status": "active"
  }
}
```

**ACCUMULATEDBALANCE RESOURCE****GET /balancemanagement/v1/accumulatedbalance****Description:**

The Application invokes this operation to retrieve total balance information for an aggregation of a set of buckets.

**Behavior:**

Status Code	Description
200	Balance information was returned successfully
400	Request Error
500	The server encountered an unexpected condition which prevented it from fulfilling the request
Other	The server may use other HTTP error status codes to reflect the error, the client must be processed in accordance with the error messages in other HTTP specification.

The example below is the query of an aggregated balance for a specific product reference, showing the attributes within the resource model that may be included in the query response.

REQUEST
GET https://{serverRoot}/balancemanagement/v1/accumulatedBalance?product.id=PRD1&name=voice Content-type: application/json
RESPONSE
200 Content-Type: application/json <pre> {   "name": "voice balance",   "description": "This aggregates the balance from all voice buckets",   "totalBalance": {     "amount": 30.7,     "units": "EUR"   },   "buckets": [     {       "id": "11",       "href": "/balancemanagement/v1/bucket/11"     },     {       "id": "12",       "href": "/balancemanagement/v1/bucket/12"     }   ],   "product": {     "id": "PRD1",     "href": "/productInventory/v1/product/PRD1"   } }           </pre>

The corresponding similar response would be obtained in implementations where the identifier of the product is included in the path of the request URI addressing API resources.

```

GET
https://{serverRoot}/balancemanagement/v1/accumulatedBalance/PRD1?name=voice
  
```

## BALANCEACTIVITY RESOURCE

### GET /balancemanagement/v1/balanceActivity

Description:

The Application invokes this operation to retrieve the list of balance-related actions that have been performed over a specific product (or commercial id reference to a product)

Behavior:

Status Code	Description
200	Balance information was returned successfully
400	Request Error
500	The server encountered an unexpected condition which prevented it from fulfilling the request
Other	The server may use other HTTP error status codes to reflect the error, the client must be processed in accordance with the error messages in other HTTP specification.

The example below is the query of the balance activity registered for a specific product reference showing the attributes within the resource model that may be included in the query response.

REQUEST
GET https://{serverRoot}/balancemanagement/v1/balanceActivity?prod.id=12345 Content-type: application/json
RESPONSE
200 Content-Type: application/json  <pre>[{   "type": "transfer",   "date": "10-02-2016",   "action": {     "id": "TRNSF11",     "href": "/balancemanagement/v1/balanceTransfer/TRNSF11"   },   "amount": {     "units": "EUR",     "amount": 10   },   "bucketBalance": {     "id": "BCKT11",     "href": "/balancemanagement/v1/bucket/BCKT11"   } }, {   "amountBefore": {     "units": "EUR",     "amount": 10   },   "amountAfter": {     "units": "EUR",     "amount": 20   },   "product": {     "id": "12345",     "href": "/productInventory/v1/product/12345"   } }, {   "type": "topup",</pre>



```

    "date": "22-03-2016",
    "action": {
      "id": "TOP1",
      "href": "/balancemanagement/v1/balanceTopup/TOP1"
    },
    "amount": {
      "units": "EUR",
      "amount": 10
    },
    "bucketBalance": {
      "id": "BCKT11",
      "href": "/balancemanagement/v1/bucket/BCKT11"
    }
  },
  "amountBefore": {
    "units": "EUR",
    "amount": 0.5
  },
  "amountAfter": {
    "units": "EUR",
    "amount": 10.5
  },
  "product": {
    "id": "123345",
    "href": "/productInventory/v1/product/12345"
  }
}
]]

```

The corresponding similar response would be obtained in implementations where the identifier of the product is included in the path of the request URI addressing API resources.

```
GET https://{serverRoot}/balancemanagement/v1/product/12345/balanceActivity
```

The example below shows the case where only the operations of a specific type are requested.

REQUEST
<pre> GET https://{serverRoot}/balancemanagement/v1/balanceActivity?prod.id=12345? type=topup Content-type: application/json </pre>
RESPONSE
<pre> 200 Content-Type: application/json  [   {     "type": "transfer",     "date": "10-02-2016",     "action": {       "id": "TRNSF11",       "href": "/balancemanagement/v1/balanceTransfer/TRNSF11"     },     "amount": {       "units": "EUR", </pre>

```

    "amount": 10
  },
  "bucketBalance": {
    "id": "BCKT11",
    "href": "/balancemanagement/v1/bucket/BCKT11"
  }
  "amountBefore": {
    "units": "EUR",
    "amount": 10
  },
  "amountAfter": {
    "units": "EUR",
    "amount": 20
  },
  "product": {
    "id": "12345",
    "href": "/productInventory/v1/product/12345"
  }
}
]]

```

The corresponding similar response would be obtained in implementations where the identifier of the product is included in the path of the request URI addressing API resources.

```

GET
https://{serverRoot}/balancemanagement/v1/product/12345/balanceActivity?type=topup

```

## BALANCETOPUPREQUEST RESOURCE

### POST /balancemanagement/v1/balanceTopup

#### Description:

The Application invokes this operation to request a new top-up operation for a given product (or commercial id reference to a product) instance consuming the credit held in a bucket for a specific service) .

#### Behavior:

Status Code	Description
201	Successful top-up operation request (resource created)
400	Request Error
500	The server encountered an unexpected condition which prevented it from fulfilling the request
Other	The server may use other HTTP error status codes to reflect the error, the client must be processed in accordance with the error messages in other HTTP specification.

The example below includes the attributes within the TopUp Operation entity resource model that are mandatory to be included in the request when creating a new resource in the server.

REQUEST
POST <a href="https://{serverRoot}/balanceManagement/v1/balanceTopup">https://{serverRoot}/balanceManagement/v1/balanceTopup</a> Content-type: application/json  <pre> {   "type": "buckettype",   "channel": {     "name": "retail"   },   "amount": {     "units": "EUR",     "amount": 10   },   "product": {     "id": "12345",     "href": "<a "="" href="/productInventory/v1/product/12345">/productInventory/v1/product/12345</a>"   } }           </pre>
RESPONSE
201 Content-Type: application/json Location: <a href="https://{serverRoot}/balanceManagement/v1/topUp/TUPxxx01">https://{serverRoot}/balanceManagement/v1/topUp/TUPxxx01</a>  Response is not required to include a BODY with the contents of the Balance resource created, but if included it must be filled with at least the mandatory parameters.

The example below shows the optional case for implementations where the identifier of the product is included in the path of the request URI.

REQUEST
POST <a href="https://{serverRoot}/balanceManagement/v1/12345/balanceTopup">https://{serverRoot}/balanceManagement/v1/12345/balanceTopup</a> Content-type: application/json  <pre> {   "type": "buckettype",   "channel": {     "name": "retail"   },   "amount": {     "units": "EUR",     "amount": 10   } }           </pre>
RESPONSE

```

201
Content-Type: application/json
Location: https://{serverRoot}/balanceManagement/v1/12345/topUp/TUPxxx01

Response is not required to include a BODY with the contents of
the Balance resource created, but if included it must be filled
with at least the mandatory parameters.
  
```

## GET /balancemanagement/v1/balanceTopup

### Description:

The Application invokes this operation to retrieve the list of top-up operations requested for a given product product (or commercial id reference to a product), filtered by given criteria. The response includes the details of all top-ups operations requested.

### Behavior:

Status Code	Description
200	TopUp request information was returned successfully
400	Request Error
500	The server encountered an unexpected condition which prevented it from fulfilling the request
Other	The server may use other HTTP error status codes to reflect the error, the client must be processed in accordance with the error messages in other HTTP specification.

The example below includes the query for the recharge operations requested for a specific reference to a product, showing the attributes within the TopUp Operation entity resource model that may be included in the query response.

<b>REQUEST</b>
<pre> GET https://{serverRoot}/balanceManagement/v1/balanceTopup?product.id=12345 Content-type: application/json           </pre>
<b>RESPONSE</b>
<pre> 200 Content-Type: application/json  [ {   "id": "TUPxxx01",   "href": "<a href="/balancemanagement/v1/balanceTopup/TUPxxx01">/balancemanagement/v1/balanceTopup/TUPxxx01</a>",   "type": "voice",   "description": "description",   "channel": {   </pre>

```

    "id": "channell1",
    "href": "http://server:port/channel/channell1",
    "name": "retail"
  },
  "requestor": {
    "id": "osidfuod",
    "href": "http://server:port/partyManagement/user/osidfuod",
    "role": "user",
    "name": "John Recharger"
  },
  "amount": {
    "units": "EUR",
    "amount": 10
  },
  "paymentMethod": {
    "id": "4",
    "href": "http://srvr:port/payMentMethods/v1/payMentMethod/4",
    "name": "cash payment"
  },
  "validFor": {
    "startDateTime": "10-02-2016",
    "endDateTime": "10-12-2016"
  },
  "requestedDate": "10-02-2016",
  "confirmationDate": "10-02-2016",
  "status": "confirmed",
  "product": {
    "id": "12345",
    "href": "/productInventory/v1/product/12345"
  }
},
{
  "id": "2ab",
  "href": "srv:port/balancemanagement/v1/balanceTopup/2ab",
  "type": "voice",
  "description": "description",
  "channel": {
    "id": "channell1",
    "href": "http://server:port/channel/channell1",
    "name": "bank teller"
  },
  "amount": {
    "units": "EUR",
    "amount": 10
  },
  "paymentMethod": {
    "id": "3",
    "href": "http://srvr:port/payMentMethods/v1/payMentMethod/3",
    "name": "voucher payment",
    "type": "voucher",
    "details": {
      "code": "H%3845",
    }
  },
  "validFor": {
    "startDateTime": "10-03-2016",
    "endDateTime": "10-12-2016"
  },
  "requestedDate": "10-03-2016",

```

```

    "confirmationDate": "10-03-2016",
    "status": "confirmed",
    "product": {
      "id": "12345",
      "href": "/productInventory/v1/product/12345"
    }
  }
}]]

```

The corresponding similar response would be obtained in implementations where the identifier of the product is included in the path of the request URI addressing API resources.

```
GET https://{serverRoot}/balancemanagement/v1/product/12345/balanceTopup
```

The example below shows the case where the top-up operation involves a specific channel.

REQUEST
<pre> GET https://{serverRoot}/balanceManagement/v1/balanceTopup?product.id=12345&amp; channel=CHNL01 Content-type: application/json </pre>
RESPONSE
<pre> 200 Content-Type: application/json  [[{   "id": "xxx001",   "href": "<a href="http://srv:port/balancemanagement/v1/12345/balanceTopup/xxx001">srv:port/balancemanagement/v1/12345/balanceTopup/xxx001</a>",   "type": "sms",   "description": "description",   "channel": {     "id": "channell1",     "href": "<a href="http://server:port/channel/channell1">http://server:port/channel/channell1</a>",     "name": "CHNL01"   },   "amount": {     "units": "EUR",     "amount": 10   },   "paymentMethod": {     "id": "5",     "href": "<a href="http://srvr:port/payMentMethods/v1/payMentMethod/5">http://srvr:port/payMentMethods/v1/payMentMethod/5</a>",     "name": "Main credit card"   },   "validFor": {     "startDateTime": "10-02-2016",     "endDateTime": "10-12-2016"   },   "requestedDate": "10-02-2016",   "confirmationDate": "10-02-2016",   "status": "confirmed",   "product": { </pre>

```

    "id": "12345",
    "href": "/productInventory/v1/product/12345"
  },
  {
    ...
  }
]
```

## GET /balancemanagement/v1/balanceTopups/{topupId}

### Description:

The Application invokes this operation to retrieve detailed information about a single top-up operation previously processed by the server.

### Behavior:

Status Code	Description
200	Information successfully retrieved
400	Request Error
500	The server encountered an unexpected condition which prevented it from fulfilling the request
Other	The server may use other HTTP error status codes to reflect the error, the client must be processed in accordance with the error messages in other HTTP specification.

The example below includes the attributes within the TopUp Operation entity resource model that may be included in the query response.

REQUEST
GET https://{serverRoot}/balanceManagement/v1/balanceTopup/TOPxxx001 Content-type: application/json
RESPONSE
200 Content-Type: application/json  <pre> {   "id": "xxx001",   "href": "srv:port/balancemanagement/v1/balanceTopup/TOPxxx001",   "type": "sms",   "description": "description",   "channel": {     "id": "channel1",     "href": "http://server:port/channel/channel1",     "name": "CHNL01"   },   }, </pre>

```

    "amount": {
      "units": "EUR",
      "amount": 10
    },
    "paymentMethod": {
      "id": "5",
      "href":
"http://srvr:port/payMentMethods/v1/payMentMethod/5",
      "name": "Main credit card"
    },
    "validFor": {
      "startDateTime": "10-02-2016",
      "endDateTime": "10-12-2016"
    },
    "requestedDate": "10-02-2016",
    "confirmationDate": "10-02-2016",
    "status": "confirmed",
    "product": {
      "id": "12345",
      "href": "/productInventory/v1/product/12345"
    }
  }
}

```

The corresponding similar response would be obtained in implementations where the identifier of the product is included in the path of the request URI addressing API resources.

```
GET https://{serverRoot}/balancemanagement/v1/product/12345/balanceTopups
```

### PATCH /balancemanagement/v1/balanceTopup/{topUpId}

This operation is optional to be supported in this API

#### Description:

The Application invokes this operation to partially update the information about a single top-up operation previously processed by the server.

Typically a modification of a request is only accepted by the server while in progress, before the status has changed to "confirmed".

The only element that are expected to be modified in the TopUp Operation resource are the amount or the validity to modify the expiration date of the credit given to a bucket.

#### Behavior:

To Be Defined.

### PUT /balancemanagement/v1/balanceTopup/{topUpId}

This operation is optional to be supported in this API

#### Description:

The Application invokes this operation to completely update the information about a single top-up operation previously processed by the server.



Typically a modification of a request is only accepted by the server while in progress, before the status has changed to “confirmed”.

The only element that are expected to be modified in the TopUp Operation resource are the amount or the validity to modify the expiration date of the credit given to a bucket.

Notice that the PUT method is intended to modify completely the resource impacted, meaning that optional values that are not included in the request may be erased in the server after updating, and will not keep the previous value stored. Behaviour of the server on optional values not included is undefined.

Behavior:

To Be Defined.

## BALANCETOPUPREQUEST/STATUS RESOURCE

### PUT /balancemanagement/v1/balanceTopup/{topUpId}/status

This operation is optional to be supported in this API

Description:

The Application invokes this operation to modify the status a top-up operation previously processed by the server.

Behavior:

Status Code	Description
204	Successful status modification
400	Request Error
500	The server encountered an unexpected condition which prevented it from fulfilling the request
Other	The server may use other HTTP error status codes to reflect the error, the client must be processed in accordance with the error messages in other HTTP specification.

The example below includes the attributes within the TopUp Operation entity resource model that are required to perform a status modification.

<b>REQUEST</b>
<pre>PUT https://{serverRoot}/balancemanagement/v1/balanceTopup/TUPxxx01/status Content-type: application/json</pre>

<pre>{   "status": "cancelled" }</pre>
<b>RESPONSE</b>
<pre>204 Content-Type: application/json</pre>

The example below shows the optional case for implementations where the identifier of the product is included in the path of the request URI addressing API resources.

<b>REQUEST</b>
<pre>PUT https://{serverRoot}/balanceManagement/v1/product/12345/balanceTopup/TUP xxx01/status Content-type: application/json  {   "status": "cancelled" }</pre>
<b>RESPONSE</b>
<pre>204 Content-Type: application/json</pre>

## GET /balancemanagement/v1/balanceTopup/{topUpId}/status

This operation is optional to be supported in this API

Description:

The Application invokes this operation to request the the status of a top-up operation previously processed by the server and if it status has been changed (i.e.: it has been cancelled) the date of the latest status change.

Behavior:

Status Code	Description
200	Information successfully retrieved
400	Request Error
500	The server encountered an unexpected condition which prevented it from fulfilling the request

Status Code	Description
Other	The server may use other HTTP error status codes to reflect the error, the client must be processed in accordance with the error messages in other HTTP specification.

The example below includes the attributes within the TopUp Operation entity resource model that may be included in the query response.

<b>REQUEST</b>
<pre>GET https://{serverRoot}/balanceManagement/v1/balanceTopup/TUPxxx01/status Content-type: application/json  {   "status": "cancelled",   "statusChangeDate": "10-02-2016" }</pre>
<b>RESPONSE</b>
<pre>204 Content-Type: application/json</pre>

The corresponding similar response would be obtained in implementations where the identifier of the product is included in the path of the request URI addressing API resources.

```
GET
https://{serverRoot}/balancemanagement/v1/product/12345/balanceTopup/TUPxxx01/status
```

## BALANCETRANSFERREQUEST RESOURCE

### POST /balancemanagement/v1/balanceTransfer

Description:

The Application invokes this operation to request a new transfer operation for a given product (or commercial id reference to a product instance consuming the credit held in a bucket for a specific service).

Behavior:

Status Code	Description
201	Transfer operation successful (resource created)
400	Request Error

Status Code	Description
500	The server encountered an unexpected condition which prevented it from fulfilling the request
Other	The server may use other HTTP error status codes to reflect the error, the client must be processed in accordance with the error messages in other HTTP specification.

The example below includes the attributes within the Transfer Operation entity resource model that are mandatory to be included in the request when creating a new resource in the server.

REQUEST
<pre>POST https://{serverRoot}/balancemanagement/v1/balanceTransfer Content-type: application/json {   "type": "data",   "channel": {     "id": "channell",     "href": "<a href="http://server:port/channel/channell">http://server:port/channel/channell</a>",     "name": "retail"   },   "targetId": "+1456789",   "amount": {     "units": "EUR",     "amount": 10   },   "product": {     "id": "12345",     "href": "<a href="/productInventory/v1/product/12345">/productInventory/v1/product/12345</a>"   } }</pre>
RESPONSE
<pre>201 Content-Type: application/json Location: <a href="https://{serverRoot}/balancemanagement/v1/balanceTransfer/TRNSF01">https://{serverRoot}/balancemanagement/v1/balanceTransfer/TRNSF01</a></pre> <p>Response is not required to include a BODY with the contents of the Balance resource created, but if included it must be filled with at least the mandatory parameters.</p>

The example below shows the optional case for implementations where the identifier of the product is included in the path of the request URI.

REQUEST
<pre>POST https://{serverRoot}/balancemanagement/v1/12345/balanceTransfer Content-type: application/json</pre>

```

{
  "type": "data",
  "channel": {
    "id": "channell1",
    "href": "http://server:port/channel/channell1",
    "name": "retail"
  },
  "targetId": "+1456789",
  "amount": {
    "units": "EUR",
    "amount": 10
  }
}

```

**RESPONSE**

```

201
Content-Type: application/json
Location:
https://{serverRoot}/balancemanagement/v1/12345/balanceTransfer/TRNSF01

```

Response is not required to include a BODY with the contents of the Balance resource created, but if included it must be filled with at least the mandatory parameters.

**GET /balancemanagement/v1/balanceTransfer****Description:**

The Application invokes this operation to retrieve the list of transfer operations requested for a given product product (or commercial id reference to a product), filtered by given criteria. The response includes the details of all transfer operations requested.

**Behavior:**

Status Code	Description
200	Transfer information was returned successfully
400	Request Error
500	The server encountered an unexpected condition which prevented it from fulfilling the request
Other	The server may use other HTTP error status codes to reflect the error, the client must be processed in accordance with the error messages in other HTTP specification.

The example below includes the attributes within the Transfer Operation entity resource model that may be included in the query response.

**REQUEST**

<pre> GET https://{serverRoot}/balancemanagement/v1/balanceTransfer?product.id=12345 Content-type: application/json </pre>
<b>RESPONSE</b>
<pre> 200 Content-Type: application/json  [   {     "id": "TRNSF1",     "href": "<a href="#">balancemanagement/v1/balanceTransfer/TRNSF1</a>",     "type": "voice",     "channel": {       "id": "channell1",       "href": "<a href="#">http://server:port/channel/channell1</a>",       "name": "retail"     },     "targetId": "+1456789",     "amount": {       "units": "EUR",       "amount": 10     },     "requestedDate": "10-02-2016",     "confirmationDate": "10-02-2016",     "status": "confirmed",     "product": {       "id": "12345",       "href": "<a href="#">/productInventory/v1/product/12345</a>"     }   },   {     ...   } ] </pre>

The corresponding similar response would be obtained in implementations where the identifier of the product is included in the path of the request URI addressing API resources.

```
GET https://{serverRoot}/balancemanagement/v1/product/12345/balanceTransfer
```

### GET /balancemanagement/v1/balanceTransfer/{transferId}

#### Description:

The Application invokes this operation to retrieve detailed information about a single transfer operation previously processed by the server.

#### Behavior:

Status Code	Description
200	Transfer information was returned successfully
400	Request Error

Status Code	Description
500	The server encountered an unexpected condition which prevented it from fulfilling the request
Other	The server may use other HTTP error status codes to reflect the error, the client must be processed in accordance with the error messages in other HTTP specification.

The example below includes the attributes within the Transfer Operation entity resource model that may be included in the query response.

REQUEST
<pre>GET https://{serverRoot}/balancemanagement/v1/transfer/TRNSF01 Content-type: application/json</pre>
RESPONSE
<pre>200 Content-Type: application/json  {   "id": "TRNSFxxx01",   "href": "<a href="#">balancemanagement/v1/12345/balanceTransfer/TRNSF01</a>",   "type": "sms",   "channel": {     "id": "channell1",     "href": "<a href="#">http://server:port/channel/channell1</a>",     "name": "retail"   },   "targetId": "+1456789",   "amount": {     "units": "EUR",     "amount": 10   },   "requestedDate": "10-02-2016",   "confirmationDate": "10-02-2016",   "status": "confirmed",   "product": {     "id": "12345",     "href": "<a href="#">/productInventory/v1/product/12345</a>"   } }</pre>

The corresponding similar response would be obtained in implementations where the identifier of the product is included in the path of the request URI addressing API resources.

```
GET https://{serverRoot}/balancemanagement/v1/product/12345/balanceTransfer
```

**PATCH /balancemanagement/v1/balanceTransfer/{transferId}**

This operation is optional to be supported in this API .

## Description:

The Application invokes this operation to partially update the information about a single transfer operation previously processed by the server.

Typically a modification of a request is only accepted by the server while in progress, before the status has changed to "confirmed".

The only element that are expected to be modified in the Transfer Operation resource are the amount or the validity to modify the expiration date of the credit given to a bucket.

## Behavior:

To Be Defined.

### PUT /balancemanagement/v1/balanceTransfer/{transferId}

This operation is optional to be supported in this API

## Description:

The Application invokes this operation to completely update the information about a single balance transfer operation previously processed by the server.

Typically a modification of a request is only accepted by the server while in progress, before the status has changed to "confirmed".

The only element that are expected to be modified in the Transfer Operation resource are the amount or the validity to modify the expiration date of the credit given to a bucket.

Notice that the PUT method is intended to modify completely the resource impacted, meaning that optional values that are not included in the request may be erased in the server after updating, and will not keep the previous value stored. Behavior of the server on optional values not included is undefined.

## Behavior:

To Be Defined.

### BALANCETRANSFERREQUEST/STATUS RESOURCE

#### PUT /balancemanagement/v1/balanceTransfer/{transferId}/status

This operation is optional to be supported in this API

## Description:

The Application invokes this operation to modify the status of a balance transfer operation previously processed by the server. This could be used to cancel an existing transfer operation.

## Behavior:

Status Code	Description
204	Successful status modification



Status Code	Description
400	Request Error
500	The server encountered an unexpected condition which prevented it from fulfilling the request
Other	The server may use other HTTP error status codes to reflect the error, the client must be processed in accordance with the error messages in other HTTP specification.

The example below includes the attributes within the Transfer Operation entity resource model that are mandatory to perform a status modification.

REQUEST
PUT https://{serverRoot}/balanceManagement/v1/balanceTransfer/TRNSF01/status Content-type: application/json  <pre>{   "status": "cancelled" }</pre>
RESPONSE
204 Content-Type: application/json

The example below shows the optional case for implementations where the identifier of the product is included in the path of the request URI addressing API resources.

REQUEST
PUT https://{serverRoot}/balanceManagement/v1/product/12345/balanceTransfer/TRNSF01/status Content-type: application/json  <pre>{   "status": "cancelled" }</pre>
RESPONSE
204 Content-Type: application/json

**GET /balancemanagement/v1/balanceTransfer/{transferId}/status**

This operation is optional to be supported in this API

**Description:**

The Application invokes this operation to request the the status of a transfer operation previously processed by the server and if it status has been changed (i.e.: it has been cancelled) the date of the latest status change.

**Behavior:**

Status Code	Description
200	Information successfully retrieved
400	Request Error
500	The server encountered an unexpected condition which prevented it from fulfilling the request
Other	The server may use other HTTP error status codes to reflect the error, the client must be processed in accordance with the error messages in other HTTP specification.

The example below includes the attributes within the TopUp Operation entity resource model that may be included in the query response.

REQUEST
<pre>GET https://{serverRoot}/balanceManagement/v1/balanceTransfer/TRNSF01/status Content-type: application/json  {   "status": "cancelled",   "statusChangeDate": "10-02-2016" }</pre>
RESPONSE
<pre>204 Content-Type: application/json</pre>

The corresponding similar response would be obtained in implementations where the identifier of the product is included in the path of the request URI addressing API resources.

```
GET
https://{serverRoot}/balancemanagement/v1/12345/balanceTransfer/TRNSF01/status
```

## BALANCEADJUSTMENTREQUEST RESOURCE

### POST /balancemanagement/v1/balanceAdjustment

#### Description:

The Application invokes this operation to perform a balance adjustment for a given bucket on a product (or commercial id reference to a product instance consuming the credit held in a bucket for a specific service).

#### Behavior:

Status Code	Description
201	Successful adjustment operation (resource created)
400	Request Error
500	The server encountered an unexpected condition which prevented it from fulfilling the request
Other	The server may use other HTTP error status codes to reflect the error, the client must be processed in accordance with the error messages in other HTTP specification.

The example below includes the attributes within the Adjustment Operation entity resource model that are mandatory to be included in the request when the adjustment is to add an amount to any of the buckets of a product.

REQUEST
<pre> POST https://{serverRoot}/balanceManagement/v1/balanceAdjustment Content-type: application/json  {   "type": "buckettype",   "reason": "this is why the adjustment was performed",   "amount": {     "units": "EUR",     "amount": 10.5   },   "product": {     "id": "12345",     "href": "/productInventory/v1/product/12345"   } } </pre>
RESPONSE
<pre> 201 Content-Type: application/json Location: https://{serverRoot}/balanceManagement/v1/balanceAdjustment/ADJ01 </pre>

Response is not required to include a BODY with the contents of the Balance resource created, but if included it must be filled with at least the mandatory parameters.

The example below includes the attributes within the Adjustment Operation entity resource model that are mandatory to be included in the request when the adjustment is to remove some amount to any of the buckets of a product.

REQUEST
<pre> POST https://{serverRoot}/balanceManagement/v1/balanceAdjustment Content-type: application/json  {   "type": "buckettype",   "reason": "this is why the adjustment was performed",   "amount": {     "units": "EUR",     "amount": -3.5   },   "product": {     "id": "12345",     "href": "/productInventory/v1/product/12345"   } } </pre>
RESPONSE
<pre> 201 Content-Type: application/json Location: <a href="https://{serverRoot}/balanceManagement/v1/balanceAdjustment/ADJ01">https://{serverRoot}/balanceManagement/v1/balanceAdjustment/ADJ01</a> </pre> <p>Response is not required to include a BODY with the contents of the Balance resource created, but if included it must be filled with at least the mandatory parameters.</p>

The example below shows the optional case for implementations where the identifier of the product is included in the path of the request URI.

REQUEST
<pre> POST https://{serverRoot}/balanceManagement/v1/product/12345/balanceAdjustment Content-type: application/json  {   "type": "buckettype",   "reason": "this is why the adjustment was performed",   "amount": { </pre>

<pre>       "units": "EUR",       "amount": -3.5     }   } </pre>
<b>RESPONSE</b>
<pre> 201 Content-Type: application/json Location: <a href="https://{serverRoot}/balanceManagement/v1/12345/balanceAdjustment/ADJ01">https://{serverRoot}/balanceManagement/v1/12345/balanceAdjustment/ADJ01</a> </pre> <p>Response is not required to include a BODY with the contents of the Balance resource created, but if included it must be filled with at least the mandatory parameters.</p>

## GET /balancemanagement/v1/balanceAdjustment

### Description:

The Application invokes this operation to retrieve the list of adjustment operations requested for a given product (or commercial id reference to a product), filtered by given criteria. The response includes the details of all balance adjustment operations requested

### Behavior:

Status Code	Description
200	TopUp information was returned successfully
400	Request Error
500	The server encountered an unexpected condition which prevented it from fulfilling the request
Other	The server may use other HTTP error status codes to reflect the error, the client must be processed in accordance with the error messages in other HTTP specification.

The example below includes the attributes within the TopUp Operation entity resource model that may be included in the query response.

<b>REQUEST</b>
<pre> GET https://{serverRoot}/balanceManagement/v1/balanceAdjustment?product.id=12345 Content-type: application/json </pre>
<b>RESPONSE</b>

```

200
Content-Type: application/json

[[
  {
    "id": "ADJ01",
    "href": "/balancemanagement/v1/12345/balanceAdjustment/ADJ01",
    "type": "voice",
    "reason": "this is why the adjustment was performed",
    "description": "description",
    "amount": {
      "units": "EUR",
      "amount": 10
    },
    "requestedDate": "10-02-2016",
    "product": {
      "id": "12345",
      "href": "/productInventory/v1/product/12345"
    }
  },
  ...
]]

```

The corresponding similar response would be obtained in implementations where the identifier of the product is included in the path of the request URI addressing API resources.

```

GET
https://{serverRoot}/balancemanagement/v1/product/12345/balanceAdjustment

```

### GET /balancemanagement/v1/balanceAdjustment/{adjustmentId}

#### Description:

The Application invokes this operation to retrieve detailed information about a single adjustment operation previously processed by the server.

#### Behavior:

Status Code	Description
200	Successful top-up update operation (resource modified)
400	Request Error
500	The server encountered an unexpected condition which prevented it from fulfilling the request
Other	The server may use other HTTP error status codes to reflect the error, the client must be processed in accordance with the error messages in other HTTP specification.

The example below includes the attributes within the TopUp Operation entity resource model that are may be included in the query response.

REQUEST
GET https://{serverRoot}/balanceManagement/v1/balanceAdjustment/ADJ001 Content-type: application/json
RESPONSE
200 Content-Type: application/json  <pre> {   "id": "ADJ001",   "href": "/balancemanagement/v1/balanceAdjustment/ADJ001",   "type": "voice",   "reason": "this is why the adjustment was performed",   "description": "description",   "amount": {     "units": "EUR",     "amount": 10   },   "requestedDate": "10-02-2016",   "product": {     "id": "12345",     "href": "/productInventory/v1/product/12345"   } }           </pre>

The corresponding similar response would be obtained in implementations where the identifier of the product is included in the path of the request URI addressing API resources.

```

GET
https://{serverRoot}/balancemanagement/v1/product/12345/balanceAdjustment/ADJ01
  
```

## BALANCERESERVEREQUEST RESOURCE

### POST /balanceManagement/v1/balanceReserve

Description:

The Application invokes this operation to balance reserve operations processed for a given bucket.

Behavior:

Status Code	Description
201	Successful balance reserve operation request (resource created)
400	Request Error
500	The server encountered an unexpected condition which prevented it from fulfilling the request

Status Code	Description
Other	The server may use other HTTP error status codes to reflect the error, the client must be processed in accordance with the error messages in other HTTP specification.

The example below shows the case where the balance reserve operation involves a specific receiving product (referenced by a commercial id such as an msisn or an internal product id).

REQUEST
<pre>POST https://{serverRoot}/balanceManagement/v1/balanceReserve Accept: application/json {   "id": "20161020000001",   "relatedParty": {     "id": "1386409xxxx"   },   "reservedAmount": {     "units": "EUR",     "amount": 10,     "precision": "00"   } }</pre>
RESPONSE
<pre>201 Content-Type: application/json Location: <a href="https://{serverRoot}/balancemanagement/v1/balanceReserve/20161020000001">https://{serverRoot}/balancemanagement/v1/balanceReserve/20161020000001</a></pre> <p>Response is not required to include a BODY with the contents of the Balance reserve resource, but if included it must be filled with at least the mandatory parameters.</p>

## BALANCEUNRESERVEREQUEST RESOURCE

### POST /balancemanagement/v1/balanceUnreserve

Description:

The Application invokes this operation to balance unreserve operations processed for a given bucket.

Behavior:

Status Code	Description
201	Successful balance unreserve operation request (resource created)
400	Request Error
500	The server encountered an unexpected condition which prevented it from fulfilling the request



Status Code	Description
Other	The server may use other HTTP error status codes to reflect the error, the client must be processed in accordance with the error messages in other HTTP specification.

The example below shows the case where the balance unreserve operation involves a specific receiving product (referenced by a commercial id such as an msisn or an internal product id).

REQUEST
<pre>POST https://{serverRoot}/balancemanagement/v1/balanceUnreserve Accept: application/json {   "id": "20161020000002",   "relatedParty": {     "id": "1386409xxxx"   },   "balanceReserve": {     "id": "20161020000001",     "href": "/balancemanagement/v1/balanceReserve/20161020000001"   } }</pre>
RESPONSE
<pre>201 Content-Type: application/json Location: <a href="https://{serverRoot}/balancemanagement/v1/balanceUnreserve/20161020000002">https://{serverRoot}/balancemanagement/v1/balanceUnreserve/20161020000002</a></pre> <p>Response is not required to include a BODY with the contents of the Balance unreserve resource, but if included it must be filled with at least the mandatory parameters.</p>

## BALANCEDEDUCTREQUEST RESOURCE

### POST /balancemanagement/v1/balanceDeduct

Description:

The Application invokes this operation to deduct balance amount stored in the server for a specific bucket under a product referenced by a product id of an individual asset created (e.g. license id for a TV service) or commercial identifier based on the value of a resource created under the product (i.e. MSISDN) that maps to an internal product id.

Behavior:

Status Code	Description
201	balance deduct successfully

Status Code	Description
400	Request Error
500	The server encountered an unexpected condition which prevented it from fulfilling the request
Other	The server may use other HTTP error status codes to reflect the error, the client must be processed in accordance with the error messages in other HTTP specification.

The example below includes the attributes within the Balance Deduct resource model that are mandatory to be included in the query response.

REQUEST
<pre>POST https://{serverRoot}/ balanceManagement/v1/balancDdeduct Accept: application/json {   "id":"20161020000003",   "reason":"reason for deduct",   "relatedParty": {     "id": "1386409xxxx"   },   "balanceReserve":{     "id":"20161020000001",     "href":"/balancemanagement/v1/balanceReserve/2016102000000 1"   } }</pre>
RESPONSE
<pre>201 Content-Type: application/json Location: <a href="https://{serverRoot}/balancemanagement/v1/balanceDeduct/20161020000003">https://{serverRoot}/balancemanagement/v1/balanceDeduct/20161020000003</a></pre> <p>Response is not required to include a BODY with the contents of the Balance deduct resource, but if included it must be filled with at least the mandatory parameters.</p>

## API NOTIFICATION

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 error status code if request is not successful.

##### Usage Samples

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

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

### UNREGISTER LISTENER

#### DELETE /hub/{id}

##### Description

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

##### Behavior

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

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

### Usage Samples

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

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

## PUBLISH EVENT TO LISTENER

### POST /client/listener

#### Description

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

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

#### Behavior

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

### Usage Samples

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

<b>Request</b>
POST /client/listener Accept: application/json  <pre>{   "eventId": "111",   "eventType": " EVENT_TYPE ",   "event": {     EVENT BODY as described in event model section   } }</pre>
<b>Response</b>

201

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

## RELEASE HISTORY

Release Number	Date	Release led by:	Description
Release 0.1	16/09/2016		First Release of Draft Version of the Document.
Release 0.2	10/11/2016		Updated after comments from TM Forum team review.
Release 0.3	11/11/2016		Updated to include "Balance Adjustment" operation.
Release 0.4	16/11/2016		Updated after comments from TM Forum team review (URL names changed in operation example templates) and additional attributes added to balance resource (status in bucket and relatedParty to link subscription to account).
Release 0.5	23/11/2016		Updated after comments from Amdocs at TM Forum team review. BucketBalance resource updated and some additional text to define the concept of subscription.
Release 0.6	28/11/2016		Updated after latest TM Forum team review. Model updated to include specific reference to productId.
Release 2.0.1	01/05/2017		New functionalities added (incorporated in R17.0) such as reserve, unreserved and deduct
Release 2.0.3	09/06/2017		Updated after official team review.  Removed the concept of subscription and introduction updated to reflect how a bucket relates to a product.
Release 17.0.1 Version 2.0.4	10/11/2017		Updated to reflect TM Forum Approved Status