# tmforum

# TM Forum Specification

# Prepay Balance Management API Conformance Profile

**TMF654**

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# Notice

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# INTRODUCTION - API DESCRIPTION

The following document is the TMF654 PrepayBalance Management API Conformance Profile.

Through this API, any Enterprise is able to manage the balance, recharge (top-up), transfer, reserve, unreserve, deduct and balance adjustments of a  bucket. A bucket is understood in the context of this API to be 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.

This document identifies the parameters that must be included in a request related to the operations above as well as the parameters expected in the response

The test scenarios in this document are intended to create a set of resources and then retrieve the information stored in the server to confirm the resources created are stored with the values originally set. Additionally, some test scenarios are included to verify that the server replies with the corresponding error response in situations where a mandatory attribute is not included in the request.

# RESOURCE MODEL CONFORMANCE

## API Mandatory Resources

The following table indicates the mandatory resources for this API.

| Resource Name | Comment |
|---|---|
| Bucket | |
| TopupBalance | |
| AdjustBalance | |
| ReserveBalance | |

## General Notes on Resource Attribute Conformance

There are three situations that could occur for an attribute:

- o Mandatory attribute,
- o Mandatory attribute if the optional parent attribute is present,
- o Non-mandatory/Optional attribute. Those are all the other attributes not mentioned in the following subsections. Please refer to the corresponding API REST Specification for more details.

- The tables in the subsections below indicate which attributes are mandatory including mandatory when an optional parent is present.
- Where a resource is an input into an API (e.g. POST, PATCH), Mandatory means that the attribute value must be supplied by the API consumer in the input (and must not be blank or null).
- Where a resource is an output from an API (e.g. GET, POST), Mandatory means that the attribute value must be supplied by the API provider in the output (and must not be blank or null).
- For a sub-resource that is not an array, Mandatory (cardinality 1..1) means that the sub-resource must be present, while Optional (cardinality 0..1) means that the sub-resource may be absent. Mandatory and Optional on the sub-resource attributes apply to the sub-resource if present.
- For a sub-resource that is an array, Mandatory (cardinality 1..*) means that at least one sub-resource must be present in the array, while Optional (cardinality 0..*) means that the array may be absent. Mandatory and Optional on the sub-resource attributes apply to each of the sub-resources if present.

In this table are listed all mandatory attributes. A mandatory attribute MUST be retrieved in resource representation when no attribute selection is used (e.g. GET /../{id}) without any attribute selection

When an attribute is listed with an indentation (in second column) it means this attribute is mandatory if root (parent) attribute is present.

# Bucket Resource Mandatory Attributes

| Mandatory attribute when parent is present | Rule |
|---|---|
| href | M (in response messages)<br><br>Generated by the server and provided in the response upon resource creation. Value in response must be the same as the one set in Location header provided upon entity creation. |
| id | M (in response messages)<br><br>Generated by the server and provided in the response upon resource creation |
| status | M (in response messages)<br>O (otherwise) |
| usageType | M |
| logicalResource (if present) | Array of LogicalResourceRef |
|     id | M |
| partyAccount (if present) | |
|     id | M |
| product (if present) | Array of ProductRef<br><br>the ProductRef |
|     id | M |
| relatedParty (if present) | Array of RelatedParty<br><br>The role attribute is not mandatory because the id could be a partyRole id.<br>In this case @referredType must indicate the partyRole (example User, Customer, etc.).<br><br>If the id is a Party id then a role must be provided. |
|     @referredType | M |
|     id | M |

# TopupBalance Resource Mandatory Attributes

| Mandatory attribute when parent is present | Rule |
| --- | --- |
| href | M (in response messages)<br>O (otherwise) |
| id | M (in response messages)<br>O (otherwise) |
| status | M (in response messages)<br>O (otherwise) |
| amount | M |
|     amount | M |
|     units | M |
| bucket (if present) | At least one of bucket, product or logicalResource must be present |
|     id | M |
| channel (if present) | |
|     href | M |
| logicalResource (if present) | Array of LogicalResourceRef. At least one of bucket, product or logicalResource must be present |
|     id | M |
| partyAccount (if present) | |
|     id | M |
| payment (if present) | |
|     id | M |
| paymentMethod (if present) | |
|     id | M |
| product (if present) | Array of ProductRef. At least one of bucket, product or logicalResource must be present |
|     id | M |
| relatedTopupBalance (if present) | |

| Mandatory attribute when parent is present | | Rule |
|---|---|---|
| | id | M |
| relatedParty (if present) | | Array of RelatedParty<br><br>The role attribute is not mandatory because the id could be a partyRole id.<br>In this case @referredType must indicate the partyRole (example User, Customer, etc.).<br><br>If the id is a Party id then a role must be provided. |
| | @referredType | M |
| | id | M |
| requestor (if present) | | See conditions for RelatedParty at relatedParty |
| impactedBucket (if present) | | Array of ImpactedBucket |
| | amountAfter | M<br><br>See conditions for Quantity at amount |
| | bucket | M<br><br>See conditions for BucketRef at bucket |
| | amountBefore | M<br><br>See conditions for Quantity at amount |
| | item | M<br><br>Array of ImpactedBucketItem |
| impactedBucket.item | | M<br><br>Array of ImpactedBucketItem |
| | amount | M<br><br>See conditions for Quantity at amount |

## AdjustBalance Resource Mandatory Attributes

| Mandatory attribute when parent is present | | Rule |
|---|---|---|
| amount | | M |
| href | | M (in response messages)<br>O (otherwise) |
| id | | M (in response messages)<br>O (otherwise) |
| status | | M (in response messages)<br>O (otherwise) |
| usageType | | M |
| bucket (if present) | | At least one of bucket, product or logicalResource must be present |
| | id | M |
| channel (if present) | | |
| | id | M |
| logicalResource (if present) | | Array of LogicalResourceRef. At least one of bucket, product or logicalResource must be present |
| | id | M |
| partyAccount (if present) | | |
| | id | M |
| product (if present) | | Array of ProductRef. At least one of bucket, product or logicalResource must be present |
| | id | M |
| relatedParty (if present) | | Array of RelatedParty<br><br>The role attribute is not mandatory because the id could be a partyRole id.<br>In this case @referredType must indicate the partyRole (example User, Customer, etc.).<br><br>If the id is a Party id then a role must be provided. |
| | @referredType | M |

| Mandatory attribute when parent is present | Rule |
|---|---|
| id | M |
| requestor (if present) | See conditions for RelatedParty at relatedParty |
| impactedBucket (if present) | Array of ImpactedBucket |
| amountAfter | M<br><br>See conditions for Quantity at amount |
| amountBefore | M<br><br>See conditions for Quantity at amount |
| bucket | M<br><br>See conditions for BucketRef at bucket |
| item | M<br><br>Array of ImpactedBucketItem |
| impactedBucket.item | M<br><br>Array of ImpactedBucketItem |
| amount | M<br><br>See conditions for Quantity at amount |

# ReserveBalance Resource Mandatory Attributes

| Mandatory attribute when parent is present | Rule |
|---|---|
| amount | M |
| href | M (in response messages)<br>O (otherwise) |
| id | M (in response messages)<br>O (otherwise) |
| status | M (in response messages)<br>O (otherwise) |
| relatedParty | M (in response messages)<br>O (otherwise)<br><br>Array of RelatedParty |

| Mandatory attribute when parent is present | | Rule |
|---|---|---|
| | | The role attribute is not mandatory because the id could be a partyRole id. In this case @referredType must indicate the partyRole (example User, Customer, etc.). If the id is a Party id then a role must be provided. |
| | @referredType | M |
| | href | M |
| | id | M |
| bucket (if present) | | At least one of bucket, product or logicalResource must be present |
| | id | M |
| channel (if present) | | |
| | href | M |
| logicalResource (if present) | | Array of LogicalResourceRef. At least one of bucket, product or logicalResource must be present |
| | id | M |
| partyAccount (if present) | | |
| | id | M |
| product (if present) | | Array of ProductRef. At least one of bucket, product or logicalResource must be present |
| | id | M |
| requestor (if present) | | See conditions for RelatedParty at relatedParty |
| impactedBucket (if present) | | Array of ImpactedBucket |
| | amountAfter | M See conditions for Quantity at amount |
| | bucket | M See conditions for BucketRef at bucket |

| Mandatory attribute when parent is present | Rule |
|---|---|
| amountBefore | M

See conditions for Quantity at amount |
| item | M

Array of ImpactedBucketItem |
| impactedBucket.item | M

Array of ImpactedBucketItem |
| amount | M

See conditions for Quantity at amount |

# API OPERATIONS CONFORMANCE

For every single resource, the following tables includes mandatory operations.

## Bucket Mandatory Operations

The following table indicates which ones are mandatory for the Bucket resource:

| Uniform API Operation |
| --- |
| GET |
| POST |

## TopupBalance Mandatory Operations

The following table indicates which ones are mandatory for the TopupBalance resource:

| Uniform API Operation |
| --- |
| GET |
| POST |

## AdjustBalance Mandatory Operations

The following table indicates which ones are mandatory for the AdjustBalance resource:

| Uniform API Operation |
| --- |
| GET |
| POST |

## ReserveBalance Mandatory Operations

The following table indicates which ones are mandatory for the ReserveBalance resource:

| Uniform API Operation |
| --- |
| GET |
| POST |

# API GET OPERATION CONFORMANCE

All the GET operations in this API share the same status code pattern.

| GET | Mandatory/Optional |
|---|---|
| Response Status Code 200 if successful | M |
| Response Status Code 404 if not found | M |

# Definitions for Filter

The following definitions apply to all the GET operations:

- Filtered Search: A filtered search can be applied using query parameters to obtain only the resources that meet the criteria defined by the filtering parameters included in the query request. Several elements can be applied to the filtered search. In that case logic, a logical AND is applied to combine the criteria (e.g.:?severity=<value>&status=<value>).
- Attribute selection (Limiting Response Data): In order to limit which attributes are included in the response, the GET request can include the ?fields= query parameter. Only those attributes whose names are supplied in this parameter will be returned. Attribute selection capabilities are the same for collections retrieval and individual resource queries.
- Level: The filtering and attribute selection can apply to the top level properties (attributes) and subproperties. The tables below show which attributes need to be supported in top-level or contained resources.

# GET /bucket?fields=…&{filtering}

This operation list or find Bucket entities

Attribute selection is mandatory for all first level attributes except for the href attribute.

Filtering on sub-resources is optional for all compliance levels

# GET /bucket/{id}?fields=…&{filtering}

This operation retrieves a Bucket entity. Attribute selection is enabled for all first level attributes.

Attribute selection is mandatory for all first level attributes except for the href attribute.

Filtering on sub-resources is optional for all compliance levels

# GET /topupBalance?fields=…&{filtering}

This operation list or find TopupBalance entities

Attribute selection is mandatory for all first level attributes except for the href attribute.

Filtering on sub-resources is optional for all compliance levels

# GET /topupBalance/{id}?fields=…&{filtering}

This operation retrieves a TopupBalance entity. Attribute selection is enabled for all first level attributes.

Attribute selection is mandatory for all first level attributes except for the href attribute.

Filtering on sub-resources is optional for all compliance levels

# GET /adjustBalance?fields=…&{filtering}

This operation list or find AdjustBalance entities

Attribute selection is mandatory for all first level attributes except for the href attribute.

Filtering on sub-resources is optional for all compliance levels

# GET /adjustBalance/{id}?fields=…&{filtering}

This operation retrieves an AdjustBalance entity. Attribute selection is enabled for all first level attributes.

Attribute selection is mandatory for all first level attributes except for the href attribute.

Filtering on sub-resources is optional for all compliance levels

# GET /reserveBalance?fields=…&{filtering}

This operation list or find ReserveBalance entities

Attribute selection is mandatory for all first level attributes except for the href attribute.

Filtering on sub-resources is optional for all compliance levels

# GET /reserveBalance/{id}?fields=…&{filtering}

This operation retrieves a ReserveBalance entity. Attribute selection is enabled for all first level attributes.

Attribute selection is mandatory for all first level attributes except for the href attribute.

Filtering on sub-resources is optional for all compliance levels

# API POST OPERATION CONFORMANCE

All the POST operations in this API share the same status code pattern.

| POST | Mandatory/Optional |
|---|---|
| Status Code 201 if resource created | M |

# POST /bucket

This operation creates a Bucket entity.

The following table provides the list of mandatory attributes when creating an instance of the Bucket resource, including any possible rule, conditions and applicable default values.

| Mandatory Attributes | Rule |
|---|---|
| usageType | M |

# POST /topupBalance

This operation creates a TopupBalance entity.

The following table provides the list of mandatory attributes when creating an instance of the TopupBalance resource, including any possible rule, conditions and applicable default values.

| Mandatory Attributes | Rule |
|---|---|
| amount | M |
| bucket | At least one of the following resources are mandatory in the request. A bucketRef,a productRef,a logicalResourceRef or relatedPartyRef |
| logicalResource | At least one of the following resources are mandatory in the request. A bucketRef,a productRef,a logicalResourceRef or relatedPartyRef |
| product | At least one of the following resources are mandatory in the request. A bucketRef,a productRef,a logicalResourceRef or relatedPartyRef |

# POST /adjustBalance

This operation creates an AdjustBalance entity.

The following table provides the list of mandatory attributes when creating an instance of the AdjustBalance resource, including any possible rule, conditions and applicable default values.

| Mandatory Attributes | Rule |
|---|---|
| amount | M |
| bucket | At least one of the following resources are mandatory in the request. A bucketRef,a productRef,or a logicalResourceRef |
| logicalResource | At least one of the following resources are mandatory in the request. A bucketRef,a productRef,or a logicalResourceRef |
| product | At least one of the following resources are mandatory in the request. A bucketRef,a productRef,or a logicalResourceRef |

# POST /reserveBalance

This operation creates a ReserveBalance entity.

The following table provides the list of mandatory attributes when creating an instance of the ReserveBalance resource, including any possible rule, conditions and applicable default values.

| Mandatory Attributes | Rule |
|---|---|
| amount | M |
| bucket | At least one of the following resources are mandatory in the request. A bucketRef,a productRef,a logicalResourceRef or relatedPartyRef |
| logicalResource | At least one of the following resources are mandatory in the request. A bucketRef,a productRef,a logicalResourceRef or relatedPartyRef |
| product | At least one of the following resources are mandatory in the request. A bucketRef,a productRef,a logicalResourceRef or relatedPartyRef |
| relatedParty | At least one of the following resources are mandatory in the request. A bucketRef,a productRef,a logicalResourceRef or relatedPartyRef |

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## Release History

| Release Status | Date | Release led by: | Description |
|---|---|---|---|
| Pre-production | 31-Jul-2020 | Kevin King<br>Vodafone Group | Updated based on schema-library and Design Guideline v4 patterns |

## Version History

| Version Number | Date | Modified by | Description |
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| 4.0.0 | 31-Jul-2020 | Alan Pope | Final edits prior to publication |