



Framework Specification

Payment Management API REST Specification

TMF676
Release 18.0.0
February 2018

Latest Update: TM Forum Release 18.0	Member Evaluation
Version 1.0.1	IPR Mode: RAND

NOTICE

Copyright © TM Forum 2018. All Rights Reserved.

This document and translations of it may be copied and furnished to others, and derivative works that comment on or otherwise explain it or assist in its implementation may be prepared, copied, published, and distributed, in whole or in part, without restriction of any kind, provided that the above copyright notice and this section are included on all such copies and derivative works. However, this document itself may not be modified in any way, including by removing the copyright notice or references to TM FORUM, except as needed for the purpose of developing any document or deliverable produced by a TM FORUM Collaboration Project Team (in which case the rules applicable to copyrights, as set forth in the [TM FORUM IPR Policy](#), must be followed) or as required to translate it into languages other than English.

The limited permissions granted above are perpetual and will not be revoked by TM FORUM or its successors or assigns.

This document and the information contained herein is provided on an "AS IS" basis and TM FORUM DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY OWNERSHIP RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Direct inquiries to the TM Forum office:

4 Century Drive, Suite 100
Parsippany, NJ 07054, USA
Tel No. +1 973 944 5100
Fax No. +1 973 944 5110
TM Forum Web Page: www.tmforum.org

TABLE OF CONTENTS

- NOTICE 2
- Table of Contents 2
- List of Tables 4
- Introduction 5
- SAMPLE USE CASES..... 6
- RESOURCE MODEL..... 7
 - PAYMENT RESOURCE 7
 - Field Descriptions 7
 - REFUND RESOURCE 12
 - Field Descriptions 13
 - Notification Resources Models 18
 - Payment Creation Notification 18
 - Payment Change Notification 18
 - Refund Creation Notification 19
- API OPERATION TEMPLATES 20
 - PAYMENT RESOURCE** 20
 - REFUND RESOURCE** 29
- API notification 39
 - Register listener 39
 - Unregister listener 39
 - Publish Event to listener 40
 - Release History 41

LIST OF TABLES

N/A

INTRODUCTION

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

This API allows the following operations

- Notify of a performed payment
- Retrieve a list of payments filtered by a given criteria
- Retrieve a single performed payment
- Notify of a performed refund
- Retrieve a list of refunds filtered by a given criteria
- Retrieve a single performed refund

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.

- Request a list of performed payments stored on a server filtered by different criteria
- Request a specific payment stored on a server
- Notify of a new performed payment
- Request a list of performed refunds stored on a server filtered by different criteria
- Request a specific refund stored on a server
- Notify of a new performed refund

Note that typically refunds that undo a payment will be applied to the same payment method that was used to perform it.

Element	Type	Mandatory in API messages	Description
id	string	Yes in response	Unique Identifier within the server for the payment.
href	string	Yes in response	A resource URI pointing to the resource in the server that stores the detailed information. This is typically the resource url to retrieve individual details for the specific payment
@type	string	No	Type of payment in case it is polymorphic
@schemaLocation	string	No	location where to retrieve the schema of the payment or any of its specializations in case it is polymorphic
correlatorId	string	No	Unique identifier in the client for the payment in case it is needed to correlate.
name	string	No	Screen name of the payment
paymentDate	date-time	Yes in response	Date when the payment was performed
authorizationCode	string	No	Authorization code retrieved from an external payment gateway that could be used for conciliation
description	string	No	Text describing the contents of the payment
amount	MoneyType	No	Amount to be paid (net of taxes)
taxAmount	MoneyType	No	Tax applied
totalAmount	MoneyType	Yes	Amount to be paid (including taxes)
channel	ChannelRef type	No	Channel used for the payment
account	AccountRef type	No	Account where the payment is charged
paymentItem	array of PaymentItem type	No	Elements that were paid with the payment. It could be a bill, an order, debt...
paymentMethod	PaymentMethod type	Yes	payment method used to perform the payment

Element	Type	Mandatory in API messages	Description
status	string	Yes in response	Status of the payment
statusDate	string	No	Date when the status was recorded
payer	RelatedPartyRef type	No	A reference to the individual that is performing the payment

Field Descriptions

PaymentItem: A payment can be made in the context of an order, a recharge, for ongoing bills, for administrative fee (e.g. re-sending a paper copy of a bill), damaged device penalty, and more. Most times each payment will only contain one payment item (a bill, a recharge, an order...). However, there can be use cases with multiple item (e.g. March bill was \$45, April bill was \$75, covered by a single payment of \$115). This structure indicates how much was spent on each particular item and references them so they can be queried if more information is necessary.

This information can be stored in case a payment is backed out (e.g. due to chargeback from a credit card company). The system (or manual procedure) will find the entity impacted by the payment withdrawal and determine what needs to happen (if it was an order maybe the order process needs to be blocked, if it was a recharge maybe the prepaid balance needs to be adjusted down, etc.). If a refund or any other further action is needed, this array of payment items contains the necessary information to perform it.

Field	Type	Description
amount	MoneyType	Amount without taxes
taxAmount	MoneyType	Taxes amount
totalAmount	MoneyType	Amount including taxes
item	EntityRefType	Reference where to get more information about the entity with another API call

AccountRef: Reference to a telco account. It is used to reference the account that owns the payment. Also, it is used as a payment method type, as accounts could be billed to pay for goods.

Field	Type	Description
id	String	Unique identifier of the account
href	String	Reference to a resource in the server where to perform actions on the account. Most likely the given uri will be called using a different API
@referredType	String	Type of the referred account (e.g.:Financial account)
name	String	Account name
description	String	Description of the associated account

ChannelRefOrValue: link to the resource that holds information about the channel used to perform the payment operation or just the channel itself with just its name

Field	Type	Description
id	String	Unique identifier for the channel entity

href	String	A resource URI pointing to the resource in the OB that stores the channel information
@referredType	String	Type of channel
name	String	Name of the channel
description	String	Description of the channel

EntityRef: Reference to an external entity. It is used to reference something that was paid with this payment.

Field	Type	Description
id	String	Unique identifier of the entity in its environment
href	String	Reference to a resource in the server where to perform actions on the entity. Most likely the given uri will be called using a different API
@referredType	String	Referred entity type (e.g.: bill, product, account, etc.)
name	String	Entity name
description	String	Entity description

PaymentMethodRefOrValue: Reference or value of the method used to process the payment. Mirrors the current definition of the Payment Methods Management API

Field	Type	Description
id	String	Unique identifier of the payment method
href	String	Reference to a resource in the server where to perform actions on the payment method. The given uri will be called using the payment methods API
name	String	Friendly name assigned to the payment method
description	String	Description of the associated payment method
validFor	TimePeriod	Period the payment method is valid
account	AccountRef	Accounts that are linked to the payment method
preferred	boolean	Defines whether this method is the preferred one of the owner
relatedParty	relatedPartyRef	Reference to the customer or party that owns that payment method or can use it
@type	String	Type of payment method
@schemaLocation	String	Location where to retrieve a schema of the payment method
authorizationCode	String	Authorization code provided by a financial institution. Typically, this would be populated for recurring payments using the method, as payments have an authorization code of their own.
status	string	Status of the payment method
statusDate	date-time	Time the payment method changed
details	Object	Definition of the payment method. Its content depends on the type field

RelatedPartyRef: link to the resource that holds information about the individual that performs the payment

Field	Type	Description
id	String	Unique identifier for the party entity
href	String	A resource URI pointing to the resource in the OB that stores the party entity information
@referredType	String	Type of the party (customer, user, agent)
role	String	Role of the party
name	String	Name of the party

JSON REPRESENTATION SAMPLE

```
{
  "id": "12345",
  "href": "{paymentsAPI}/payment/12345",
  "correlatorId": "67890",
  "paymentDate": "2017-05-08T12:06:38.230Z",
  "authorizationCode": "xxxxxxxxxxxxxxxxxxxx",
  "name": "Example",
  "description": "an example payment",
  "amount": {
    "amount": 10,
    "units": "EUR"
  },
  "taxAmount": {
    "amount": 1.6,
    "units": "EUR"
  },
  "totalAmount": {
    "amount": 11.6,
    "units": "EUR"
  },
  "channel": {
    "id": "channell",
    "href": "http://server:port/channels/channell",
    "name": "WEB Portal"
  },
  "account": {
    "id": "44444",
    "href": "{accountsAPI}/accounts/44444",
    "name": "Telco fusion account",
    "description": "John Doe's telco account"
  },
  "paymentItem": [{
    "amount": {
      "amount": 6,
      "units": "EUR"
    },
    "taxAmount": {
      "amount": 0.96,
      "units": "EUR"
    },
    "totalAmount": {
      "amount": 6.96,
      "units": "EUR"
    },
    "item": {
      "id": "1234",
      "@referredType": "bill",
      "href": "{billingAPI}/accounts/44444/bills/1234"
    }
  }],
  "amount": {
    "amount": 4,
    "units": "EUR"
  },
  "taxAmount": {
    "amount": 0.64,
```

```
        "units": "EUR"
      },
      "totalAmount": {
        "amount": 4.64,
        "units": "EUR"
      },
      "item": {
        "@referredType": "product",
        "id": "9999",
        "href": "{catalogAPI}/products/9999"
      }
    ],
    "paymentMethod": {
      "@type": "voucher",
      "details": {
        "code": "H%3845",
        "description": "Get 300MB free",
        "value": [{
          "amount": 11.60,
          "units": "EUR"
        }]
      }
    },
    "status": "pendingAuthorization",
    "statusDate": "2017-05-08T12:06:38.230Z",
    "payer": {
      "id": "3333333333333333",
      "href": "{partiesAPI}/party/3333333333333333",
      "name": "somebody",
      "@referredType": "individual"
    }
  }
}
```

REFUND RESOURCE

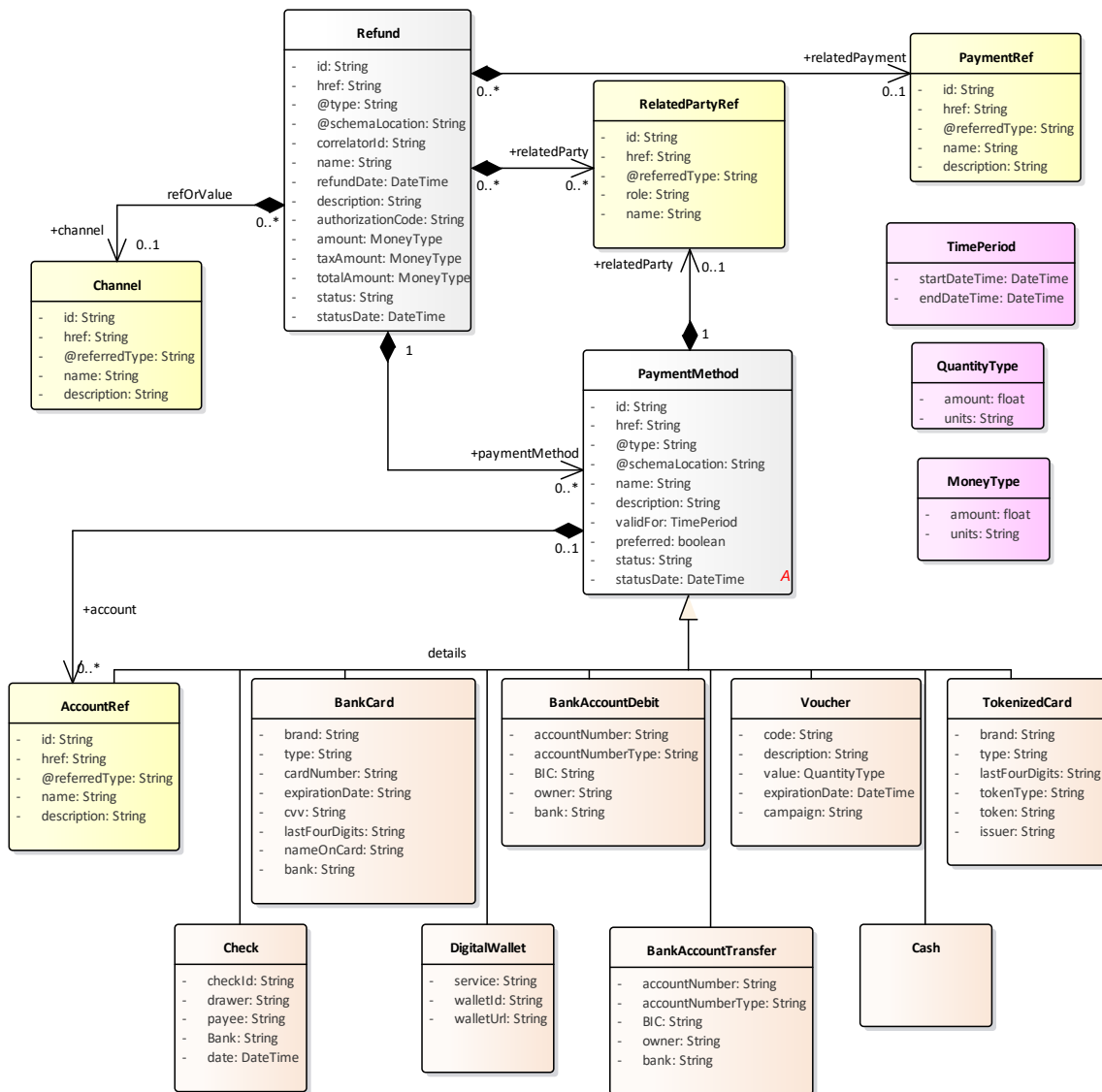


Figure 2 Refund resource model

FIELD DESCRIPTIONS

Element	Type	Mandatory in API messages	Description
id	string	Yes in response	Unique Identifier within the server for the refund.
correlatorId	string	No	Unique identifier in the client for the refund in case it is needed to correlate.
@type	string	No	Type of refund, in case it is polymorphic

Element	Type	Mandatory in API messages	Description
@schemaLocation	string	No	Location where to retrieve a schema of the refund
name	string	No	Screen name of the refund
href	string	Yes in response	A resource URI pointing to the resource in the server that stores the detailed information. This is typically the resource url to retrieve individual details for the specific refund
refundDate	date-time	Yes in response	Date when the refund was performed
authorizationCode	string	No	Authorization code retrieved from an external payment gateway that can be used for conciliation
description	string	No	Text describing the contents of the refund
amount	MoneyType	No	Amount to be refunded (net of taxes)
taxAmount	MoneyType	No	Tax applied
totalAmount	MoneyType	Yes	Amount to be refunded (including taxes)
channel	ChannelRef type	No	Channel used for the refund
account	AccountRef type	No	Account where the refund is associated
paymentMethod	PaymentMethod type	Yes	Payment method where the amount will be refunded
relatedPayment	PaymentRef type	No	Payment related to this refund (e.g.: in case a refund is used to compensate for a previous payment)
reason	string	No	Reason for the refund
status	string	Yes in response	Status of the refund
statusDate	string	No	Date when the status was recorded
relatedParty	RelatedPartyRef type	No	references to the customer being refunded, the agent or individual that is performing the refund...

Field Descriptions

AccountRef: Reference to a telco account. It is used to reference the account associated with the refund.

Field	Type	Description
id	String	Unique identifier of the account
href	String	Reference to a resource in the server where to perform actions on the account. Most likely the given uri will be called using a different API
@referredType	String	Type of the referred account (e.g.: financial account)
name	String	Account name
description	String	Description of the associated account

ChannelRefOrValue: link to the resource that holds information about the channel used to perform the refund operation or just the channel itself with just its name

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

PaymentMethodRefOrValue: Reference or value of the method used to process the payment. Mirrors the current definition of the Payment Methods Management API

Field	Type	Description
id	String	Unique identifier of the payment method
href	String	Reference to a resource in the server where to perform actions on the payment method. The given uri will be called using the payment methods API
name	String	Friendly name assigned to the payment method
description	String	Description of the associated payment method
validFor	TimePeriod	Period the payment method is valid
account	AccountRef	Accounts that are linked to the payment method
preferred	boolean	Defines whether this method is the preferred one of the owner
relatedParty	relatedPartyRef	Reference to the customer or party that owns that payment method or can use it
@type	String	Type of payment method
authorizationCode	String	Authorization code provided by a financial institution. Typically, this would be populated for recurring payments using the method, as payments have an authorization code of their own.
status	string	Status of the payment method
statusDate	date-time	Time the payment method changed
details	Object	Definition of the payment method. Its content depends on the type field

RelatedPartyRef: link to the resource that holds information about the individual that performs the payment

Field	Type	Description
id	String	Unique identifier for the party entity
href	String	A resource URI pointing to the resource in the OB that stores the party entity information

@referredType	String	Type of the party (customer, user, agent)
role	String	Role of the party
name	String	Name of the party

PaymentRef: Reference to a payment. It is used to reference a payment that is being compensated with the refund. The reference can be used to request details of the payment or perform actions on it.

Field	Type	Description
id	String	Unique identifier of the payment
href	String	Reference to a resource in the server where to perform actions on the payment using the payments API.
@referredPayment	String	Type of referred payment, in case it is polymorphic
name	String	payment name
description	String	Description of the associated payment

JSON REPRESENTATION SAMPLE

```
{
  "id": "12345",
  "href": "{paymentsApi}/refund/67890",
  "correlatorId": "67890",
  "name": "Example refund",
  "refundDate": "2017-05-11T12:06:38.230Z",
  "authorizationCode": "xxxxxxxxxxxxxxxxxxxx",
  "description": "Refund because the order 666 was cancelled",
  "amount": {
    "amount": 10,
    "units": "EUR"
  },
  "taxAmount": {
    "amount": 1.6,
    "units": "EUR"
  },
  "totalAmount": {
    "amount": 11.6,
    "units": "EUR"
  },
  "channel": {
    "id": "channell",
    "href": "http://server:port/channels/channell",
    "name": "WEB Portal"
  },
  "account": {
    "id": "44444",
    "href": "{accountManagementAPI}/account/44444",
    "name": "Telco fusion account",
    "description": "John Doe's telco account"
  },
  "paymentMethod": {
    "id": "88888",
    "href": "{paymentMethodsAPI}/paymentMethod/88888",
    "description": "bank card",
    "validFor": {
      "startDateTime": "2010-03-25T12:00:00",
      "endDateTime": "2010-04-25T12:00:00"
    }
  }
}
```



```
    },
    "account": {
      "id": "99999",
      "href":
        "{customerManagementAPI}/customerAccount/99999",
      "name": "John Doe's account",
      "description": "John Doe's telco account"
    },
    "@type": "bankCard",
    "details": {
      "brand": "MasterCard",
      "type": "Debit",
      "cardNumber": "000000000000000000",
      "expirationDate": "2019-03-25T12:00:00",
      "cvv": "000",
      "nameOnCard": "John Doe",
      "bank": "Fictitious Bank.inc"
    }
  },
  "relatedPayment": {
    "id": "55555",
    "href": "{paymentsAPI}/payments/55555",
    "name": "Some payment",
    "description": "John Doe's last payment"
  },
  "reason": "orderCancelled",
  "status": "pendingAuthorization",
  "statusDate": "2017-05-11T12:06:38.230Z",
  "relatedParty": {
    "id": "1234567890"
    "href": "{partiesAPI}/party/1234567890",
    "role": "requestor",
    "@referredType": "agent",
    "name": "somebody"
  }
}
```

Notification Resources Models

The following notifications are defined for this API

Notifications related to Payment:

- PaymentCreationNotification
- PaymentModificationNotification

Notifications related to User Refund:

- RefundCreationNotification

PAYMENT CREATION NOTIFICATION

Notification sent when a new payment has been performed.

Json representation sample

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

```
{
  "eventId": "00001",
  "eventTime": "2016-11-16T16:42:25-04:00",
  "eventType": "PaymentCreationNotification",
  "event": {
    "payment": :
      {-- SEE Payment RESOURCE SAMPLE --}
  }
}
```

PAYMENT CHANGE NOTIFICATION

Notification sent when the status of a payment has been modified.

Json representation sample

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

```
{
  "eventId": "00001",
  "eventTime": "2016-11-16T16:42:25-04:00",
  "eventType": "PaymentChangeNotification",
  "event": {
    "payment": :
      {-- SEE Payment RESOURCE SAMPLE --}
  }
}
```

```
}
```

REFUND CREATION NOTIFICATION

Notification sent when a payment refund has been performed.

Json representation sample

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

```
{
  "eventId": "00001",
  "eventTime": "2016-11-16T16:42:25-04:00",
  "eventType": "RefundCreationNotification",
  "event": {
    "refund":
      {-- SEE Refund RESOURCE SAMPLE --}
  }
}
```

API OPERATION TEMPLATES

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

Remember that the following Uniform Contract rules must be used:

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

PAYMENT RESOURCE

GET /paymentManagement/v1/payment

Description:

The Application invokes this operation to retrieve a list of payments from the server.

The request could include filters to retrieve only a specific subset of all the payments stored in the server such as filtering by type or validity date.

Behavior:

Status Code	Description
200	Payment 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 Payment resource model that must be included in the query response

REQUEST
<pre>GET https://{serverRoot}/paymentManagement/v1/payment Content-type: application/json X-Total-Count: 2</pre>
RESPONSE
<pre>200 Content-Type: application/json [{ "id": "12345", "correlatorId": "67890", "href": "{paymentManagementAPI}/payment/12345", "paymentDate": "2017-05-08T12:06:38.230Z", "name": "Example", "description": "an example payment", "amount": { "amount": 10, "units": "EUR" }, "taxAmount": { "amount": 1.6, "units": "EUR" }, "totalAmount": { "amount": 11.6, "units": "EUR" }, "channel": { "id": "channell1", "href": "http://server:port/channels/channell1", "name": "WEB Portal" }, "account": { "id": "44444", "href": "{accountManagementAPI}/accounts/44444",</pre>

```

        "name": "Telco fusion account",
        "description": "John Doe's telco account"
    },
    "paymentItem": [{
        "amount": {
            "amount": 6,
            "units": "EUR"
        },
        "taxAmount": {
            "amount": 0.96,
            "units": "EUR"
        },
        "totalAmount": {
            "amount": 6.96,
            "units": "EUR"
        },
        "item": {
            "@referredType": "bill",
            "id": "1234",
            "href": "{billingAPI}/account/44444/bill/1234"
        }
    }],
    {
        "totalAmount": {
            "amount": 4.64,
            "units": "EUR"
        },
        "amount": {
            "amount": 4,
            "units": "EUR"
        },
        "taxAmount": {
            "amount": 0.64,
            "units": "EUR"
        },
        "item": {
            "@referredType": "product",
            "id": "9999",
            "href": "{catalogAPI}/product/9999"
        }
    }],
    "paymentMethod": {
        "@type": "voucher",
        "details": {
            "id": "12345",
            "code": "H%3845",
            "description": "Get 300MB free",
            "value": [{
                "amount": 11.60,
                "units": "EUR"
            }]
        }
    },
    "status": "pendingAuthorization",
    "statusDate": "2017-05-08T12:06:38.230Z",
    "payer": {
        "id": "3333333333333333",
        "href": "{partiesAPI}/party/3333333333333333",
        "role": "customer",
        "name": "somebody"
    }
}

```

```

    },
    {
      "id": "67890",
      "correlatorId": "333333",
      "href": "{paymentManagementAPI}/payment/67890",
      "paymentDate": "2017-05-10T12:06:38.230Z",
      "name": "second example",
      "description": "a second example payment",
      "amount": {
        "amount": 5,
        "units": "EUR"
      },
      "taxAmount": {
        "amount": 0.8,
        "units": "EUR"
      },
      "totalAmount": {
        "amount": 5.8,
        "units": "EUR"
      },
      "channel": {
        "id": "channel2",
        "href": "http://server:port/channels/channel2",
        "name": "mobile app"
      },
      "account": {
        "id": "55555",
        "href": "{accountManagementAPI}/account/55555",
        "name": "Telco fusion account",
        "description": "Jane Doe's telco account"
      },
      "paymentItem": [{
        "amount": {
          "amount": 5,
          "units": "EUR"
        },
        "taxAmount": {
          "amount": 0.8,
          "units": "EUR"
        },
        "totalAmount": {
          "amount": 5.8,
          "units": "EUR"
        },
        "item": {
          "@referredType": "product",
          "id": "1234",
          "href": "{catalogAPI}/product/687954"
        }
      }],
      "paymentMethod": {
        "@type": "bankCard",
        "details": {
          "network": "MasterCard",
          "type": "Debit",
          "cardNumber": "0000000000000000",
          "expirationDate": "2020-10-10T12:00:00",
          "cvv": "000",
          "nameOnCard": "Jane Doe",

```

```

        "bank": "Fictitious Bank.inc"
      },
    },
    "status": "authorized",
    "statusDate": "2017-05-11T12:06:38.230Z",
    "payer": {
      "id": "3333333333333333",
      "href": "{partiesAPI}/party/3333333333333333",
      "role": "customer",
      "name": "somebody"
    }
  }
}

```

The example below shows the case where the reports for a user must only include payments performed in a specific time period

REQUEST
<pre> GET https://{serverRoot}/payments/v1/payment?startDate=2017-05-10&endDate=2017-05-12 Content-type: application/json X-Total-Count: 1 </pre>
RESPONSE
<pre> 200 Content-Type: application/json [[{ "id": "67890", "correlatorId": "333333", "href": "{paymentManagementAPI}/payment/67890", "paymentDate": "2017-05-10T12:06:38.230Z", "name": "second example", "description": "a second example payment", "amount": { "amount": 5, "units": "EUR" }, "taxAmount": { "amount": 0.8, "units": "EUR" }, "totalAmount": { "amount": 5.8, "units": "EUR" }, "channel": { "id": "channel2", "href": "http://server:port/channels/channel2", "name": "mobile app" }, "account": { "id": "55555", "href": "{accountManagementAPI}/account/55555", "name": "Telco fusion account", </pre>

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 payment 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}/paymentManagement/v1/payment Content-Type: application/json { "correlatorId": "987654321", "name": "third example", "description": "a third example payment", "amount": { "amount": 50, "units": "EUR" }, "taxAmount": { "amount": 10, "units": "EUR" }, "totalAmount": { "amount": 60, "units": "EUR" }, "channel": { "id": "channel3", "href": "http://server:port/channels/channel3", "name": "Retailer" }, "account": { "id": "3210654", "href": "{accountManagementAPI}/account/3210654", "name": "Somebody's telco account", "description": "Somebody's telco account" }, "paymentItem": [{ "amount": { "amount": 50, "units": "EUR" }, "taxAmount": { "amount": 10, "units": "EUR" }, "totalAmount": { </pre>

```

        "amount": 60,
        "units": "EUR"
    },
    "item": {
        "@referredType": "order",
        "id": "32",
        "href": "{orderingAPI}/orders/32"
    }
}
],
"paymentMethod": {
    "@type": "bankCard",
    "details": {
        "brand": "Visa",
        "type": "Creit",
        "cardNumber": "1234567890123456",
        "expirationDate": "2019-01-01T12:00:00",
        "cvv": "000",
        "nameOnCard": "Somebody",
        "bank": "Fictitious Bank.inc"
    }
},
"payer": {
    "id": "3333333333333333",
    "href": "{partiesAPI}/party/3333333333333333",
    "role": "customer",
    "name": "somebody"
}
}

```

RESPONSE

201
 Content-Type: application/json
 Location: https://{serverRoot}/paymentManagement/v1/payment/99999999

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

GET /paymentManagement/v1/payment/{paymentId}

Description:

The Application invokes this operation to retrieve a specific payment.

Behavior:

Status Code	Description
200	the payment 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 Payment resource model that must be included in the query response

REQUEST
<pre>GET https://{serverRoot}/paymentManagement/v1/payment/99999999 Content-type: application/json</pre>
RESPONSE
<pre>200 Content-Type: application/json { "id": "99999999", "href": "{paymentManagementAPI}/payment/99999999", "paymentDate": "2017-05-11T12:00:00", "correlatorId": "987654321", "name": "third example", "description": "a third example payment", "amount": { "amount": 50, "units": "EUR" }, "taxAmount": { "amount": 10, "units": "EUR" }, "totalAmount": { "amount": 60, "units": "EUR" }, "channel": { "id": "channel3", "href": "http://server:port/channels/channel3", "name": "Retailer" }, "account": { "id": "3210654", "href": "{accountManagementAPI}/account/3210654", "name": "Somebody's telco account", "description": "Somebody's telco account" }, "paymentItem": [{ "amount": { "amount": 50,</pre>

```

        "units": "EUR"
      },
      "taxAmount": {
        "amount": 10,
        "units": "EUR"
      },
      "totalAmount": {
        "amount": 60,
        "units": "EUR"
      },
      "item": {
        "@referredType": "order",
        "id": "32",
        "href": "{orderingAPI}/orders/32"
      }
    }],
    "paymentMethod": {
      "@type": "bankCard",
      "details": {
        "brand": "Visa",
        "type": "Credit",
        "cardNumber": "1234567890123456",
        "expirationDate": "2019-01-01T12:00:00",
        "cvv": "000",
        "nameOnCard": "Somebody",
        "bank": "Fictitious Bank.inc"
      }
    },
    "status": "authorized",
    "statusDate": "2017-05-11T12:00:00",
    "payer": {
      "id": "3333333333333333",
      "href": "{partiesAPI}/party/3333333333333333",
      "role": "customer",
      "name": "somebody"
    }
  }
}

```

REFUND RESOURCE

Operations over refund resource are expected to be performed by a privileged user/system (such as an admin)

GET /paymentManagement/v1/refund

```

[ {
  "id": "12345",
  "correlatorId": "67890",
  "name": "Example refund",
  "description": "Refund because the order 666 was cancelled",
  "amount": {
    "amount": 10,
    "units": "EUR"
  },
  "taxAmount": {
    "amount": 1.6,
    "units": "EUR"
  }
}

```

```

    },
    "totalAmount": {
      "amount": 11.6,
      "units": "EUR"
    },
    "channel": {
      "id": "channell1",
      "href": "http://server:port/channels/channell1",
      "name": "WEB Portal"
    },
    "account": {
      "id": "44444",
      "href": "{accountManagementAPI}/account/44444",
      "name": "Telco fusion account",
      "description": "John Doe's telco account"
    },
    "paymentMethod": {
      "id": "88888",
      "href": "{paymentMethodsAPI}/paymentMethod/88888",
      "description": "bank card",
      "validFor": {
        "startDateTime": "2010-03-25T12:00:00",
        "endDateTime": "2010-04-25T12:00:00"
      },
      "@type": "bankCard",
      "details": {
        "brand": "MasterCard",
        "type": "Debit",
        "cardNumber": "0000000000000000",
        "expirationDate": "2019-03-25T12:00:00",
        "cvv": "000",
        "nameOnCard": "John Doe",
        "bank": "Fictitious Bank.inc"
      }
    },
    "relatedPayment": {
      "id": "55555",
      "href": "{paymentsAPI}/payment/55555",
      "name": "Some payment",
      "description": "John Doe's last payment"
    },
    "reason": "orderCancelled",
    "status": "pendingAuthorization",
    "statusDate": "2017-05-11T12:06:38.230Z",
    "relatedParty": [{
      "id": "1234567890",
      "href": "{partiesAPI}/individual/1234567890",
      "role": "requestor",
      "name": "somebody",
      "@referredType": "individual"
    }
  ]
}

```

Description:

The Application invokes this operation to retrieve a list of refunds from the server.

The request could include filters in order to retrieve only a specific subset of all the refunds stored in the server such as filtering by type or validity date.

Behavior:

Status Code	Description
200	Refund 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 Refund resource model that must be included in the query response

REQUEST
<pre>GET https://{serverRoot}/paymentManagement/v1/refund Content-type: application/json X-Total-Count: 2</pre>
RESPONSE
<pre>200 Content-Type: application/json [{ "id": "12345", "correlatorId": "67890", "name": "Example refund", "description": "Refund because the order 666 was cancelled", "amount": { "amount": 10, "units": "EUR" }, "taxAmount": { "amount": 1.6, "units": "EUR" }, "totalAmount": { "amount": 11.6, "units": "EUR" }, "channel": { "id": "channell1", "href": "http://server:port/channels/channell1", "name": "WEB Portal" }, "account": { "id": "44444", "href": "{accountManagementAPI}/account/44444", </pre>

```

        "name": "Telco fusion account",
        "description": "John Doe's telco account"
    },
    "paymentMethod": {
        "id": "88888",
        "href": "{paymentMethodsAPI}/paymentMethod/88888",
        "description": "bank card",
        "validFor": {
            "startDateTime": "2010-03-25T12:00:00",
            "endDateTime": "2010-04-25T12:00:00"
        },
        "type": "bankCard",
        "details": {
            "brand": "MasterCard",
            "@type": "Debit",
            "cardNumber": "000000000000000000",
            "expirationDate": "2019-03-25T12:00:00",
            "cvv": "000",
            "nameOnCard": "John Doe",
            "bank": "Fictitious Bank.inc"
        }
    },
    "relatedPayment": {
        "id": "55555",
        "href": "{paymentsAPI}/payment/55555",
        "name": "Some payment",
        "description": "John Doe's last payment"
    },
    "reason": "orderCancelled",
    "status": "pendingAuthorization",
    "statusDate": "2017-05-11T12:06:38.230Z",
    "relatedParty": [{
        "id": "1234567890",
        "href": "{partiesAPI}/individual/1234567890",
        "role": "requestor",
        "name": "somebody",
        "@referredType": "individual"
    }]
},
{
    "id": "987634",
    "correlatorId": "131313",
    "name": "Another example refund",
    "description": "Compensation for downtime",
    "amount": {
        "amount": 4,
        "units": "EUR"
    },
    "taxAmount": {
        "amount": 0.3,
        "units": "EUR"
    },
    "totalAmount": {
        "amount": 4.3,
        "units": "EUR"
    },
    "channel": {
        "id": "channel4",
        "href": "{channelsAPI}/channel/channel4",
        "name": "Call Center"
    }
}

```



```

    },
    "account": {
      "id": "44444",
      "href": "{accountsAPI}/account/44444",
      "name": "Telco fusion account",
      "description": "John Doe's telco account"
    },
    "paymentMethod": {
      "description": "account reference",
      "@type": "account",
      "details": {
        "id": "44444",
        "href": "{accountsAPI}/account/44444",
        "name": "Telco fusion account",
        "description": "John Doe's telco account"
      }
    },
    "reason": "compensation for downtime",
    "status": "authorized",
    "statusDate": "2017-07-09T12:06:38.230Z",
    "relatedParty": [{
      "id": "1234567890",
      "href": "{partiesAPI}/individual/1234567890",
      "role": "requestor",
      "name": "somebody",
      "@referredType": "individual"
    }]
  }
}

```

The example below shows the case where the reports for a user must only include refunds performed in a specific time period

REQUEST
<pre> GET https://{serverRoot}/paymentManagement/v1/refund?startDate=2017-05-10&endDate=2017-05-12 Content-type: application/json X-Total-Count: 1 </pre>
RESPONSE
<pre> [{ "id": "12345", "correlatorId": "67890", "name": "Example refund", "description": "Refund because the order 666 was cancelled", "amount": { "amount": 10, "units": "EUR" }, "taxAmount": { "amount": 1.6, "units": "EUR" } },] </pre>

```

    "totalAmount": {
      "amount": 11.6,
      "units": "EUR"
    },
    "channel": {
      "id": "channell1",
      "href": "http://server:port/channels/channell1",
      "name": "WEB Portal"
    },
    "account": {
      "id": "44444",
      "href": "{accountManagementAPI}/account/44444",
      "name": "Telco fusion account",
      "description": "John Doe's telco account"
    },
    "paymentMethod": {
      "id": "88888",
      "href": "{paymentMethodsAPI}/paymentMethod/88888",
      "description": "bank card",
      "validFor": {
        "startDateTime": "2010-03-25T12:00:00",
        "endDateTime": "2010-04-25T12:00:00"
      },
      "@type": "bankCard",
      "details": {
        "brand": "MasterCard",
        "type": "Debit",
        "cardNumber": "0000000000000000",
        "expirationDate": "2019-03-25T12:00:00",
        "cvv": "000",
        "nameOnCard": "John Doe",
        "bank": "Fictitious Bank.inc"
      }
    },
    "relatedParty": [{
      "id": "1234567890",
      "href": "{customersAPI}/customer/1234567890",
      "role": "requestor",
      "name": "somebody",
      "@referredType": "customer"
    }
  ]
}

```

POST /paymentManagement/v1/refund

Description:

The Application invokes this operation to request a new refund to be created.

Behavior:

Status Code	Description
201	Successful refund generated (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 refund 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}/paymentManagement/v1/refund Content-Type: application/json { "correlatorId": "000312456", "name": "Example refund", "description": "Refund because the payment was wrong", "amount": { "amount": 20, "units": "EUR" }, "taxAmount": { "amount": 3, "units": "EUR" }, "totalAmount": { "amount": 23, "units": "EUR" }, "channel": { "id": "channel3", "href": "{channelsAPI}/channel/channel3", "name": "Retailer" }, "account": { "id": "55556666", "href": "{accountManagementAPI}/account/55556666", "name": "Jane Doe's account", "description": "Jane Doe's telco account" }, "paymentMethod": { "description": "cash paid in store", "@type": "cash", "details": {} }, "relatedPayment": { "id": "654987321", "href": "{paymentsAPI}/payment/654987321", "name": "Some payment", "description": "Jane Doe's last payment" }, "relatedParty": [{ </pre>

<pre> "id": "9876543210" "href": "{agentsAPI}/agents/9876543210", "role": "requestor", "name": "agent", "@referredType": "individual" }, { "id": "0123456789" "href": "{customersAPI}/customer/0123456789", "role": "customer", "name": "John Doe", "@referredType": "customer" }] } </pre>
RESPONSE
<p>201 Content-Type: application/json Location: https://{serverRoot}/paymentManagement/v1/refund/00000001</p> <p>Response is not required to include a BODY with the contents of the payment resource created, but if included it must be filled with at least the mandatory parameters.</p>

GET /paymentManagement/v1/refund/{refundId}

Description:

The Application invokes this operation to retrieve a specific refund.

Behavior:

Status Code	Description
200	the refund 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 Refund resource model that must be included in the query response

REQUEST

```
GET https://{serverRoot}/paymentManagement/v1/refund/321987654
Content-type: application/json
```

RESPONSE

```
200
Content-Type: application/json
{
  "id": "321987654",
  "correlatorId": "67890",
  "name": "Example refund",
  "description": "a single refund",
  "amount": {
    "amount": 30,
    "units": "EUR"
  },
  "taxAmount": {
    "amount": 4.2,
    "units": "EUR"
  },
  "totalAmount": {
    "amount": 34.2,
    "units": "EUR"
  },
  "channel": {
    "id": "channel4",
    "href": "{channelAPI}/channel/channel4",
    "name": "Call Center"
  },
  "account": {
    "id": "321456987",
    "href": "{accountManagementAPI}/account/321456987",
    "name": "Telco fusion account",
    "description": "John Doe's telco account"
  },
  "paymentMethod": {
    "id": "333333",
    "href": "{paymentMethodsAPI}/paymentMethod/333333",
    "description": "bank card",
    "validFor": {
      "startDateTime": "2010-03-25T12:00:00",
      "endDateTime": "2020-04-25T12:00:00"
    },
    "type": "@bankCard",
    "details": {
      "brand": "MasterCard",
      "type": "Debit",
      "cardNumber": "0000000000000000",
      "expirationDate": "2019-03-25T12:00:00",
      "cvv": "000",
      "nameOnCard": "John Doe",
      "bank": "Fictitious Bank.inc"
    }
  },
  "relatedParty": [{
    "id": "9876543210"
    "href": "{agentsAPI}/agents/9876543210",
    "role": "requestor",
```

```
    "name": "agent",  
    "@referredType": "individual"  
  }, {  
    "id": "0123456789"  
    "href": "{customersAPI}/customer/0123456789",  
    "role": "customer",  
    "name": "John Doe",  
    "@referredType": "customer"  
  } ]  
}
```

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.

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

UNREGISTER LISTENER

DELETE /hub/{id}

Description

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

Behavior

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

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

Usage Samples

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

REQUEST
DELETE /api/hub/42 Accept: application/json
RESPONSE
204

PUBLISH EVENT TO LISTENER

POST /client/listener

Description

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

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

Behavior

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

Usage Samples

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

REQUEST

<pre> POST /client/listener Accept: application/json { "eventId": "111", "eventType": " EVENT_TYPE ", "event": { EVENT BODY as described in event model section } } </pre>
RESPONSE
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	05-Jun-2017	Guillermo Martínez (Telefónica)	First Release of Draft Version of the Document.
Release 1.0.0	17-Nov-2017	Guillermo Martínez (Telefónica)	Final Release of the document
Release 18.0.0 Version 1.0.1	19-Feb-2018	Adrienne Walcott	Formatting/style edits prior to publishing