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Product Ordering Management API REST Specification

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N/A

INTRODUCTION

The following document is the specification of the REST API for Product Order Management. It includes the model definition as well as all available operations. Possible actions are creating, updating and retrieving Product Orders.

The Product Ordering API provides a standardized mechanism for placing a product order with all of the necessary order parameters. The API consists of a simple set of operations that interact with CRM/Order Negotiation systems in a consistent manner. A product order is created based on a product offer that is defined in a catalog. The product offer identifies the product or set of products that are available to a customer, and includes characteristics such as pricing, product options and market.

The product order references the product offer and identifies any specific requests made by the customer.

Product Ordering API manages product order resource:

- A Product Order is a type of order which can be used to place an order between a customer and a service provider or between a service provider and a partner and vice versa,
- Main Product Order attributes are its identifier, state, priority category (mass market, Enterprise, etc.) related dates (start, completion, etc.), related billing account, related parties and order items
- Main Order Items (aka order lines) attributes are the ordered offering and product characteristics with the related action to be performed (e.g. add or delete the products), state, location information for delivery, order item price and price alteration.

Product ordering API performs the following operations on Product Order:

- Retrieval of a product order or a collection of product orders depending on filter criteria
- Partial update of a product order (including updating rules)
- Creation of a product order (including default values and creation rules)
- Deletion of product order (for administration purposes)
- Notification of events on product order
 - o Order creation
 - o Order removal
 - o Order state change
 - o Order value change used to notify that any data in an order has just changed
 - o Order information required used to notify that some data in the order need to be filled / are missing

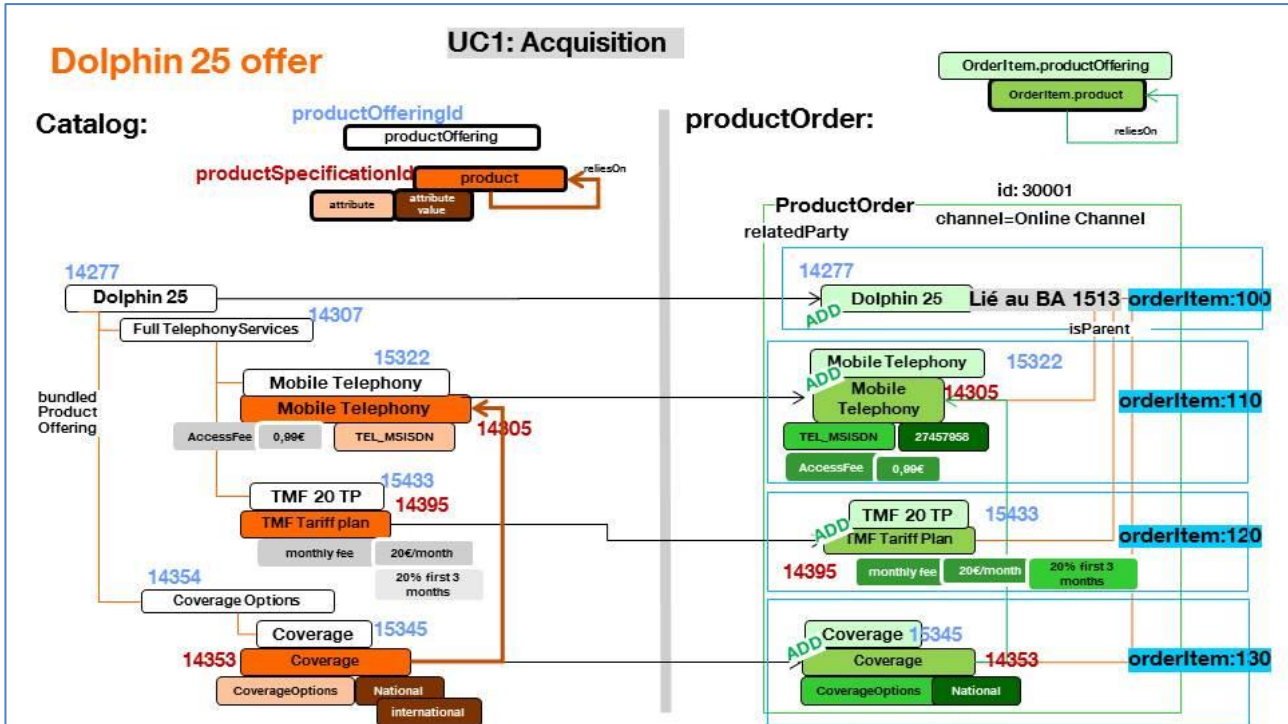
The following Assumptions were considered in the development of this document :

- The Order Management system has access to the commercial catalog system.

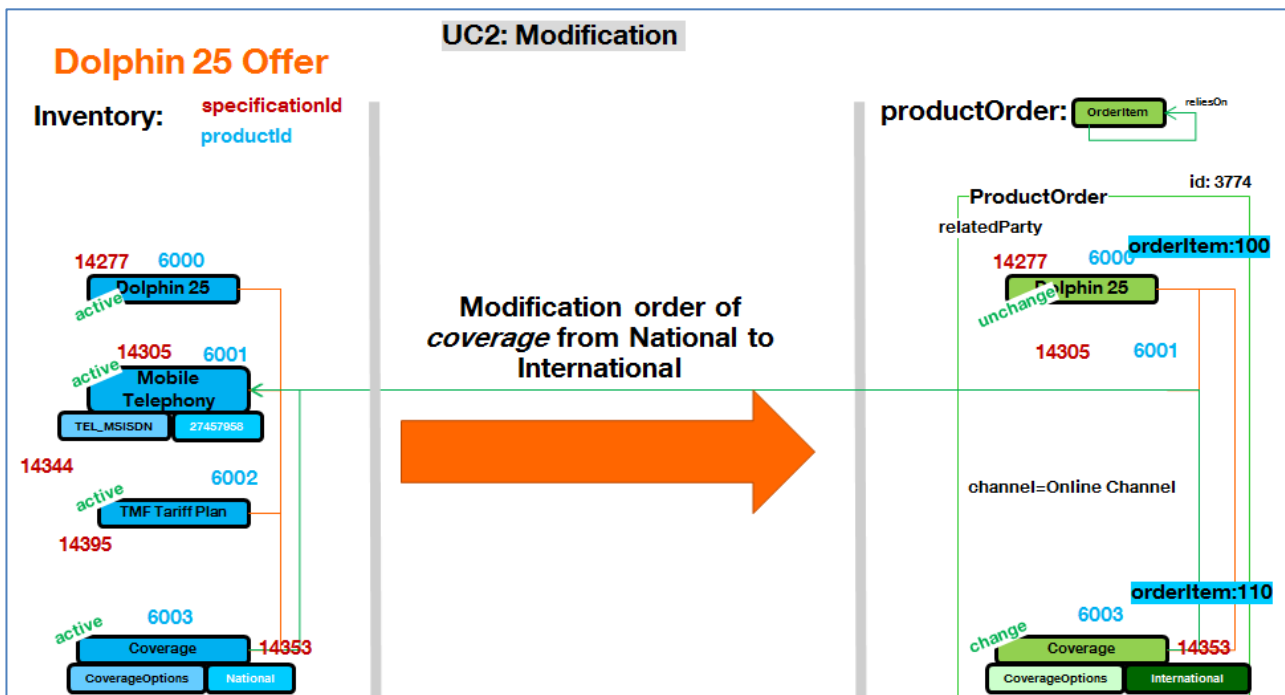
SAMPLE USE CASES

Two use case samples to illustrate the resource JSON representation in the following sections :

Use case 1 (UC1) : Acquisition



Use case 2 (UC2) : Modification



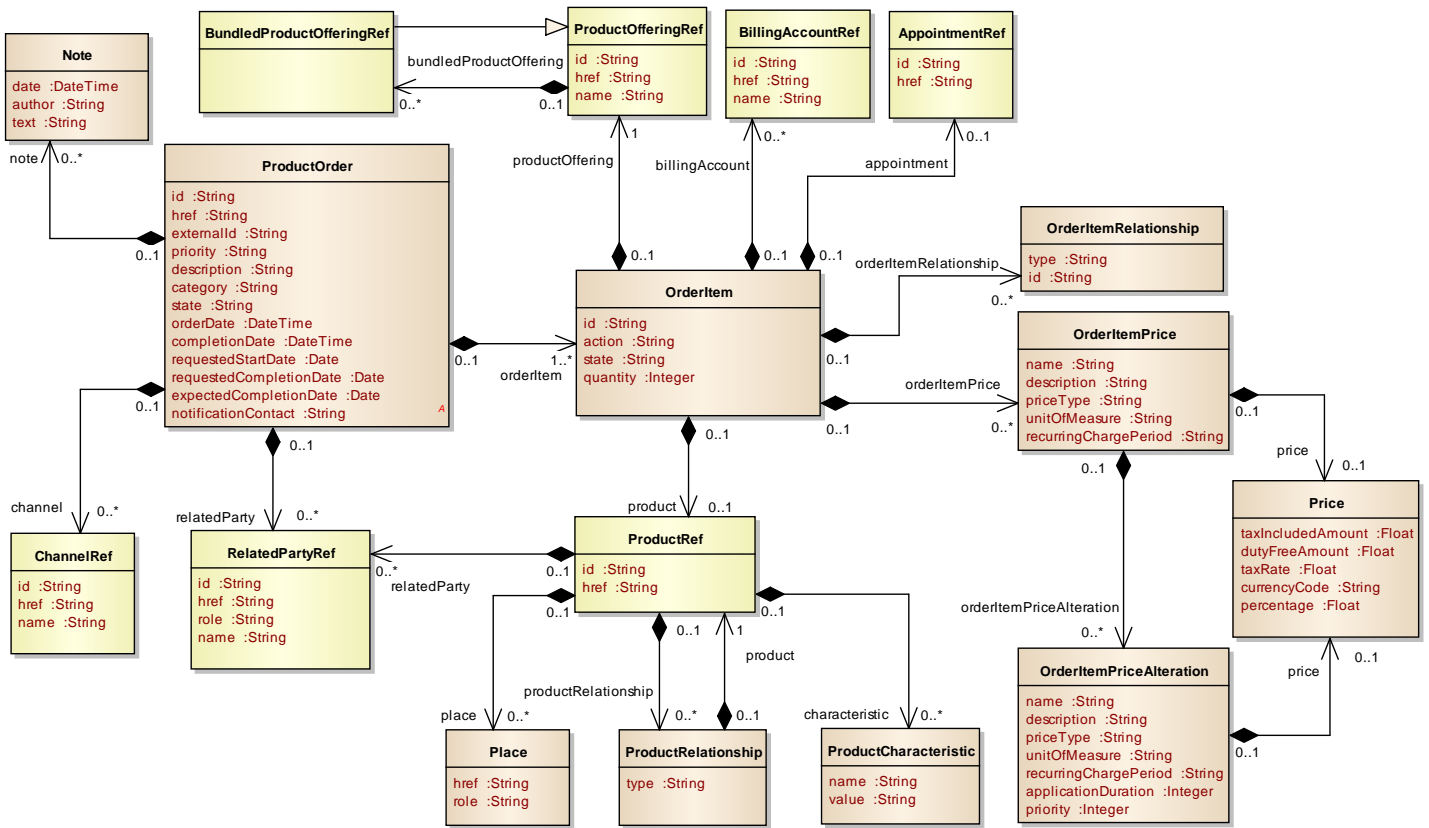
RESOURCE MODEL

Managed Entity and Task Resource Models

PRODUCT ORDER RESOURCE

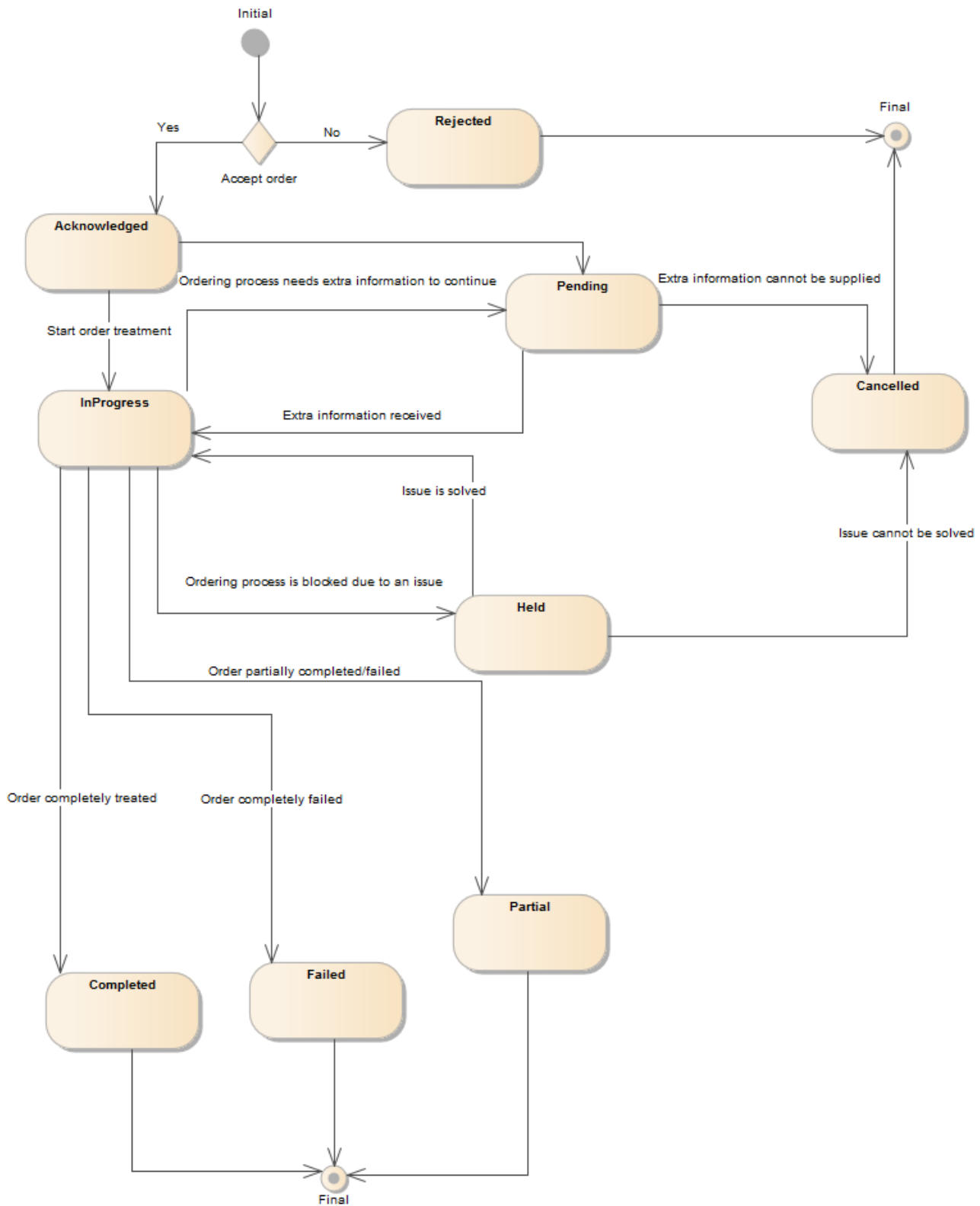
A Product Order is a type of order which can be used to place an order between a customer and a service provider or between a service provider and a partner and vice versa.

Resource model



Lifecycle

The product order lifecycle is tracked by mean of the state field. Typical lifecycle values are: Rejected, Acknowledged, Pending, InProgress, Cancelled, Held, Partial, Completed and Failed. The state machine specifying the typical state change transitions is provided below.



Field descriptions

ProductOrder fields

category	A string. Used to categorize the order from a business perspective that can be useful for the OM system (e.g. "enterprise", "residential", ...).
completionDate	A date time (DateTime). Date when the order was completed.
description	A string. Description of the product order.
expectedCompletionDate	A date (Date). Expected delivery date amended by the provider.
externalId	A string. ID given by the consumer and only understandable by him (to facilitate his searches afterwards).
href	A string. Hyperlink to access the order.
id	A string. ID created on repository side (OM system).
notificationContact	A string. Contact attached to the order to send back information regarding this order.
orderDate	A date time (DateTime). Date when the order was created.
priority	A string. A way that can be used by consumers to prioritize orders in OM system (from 0 to 4 : 0 is the highest priority, and 4 the lowest).
requestedCompletionDate	A date (Date). Requested delivery date from the requestor perspective.
requestedStartDate	A date (Date). Order start date wished by the requestor.
state	A string. Tracks the lifecycle status of the product order, such as Acknowledged, Rejected, InProgress, Pending and so on.
note	A list of notes (Note [*]). Extra information about the ticket or a product order.
orderItem	A list of order items (OrderItem [1..*]).
relatedParty	A list of related party references (RelatedPartyRef [*]). A related party defines party or party role linked to a specific entity.
channel	A list of channel references (ChannelRef [*]). The channel defines the channel for selling product offerings.

Note sub-resource

Extra information about the product order.

author	A string. Author of the note.
date	A date time (DateTime). Date of the note.
text	A string. Text of the note.

OrderItem sub-resource

An identified part of the order. A product order is decomposed into one or more order items.

action	A string. Can be "add" / "modify" / "no_change"/ "delete".
appointment	An appointment references (AppointmentRef). Used to precise that an appointment was set up with a related party for this order item.
id	A string. Identifier of the line item (generally it is a sequence number 01, 02, 03 ...).
quantity	An integer. Quantity ordered.
state	A string. State of the order item: described in the state machine diagram.
billingAccount	A list of billing account references (BillingAccountRef [*]). A BillingAccount is a detailed description of a bill structure.
orderItemPrice	A list of order item prices (OrderItemPrice[*]). An amount, usually of money, that represents the actual price paid by the Customer for this item.
orderItemRelationship	A list of order item relationships (OrderItemRelationship [*]). Linked order items to the one instantiate.
productOffering	A product offering reference (ProductOfferingRef). A product offering represents entities that are orderable from the provider of the catalog, this resource includes pricing information.
product	<p>A product reference (ProductRef). Configure the product characteristics (only configurable characteristics and necessary only if a non-default value is selected) and/or identify the product that needs to be modified/deleted</p> <p>May be a bundle product instantiation, in this case, it will contain the list of bundled product to instantiate</p> <p>Nota : Each product to instantiate corresponds to a purchased productOffering. In case of bundles, the order of the list in the productOffering bundle must match the order of the list in the product instance bundle to deliver.</p>

[OrderItemPrice sub-resource](#)

An amount, usually of money, that represents the actual price paid by the Customer for this item.

description	A string. A narrative that explains in detail the semantics of this order item price.
name	A string. A short descriptive name such as "Subscription price".
priceType	A string. A category that describes the price, such as recurring, discount, allowance, penalty, and so forth.
recurringChargePeriod	A string. Could be month, week...
unitOfMeasure	A string. Could be minutes, GB...

price	A price (Price). Provides all amounts (tax included, duty free, tax rate), used currency and percentage to apply for order item price and price alteration.
orderItemPriceAlteration	A list of order item price alterations (OrderItemPriceAlteration [*]). Is an amount, usually of money, that modifies the price charged for an order item.

[OrderItemPriceAlteration sub-resource](#)

Is an amount, usually of money, that modifies the price charged for an order item.

applicationDuration	An integer. Duration during which the alteration applies on the order item price (for instance 2 months free of charge for the recurring charge).
description	A string. A narrative that explains in detail the semantics of this order item price alteration.
name	A string. A short descriptive name such as "Monthly discount".
priceType	A string. A category that describes the price such as recurring, one time and usage.
priority	An integer. Priority level for applying this alteration among all the defined alterations on the order item price.
recurringChargePeriod	A string. Could be month, week...
unitOfMeasure	A string. Could be minutes, GB...
price	A price (Price). Provides all amounts (tax included, duty free, tax rate), used currency and percentage to apply for order item price and price alteration.

[OrderItemRelationship sub-resource](#)

Linked order items to the one instantiate.

type	A string. Type of the order item relationship.
id	A string. Unique identifier of an order item.

[Appointment sub-resource](#)

Used to precise that an appointment was set-up with a related party for this order item.

id	A string. Unique identifier of an appointment.
href	A string. Reference to an appointment.

[Place sub-resource](#)

Used to define a place useful for the product (for example a delivery geographical place).

href	A string. Reference of a place (for instance in google map).
------	--

role A string. Role of the place (for instance delivery geographical place).

Price sub-resource

Provides all amounts (tax included, duty free, tax rate), used currency and percentage to apply for order item price and price alteration.

currencyCode A string. A string used as a code for specifying the currency associated to the given amounts. The ISO4217 norm uses 3 letters to define the currency (for example USD for US dollar or EUR for Euro).

dutyFreeAmount A float. All taxes excluded amount (expressed in the given currency).

percentage A float. Percentage to apply.

taxIncludedAmount A float. All taxes included amount (expressed in the given currency).

taxRate A float. Applied tax rate on amount.

ProductCharacteristic sub-resource

Characteristics of the product to instantiate or to modify.

name A string. Name of the characteristic.

value A string. Value of the characteristic.

ProductRelationship sub-resource

Linked products to the one instantiate, it can be :

- "bundled" if the product is a bundle and you want to describe the "bundled" products inside this bundle
- "reliesOn" if the product needs another already owned product to rely on (e.g. an option on an already owned mobile access product)
- "targets" or "isTargeted" (depending on the way of expressing the link) for any other kind of links that may be useful.

type A string. Type of the product relationship. It can be :
 "bundled" if the product is a bundle and you want to describe the "bundled" products inside this bundle
 "reliesOn" if the product needs another already owned product to rely on (e.g. an option on an already owned mobile access product) For this relationship the target could be a product sold within a separated offering and already owned by the customer
 "targets" or "isTargeted" (depending on the way of expressing the link) for any other kind of links that may be useful.

product A product reference (ProductRef). Configure the product characteristics (only configurable characteristics and necessary only if a non-default value is selected) and/or identify the product that needs to be modified/deleted
 May be a bundle product instantiation, in this case, it will contain the list of bundled product to instantiate

Nota : Each product to instantiate corresponds to a purchased productOffering. In case of bundles, the order of the list in the productOffering bundle must match the order of the list in the product instance bundle to deliver.

[BillingAccountRef relationship](#)

BillingAccount reference. A BillingAccount is a detailed description of a bill structure.

href	A string. Reference of the billing account.
id	A string. Unique identifier of the billing account.
name	A string. Name of the billing account.

[BundledProductOfferingRef relationship](#)

BundledProductOffering Reference. A type of ProductOffering that belongs to a grouping of ProductOfferings made available to the market. It inherits of all attributes of ProductOffering.

Href	A string. Reference of the product offering.
Id	A string. Unique identifier of the product offering.
Name	A string. Name of the product offering.
bundledProductOffering	A list of bundled product offering references (BundledProductOfferingRef [*]). A type of ProductOffering that belongs to a grouping of ProductOfferings made available to the market. It inherits of all attributes of ProductOffering.

[ChannelRef relationship](#)

Channel reference. The channel defines the channel for selling product offerings.

href	A string. Reference of the channel.
id	A string. Unique identifier of the channel.
name	A string. Name of the channel.

[ProductOfferingRef relationship](#)

ProductOffering reference. A product offering represents entities that are orderable from the provider of the catalog, this resource includes pricing information.

href	A string. Reference of the product offering.
id	A string. Unique identifier of the product offering.
name	A string. Name of the product offering.
bundledProductOffering	A list of bundled product offering references (BundledProductOfferingRef [*]). A type of ProductOffering that belongs to a grouping of ProductOfferings made available to the market. It inherits of all attributes of ProductOffering.

ProductRef relationship

Product reference. Configure the product characteristics (only configurable characteristics and necessary only if a non-default value is selected) and/or identify the product that needs to be modified/deleted. May be a bundle product instantiation, in this case, it will contain the list of bundled product to instantiate. Nota : Each product to instantiate corresponds to a purchased productOffering. In case of bundles, the order of the list in the productOffering bundle must match the order of the list in the product instance bundle to deliver.

href	A string. Reference of the product.
id	A string. Unique identifier of the product.
productRelationship	<p>A list of product relationships (ProductRelationship [*]). Linked products to the one instantiate, it can be :</p> <ul style="list-style-type: none"> - "bundled" if the product is a bundle and you want to describe the "bundled" products inside this bundle - "reliesOn" if the product needs another already owned product to rely on (e.g. an option on an already owned mobile access product). For this "reliesOn" relationship the target could be a product sold within a separated offering and already owned by the customer <p>"targets" or "isTargeted" (depending on the way of expressing the link) for any other kind of links that may be useful.</p>
place	A list of places (Place [*]). Used to defined a place useful for the product (for example a delivery geographical place).
characteristic	A list of product characteristics (ProductCharacteristic [*]). Characteristics of the product to instantiate or to modify.
relatedParty	A list of related party references (RelatedPartyRef [*]). A related party defines party or party role linked to a specific entity.

RelatedPartyRef relationship

RelatedParty reference. A related party defines party or party role linked to a specific entity.

href	A string. Reference of the related party, could be a party reference or a party role reference.
id	A string. Unique identifier of a related party.
name	A string. Name of the related party.
role	A string. Role of the related party.
validFor	A time period. Validity period of the related party.

Json representation sample

We provide below the json representation of a sample of a 'ProductOrder' resource object corresponding to the use case 1 (acquisition of a new product offering).

```

{
  "category": "Residential",
  "completionDate": "2016-05-30T00:00",
  "description": "This product order covers UC1 - Acquisition",
  "expectedCompletionDate": "2016-05-30",
  "externalId": "3774",
  "href": "https://host:port/productOrdering/productOrder/3774",
  "id": "3774",
  "notificationContact": "jean.pontus@orange.com",
  "orderDate": "2016-05-30T00:00",
  "priority": 1,
  "requestedCompletionDate": "2016-05-30",
  "requestedStartDate": "2016-05-30",
  "state": "completed",
  "note": [
    {
      "author": "Mr Pence",
      "date": "2016-05-30T00:00",
      "text": "This is quite important because Mr Pontus is a VIP"
    }
  ],
  "orderItem": [
    {
      "id": "100",
      "action": "add",
      "quantity": 1,
      "state": "InProgress",
      "billingAccount": [
        {
          "href": "https://host:port/onboardingManagement/billingAccount/1513",
          "id": "1513",
          "name": "Home Account"
        }
      ],
      "productOffering": {
        "href": "https://host:port/productCatalog/productOffering/14277",
        "id": "14277",
        "name": "Dolphin25"
      },
      "product": {
        "relatedParty": [
          {
            "href": "https://host:port/partyManagement/individual/9492",
            "id": "9492",
            "name": "Jean Pontus",
            "role": "holder",
            "validFor": {
              "startDateTime": "2016-05-26T00:00",
              "endDateTime": "2016-12-26T00:00"
            }
          }
        ]
      }
    }
  ]
}

```



```

    },
    "orderItemRelationship": [
      {
        "type": "isParent",
        "id": "110"
      },
      {
        "type": "isParent",
        "id": "120"
      },
      {
        "type": "isParent",
        "id": "130"
      }
    ]
  },
  {
    "id": "110",
    "action": "add",
    "quantity": 1,
    "state": "InProgress",
    "orderItemPrice": [
      {
        "description": "Mobile Telephony Access Fee",
        "name": "Mobile Telephony Access Fee",
        "priceType": "OneTime",
        "price": {
          "currencyCode": "EUR",
          "dutyFreeAmount": 0.99,
          "taxIncludedAmount": 1.21,
          "taxRate": 21.64
        }
      }
    ],
    "orderItemRelationship": [
      {
        "type": "isChild",
        "id": "100"
      }
    ],
    "productOffering": {
      "href": "https://host:port/productCatalog/productOffering/15322",
      "id": "15322",
      "name": "Mobile Telephony"
    },
    "product": {
      "characteristic": [
        {
          "name": "TEL_MSISDN",
          "value": "27457958"
        }
      ]
    }
  },
  {
    "id": "120",
    "action": "add",

```

```

"quantity": 1,
"state": "InProgress",
"orderItemPrice": [
  {
    "description": "recurring fee for Dolphin plan",
    "name": "dolphin 25",
    "priceType": "recurring",
    "recurringChargePeriod": "monthly",
    "price": {
      "currencyCode": "EUR",
      "dutyFreeAmount": 20.00,
      "taxIncludedAmount": 24.43,
      "taxRate": 4.43
    }
  },
  "orderItemPriceAlteration": [
    {
      "applicationDuration": 3,
      "description": "20% off for 3 first months",
      "name": "3months20",
      "priceType": "recurring",
      "priority": 10,
      "recurringChargePeriod": "monthly",
      "price": {
        "currencyCode": "EUR",
        "percentage": 20.0
      }
    }
  ]
}],
"productOffering": {
  "href": "https://host:port/productCatalog/productOffering/15433",
  "id": "15433",
  "name": "TMF Tarif Plan"
},
"orderItemRelationship": [
  {
    "type": "isChild",
    "id": "100"
  }
]
},
{
  "id": "130",
  "action": "add",
  "quantity": 1,
  "state": "InProgress",
  "productOffering": {
    "href": "https://host:port/productCatalog/productOffering/15345",
    "id": "15345",
    "name": "Coverage"
  },
  "product": {
    "characteristic": [
      {
        "name": "Coverage",
        "value": "National"
      }
    ]
  }
}

```

```

    }
  ]
},
"orderItemRelationship": [
  {
    "type": "reliesOn",
    "id": "110"
  },
  {
    "type": "isChild",
    "id": "100"
  }
]
}
],
"relatedParty": [
  {
    "href": "https://host:port/partyManagement/organization/7405",
    "id": "7405",
    "name": "TMF Telco",
    "role": "service provider",
    "validFor": {
      "startDateTime": "2016-05-29T00:00",
      "endDateTime": "2016-12-26T00:00"
    }
  }
],
"channel": [
  {
    "href": "https://host:port/productCatalogManagement/channel/3017",
    "id": "3017",
    "name": "Online Channel"
  }
]
}

```

Notification Resource Models

Four notifications are defined for this API.

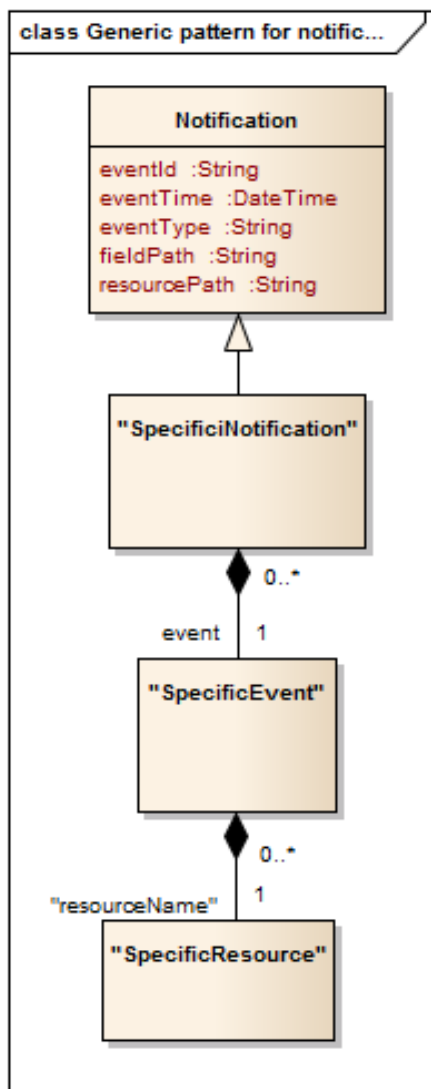
Notifications related to ProductOrder:

- ProductOrderCreationNotification
- ProductOrderAttributeValueChangeNotification
- ProductOrderStateChangeNotification
- ProductOrderRemoveNotification

The notification structure for all notifications in this API follow the pattern depicted by the figure below.

A notification resource (depicted by "SpecificNotification" placeholder) is a sub class of a generic Notification structure containing an id of the event occurrence (eventId), an event timestamp (eventTime), and the name of the notification resource (eventType).

This notification structure owns an event structure ("SpecificEvent" placeholder) linked to the resource concerned by the notification using the resource name as access field ("resourceName" placeholder).



PRODUCT ORDER CREATION NOTIFICATION

Notification sent when a new ProductOrder resource is created.

Json representation sample

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

```

{
  "eventId":"00001",
  "eventTime":"2016-11-16T16:42:25-04:00",
  "eventType":"ProductOrderCreationNotification",
  "event":{
    "productOrder":
      [-- SEE ProductOrder RESOURCE SAMPLE --]
  }
}

```

PRODUCT ORDER ATTRIBUTE VALUE CHANGE NOTIFICATION

Notification sent when changing an attribute of a ProductOrder resource.

Json representation sample

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

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

PRODUCT ORDER STATE CHANGE NOTIFICATION

Notification sent when changing the state of a ProductOrder resource.

Json representation sample

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

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

PRODUCT ORDER REMOVE NOTIFICATION

Notification sent when removing a ProductOrder resource.

Json representation sample

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

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

```
"eventType":"ProductOrderRemoveNotification",  
"event": {  
  "productOrder" :  
    {-- SEE ProductOrder RESOURCE SAMPLE --}  
  }  
}
```

API OPERATIONS

Remember the following Uniform Contract:

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

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

Notifications are also described in a subsequent section.

OPERATIONS ON PRODUCT ORDER

LIST PRODUCT ORDERS

GET /productOrder?fields=...&{filtering}

Description

This operation list product order entities.

Attribute selection is enabled for all first level attributes.

Filtering may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving ProductOrder resources.

Searching product orders with channel id 3017 used during sell process. The result items are shrunk to show only few attributes (fields=completionDate, externalId, id, notificationContact, orderDate, state, relatedParty, channel)

Request
<pre>GET /productOrderingManagement/productOrder?channel.id=3017&fields=completionDate,externalId,id,notificationContact,orderDate,state,relatedParty,channel Accept: application/json</pre>
Response
<pre>200 [{ "completionDate": "2016-05-30T00:00", "externalId": "3774", "id": "3774", "notificationContact": "jean.pontus@orange.com", "orderDate": "2016-05-30T00:00", "state": "completed", "relatedParty": [{ "href": "https://host:port/partyManagement/organization/7405", "id": "7405", "name": "TMF Telco", "role": "service provider", "validFor": { "startDateTime": "2016-05-29T00:00", "endDateTime": "2016-12-26T00:00" } }], "channel": [{ "href": "https://host:port/productCatalogManagement/channel/3017", "id": "3017",</pre>


```
"name": "Online Channel"
  }
]
},
{
  "completionDate": "2016-07-14T00:00",
  "expectedCompletionDate": "2016-07-14",
  "externalId": "4002",
  "id": "4002",
  "notificationContact": "jean.pontus@orange.com",
  "orderDate": "2016-07-14T00:00",
  "state": "pending",
  "relatedParty": [
    {
      "href": "https://host:port/partyManagement/organization/7405",
      "id": "7405",
      "name": "TMF Telco",
      "role": "service provider",
      "validFor": {
        "startDateTime": "2016-07-14T00:00",
        "endDateTime": "2016-12-26T00:00"
      }
    }
  ],
  "channel": [
    {
      "href": "https://host:port/productCatalogManagement/channel/3017",
      "id": "3017",
      "name": "Online Channel"
    }
  ]
}
]
```

RETRIEVE PRODUCT ORDER

GET `/productOrder/{id}?fields=...&{filtering}`

Description

This operation retrieves a product order entity.

Attribute selection is enabled for all first level attributes.

Filtering on sub-resources may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's a sample of a request for retrieving a ProductOrder resource corresponding to use case 1 (acquisition of a new product offering).

Request

GET /productOrderingManagement/productOrder/3774
 Accept: application/json

Response

200

```
{
  "category": "Residential",
  "completionDate": "2016-05-30T00:00",
  "description": "This product order covers UC1 - Acquisition",
  "expectedCompletionDate": "2016-05-30",
  "externalId": "3774",
  "href": "https://host:port/productOrdering/productOrder/3774",
  "id": "3774",
  "notificationContact": "jean.pontus@orange.com",
  "orderDate": "2016-05-30T00:00",
  "priority": 1,
  "requestedCompletionDate": "2016-05-30",
  "requestedStartDate": "2016-05-30",
  "state": "completed",
  "note": [
    {
      "author": "Mr Pence",
      "date": "2016-05-30T00:00",
      "text": "This is quite important because Mr Pontus is a VIP"
    }
  ],
  "orderItem": [
    {
      "id": "100",
      "action": "add",
      "quantity": 1,
      "state": "InProgress",
      "billingAccount": [
        {
          "href": "https://host:port/onboardingManagement/billingAccount/1513",
          "id": "1513",
          "name": "Home Account"
        }
      ],
      "productOffering": {
        "href": "https://host:port/productCatalog/productOffering/14277",
        "id": "14277",
        "name": "Dolphin25"
      },
      "product": {
        "relatedParty": [
          {
            "href": "https://host:port/partyManagement/individual/9492",
            "id": "9492",
            "name": "Jean Pontus",
            "role": "holder",
            "validFor": {
```

```

    "startDateTime": "2016-05-26T00:00",
    "endDateTime": "2016-12-26T00:00"
  }
}
],
},
"orderItemRelationship": [
  {
    "type": "isParent",
    "id": "110"
  },
  {
    "type": "isParent",
    "id": "120"
  },
  {
    "type": "isParent",
    "id": "130"
  }
]
},
{
  "id": "110",
  "action": "add",
  "quantity": 1,
  "state": "InProgress",
  "orderItemPrice": [
    {
      "description": "Mobile Telephony Access Fee",
      "name": "Mobile Telephony Access Fee",
      "priceType": "OneTime",
      "price": {
        "currencyCode": "EUR",
        "dutyFreeAmount": 0.99,
        "taxIncludedAmount": 1.21,
        "taxRate": 21.64
      }
    }
  ],
  "orderItemRelationship": [
    {
      "type": "isChild",
      "id": "100"
    }
  ],
  "productOffering": {
    "href": "https://host:port/productCatalog/productOffering/15322",
    "id": "15322",
    "name": "Mobile Telephony"
  },
  "product": {
    "characteristic": [
      {
        "name": "TEL_MSISDN",
        "value": "27457958"
      }
    ]
  }
}

```

```

},
{
  "id": "120",
  "action": "add",
  "quantity": 1,
  "state": "InProgress",
  "orderItemPrice": [
    {
      "description": "recurring fee for Dolphin plan",
      "name": "adolphin 25",
      "priceType": "recurring",
      "recurringChargePeriod": "monthly",
      "price": {
        "currencyCode": "EUR",
        "dutyFreeAmount": 20.00,
        "taxIncludedAmount": 24.43,
        "taxRate": 4.43
      },
      "orderItemPriceAlteration": [
        {
          "applicationDuration": 3,
          "description": "20% off for 3 first months",
          "name": "3months20",
          "priceType": "recurring",
          "priority": 10,
          "recurringChargePeriod": "monthly",
          "price": {
            "currencyCode": "EUR",
            "percentage": 20.0
          }
        }
      ]
    }
  ],
  "productOffering": {
    "href": "https://host:port/productCatalog/productOffering/15433",
    "id": "15433",
    "name": "TMF Tarif Plan"
  },
  "orderItemRelationship": [
    {
      "type": "isChild",
      "id": "100"
    }
  ]
},
{
  "id": "130",
  "action": "add",
  "quantity": 1,
  "state": "InProgress",
  "productOffering": {
    "href": "https://host:port/productCatalog/productOffering/15345",
    "id": "15345",
    "name": "Coverage"
  },
  "product": {

```

```
    "characteristic": [
      {
        "name": "Coverage",
        "value": "National"
      }
    ]
  },
  "orderItemRelationship": [
    {
      "type": "reliesOn",
      "id": "110"
    },
    {
      "type": "isChild",
      "id": "100"
    }
  ]
},
"relatedParty": [
  {
    "href": "https://host:port/partyManagement/organization/7405",
    "id": "7405",
    "name": "TMF Telco",
    "role": "service provider",
    "validFor": {
      "startDateTime": "2016-05-29T00:00",
      "endDateTime": "2016-12-26T00:00"
    }
  }
],
"channel": [
  {
    "href": "https://host:port/productCatalogManagement/channel/3017",
    "id": "3017",
    "name": "Online Channel"
  }
]
}
```

CREATE PRODUCT ORDER

POST /productOrder

Description

This operation creates a product order entity.

Mandatory and Non Mandatory Attributes

The following tables provides the list of mandatory and non-mandatory attributes when creating a ProductOrder, including any possible rule conditions and applicable default values.

Mandatory Attributes	Rule
relatedParty	
orderItem	

Non Mandatory Attributes	Default Value	Rule
category	Uncategorized	
completionDate		
description		
expectedCompletionDate		
externalId		
notificationContact		
orderDate		
priority	4 (lowest)	
requestedCompletionDate		
requestedStartDate		
state	Acknowledged	
note		
channel		

Additional Rules

The following table provides additional rules indicating mandatory fields in sub-resources or relationships when creating a ProductOrder resource.

Context	Mandatory Sub-Attributes
orderItem	id, action, billingAccount, product
note	text
relatedParty	id OR href OR name
orderItem.product.place	role, href
orderItem.productOffering	id OR href
orderItem.product	characteristic (if action==add), id OR href (if action==modify or action==delete)

The following pre-conditions apply for this operation.

Pre-conditions
PATCH allowed if order not completed

Default Values Summary

When creating the resource, the following table summarizes the default values applicable to optional attributes of the resource (or sub-resources).

Attributes	Default Value
state	Acknowledged
priority	4 (lowest)
category	Uncategorized
orderItem.state	Acknowledged

Usage Samples

Here's a sample of a request for creating a ProductOrder resource. In this sample, the request concerns the use case 1 (acquisition of a new product offering).

Request

```
POST /productOrderingManagement/productOrder
Content-Type: application/json
{
  "category": "Residential",
  "completionDate": "2016-05-30T00:00",
  "description": "This product order covers UC1 - Acquisition",
  "expectedCompletionDate": "2016-05-30",
  "externalId": "3774",
  "notificationContact": "jean.pontus@orange.com",
  "orderDate": "2016-05-30T00:00",
  "priority": 1,
  "requestedCompletionDate": "2016-05-30",
  "requestedStartDate": "2016-05-30",
  "state": "completed",
  "note": [
    {
      "author": "Mr Pence",
      "date": "2016-05-30T00:00",
      "text": "This is quite important because Mr Pontus is a VIP"
    }
  ],
  "orderItem": [
    {
      "id": "100",
      "action": "add",
      "quantity": 1,
      "state": "InProgress",
      "billingAccount": [
        {
          "href": "https://host:port/onboardingManagement/billingAccount/1513",
          "id": "1513",
          "name": "Home Account"
        }
      ]
    }
  ],
  "productOffering": {
    "href": "https://host:port/productCatalog/productOffering/14277",
    "id": "14277",
    "name": "Dolphin25"
  },
  "product": {
    "relatedParty": [
      {
        "href": "https://host:port/partyManagement/individual/9492",
        "id": "9492",
        "name": "Jean Pontus",
        "role": "holder",
```

```

    "validFor": {
      "startDateTime": "2016-05-26T00:00",
      "endDateTime": "2016-12-26T00:00"
    }
  }
],
},
"orderItemRelationship": [
  {
    "type": "isParent",
    "id": "110"
  },
  {
    "type": "isParent",
    "id": "120"
  },
  {
    "type": "isParent",
    "id": "130"
  }
]
},
{
  "id": "110",
  "action": "add",
  "quantity": 1,
  "state": "InProgress",
  "orderItemPrice": [
    {
      "description": "Mobile Telephony Access Fee",
      "name": "Mobile Telephony Access Fee",
      "priceType": "OneTime",
      "price": {
        "currencyCode": "EUR",
        "dutyFreeAmount": 0.99,
        "taxIncludedAmount": 1.21,
        "taxRate": 21.64
      }
    }
  ],
  "orderItemRelationship": [
    {
      "type": "isChild",
      "id": "100"
    }
  ],
  "productOffering": {
    "href": "https://host:port/productCatalog/productOffering/15322",
    "id": "15322",
    "name": "Mobile Telephony"
  },
  "product": {
    "characteristic": [
      {
        "name": "TEL_MSISDN",
        "value": "27457958"
      }
    ]
  }
}

```



```
]
}
},
{
  "id": "120",
  "action": "add",
  "quantity": 1,
  "state": "InProgress",
  "orderItemPrice": [
    {
      "description": "recurring fee for Dolphin plan",
      "name": "adolphin 25",
      "priceType": "recurring",
      "recurringChargePeriod": "monthly",
      "price": {
        "currencyCode": "EUR",
        "dutyFreeAmount": 20.00,
        "taxIncludedAmount": 24.43,
        "taxRate": 4.43
      },
      "orderItemPriceAlteration": [
        {
          "applicationDuration": 3,
          "description": "20% off for 3 first months",
          "name": "3months20",
          "priceType": "recurring",
          "priority": 10,
          "recurringChargePeriod": "monthly",
          "price": {
            "currencyCode": "EUR",
            "percentage": 20.0
          }
        }
      ]
    }
  ],
  "productOffering": {
    "href": "https://host:port/productCatalog/productOffering/15433",
    "id": "15433",
    "name": "TMF Tarif Plan"
  },
  "orderItemRelationship": [
    {
      "type": "isChild",
      "id": "100"
    }
  ]
},
{
  "id": "130",
  "action": "add",
  "quantity": 1,
  "state": "InProgress",
  "productOffering": {
    "href": "https://host:port/productCatalog/productOffering/15345",
    "id": "15345",
    "name": "Coverage"
  }
}
```

```

    },
    "product": {
      "characteristic": [
        {
          "name": "Coverage",
          "value": "National"
        }
      ]
    },
    },
    "orderItemRelationship": [
      {
        "type": "reliesOn",
        "id": "110"
      },
      {
        "type": "isChild",
        "id": "100"
      }
    ]
  }
],
"relatedParty": [
  {
    "href": "https://host:port/partyManagement/organization/7405",
    "id": "7405",
    "name": "TMF Telco",
    "role": "service provider",
    "validFor": {
      "startDateTime": "2016-05-29T00:00",
      "endDateTime": "2016-12-26T00:00"
    }
  }
],
"channel": [
  {
    "href": "https://host:port/productCatalogManagement/channel/3017",
    "id": "3017",
    "name": "Online Channel"
  }
]
}

```

Response

201

```

{
  "category": "Residential",
  "completionDate": "2016-05-30T00:00",
  "description": "This product order covers UC1 - Acquisition",
  "expectedCompletionDate": "2016-05-30",
  "externalId": "3774",
  "href": "https://host:port/productOrdering/productOrder/3774",
  "id": "3774",
  "notificationContact": "jean.pontus@orange.com",

```

```
"orderDate": "2016-05-30T00:00",
"priority": 1,
"requestedCompletionDate": "2016-05-30",
"requestedStartDate": "2016-05-30",
"state": "completed",
"note": [
  {
    "author": "Mr Pence",
    "date": "2016-05-30T00:00",
    "text": "This is quite important because Mr Pontus is a VIP"
  }
],
"orderItem": [
  {
    "id": "100",
    "action": "add",
    "quantity": 1,
    "state": "InProgress",
    "billingAccount": [
      {
        "href": "https://host:port/onboardingManagement/billingAccount/1513",
        "id": "1513",
        "name": "Home Account"
      }
    ],
    "productOffering": {
      "href": "https://host:port/productCatalog/productOffering/14277",
      "id": "14277",
      "name": "Dolphin25"
    },
    "product": {
      "relatedParty": [
        {
          "href": "https://host:port/partyManagement/individual/9492",
          "id": "9492",
          "name": "Jean Pontus",
          "role": "holder",
          "validFor": {
            "startDateTime": "2016-05-26T00:00",
            "endDateTime": "2016-12-26T00:00"
          }
        }
      ]
    }
  }
],
"orderItemRelationship": [
  {
    "type": "isParent",
    "id": "110"
  },
  {
    "type": "isParent",
    "id": "120"
  },
  {
    "type": "isParent",
    "id": "130"
  }
]
```

```

    }
  ]
},
{
  "id": "110",
  "action": "add",
  "quantity": 1,
  "state": "InProgress",
  "orderItemPrice": [
    {
      "description": "Mobile Telephony Access Fee",
      "name": "Mobile Telephony Access Fee",
      "priceType": "OneTime",
      "price": {
        "currencyCode": "EUR",
        "dutyFreeAmount": 0.99,
        "taxIncludedAmount": 1.21,
        "taxRate": 21.64
      }
    }
  ],
  "orderItemRelationship": [
    {
      "type": "isChild",
      "id": "100"
    }
  ],
  "productOffering": {
    "href": "https://host:port/productCatalog/productOffering/15322",
    "id": "15322",
    "name": "Mobile Telephony"
  },
  "product": {
    "characteristic": [
      {
        "name": "TEL_MSISDN",
        "value": "27457958"
      }
    ]
  }
}
},
{
  "id": "120",
  "action": "add",
  "quantity": 1,
  "state": "InProgress",
  "orderItemPrice": [
    {
      "description": "recurring fee for Dolphin plan",
      "name": "adolphin 25",
      "priceType": "recurring",
      "recurringChargePeriod": "monthly",
      "price": {
        "currencyCode": "EUR",
        "dutyFreeAmount": 20.00,
        "taxIncludedAmount": 24.43,

```

```
    "taxRate": 4.43
  },
  "orderItemPriceAlteration": [
    {
      "applicationDuration": 3,
      "description": "20% off for 3 first months",
      "name": "3months20",
      "priceType": "recurring",
      "priority": 10,
      "recurringChargePeriod": "monthly",
      "price": {
        "currencyCode": "EUR",
        "percentage": 20.0
      }
    }
  ]
},
"productOffering": {
  "href": "https://host:port/productCatalog/productOffering/15433",
  "id": "15433",
  "name": "TMF Tarif Plan"
},
"orderItemRelationship": [
  {
    "type": "isChild",
    "id": "100"
  }
]
},
{
  "id": "130",
  "action": "add",
  "quantity": 1,
  "state": "InProgress",
  "productOffering": {
    "href": "https://host:port/productCatalog/productOffering/15345",
    "id": "15345",
    "name": "Coverage"
  },
  "product": {
    "characteristic": [
      {
        "name": "Coverage",
        "value": "National"
      }
    ]
  },
  "orderItemRelationship": [
    {
      "type": "reliesOn",
      "id": "110"
    },
    {
      "type": "isChild",
      "id": "100"
    }
  ]
}
```

```

    }
  ]
}
],
"relatedParty": [
  {
    "href": "https://host:port/partyManagement/organization/7405",
    "id": "7405",
    "name": "TMF Telco",
    "role": "service provider",
    "validFor": {
      "startDateTime": "2016-05-29T00:00",
      "endDateTime": "2016-12-26T00:00"
    }
  }
],
"channel": [
  {
    "href": "https://host:port/productCatalogManagement/channel/3017",
    "id": "3017",
    "name": "Online Channel"
  }
]
}

```

Here's a sample of a request for creating a ProductOrder resource. In this example the request concerns the use case 2 (modification of a previous product order).

Request

```

POST /productOrderingManagement/productOrder
Content-Type: application/json
{
  "category": "Residential",
  "completionDate": "2016-07-14T00:00",
  "description": "This product order covers UC2 - Update",
  "expectedCompletionDate": "2016-07-14",
  "externalId": "4002",
  "notificationContact": "jean.pontus@orange.com",
  "orderDate": "2016-07-14T00:00",
  "priority": 1,
  "requestedCompletionDate": "2016-07-14",
  "requestedStartDate": "2016-07-14",
  "state": "pending",
  "note": [
    {
      "author": "Mr Pence",
      "date": "2016-07-14T00:00",
      "text": "coverage update for an existing line"
    }
  ],
  "orderItem": [
    {
      "id": "100",

```

```
"action": "no_change",
"quantity": 1,
"state": "pending",
"billingAccount": [
  {
    "href": "https://host:port/onboardingManagement/billingAccount/1513",
    "id": "1513",
    "name": "Home Account"
  }
],
"productOffering": {
  "href": "https://host:port/productCatalog/productOffering/14277",
  "id": "14277",
  "name": "Dolphin25"
},
"product": {
  "id": "6000",
  "href": "https://host:port/productInventory/product/6000",
  "relatedParty": [
    {
      "href": "https://host:port/partyManagement/individual/9492",
      "id": "9492",
      "name": "Jean Pontus",
      "role": "holder",
      "validFor": {
        "startDateTime": "2016-05-26T00:00",
        "endDateTime": "2016-12-26T00:00"
      }
    }
  ]
},
"orderItemRelationship": [
  {
    "type": "isParent",
    "id": "110"
  }
]
},
{
  "id": "110",
  "action": "modify",
  "quantity": 1,
  "state": "InProgress",
  "productOffering": {
    "href": "https://host:port/productCatalog/productOffering/15345",
    "id": "15345",
    "name": "Coverage"
  },
  "product": {
    "id": "6003",
    "href": "https://host:port/productInventory/product/6003",
    "characteristic": [
      {
        "name": "Coverage",
        "value": "international"
      }
    ]
  }
}
```

```

    ]
  },
  "orderItemRelationship": [
    {
      "type": "isChild",
      "id": "100"
    }
  ]
},
"relatedParty": [
  {
    "href": "https://host:port/partyManagement/organization/7405",
    "id": "7405",
    "name": "TMF Telco",
    "role": "service provider",
    "validFor": {
      "startDateTime": "2016-07-14T00:00",
      "endDateTime": "2016-12-26T00:00"
    }
  }
],
"channel": [
  {
    "href": "https://host:port/productCatalogManagement/channel/3017",
    "id": "3017",
    "name": "Online Channel"
  }
]
}

```

Response

```

201
{
  "category": "Residential",
  "completionDate": "2016-07-14T00:00",
  "description": "This product order covers UC2 - Update",
  "expectedCompletionDate": "2016-07-14",
  "externalId": "4002",
  "href": "https://host:port/productOrdering/productOrder/4002",
  "id": "4002",
  "notificationContact": "jean.pontus@orange.com",
  "orderDate": "2016-07-14T00:00",
  "priority": 1,
  "requestedCompletionDate": "2016-07-14",
  "requestedStartDate": "2016-07-14",
  "state": "pending",
  "note": [
    {
      "author": "Mr Pence",
      "date": "2016-07-14T00:00",
      "text": "coverage update for an existing line"
    }
  ],
}

```



```
"orderItem": [
  {
    "id": "100",
    "action": "no_change",
    "quantity": 1,
    "state": "pending",
    "billingAccount": [
      {
        "href": "https://host:port/onboardingManagement/billingAccount/1513",
        "id": "1513",
        "name": "Home Account"
      }
    ],
    "productOffering": {
      "href": "https://host:port/productCatalog/productOffering/14277",
      "id": "14277",
      "name": "Dolphin25"
    },
    "product": {
      "id": "6000",
      "href": "https://host:port/productInventory/product/6000",
      "relatedParty": [
        {
          "href": "https://host:port/partyManagement/individual/9492",
          "id": "9492",
          "name": "Jean Pontus",
          "role": "holder",
          "validFor": {
            "startDateTime": "2016-05-26T00:00",
            "endDateTime": "2016-12-26T00:00"
          }
        }
      ]
    }
  },
  {
    "orderItemRelationship": [
      {
        "type": "isParent",
        "id": "110"
      }
    ]
  },
  {
    "id": "110",
    "action": "add",
    "quantity": 1,
    "state": "modify",
    "productOffering": {
      "href": "https://host:port/productCatalog/productOffering/15345",
      "id": "15345",
      "name": "Coverage"
    },
    "product": {
      "id": "6003",
      "href": "https://host:port/productInventory/product/6003",
      "characteristic": [
        {
```

```

    "name": "Coverage",
    "value": "international"
  }
]
},
"orderItemRelationship": [
  {
    "type": "isChild",
    "id": "100"
  }
]
}
],
"relatedParty": [
  {
    "href": "https://host:port/partyManagement/organization/7405",
    "id": "7405",
    "name": "TMF Telco",
    "role": "service provider",
    "validFor": {
      "startDateTime": "2016-07-14T00:00",
      "endDateTime": "2016-12-26T00:00"
    }
  }
],
"channel": [
  {
    "href": "https://host:port/productCatalogManagement/channel/3017",
    "id": "3017",
    "name": "Online Channel"
  }
]
}
}

```

PATCH PRODUCT ORDER

PATCH /productOrder/{id}

Description

This operation allows partial updates of a product order entity. Support of json/merge (<https://tools.ietf.org/html/rfc7386>) is mandatory, support of json/patch (<http://tools.ietf.org/html/rfc5789>) is optional.

Note: If the update operation yields to the creation of sub-resources or relationships, the same rules concerning mandatory sub-resource attributes and default value settings in the POST operation applies to the PATCH operation. Hence these tables are not repeated here.

Patchable and Non Patchable Attributes

The tables below provide the list of patchable and non patchable attributes, including constraint rules on their usage.

Patchable Attributes	Rule
category	
description	
expectedCompletionDate	
notificationContact	
priority	
requestedCompletionDate	
requestedStartDate	
state	
note	
orderItem	
relatedParty	
channel	

Non Patchable Attributes	Rule
id	
href	
externalId	
orderDate	
completionDate	
orderItem.id	
orderItem.action	
category	
description	
expectedCompletionDate	
notificationContact	
priority	
requestedCompletionDate	
requestedStartDate	
state	
note	
orderItem	
relatedParty	
channel	

Additional Rules

The following pre-conditions apply for this operation.

Pre-conditions
PATCH allowed if order not completed

Usage Samples

Here's an example of a request for patching a ProductOrder resource.

Changing the priority of the order (using json-merge)

Request

PATCH /productOrderingManagement/productOrder/3774 Content-Type: application/merge-patch+json { "priority": 2 }
Response
201 { Similar JSON as in GET response with priority changed }

DELETE PRODUCT ORDER

DELETE /productOrder/{id}

Note: this operation is available only to ADMIN API users

Description

This operation deletes a product order entity.

Usage Samples

Here's an example of a request for deleting a ProductOrder resource.

Request
DELETE /productOrderingManagement/productOrder/3774
Response
204

API NOTIFICATIONS

For every single of operation on the entities use the following templates and provide sample REST notification POST calls.

It is assumed that the Pub/Sub uses the Register and UnRegister mechanisms described in the REST Guidelines reproduced below.

REGISTER LISTENER

POST /hub

Description

Sets the communication endpoint address the service instance must use to deliver information about its health state, execution state, failures and metrics. Subsequent POST calls will be rejected by the service if it does not support multiple listeners. In this case DELETE /api/hub/{id} must be called before an endpoint can be created again.

Behavior

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

Returns HTTP/1.1 status code 409 if request is not successful.

Usage Samples

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

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

UNREGISTER LISTENER

DELETE /hub/{id}**Description**

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

Behavior

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

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

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

POST /client/listener
Accept: application/json

```
{  
  "event": {  
    EVENT BODY  
  },  
  "eventType": "EVENT_TYPE"  
}
```

Response

201

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

ACKNOWLEDGEMENTS

RELEASE HISTORY

Release Number	Date	Release led by:	Description
Release 1.0	04/15/2013	Pierre Gauthier TM Forum pgauthier@tmforum.org	First Release of Draft Version of the Document.
Release 1.1			Updated for use in the Paris Spec Jam – and rebranded.
Release 2.0	04/15/2016	Pierre Gauthier TM Forum pgauthier@tmforum.org Mariano Belaunde Orange mariano.belaunde@orange.com	Regenerated from the API Data Model – and rebranded.
Release 3.0	10/07/2016	Ludovic Robert Orange ludovic.robert@orange.com Mariano Belaunde Orange mariano.belaunde@orange.com	Add price and price alteration on order item Regenerated from the API Data Model