



## *Frameworkx Specification*

# Product Ordering API REST Specification

**TMF622**  
**Release 14.5.0**  
**November 2014**

<b>Latest Update: Frameworkx Release 14.5</b>	<b>Member Evaluation</b>
<b>Version 2.0.0</b>	<b>IPR Mode: RAND</b>

## NOTICE

Copyright © TM Forum 2014. 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:

240 Headquarters Plaza,  
East Tower – 10<sup>th</sup> Floor,  
Morristown, NJ 07960 USA

Tel No. +1 973 944 5100

Fax No. +1 973 944 5110

TM Forum Web Page: [www.tmforum.org](http://www.tmforum.org)

## TABLE OF CONTENTS

NOTICE .....	2
Table of Contents.....	3
List of Tables .....	4
Introduction .....	5
SAMPLE USE CASES .....	6
RESOURCE MODEL .....	7
Managed Entity and Task Resource Models .....	7
ProductOrder lifecycle .....	7
ProductOrder .....	9
Notification Resource Models .....	17
Order Creation Notification .....	18
Order Remove Notification .....	23
Order State change Notification.....	23
Order Value Notification.....	23
Order Information Required Notification.....	24
API OPERATION TEMPLATES .....	26
GET /orderManagement/productOrder/{ID} .....	26
GET /orderManagement/productOrder/{field selector}&{filtering expression}.....	31
PATCH /orderManagement/productOrder/{ID}.....	36
POST orderManagement/productorder .....	43
DELETE orderManagement/productorder/{ID}.....	49
API NOTIFICATION TEMPLATES .....	51
REGISTER LISTENER POST /hub .....	51
UNREGISTER LISTENER DELETE hub/{id}.....	52
publish {EventTYPE} POST /listener .....	52
Release History .....	54

## LIST OF TABLES

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.

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

Reader will find examples of use cases using Product Order API in “Open Digital Business Scenarios and Use Cases” document

## RESOURCE MODEL

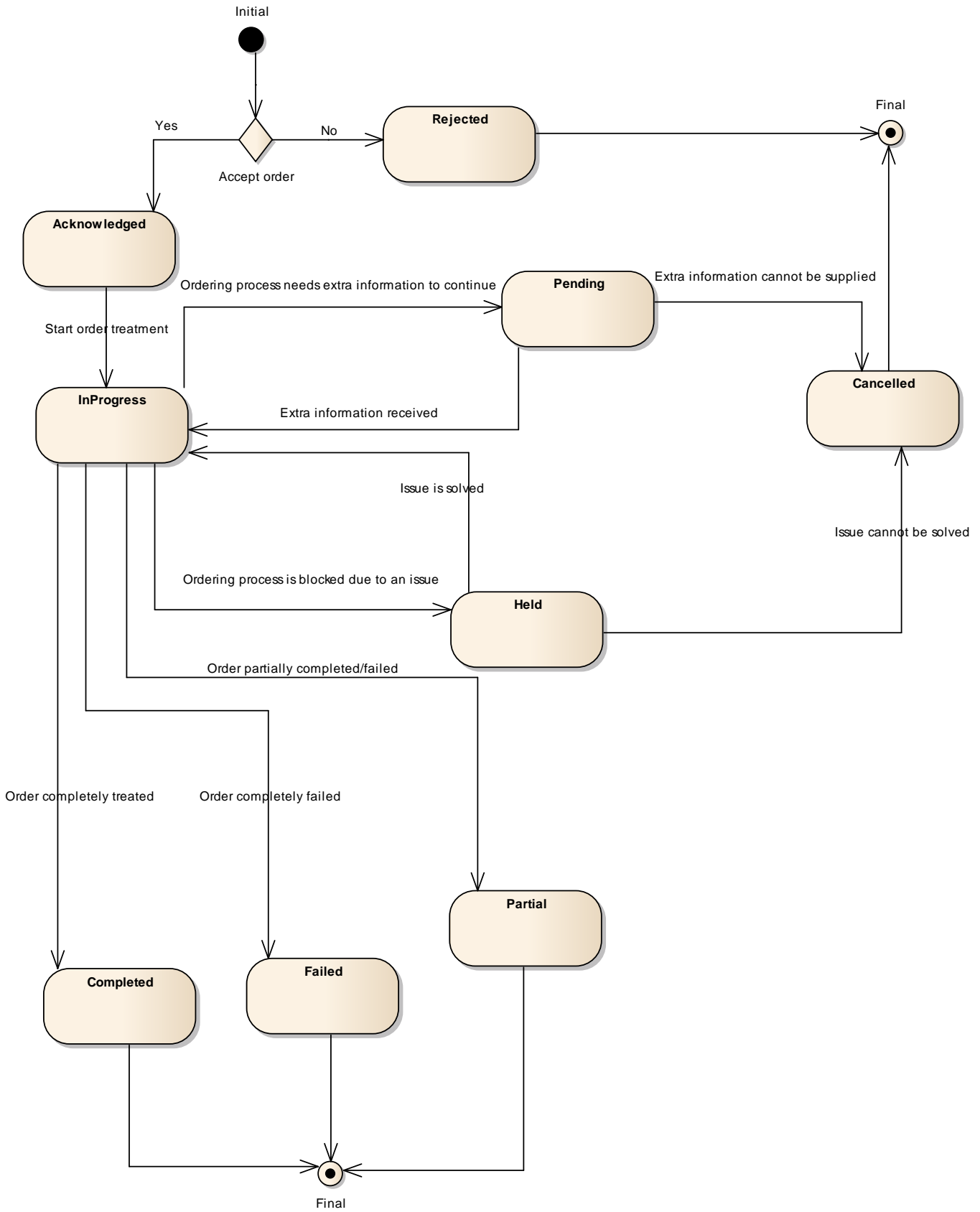
### Managed Entity and Task Resource Models

#### PRODUCTORDER LIFECYCLE

Here is the state machine diagram for a product order. Each order states are described in the tab below.

The order item states are the same as the order ones. Note that the order and order item states are tightly linked and need to be consistent, for example :

- Order, state : InProgress
  - o Order item 1, state : InProgress (Valid)
  - o Order item 2, state : Pending (Valid)
  - o Order item 3, state : Held (Valid)
  - o Order item 4, state : Completed (Valid until there is another order item which is NOT completed)
  - o Order item 5, state : Cancelled (Not valid : if an order item is cancelled, maybe the whole order should be cancelled too)





Acknowledged	The <i>Acknowledged</i> state is where an order has been received and has passed message and basic business validations.
In Progress	The <i>In Progress</i> state is where an order has passed the Order Feasibility check successfully and service delivery has started.
Cancelled	The <i>Cancelled</i> state is where an In-Flight Order has been successfully cancelled.
Completed	The <i>Completed</i> state is where an order has complete provision and the service is now active.
Rejected	The <i>Rejected</i> state is where: <ul style="list-style-type: none"> <li>- An order failed the Order Feasibility check</li> <li>- Invalid information is provided through the order request</li> <li>- The order request fails to meet business rules for ordering.</li> </ul>
Pending	The <i>Pending</i> state is used when an order is currently in a waiting stage for an action/activity to be completed before the order can progress further, pending order amend or cancel assessment. In situations where Access Seeker action is required, an "information required" notification will be issued on transition into this state.  A pending stage can lead into auto cancellation of an order, if no action is taken within the defined timeframes to be described under the Agreement.
Held	The <i>Held</i> state is used when an order cannot be progressed due to an issue. SP has temporarily delayed completing an order to resolve an infrastructure shortfall to facilitate supply of order. Upon resolution of the issue, the order will continue to progress.
Failed	All Order items have failed which results in the entire Order has <i>Failed</i> .
Partial	Some Order items have failed and some have succeeded so the entire Order is in a <i>Partial</i> state. This provides support for partial Failure of an Order

---

## PRODUCTORDER

Here under a product order composed of 4 order lines (orderItems) :

- Line "1" : Purchasing of a new simple product that needs a physical delivery place and an appointment to be delivered
- Line "2" : Modification of a characteristic value of an already owned product, and change the user associated to this Product
- Line "3" : Purchasing of a new simple product that needs (is supported by) another already owned product (in this case for example a new product that relies on the owned mobile access product to be installed)
- Line "4" : Purchasing of a bundled product composed of two atomic products

```
{
  "id": "42",
  "href": "http://serverlocation:port/orderManagement/productOrder/42",
  "externalId": "NiceNameForTheConsumer_42",
  "priority": "1",
  "description": "A wonderful 42 order for brand new products",
}
```

```
"category":"residential",
"state":"InProgress",
"orderDate":"2013-04-12T16:42:23-04:00",
"completionDate":"2013-04-19T16:42:23-04:00",
"requestedStartDate":"2013-04-12T16:42:23-04:00",
"requestedCompletionDate":"2013-04-19T16:42:23-04:00",
"expectedCompletionDate":"2013-04-19T16:42:23-04:00",
"notificationContact":"emailAddr-myAddress@hotmail.com",
"note":[
  {
    "text":"A free text detailing the note",
    "date":"2013-04-12T16:42:23-04:00",
    "author":"name"
  }
],
"relatedParty":[
  {
    "role":"customer",
    "id":"345221",
    "href":"http://serverlocation:port/partyManagement/customer/345221"
    "name":"John Doe"
  },
  {
    "role":"partner",
    "id":"42",
    "href":"http://serverlocation:port/partyManagement/partner/42"
  },
  {
    "role":"seller",
    "id":"4563",
    "href":"http://serverlocation:port/partnerManagement/partner/4563"
  }
],
"orderItem":[
  {
    "id":"1",
    "action":"add",
    "state":"Acknowledged",
    "billingAccount":{
      "id":"123456",
      "href":"http://serverlocation:port/billingManagement/billingAccount/123456"
    }
  },
  "appointment":"http://www.doodle.com/1WCV5647438",
  "productOffering":{
```

```
    "id": "42",
    "href": "http://serverlocation:port/catalogManagement/productOffering/42"
  },
  "product": {
    "place": {
      "href": "http://map.google.com/.../1234112GDE",
      "role": "DeliveryPlace"
    },
    "productCharacteristic": [
      {
        "name": "Colour",
        "value": "White"
      },
      {
        "name": "Memory",
        "value": "16"
      }
    ]
  }
},
{
  "id": "2",
  "action": "modify",
  "state": "InProgress",
  "productOffering": {
    "id": "43",
    "href": "http://serverlocation:port/catalogManagement/productOffering/43"
  },
  "product": {
    "id": "456",
    "href": "http://serverlocation:port/inventoryManagement/product/456",
    "productCharacteristic": [
      {
        "name": "anotherCharacteristic",
        "value": "itsValue"
      }
    ],
    "relatedParty": [
      {
        "role": "user",
        "id": "5667443",
        "href": "http://serverlocation:port/partyManagement/user/5667443",
        "name": "Jimmy Doe"
      }
    ]
  }
}
```

```
    }
  },
  {
    "id": "3",
    "action": "add",
    "state": "InProgress",
    "billingAccount": {
      "id": "123456",
      "href": "http://serverlocation:port/billingManagement/billingAccount/123456"
    },
    "productOffering": {
      "id": "51",
      "href": "http://serverlocation:port/catalogManagement/productOffering/51"
    },
    "product": {
      "id": "511",
      "href": "http://serverlocation:port/inventoryManagement/product/456",
      "productCharacteristic": [
        {
          "name": "anotherCharacteristic",
          "value": "itsValue"
        }
      ],
      "productRelationship": [
        {
          "type": "reliesOn",
          "product": {
            "productCharacteristic": [
              {
                "name": "MSISDN",
                "value": "003467488299002"
              }
            ]
          }
        }
      ]
    }
  }
],
{
  "id": "4",
  "action": "add",
  "state": "InProgress",
  "billingAccount": {
    "id": "1789",
    "href": "http://serverlocation:port/billingManagement/billingAccount/1789"
  }
}
```

```
    }],
    "productOffering":{
      "id":"44",
      "href":"http://serverlocation:port/catalogManagement/productOffering/Bundle44",
      "bundledProductOffering":[
        {
          "id":" BundledPSTN444",
          "href":"http://serverlocation:port/catalogManagement/productOffering/BundledPSTN444"
        },
        {
          "id":" Bundled Mobile443",
          "href":"http://serverlocation:port/catalogManagement/productOffering/BundledMobile443"
        }
      ]
    },
    "product":{
      "productRelationship":[
        {
          "type":"bundled",
          "product":{
            "productCharacteristic":[
              {
                "name":"PSTNNumber",
                "value":"003427488299002"
              }
            ]
          }
        },
        {
          "type":"bundled",
          "product":{
            "productCharacteristic":[
              {
                "name":"MobileNumber",
                "value":"003464553000300"
              }
            ]
          }
        }
      ]
    }
  ]
}
```

```
}

```

### Field Descriptions :

**BillingAccount:** is the billingAccount to use to bill the ordered products

Field	Description
<b>id</b>	Unique identifier of the billing account
<b>href</b>	Reference of the billing account

Note: Extra-information about the order (e.g. useful to add extra delivery information that could be useful for a human process : a digicode access to a building, ...).

Field	Description
<b>date</b>	Date of the note
<b>author</b>	Author of the note
<b>text</b>	Text of the note

**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.

Field	Description
<b>category</b>	Used to categorize the order from a business perspective that can be useful for the OM system (e.g. "enterprise", "residential", ...)
<b>completionDate</b>	Date when the order was completed
<b>description</b>	Description of the product order
<b>expectedCompletionDate</b>	Expected delivery date amended by the provider
<b>externalId</b>	ID given by the consumer and only understandable by him (to facilitate his searches afterwards)
<b>href</b>	Hyperlink to access the order
<b>id</b>	ID created on repository side (OM system)
<b>notificationContact</b>	Contact attached to the order to send back information regarding this order
<b>orderDate</b>	Date when the order was created
<b>priority</b>	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)
<b>requestedCompletionDate</b>	Requested delivery date from the requestor perspective
<b>requestedStartDate</b>	Order start date wished by the requestor
<b>state</b>	State of the order : described in the state-machine diagram above

**OrderItem:** Order items that have to be treated

Field	Description
<b>id</b>	Identifier of the line item (generally it is a sequence number 01, 02, 03, ...)
<b>action</b>	Can be "add" / "modify" / "no_change" / "delete"
<b>state</b>	State of the order item : described in the state machine diagram

<b>appointment</b>	Used to precise that an appointment was set up with a related party for this order item
--------------------	-----------------------------------------------------------------------------------------

Place: Used to defined a place useful for the product (for example a delivery geographical place)

Field	Description
href	Reference of a place (for instance in google map)
role	Role of the place (for instance delivery geographical place)

Product: 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.

Field	Description
id	Identifier of the owned product (useful for delete or modify command)
href	Reference to the owned product (useful for delete or modify command)

ProductCharacteristic: Characteristics of the product to instantiate or to modify

Field	Description
name	Name of the characteristic
value	Value of the characteristic

ProductOffering: Ordered offering (pricing, default values, etc. are fetched by the OM directly from the catalogue). May be a bundle ProductOffering, in this case, it will contain the list of bundled offers that are ordered

Field	Description
id	Unique identifier of the product offering
href	Reference of the product offering

ProductRelationship: Linked products to the one instantiate.

Field	Description
type	Type of the product relationship. It can be : <ul style="list-style-type: none"> <li>“bundled” if the product is a bundle and you want to describe the “bundled” products inside this bundle</li> <li>“reliesOn” if the product needs another already owned product to rely on (e.g. an option on an already owned mobile access product)</li> </ul> “targets” or “isTargeted” (depending on the way of expressing the link) for any

---

other kind of links that may be useful

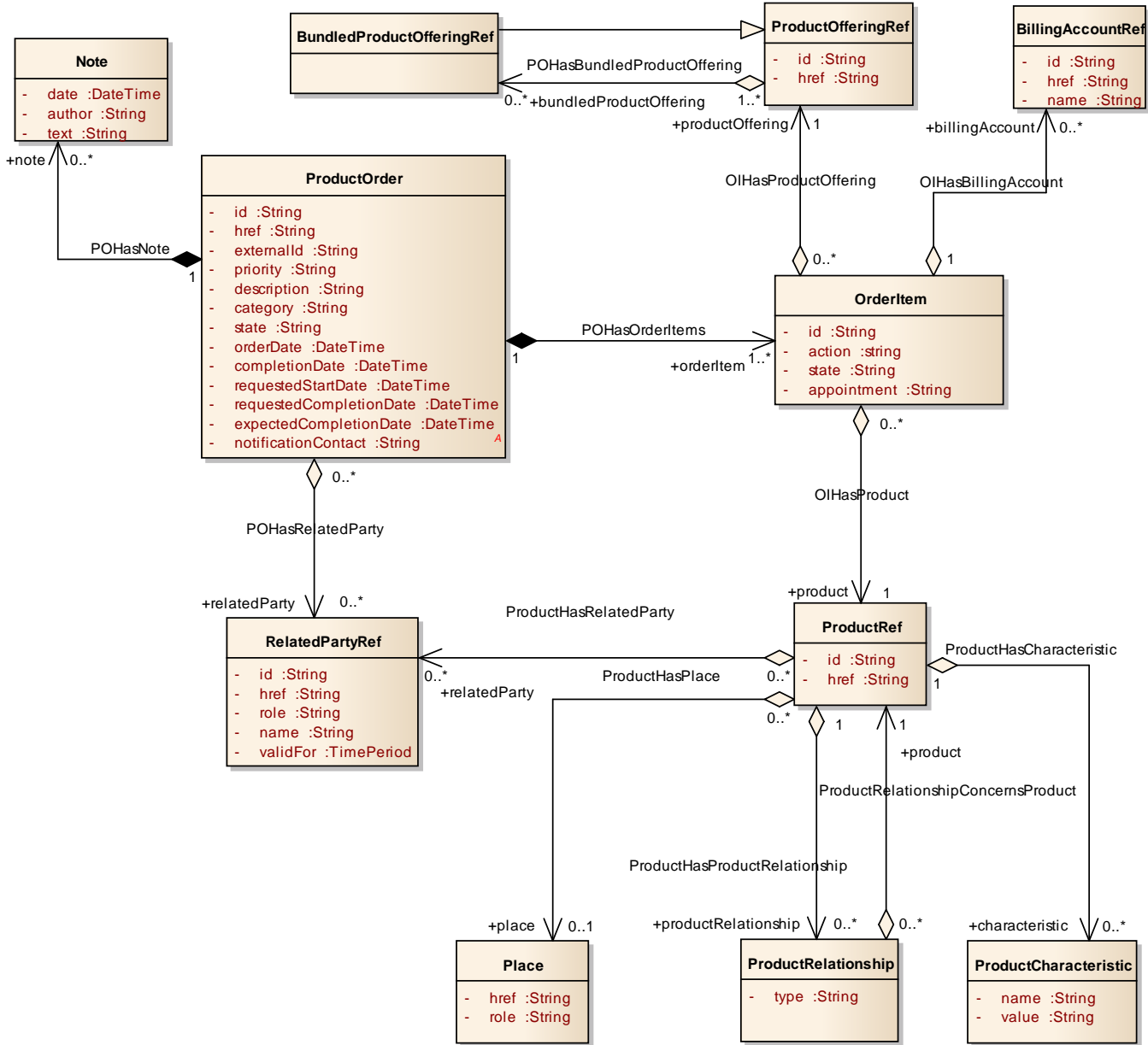
---

RelatedParty: Defines parties which are involved in the order and the role they are playing. At product order level, it may be the customer and at the product level, it may be the user.

Field	Description
id	Unique identifier of related party
href	Reference of the relatedParty, could be a party reference or a partyRole reference
role	Role of the related party
name	Name of the related party

UML model:



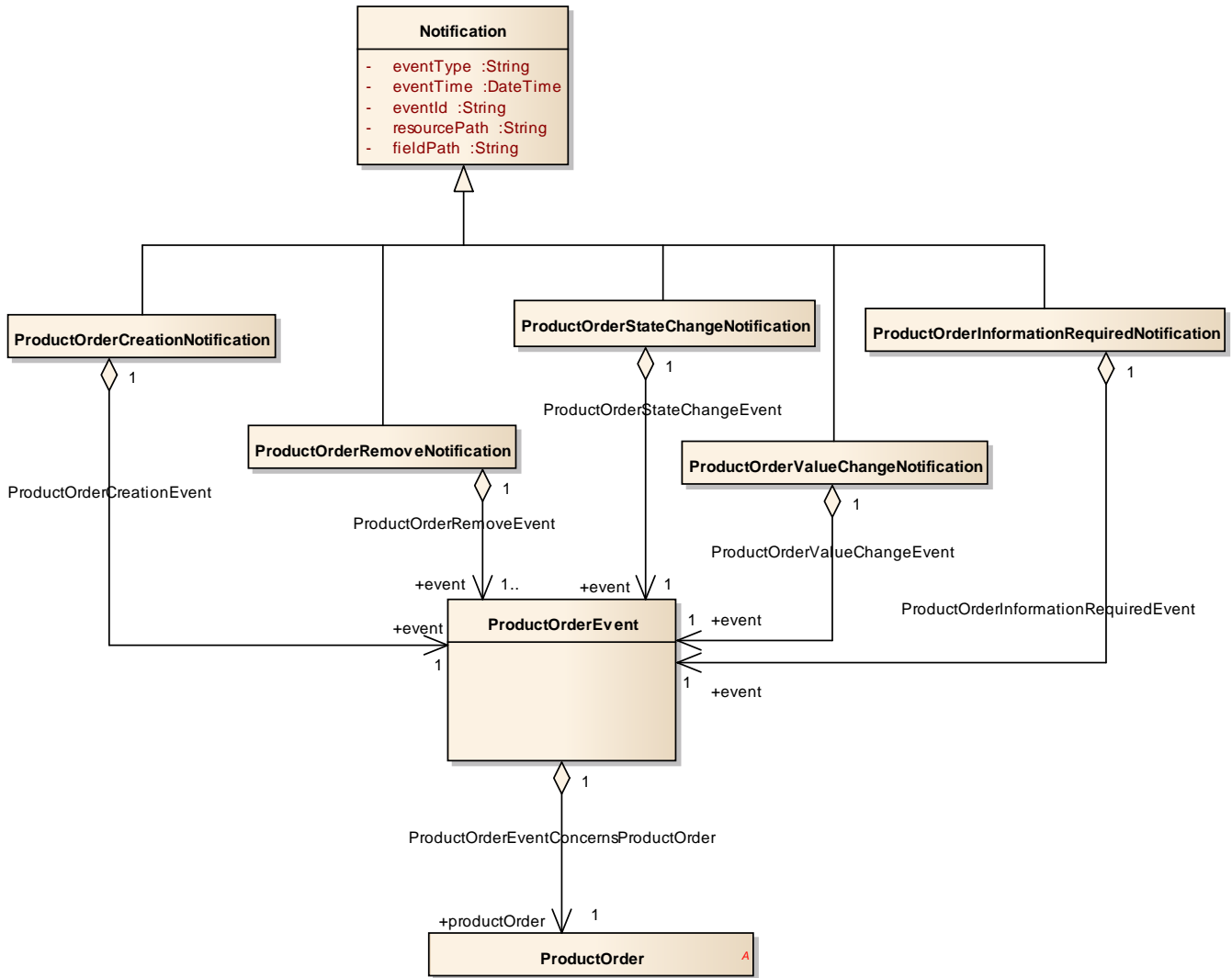


## Notification Resource Models

Five notification types are defined :

- orderCreationNotification
- orderRemoveNotification
- orderStateChangeNotification
- orderValueChangeNotification
- orderInformationRequiredNotification

UML model:



## ORDER CREATION NOTIFICATION

Used to notify that a new order has just been created.

```

{
  "eventId":"00001",
  "eventTime":"2013-04-19T16:42:25-04:00",
  "eventType":"orderCreationNotification",
  "event":{
    "productOrder":{
      "id":"42",
    }
  }
}
    
```

```
"href":"http://serverlocation:port/orderManagement/productOrder/42",
"externalId":"NiceNameForTheConsumer_42",
"priority":"1",
"description":"A wonderful 42 order for brand new products",
"category":"residential",
"state":"InProgress",
"orderDate":"2013-04-12T16:42:23-04:00",
"completionDate":"2013-04-19T16:42:23-04:00",
"requestedStartDate":"2013-04-12T16:42:23-04:00",
"requestedCompletionDate":"2013-04-19T16:42:23-04:00",
"expectedCompletionDate":"2013-04-19T16:42:23-04:00",
"notificationContact":"emailAddr-myAddress@hotmail.com",

"note":[
  {
    "text":"A free text detailing the note",
    "date":"2013-04-12T16:42:23-04:00",
    "author":"name"
  }
],
"relatedParty":[
  {
    "role":"customer",
    "id":"345221",
    "href":"http://serverlocation:port/partyManagement/customer/345221"
    "name":"John Doe"
  },
  {
    "role":"partner",
    "id":"42",
    "href":"http://serverlocation:port/partyManagement/partner/42"
  },
  {
    "role":"seller",
    "id":"4563",
    "href":"http://serverlocation:port/partnerManagement/partner/4563"
  }
],
"orderItem":[
  {
    "id":"1",
    "action":"add",
    "state":"Acknowledged",
    "billingAccount":{
      "id":"123456",
```

```
    "href":"http://serverlocation:port/billingManagement/billingAccount/123456"
  }],
  "appointment":"http://www.doodle.com/1WCV5647438",
  "productOffering":{
    "id":"42",
    "href":"http://serverlocation:port/catalogManagement/productOffering/42"
  },
  "product":{
    "place":{
      "href":"http://map.google.com/.../1234112GDE",
      "role":"DeliveryPlace"
    },
    "productCharacteristic":[
      {
        "name":"Colour",
        "value":"White"
      },
      {
        "name":"Memory",
        "value":"16"
      }
    ]
  }
},
{
  "id":"2",
  "action":"modify",
  "state":"InProgress",
  "productOffering":{
    "id":"43",
    "href":"http://serverlocation:port/catalogManagement/productOffering/43"
  },
  "product":{
    "id":"456",
    "href":"http://serverlocation:port/inventoryManagement/product/456",
    "productCharacteristic":[
      {
        "name":"anotherCharacteristic",
        "value":"itsValue"
      }
    ]
  },
  "relatedParty":[
    {
      "role":"user",
```

```
    "id": "5667443",
    "href": "http://serverlocation:port/partyManagement/user/5667443"
    "name": "Jimmy Doe"
  }
]
}
},
{
  "id": "3",
  "action": "add",
  "state": "InProgress",
  "billingAccount": {
    "id": "123456",
    "href": "http://serverlocation:port/billingManagement/billingAccount/123456"
  },
  "productOffering": {
    "id": "51",
    "href": "http://serverlocation:port/catalogManagement/productOffering/51"
  },
  "product": {
    "id": "511",
    "href": "http://serverlocation:port/inventoryManagement/product/456",
    "productCharacteristic": [
      {
        "name": "anotherCharacteristic",
        "value": "itsValue"
      }
    ],
    "productRelationship": [
      {
        "type": "reliesOn",
        "product": {
          "productCharacteristic": [
            {
              "name": "MSISDN",
              "value": "003467488299002"
            }
          ]
        }
      }
    ]
  }
},
{
  "id": "4",
```

```
"action":"add",
"state":"InProgress",
"billingAccount":{
  "id":"1789",
  "href":"http://serverlocation:port/billingManagement/billingAccount/1789"
},
"productOffering":{
  "id":"44",
  "href":"http://serverlocation:port/catalogManagement/productOffering/Bundle44",
  "bundledProductOffering":[
    {
      "id":" BundledPSTN444",
      "href":"http://serverlocation:port/catalogManagement/productOffering/BundledPSTN444"
    },
    {
      "id":" Bundled Mobile443",
      "href":"http://serverlocation:port/catalogManagement/productOffering/BundledMobile443"
    }
  ]
},
"product":{
  "productRelationship":[
    {
      "type":"bundled",
      "product":{
        "productCharacteristic":[
          {
            "name":"PSTNNumber",
            "value":"003427488299002"
          }
        ]
      }
    },
    {
      "type":"bundled",
      "product":{
        "productCharacteristic":[
          {
            "name":"MobileNumber",
            "value":"003464553000300"
          }
        ]
      }
    }
  ]
}
}
```

```
}
```

---

## ORDER REMOVE NOTIFICATION

Used to notify that an order was deleted.

```
{
  "eventId":"00002",
  "eventTime":"2013-04-19T16:42:25-30:00",
  "eventType":"orderRemoveNotification",
  "event":{
    "productOrder":{
      "id":" 42",
      "href":"http://serverlocation:port/orderManagement/productOrder/42",
      "externalID":"NiceNameForTheConsumer_42"
    }
  }
}
```

---

## ORDER STATE CHANGE NOTIFICATION

Used to notify that an order state is evolving.

```
{
  "eventId":"00003",
  "eventTime":"2013-04-19T16:42:25-30:00",
  "eventType":"orderStateChangeNotification",
  "event":{
    "productOrder":{
      "id":" 42",
      "href":"http://serverlocation:port/orderManagement/productOrder/42",
      "externalID":"NiceNameForTheConsumer_42",
      "state":"Completed"
    }
  }
}
```

---

## ORDER VALUE NOTIFICATION

Used to notify that any data in an order has just changed.

```
{
  "eventId":"00004",
  "eventTime":"2013-04-19T16:42:25-30:00",
  "eventType":"orderValueChangeNotification",
```

```

"event":{
  "productOrder":{
    "id": " 42",
    "href":"http://serverlocation:port/orderManagement/productOrder/42",
    "externalID":"NiceNameForTheConsumer_42",
    "orderItem":[
      {
        "id":"1",
        "product":{
          "productCharacteristic":[
            {
              "name":"Colour",
              "value":"Black"
            }
          ]
        }
      }
    ]
  }
}

```

---

## ORDER INFORMATION REQUIRED NOTIFICATION

Used to notify that some data in the order needs to be filled / is missing.

- “resourcePath” allows to precise if it is a data at order level or at orderItem level (and which one of them) that is missing
- “fieldPath” details which field is missing, its structure is quite similar to GET filter criteria
  - o “missing=” points at the missing field
  - o “&<criteria>” can be used to identify a specific element in lists

Simple example : notification contact is missing

```

{
  "eventId":"00005",
  "eventTime":"2013-04-19T16:42:25-30:00",
  "eventType":"orderInformationRequiredNotification",
  "resourcePath":"/order/42 ",
  "fieldPath":"missing=notificationContact",
  "event":{
    "productOrder":{
      "id": " 42",
      "href":"http://serverlocation:port/orderManagement/productOrder/42",
      "externalID":"NiceNameForTheConsumer_42"
    }
  }
}

```



Complex example : in the order item “1”, the IMEI characteristic value is missing to instantiate the product “465665”

```
{
  "eventId":"00006",
  "eventTime":"2013-04-19T16:42:25-30:00",
  "eventType":"orderInformationRequiredNotification",
  "resourcePath":"/order/42/orderItem/1",
  "fieldPath":"missing=product.productCharacteristic.value&product.id=465665&product.productCharacteristic.name=IMEI",
  "event":{
    "productOrder":{
      "id":" 42",
      "href":"http://serverlocation:port/orderManagement/productOrder/42",
      "externalID":"NiceNameForTheConsumer_42"
    }
  }
}
```

## API OPERATION TEMPLATES

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.

GET /orderManagement/productOrder/{ID}

Note that collections can be retrieved via GET /orderManagement/productOrder with no {ID}

### Description :

This operation is used to retrieve order information using the ID

Attribute selection is enabled on all first level attributes but not on inner classes.

Attribute selection may optionally be enabled on all attributes and inner classes.

### Behavior :

- Return status codes
  - 200 OK - the request was successful
  - 404 Not found - the supplied ID does not match a known productOrder

Use case : Get a specific order based on its ID

<b>REQUEST</b>
GET /orderManagement/productOrder/42 Accept: application/json
<b>RESPONSE</b>
200 Content-Type: application/json  <pre>{   "id": "42",   "href": "http://serverlocation:port/orderManagement/productOrder/42",   "externalId": "NiceNameForTheConsumer_42",   "priority": "1",   "description": "A wonderful 42 order for brand new products",   "category": "residential",   "state": "InProgress",   "orderDate": "2013-04-12T16:42:23-04:00",   "completionDate": "2013-04-19T16:42:23-04:00",   "requestedStartDate": "2013-04-12T16:42:23-04:00",   "requestedCompletionDate": "2013-04-19T16:42:23-04:00",   "expectedCompletionDate": "2013-04-19T16:42:23-04:00",   "notificationContact": "emailAddr-myAddress@hotmail.com",   "note": [     {</pre>

```
"text": "A free text detailing the note",
"date": "2013-04-12T16:42:23-04:00",
"author": "name"
}
],
"relatedParty": [
  {
    "role": "customer",
    "id": "345221",
    "href": "http://serverlocation:port/partyManagement/customer/345221"
    "name": "John Doe"
  },
  {
    "role": "partner",
    "id": "42",
    "href": "http://serverlocation:port/partyManagement/partner/42"
  },
  {
    "role": "seller",
    "id": "4563",
    "href": "http://serverlocation:port/partnerManagement/partner/4563"
  }
],
"orderItem": [
  {
    "id": "1",
    "action": "add",
    "state": "Acknowledged",
    "billingAccount": [
      {
        "id": "123456",
        "href": "http://serverlocation:port/billingManagement/billingAccount/123456"
      }
    ],
    "appointment": "http://www.doodle.com/1WCV5647438",
    "productOffering": {
      "id": "42",
      "href": "http://serverlocation:port/catalogManagement/productOffering/42"
    },
    "product": {
      "place": {
        "href": "http://map.google.com/.../1234112GDE",
        "role": "DeliveryPlace"
      }
    },
    "productCharacteristic": [
      {
```

```
        "name": "Colour",
        "value": "White"
    },
    {
        "name": "Memory",
        "value": "16"
    }
]
},
{
    "id": "2",
    "action": "modify",
    "state": "InProgress",
    "productOffering": {
        "id": "43",
        "href": "http://serverlocation:port/catalogManagement/productOffering/43"
    },
    "product": {
        "id": "456",
        "href": "http://serverlocation:port/inventoryManagement/product/456",
        "productCharacteristic": [
            {
                "name": "anotherCharacteristic",
                "value": "itsValue"
            }
        ],
        "relatedParty": [
            {
                "role": "user",
                "id": "5667443",
                "href": "http://serverlocation:port/partyManagement/user/5667443",
                "name": "Jimmy Doe"
            }
        ]
    }
},
{
    "id": "3",
    "action": "add",
    "state": "InProgress",
    "billingAccount": {
        "id": "123456",
        "href": "http://serverlocation:port/billingManagement/billingAccount/123456"
    }
},
}
```

```
"productOffering":{
  "id":"51",
  "href":"http://serverlocation:port/catalogManagement/productOffering/51"
},
"product":{
  "id":"511",
  "href":"http://serverlocation:port/inventoryManagement/product/456",
  "productCharacteristic":[
    {
      "name":"anotherCharacteristic",
      "value":"itsValue"
    }
  ],
  "productRelationship":[
    {
      "type":"reliesOn",
      "product":{
        "productCharacteristic":[
          {
            "name":"MSISDN",
            "value":"003467488299002"
          }
        ]
      }
    }
  ]
}
},
{
  "id":"4",
  "action":"add",
  "state":"InProgress",
  "billingAccount":{
    "id":"1789",
    "href":"http://serverlocation:port/billingManagement/billingAccount/1789"
  },
  "productOffering":{
    "id":"44",
    "href":"http://serverlocation:port/catalogManagement/productOffering/Bundle44",
    "bundledProductOffering":[
      {
        "id":" BundledPSTN444",
        "href":"http://serverlocation:port/catalogManagement/productOffering/BundledPSTN444"
      }
    ],
  },
}
```



Attribute selection may optionally be enabled on all attributes and inner classes.

### Behavior :

- Return status codes
  - 200 OK - the request was successful (includes situation in which no orders matched supplied criteria)
  - 400 Bad Request - error

Use case : Get all the orders for a given customer that were completed before a specified date

<b>REQUEST</b>
<pre>GET /orderManagement/productOrder?relatedParty.role=customer&amp; relatedParty.id=345221&amp;completionDate.lt=2013-09-10 T00:00:00 -04:00</pre> <p>Accept: application/json</p>
<b>RESPONSE</b>
<pre>200 Content-Type: application/json  [ {   "id": "42",   "href": "http://serverlocation:port/orderManagement/productOrder/42",   "externalId": "NiceNameForTheConsumer_42",   "priority": "1",   "description": "A wonderful 42 order for brand new products",   "category": "residential",   "state": "Completed",   "orderDate": "2013-04-12T16:42:23-04:00",   "completionDate": "2013-04-19T16:42:23-04:00",   "requestedStartDate": "2013-04-12T16:42:23-04:00",   "requestedCompletionDate": "2013-04-19T16:42:23-04:00",   "expectedCompletionDate": "2013-04-19T16:42:23-04:00",   "notificationContact": "emailAddr-myAddress@hotmail.com",   "note": [     {       "text": "A free text detailing the note",       "date": "2013-04-12T16:42:23-04:00",       "author": "name"     }   ] }</pre>



```
],
"relatedParty":[
  {
    "role":"customer",
    "id":"345221",
    "href":"http://serverlocation:port/partyManagement/customer/345221"
    "name":"John Doe"
  },
  {
    "role":"partner",
    "id":"42",
    "href":"http://serverlocation:port/partyManagement/partner/42"
  },
  {
    "role":"seller",
    "id":"4563",
    "href":"http://serverlocation:port/partnerManagement/partner/4563"
  }
],
"orderItem":[
  {
    "id":"1",
    "action":"add",
    "state":"Completed",
    "billingAccount":{
      "id":"123456",
      "href":"http://serverlocation:port/billingManagement/billingAccount/123456"
    },
    "appointment":"http://www.doodle.com/1WCV5647438",
    "productOffering":{
      "id":"42",
      "href":"http://serverlocation:port/catalogManagement/productOffering/42"
    },
    "product":{
      "place":{
        "href":"http://map.google.com/.../1234112GDE",
        "role":"DeliveryPlace"
      },
      "productCharacteristic":[
        {
          "name":"Colour",
          "value":"White"
        },
        {

```

```
        "name": "Memory",
        "value": "16"
    }
]
},
{
    "id": "2",
    "action": "modify",
    "state": "Completed",
    "productOffering": {
        "id": "43",
        "href": "http://serverlocation:port/catalogManagement/productOffering/43"
    },
    "product": {
        "id": "456",
        "href": "http://serverlocation:port/inventoryManagement/product/456",
        "productCharacteristic": [
            {
                "name": "anotherCharacteristic",
                "value": "itsValue"
            }
        ],
    },
    "relatedParty": [
        {
            "role": "user",
            "id": "5667443",
            "href": "http://serverlocation:port/partyManagement/user/5667443"
            "name": "Jimmy Doe"
        }
    ]
},
{
    "id": "3",
    "action": "add",
    "state": "Completed",
    "billingAccount": {
        "id": "123456",
        "href": "http://serverlocation:port/billingManagement/billingAccount/123456"
    },
    "productOffering": {
        "id": "51",
        "href": "http://serverlocation:port/catalogManagement/productOffering/51"
    },
}
```

```
"product":{
  "id":"511",
  "href":"http://serverlocation:port/inventoryManagement/product/456",
  "productCharacteristic":[
    {
      "name":"anotherCharacteristic",
      "value":"itsValue"
    }
  ],
  "productRelationship":[
    {
      "type":"reliesOn",
      "product":{
        "productCharacteristic":[
          {
            "name":"MSISDN",
            "value":"003467488299002"
          }
        ]
      }
    }
  ]
},
{
  "id":"4",
  "action":"add",
  "state":"Completed",
  "billingAccount":{
    "id":"1789",
    "href":"http://serverlocation:port/billingManagement/billingAccount/1789"
  }
},
{
  "productOffering":{
    "id":"44",
    "href":"http://serverlocation:port/catalogManagement/productOffering/Bundle44",
    "bundledProductOffering":[
      {
        "id":" BundledPSTN444",
        "href":"http://serverlocation:port/catalogManagement/productOffering/BundledPSTN444"
      },
      {
        "id":" Bundled Mobile443",
        "href":"http://serverlocation:port/catalogManagement/productOffering/BundledMobile443"
      }
    ]
  }
}
```

```
]
},
"product":{
  "productRelationship":[
    {
      "type":"bundled",
      "product":{
        "productCharacteristic":[
          {
            "name":"PSTNNumber",
            "value":"003427488299002"
          }
        ]
      }
    },
    {
      "type":"bundled",
      "product":{
        "productCharacteristic":[
          {
            "name":"MobileNumber",
            "value":"003464553000300"
          }
        ]
      }
    }
  ]
}
]
}]
```

PATCH /orderManagement/productOrder/{ID}

Description :

This operation is used to modify orders and/or their items.

Behavior :

- Return status codes
  - 200 OK - the request was successful

- 400 Bad Request - error

Attribute name	Patchable	Rule
id	No	
href	No	
externalID	No	
state	Yes	To manage the order delivery process : InProgress (start process), Held / Pending (suspend process)  Influence the orderItem states
priority	Yes	
category	Yes	
orderDate	No	
requestedStartDate	Yes	Only when order is in "Acknowledged" state – delivery process not started
completionDate	No	
requestedCompletionDate	Yes	Only when order is in "Acknowledged" state – delivery process not started
expectedCompletionDate	Yes	
notificationContact	Yes	
note	Yes	
relatedParty	Yes	Only when order is in "Acknowledged" state – delivery process not started

orderItem.id	No	
orderItem.action	No	
orderItem.state	Yes	To manage the order item delivery process : InProgress (start sub process), Held / Pending (suspend sub process)  Influence the order states
orderItem.billingAccount	Yes	Only when order is in "Acknowledged" state – delivery process not started
orderItem.productOffering	Yes	Only when order is in "Acknowledged" state – delivery process not started
orderItem.product	Yes	Only when order item is in "Acknowledged" or "Pending" state – delivery process not started or suspended
orderItem.product.place	Yes	Only when order item is in "Acknowledged" or "Pending" state – delivery process not started or suspended
orderItem.appointment	Yes	Only when order item is in "Acknowledged" or "Pending" state – delivery process not started or suspended

Further document any rules that must be implemented when patching attributes.

Rule name	Rule/Pre Condition/Side Effects/Post Conditions
State patches	When patching an order state to : <ul style="list-style-type: none"> <li>- "Pending" / "Held" : all "InProgress" order items SHOULD be set to "Pending" / "Held"</li> <li>- "InProgress" :</li> </ul>

	<ul style="list-style-type: none"> <li>○ all “Acknowledged” order items MUST be set to “InProgress”</li> <li>○ all “Pending”/“Held” order items MAY be set to “InProgress”</li> </ul> <p>When patching an order item state to :</p> <ul style="list-style-type: none"> <li>- “Pending” / “Held” : the order state itself SHOULD be set to “Pending” / “Held”</li> </ul>
--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Use case : Resume order

Note : Suspend would be the same request using the “Pending” state.

<b>REQUEST</b>
<p>PATCH orderManagement/productOrder/42 Content-type: application/json</p> <pre>{   "state":"InProgress" }</pre>
<b>RESPONSE</b>
<p>201 Content-Type: application/json</p> <pre>{   "id":"42",   "href":"http://serverlocation:port/orderManagement/productOrder/42",   "externalId":"NiceNameForTheConsumer_42",   "priority":"1",   "description":"A wonderful 42 order for brand new products",   "category":"residential",   "state":"InProgress",   "orderDate":"2013-04-12T16:42:23-04:00",   "completionDate":"2013-04-19T16:42:23-04:00",   "requestedStartDate":"2013-04-12T16:42:23-04:00",   "requestedCompletionDate":"2013-04-19T16:42:23-04:00",   "expectedCompletionDate":"2013-04-19T16:42:23-04:00",   "notificationContact":"emailAddr-myAddress@hotmail.com",   "note":[     {       "text":"A free text detailing the note",     }   ] }</pre>

```
"date":"2013-04-12T16:42:23-04:00",
"author":"name"
}
],
"relatedParty":[
{
"role":"customer",
"id":"345221",
"href":"http://serverlocation:port/partyManagement/customer/345221"
"name":"John Doe"
},
{
"role":"partner",
"id":"42",
"href":"http://serverlocation:port/partyManagement/partner/42"
},
{
"role":"seller",
"id":"4563",
"href":"http://serverlocation:port/partnerManagement/partner/4563"
}
],
"orderItem":[
{
"id":"1",
"action":"add",
"state":"InProgress",
"billingAccount":{
"id":"123456",
"href":"http://serverlocation:port/billingManagement/billingAccount/123456"
}},
"appointment":"http://www.doodle.com/1WCV5647438",
"productOffering":{
"id":"42",
"href":"http://serverlocation:port/catalogManagement/productOffering/42"
},
"product":{
"place":{
"href":"http://map.google.com/.../1234112GDE",
"role":"DeliveryPlace"
}
},
"productCharacteristic":[
{
"name":"Colour",
```



```
        "value":"White"
      },
      {
        "name":"Memory",
        "value":"16"
      }
    ]
  }
},
{
  "id":"2",
  "action":"modify",
  "state":"InProgress",
  "productOffering":{
    "id":"43",
    "href":"http://serverlocation:port/catalogManagement/productOffering/43"
  },
  "product":{
    "id":"456",
    "href":"http://serverlocation:port/inventoryManagement/product/456",
    "productCharacteristic":[
      {
        "name":"anotherCharacteristic",
        "value":"itsValue"
      }
    ],
    "relatedParty":[
      {
        "role":"user",
        "id":"5667443",
        "href":"http://serverlocation:port/partyManagement/user/5667443"
        "name":"Jimmy Doe"
      }
    ]
  }
},
{
  "id":"3",
  "action":"add",
  "state":"InProgress",
  "billingAccount":{
    "id":"123456",
    "href":"http://serverlocation:port/billingManagement/billingAccount/123456"
  },
  "productOffering":{
```

```
"id": "51",
  "href": "http://serverlocation:port/catalogManagement/productOffering/51"
},
"product": {
  "id": "511",
  "href": "http://serverlocation:port/inventoryManagement/product/456",
  "productCharacteristic": [
    {
      "name": "anotherCharacteristic",
      "value": "itsValue"
    }
  ],
  "productRelationship": [
    {
      "type": "reliesOn",
      "product": {
        "productCharacteristic": [
          {
            "name": "MSISDN",
            "value": "003467488299002"
          }
        ]
      }
    }
  ]
}
},
{
  "id": "4",
  "action": "add",
  "state": "InProgress",
  "billingAccount": {
    "id": "1789",
    "href": "http://serverlocation:port/billingManagement/billingAccount/1789"
  },
  "productOffering": {
    "id": "44",
    "href": "http://serverlocation:port/catalogManagement/productOffering/Bundle44",
    "bundledProductOffering": [
      {
        "id": "BundledPSTN444",
        "href": "http://serverlocation:port/catalogManagement/productOffering/BundledPSTN444"
      }
    ],
    {
```



Behavior :

- Return status codes
  - 201 Created - the request was successful
  - 400 Bad Request – error

ID Management :

POST should be used without specifying the id and the href, the OM system is in charge of generating the id + href for the ProductOrder.

When performing a POST, these are the allowed attributes (all Product Order attributes that are not in that list MUST NOT be used during POST, they are calculated/defined by the OM system) :

Attribute name	Mandatory	Default	Rule
externalID	N	N/A	
state	N	“Acknowledged”	
priority	N	4 (the lowest)	
Description	N	N/A	
category	N	“uncategorized”	
requestedStartDate	N	No specified default value	
requestedCompletionDate	N	No specified default value	
notificationContact	N	No specified default value	
note	N	No specified default value	
relatedParty	Y		They must be at least a defined party linked to the order (Customer, ...)
orderItem.id	Y		

orderItem.action	Y		
orderItem.state	N	"Acknowledged"	
orderItem.billingAccount	Y		
orderItem.productOffering	N		The productOffering may not be useful when doing a "modify" or "delete" on an owned product
orderItem.product	Y		
orderItem.product.place	N		
orderItem.appointment	N		

- Further specify any rules on the creation of the entity

Rule name	Rule
POST Mandatory attributes within product Order	<ul style="list-style-type: none"> <li>○ Within "billingAccount" <ul style="list-style-type: none"> <li>▪ id AND/OR href</li> </ul> </li> <li>○ Within "note" <ul style="list-style-type: none"> <li>▪ text</li> </ul> </li> <li>○ Within "relatedParty" <ul style="list-style-type: none"> <li>▪ id AND/OR href AND/OR name</li> <li>▪ role</li> </ul> </li> </ul>
POST Mandatory attributes within product Order item	<ul style="list-style-type: none"> <li>○ Within "place" <ul style="list-style-type: none"> <li>▪ Role</li> <li>▪ id AND/OR href</li> </ul> </li> <li>○ Within "productOffering" <ul style="list-style-type: none"> <li>▪ id AND/OR href</li> </ul> </li> <li>○ Within "product" <ul style="list-style-type: none"> <li>▪ Depends on the order item "action", cf. rule below</li> </ul> </li> </ul>
POST Mandatory attributes within product (in each order item)	<ul style="list-style-type: none"> <li>○ If orderItem.action = "add" : <ul style="list-style-type: none"> <li>▪ productCharacteristics</li> </ul> </li> <li>○ If orderItem.action = "modify" <ul style="list-style-type: none"> <li>▪ id AND/OR href</li> </ul> </li> </ul>

- If orderItem.action = "delete"
  - id AND/OR href

## REQUEST

POST /orderManagement/productOrder  
Content-type: application/json

```
{ "note":[
  {
    "text":"A free text detailing the note"
  }
],
"relatedParty":[
  {
    "role":"customer",
    "id":"345221",
    "href":"http://serverlocation:port/partyManagement/customer/345221",
    "name":"John Doe"
  },
  {
    "role":"seller",
    "id":"4563",
    "href":"http://serverlocation:port/partnerManagement/partner/4563"
  }
],
"orderItem":[
  {
    "id":"1",
    "action":"add",
    "billingAccount":{
      "id":"1789",
      "href":"http://serverlocation:port/billingManagement/billingAccount/1789"
    },
    "productOffering":{
      "id":"42",
      "href":"http://serverlocation:port/catalogManagement/productOffering/42"
    },
    "product":{
      "productCharacteristic":[
        {
          "name":"Colour",
          "value":"White"
        }
      ]
    }
  }
]
```

```
    },
    {
      "name": "Memory",
      "value": "16"
    }
  ]
}
},
{
  "id": "2",
  "action": "modify",
  "product": {
    "id": "456",
    "href": "http://serverlocation:port/inventoryManagement/product/456",
    "relatedParty": [
      {
        "role": "user",
        "id": "5667443",
        "href": "http://serverlocation:port/partyManagement/user/5667443",
        "name": "Jimmy Doe"
      }
    ]
  }
}
},
{
  "id": "3",
  "action": "delete",
  "product": {
    "id": "456",
    "href": "http://serverlocation:port/inventoryManagement/product/456"
  }
}
]
}
```

**RESPONSE**

201  
Content-Type: application/json

```
{
  "id": "42",
  "href": "http://serverlocation:port/orderManagement/productOrder/42",
  "priority": "4",
  "category": "uncategorized",
```

```
"state":"Acknowledged",
"orderDate":"2013-04-12T16:42:23-04:00",
"expectedCompletionDate":"2013-04-19T16:42:23-04:00", "note":[
  {
    "text":"A free text detailing the note"
  }
],
"relatedParty":[
  {
    "role":"customer",
    "id":"345221",
    "href":"http://serverlocation:port/partyManagement/customer/345221"
    "name":"John Doe"
  },
  {
    "role":"seller",
    "id":"4563",
    "href":"http://serverlocation:port/partnerManagement/partner/4563"
  }
],
"orderItem":[
  {
    "id":"1",
    "action":"add",
    "state":"Acknowledged",
    "billingAccount":{
      "id":"1789",
      "href":"http://serverlocation:port/billingManagement/billingAccount/1789"
    },
    "productOffering":{
      "id":"42",
      "href":"http://serverlocation:port/catalogManagement/productOffering/42"
    },
    "product":{
      "productCharacteristic":[
        {
          "name":"Colour",
          "value":"White"
        },
        {
          "name":"Memory",
          "value":"16"
        }
      ]
    }
  }
],
{
  "id":"2",
  "action":"modify",
  "state":"Acknowledged",
  "product":{
    "id":"456",
```



```
"href":"http://serverlocation:port/inventoryManagement/product/456",
"relatedParty":[
  {
    "role":"user",
    "id":"5667443",
    "href":"http://serverlocation:port/partyManagement/user/5667443",
    "name":"Jimmy Doe"
  }
],
},
{
  "id":"3",
  "action":"delete",
  "state":"Acknowledged",
  "product":{
    "id":"456",
    "href":"http://serverlocation:port/inventoryManagement/product/456"
  }
}
]
```

## DELETE ORDERMANAGEMENT/PRODUCTORDER/{ID}

This operation is used to delete a managed entity or a product order entirely.

**Warning : it should only be used for administration matters**

### Description :

This operation is used to delete an order.

The only usable and also mandatory attributes for the deletion are id AND/OR href.

### Behavior :

- Returns HTTP/1.1 status code 200 if the request was successful.
- 404 if the product order does not exist
- 403 if the operation is forbidden

## REQUEST

DELETE /orderManagement/productOrder/5868839

RESPONSE
----------

200
-----

## API NOTIFICATION TEMPLATES

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

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

### REGISTER LISTENER POST /HUB

Description :

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

Behavior :

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

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

#### REQUEST

POST /api/hub

Accept: application/json

```
{"callback": "http://in.listener.com"}
```

#### RESPONSE

201

Content-Type: application/json

Location: /api/hub/42

```
{"id": "42", "callback": "http://in.listener.com", "query": null}
```

## UNREGISTER LISTENER DELETE HUB/{ID}

Description :

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

Behavior :

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

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

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

## PUBLISH {EVENTTYPE} POST /LISTENER

Description :

Provide the Event description

Behavior :

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

<b>REQUEST</b>
POST /client/listener Accept: application/json  {  "event": {

<b>EVENT BODY</b> <pre>    },     "eventType": "eventType" }</pre>
<b>RESPONSE</b>
201 Content-Type: application/json

Example see TMF REST Design Guidelines.

## RELEASE HISTORY

Release Number	Date	Release led by:	Description
Release 1.0	04/15/2013	Pierre Gauthier TM Forum <a href="mailto:pgauthier@tmforum.org">pgauthier@tmforum.org</a>	First Release of Draft Version of the Document.
Release 1.1			Updated for use in the Paris Spec Jam – and rebranded,.