Frameworx Specification

Product Inventory Management API REST Specification

TMF637
Release 16.5.1
April 2017

Latest Update: Frameworx Release 16.5	TM Forum Approved
Version 2.1.1	IPR Mode: RAND

NOTICE

Direct inquiries to the TM Forum office:

240 Headquarters Plaza,
East Tower – 10th Floor,
Morristown, NJ 07960 USA
Tel No. +1 973 944 5100
Fax No. +1 973 944 5110
TM Forum Web Page: www.tmforum.org

TABLE OF CONTENTS

LIST OF TABLES

N/A

INTRODUCTION

The Product Inventory Management API provides the operations to manage products.

SAMPLE USE CASES

RESOURCE MODEL

Managed Entity and Task Resource Models

PRODUCT RESOURCE

A product offering procured by a customer or other interested party playing a party role. A product is realized as one or more service(s) and / or resource(s).

Resource model
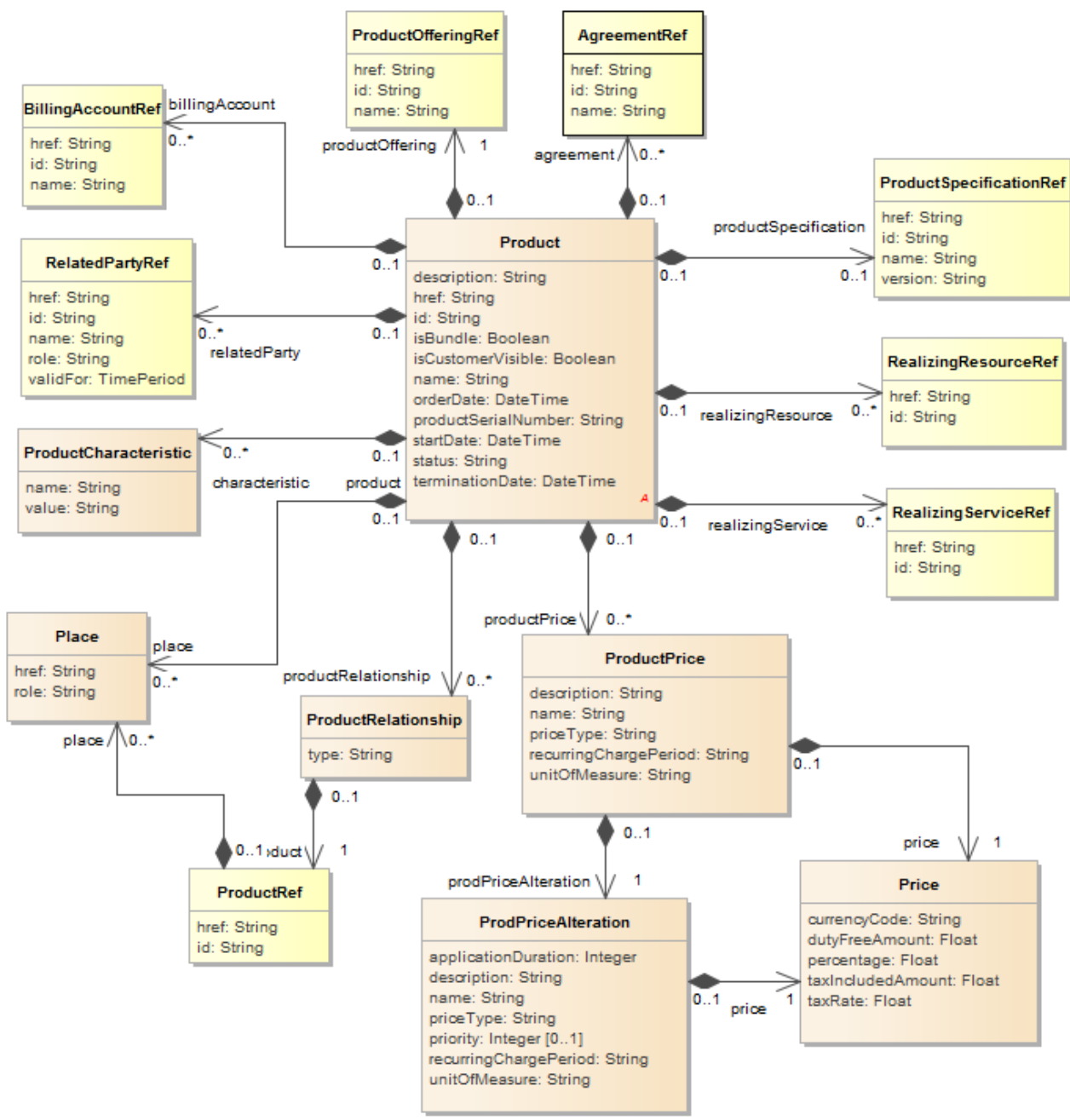
Lifecycle

A Product lifecycle is tracked by the status field. Typical lifecycle values that can be taken are: Created, Pending Active, Aborted, Cancelled, Active, Suspended, Pending Terminate and Terminate. The state machine specifying the typical state change transitions is provided below.
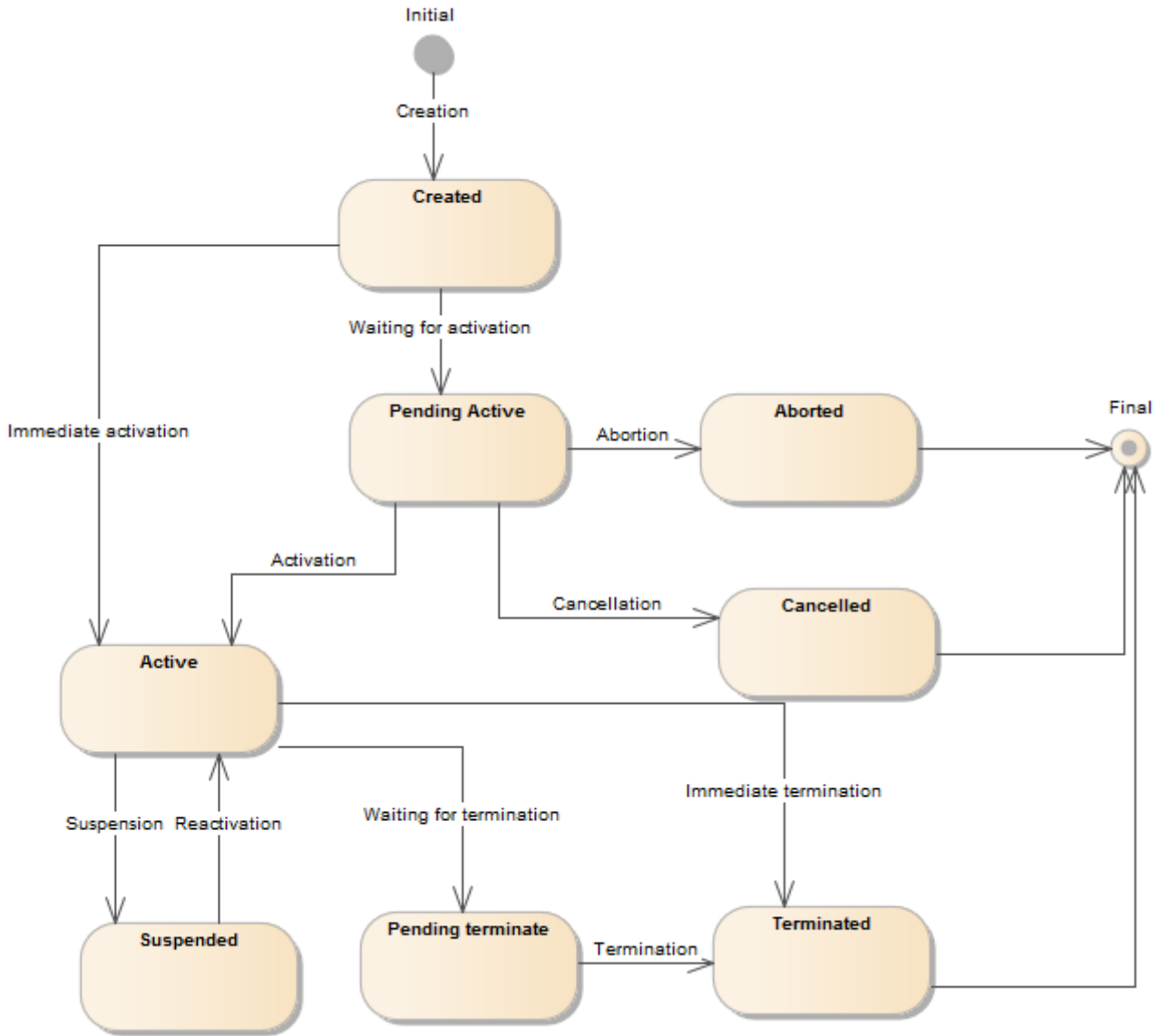
Field descriptions

Product fields

description	A string. Is the description of the product. It could be copied from the description of the Product Offering.
href	A string. Reference of the product.
id	A string. Unique identifier of the product.

isBundle	A boolean. If true, the product is a ProductBundle which is an instantiation of a BundledProductOffering. If false, the product is a ProductComponent which is an instantiation of a SimpleProductOffering.
isCustomerVisible	A boolean. If true, the product is visible by the customer.
name	A string. Name of the product. It could be the same as the name of the product offering.
orderDate	A date time (DateTime). Is the date when the product was ordered.
productSerialNumber	A string. Is the serial number for the product. This is typically applicable to tangible products e.g. Broadband Router.
startDate	A date time (DateTime). Is the date from which the product starts.
status	A string. Is the lifecycle status of the product.
terminationDate	A date time (DateTime). Is the date when the product was terminated.
realizingService	A list of realizing service references (RealizingServiceRef [*]). RealizingService is a link to the service that realizes the product.
billingAccount	A list of billing account references (BillingAccountRef [*]). A BillingAccount is a detailed description of a bill structure.
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.
agreement	A list of agreement references (AgreementRef [*]). An agreement represents a contract or arrangement, either written or verbal and sometimes enforceable by law, such as a service level agreement or a customer price agreement. An agreement involves a number of other business entities, such as products, services, and resources and/or their specifications.
characteristic	A list of product characteristics (ProductCharacteristic [*]). Characteristics of the product to instantiate or to modify.

productRelationship	A list of product relationships (ProductRelationship [*]). 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.

realizingResource	A list of realizing resource references (RealizingResourceRef [*]). RealizingResource is a link to the resource that realizes the product.
relatedParty	A list of related party references (RelatedPartyRef [*]). A related party defines party or party role linked to a specific entity.
productPrice	A list of product prices (ProductPrice [*]). An amount, usually of money, that represents the actual price paid by a Customer for a purchase, a rent or a lease of a Product. The price is valid for a defined period of time.
productSpecification	A product specification reference (ProductSpecificationRef). A ProductSpecification is a detailed description of a tangible or intangible object made available externally in the form of a ProductOffering to customers or other parties playing a party role.
place	A list of places (Place [*]). Used to defined a place useful for the product (for example a delivery geographical place).

Place sub-resource

Used to defined 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.

ProdPriceAlteration sub-resource

Is an amount, usually of money, that modifies the price charged for a Product.

applicationDuration	An integer. Duration during which the ProdPriceAlteration applies on the ProductPrice (for instance 2 months free of charge for the recurring charge).
description	A string. A narrative that explains in detail the semantics of this ProdPriceAlteration.

name	A string. A short descriptive name such as "Monthly discount".
priceType	A string. A category that describes the price such as recurring, one shot and so forth.
priority	An integer. Priority level for applying this alteration among all the defined alterations.
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.

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.

ProductPrice sub-resource

An amount, usually of money, that represents the actual price paid by a Customer for a purchase, a rent or a lease of a Product. The price is valid for a defined period of time.

description	A string. A narrative that explains in detail the semantics of this product 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...
prodPriceAlteration	A prod price alteration (ProdPriceAlteration). Is an amount, usually of money, that modifies the price charged for a Product.
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.

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) "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.

AgreementRef relationship

Agreement reference. An agreement represents a contract or arrangement, either written or verbal and sometimes enforceable by law, such as a service level agreement or a customer price agreement. An agreement involves a number of other business entities, such as products, services, and resources and/or their specifications.

href	A string. Reference of the agreement.
id	A string. Identifier of the agreement.
name	A string. Name of the agreement.

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.

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	A list of product relationships (ProductRelationship [*]). 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.

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.

ProductSpecificationRef relationship

Product specification reference: A ProductSpecification is a detailed description of a tangible or intangible object made available externally in the form of a ProductOffering to customers or other parties playing a party role.

href	A string. Reference of the product specification.
id	A string. Unique identifier of the product specification.
name	A string. Name of the product specification.
version	A string. Version of the product specification.

RealizingResourceRef relationship

RealizingResource reference. RealizingResource is a link to the resource that realizes the product.

href	A string. Reference of the resource.
id	A string. Unique identifier of the resource.

RealizingServiceRef relationship

RealizingService reference. RealizingService is a link to the service that realizes the product.

href	A string. Reference of the service.
id	A string. Unique identifier of the service.

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 an example of a 'Product' resource object

```json
{
    "description": "This  product ...",
    "href": "https://host:port/product/product/4501",
    "id": "4501",
    "isBundle": false,
    "isCustomerVisible": false,
    "name": "Broadband",
    "orderDate": "2016-10-07T00:00",
    "productSerialNumber": "123456789",
    "startDate": "2016-10-07T00:00",
    "status": "Active",
    "terminationDate": "2016-10-07T00:00",
    "realizingService": [
        {
            "href": "https://host:port/productCatalogManagement/serviceSpecification/5568",
            "id": "5568"
        }
    ],
    "billingAccount": [
        {
            "href": "https://host:port/onboardingManagement/billingAccount/2618",
            "id": "2618",
            "name": "Home Account"
        }
    ],
    "productOffering": {
        "href": "https://host:port/productOffering/productOffering/9785",
        "id": "9785",
        "name": "My Quick BB Offer",
        "bundledProductOffering": [
            {
                "href": "https://host:port/productOffering/bundledProductOffering/9187",
                "id": "9187",
                "name": "Robust Offer",
                "bundledProductOffering": []
            }
        ]
    },
    "agreement": [
        {
            "href": "https://host:port/onboardingManagement/agreement/6857",
            "id": "6857",
            "name": "Summer Contract Agreement"
        }
    ],
    "characteristic": [
        [
            {
                "name": "Colour",
                "value": "pink"
            },
            {
                "name": "Memory",
                "value": "16"
            }
        ]
```

```json
  ],
  "productRelationship": [
    {
      "type": "reliesOn",
      "product": {
        "href": "https://host:port/product/product/3302",
        "id": "3302",
        "productRelationship": [
          {
            "type": "reliesOn",
            "product": null
          }
        ],
        "place": [
          "http://mymaps.com/YURFY"
        ],
        "characteristic": [
          [
            {
              "name": "Colour",
              "value": "grey"
            },
            {
              "name": "Memory",
              "value": "32"
            }
          ]
        ],
        "relatedParty": [
          {
            "href": "https://host:port/partyManagement/organization/7308",
            "id": "7308",
            "name": "Jimmy Doe",
            "role": "customer",
            "validFor": {
              "startDateTime": "2016-10-04T00:00",
              "endDateTime": "2017-05-05T00:00"
            }
          }
        ]
      }
    }
  ],
  "realizingResource": [
    {
      "href": "https://host:port/productCatalogManagement/resourceSpecification/8613",
      "id": "8613"
    }
  ],
  "relatedParty": [
    {
      "href": "https://host:port/partyManagement/organization/9888",
      "id": "9888",
      "name": "Jimmy Doe",
      "role": "employee",
      "validFor": {
```

```
          "startDateTime": "2016-10-03T00:00",
          "endDateTime": "2017-05-05T00:00"
        }
      }
    ],
    "productPrice": [
      {
        "description": "This  product price ...",
        "name": "Regular Price",
        "priceType": "recurring",
        "recurringChargePeriod": "monthly",
        "unitOfMeasure": "seconds",
        "prodPriceAlteration": {
          "applicationDuration": 12,
          "description": "This  prod price alteration ...",
          "name": "Shipping Discount",
          "priceType": "recurring",
          "priority": 33,
          "recurringChargePeriod": "month",
          "unitOfMeasure": "GB",
          "price": {
            "currencyCode": "EUR",
            "dutyFreeAmount": 54.68,
            "percentage": 30.0,
            "taxIncludedAmount": 9.86,
            "taxRate": 69.78
          }
        },
        "price": {
          "currencyCode": "EUR",
          "dutyFreeAmount": 49.09,
          "percentage": 30.0,
          "taxIncludedAmount": 96.45,
          "taxRate": 80.55
        }
      }
    ],
    "productSpecification": {
      "href": "https://host:port/productSpecification/productSpecification/5963",
      "id": "5963",
      "name": "Clara987",
      "version": "1.1"
    },
    "place": [
      "http://mymaps.com/YURFY"
    ]
}
```

Notification Resource Models

5 notifications are defined for this API

Notifications related to Product:
- ProductCreationNotification
- ProductAttributeValueChangeNotification
- ProductStateChangeNotification
- ProductBatchNotification
- ProductRemoveNotification

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 occurence (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).
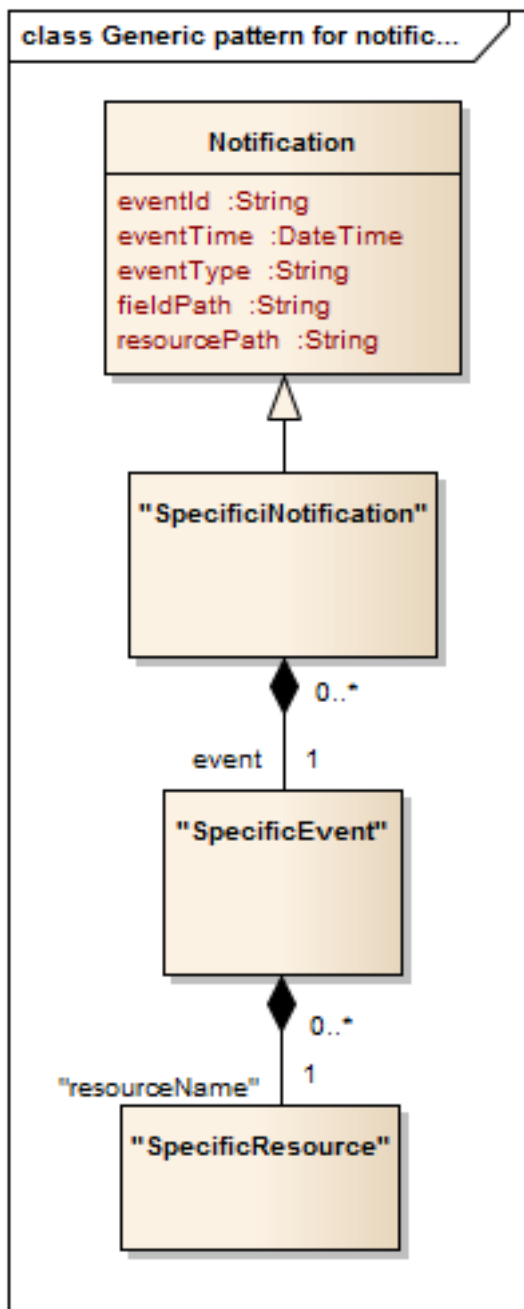
PRODUCT CREATION NOTIFICATION

Notification sent when a new Product resource is created.

Json representation sample

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

```
{
   "eventId":"00001",
   "eventTime":"2015-11-16T16:42:25-04:00",
   "eventType":"ProductCreationNotification",
   "event": {
     "product" :
        {-- SEE Product RESOURCE SAMPLE --}
   }
}
```

PRODUCT ATTRIBUTE VALUE CHANGE NOTIFICATION

Notification sent when changing an attribute of a Product resource.

Json representation sample

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

```
{
   "eventId":"00001",
   "eventTime":"2015-11-16T16:42:25-04:00",
   "eventType":"ProductAttributeValueChangeNotification",
   "event": {
     "product" :
        {-- SEE Product RESOURCE SAMPLE --}
   }
}
```

PRODUCT STATE CHANGE NOTIFICATION

Notification sent when changing the state of a Product resource.

Json representation sample

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

```
{
   "eventId":"00001",
   "eventTime":"2015-11-16T16:42:25-04:00",
   "eventType":"ProductStateChangeNotification",
```

```
  "event": {
    "product" :
       {-- SEE Product RESOURCE SAMPLE --}
  }
}
```

PRODUCT BATCH NOTIFICATION

Notification sent when a batch job on resource Product changes

Json representation sample

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

```
{
   "eventId":"00001",
   "eventTime":"2015-11-16T16:42:25-04:00",
   "eventType":"ProductBatchNotification",
   "event": {
     "product" :
        {-- SEE Product RESOURCE SAMPLE --}
   }
}
```

PRODUCT REMOVE NOTIFICATION

Notification sent when removing a Product resource.

Json representation sample

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

```
{
   "eventId":"00001",
   "eventTime":"2015-11-16T16:42:25-04:00",
   "eventType":"ProductRemoveNotification",
   "event": {
     "product" :
        {-- SEE Product 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

LIST PRODUCTS

```
GET /product?fields=...&{filtering}
```

Description

This operation list product 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 Product resources.

Searching a product with a given serial number. The result items are shrinked to show only the id and the name (fields=id,name)

Request
GET /productInventoryManagement/product?fields=id,name&productSerialNumber="987654321" Accept: application/json
Response

200
 	
[
  {
    "id": "986787",
    "name": "Hologram Glasses"
  }
]

RETRIEVE PRODUCT

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

Description

This operation retrieves a product 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 an example of a request for retrieving a Product resource.

Request

GET /productInventoryManagement/product/4501
Accept: application/json

Response

```
200

{
  "description": "This  product ...",
  "href": "https://host:port/product/product/4501",
  "id": "4501",
  "isBundle": false,
  "isCustomerVisible": false,
  "name": "Broadband",
  "orderDate": "2016-10-07T00:00",
  "productSerialNumber": "123456789",
  "startDate": "2016-10-07T00:00",
  "status": "Active",
  "terminationDate": "2016-10-07T00:00",
  "realizingService": [
    {
      "href": "https://host:port/productCatalogManagement/serviceSpecification/5568",
      "id": "5568"
    }
  ],
  "billingAccount": [
    {
      "href": "https://host:port/onboardingManagement/billingAccount/2618",
      "id": "2618",
      "name": "Home Account"
    }
  ],
  "productOffering": {
    "href": "https://host:port/productOffering/productOffering/9785",
    "id": "9785",
    "name": "My Quick BB Offer",
    "bundledProductOffering": [
      {
        "href": "https://host:port/productOffering/bundledProductOffering/9187",
        "id": "9187",
        "name": "Robust Offer",
        "bundledProductOffering": []
      }
    ]
  },
  "agreement": [
    {
      "href": "https://host:port/onboardingManagement/agreement/6857",
      "id": "6857",
      "name": "Summer Contract Agreement"
    }
```

```
    ],
    "characteristic": [
      [
        {
          "name": "Colour",
          "value": "pink"
        },
        {
          "name": "Memory",
          "value": "16"
        }
      ]
    ],
    "productRelationship": [
      {
        "type": "reliesOn",
        "product": {
          "href": "https://host:port/product/product/3302",
          "id": "3302",
          "productRelationship": [
            {
              "type": "reliesOn",
              "product": null
            }
          ],
          "place": [
            "http://mymaps.com/YURFY"
          ],
          "characteristic": [
            [
              {
                "name": "Colour",
                "value": "grey"
              },
              {
                "name": "Memory",
                "value": "32"
              }
            ]
          ],
          "relatedParty": [
            {
              "href": "https://host:port/partyManagement/organization/7308",
              "id": "7308",
              "name": "Jimmy Doe",
              "role": "customer",
              "validFor": {
                "startDateTime": "2016-10-04T00:00",
                "endDateTime": "2017-05-05T00:00"
              }
            }
          ]
        }
      }
    ],
    "realizingResource": [
```

```
        {
            "href": "https://host:port/productCatalogManagement/resourceSpecification/8613",
            "id": "8613"
        }
    ],
    "relatedParty": [
        {
            "href": "https://host:port/partyManagement/organization/9888",
            "id": "9888",
            "name": "Jimmy Doe",
            "role": "employee",
            "validFor": {
                "startDateTime": "2016-10-03T00:00",
                "endDateTime": "2017-05-05T00:00"
            }
        }
    ],
    "productPrice": [
        {
            "description": "This  product price ...",
            "name": "Regular Price",
            "priceType": "recurring",
            "recurringChargePeriod": "monthly",
            "unitOfMeasure": "seconds",
            "prodPriceAlteration": {
                "applicationDuration": 12,
                "description": "This  prod price alteration ...",
                "name": "Shipping Discount",
                "priceType": "recurring",
                "priority": 33,
                "recurringChargePeriod": "month",
                "unitOfMeasure": "GB",
                "price": {
                    "currencyCode": "EUR",
                    "dutyFreeAmount": 54.68,
                    "percentage": 30.0,
                    "taxIncludedAmount": 9.86,
                    "taxRate": 69.78
                }
            },
            "price": {
                "currencyCode": "EUR",
                "dutyFreeAmount": 49.09,
                "percentage": 30.0,
                "taxIncludedAmount": 96.45,
                "taxRate": 80.55
            }
        }
    ],
    "productSpecification": {
        "href": "https://host:port/productSpecification/productSpecification/5963",
        "id": "5963",
        "name": "Clara987",
        "version": "1.1"
    },
    "place": [
```

```
      "http://mymaps.com/YURFY"
   ]
}
```

CREATE PRODUCT

POST /product

Note: this operation is available only to ADMIN API users

Description

This operation creates a product entity.

Mandatory and Non Mandatory Attributes

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

Mandatory Attributes	Rule
name	
relatedParty	

Non Mandatory Attributes	Default Value	Rule
description		
isBundle		
isCustomerVisible		
orderDate		
productSerialNumber		
startDate		
status		
terminationDate		
realizingService		
billingAccount		
productOffering		
agreement		
characteristic		
productRelationship		
realizingResource		
productPrice		
productSpecification		
place		

Additional Rules

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

Context	Mandatory Sub-Attributes

agreement	id, href
productOffering	id, href
productSpecification	id, href
billingAccount	id, href
relatedParty	id, href

Usage Samples

Here's an example of a request for creating a Product resource. In this example the request only passes mandatory attributes.

Request

```
POST /productInventoryManagement/product
Content-Type: application/json

{
    "name": "Broadband",
    "relatedParty": [
        {
            "href": "https://host:port/partyManagement/organization/9888",
            "id": "9888",
            "name": "Jimmy Doe",
            "role": "employee",
            "validFor": {
                "startDateTime": "2016-10-03T00:00",
                "endDateTime": "2017-05-05T00:00"
            }
        }
    ]
}
```

Response

```
201

{
    "href": "https://host:port/product/product/4501",
    "id": "4501",
    "name": "Broadband",
    "relatedParty": [
        {
            "href": "https://host:port/partyManagement/organization/9888",
            "id": "9888",
            "name": "Jimmy Doe",
            "role": "employee",
            "validFor": {
                "startDateTime": "2016-10-03T00:00",
                "endDateTime": "2017-05-05T00:00"
            }
        }
```

```
    ]
}
```

PATCH PRODUCT

PATCH /product/{id}

Note: this operation is available only to ADMIN API users

Description

This operation allows partial updates of a product 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.
Notice that patching is possible only for 'admin' API users.

Patchable Attributes	Rule
description	
isBundle	
isCustomerVisible	
name	
productSerialNumber	
startDate	
status	
terminationDate	
realizingService	
billingAccount	
productOffering	
agreement	
characteristic	
productRelationship	
realizingResource	
relatedParty	
productPrice	
productSpecification	
place	

Non Patchable Attributes	Rule
id	
href	

orderDate	
description	
isBundle	
isCustomerVisible	
name	
productSerialNumber	
startDate	
status	
terminationDate	
realizingService	
billingAccount	
productOffering	
agreement	
characteristic	
productRelationship	
realizingResource	
relatedParty	
productPrice	
productSpecification	
place	

Usage Samples

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

Changing the tax rate (using json-patch)

Request

PATCH /productInventoryManagement/product/42
Content-Type: application/json-patch+json

```
{
    "path": "/productPrice/price/taxRate",
    "value": 5.5,
    "op": "replace"
}
```

Response

201

{ Similar JSON as in GET response with tax rate changed}

DELETE PRODUCT

```
DELETE /product/{id}
```

Note: this operation is available only to ADMIN API users

Description

This operation deletes a product entity.

Usage Samples

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

Request
DELETE /productInventoryManagement/product/42
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 using the API data model and rebranded.
Release 2.1	28/11/2016	Pierre Gauthier TM Forum pgauthier@tmforum.org	Updates for Fx16.5