Frameworx Specification

Product Inventory Management API REST Specification

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NOTICE

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INTRODUCTION

The following document is the template for the REST API documentation.

RESOURCE MODEL

PRODUCT Resource

```
{
  "id": " 42",
  "href": "http://server:port/inventoryApi/product/42",
  "name": "Broadband",
  "description": "Description of the instantiated broadband product",
  "status": "active",
  "isCustomerVisible": true,
  "isBundle" : true,
  "productSerialNumber": "Not useful in this case, we are describing a service…",
  "startDate": "2013-07-21 08:16:39ZGMT+1",
  "orderDate": "2013-07-21 06:16:39ZGMT+1",
  "terminationDate": "",

  "productOffering":
  {
      "id": " 4",
      "href": "http://server:port/catalogApi/productOffering/4",
      "name": "My Quick BB Offer"
  },
  "productSpecification":
  {
      "id": " 4",
      "href": " http://server:port/catalogApi/ productSpecification /42"
  },
  "productCharacteristic":[
  {
      "name":"speed",
      "value":"16M"
  }],
  "productRelationship":[
  {
      "type":"contains",
      "product":{
          "id": "59",
          "href":" http://server:port/inventoryApi/product/59"
      }
  }],
  "billingAccount": [
  {
      "id": "678",
      "href": http://server:port/billingApi/billingAccount/678",
      "name" : "account name"
  }],
```

```
    "relatedParty": [
    {
        "id": "42",
        "role":"partner",
        "href":"http://serverlocation:port/partnerManagement/partner/42"
    }],

  "place":"http://map.google.com/.../1234112GDE",
  "realizingResource": [
  {
        "id": "not useful in this case, we are describing a service…",
        "href": "not useful in this case, we are describing a service…"
  }],
  "realizingService": [
  {
        "id": "46779",
        "href": "http://server:port/inventoryApi/service/46779"
  }],
  "productPrice" : [{
    "name" : "…",
    "description" : "",
    "validFor":{
        "startDateTime":"2013-04-19T16:42:23-04:00",
        "endDateTime":"2013-06-19T00:00:00-04:00"
    },
    "priceType":"recurring",
    "recurringChargePeriod":"monthly",
    "unitOfMeasure":"",
    "price":{
        "amount":"12",
        "currency":"$"
    }
  }]

}
```

FIELD DESCRIPTIONS

| Field Name	Mandatory/ Optional	Description
Id	M	"id" is the ID created for the product
Name	M	"name" is the name of the product. It could be the same as the name of the Product Offering
Description	O	"description" is the description of the product. It could be copied from the description of the Product Offering.

Status	M	"status" is the lifecycle status of the product.
isBundle	M	
isCustomerVisible	M	
productSerialNumber	O	"productSerialNumber" is the serial number for the product. This is typically applicable to tangible products e.g. Broadband Router.
startDate	O	"startDate" is the date from which the product starts
orderDate	O	"orderDate" is the date when the product was ordered.
terminationDate	O	"terminationDate" is the date when the product was terminated. Not applicable to active products.
productOffering	M	"productOffering" is a link to the product offering.
productSpecification	O	"productSpecification" is a link to the product specification. It may be useful to manage links directly to the ProductSpec, when the product is a non-bundle one you may not manage the ProductOffering link with this Product.
productCharacteristics	O	"productCharacteristics" is a list of name value pairs to list the various relevant characteristics of the instantiated product.
productRelationships	O	"productRelationships" is a collection of a number of types of relationships between the product e.g bundle. The value of the 'type' attribute should describe the direction of the relationship. E.g. "isContainedIn"
billingAccount	O	"billingAccount" is a link to the billing account on which the product is billed. This is optional because in some cases the parent is billed and not all the children.
relatedParties	O	"relatedParties" is a link to collection of parties. Each party will contain a role and a link.
agreementItem	O	"agreementItem" is a link to the agreement item for the product. Agreement item will contain the terms and conditions for the product including the product term.
Place	O	"place" is a link to the place where the product is provided.
Service	O	"service" is a link to the service that realizes the product.
Resource	O	"resource" is a link to the resource that realizes the product.
productPrice	O	"productPrice" is a collection of all applicable prices for the product, it's an override of the default one specified in the ProductOffering.
-name		
-description		
-valid for		

STATUS ATTRIBUTE

The status attribute is used by a state machine through the different lifecycle stages for the product records. Valid status values are:|

Status code	Description	
created	No identified status yet - newly injected into the target system	
pending active	Prepared, but not active for customer yet	
aborted	Activation aborted for technical / internal reasons	
cancelled	Activation aborted by customer / legal request	
active	Active for customer use of product	
pending terminate	To be terminated, but still in use	
terminated	No longer active for customer	From this status on, the ratedProductUsage collection will have a values
suspended	Temporary suspension, not usable for customer, typically because of barring caused by payment / dunning issues or customer request	

STATE MACHINE DIAGRAM FOR STATUS ATTRIBUTE ON PRODUCT
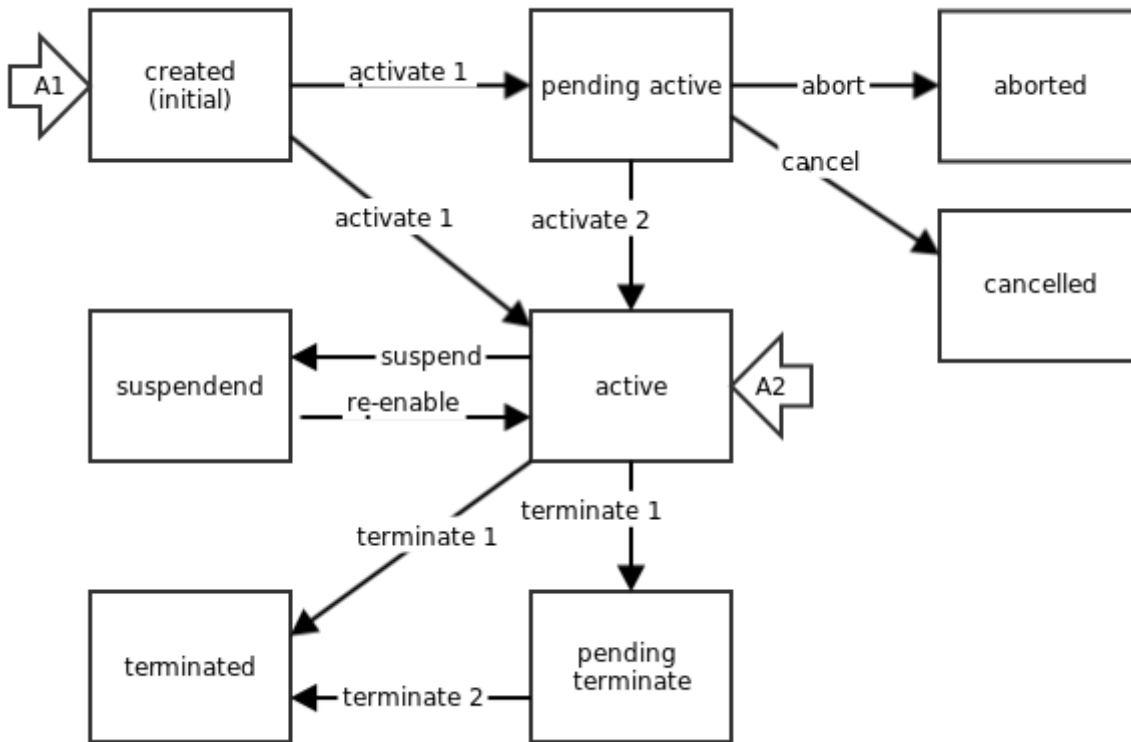
UML Model:
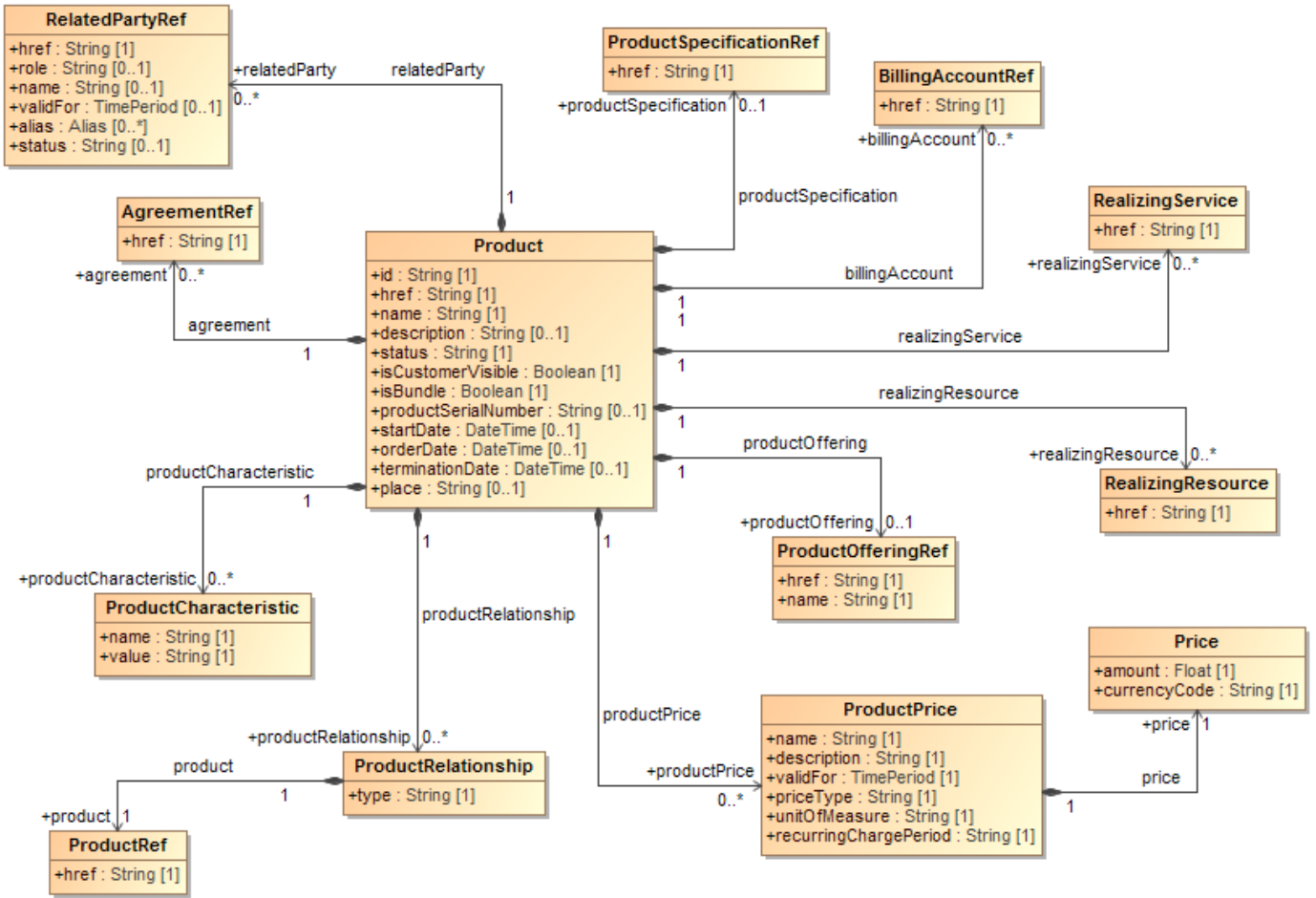
Notification Resource Models

PRODUCTCREATIONNOTIFICATION

Used to notify that a product entry was created in the inventory

```
{

   "event": {
        "id": "http://server:port/inventoryApi/product/42",
        "name": "Broadband",
        "description": "Description of the instantiated broadband product",
        "status": "active",
        "isCustomerVisible": true,
        "isBundle": true,
        "startDate": "2013-07-21 08:16:39ZGMT+1",
        "orderDate": "2013-07-21 06:16:39ZGMT+1",
        "productOffering":
        {
             "href": "http://server:port/catalogApi/productOffering/4",
             "name": "My Quick BB Offer"
        },
        "productSpecification":
        {
             "href": " http://server:port/catalogApi/productOffering/4"
        },
        "productCharacteristics":[
        {
             "name":"speed",
             "value":"16M"
        }],
        "productRelationships":[
        {
             "type":"contains",
             "product":{
                  "id":" http://server:port/inventoryApi/product/59"
             }
        }],
        "billingAccount":
        {
             "id": "http://server:port/billingApi/billingAccount/678"
        },
        "relatedParties": [
        {
             "role":"partner",
          "reference":"http://serverlocation:port/partnerManagement/partner/42"
        }],
```

```
        "realizingServices": [
        {
            "id": "46779",
            "href": "http://server:port/inventoryApi/service/46779"
        }],
        "productPrice" : [{
          "name" : "…",
          "description" : "",
          "validFor":{
                "startDateTime":"2013-04-19T16:42:23-04:00",
                "endDateTime":"2013-06-19T00:00:00-04:00"
          },
          "priceType":"recurring",
          "recurringChargePeriod":"monthly",
          "unitOfMeasure":"",
          "price":{
                "amount":"12",
                "currency":"$"
          }
        }]
    },
    "eventType": "productCreationNotification"
}
```

PRODUCTVALUECHANGENOTIFICATION

Used to notify that a product entry was modified in the inventory

```
{
  "event": {
        "id": "42",
        "href": "http://server:port/inventoryApi/product/42",
        "productCharacteristics":[
        {
                "name":"speed",
                "value":"32M"
        }]
    },
    "eventType": "productValueChangeNotification"
}
```

PRODUCTSTATUSCHANGENOTIFICATION

Used to notify that a product entry status has changed in the inventory

```
{
   "event": {
        "href": "http://server:port/inventoryApi/product/42",
        "status": "active"
     },
     "eventType":  "productStatusChangeNotification"
}
```

PRODUCTDELETIONNOTIFICATION

Used to notify that a product entry was removed from the inventory

```
{
   "event": {
      "id": "http://server:port/inventoryApi/product/42",
    },
    "eventType": "ProductDeletionNotification"
}
```

PRODUCTBATCHNOTIFICATION

Used to notify that one or many changes appeared in the inventory concerning a specific party, this (these) change(s) being the result of a specific business interaction.

```
{
   "event": [
     {
        "event": {
           "id": "http://server:port/inventoryApi/product/42",
        },
        "eventType": "ProductDeletionNotification"
     },
     {
        "event": {
           "id": "http://server:port/inventoryApi/product/42",
           "state" : "…"
        },
        "eventType": "ProductStateChangeNotification"
```

```
      }

   ],
   "reason" : "Contract Termination",
   "details" : {
      "name" : "",
      "value" : ""
   }
   "eventType": "ProductTransactionNotification"
}
```

API OPERATION TEMPLATES

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

Remember that the following Uniform Contract rules must be used :

Operation on Entities	Uniform API Operation	Description
Query Entities	GET Resource	GET must be used to retrieve a representation of a resource.
Create Entity	POST Resource	POST must be used to create a new resource
Partial Update of an Entity	PATCH Resource	PATCH must be used to partially update a resource For reconciliation processes
Complete Update of an Entity	PUT Resource	PUT must be used to completely update a resource identified by its resource URI
Remove an Entity	DELETE Resource	DELETE must be used to remove a resource

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

Notifications are also described in a subsequent section.

GET /inventoryApi/product/{ID}

This Uniform Contract operation is used to retrieve the representation of a product inventory.

Note that collections can be retrieved via GET /inventoryApi/product with no {ID}

Description :

- Allows to retrieve product inventory content
- Filtering is enabled on all attributes and field selection also
- The resource is a managed entity.
- The identifier is an hyperlink

Behavior :

- Returns HTTP/1.1 status code 200 if the request was successful.

Case : Querying the product inventory to retrieve an overview of all the top level products for a given customer

REQUEST
GET /inventoryApi/product/?relatedParties.role=customer&relatedParties.reference=42&isTopLevel=true&fields=name, description, status Accept: application/json
RESPONSE

200 Content-Type: application/json
 	
 [{
   "id": "42",
  "href": "http://server:port/inventoryApi/product/42",
  "name": "Broadband",
  "description": "Description of the instantiated broadband product",
  "status": "active"
}, {
  "id": "55",
  "href": "http://server:port/inventoryApi/product/55",
  "name": "Mobile data access",
  "description": "Description of the instantiated broadband product",
  "status": "active"
}]

PUT INVENTORYAPI/PRODUCT/{ID}

This Uniform Contract operation is used to completely update the representation of a product.

Description :

- Replaces a product entry inside the inventory
- The resource is a managed entity

Behavior :

- Returns HTTP/1.1 status code 201 if the request was successful.

- Standard error codes in case of errors.

<table>
<tr><td>REQUEST</td></tr>
</table>

```
PUT inventoryApi/product/42
Content-type: application/json

{
  "id": "42",
  "href": "http://server:port/inventoryApi/product/42",
  "name": "Broadband",
  "description": "Description of the instantiated broadband product",
  "status": "active",
  "startDate": "2013-07-21 08:16:39ZGMT+1",
  "orderDate": "2013-07-21 06:16:39ZGMT+1",
  "terminationDate": "",
  "productOffering":
  {
      "id" : "4",
      "href": "http://server:port/catalogApi/productOffering/4",
      "name": "My Quick BB Offer"
  },
  "productSpecification":
  {
      "id": " http://server:port/catalogApi/productOffering/4"
  },
  "productCharacteristics":[
  {
      "name":"speed",
      "value":"16M"
  }],
  "productRelationships":[
  {
      "type":"contains",
      "product":{
          "id":" http://server:port/inventoryApi/product/59"
      }
  }],
  "billingAccount":
  {
      "id": "http://server:port/billingApi/billingAccount/678"
  },
  "relatedParties": [
  {
      "role":"partner",
    "reference":"http://serverlocation:port/partnerManagement/partner/42"
  }],
  "realizingServices": [
```

```
{
    "id": " 46779",
    "href": "http://server:port/inventoryApi/service/46779"
}],
"productPrice" : [{
  "name" : "…",
 "description" : "",
 "validFor":{
     "startDateTime":"2013-04-19T16:42:23-04:00",
     "endDateTime":"2013-06-19T00:00:00-04:00"
 },
 "priceType":"recurring",
 "recurringChargePeriod":"monthly",
 "unitOfMeasure":"",
 "price":{
     "amount":"12",
     "currency":"$"
 }
}]
}
```

RESPONSE

201
Content-Type: application/json

{ JSON Resource Representation with every attributes
}

PATCH INVENTORYAPI/PRODUCT/{ID}

Description :

- Partially updates a product entry in the inventory
- The resource is a managed entity

Behavior :

- Returns HTTP/1.1 status code 201 if the request was successful.
- Standard error codes in case of an error.

Case : Patch the product inventory entry once the service delivery is fully done, thus linking the service ID to the product instance

REQUEST

PATCH inventoryApi/product/42

Content-type: application/json

```
{
    "realizingServices": [
    {
        "id": "http://server:port/inventoryApi/service/46779"
    }]
}
```

RESPONSE

201
Content-Type: application/json

{ JSON Resource Representation with every attributes
}

POST INVENTORYAPI/PRODUCT

Description :

- Allows to create a new product entry in the inventory
- The resource is a managed entity

Behavior :

- Returns HTTP/1.1 status code 201 if the request was successful.
- Standard error codes in case of an error.

REQUEST

POST inventoryApi/product
Content-type: application/json

```
{
    "name": "Samsung Galaxy S4",
    "description": "Description of the instantiated handset product",
    "status": "active",
    "productSerialNumber": "59745034OOR030",
    "startDate": "",
    "orderDate": "2013-07-21 06:16:39ZGMT+1",
    "terminationDate": ""
    "productOffering":
    {
        "id": "http://server:port/catalogApi/productOffering/22",
        "name": "My Quick BB Offer"
    },
```

```
    "productSpecification":
    {
        "id": " http://server:port/catalogApi/productOffering/21"
    },
    "productCharacteristics":[
    {
        "name":"color",
        "value":"black"
    }]
    "billingAccount":
    {
        "id": "http://server:port/billingApi/billingAccount/678"
    },
    "relatedParties": [
    {
        "role":"partner",
        "reference":"http://serverlocation:port/partnerManagement/partner/42"
    }],
    "place":"http://map.google.com/.../1234112GDE",
    "realizingResources": [
    {
        "id": " http://server:port/inventoryApi/device/659394EDOD0O"
    }],
    "productPrice" : [{
        "name" : "…",
        "description" : "",
        "validFor":{
            "startDateTime":"2013-04-19T16:42:23-04:00",
            "endDateTime":"2013-06-19T00:00:00-04:00"
        },
        "priceType":"non-recurring",
        "price":{
            "amount":"300",
            "currency":"$"
        }
    }]
}
```

RESPONSE

201
Content-Type: application/json

{ JSON Resource Representation with every provided and default attributes
}

DELETE INVENTORYAPI/PRODUCT/{ID}

Description :

- Delete a product in the inventory

Behavior :

- Returns HTTP/1.1 status code 200 if the request was successful.
- Standard error codes in case of an error.
- Under certain policies, some errors may be raised when using this operation (for example if integrity violations are forbidden in the inventory).

REQUEST
DELETE inventoryApi/product/42
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.

REQUEST
DELETE /api/hub/{id} Accept: application/json
RESPONSE
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.

REQUEST

POST /client/listener
Accept: application/json
 	
{
 	
  "event": {
 	
  EVENT BODY
    },
  "eventType": "eventType"
}

RESPONSE
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 pgauthier@tmforum.org	First Release of Draft Version of the Document.
Release 1.1			Updated for use in the Paris Spec Jam – and rebranded.