

TM Forum Specification

Product Inventory Management API Conformance Profile

TMF637B
Release 19.0.0
June 2019

Release: Release 19.0.0	Status: Member Evaluation
Version: 4.0.0	IPR Mode: RAND

NOTICE

Copyright © TM Forum 2018. All Rights Reserved.

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

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

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

Direct inquiries to the TM Forum office:

4 Century Drive, Suite 100

Parsippany, NJ 07054, USA

Tel No. +1 973 944 5100

Fax No. +1 973 944 5110

TM Forum Web Page: www.tmforum.org

Table of Contents

NOTICE	2
Table of Contents.....	3
INTRODUCTION - API DESCRIPTION.....	4
RESOURCE MODEL CONFORMANCE.....	5
API MANDATORY AND OPTIONAL RESOURCES	5
Product MANDATORY AND OPTIONAL ATTRIBUTES	5
API OPERATIONS CONFORMANCE.....	12
Product MANDATORY AND OPTIONAL OPERATIONS.....	13
API GET FILTERING OPERATION CONFORMANCE.....	14
Filtering in Product resource	Error! Bookmark not defined.
/productInventoryManagement/product/.....	14
/productInventoryManagement/product/{ID}.....	15
API POST OPERATION CONFORMANCE	16
API PATCH OPERATION CONFORMANCE.....	17
API DELETE OPERATION CONFORMANCE.....	18
API CONFORMANCE TEST SCENARIOS.....	19
Product resource TEST CASES.....	19
Document History.....	25
Release History	25
Contributors to Document.....	25

INTRODUCTION - API DESCRIPTION

This document is the REST API conformance profile for the Product Inventory Management REST API (TMF 622).

The Product API provides a standardized mechanism to retrieve product inventory information. The API consists of a simple set of operations that interact with Inventory systems in a consistent manner. Usually, a product is created and modified consequently to product order but could be also 'directly' modified for administrative reason.

RESOURCE MODEL CONFORMANCE

API MANDATORY AND OPTIONAL RESOURCES

For the resources defined by the API fill the following table and indicate which ones are mandatory and which ones are optional.

Resource Name	Mandatory or Optional	Comments
product	M	

Product MANDATORY AND OPTIONAL ATTRIBUTES

The table below summarizes mandatory and optional attributes for resource "Product"

Attribute Name	Mandatory or Optional	Comments
id	M (in response messages) O (otherwise)	Initially generated by the server and provided in the response upon resource creation. Not available in POST request
href	M (in response messages) O (otherwise)	Initially generated by the server and provided in the response upon resource creation Value in response must be the same as the one set in Location header provided upon entity creation Not available in POST request
description	O	
isBundle	O	
isCustomerVisible	O	
name		
orderDate	O	Not available in POST request
productSerialNumber	O	
startDate	O	Not available in POST request Business Required
terminationDate	O	Not available in POST request Business Required
status	M (in response messages) O (otherwise)	Only required in response messages from the server when

		providing the Product entity contents (responses to create-POST and read-GET the entity)
@baseType	O	
@type	O	
@schemaLocation	O	
agreement	O	Array of agreement
id	M	
href	O	
agreementItemId		
name	O	
@baseType	O	
@schemaLocation	O	
@type	O	
@referredType	O	
billingAccount	O/M	zero or one billing account same rule applies for billingAccount structure nested in productPrice Must be managed when recurring charge are linked to this product
id	M	
href	O	
name	O	
@baseType	O	
@schemaLocation	O	
@type	O	
@referredType	O	
product	O	Array of nested product
See product structure		
productCharacteristic	O/M	Array of product characteristic(s) Required if targetProductSchema not providedand productSpecification features characteristic
name	M	
valueType	O	string is considered by default
value	M	This attribute type is any in the swagger
@baseType	O	

@schemaLocation	O	
@type	O	
productOffering	O/M	0 or 1 At least a productOffering or a productSpecification must be provided.
id	M	
href	O	
name	O	
@baseType	O	
@schemaLocation	O	
@type	O	
@referredType	O	
productOrderItem	O	An array of productOrderItem embedded in this productOrderItem.
orderItemAction	O	
orderItemId	M	
productOrderHref	O	
productOrderId	M	
role	O	
@baseType	O	
@schemaLocation	O	
@type	O	
@referredType	O	
productPrice	O/M	Array of productPrice Mandatory if the product is priced
description	O	
name	O	
priceType	M	
recurringChargePeriod	M if price type is recurring – must not be filled else	
unitOfMeasure	O	
@basetype	O	
@schemaLocation	O	
@type	O	
price	O/M	zero or 1 for each orderPrice and priceAlteration Mandatory if the product is priced

	percentage	O	
	taxRate	O	
	dutyFreeAmount	M if price taxIncludedAmount not provided. Exception: : if price is used in priceAlteration dutyFreeAmount and taxIncludedAmount could be null if a percentage is provided	see amount for internal structure
	taxIncludedAmount	M if dutyFreeAmount not provided Exception: if price is used in priceAlteration dutyFreeAmount and taxIncludedAmount could be null if a percentage is provided	see amount for internal structure
	@baseType	O	
	@schemaLocation	O	
	@type	O	
	amount	M for amount	Structure used to describe amount in the API
	unit	M	
	value	M	
	priceAlteration	O/M	Array of price(s) Must be provided if catalog rules allow price alteration for this product
	applicationDuration	O	
	description	O	
	name	O	
	priceType	M	
	priority	O Exception: if several priceAlteration with same type applied on a same priceItem priority must be valued	
	recurringChargePeriod	M if price type is recurring – must not be filled else	
	unitOfMeasure	O	

@baseType	O	
@schemaLocation	O	
@type	O	
productOfferingPrice	O	zero or 1 for priceAlteration or itemPrice
id	M	
href	O	
name	O	
@baseType	O	
@schemaLocation	O	
@type	O	
@referredType	O	
productRelationship		Array of product relationship(s)
relationshipType	M	
product	M	A referred or valued product must be present
@baseType	O	
@schemaLocation	O	
@type	O	
ProductSpecification	O/M	0 or 1 At least a productOffering or a productSpecification must be provided.
id	M	
href	O	
version	O	
name	O	
targetProductSchema		0 or 1
@baseType	O	
@schemaLocation	O	
@type	M	
productTerm	O	Array of term(s)
description	O	
name	M if duration not provided	
duration	M if name not provided	see amount above for internal structure
@baseType	O	
@schemaLocation	O	
@type	O	
realizingResource	O	an array of resource realizing this product
id	M	
href	O	
name	O	

value	O	
@baseType	O	
@schemaLocation	O	
@type	O	
@referredType	O	
realizingService	O	an array of service realizing this product
id	M	
href	O	
name	O	
@baseType	O	
@schemaLocation	O	
@type	O	
@referredType	O	
relatedParty	O/M	Array of structures same rule applies for relatedParty structure nested in product Required if this product is related to a customer, a user, etc... any party and role associated.
id	M	
href	O	
role	M/O	The role is mandatory if the id is referring a party resource. The role is optional is the id is referring a partyRole resource.
name	O	
@referredType	M	It allows to get id type : partyRole or Party or Party specialization: individual or organization
@baseType	O	
@schemaLocation	O	
@type	O	
relatedPlace	O/M	Array of place(s) Must be present for any product installed at a place.
id	O	The place could provide by id or literally
href	O	
name	O	
role	M	
@referredType	M	Because place could be a geographicAddress,

			geographicLocation or a geographicSite, a type must be provided.
	@schemaLocation	0	
	@baseType	0	
	@type	0	

NOTIFICATION MODEL CONFORMANCE

The Pub/Sub models are common and described in the TMF REST Design Guidelines. Use the following templates to describe the Hub Mandatory and Optional attributes and filtering support.

Product MANDATORY AND OPTIONAL NOTIFICATIONS

For the Notifications defined by the API the following table indicates which ones are mandatory and which ones are optional.

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

Notification Name	Mandatory or Optional	Comments
productCreateEvent	O	
productAttributeValueChangeEvent	O	
productStateChangeEvent	O	
productBatchEvent	O	
productDeleteEvent	O	

All attributes of the resource associated with the notification are mandatory.

API OPERATIONS CONFORMANCE

For every single resource use the following templates and define what operations are optional and what operations are mandatory.

Product MANDATORY AND OPTIONAL OPERATIONS

The following table indicates which ones are mandatory and which ones are optional for Product resource:

Uniform API Operation	Mandatory/Optional	Comments
GET	M	GET must be used to retrieve a representation of a resource
POST	O (used only for admin reason)	POST must be used to create a new resource
PATCH	O (used only for admin reason)	PATCH must be used to partially update a resource
DELETE	O (used only for admin reason)	DELETE must be used to remove a resource

API GET FILTERING OPERATION CONFORMANCE

For every single resource use the following template to specify the mandatory and optional features supported by the GET filtering operation.

Definitions

Filtered Search: A filtered search can be applied using query parameters in order to obtain only the resource entities that meet the criteria defined by the filtering parameters included in the query request. Several elements can be applied to the filtered search. In that case logic, a logical AND is applied to combine the criteria (e.g.:?category=<value> &state=<value>)

Attribute selection (Filtered Response Data): In order to apply a filter and limit the number of attributes included in the response, the GET request can include the “?fields=” query parameter. Several elements can be applied to the filter. In that case, a logical AND is applied to combine the values (e.g.:?fields=category,state) will provide in the response only the values assigned to attributes category and state. Attribute selection capabilities are the same for collections retrieval and individual resource queries

All the GET operations in this API share the state status code pattern:

GET	M	
Response Status Code 200	M	With JSON appointment objects as body response.
Response Status Code 404	M	When resource can't be found
Other Status Codes	N/A	

/productInventoryManagement/v4/product?fields=...&{filtering}

Filtered Search:

Providing filtering criteria is mandatory to avoid too many answers retrieved. See example below:

- productOffering.id
- description
- relatedParty.id + relatedParty.role
- status
- billingAccount.id
- etc...

Filtered Data: A filtered response can be requested for the following attributes using the “?fields=” query parameter

- Any of the attributes in the first level of Product resource definition

`/productInventoryManagement/v4/product/{ID}?fields=...`

Filtered Search: A filtered response can be requested for the following attributes using the “?fields=” query parameter

- Any of the attributes in the first level of Product resource definition

API POST OPERATION CONFORMANCE

This section defines which attributes are mandatory for POST operation.

Since POST operation is optional for product this is not applicable in this conformance document

API PATCH OPERATION CONFORMANCE

This section defines which attributes are patchable.

Since PATCH operation is optional and not included in the basic CONNECT certification this is not applicable in this conformance document.

API DELETE OPERATION CONFORMANCE

This section defines what operations can be used to delete a Product resource.

Since DELETE operation is optional and not included in the basic CONNECT certification this is not applicable in this conformance document

API CONFORMANCE TEST SCENARIOS

This section describes the test scenarios required for the basic CONNECT certification of Product Inventory API.

Test Cases must be executed in the order defined for each resource because the result from one of the scenarios will be input for the next one.

Requests must be addressed to the endpoint provided for certification, specifically they must be addressed to the URI defined by the concatenation of the {apiRoot} and the specific resource, where the {apiRoot} is defined as {serverRoot}/tmf-api/productInventoryManagement/v4, being {serverRoot} the certification endpoint.

Product resource TEST CASES

Nominal Scenarios

TC_ProductInventory_N1 – Retrieve a product from its id

This test case needs to have a product pre-existing already on the server side:

```
{
  "id": "g265-tf85",
  "href": "https://host:port/productInventoryManagement/v4/product/g265-tf85",
  "description": "product description",
  "isBundle": false,
  "isCustomerVisible": true,
  "name": "Voice Over IP Basic instance for Jean",
  "productSerialNumber": "N/A",
  "startDate": "2017-11-01T09:37:29.961Z",
  "status": "Active",
  "@baseType": "Product",
  "@type": "Product",
  "@schemaLocation": "https://host:port/Product.json",
  "realizingService": [
    {
      "id": "123t-78k",
      "href": "https...",
      "role": "RelalizingService",
      "@referredType": "Service"
    }
  ],
  "productOffering": {
    "id": "PO-101-1",
    "href": "https...",
    "name": "Voice Over IP Basic",
    "@referredType": "ProductOffering"
  },
  "productOrder": [
```

```
{
  "productOrderId": "1023-98gh",
  "productOrderHref": "https...",
  "orderItemId": "2",
  "orderItemAction": "add",
  "@referredType": "ProductOrder",
  "role" : "Install order"
},
{
  "productOrderId": "df65-gh12",
  "productOrderHref": "https...",
  "orderItemId": "2",
  "orderItemAction": "change",
  "@referredType": "ProductOrder",
  "role" : "change management order"
},
{
  "productOrderId": "5ghh-sd12",
  "productOrderHref": "https...",
  "orderItemId": "3",
  "orderItemAction": "change",
  "@referredType": "ProductOrder",
  "role" : "change management order"
}
],
"productCharacteristic": [
  {
    "name": "Number",
    "valueType": "string",
    "value": "415 279 7439"
  }
],
"relatedParty": [
  {
    "id": "45hj-8888",
    "href": "https...",
    "name": "Jean",
    "role": "User",
    "@referredType": "Individual"
  }
],
"productSpecification": {
  "id": "PS-101",
  "href": "https...",
  "@referredType": "ProductSpecification",
  "version": "1"
}
}
```

- Send a GET message to `{/apiRoot}/productInventoryManagement/v4/product/ g265-tf85`
- Wait for a response from the server with the following characteristics
 - Response Code 200-OK
 - The body of the response includes one product resource referring to `{ g265-tf85}`
 - The body of the response for the resource with identifier `{ g265-tf85}` matches the values described above

TC_ProductInventory_N2 – Search for Product with specific characteristics

This test case needs to have another product pre-existing already on the server side:

```
{
  "id": "sd66-uyj6",
  "href": "https://host:port/productInventoryManagement/v4/product/sd66-uyj6",
  "description": "product description",
  "isBundle": false,
  "isCustomerVisible": true,
  "name": "Voice Over IP Basic instance for Louise",
  "productSerialNumber": "N/A",
  "startDate": "2017-11-01T09:37:30.961Z",
  "status": "Active",
  "@baseType": "Product",
  "@type": "Product",
  "@schemaLocation": "https://host:port/Product.json",
  "realizingService": [
    {
      "id": "zert-654",
      "href": "https...",
      "role": "RelalizingService",
      "@referredType": "Service"
    }
  ],
  "productOffering": {
    "id": "PO-101-1",
    "href": "https...",
    "name": "Voice Over IP Basic",
    "@referredType": "ProductOffering"
  },
  "productOrder": [
    {
      "productOrderId": "ozer-54jj",
      "productOrderHref": "https...",

```

```

    "orderId": "1",
    "orderItemAction": "add",
    "role" : "Install order"
  }
],
"productCharacteristic": [
  {
    "name": "Number",
    "valueType": "string",
    "value": "415 896 4201"
  }
],
"relatedParty": [
  {
    "id": "dfr7-7896",
    "href": "https...",
    "name": "Louise",
    "role": "User",
    "@referredType": "Individual"
  }
],
"productSpecification": {
  "id": "PS-101",
  "href": "https...",
  "@referredType": "ProductSpecification",
  "version": "1"
}
}

```

- Send a GET message to `{apiRoot}/productInventory/product/?productSpecification.id= PS-101`
- Wait for a response from the server with the following characteristics
 - Response Code 200-OK
 - The body of the response includes two product resources, referring to `{ g265-tf85}` and `{ sd66-uyj6}`
 - The body of the response for the resource with each identifier matches the values in the corresponding original request
- Send a GET message to `{apiRoot}/productInventory/product/?relatedParty.id= dfr7-7896`
- Wait for a response from the server with the following characteristics
 - Response Code 200-OK

- The body of the response includes one product resource, referring to { sd66-uyj6}
- The response message includes all mandatory parameters
- The body of the response for the resource with identifier { sd66-uyj6} matches the values in the original request
- Send a GET message to `/{apiRoot}/productInventory/product/?productOrder.productOrderId=1023-98gh`
- Wait for a response from the server with the following characteristics
 - Response Code 200-OK
 - The body of the response includes one product resource, referring to g265-tf85}
 - The response message includes all mandatory parameters
 - The body of the response for the resource with identifier { g265-tf85} matches the values in the original request

TC_ProductInventory_N3 – Filtered retrieval of product data

- Send a GET message to `/{apiRoot}/productInventory/product/{g265-tf85}?fields=name,status`
- Wait for a response from the server with the following characteristics
 - Response Code 200-OK
 - The body of the response includes one productn resource, referring to { g265-tf85} and including only attributes *name* (Voice Over IP Basic instance for Jean) and *status(Active)*, matching the values in the original request

Notice that this test case is using parameters " name" and "status" to filter the data included in the response but any other parameter could be used

TC_ProductInventory_N4 – Filtered Search and Filtered data response

- Send a GET message to `/{apiRoot}/productInventoryManagement/v4/product//?realizingService.id=123t-78k&fields= id,href,status`
- Wait for a response from the server with the following characteristics
 - Response Code 200-OK
 - The body of the response includes one product resource, referring to { g265-tf85}

- The body of the response should be :

```
{
  "id": "g265-tf85",
  "href": "https://host:port/productInventoryManagement/v4/product/g265-tf85",
  "status": "Active"
}
```

Notice that this test case is using parameters "id" and "href" to filter the data included in the response but any other parameter could be used

Error Scenarios

TC_ProductInventory_E1 – Unknown Product

- Send a GET message to `{apiRoot}/productInventoryManagement/v4/product/{8888-zser}`, where `{8888-zser}` does not match any of the identifiers previously created in the server
- Wait for a response from the server with the following characteristics

Response Code 404-Not Found

Document History

Version History

Version Number	Date	Release led by:	Description
1.0.0	03-Apr-2018	Ludovic Robert	First Release of the Document.
4.0.0	16-Jul-2019	Ludovic Robert	Corrected for R19.0

Release History

Version Number	Date	Release led by:	Description
Release 18.0	03-Apr-2018	Ludovic Robert	First Release of the Document.
Release 19.0	16-Jul-2019	Ludovic Robert	Corrected for R19.0

Contributors to Document

Ludovic Robert	Orange
Pierre Gauthier	TM Forum
Henrique Rodrigues	TMForum