TM Forum Specification

TMF622 Product Ordering API REST Specification

TMF622

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NOTICE

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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 specification covers also a task-based resource to request Product Order Cancellation.

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 Product Order creation
  - o Product Order removal
  - o Product Order state change
  - o Product Order value change used to notify that any data in an order has just changed
  - o Product Order information required used to notify that some data in the order need to be filled / are missing

…on CancelProductorder:
- Retrieval of a product order cancellation request or a collection of product order cancellation requests depending on filter criteria
- Creation of a product order cancel request
- Notification of events on product order
  - o Cancel Product Order creation
  - o Cancel Product Order state change
  - o Order information required used to notify that some data in the cancel product 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.
- The Order Management system has the capability to assess product order cancellation request.

SAMPLE USE CASES

To illustrate JSON representation of resources concerned by these APIs, we use the two use cases detailed below.

Use case 1 (UC1): Acquisition

This UC illustrates the acquisition of a new TMF mobile line featuring a mobile access, a tariff plan and a coverage options.
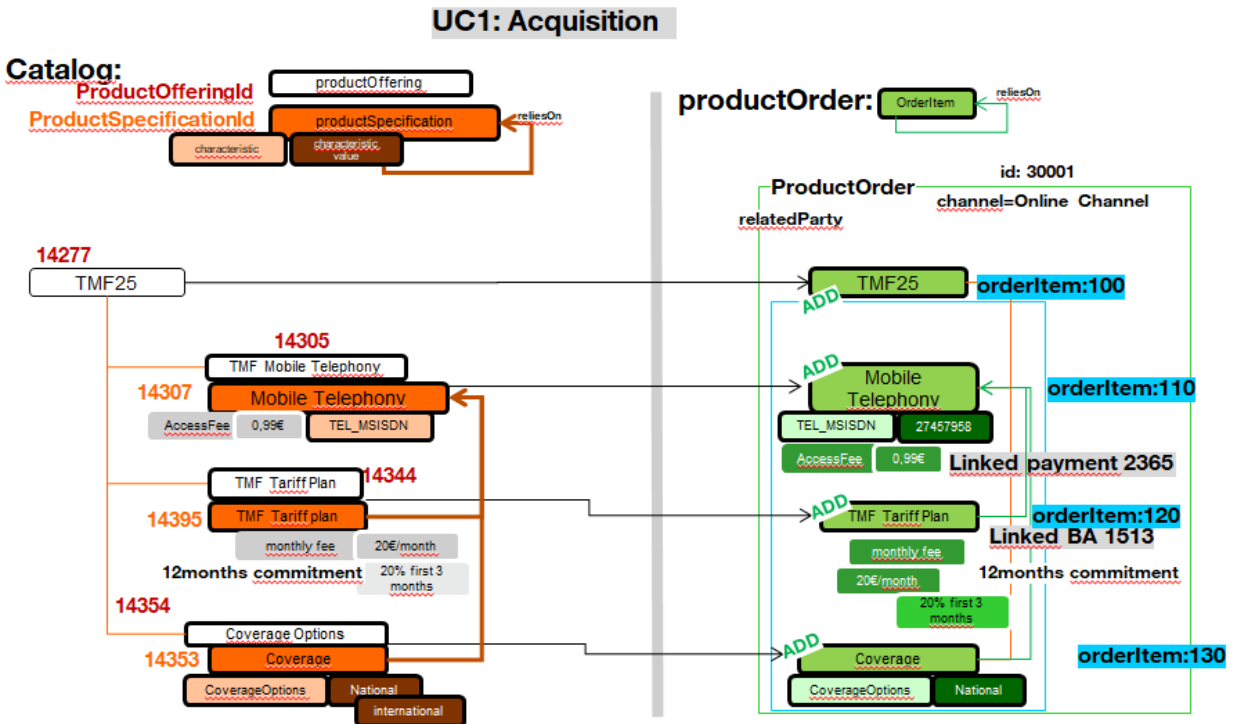
Use case 2 (UC2): Modification

This UC illustrates a modification of the coverage option.

UC2: Change product ordering

Inventory:
ProductOfferingId
ProductSpecificationId
productId

productOrder:

Modification order of *coverage* from National to International
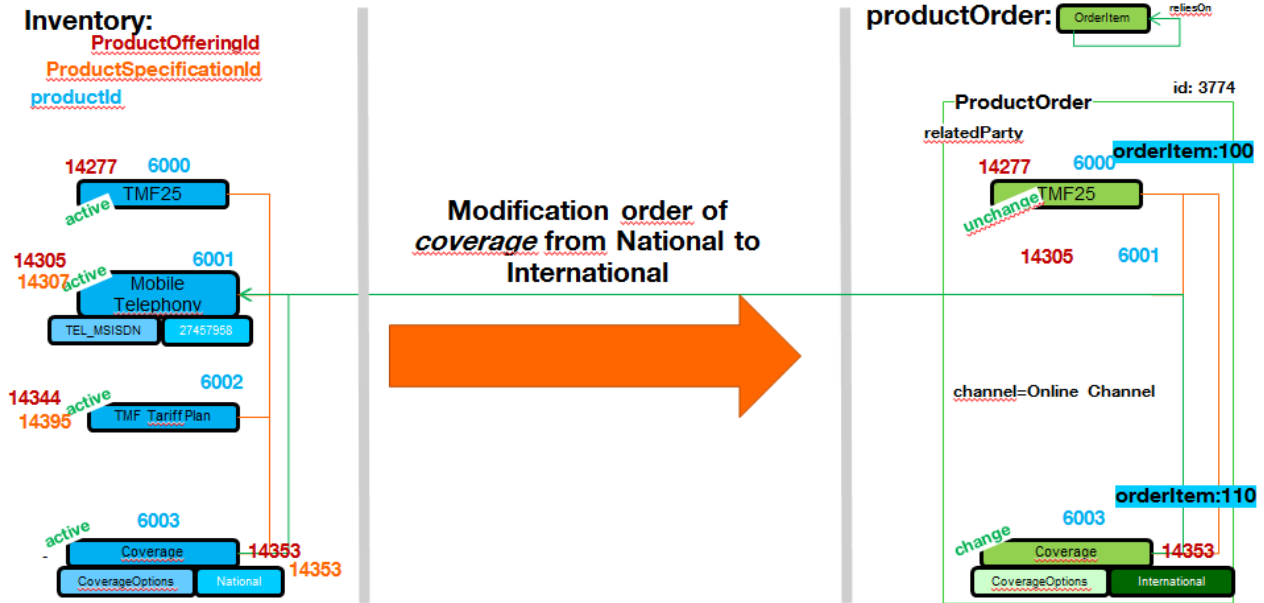
Support of polymorphism and extension patterns

Support of polymorphic collections and types and schema based extension is provided by means of a list of generic meta-attributes that we describe below. Polymorphism in collections occurs when entities inherit from base entities, for instance an AProductOrder and BProductOrder inheriting properties from the ProductOrder entity.

Generic support of polymorphism and pattern extensions is described in the TMF API Guidelines v3.0 Part 2 document.

The @type attribute provides a way to represent the actual class type of an entity. For example, within a list of ProductOrder instances some may be instances of AProductOrder where other could be instances of BProductOrder. The @type gives this information. All resources and sub-resources of this API have a @type attributes that can be provided when this is useful.

The @referredType can be used within reference entities (like for instance an ProductOrderRef object) to explicitly denote the actual entity type of the referred class. Notice that in reference entities the @type, when used, denotes the class type of the reference itself, such as AProductOrderRef or BProductOrderRef, and not the class type of the referred object. However since reference classes are rarely sub-classed, @type is generally not useful in reference objects.

The @schemaLocation property can be used in resources to allow specifying user-defined properties of an Entity or to specify the expected *characteristics* of an entity.

The @baseType attribute gives a way to provide explicitly the base of class of a given resource that has been extended.

RESOURCE MODEL

Managed Entity and Task Resource Models

Product Order resource

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

Resource model

QuoteRef
id : String
href : String
name : String
@baseType : String
@schemaLocation : Uri
@type : String
@referredType : String

AgreementRef
id : String
href : String
name : String
@baseType : String
@schemaLocation : Uri
@type : String
@referredType : String

RelatedChannel
id : String
href : String
name : String
role : String
@baseType : String
@schemaLocation : Uri
@type : String
@referredType : String

Note
id : String
author : String
date : DateTime
text : String
@baseType : String
@schemaLocation : Uri
@type : String

PaymentRef
id : String
href : String
name : String
@baseType : String
@schemaLocation : Uri
@type : String
@referredType : String

AppointmentRef
id : String
href : String
description : String
@baseType : String
@schemaLocation : Uri
@type : String
@referredType : String

OrderTerm
description : String
name : String
duration : Quantity
@baseType : String
@schemaLocation : Uri
@type : String

ProductOfferingQualificationItemRef
id : String
href : String
name : String
productOfferingQualificationHref : String
productOfferingQualificationId : String
productOfferingQualificationName : String
@baseType : String
@schemaLocation : Uri
@type : String
@referredType : String

OrderItemRelationship
id : String
relationshipType : String
@baseType : String
@schemaLocation : Uri
@type : String

QuoteItemRef
id : String
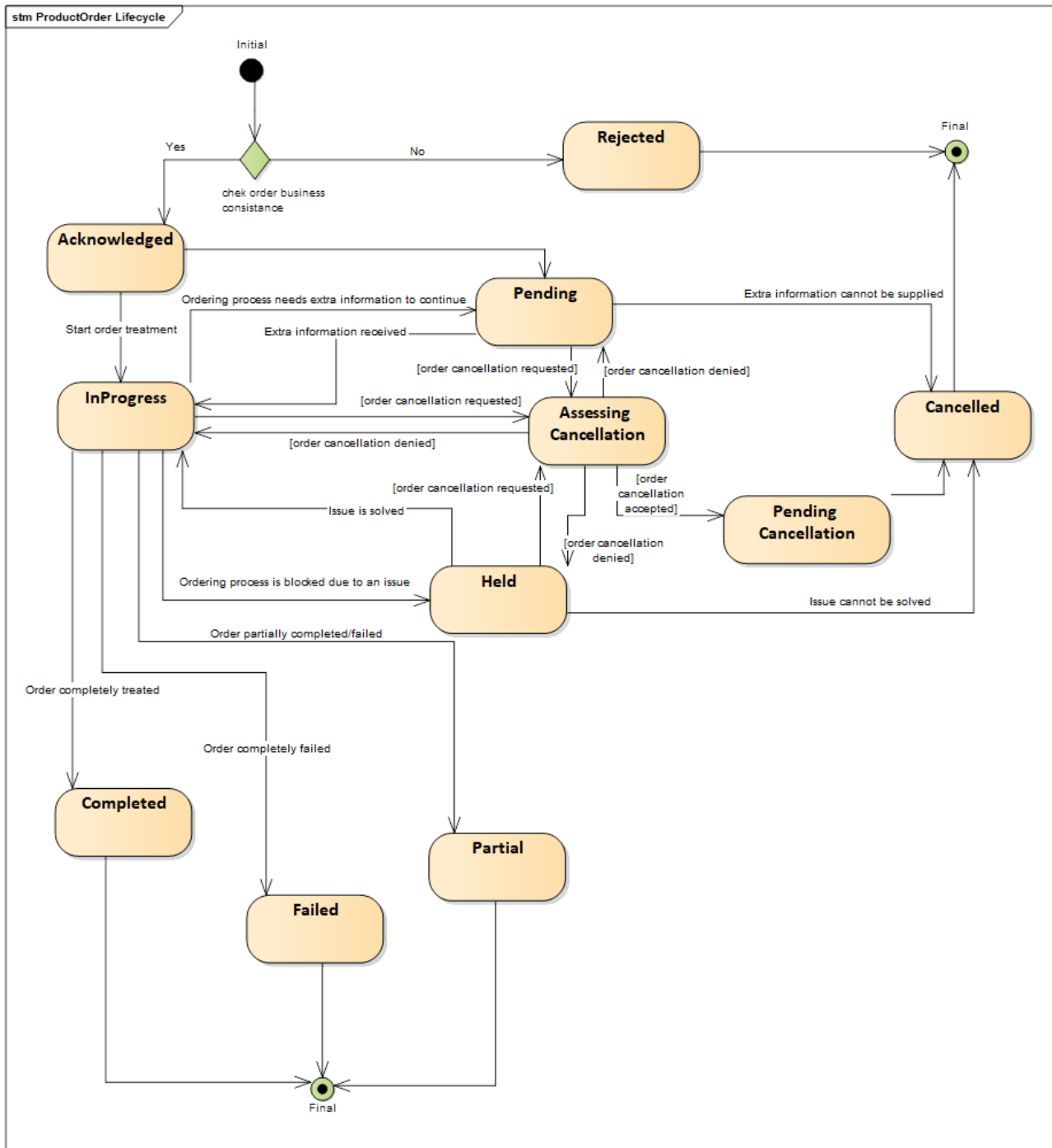href : String
name : String
quoteHref : String
quoteId : String
quoteName : String
@baseType : String
@schemaLocation : Uri
@type : String
@referredType : String

«Enumeration» ProductOrderStateType
acknowledged
rejected
pending
held
inProgress
cancelled
completed
failed
partial
assessingCancellation
pendingCancellation

ProductOrder
id : String
href : String
cancellationDate : DateTime
cancellationReason : String
category : String
completionDate : DateTime
description : String
expectedCompletionDate : DateTime
externalId : String
notificationContact : String
orderDate : DateTime
priority : String
requestedCompletionDate : DateTime
requestedStartDate : DateTime
state : ProductOrderStateType
@baseType : String
@schemaLocation : Uri
@type : String

ProductOrderItem
id : String
quantity : integer
action : OrderItemActionType
state : ProductOrderItemStateType
@baseType : String
@schemaLocation : Uri
@type : String

«Enumeration» OrderItemActionType
add
modify
delete
noChange

«Enumeration» ProductOrderItemStateType
acknowledged
rejected
pending
held
inProgress
cancelled
completed
failed
assessingCancellation
pendingCancellation

RelatedPlaceRefOrValue
id : String
href : String
name : String
role : String
@baseType : String
@schemaLocation : Uri
@type : String
@referredType : String

Characteristic
name : String
valueType : String
value : Any
@baseType : String
@schemaLocation : Uri
@type : String

AgreementItemRef
id : String
href : String
agreementItemId : String
name : String
@baseType : String
@schemaLocation : Uri
@type : String
@referredType : String

ProductOfferingRef
id : String
href : String
name : String
@baseType : String
@schemaLocation : Uri
@type : String
@referredType : String

BillingAccountRef
id : String
href : String
name : String
@baseType : String
@schemaLocation : Uri
@type : String
@referredType : String

ProductOfferingQualificationRef
id : String
href : String
name : String
@baseType : String
@schemaLocation : Uri
@type : String
@referredType : String

OrderPrice
description : String
name : String
priceType : String
recurringChargePeriod : String
unitOfMeasure : String
@baseType : String
@schemaLocation : Uri
@type : String

ProductRefOrValue
id : String
href : String
description : String
isBundle : Boolean
isCustomerVisible : Boolean
name : String
orderDate : DateTime
productSerialNumber : String
startDate : DateTime
terminationDate : DateTime
status : ProductStatusType
@baseType : String
@schemaLocation : Uri
@type : String
@referredType : String

RelatedParty
id : String
href : String
name : String
role : String
@baseType : String
@schemaLocation : Uri
@type : String
@referredType : String

«Enumeration» ProductStatusType
created
pendingActive
cancelled
active
pendingTerminate
terminated
suspended
aborted

PriceAlteration
applicationDuration : Integer
description : String
name : String
priceType : String
priority : Integer
recurringChargePeriod : String
unitOfMeasure : String
@baseType : String
@schemaLocation : Uri
@type : String

ProductRelationship
relationshipType : String
@baseType : String
@schemaLocation : Uri
@type : String

ServiceRef
id : String
href : String
name : String
@baseType : String
@schemaLocation : Uri
@type : String
@referredType : String

ResourceRef
id : String
href : String
name : String
@baseType : String
@schemaLocation : Uri
@type : String
@referredType : String

ProductTerm
description : String
name : String
duration : Quantity
validFor : TimePeriod
@baseType : String
@schemaLocation : Uri
@type : String

ProductSpecificationRef
id : String
href : String
name : String
version : String
@baseType : String
@schemaLocation : Uri
@type : String
@referredType : String

RelatedProductOrderItem
orderItemAction : String
orderItemId : String
productOrderHref : String
productOrderId : String
role : String
@baseType : String
@schemaLocation : Uri
@type : String
@referredType : String

ProductPrice
description : String
name : String
priceType : String
recurringChargePeriod : String
unitOfMeasure : String
@baseType : String
@schemaLocation : Uri
@type : String

TargetProductSchema
@baseType : String
@schemaLocation : String
@type : String

Price
percentage : Float
taxRate : Float
dutyFreeAmount : Money
taxIncludedAmount : Money
@baseType : String
@schemaLocation : Uri
@type : String

ProductOfferingPriceRef
id : String
href : String
name : String
@baseType : String
@schemaLocation : Uri
@type : String
@referredType : String

Lifecycle

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.

State	Definition
Acknowledged	The Acknowledged state is where an order/item has been received and has passed message and basic business validations.
Rejected	The Rejected state is where: • An order failed the Order Feasibility check

	• Invalid information is provided through the order request • The order request fails to meet business rules for ordering Same rules applied for order item.
Pending	The Pending state is used when an order/item is currently in a waiting stage for an action/activity to be completed before the order/item 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/item, if no action is taken within the defined timeframes to be described under the Agreement.
InProgress	The In Progress state is where an order Item has passed the Order Feasibility check successfully and product delivery has started. For the order at least one order item is inProgress
Held	The Held state is used when an order/item cannot be progressed due to an issue. SP has temporarily delayed completing an order/item to resolve an infrastructure shortfall to facilitate supply of order. Upon resolution of the issue, the order/item will continue to progress.
AssessingCancellation	Following a cancel request, the SP is assessing if cancel can be done for the order/item (or if the PO has reached PONR). If cancellation request is not accepted after assessment the order will return in Held or Pending or InProgress state.
PendingCancellation	Once a cancel order has been accepted by SP, it could in some UC take time to effectively cancel the order/item. During this time when accepted cancellation is effectively processed we use Pending Cancellation.
Cancelled	The Cancelled state is where an In-Flight Order/item has been successfully cancelled.
Completed	The Completed state is where an item has complete provision and the service is now active. For an order all order item are completed
Failed	Order item as not a successful delivery completion. The product is not delivered and the order item failed. All Order items have failed which results in the entire Order has Failed.
Partial	Some Order items have failed and some have succeeded so the entire Order is in a Partial state. This provides support for partial Failure of an Order. This state is not available at item level

State engine comments:
- The choice to accept order is done for the complete order and we cannot have a partial acceptance with some item in rejected and some other in acknowledged.
- Consistence rules must be defined between order state & order item state (example: an order has a failed state if it has all order item state with Completed or Failed status with at least one Completed and one Failed)

Field descriptions

ProductOrder fields

agreement	A list of agreement references (AgreementRef [*]). A reference to an agreement defined in the context of the product order.
billingAccount	A billing account reference (BillingAccountRef). A BillingAccount is a detailed description of a bill structure.
cancellationDate	A date time (DateTime). Date when the order is cancelled. This is used when order is cancelled.
cancellationReason	A string. Reason why the order is cancelled. This is used when order is cancelled.
category	A string. Used to categorize the order from a business perspective that can be useful for the OM system (e.g. "enterprise", "residential", ...).
channel	A list of related channels (RelatedChannel [*]). Related channel to another entity. May be online web, mobile app, social ,etc.
completionDate	A date time (DateTime). Date when the order was completed.
description	A string. Description of the product order.
expectedCompletionDate	A date time (DateTime). Expected delivery date amended by the provider.
externalId	A string. ID given by the consumer and only understandable by him (to facilitate his searches afterwards).
href	A string. Hyperlink to access the order.
id	A string. ID created on repository side (OM system).
note	A list of notes (Note [*]). Extra information about a given entity.
notificationContact	A string. Contact attached to the order to send back information regarding this order.
orderDate	A date time (DateTime). Date when the order was created.
orderTotalPrice	A list of order prices (OrderPrice [*]). An amount, usually of money, that represents the actual price paid by the Customer for this item or this order.
payment	A list of payment references (PaymentRef [*]). If an immediate payment has been done at the product order submission, the payment information are captured and stored (as a reference) in the order.
priority	A string. A way that can be used by consumers to prioritize orders in OM system (from 0 to 4 : 0 is the highest priority, and 4 the lowest).

productOfferingQualification	A list of product offering qualification references (ProductOfferingQualificationRef [*]). It's a productOfferingQualification that has been executed previously.
productOrderItem	A list of product order items (ProductOrderItem [1..*]). An identified part of the order. A product order is decomposed into one or more order items.
quote	A list of quote references (QuoteRef [*]). It's a Quote that has been executed previously.
relatedParty	A list of related parties (RelatedParty [*]). Related Entity reference. A related party defines party or party role linked to a specific entity.
requestedCompletionDate	A date time (DateTime). Requested delivery date from the requestor perspective.
requestedStartDate	A date time (DateTime). Order fulfillment start date wished by the requestor. This is used when, for any reason, requestor cannot allow seller to begin to operationally begin the fulfillment before a date.
state	A product order state type (ProductOrderStateType). Tracks the lifecycle status of the product order, such as Acknowledged, Rejected, InProgress, Pending and so on.

Characteristic sub-resource

Describes a given characteristic of an object or entity through a name/value pair.

name	A string. Name of the characteristic.
value	An any (Any). The value of the characteristic.
valueType	A string. Data type of the value of the characteristic.

Money sub-resource

A base / value business entity used to represent money.

unit	A string. Currency (ISO4217 norm uses 3 letters to define the currency).
value	A float. A positive floating point number.

Note sub-resource

Extra information about a given entity.

author	A string. Author of the note.
date	A date time (DateTime). Date of the note.
id	A string. Identifier of the note within its containing entity (may or may not be globally unique, depending on provider implementation).

text   A string. Text of the note.

OrderItemRelationship sub-resource

id   A string.

relationshipType   A string. The type of order item relationship.

OrderPrice sub-resource

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

billingAccount   A billing account reference (BillingAccountRef). A reference to a billing account used
                        for paid the order price charge.

description   A string. A narrative that explains in detail the semantics of this order item price.

name   A string. A short descriptive name such as "Subscription price".

price   A price (Price). a structure used to define price amount.

priceAlteration   A list of price alterations (PriceAlteration [*]). a strucuture used to describe a price
                        alteration.

priceType   A string. A category that describes the price, such as recurring, discount, allowance,
                        penalty, and so forth.

productOfferingPrice   A product offering price reference (ProductOfferingPriceRef). An amount, usually of
                        money, that is asked for or allowed when a ProductOffering is bought, rented, or
                        leased. The price is valid for a defined period of time.

recurringChargePeriod   A string. Could be month, week...

unitOfMeasure   A string. Could be minutes, GB...

OrderTerm sub-resource

Description of a productTerm linked to this orderItem. This represent a commitment with a duration.

description   A string. Description of the productOrderTerm.

duration   A quantity (Quantity). Duration of the productOrderTerm.

name   A string. Name of the productOrderTerm.

Price sub-resource

Provides all amounts (tax included, duty free, tax rate), used currency and percentage to apply for Price Alteration.

dutyFreeAmount	A money (Money). All taxes excluded amount (expressed in the given currency).
percentage	A float. Percentage to apply for ProdOfferPriceAlteration.
taxIncludedAmount	A money (Money). All taxes included amount (expressed in the given currency).
taxRate	A float. Tax rate.

PriceAlteration sub-resource

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

applicationDuration	An integer. Duration during which the alteration applies on the order item price (for instance 2 months free of charge for the recurring charge).
description	A string. A narrative that explains in detail the semantics of this order item price alteration.
name	A string. Name of the order item price alteration.
price	A price (Price). Provides all amounts (tax included, duty free, tax rate), used currency and percentage to apply for Price Alteration.
priceType	A string. A category that describes the price such as recurring, one time and usage.
priority	An integer. Priority level for applying this alteration among all the defined alterations on the order item price.
productOfferingPrice	A product offering price reference (ProductOfferingPriceRef). ProductPriceOffering reference. An amount, usually of money, that is asked for or allowed when a ProductOffering is bought, rented, or leased.
recurringChargePeriod	A string. Could be month, week...
unitOfMeasure	A string. Could be minutes, GB...

ProductOrderItem sub-resource

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

action	An order item action type (OrderItemActionType). The action to be carried out on the Product. Can be: add, modify, delete, noChange.
appointment	An appointment reference (AppointmentRef). Refers an appointment, such as a Customer presentation or internal meeting or site visit.
billingAccount	A billing account reference (BillingAccountRef). A BillingAccount is a detailed description of a bill structure.
id	A string. Identifier of the line item (generally it is a sequence number 01, 02, 03,

...).

itemPrice	A list of order prices (OrderPrice [*]). An amount, usually of money, that represents the actual price paid by the Customer for this item or this order.
itemTerm	A list of order terms (OrderTerm [*]). Description of a productTerm linked to this orderItem. This represent a commitment with a duration.
itemTotalPrice	A list of order prices (OrderPrice [*]). An amount, usually of money, that represents the actual price paid by the Customer for this item or this order.
payment	A list of payment references (PaymentRef [*]). If an immediate payment has been done at the product order submission, the payment information are captured and stored (as a reference) in the order.
product	A product ref or value (ProductRefOrValue). A product to be created defined by value or existing defined by reference. The polymorphic attributes @type, @schemaLocation & @referredType are related to the product entity and not the RelatedProductRefOrValue class itself.
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.
productOfferingQualificationItem	A product offering qualification item reference (ProductOfferingQualificationItemRef). It's a productOfferingQualification item that has been executed previously.
productOrderItem	A list of product order items (ProductOrderItem [*]). An identified part of the order. A product order is decomposed into one or more order items.
productOrderItemRelationship	A list of order item relationships (OrderItemRelationship [*]).
qualification	A list of product offering qualification references (ProductOfferingQualificationRef [*]). It's a productOfferingQualification that has been executed previously.
quantity	An integer. Quantity ordered.
quoteItem	A quote item reference (QuoteItemRef). It's a Quote item that has been executed previously.
state	A product order item state type (ProductOrderItemStateType). State of the order item : described in the state machine diagram.

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.

billingAccount	A billing account reference (BillingAccountRef). A BillingAccount is a detailed description of a bill structure.
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".
price	A price (Price). Provides all amounts (tax included, duty free, tax rate), used currency and percentage to apply for Price Alteration.
priceType	A string. A category that describes the price, such as recurring, discount, allowance, penalty, and so forth.
productOfferingPrice	A product offering price reference (ProductOfferingPriceRef). ProductPriceOffering reference. An amount, usually of money, that is asked for or allowed when a ProductOffering is bought, rented, or leased.
productPriceAlteration	A list of price alterations (PriceAlteration [*]). Is an amount, usually of money, that modifies the price charged for an order item.
recurringChargePeriod	A string. Could be month, week...
unitOfMeasure	A string. Could be minutes, GB...

ProductRefOrValue sub-resource

A product to be created defined by value or existing defined by reference. The polymorphic attributes @type, @schemaLocation & @referredType are related to the product entity and not the RelatedProductRefOrValue class itself.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Reference of the product.
id	A string. Unique identifier of the product.
name	A string. Name of the product. It could be the same as the name of the product offering.
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.
terminationDate	A date time (DateTime). Is the date when the product was terminated.
agreement	A list of agreement item references (AgreementItemRef [*]). 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.
billingAccount	A billing account reference (BillingAccountRef). A BillingAccount is a detailed description of a bill structure.
place	A list of related place ref or values (RelatedPlaceRefOrValue [*]). Related Entity reference. A related place defines a place described by reference or by value linked to a specific entity. The polymorphic attributes @type, @schemaLocation & @referredType are related to the place entity and not the RelatedPlaceRefOrValue class itself.
product	A list of product ref or values (ProductRefOrValue [*]). A product to be created defined by value or existing defined by reference. The polymorphic attributes @type, @schemaLocation & @referredType are related to the product entity and not the RelatedProductRefOrValue class itself.
productCharacteristic	A list of characteristics (Characteristic [*]). Describes a given characteristic of an object or entity through a name/value pair.
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.
productOrderItem	A list of related product order items (RelatedProductOrderItem [*]). RelatedProductOrderItem (ProductOrder item) .The product order item which triggered product creation/change/termination.
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.

productRelationship	A list of product relationships (ProductRelationship [*]). Linked products to the one instantiate, such as [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.
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.
productTerm	A list of product terms (ProductTerm [*]). Description of a productTerm linked to this product. This represent a commitment with a duration.
realizingResource	A list of resource references (ResourceRef [*]).
realizingService	A list of service references (ServiceRef [*]). for when Service is used by other entities.
relatedParty	A list of related parties (RelatedParty [*]). Related Entity reference. A related party defines party or party role linked to a specific entity.
status	A product status type (ProductStatusType). Is the lifecycle status of the product.

ProductRelationship sub-resource

Linked products to the one instantiate, such as [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 ref or value (ProductRefOrValue). A product to be created defined by value or existing defined by reference. The polymorphic attributes @type, @schemaLocation & @referredType are related to the product entity and not the RelatedProductRefOrValue class itself.
relationshipType	A string. Type of the product relationship, such as [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.

ProductTerm sub-resource

Description of a productTerm linked to this product. This represent a commitment with a duration.

description	A string. Description of the productTerm.

duration   A quantity (Quantity). Duration of the productTerm.

name   A string. Name of the productTerm.

validFor   A time period. productTerm validity period.

Quantity sub-resource

An amount in a given unit.

amount   A float. Numeric value in a given unit.

units   A string. Unit.

RelatedChannel sub-resource

Related channel to another entity. May be online web, mobile app, social ,etc.

@referredType   A string. The actual type of the target instance when needed for disambiguation.

href   A string. Reference of the related entity.

id   A string. Unique identifier of a related entity.

name   A string. Name of the channel.

name   A string. Name of the channel.

role   A string. Role playing by the channel.

RelatedParty sub-resource

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

@referredType   A string. The actual type of the target instance when needed for disambiguation.

href   A string. Reference of the related entity.

id   A string. Unique identifier of a related entity.

name   A string. Name of the related entity.

role   A string. Role played by the related party.

RelatedPlaceRefOrValue sub-resource

Related Entity reference. A related place defines a place described by reference or by value linked to a specific entity. The polymorphic attributes @type, @schemaLocation & @referredType are related to the place entity and not the RelatedPlaceRefOrValue class itself.

@referredType   A string. The actual type of the target instance when needed for disambiguation.

href	A string. Unique reference of the place.
id	A string. Unique identifier of the place.
name	A string. A user-friendly name for the place, such as [Paris Store], [London Store], [Main Home].
href	A string. Unique reference of the place.
id	A string. Unique identifier of the place.
name	A string. A user-friendly name for the place, such as [Paris Store], [London Store], [Main Home].
role	A string.

RelatedProductOrderItem sub-resource

RelatedProductOrderItem (ProductOrder item) .The product order item which triggered product creation/change/termination.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
orderItemAction	A string. Action of the order item for this product.
orderItemId	A string. Identifier of the order item where the product was managed.
productOrderHref	A string. Reference of the related entity.
productOrderId	A string. Unique identifier of a related entity.
role	A string. role of the product order item for this product.

TargetProductSchema sub-resource

The reference object to the schema and type of target product which is described by product specification.

@schemaLocation	A string. This field provides a link to the schema describing the target product.
@type	A string. Class type of the target product.

AgreementItemRef 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.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Reference of the related entity.

id	A string. Unique identifier of a related entity.
name	A string. Name of the related entity.
agreementItemId	A string. Identifier of the agreement.

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.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Reference of the related entity.
id	A string. Unique identifier of a related entity.
name	A string. Name of the agreement.
name	A string. Name of the agreement.

AppointmentRef relationship

Refers an appointment, such as a Customer presentation or internal meeting or site visit.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
description	A string. An explanatory text regarding the appointment made with a party.
href	A string. The reference of the appointment.
id	A string. The identifier of the referred appointment.

BillingAccountRef relationship

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

@referredType	A string. The actual type of the target instance when needed for disambiguation.
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.

PaymentRef relationship

If an immediate payment has been done at the product order submission, the payment information are captured and stored (as a reference) in the order.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Reference of the related entity.
id	A string. Unique identifier of a related entity.
name	A string. A name for the payment.
name	A string. A name for the payment.

ProductOfferingPriceRef relationship

ProductPriceOffering reference. An amount, usually of money, that is asked for or allowed when a ProductOffering is bought, rented, or leased.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Reference of the related entity.
id	A string. Unique identifier of a related entity.
name	A string. Name of the related entity.

ProductOfferingQualificationItemRef relationship

It's a productOfferingQualification item that has been executed previously.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Reference of the related entity.
id	A string. Id of an item of a product offering qualification.
name	A string. Name of the related entity.
id	A string. Id of an item of a product offering qualification.
productOfferingQualificationHref	A string. Reference of the related entity.
productOfferingQualificationId	A string. Unique identifier of a related entity.
productOfferingQualificationName	A string. Name of the related entity.

ProductOfferingQualificationRef relationship

It's a productOfferingQualification that has been executed previously.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Reference of the related entity.

id	A string. Unique identifier of a related entity.
name	A string. Name of the related entity.

ProductOfferingRef relationship

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

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Reference of the related entity.
id	A string. Unique identifier of a related entity.
name	A string. Name of the related 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.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Reference of the related entity.
id	A string. Unique identifier of a related entity.
name	A string. Name of the related entity.
targetProductSchema	A target product schema (TargetProductSchema). A target product schema reference. The reference object to the schema and type of target product which is described by product specification.
version	A string. Version of the product specification.

QuoteItemRef relationship

It's a Quote item that has been executed previously.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Reference of the related entity.
id	A string. Id of an item of a quote.
name	A string. Name of the related entity.
id	A string. Id of an item of a quote.
quoteHref	A string. Reference of the related entity.

quoteId   A string. Unique identifier of a related entity.

quoteName   A string. Name of the related entity.

QuoteRef relationship

It's a Quote that has been executed previously.

@referredType   A string. The actual type of the target instance when needed for disambiguation.

href   A string. Reference of the related entity.

id   A string. Unique identifier of a related entity.

name   A string. Name of the related entity.

ResourceRef relationship

@referredType   A string. The actual type of the target instance when needed for disambiguation.

href   A string. Reference of the related entity.

id   A string. Unique identifier of a related entity.

name   A string. Name of the resource.

name   A string. Name of the resource.

value   A string. The resource value that can be used to identify a resource with a public key (e.g.: a tel nr, an msisdn).

ServiceRef relationship

Service reference, for when Service is used by other entities.

@referredType   A string. The actual type of the target instance when needed for disambiguation.

href   A string. Reference of the related entity.

id   A string. Unique identifier of a related entity.

name   A string. Name of the related entity.

Json representation sample

We provide below the json representation of an example of a 'ProductOrder' resource object

```
{
    "id": "30001",
    "href": "https://{apiRoot}/productOrderingManagement/v4/productOrder/30001",
    "category": "B2C product order",
```

```json
    "completionDate": "2019-05-02T08:13:59.506Z",
    "description": "Product Order illustration sample",
    "expectedCompletionDate": "2019-05-02T08:13:59.506Z",
    "externalId": "PO-456",
    "orderDate": "2019-04-30T08:13:59.506Z",
    "priority": "1",
    "requestedCompletionDate": "2019-05-02T08:13:59.506Z",
    "requestedStartDate": "2019-05-03T08:13:59.506Z",
    "channel": [
      {
        "id": "1",
        "role": "Used channel for order capture",
        "name": "Online chanel"
      }
    ],
    "note": [
      {
        "id": "1",
        "author": "Jean Pontus",
        "date": "2019-04-30T08:13:59.509Z",
        "text": "This is a TMF product order illustration"
      }
    ],
    "productOrderItem": [
      {
        "id": "100",
        "quantity": 1,
        "action": "add",
        "product": {
          "isBundle": true,
          "@type": "Product"
        },
        "productOffering": {
          "id": "14277",
          "href": "https://host:port/productCatalogManagement/v4/productOffering/14277",
          "name": "TMF25"
        },
        "productOrderItemRelationship": [
          {
            "id": "110",
            "relationshipType": "bundles"
          },
          {
            "id": "120",
            "relationshipType": "bundles"
          },
          {
            "id": "130",
            "relationshipType": "bundles"
          }
        ],
        "state": "completed",
        "@type": "ProductOrderItem"
      },
      {
```

```
      "id": "110",
      "quantity": 1,
      "action": "add",
      "itemPrice": [
        {
          "description": "Access Fee",
          "name": "Access Fee",
          "priceType": "nonRecurring",
          "price": {
            "taxRate": 0,
            "dutyFreeAmount": {
              "unit": "EUR",
              "value": 0.99
            },
            "taxIncludedAmount": {
              "unit": "EUR",
              "value": 0.99
            }
          }
        }
      ],
      "payment": [
        {
          "id": "2365",
          "href": "https://host:port/paymentManagement/v4/cashPayment/2365",
          "name": "Cash payment for access fee",
          "@type": "CashPayment",
          "@referredType": "Payment"
        }
      ],
      "product": {
        "isBundle": false,
        "@type": "Product",
        "productCharacteristic": [
          {
            "name": "TEL_MSISDN",
            "valueType": "string",
            "value": "415 279 7439"
          }
        ],
        "productSpecification": {
          "id": "14307",
          "href": "https://host:port/productCatalogManagement/v4/productSpecification/14307",
          "name": "Mobile Telephony",
          "version": "1",
          "@type": "ProductSpecificationRef"
        }
      },
      "productOffering": {
        "id": "14305",
        "href": "https://host:port/productCatalogManagement/v4/productOffering/14305",
        "name": "TMF Mobile Telephony"
      },
      "state": "completed",
      "@type": "ProductOrderItem"
```

```
    },
    {
      "id": "120",
      "quantity": 1,
      "action": "add",
      "billingAccount": {
        "id": "1513",
        "href": "https://host:port/billingAccountManagement/v4/billingAccount/1513",
        "@type": "BillingAccount"
      },
      "itemPrice": [
        {
          "description": "Tariff plan monthly fee",
          "name": "MonthlyFee",
          "priceType": "recurring",
          "recurringChargePeriod": "month",
          "price": {
            "taxRate": 0,
            "dutyFreeAmount": {
              "unit": "EUR",
              "value": 20
            },
            "taxIncludedAmount": {
              "unit": "EUR",
              "value": 20
            }
          },
          "priceAlteration": [
            {
              "applicationDuration": 3,
              "description": "20% for first 3 months",
              "name": "WelcomeDiscount",
              "priceType": "recurring",
              "priority": 1,
              "recurringChargePeriod": "month",
              "price": {
                "percentage": 20,
                "taxRate": 0,
                "@type": "price"
              }
            }
          ]
        }
      ],
      "itemTerm": [
        {
          "description": "Tariff plan 12 Months commitment",
          "name": "12Months",
          "duration": {
            "amount": 12,
            "units": "month"
          }
        }
      ],
      "product": {
```

```json
      "isBundle": false,
      "@type": "Product",
      "productSpecification": {
        "id": "14395",
        "href": "https://host:port/productCatalogManagement/v4/productSpecification/14395",
        "name": "TMF Tariff plan",
        "version": "1",
        "@type": "ProductSpecificationRef"
      }
    },
    "productOffering": {
      "id": "14344",
      "href": "https://host:port/productCatalogManagement/v4/productOffering/14344",
      "name": "TMF Tariff Plan"
    },
    "productOrderItemRelationship": [
      {
        "id": "110",
        "relationshipType": "reliesOn"
      }
    ],
    "state": "completed",
    "@type": "ProductOrderItem"
  },
  {
    "id": "130",
    "quantity": 1,
    "action": "add",
    "product": {
      "isBundle": false,
      "@type": "Product",
      "productCharacteristic": [
        {
          "name": "CoverageOptions",
          "valueType": "string",
          "value": "National"
        }
      ],
      "productSpecification": {
        "id": "14353",
        "href": "https://host:port/productCatalogManagement/v4/productSpecification/14353",
        "name": "Coverage",
        "version": "1",
        "@type": "ProductSpecificationRef"
      }
    },
    "productOffering": {
      "id": "14354",
      "href": "https://host:port/productCatalogManagement/v4/productOffering/14354",
      "name": "Coverage Options"
    },
    "productOrderItemRelationship": [
      {
        "id": "110",
        "relationshipType": "reliesOn"
```

```
          }
        ],
        "state": "completed",
        "@type": "ProductOrderItem"
      }
    ],
    "relatedParty": [
      {
        "id": "456-dd-df45",
        "href": "https://host:port/partyManagement/v4/individual/456-dd-df45",
        "name": "Joe Doe",
        "role": "Seller",
        "@type": "RelatedParty",
        "@referredType": "Individual"
      },
      {
        "id": "ff55-hjy4",
        "href": "https://host:port/partyRoleManagement/v4/customer/ff55-hjy4",
        "name": "Jean Pontus",
        "@type": "RelatedParty",
        "@referredType": "Customer"
      }
    ],
    "state": "completed",
    "@type": "ProductOrder"
}
```

Cancel Product Order resource

Request for cancellation an existing product order.

Resource model
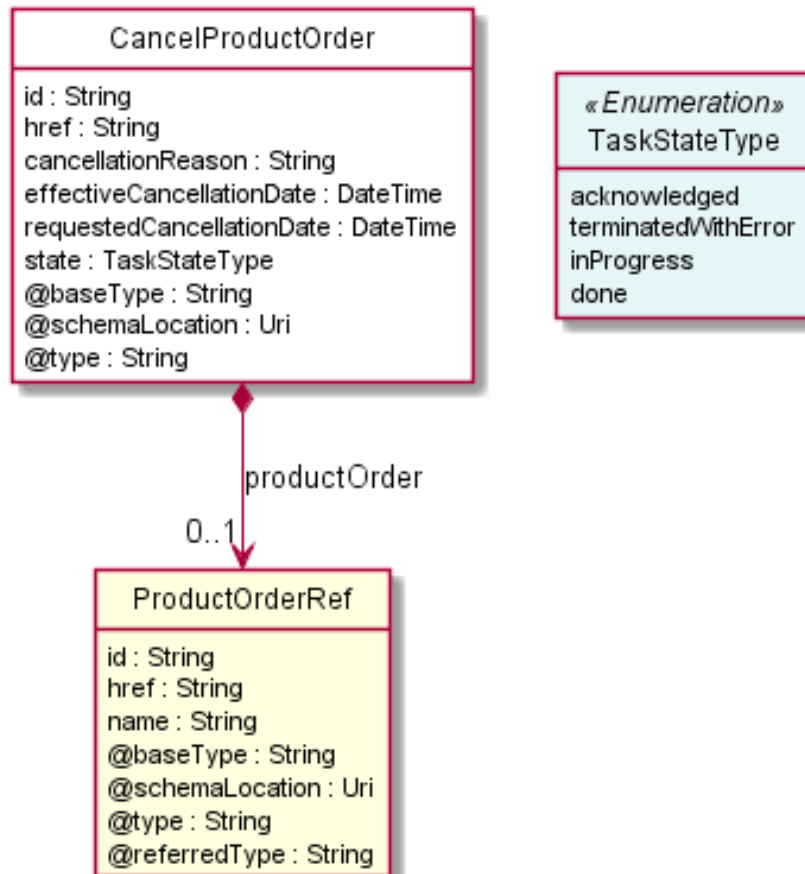
Lifecycle
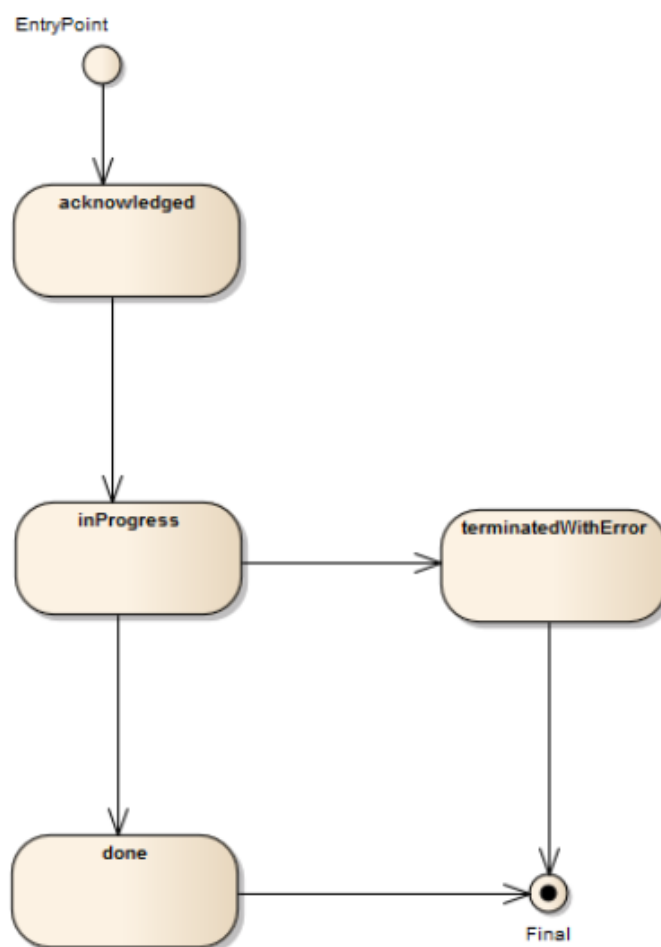
State	Definition
InProgress	The *In Progress* state is when the cancel request is currently in the hands of the SP sales team to assess customer cancel request.
Acknowledged	The acknowledged state is where a cancellation request has been received and has passed message and basic business validations.
TerminatedWith Error	The Cancellation Request could not be correctly completed by SP sales team. Cancel result is not available
Done	Cancellation request has been assessed and result available.

Field descriptions

CancelProductOrder fields

cancellationReason	A string. Reason why the order is cancelled.
effectiveCancellationDate	A date time (DateTime). Date when the order is cancelled.
href	A string. Hyperlink to access the cancellation request.
id	A string. id of the cancellation request (this is not an order id).
requestedCancellationDate	A date time (DateTime). Date when the submitter wants the order to be cancelled.
productOrder	A product order reference (ProductOrderRef). ProductOrder (ProductOrder) .The product order which the recommendation is related with.
state	A task state type (TaskStateType). Tracks the lifecycle status of the cancellation request, such as Acknowledged, Rejected, InProgress, Pending and so on.

ProductOrderRef relationship

ProductOrder (ProductOrder) .The product order which the recommendation is related with.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
href	A string. Reference of the related entity.
id	A string. Unique identifier of a related entity.
name	A string. Name of the related entity.

Json representation sample

We provide below the json representation of an example of a 'CancelProductOrder' resource object

```
{
  "id": "789-fsds5-kjp",
  "href": "https://{apiRoot}/productOrderingManagement/v4/cancelProductOrder/789-fsds5-kjp",
  "cancellationReason": "Duplicate order",
  "effectiveCancellationDate": "2019-04-30T12:58:35.489Z",
  "requestedCancellationDate": "2019-04-30T12:56:21.931Z",
  "productOrder": {
    "id": "45f-98f-ss45",
    "href": "https://host:port/productOrderingManagement/v4/productOrder/45f-98f-ss45",
    "@referredType": "ProductOrder"
  },
  "state": "done",
  "@type": "CancelProductOrder"
}
```

Notification Resource Models

8 notifications are defined for this API

Notifications related to ProductOrder:
   - ProductOrderCreateEvent
   - ProductOrderAttributeValueChangeEvent
   - ProductOrderDeleteEvent
   - ProductOrderStateChangeEvent
   - ProductOrderInformationRequiredEvent

Notifications related to CancelProductOrder:
   - CancelProductOrderCreateEvent
   - CancelProductOrderStateChangeEvent
   - CancelProductOrderInformationRequiredEvent

The notification structure for all notifications in this API follow the pattern depicted by the figure below.
A notification event resource (depicted by "SpecificEvent" placeholder) is a sub class of a generic Event structure containing at least an id of the event occurrence (eventId), an event timestamp (eventTime), and the name of the resource (eventType).
This notification structure owns an event payload structure ("SpecificEventPayload" placeholder) linked to the resource concerned by the notification using the resource name as access field ("resourceName" placeholder).
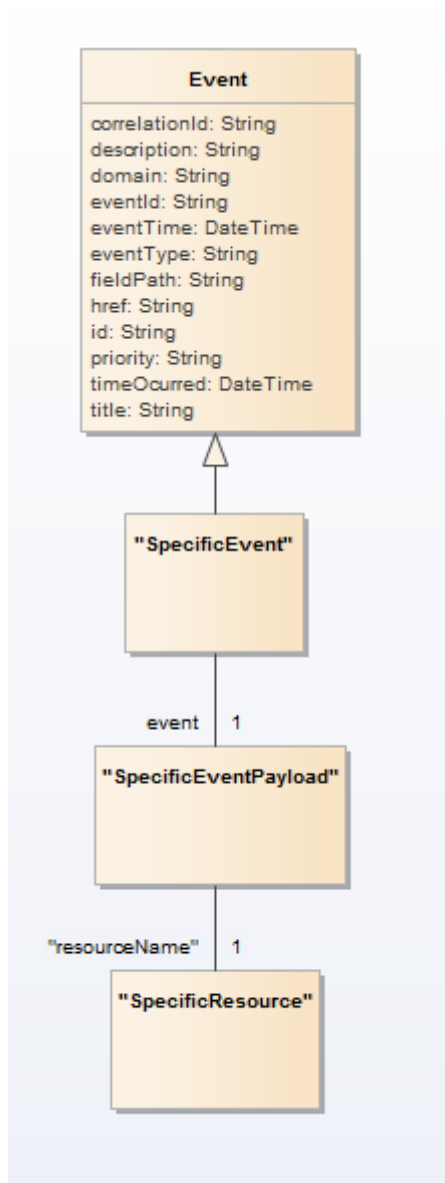
Product Order Create Event

Notification ProductOrderCreateEvent case for resource ProductOrder

Json representation sample

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

```
{
   "eventId":"00001",
   "eventTime":"2015-11-16T16:42:25-04:00",
   "eventType":"ProductOrderCreateEvent",
    "event": {
     "productOrder" :
        {-- SEE ProductOrder RESOURCE SAMPLE --}
   }
}
```

Product Order Attribute Value Change Event

Notification ProductOrderAttributeValueChangeEvent case for resource ProductOrder

Json representation sample

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

```
{
    "eventId":"00001",
    "eventTime":"2015-11-16T16:42:25-04:00",
    "eventType":"ProductOrderAttributeValueChangeEvent",
     "event": {
       "productOrder" :
          {-- SEE ProductOrder RESOURCE SAMPLE --}
    }
}
```

Product Order Delete Event

Notification ProductOrderDeleteEvent case for resource ProductOrder

Json representation sample

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

```
{
    "eventId":"00001",
    "eventTime":"2015-11-16T16:42:25-04:00",
    "eventType":"ProductOrderDeleteEvent",
     "event": {
       "productOrder" :
          {-- SEE ProductOrder RESOURCE SAMPLE --}
    }
}
```

Product Order State Change Event

Notification ProductOrderStateChangeEvent case for resource ProductOrder

Json representation sample

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

```
{
    "eventId":"00001",
```

```
    "eventTime":"2015-11-16T16:42:25-04:00",
    "eventType":"ProductOrderStateChangeEvent",
     "event": {
       "productOrder" :
          {-- SEE ProductOrder RESOURCE SAMPLE --}
     }
}
```

Product Order Information Required Event

Notification ProductOrderInformationRequiredEvent case for resource ProductOrder

Json representation sample

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

```
{
    "eventId":"00001",
    "eventTime":"2015-11-16T16:42:25-04:00",
    "eventType":"ProductOrderInformationRequiredEvent",
     "event": {
       "productOrder" :
          {-- SEE ProductOrder RESOURCE SAMPLE --}
     }
}
```

Cancel Product Order Create Event

Notification CancelProductOrderCreateEvent case for resource CancelProductOrder

Json representation sample

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

```
{
    "eventId":"00001",
    "eventTime":"2015-11-16T16:42:25-04:00",
    "eventType":"CancelProductOrderCreateEvent",
     "event": {
       "cancelProductOrder" :
          {-- SEE CancelProductOrder RESOURCE SAMPLE --}
     }
}
```

Cancel Product Order State Change Event

Notification CancelProductOrderStateChangeEvent case for resource CancelProductOrder

Json representation sample

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

```
{
    "eventId":"00001",
    "eventTime":"2015-11-16T16:42:25-04:00",
    "eventType":"CancelProductOrderStateChangeEvent",
     "event": {
        "cancelProductOrder" :
            {-- SEE CancelProductOrder RESOURCE SAMPLE --}
    }
}
```

Cancel Product Order Information Required Event

Notification CancelProductOrderInformationRequiredEvent case for resource CancelProductOrder

Json representation sample

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

```
{
    "eventId":"00001",
    "eventTime":"2015-11-16T16:42:25-04:00",
    "eventType":"CancelProductOrderInformationRequiredEvent",
     "event": {
        "cancelProductOrder" :
            {-- SEE CancelProductOrder RESOURCE SAMPLE --}
    }
}
```

API OPERATIONS

Document only allowed following operation:

Operation on Entities	Uniform API Operation	Description
Query Entities	GET productOrder GET cancelProductOrder	GET must be used to retrieve a representation of a resource.
Create Entity	POST productOrder	POST must be used to create a new resource
Partial Update of an Entity	PATCH productOrder	PATCH must be used to partially update a resource
Remove an Entity	DELETE productOrder	DELETE must be used to remove a resource
Execute an Action on an Entity	POST on TASK cancelProductOrder	POST must be used to execute Task Resources (cancel an order)
Other Request Methods	POST on TASK Resource	GET and POST must not be used to tunnel other request methods.

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

Notifications are also described in a subsequent section.

Operations on Product Order

List product orders

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

Description

This operation list product order entities.

Attribute selection is enabled for all first level attributes.

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

Usage Samples

Here's an example of a request for retrieving a list of product order(s). The given criteria is the category (B2C) and state (held).

Request
GET serverRoot/tmf-api/productOrderingManagement/v4/productOrder?fields=id,href,expectedCompletionDate&category=B2C&state=held Accept: application/json

Response

200
 	
`[`
`  {`
`    "id": "6987",`
`    "href": ".../productOrderingManagement/v4/productOrder/6987",`
`    "expectedCompletionDate": "2019-04-11T14:52:21.823Z"`
`  },`
`  {`
`    "id": "7412",`
`    "href": ".../productOrderingManagement/v4/productOrder/7412",`
`    "expectedCompletionDate": "2019-04-18T14:21:31.325Z"`
`  },`
`  {`
`    "id": "3214",`
`    "href": ".../productOrderingManagement/v4/productOrder/3214",`
`    "expectedCompletionDate": "2019-04-21T18:08:31.325Z"`
`  },`
`  {`
`    "id": "6547",`
`    "href": ".../productOrderingManagement/v4/productOrder/6547",`
`    "expectedCompletionDate": "2019-04-29T10:48:28.325Z"`
`  }`
`]`

Retrieve product order

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

Description

This operation retrieves a product order entity.
Attribute selection is enabled for all first level attributes.
Filtering on sub-resources may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving a product order for use case 1. The given criteria is the product order id 30001.

<table>
<tr><td>

Request

</td></tr>
<tr><td>

GET serverRoot/tmf-api/productOrderingManagement/v4/productOrder/30001
Accept: application/json

</td></tr>
<tr><td>

Response

</td></tr>
<tr><td>

200

```
{
    "id": "30001",
    "href": "https://host:port/productOrderingManagement/v4/productOrder/30001",
    "category": "B2C product order",
    "completionDate": "2019-05-02T08:13:59.506Z",
    "description": "Product Order illustration sample",
    "expectedCompletionDate": "2019-05-02T08:13:59.506Z",
    "externalId": "PO-456",
    "orderDate": "2019-04-30T08:13:59.506Z",
    "priority": "1",
    "requestedCompletionDate": "2019-05-02T08:13:59.506Z",
    "requestedStartDate": "2019-05-03T08:13:59.506Z",
    "channel": [
        {
            "id": "1",
            "role": "Used channel for order capture",
            "name": "Online chanel"
        }
    ],
    "note": [
        {
            "id": "1",
            "author": "Jean Pontus",
            "date": "2019-04-30T08:13:59.509Z",
            "text": "This is a TMF product order illustration"
        }
    ],
    "productOrderItem": [
```

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

```json
{
  "id": "100",
  "quantity": 1,
  "action": "add",
  "productOffering": {
    "id": "14277",
    "href": "https://host:port/productCatalogManagement/v4/productOffering/14277",
    "name": "TMF25"
  },
  "productOrderItemRelationship": [
    {
      "id": "110",
      "relationshipType": "bundles"
    },
    {
      "id": "120",
      "relationshipType": "bundles"
    },
    {
      "id": "130",
      "relationshipType": "bundles"
    }
  ],
  "state": "completed",
  "@type": "ProductOrderItem"
},
{
  "id": "110",
  "quantity": 1,
  "action": "add",
  "itemPrice": [
    {
      "description": "Access Fee",
      "name": "Access Fee",
      "priceType": "nonRecurring",
      "price": {
        "taxRate": 0,
        "dutyFreeAmount": {
          "unit": "EUR",
          "value": 0.99
        },
        "taxIncludedAmount": {
          "unit": "EUT",
          "value": 0.99
        }
      }
    }
  ],
  "payment": [
    {
      "id": "2365",
      "href": "https://host:port/paymentManagement/v4/cashPayment/2365",
      "name": "Cash payment for access fee",
      "@type": "CashPayment",
      "@referredType": "Payment"
```

```
        }
      ],
      "product": {
        "isBundle": false,
        "@type": "Product",
        "productCharacteristic": [
          {
            "name": "TEL_MSISDN",
            "valueType": "string",
            "value": "415 279 7439"
          }
        ],
        "productSpecification": {
          "id": "14307",
          "href": "https://host:port/productCatalogManagement/v4/productSpecification/14307",
          "name": "Mobile Telephony",
          "version": "1",
          "@type": "ProductSpecificationRef"
        }
      },
      "productOffering": {
        "id": "14305",
        "href": "https://host:port/productCatalogManagement/v4/productOffering/14305",
        "name": "TMF Mobile Telephony"
      },
      "state": "completed",
      "@type": "ProductOrderItem"
    },
    {
      "id": "120",
      "quantity": 1,
      "action": "add",
      "billingAccount": {
        "id": "1513",
        "href": "https://host:port/billingAccountManagement/v4/billingAccount/1513",
        "@type": "BillingAccount"
      },
      "itemPrice": [
        {
          "description": "Tariff plan monthly fee",
          "name": "MonthlyFee",
          "priceType": "recurring",
          "recurringChargePeriod": "month",
          "price": {
            "taxRate": 0,
            "dutyFreeAmount": {
              "unit": "EUR",
              "value": 20
            },
            "taxIncludedAmount": {
              "unit": "EUR",
              "value": 20
            }
          },
          "priceAlteration": [
```

```
                    {
                        "applicationDuration": 3,
                        "description": "20% for first 3 months",
                        "name": "WelcomeDiscount",
                        "priceType": "recurring",
                        "priority": 1,
                        "recurringChargePeriod": "month",
                        "price": {
                            "percentage": 20,
                            "taxRate": 0,
                            "@type": "price"
                        }
                    }
                ]
            }
        ],
        "itemTerm": [
            {
                "description": "Tariff plan 12 Months commitment",
                "name": "12Months",
                "duration": {
                    "amount": 12,
                    "units": "month"
                }
            }
        ],
        "product": {
            "isBundle": false,
            "@type": "Product",
            "productSpecification": {
                "id": "14395",
                "href": "https://host:port/productCatalogManagement/v4/productSpecification/14395",
                "name": "TMF Tariff plan",
                "version": "1",
                "@type": "ProductSpecificationRef"
            }
        },
        "productOffering": {
            "id": "14344",
            "href": "https://host:port/productCatalogManagement/v4/productOffering/14344",
            "name": "TMF Tariff Plan"
        },
        "productOrderItemRelationship": [
            {
                "id": "110",
                "relationshipType": "reliesOn"
            }
        ],
        "state": "completed",
        "@type": "ProductOrderItem"
    },
    {
        "id": "130",
        "quantity": 1,
        "action": "add",
```

```json
      "product": {
        "isBundle": false,
        "@type": "Product",
        "productCharacteristic": [
          {
            "name": "CoverageOptions",
            "valueType": "string",
            "value": "National"
          }
        ],
        "productSpecification": {
          "id": "14353",
          "href": "https://host:port/productCatalogManagement/v4/productSpecification/14353",
          "name": "Coverage",
          "version": "1",
          "@type": "ProductSpecificationRef"
        }
      },
      "productOffering": {
        "id": "14354",
        "href": "https://host:port/productCatalogManagement/v4/productOffering/14354",
        "name": "Coverage Options"
      },
      "productOrderItemRelationship": [
        {
          "id": "110",
          "relationshipType": "reliesOn"
        }
      ],
      "state": "completed",
      "@type": "ProductOrderItem"
    }
  ],
  "relatedParty": [
    {
      "id": "456-dd-df45",
      "href": "https://host:port/partyManagement/v4/individual/456-dd-df45",
      "name": "Joe Doe",
      "role": "Seller",
      "@type": "RelatedParty",
      "@referredType": "Individual"
    },
    {
      "id": "ff55-hjy4",
      "href": "https://host:port/partyRoleManagement/v4/customer/ff55-hjy4",
      "name": "Jean Pontus",
      "@type": "RelatedParty",
      "@referredType": "Customer"
    }
  ],
  "state": "completed",
  "@type": "ProductOrder"
}
```

Here's an example of a request for retrieving a product order for use case 2. The given criteria is the product order id 3774.

Request
GET serverRoot/tmf-api/productOrderingManagement/v4/productOrder/3774 Accept: application/json

Response

```
200

{
    "id": "3774",
    "href": "https://host:port/productOrderingManagement/v4/productOrder/3774",
    "category": "B2C product order",
    "description": "Product Order change illustration sample",
    "expectedCompletionDate": "2019-05-22T08:13:59.506Z",
    "externalId": "PO-457",
    "orderDate": "2019-04-30T08:13:59.506Z",
    "priority": "1",
    "requestedCompletionDate": "2019-05-22T08:13:59.506Z",
    "requestedStartDate": "2019-05-22T08:13:59.506Z",
    "channel": [
        {
            "id": "1",
            "role": "Used channel for order capture",
            "name": "Online chanel"
        }
    ],
    "note": [
        {
            "id": "1",
            "author": "Jean Pontus",
            "date": "2019-05-22T08:13:59.509Z",
            "text": "This is a TMF product order illustration to change existing product"
        }
    ],
    "productOrderItem": [
        {
            "id": "100",
            "quantity": 1,
            "action": "noChange",
            "product": {
                "id": "6000",
                "href": "https://host:port/productInventoryManagement/v4/product/6000"
            },
            "productOrderItemRelationship": [
                {
```

```json
          "id": "110",
          "relationshipType": "bundles"
        }
      ],
      "state": "inProgress",
      "@type": "ProductOrderItem"
    },
    {
      "id": "110",
      "quantity": 1,
      "action": "change",
      "product": {
        "id": "6003",
        "href": "https://host:port/productInventoryManagement/v4/product/6003",
        "@type": "Product",
        "productCharacteristic": [
          {
            "name": "CoverageOptions",
            "valueType": "string",
            "value": "International"
          }
        ],
        "productRelationship": [
          {
            "relationshipType": "reliesOn",
            "product": {
              "id": "6001",
              "href": "https://host:port/productInventoryManagement/v4/product/6001"
            }
          }
        ]
      },
      "state": "inProgress",
      "@type": "ProductOrderItem"
    }
  ],
  "relatedParty": [
    {
      "id": "456-dd-df45",
      "href": "https://host:port/partyManagement/v4/individual/456-dd-df45",
      "name": "Joe Doe",
      "role": "Seller",
      "@type": "RelatedParty",
      "@referredType": "Individual"
    },
    {
      "id": "ff55-hjy4",
      "href": "https://host:port/partyRoleManagement/v4/customer/ff55-hjy4",
      "name": "Jean Pontus",
      "@type": "RelatedParty",
      "@referredType": "Customer"
    }
  ],
  "state": "inProgress",
  "@type": "ProductOrder"
```

```
}
```

Create product order

POST /productOrder

Description

This operation creates a product order entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a ProductOrder, including any possible rule conditions and applicable default values. Notice that it is up to an implementer to add additional mandatory attributes.

Mandatory Attributes	Rule
productOrderItem	At least one productOrderItem must be present.

Non Mandatory Attributes	Rule
agreement	
billingAccount	
cancellationDate	
cancellationReason	
category	
channel	Channel role by default is 'submitChannel'
completionDate	
description	
expectedCompletionDate	
externalId	
note	
notificationContact	
orderDate	
orderTotalPrice	
payment	
priority	
productOfferingQualification	
quote	
relatedParty	
requestedCompletionDate	
requestedStartDate	
state	

Additional Rules

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

Context	Mandatory Sub-Attributes
productOrderItem	id, action
channel	id
note	text
quote	id
agreement	id
qualification	id
productOfferingQualificationItem	id, productOfferingQualificationId
appointment	id
productOffering	id
productOrderItemRelationship	id, relationshipType
payment	id
realizingService	id
realizingResource	id
relatedParty	referredType
billingAccount	id
productSpecification	id
productRelationship	relationshipType, product
productOfferingPrice	id

The following pre-conditions apply for this operation.

Pre-conditions
When creating a product order (post) an order should not have any of the following attributes cancellationDate, cancellationReason and orderDate valued
When creating a product order (post) an order should not have the state valued
When creating a product order (post) an order item should not have the state valued
Except specific change UC at least one related party must be provided

Usage Samples

Here's an example of a request for creating a product order for use case 1 - the resulting product order is 30001.

Request

POST serverRoot/tmf-api/productOrderingManagement/v4/productOrder
Content-Type: application/json
 	
{
   "category": "B2C product order",
   "description": "Product Order illustration sample",
   "externalId": "PO-456",
   "priority": "1",
   "requestedCompletionDate": "2019-05-02T08:13:59.506Z",

```
  "requestedStartDate": "2019-05-03T08:13:59.506Z",
  "channel": [
    {
      "id": "1",
      "role": "Used channel for order capture",
      "name": "Online chanel"
    }
  ],
  "note": [
    {
      "id": "1",
      "author": "Jean Pontus",
      "date": "2019-04-30T08:13:59.509Z",
      "text": "This is a TMF product order illustration"
    }
  ],
  "productOrderItem": [
    {
      "id": "100",
      "quantity": 1,
      "action": "add",
      "productOffering": {
        "id": "14277",
        "href": "https://host:port/productCatalogManagement/v4/productOffering/14277",
        "name": "TMF25"
      },
      "productOrderItemRelationship": [
        {
          "id": "110",
          "relationshipType": "bundles"
        },
        {
          "id": "120",
          "relationshipType": "bundles"
        },
        {
          "id": "130",
          "relationshipType": "bundles"
        }
      ],
      "@type": "ProductOrderItem"
    },
    {
      "id": "110",
      "quantity": 1,
      "action": "add",
      "itemPrice": [
        {
          "description": "Access Fee",
          "name": "Access Fee",
          "priceType": "nonRecurring",
          "price": {
            "taxRate": 0,
            "dutyFreeAmount": {
              "unit": "EUR",
```

```
                  "value": 0.99
                },
                "taxIncludedAmount": {
                  "unit": "EUT",
                  "value": 0.99
                }
              }
            }
          ],
          "payment": [
            {
              "id": "2365",
              "href": "https://host:port/paymentManagement/v4/cashPayment/2365",
              "name": "Cash payment for access fee",
              "@type": "CashPayment",
              "@referredType": "Payment"
            }
          ],
          "product": {
            "isBundle": false,
            "@type": "Product",
            "productCharacteristic": [
              {
                "name": "TEL_MSISDN",
                "valueType": "string",
                "value": "415 279 7439"
              }
            ],
            "productSpecification": {
              "id": "14307",
              "href": "https://host:port/productCatalogManagement/v4/productSpecification/14307",
              "name": "Mobile Telephony",
              "version": "1",
              "@type": "ProductSpecificationRef"
            }
          },
          "productOffering": {
            "id": "14305",
            "href": "https://host:port/productCatalogManagement/v4/productOffering/14305",
            "name": "TMF Mobile Telephony"
          },
          "@type": "ProductOrderItem"
        },
        {
          "id": "120",
          "quantity": 1,
          "action": "add",
          "billingAccount": {
            "id": "1513",
            "href": "https://host:port/billingAccountManagement/v4/billingAccount/1513",
            "@type": "BillingAccount"
          },
          "itemPrice": [
            {
              "description": "Tariff plan monthly fee",
```

```
                "name": "MonthlyFee",
                "priceType": "recurring",
                "recurringChargePeriod": "month",
                "price": {
                  "taxRate": 0,
                  "dutyFreeAmount": {
                    "unit": "EUR",
                    "value": 20
                  },
                  "taxIncludedAmount": {
                    "unit": "EUR",
                    "value": 20
                  }
                },
                "priceAlteration": [
                  {
                    "applicationDuration": 3,
                    "description": "20% for first 3 months",
                    "name": "WelcomeDiscount",
                    "priceType": "recurring",
                    "priority": 1,
                    "recurringChargePeriod": "month",
                    "price": {
                      "percentage": 20,
                      "taxRate": 0,
                      "@type": "price"
                    }
                  }
                ]
              }
            ],
            "itemTerm": [
              {
                "description": "Tariff plan 12 Months commitment",
                "name": "12Months",
                "duration": {
                  "amount": 12,
                  "units": "month"
                }
              }
            ],
            "product": {
              "isBundle": false,
              "@type": "Product",
              "productSpecification": {
                "id": "14395",
                "href": "https://host:port/productCatalogManagement/v4/productSpecification/14395",
                "name": "TMF Tariff plan",
                "version": "1",
                "@type": "ProductSpecificationRef"
              }
            },
            "productOffering": {
              "id": "14344",
              "href": "https://host:port/productCatalogManagement/v4/productOffering/14344",
```

```json
          "name": "TMF Tariff Plan"
        },
        "productOrderItemRelationship": [
          {
            "id": "110",
            "relationshipType": "reliesOn"
          }
        ],
        "@type": "ProductOrderItem"
      },
      {
        "id": "130",
        "quantity": 1,
        "action": "add",
        "product": {
          "isBundle": false,
          "@type": "Product",
          "productCharacteristic": [
            {
              "name": "CoverageOptions",
              "valueType": "string",
              "value": "National"
            }
          ],
          "productSpecification": {
            "id": "14353",
            "href": "https://host:port/productCatalogManagement/v4/productSpecification/14353",
            "name": "Coverage",
            "version": "1",
            "@type": "ProductSpecificationRef"
          }
        },
        "productOffering": {
          "id": "14354",
          "href": "https://host:port/productCatalogManagement/v4/productOffering/14354",
          "name": "Coverage Options"
        },
        "productOrderItemRelationship": [
          {
            "id": "110",
            "relationshipType": "reliesOn"
          }
        ],
        "@type": "ProductOrderItem"
      }
    ],
    "relatedParty": [
      {
        "id": "456-dd-df45",
        "href": "https://host:port/partyManagement/v4/individual/456-dd-df45",
        "name": "Joe Doe",
        "role": "Seller",
        "@type": "RelatedParty",
        "@referredType": "Individual"
      },
```

```
            {
                "id": "ff55-hjy4",
                "href": "https://host:port/partyRoleManagement/v4/customer/ff55-hjy4",
                "name": "Jean Pontus",
                "@type": "RelatedParty",
                "@referredType": "Customer"
            }
        ],
        "@type": "ProductOrder"
}
```

Response

```
201

{
    "id": "30001",
    "href": "https://host:port/productOrderingManagement/v4/productOrder/30001",
    "category": "B2C product order",
    "description": "Product Order illustration sample",
    "expectedCompletionDate": "2019-05-02T08:13:59.506Z",
    "externalId": "PO-456",
    "orderDate": "2019-04-30T08:13:59.506Z",
    "priority": "1",
    "requestedCompletionDate": "2019-05-02T08:13:59.506Z",
    "requestedStartDate": "2019-05-03T08:13:59.506Z",
    "channel": [
        {
            "id": "1",
            "role": "Used channel for order capture",
            "name": "Online chanel"
        }
    ],
    "note": [
        {
            "id": "1",
            "author": "Jean Pontus",
            "date": "2019-04-30T08:13:59.509Z",
            "text": "This is a TMF product order illustration"
        }
    ],
    "productOrderItem": [
        {
            "id": "100",
            "quantity": 1,
            "action": "add",
            "productOffering": {
                "id": "14277",
                "href": "https://host:port/productCatalogManagement/v4/productOffering/14277",
                "name": "TMF25"
            },
            "productOrderItemRelationship": [
```

```
          {
            "id": "110",
            "relationshipType": "bundles"
          },
          {
            "id": "120",
            "relationshipType": "bundles"
          },
          {
            "id": "130",
            "relationshipType": "bundles"
          }
        ],
        "state": "acknowledged",
        "@type": "ProductOrderItem"
      },
      {
        "id": "110",
        "quantity": 1,
        "action": "add",
        "itemPrice": [
          {
            "description": "Access Fee",
            "name": "Access Fee",
            "priceType": "nonRecurring",
            "price": {
              "taxRate": 0,
              "dutyFreeAmount": {
                "unit": "EUR",
                "value": 0.99
              },
              "taxIncludedAmount": {
                "unit": "EUT",
                "value": 0.99
              }
            }
          }
        ],
        "payment": [
          {
            "id": "2365",
            "href": "https://host:port/paymentManagement/v4/cashPayment/2365",
            "name": "Cash payment for access fee",
            "@type": "CashPayment",
            "@referredType": "Payment"
          }
        ],
        "product": {
          "isBundle": false,
          "@type": "Product",
          "productCharacteristic": [
            {
              "name": "TEL_MSISDN",
              "valueType": "string",
              "value": "415 279 7439"
```

```
        }
      ],
      "productSpecification": {
        "id": "14307",
        "href": "https://host:port/productCatalogManagement/v4/productSpecification/14307",
        "name": "Mobile Telephony",
        "version": "1",
        "@type": "ProductSpecificationRef"
      }
    },
    "productOffering": {
      "id": "14305",
      "href": "https://host:port/productCatalogManagement/v4/productOffering/14305",
      "name": "TMF Mobile Telephony"
    },
    "state": "acknowledged",
    "@type": "ProductOrderItem"
  },
  {
    "id": "120",
    "quantity": 1,
    "action": "add",
    "billingAccount": {
      "id": "1513",
      "href": "https://host:port/billingAccountManagement/v4/billingAccount/1513",
      "@type": "BillingAccount"
    },
    "itemPrice": [
      {
        "description": "Tariff plan monthly fee",
        "name": "MonthlyFee",
        "priceType": "recurring",
        "recurringChargePeriod": "month",
        "price": {
          "taxRate": 0,
          "dutyFreeAmount": {
            "unit": "EUR",
            "value": 20
          },
          "taxIncludedAmount": {
            "unit": "EUR",
            "value": 20
          }
        },
        "priceAlteration": [
          {
            "applicationDuration": 3,
            "description": "20% for first 3 months",
            "name": "WelcomeDiscount",
            "priceType": "recurring",
            "priority": 1,
            "recurringChargePeriod": "month",
            "price": {
              "percentage": 20,
              "taxRate": 0,
```

```
                    "@type": "price"
                  }
              }
            ]
        }
      ],
      "itemTerm": [
        {
          "description": "Tariff plan 12 Months commitment",
          "name": "12Months",
          "duration": {
            "amount": 12,
            "units": "month"
          }
        }
      ],
      "product": {
        "isBundle": false,
        "@type": "Product",
        "productSpecification": {
          "id": "14395",
          "href": "https://host:port/productCatalogManagement/v4/productSpecification/14395",
          "name": "TMF Tariff plan",
          "version": "1",
          "@type": "ProductSpecificationRef"
        }
      },
      "productOffering": {
        "id": "14344",
        "href": "https://host:port/productCatalogManagement/v4/productOffering/14344",
        "name": "TMF Tariff Plan"
      },
      "productOrderItemRelationship": [
        {
          "id": "110",
          "relationshipType": "reliesOn"
        }
      ],
      "state": "acknowledged",
      "@type": "ProductOrderItem"
    },
    {
      "id": "130",
      "quantity": 1,
      "action": "add",
      "product": {
        "isBundle": false,
        "@type": "Product",
        "productCharacteristic": [
          {
            "name": "CoverageOptions",
            "valueType": "string",
            "value": "National"
          }
        ],
```

```
            "productSpecification": {
               "id": "14353",
               "href": "https://host:port/productCatalogManagement/v4/productSpecification/14353",
               "name": "Coverage",
               "version": "1",
               "@type": "ProductSpecificationRef"
            }
         },
         "productOffering": {
            "id": "14354",
            "href": "https://host:port/productCatalogManagement/v4/productOffering/14354",
            "name": "Coverage Options"
         },
         "productOrderItemRelationship": [
            {
               "id": "110",
               "relationshipType": "reliesOn"
            }
         ],
         "state": "acknowledged",
         "@type": "ProductOrderItem"
      }
   ],
   "relatedParty": [
      {
         "id": "456-dd-df45",
         "href": "https://host:port/partyManagement/v4/individual/456-dd-df45",
         "name": "Joe Doe",
         "role": "Seller",
         "@type": "RelatedParty",
         "@referredType": "Individual"
      },
      {
         "id": "ff55-hjy4",
         "href": "https://host:port/partyRoleManagement/v4/customer/ff55-hjy4",
         "name": "Jean Pontus",
         "@type": "RelatedParty",
         "@referredType": "Customer"
      }
   ],
   "state": "acknowledged",
   "@type": "ProductOrder"
}
```

Here's an example of a request for ordering a product described via schema and not using characteristic

Request

```
POST serverRoot/tmf-api/productOrderingManagement/v4/productOrder
Content-Type: application/json

{
```

```json
    "category": "B2B product order",
    "description": "Product Order illustration sample",
    "externalId": "PO-785",
    "priority": "1",
    "requestedCompletionDate": "2019-05-02T08:13:59.506Z",
    "requestedStartDate": "2019-05-03T08:13:59.506Z",
    "productOrderItem": [
      {
        "id": "110",
        "quantity": 1,
        "action": "add",
        "product": {
          " isBundle": false,
          "@type": "UNI",
          "productSpecification": {
            "id": "dfg-56d",
            "href": "https...",
            "version": "v2",
            "name": "UNI specification",
            "targetProductSchema": {
              "@type": "UNI",
              "@schemaLocation": "https://github.com/..UNISpec.json"
            }
          },
          "buyerId": "AF001",
          "physicalLayer": "10BASE-T",
          "synchronousModeEnabled": true,
          "numberOfLinks": 1,
          "tokenShareEnabled": true,
          "uniResiliency": "NONE",
          "maxServiceFrameSize": 1256
        },
        "@type": "ProductOrderItem"
      }
    ],
    "relatedParty": [
      {
        "id": "456-dd-df45",
        "href": "https://host:port/partyManagement/v4/individual/456-dd-df45",
        "name": "Joe Doe",
        "role": "Seller",
        "@type": "RelatedParty",
        "@referredType": "Individual"
      },
      {
        "id": "ff55-hjy4",
        "href": "https://host:port/partyRoleManagement/v4/customer/ff55-hjy4",
        "name": "Jean Pontus",
        "@type": "RelatedParty",
        "@referredType": "Customer"
      }
    ],
    "@type": "ProductOrder"
}
```

Response

201

```json
{
    "id": "30002",
    "href": "https://host:port/productOrderingManagement/v4/productOrder/30002",
    "category": "B2B product order",
    "description": "Product Order illustration sample",
    "expectedCompletionDate": "2019-05-02T08:13:59.506Z",
    "externalId": "PO-785",
    "orderDate": "2019-04-30T08:13:59.506Z",
    "priority": "1",
    "requestedCompletionDate": "2019-05-02T08:13:59.506Z",
    "requestedStartDate": "2019-05-03T08:13:59.506Z",
    "productOrderItem": [
        {
            "id": "110",
            "quantity": 1,
            "action": "add",
            "product": {
                " isBundle": false,
                "@type": "UNI",
                "productSpecification": {
                    "id": "dfg-56d",
                    "href": "https...",
                    "version": "v2",
                    "name": "UNI specification",
                    "targetProductSchema": {
                        "@type": "UNI",
                        "@schemaLocation": "https://github.com/..UNISpec.json"
                    }
                },
                "buyerId": "AF001",
                "physicalLayer": "10BASE-T",
                "synchronousModeEnabled": true,
                "numberOfLinks": 1,
                "tokenShareEnabled": true,
                "uniResiliency": "NONE",
                "maxServiceFrameSize": 1256
            },
            "state": "acknowledged",
            "@type": "ProductOrderItem"
        }
    ],
    "relatedParty": [
        {
            "id": "456-dd-df45",
            "href": "https://host:port/partyManagement/v4/individual/456-dd-df45",
            "name": "Joe Doe",
            "role": "Seller",
            "@type": "RelatedParty",
```

```
        "@referredType": "Individual"
      },
      {
        "id": "ff55-hjy4",
        "href": "https://host:port/partyRoleManagement/v4/customer/ff55-hjy4",
        "name": "Jean Pontus",
        "@type": "RelatedParty",
        "@referredType": "Customer"
      }
    ],
    "state": "acknowledged",
    "@type": "ProductOrder"
}
```

Patch product order

PATCH /productOrder/{id}

Description

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

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

Patchable and Non Patchable Attributes

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

Patchable Attributes	Rule
agreement	
billingAccount	
cancellationDate	
cancellationReason	
category	
channel	
completionDate	
description	
expectedCompletionDate	
externalId	
note	
notificationContact	
orderTotalPrice	
payment	
priority	

productOfferingQualification	
productOrderItem	
quote	
relatedParty	
requestedCompletionDate	
requestedStartDate	
state	

Non Patchable Attributes	Rule
id	
href	
orderDate	

Additional Rules

The following pre-conditions apply for this operation.

Pre-conditions
When creating a product order (post) an order should not have any of the following attributes cancellationDate, cancellationReason and orderDate valued
When creating a product order (post) an order should not have the state valued
When creating a product order (post) an order item should not have the state valued

Usage Samples

Here's an example of a request for updating a product order for use case 1 - Change value for billing account id. Assumptions: the product order state allow this on the fly modification - the full resource representation is sent in PATCH response

---

Request

```
PATCH serverRoot/tmf-api/productOrderingManagement/v4/productOrder/30001
Content-Type: application/json-patch+json

[
  {
    "op": "replace",
    "path": "/productOrderItem/billingAccount/id?productOrderItem.id=120",
    "value": "1889"
  },
  {
    "op": "replace",
    "path": "/productOrderItem/billingAccount/href?productOrderItem.id=120",
    "value": "https://host:port/billingAccountManagement/v4/billingAccount/1889"
  }
]
```

Response

200

```json
{
  "id": "30001",
  "href": "https://host:port/productOrderingManagement/v4/productOrder/30001",
  "category": "B2C product order",
  "description": "Product Order illustration sample",
  "expectedCompletionDate": "2019-05-02T08:13:59.506Z",
  "externalId": "PO-456",
  "orderDate": "2019-04-30T08:13:59.506Z",
  "priority": "1",
  "requestedCompletionDate": "2019-05-02T08:13:59.506Z",
  "requestedStartDate": "2019-05-03T08:13:59.506Z",
  "channel": [
    {
      "id": "1",
      "name": "Online chanel"
    }
  ],
  "note": [
    {
      "id": "1",
      "author": "Jean Pontus",
      "date": "2019-04-30T08:13:59.509Z",
      "text": "This is a TMF product order illustration"
    }
  ],
  "productOrderItem": [
    {
      "id": "100",
      "quantity": 1,
      "action": "add",
      "productOffering": {
        "id": "14277",
        "href": "https://host:port/productCatalogManagement/v4/productOffering/14277",
        "name": "TMF25"
      },
      "productOrderItemRelationship": [
        {
          "id": "110",
          "relationshipType": "bundles"
        },
        {
          "id": "120",
          "relationshipType": "bundles"
        },
        {
          "id": "130",
          "relationshipType": "bundles"
        }
```

```
        ],
        "state": "acknowledged",
        "@type": "ProductOrderItem"
    },
    {
        "id": "110",
        "quantity": 1,
        "action": "add",
        "itemPrice": [
            {
                "description": "Access Fee",
                "name": "Access Fee",
                "priceType": "nonRecurring",
                "price": {
                    "taxRate": 0,
                    "dutyFreeAmount": {
                        "unit": "EUR",
                        "value": 0.99
                    },
                    "taxIncludedAmount": {
                        "unit": "EUT",
                        "value": 0.99
                    }
                }
            }
        ],
        "payment": [
            {
                "id": "2365",
                "href": "https://host:port/paymentManagement/v4/cashPayment/2365",
                "name": "Cash payment for access fee",
                "@type": "CashPayment",
                "@referredType": "Payment"
            }
        ],
        "product": {
            "isBundle": false,
            "@type": "Product",
            "productCharacteristic": [
                {
                    "name": "TEL_MSISDN",
                    "valueType": "string",
                    "value": "415 279 7439"
                }
            ],
            "productSpecification": {
                "id": "14307",
                "href": "https://host:port/productCatalogManagement/v4/productSpecification/14307",
                "name": "Mobile Telephony",
                "version": "1",
                "@type": "ProductSpecificationRef"
            }
        },
        "productOffering": {
            "id": "14305",
```

```
        "href": "https://host:port/productCatalogManagement/v4/productOffering/14305",
        "name": "TMF Mobile Telephony"
      },
      "state": "acknowledged",
      "@type": "ProductOrderItem"
    },
    {
      "id": "120",
      "quantity": 1,
      "action": "add",
      "billingAccount": {
        "id": "1889",
        "href": "https://host:port/billingAccountManagement/v4/billingAccount/1889",
        "@type": "BillingAccount"
      },
      "itemPrice": [
        {
          "description": "Tariff plan monthly fee",
          "name": "MonthlyFee",
          "priceType": "recurring",
          "recurringChargePeriod": "month",
          "price": {
            "taxRate": 0,
            "dutyFreeAmount": {
              "unit": "EUR",
              "value": 20
            },
            "taxIncludedAmount": {
              "unit": "EUR",
              "value": 20
            }
          },
          "priceAlteration": [
            {
              "applicationDuration": 3,
              "description": "20% for first 3 months",
              "name": "WelcomeDiscount",
              "priceType": "recurring",
              "priority": 1,
              "recurringChargePeriod": "month",
              "price": {
                "percentage": 20,
                "taxRate": 0,
                "@baseType": "string",
                "@schemaLocation": "string",
                "@type": "string"
              }
            }
          ]
        }
      ],
      "itemTerm": [
        {
          "description": "Tariff plan 12 Months commitment",
          "name": "12Months",
```

```
            "duration": {
               "amount": 12,
               "units": "month"
            }
         }
      ],
      "product": {
         "isBundle": false,
         "@type": "Product",
         "productSpecification": {
            "id": "14395",
            "href": "https://host:port/productCatalogManagement/v4/productSpecification/14395",
            "name": "TMF Tariff plan",
            "version": "1",
            "@type": "ProductSpecificationRef"
         }
      },
      "productOffering": {
         "id": "14344",
         "href": "https://host:port/productCatalogManagement/v4/productOffering/14344",
         "name": "TMF Tariff Plan"
      },
      "productOrderItemRelationship": [
         {
            "id": "110",
            "relationshipType": "reliesOn"
         }
      ],
      "state": "acknowledged",
      "@type": "ProductOrderItem"
   },
   {
      "id": "130",
      "quantity": 1,
      "action": "add",
      "product": {
         "isBundle": false,
         "@type": "Product",
         "productCharacteristic": [
            {
               "name": "CoverageOptions",
               "valueType": "string",
               "value": "National"
            }
         ],
         "productSpecification": {
            "id": "14353",
            "href": "https://host:port/productCatalogManagement/v4/productSpecification/14353",
            "name": "Coverage",
            "version": "1",
            "@type": "ProductSpecificationRef"
         }
      },
      "productOffering": {
         "id": "14354",
```

```
          "href": "https://host:port/productCatalogManagement/v4/productOffering/14354",
          "name": "Coverage Options"
        },
        "productOrderItemRelationship": [
          {
            "id": "110",
            "relationshipType": "reliesOn"
          }
        ],
        "state": "acknowledged",
        "@type": "ProductOrderItem"
      }
    ],
    "relatedParty": [
      {
        "id": "456-dd-df45",
        "href": "https://host:port/partyManagement/v4/individual/456-dd-df45",
        "name": "Joe Doe",
        "role": "Seller",
        "@type": "Individual"
      },
      {
        "id": "ff55-hjy4",
        "href": "https://host:port/partyRoleManagement/v4/customer/ff55-hjy4",
        "name": "Jean Pontus",
        "@type": "Customer",
        "@referredType": "PartyRole"
      }
    ],
    "state": "acknowledged",
    "@type": "ProductOrder"
}
```

Here's an example of a request for updating a product order for use case 1 - Change value for billing account id. Assumptions: the product order state allow this on the fly modification - the full resource representation is sent in PATCH response

Request

```
PATCH serverRoot/tmf-api/productOrderingManagement/v4/productOrder/30001
Content-Type: application/merge-patch+json

{
  "id": "30001",
  "productOrderItem": [
    {
      "id": "100",
      "quantity": 1,
      "action": "add",
      "@type": "ProductOrderItem"
    },
```

```
      {
        "id": "110",
        "quantity": 1,
        "action": "add",
        "@type": "ProductOrderItem"
      },
      {
        "id": "120",
        "quantity": 1,
        "action": "add",
        "billingAccount": {
          "id": "1889",
          "href": "https://host:port/billingAccountManagement/v4/billingAccount/1889",
          "@type": "BillingAccount"
        },
        "@type": "ProductOrderItem"
      },
      {
        "id": "130",
        "quantity": 1,
        "action": "add",
        "@type": "ProductOrderItem"
      }
  ],
  "@type": "ProductOrder"
}
```

Response

```
200

{
  "id": "30001",
  "href": "https://host:port/productOrderingManagement/v4/productOrder/30001",
  "category": "B2C product order",
  "description": "Product Order illustration sample",
  "expectedCompletionDate": "2019-05-02T08:13:59.506Z",
  "externalId": "PO-456",
  "orderDate": "2019-04-30T08:13:59.506Z",
  "priority": "1",
  "requestedCompletionDate": "2019-05-02T08:13:59.506Z",
  "requestedStartDate": "2019-05-03T08:13:59.506Z",
  "channel": [
    {
      "id": "1",
      "name": "Online chanel"
    }
  ],
  "note": [
    {
      "id": "1",
      "author": "Jean Pontus",
```

```json
      "date": "2019-04-30T08:13:59.509Z",
      "text": "This is a TMF product order illustration"
    }
  ],
  "productOrderItem": [
    {
      "id": "100",
      "quantity": 1,
      "action": "add",
      "productOffering": {
        "id": "14277",
        "href": "https://host:port/productCatalogManagement/v4/productOffering/14277",
        "name": "TMF25"
      },
      "productOrderItemRelationship": [
        {
          "id": "110",
          "relationshipType": "bundles"
        },
        {
          "id": "120",
          "relationshipType": "bundles"
        },
        {
          "id": "130",
          "relationshipType": "bundles"
        }
      ],
      "state": "acknowledged",
      "@type": "ProductOrderItem"
    },
    {
      "id": "110",
      "quantity": 1,
      "action": "add",
      "itemPrice": [
        {
          "description": "Access Fee",
          "name": "Access Fee",
          "priceType": "nonRecurring",
          "price": {
            "taxRate": 0,
            "dutyFreeAmount": {
              "unit": "EUR",
              "value": 0.99
            },
            "taxIncludedAmount": {
              "unit": "EUT",
              "value": 0.99
            }
          }
        }
      ],
      "payment": [
        {
```

```
                    "id": "2365",
                    "href": "https://host:port/paymentManagement/v4/cashPayment/2365",
                    "name": "Cash payment for access fee",
                    "@type": "CashPayment",
                    "@referredType": "Payment"
                }
            ],
            "product": {
                "isBundle": false,
                "@type": "Product",
                "productCharacteristic": [
                    {
                        "name": "TEL_MSISDN",
                        "valueType": "string",
                        "value": "415 279 7439"
                    }
                ],
                "productSpecification": {
                    "id": "14307",
                    "href": "https://host:port/productCatalogManagement/v4/productSpecification/14307",
                    "name": "Mobile Telephony",
                    "version": "1",
                    "@type": "ProductSpecificationRef"
                }
            },
            "productOffering": {
                "id": "14305",
                "href": "https://host:port/productCatalogManagement/v4/productOffering/14305",
                "name": "TMF Mobile Telephony"
            },
            "state": "acknowledged",
            "@type": "ProductOrderItem"
        },
        {
            "id": "120",
            "quantity": 1,
            "action": "add",
            "billingAccount": {
                "id": "1889",
                "href": "https://host:port/billingAccountManagement/v4/billingAccount/1889",
                "@type": "BillingAccount"
            },
            "itemPrice": [
                {
                    "description": "Tariff plan monthly fee",
                    "name": "MonthlyFee",
                    "priceType": "recurring",
                    "recurringChargePeriod": "month",
                    "price": {
                        "taxRate": 0,
                        "dutyFreeAmount": {
                            "unit": "EUR",
                            "value": 20
                        },
                        "taxIncludedAmount": {
```

```
                "unit": "EUR",
                "value": 20
              }
            },
            "priceAlteration": [
              {
                "applicationDuration": 3,
                "description": "20% for first 3 months",
                "name": "WelcomeDiscount",
                "priceType": "recurring",
                "priority": 1,
                "recurringChargePeriod": "month",
                "price": {
                  "percentage": 20,
                  "taxRate": 0,
                  "@baseType": "string",
                  "@schemaLocation": "string",
                  "@type": "string"
                }
              }
            ]
          }
        ],
        "itemTerm": [
          {
            "description": "Tariff plan 12 Months commitment",
            "name": "12Months",
            "duration": {
              "amount": 12,
              "units": "month"
            }
          }
        ],
        "product": {
          "isBundle": false,
          "@type": "Product",
          "productSpecification": {
            "id": "14395",
            "href": "https://host:port/productCatalogManagement/v4/productSpecification/14395",
            "name": "TMF Tariff plan",
            "version": "1",
            "@type": "ProductSpecificationRef"
          }
        },
        "productOffering": {
          "id": "14344",
          "href": "https://host:port/productCatalogManagement/v4/productOffering/14344",
          "name": "TMF Tariff Plan"
        },
        "productOrderItemRelationship": [
          {
            "id": "110",
            "relationshipType": "reliesOn"
          }
        ],
```

```json
        "state": "acknowledged",
        "@type": "ProductOrderItem"
      },
      {
        "id": "130",
        "quantity": 1,
        "action": "add",
        "product": {
          "isBundle": false,
          "@type": "Product",
          "productCharacteristic": [
            {
              "name": "CoverageOptions",
              "valueType": "string",
              "value": "National"
            }
          ],
          "productSpecification": {
            "id": "14353",
            "href": "https://host:port/productCatalogManagement/v4/productSpecification/14353",
            "name": "Coverage",
            "version": "1",
            "@type": "ProductSpecificationRef"
          }
        },
        "productOffering": {
          "id": "14354",
          "href": "https://host:port/productCatalogManagement/v4/productOffering/14354",
          "name": "Coverage Options"
        },
        "productOrderItemRelationship": [
          {
            "id": "110",
            "relationshipType": "reliesOn"
          }
        ],
        "state": "acknowledged",
        "@type": "ProductOrderItem"
      }
    ],
    "relatedParty": [
      {
        "id": "456-dd-df45",
        "href": "https://host:port/partyManagement/v4/individual/456-dd-df45",
        "name": "Joe Doe",
        "role": "Seller",
        "@type": "Individual"
      },
      {
        "id": "ff55-hjy4",
        "href": "https://host:port/partyRoleManagement/v4/customer/ff55-hjy4",
        "name": "Jean Pontus",
        "@type": "Customer",
        "@referredType": "PartyRole"
      }
```

```
    ],
    "state": "acknowledged",
    "@type": "ProductOrder"
}
```

Delete product order

DELETE /productOrder/{id}

Description

This operation deletes a product order entity.

Usage Samples

Here's an example of a request for deleting a product order.

Request
DELETE serverRoot/tmf-api/productOrderingManagement/v4/productOrder/3774

Response
204

Operations on Cancel Product Order

List cancel product orders

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

Description

This operation list cancel product order entities.
Attribute selection is enabled for all first level attributes.
Filtering may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a request for retrieving a list of product order cancel request(s). The given criteria is the cancel request state (done).

Request
GET serverRoot/tmf-api/productOrderingManagement/v4/cancelProductOrder?fields=id,productOrder.id,productOrder.href&state=done Accept: application/json

Response

200
 	
[
  {
    "id": "6987",
    "productOrder": {
      "id": "45f-98f-ss45",
      "href": "https://host:port/productOrderingManagement/v4/productOrder/45f-98f-ss45"
    }
  },
  {
    "id": "7412",
    "productOrder": {
      "id": "45f-789-sdre",
      "href": "https://host:port/productOrderingManagement/v4/productOrder/45f-789-sdre"
    }
  },
  {
    "id": "3214",
    "productOrder": {
      "id": "45f-as4-os3f",
      "href": "https://host:port/productOrderingManagement/v4/productOrder/45f-as4-os3f"
    }
  }
]

Retrieve cancel product order

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

Description

This operation retrieves a cancel product order entity.
Attribute selection is enabled for all first level attributes.
Filtering on sub-resources may be available depending on the compliance level supported by an implementation.

Usage Samples

Here's an example of a cancel product order request retrieval. The given criteria is the product order request cancel id 789-fsds5-kjp.

Request
GET serverRoot/tmf-api/productOrderingManagement/v4/cancelProductOrder/789-fsds5-kjp Accept: application/json
Response

200
 	
{
   "id": "789-fsds5-kjp",
   "href": "https://host:port/productOrderingManagement/v4/cancelProductOrder/789-fsds5-kjp",
   "cancellationReason": "Duplicate order",
   "effectiveCancellationDate": "2019-04-30T12:58:35.489Z",
   "requestedCancellationDate": "2019-04-30T12:56:21.931Z",
   "productOrder": {
      "id": "45f-98f-ss45",
      "href": "https://host:port/productOrderingManagement/v4/productOrder/45f-98f-ss45",
      "@referredType": "ProductOrder"
   },
   "state": "done",
   "@type": "CancelProductorder"
}

Create cancel product order

POST /cancelProductOrder

Description

This operation creates a cancel product order entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a CancelProductOrder, including any possible rule conditions and applicable default values. Notice that it is up to an implementer to add additional mandatory attributes.

Mandatory Attributes	Rule
productOrder	

Non Mandatory Attributes	Rule
cancellationReason	
effectiveCancellationDate	
requestedCancellationDate	
state	

Additional Rules

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

Context	Mandatory Sub-Attributes
productOrder	id

The following pre-conditions apply for this operation.

Pre-conditions
product order id must exist

Usage Samples

Here's an example of a request for cancel a product order - the resulting product order cancellation request is 789-fsds5-kjp.

Request

POST serverRoot/tmf-api/productOrderingManagement/v4/cancelProductOrder
Content-Type: application/json

```
{
   "cancellationReason": "Duplicate order",
   "requestedCancellationDate": "2019-04-30T12:56:21.931Z",
   "productOrder": {
      "id": "45f-98f-ss45",
      "href": "https://host:port/productOrderingManagement/v4/productOrder/45f-98f-ss45",
      "@referredType": "ProductOrder"
   },
   "@type": "CancelProductorder"
}
```

Response

201

{

```
   "id": "789-fsds5-kjp",
   "href": "https://host:port/productOrderingManagement/v4/cancelProductOrder/789-fsds5-kjp",
   "cancellationReason": "Duplicate order",
   "requestedCancellationDate": "2019-04-30T12:56:21.931Z",
   "productOrder": {
      "id": "45f-98f-ss45",
      "href": "https://host:port/productOrderingManagement/v4/productOrder/45f-98f-ss45",
      "@referredType": "ProductOrder"
   },
   "state": "done",
   "@type": "CancelProductorder"
}
```

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.

POST

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non-mandatory attributes when creating a ProductOrder, including any possible rule conditions and applicable default values. Notice that it is up to an implementer to add additional mandatory attributes.

Mandatory Attributes	Rule
productOrderItem	At least one productOrderItem must be present.

Non Mandatory Attributes	Rule
ProductOfferingQualification	
billingAccount	
cancellationDate	Must be not provided in the POST request
cancellationReason	Must be not provided in the POST request
category	

relatedChannel	If channel provided, an id must be filled. Channel role by default is 'submitChannel'
completionDate	Must be not provided in the POST request
description	
expectedCompletionDate	Must be not provided in the POST request
externalId	
note	
notificationContact	
orderDate	Must be not provided in the POST request
orderTotalPrice	Must be not provided in the POST request
payment	
priority	
quote	
relatedParty	Except specific change UC at least one related party must be provided
requestedCompletionDate	
requestedStartDate	
state	Must be not provided in the POST request

Additional Rules

Additional rules for all related classes to productOrder are described in Conformance profile (in particular for attribute cardinality).

Acknowledgements

VERSION History

Release Number	Date	Release led by:	Description
Release 1.0	04/15/2013	Pierre Gauthier TM Forum pgauthier@tmforum.org	First Release of Draft Version of the Document.
Release 1.1			Updated for use in the Paris Spec Jam – and rebranded.
Release 2.0	04/15/2016	Pierre Gauthier TM Forum pgauthier@tmforum.org Mariano Belaunde Orange mariano.belaunde@orange.com	Regenerated from the API Data Model – and rebranded.
Release 3.0	11/8/2017	Pierre Gauthier TM Forum pgauthier@tmforum.org Mariano Belaunde Orange mariano.belaunde@orange.com Ludovic Robert Orange ludovic.robert@orange.com	AP-974 The productOrder API have been updated: - with the guideline 3.0 - with request coming from the community (AP954 & AP 432 for example) - with change requests coming from the MEF To list modifications taken into account: - Change OrderItemPrice class name to OrderPrice name - Add BA-ProductOrder relationship - Modify BA-OrderItem cardinality

			(0..* --> 0..1) • Add BA-OrderPrice relationship • Change PlaceRef with Place • Change relationship name between Product-Place to placeReforValue name • Add geographicalAddress, geographicalsubAddress, geoLocation, GeoPoint • Add @baseType,@type and @schemaLocation attributes on all concerned classes (Aligned with guideline) • Add QualificationRef class and link from productOrderItem • Add OrderTerm and link from productOrderItem • Add PaymentRef and link from productOrderItem & productOrder • Add 'describing' pattern to allow schema extension usage to describe product spec characteristic (same as in API entity Catalog) Adopt reforValue patern (based on annotation)
3.0.1	06/12/2017	P. Gauthier / L.Robert	Added attributes @type and @schemaLocation in Product class. Add a 'targetResourceSchema' attribute featuring @type and @schemaLocation attributes to TargetResourceSchema
4.0.0		P. Gauthier / L.Robert	Schema-driven API with polymorphism pattern add productOfferingPrice.id add recursive OrderItem

Release History

Release Number	Date	Release led by:	Description
Release 17.5	06/12/2017	Ludovic Robert Orange ludovic.robert@orange.com	
Release 19.0		Ludovic Robert Orange ludovic.robert@orange.com	Version 4.0 of the API REST *Nota: the version 4.0 is assigned to all the APIs delivered in the release 19.0*