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TM Forum Specification

Shopping Cart Management API REST Specification

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NOTICE

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Introduction

The following document is the specification of the REST API for Shopping Cart. It includes the model definition as well as all available operations.

Shopping Cart is the necessary component in modern sales channel both for online channel of e-commerce and call center and physical stores. It allows visitors to the shopping site to select items for eventual purchase. It provides a means of capturing a user purchase requirement, to accumulate a list of items for purchase, described as "placing items in the shopping cart" or "adding to cart." It typically calculates a total charge for the cart including chosen goods or service, shipping and handling charges and the associated taxes are typically calculated during the checkout. Shopping cart supports purchase of both tangible and intangible good and service (e.g. mobile device or family plan). The charge includes the one-off fee such as the fee for handset and the recurring fee. The customer will be informed about the fee information, but only pay the one-off fee after confirming the shopping cart. The recurring fee may be paid when reaching the bill cycle.

Shopping Cart Item is a contained sub resource. Cart item is the product offering which has been selected and added into the shopping cart with its price calculation. This item represents the customer's request to order, but not finally decided.

The Shopping Cart API provides standardized mechanism for the management of shopping carts. Including creation, update, retrieval, deletion and notification of event. Shopping Cart entity is used for the temporarily selection and reservation of product offerings in e-commerce and retail purchase. Shopping cart supports purchase of both tangible and intangible goods and service (e.g. handset, telecom network service). The charge includes the one-off fee such as the fee for handset and the recurring fee such as the fee of a network service. Shopping Cart contains list of cart items, a reference to party or party role (e.g. customer) or contact medium in case of unknown customer, in addition the calculated total items price including promotions and discounts (alterations).

SAMPLE USE CASES

Reader will find example of use cases using Usage API in "Open Digital Business Scenarios and Use Cases" document.

Use Case 1: Prospect Purchase Product Offering using Shopping Cart

This use case describes the prospect selects and purchases the offering using the shopping cart, and finally proceed to checkout and submits the request to generate the order. Online shopping portal is available, including the offerings and integration with external systems such as payment, logistics, workforce management.

- The prospect browses the online shopping portal.
- The prospect browses the offering and chooses what he/she wants to purchase, and add it into the shopping cart.
- The shopping cart is created for the prospect with the added items and visible for the prospect to operate on it.
- The customer can also remove the existing item in the cart, or empty it completely.
- The prospect checkout the shopping cart to generate the product order in draft status (Checkout Flow).
- The prospect required to enroll as customer, customer is generated in CRM system. The prospect become a customer
- The customer fills in the delivery address for the order.
- The customer finishes payment.
- The order is submitted and it can be tracked.
- The customer comments the purchase process or share the experience.

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Use Case 2: Customer Purchase Product Offering using Shopping Cart

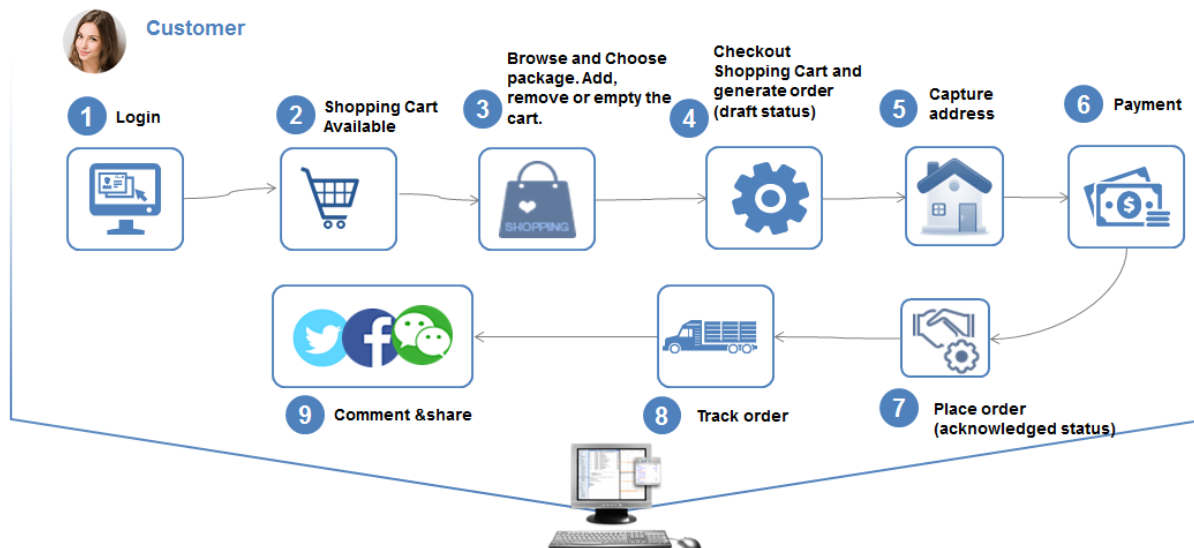
This use case describes the customer selects and purchases the offering using the shopping cart, and finally submits the request to generate the order. Online shopping portal is available, including the offerings and integration with external systems such as payment, logistics, workforce management. Customer has logged into the online shopping portal.

- The customer logs into the online shopping portal.
- If the customer has already saved the shopping cart in the previous purchase process during last time of log-in, the shopping cart can be retrieved and reused.
- The customer browses the offering and chooses what he/she wants to purchase, and add it into the shopping cart.
- The shopping cart is created for the customer witht he added items and visible for the customer to operate on it.
- The customer can also removes the existing item in the cart, or empty it completely.
- The customer submits the shopping cart to generate the product order in draft status (Checkout Flow)
- The customer fills in the delivery address for the order.
- The customer finishes payment.
- The order is submitted and it can be tracked.
- The customer comments the purchase process or share the experience.

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 a BillingAccount and SettlementAccount inheriting properties from the abstract Account 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 Account instances some may be instances of BillingAccount where other could be instances of SettlementAccount. 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 PartyAccountRef 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 BillingAccountRef or SettlementAccountRef, 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

Shopping Cart resource

Shopping Cart resource is used for the temporarily selection and reservation of product offerings in e-commerce, call center and retail purchase. Shopping cart supports purchase of both physical and digital goods and service (e.g. handset, telecom network service). Shopping Cart contain list of cart items, a reference to customer (partyRole) or contact medium in case customer not exist, and the total items price including promotions.

Resource model

Field descriptions

ShoppingCart fields

cartItem	A list of cart items (CartItem [*]). An identified part of the shopping cart. A shopping cart is decomposed into one or more shopping cart item. Cart item represents a product offering or bundled product offering that user wish to purchase, as well as the pricing of the product offering, reference to product in case of configured characteristic or installation address. Cart items can be related to other cart item to related bundled offerings or reference cart Items to a shipping options.

cartTotalPrice	A list of cart prices (CartPrice [*]). Total amount of the shopping cart, usually of money, that represents the actual price paid by the Customer for cart (considering only "Active" cart items).
contactMedium	A list of contact mediums (ContactMedium [*]). Indicates the contact medium that could be used to contact the party.
href	A string. Hyperlink to access the shopping cart.
id	A string. Unique identifier created on provider side (e.g. Order Capture system).
relatedParty	A list of related parties (RelatedParty [*]). Related Entity reference. A related party defines party or party role linked to a specific entity.
validFor	A time period. The period for which the shopping cart is valid (e.g. 90 if no activity or 7 days if cart is empty).

CartItem sub-resource

An identified part of the shopping cart. A shopping cart is decomposed into one or more shopping cart item. Cart item represents a product offering or bundled product offering that user wish to purchase, as well as the pricing of the product offering, reference to product in case of configured characteristic or installation address. Cart items can be related to other cart item to related bundled offerings or reference cart Items to a shipping options.

ItemTotalPrice	A list of cart prices (CartPrice [*]). An amount, usually of money, that represents the actual price paid by the customer for this item. May represent the total price of the shopping cart or the total of the cart item depending on the relation.
action	A cart item action type (CartItemActionType). The action to be carried out on the Product. Can be: add, modify, delete, noChange.
cartItem	A list of cart items (CartItem [*]). An identified part of the shopping cart. A shopping cart is decomposed into one or more shopping cart item. Cart item represents a product offering or bundled product offering that user wish to purchase, as well as the pricing of the product offering, reference to product in case of configured characteristic or installation address. Cart items can be related to other cart item to related bundled offerings or reference cart Items to a shipping options.
cartItemRelationship	A list of cart item relationships (CartItemRelationship [*]). Relationship among cart items mainly other than hierarchical relationships such as "RelyOn", "DependentOn", "Shipping" etc.
id	A string. Identifier of the cart item (generally it is a sequence number 01, 02, 03, ...) in the shopping cart.

itemPrice	A list of cart prices (CartPrice [*]). An amount, usually of money, that represents the actual price paid by the customer for this item. May represent the total price of the shopping cart or the total of the cart item depending on the relation.
itemTerm	A list of cart terms (CartTerm [*]).
note	A list of notes (Note [*]). Extra information about a given entity.
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.
quantity	An integer. Quantity of cart items.
status	A cart item status type (CartItemStatusType). status of cart item. e.g "active" , "savedForLater".

CartItemRelationship sub-resource

Relationship among cart items mainly other than hierarchical relationships such as "RelyOn", "DependentOn", "Shipping" etc.

cartItem	A list of cart item references (CartItemRef [*]). CartIlem reference. A CartItem is an identified part of the shopping cart.
id	A string. Unique identifier of the referred cart item.
relationshipType	A string. Type of the cart item relationship.

CartPrice sub-resource

An amount, usually of money, that represents the actual price paid by the customer for this item. May represent the total price of the shopping cart or the total of the cart item depending on the relation.

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). Provides all amounts (tax included, duty free, tax rate), used currency and percentage to apply for Price Alteration.
priceAlteration	A list of price alterations (PriceAlteration [*]). Is an amount, usually of money, that modifies the price charged for an order item.

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...

CartTerm sub-resource

description	A string.
duration	A quantity (Quantity). An amount in a given unit.
name	A string.

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.

ContactMedium sub-resource

Indicates the contact medium that could be used to contact the party.

characteristic	A medium characteristic (MediumCharacteristic). Any additional characteristic(s) of this contact medium.
mediumType	A string. Type of the contact medium, such as: email address, telephone number, postal address.
preferred	A boolean. If true, indicates that is the preferred contact medium.
validFor	A time period. The time period that the contact medium is valid for.

MediumCharacteristic sub-resource

Describes the contact medium characteristics that could be used to contact a party (an individual or an organization).

city	A string. The city.
contactType	A string. The type of contact, for example: phone number such as mobile, fixed home, fixed office. postal address such as shipping instalation….
country	A string. The country.
emailAddress	A string. Full email address in standard format.
faxNumber	A string. The fax number of the contact.
phoneNumber	A string. The primary phone number of the contact.
postCode	A string. Postcode.
socialNetworkId	A string. Identifier as a member of a social network.
stateOrProvince	A string. State or province.
street1	A string. Describes the street.
street2	A string. Complementary street description.

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.

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...

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.
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.
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.

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].
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.

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.

CartItemRef relationship

CartIlem reference. A CartItem is an identified part of the shopping cart.

| @referredType | A string. The actual type of the target instance when needed for disambiguation. |
| id | A string. Unique identifier of the cart item. |

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.

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.

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.
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 'ShoppingCart' resource object

```
{
  "id": "1203",
  "href": "https://mycsp.com:8080/tmf-api/shoppingCart/v4/shoppingCart/1203",
  "cartItem": [
    {
      "id": "1203-100",
      "action": "add",
      "quantity": 1,
      "status": "active",
      "ItemTotalPrice": [
        {
          "description": "Total Recurring Price.",
          "name": "Monthly Price",
          "priceType": "recurring",
          "recurringChargePeriod": "month",
          "price": {
            "taxRate": 10,
            "dutyFreeAmount": {
              "unit": "EUR",
              "value": 29
            },
            "taxIncludedAmount": {
              "unit": "EUR",
              "value": 31.9
            }
          }
        },
        "priceAlteration": [
          {
            "applicationDuration": 3,
            "description": "First 3 month get 50% off",
            "name": "WelcomeDiscount",
            "priceType": "recurring",
            "priority": 1,
            "recurringChargePeriod": "month",
            "price": {
              "percentage": 50
            }
          }
        ]
      }
    ],
    "itemPrice": [
      {
        "description": "Total Recurring Price.",
```

```json
        "name": "Monthly Price",
        "priceType": "recurring",
        "recurringChargePeriod": "month",
        "unitOfMeasure": "string",
        "price": {
          "taxRate": 10,
          "dutyFreeAmount": {
            "unit": "EUR",
            "value": 29
          },
          "taxIncludedAmount": {
            "unit": "EUR",
            "value": 31.9
          }
        },
        "priceAlteration": [
          {
            "applicationDuration": 3,
            "description": "First 3 month get 50% off",
            "name": "WelcomeDiscount",
            "priceType": "recurring",
            "priority": 1,
            "recurringChargePeriod": "month",
            "unitOfMeasure": "string",
            "price": {
              "percentage": 50
            }
          }
        ],
        "productOfferingPrice": {
          "id": "1788",
          "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/productOfferingPrice/1788",
          "name": "Recurring Monthly Price for Talk Simple 25"
        }
      }
    }
  ],
  "itemTerm": [
    {
      "description": "Tariff plan 12 Months commitment",
      "name": "12Months",
      "duration": {
        "amount": 12,
        "units": "month"
      }
    }
  ],
  "note": [
    {
      "id": "88",
      "author": "Jack Smith",
      "date": "2019-05-28T12:02:41.791Z",
      "text": "Please wrap with double bag"
    }
  ],
  "product": {
```

```json
      "isBundle": false,
      "name": "Talk Simple 25",
      "productCharacteristic": [
        {
          "name": "TEL_MSISDN",
          "valueType": "string",
          "value": "415 279 7439"
        }
      ],
      "relatedParty": [
        {
          "id": "9866",
          "href": "https://mycsp.com:8080/tmf-api/partyManagement/v4/individual/9866",
          "name": "Sandy Smith",
          "role": "member",
          "@referredType": "Individual"
        }
      ]
    },
    "productOffering": {
      "id": "142456",
      "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/productOffering/142456",
      "name": "Talk Simple 25"
    }
  }
],
"cartTotalPrice": [
  {
    "description": "Total Recurring Price.",
    "name": "Monthly Price",
    "priceType": "recurring",
    "recurringChargePeriod": "month",
    "price": {
      "taxRate": 10,
      "dutyFreeAmount": {
        "unit": "EUR",
        "value": 29
      },
      "taxIncludedAmount": {
        "unit": "EUR",
        "value": 31.9
      }
    },
    "priceAlteration": [
      {
        "applicationDuration": 3,
        "description": "Total Discount",
        "name": "WelcomeDiscount",
        "priceType": "recurring",
        "priority": 1,
        "recurringChargePeriod": "month",
        "price": {
          "percentage": 50
        }
      }
```

```
        ]
      }
    ],
    "relatedParty": [
      {
        "id": "9176",
        "href": "https://mycsp.com:8080/tmf-api/partyManagement/v4/customer/9176",
        "name": "Jack Smith",
        "role": "customer",
        "@referredType": "Customer"
      }
    ],
    "validFor": {
      "endDateTime": "2019-05-28T12:02:41.791Z",
      "startDateTime": "2019-08-28T12:02:41.791Z"
    }
  }
```

Notification Resource Models

3 notifications are defined for this API

Notifications related to ShoppingCart:
   - ShoppingCartCreateEvent
   - ShoppingCartAttributeValueChangeEvent
   - ShoppingCartDeleteEvent

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).
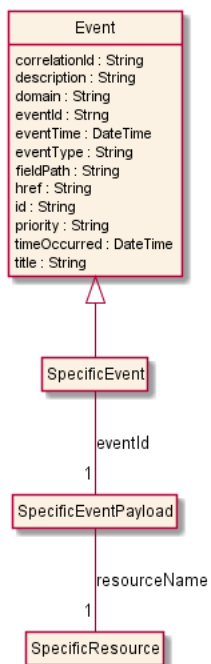
Shopping Cart Create Event

Notification ShoppingCartCreateEvent case for resource ShoppingCart

Json representation sample

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

```
{
   "eventId":"00001",
   "eventTime":"2015-11-16T16:42:25-04:00",
   "eventType":"ShoppingCartCreateEvent",
    "event": {
      "shoppingCart" :
         {-- SEE ShoppingCart RESOURCE SAMPLE --}
   }
}
```

Shopping Cart Attribute Value Change Event

Notification ShoppingCartAttributeValueChangeEvent case for resource ShoppingCart

Json representation sample

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

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

```
    "eventType":"ShoppingCartAttributeValueChangeEvent",
    "event": {
      "shoppingCart" :
          {-- SEE ShoppingCart RESOURCE SAMPLE --}
    }
}
```

Shopping Cart Delete Event

Notification ShoppingCartDeleteEvent case for resource ShoppingCart

Json representation sample

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

```
{
    "eventId":"00001",
    "eventTime":"2015-11-16T16:42:25-04:00",
    "eventType":"ShoppingCartDeleteEvent",
    "event": {
      "shoppingCart" :
          {-- SEE ShoppingCart RESOURCE SAMPLE --}
    }
}
```

API OPERATIONS

Remember the following Uniform Contract:

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

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

Notifications are also described in a subsequent section.

Operations on Shopping Cart

List shopping carts

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

Description

This operation list shopping cart 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 shopping cart(s). The given criteria is the customer (id,role)

Request
GET /tmf-api/shoppingCart/v4/shoppingCart?fields=id,href,relatedParty.name&relatedParty.role=customer&relatedParty.id=9176 Accept: application/json

Response

200
 	
[
  {
    "id": "1203",
    "href": "https://host:port/shoppingCart/v4/shoppingCart/1203",
    "relatedParty": [
      {
        "name": "Jack Smith"
      }
    ]
  }
]

Retrieve shopping cart

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

Description

This operation retrieves a shopping cart 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 spesific shopping cart.

Request

GET /tmf-api/shoppingCart/v4/shoppingCart/1203
Accept: application/json

Response

200

```json
{
   "id": "1203",
   "href": "https://mycsp.com:8080/tmf-api/shoppingCart/v4/shoppingCart/1203",
   "@type": "ShoppingCart",
   "cartItem": [
      {
         "id": "1203-100",
         "action": "add",
         "quantity": 1,
         "status": "active",
         "ItemTotalPrice": [
            {
               "description": "Total Recurring Price.",
               "name": "Monthly Price",
               "priceType": "recurring",
               "recurringChargePeriod": "month",
               "price": {
                  "taxRate": 10,
                  "dutyFreeAmount": {
                     "unit": "EUR",
                     "value": 29
                  },
                  "taxIncludedAmount": {
                     "unit": "EUR",
                     "value": 31.9
                  }
               },
               "priceAlteration": [
                  {
                     "applicationDuration": 3,
                     "description": "First 3 month get 50% off",
                     "name": "WelcomeDiscount",
                     "priceType": "recurring",
                     "priority": 1,
                     "recurringChargePeriod": "month",
                     "price": {
                        "percentage": 50
                     }
                  }
               ]
            }
         ],
```

```
"itemPrice": [
  {
    "description": "Total Recurring Price.",
    "name": "Monthly Price",
    "priceType": "recurring",
    "recurringChargePeriod": "month",
    "price": {
      "taxRate": 10,
      "dutyFreeAmount": {
        "unit": "EUR",
        "value": 29
      },
      "taxIncludedAmount": {
        "unit": "EUR",
        "value": 31.9
      }
    },
    "priceAlteration": [
      {
        "applicationDuration": 3,
        "description": "First 3 month get 50% off",
        "name": "WelcomeDiscount",
        "priceType": "recurring",
        "priority": 1,
        "recurringChargePeriod": "month",
        "price": {
          "percentage": 50
        }
      }
    ],
    "productOfferingPrice": {
      "id": "1788",
      "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/productOfferingPrice/1788",
      "name": "Recurring Monthly Price for Talk Simple 25"
    }
  }
],
"itemTerm": [
  {
    "description": "Tariff plan 12 Months commitment",
    "name": "12Months",
    "duration": {
      "amount": 12,
      "units": "month"
    }
  }
],
"note": [
  {
    "id": "88",
    "author": "Jack Smith",
    "date": "2019-05-28T12:02:41.791Z",
    "text": "Please wrap with double bag"
  }
```

```
          ],
          "product": {
            "isBundle": false,
            "name": "Talk Simple 25",
            "productCharacteristic": [
              {
                "name": "TEL_MSISDN",
                "valueType": "string",
                "value": "415 279 7439"
              }
            ],
            "relatedParty": [
              {
                "id": "9866",
                "href": "https://mycsp.com:8080/tmf-api/partyManagement/v4/individual/9866",
                "name": "Sandy Smith",
                "role": "member",
                "@referredType": "Individual"
              }
            ]
          },
          "productOffering": {
            "id": "142456",
            "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/productOffering/142456",
            "name": "Talk Simple 25"
          }
        }
      ],
      "cartTotalPrice": [
        {
          "description": "Total Recurring Price.",
          "name": "Monthly Price",
          "priceType": "recurring",
          "recurringChargePeriod": "month",
          "price": {
            "taxRate": 10,
            "dutyFreeAmount": {
              "unit": "EUR",
              "value": 29
            },
            "taxIncludedAmount": {
              "unit": "EUR",
              "value": 31.9
            }
          },
          "priceAlteration": [
            {
              "applicationDuration": 3,
              "description": "Total Discount",
              "name": "WelcomeDiscount",
              "priceType": "recurring",
              "priority": 1,
              "recurringChargePeriod": "month",
              "price": {
```

```
                "percentage": 50
            }
        }
    ]
}
    ],
    "relatedParty": [
        {
            "id": "9176",
            "href": "https://mycsp.com:8080/tmf-api/partyManagement/v4/customer/9176",
            "name": "Jack Smith",
            "role": "customer",
            "@referredType": "Customer"
        }
    ],
    "validFor": {
        "endDateTime": "2019-05-28T12:02:41.791Z",
        "startDateTime": "2019-08-28T12:02:41.791Z"
    }
}
```

Create shopping cart

POST /shoppingCart

Description

This operation creates a shopping cart entity.

Mandatory and Non Mandatory Attributes

The following tables provide the list of mandatory and non mandatory attributes when creating a ShoppingCart, 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

Non Mandatory Attributes	Rule
cartItem	
cartTotalPrice	
contactMedium	
relatedParty	
validFor	

Usage Samples

Here's an example of a request for creating a shoppoing cart for existing customer - the resulting shoppoing cart is 1203.

Request

```
POST /tmf-api/shoppingCart/v4/shoppingCart
Content-Type: application/json

{
  "cartItem": [
    {
      "action": "add",
      "quantity": 1,
      "status": "active",
      "itemTerm": [
        {
          "description": "Tariff plan 12 Months commitment",
          "name": "12Months",
          "duration": {
            "amount": 12,
            "units": "month"
          }
        }
      ],
      "note": [
        {
          "id": "88",
          "author": "Jack Smith",
          "date": "2019-05-28T12:02:41.791Z",
          "text": "Please wrap with double bag"
        }
      ],
      "product": {
        "isBundle": false,
        "name": "Talk Simple 25",
        "productCharacteristic": [
          {
            "name": "TEL_MSISDN",
            "valueType": "string",
            "value": "415 279 7439"
          }
        ],
        "relatedParty": [
          {
            "id": "9866",
            "href": "https://mycsp.com:8080/tmf-api/partyManagement/v4/individual/9866",
            "name": "Sandy Smith",
            "role": "member",
            "@referredType": "Individual"
          }
        ]
      },
      "productOffering": {
        "id": "142456",
        "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/productOffering/142456",
        "name": "Talk Simple 25"
```

```
            }
        }
    ],
    "relatedParty": [
        {
            "id": "9176",
            "href": "https://mycsp.com:8080/tmf-api/partyManagement/v4/customer/9176",
            "name": "Jack Smith",
            "role": "customer",
            "@referredType": "Customer"
        }
    ]
}
```

Response

```
201

{
    "id": "1203",
    "href": "https://mycsp.com:8080/tmf-api/shoppingCart/v4/shoppingCart/1203",
    "@type": "ShoppingCart",
    "cartItem": [
        {
            "id": "1203-100",
            "action": "add",
            "quantity": 1,
            "status": "active",
            "ItemTotalPrice": [
                {
                    "description": "Total Recurring Price.",
                    "name": "Monthly Price",
                    "priceType": "recurring",
                    "recurringChargePeriod": "month",
                    "price": {
                        "taxRate": 10,
                        "dutyFreeAmount": {
                            "unit": "EUR",
                            "value": 29
                        },
                        "taxIncludedAmount": {
                            "unit": "EUR",
                            "value": 31.9
                        }
                    },
                    "priceAlteration": [
                        {
                            "applicationDuration": 3,
                            "description": "First 3 month get 50% off",
                            "name": "WelcomeDiscount",
                            "priceType": "recurring",
                            "priority": 1,
```

```
                    "recurringChargePeriod": "month",
                    "price": {
                        "percentage": 50
                    }
                }
            ]
        }
    ],
    "itemPrice": [
        {
            "description": "Total Recurring Price.",
            "name": "Monthly Price",
            "priceType": "recurring",
            "recurringChargePeriod": "month",
            "price": {
                "taxRate": 10,
                "dutyFreeAmount": {
                    "unit": "EUR",
                    "value": 29
                },
                "taxIncludedAmount": {
                    "unit": "EUR",
                    "value": 31.9
                }
            },
            "priceAlteration": [
                {
                    "applicationDuration": 3,
                    "description": "First 3 month get 50% off",
                    "name": "WelcomeDiscount",
                    "priceType": "recurring",
                    "priority": 1,
                    "recurringChargePeriod": "month",
                    "price": {
                        "percentage": 50
                    }
                }
            ],
            "productOfferingPrice": {
                "id": "1788",
                "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/productOfferingPrice/1788",
                "name": "Recurring Monthly Price for Talk Simple 25"
            }
        }
    ],
    "itemTerm": [
        {
            "description": "Tariff plan 12 Months commitment",
            "name": "12Months",
            "duration": {
                "amount": 12,
                "units": "month"
            }
        }
```

```
                ],
                "note": [
                    {
                        "id": "88",
                        "author": "Jack Smith",
                        "date": "2019-05-28T12:02:41.791Z",
                        "text": "Please wrap with double bag"
                    }
                ],
                "product": {
                    "isBundle": false,
                    "name": "Talk Simple 25",
                    "productCharacteristic": [
                        {
                            "name": "TEL_MSISDN",
                            "valueType": "string",
                            "value": "415 279 7439"
                        }
                    ],
                    "relatedParty": [
                        {
                            "id": "9866",
                            "href": "https://mycsp.com:8080/tmf-api/partyManagement/v4/individual/9866",
                            "name": "Sandy Smith",
                            "role": "member",
                            "@referredType": "Individual"
                        }
                    ]
                },
                "productOffering": {
                    "id": "142456",
                    "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/productOffering/142456",
                    "name": "Talk Simple 25"
                }
            }
        ],
        "cartTotalPrice": [
            {
                "description": "Total Recurring Price.",
                "name": "Monthly Price",
                "priceType": "recurring",
                "recurringChargePeriod": "month",
                "price": {
                    "taxRate": 10,
                    "dutyFreeAmount": {
                        "unit": "EUR",
                        "value": 29
                    },
                    "taxIncludedAmount": {
                        "unit": "EUR",
                        "value": 31.9
                    }
                },
                "priceAlteration": [
```

```json
                        {
                            "applicationDuration": 3,
                            "description": "Total Discount",
                            "name": "WelcomeDiscount",
                            "priceType": "recurring",
                            "priority": 1,
                            "recurringChargePeriod": "month",
                            "price": {
                                "percentage": 50
                            }
                        }
                    ]
                }
            ],
            "relatedParty": [
                {
                    "id": "9176",
                    "href": "https://mycsp.com:8080/tmf-api/partyManagement/v4/customer/9176",
                    "name": "Jack Smith",
                    "role": "customer",
                    "@referredType": "Customer"
                }
            ],
            "validFor": {
                "endDateTime": "2019-05-28T12:02:41.791Z",
                "startDateTime": "2019-08-28T12:02:41.791Z"
            }
        }
```

Here's an example of a request for creating a shoppoing cart for prospect customer (anounymouse) - the resulting shoppoing cart is 19501.

Request

POST /tmf-api/shoppingCart/v4/shoppingCart
Content-Type: application/json
 	
{
   "cartItem": [
     {
       "action": "add",
       "quantity": 1,
       "status": "active",
       "ItemTotalPrice": [
         {
           "description": "Total Recurring Price.",
           "name": "Monthly Price",
           "priceType": "recurring",
           "recurringChargePeriod": "month",
           "price": {
             "taxRate": 10,

```
          "dutyFreeAmount": {
            "unit": "EUR",
            "value": 29
          },
          "taxIncludedAmount": {
            "unit": "EUR",
            "value": 31.9
          }
        },
        "priceAlteration": [
          {
            "applicationDuration": 3,
            "description": "First 3 month get 50% off",
            "name": "WelcomeDiscount",
            "priceType": "recurring",
            "priority": 1,
            "recurringChargePeriod": "month",
            "price": {
              "percentage": 50
            }
          }
        ]
      }
    ],
    "itemPrice": [
      {
        "description": "Total Recurring Price.",
        "name": "Monthly Price",
        "priceType": "recurring",
        "recurringChargePeriod": "month",
        "unitOfMeasure": "string",
        "price": {
          "taxRate": 10,
          "dutyFreeAmount": {
            "unit": "EUR",
            "value": 29
          },
          "taxIncludedAmount": {
            "unit": "EUR",
            "value": 31.9
          }
        },
        "priceAlteration": [
          {
            "applicationDuration": 3,
            "description": "First 3 month get 50% off",
            "name": "WelcomeDiscount",
            "priceType": "recurring",
            "priority": 1,
            "recurringChargePeriod": "month",
            "unitOfMeasure": "string",
            "price": {
              "percentage": 50
            }
```

```
                    }
                ],
                "productOfferingPrice": {
                    "id": "1788",
                    "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/productOfferingPrice/1788",
                    "name": "Recurring Monthly Price for Talk Simple 25"
                }
            }
        ],
        "itemTerm": [
            {
                "description": "Tariff plan 12 Months commitment",
                "name": "12Months",
                "duration": {
                    "amount": 12,
                    "units": "month"
                }
            }
        ],
        "note": [
            {
                "id": "88",
                "author": "Jack Smith",
                "date": "2019-05-28T12:02:41.791Z",
                "text": "This is a gift"
            }
        ],
        "product": {
            "isBundle": false,
            "name": "Talk Simple 25",
            "productCharacteristic": [
                {
                    "name": "TEL_MSISDN",
                    "valueType": "string",
                    "value": "415 279 7439"
                }
            ]
        },
        "productOffering": {
            "id": "142456",
            "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/productOffering/142456",
            "name": "Talk Simple 25"
        }
    }
],
"cartTotalPrice": [
    {
        "description": "Total Recurring Price.",
        "name": "Monthly Price",
        "priceType": "recurring",
        "recurringChargePeriod": "month",
        "price": {
            "taxRate": 10,
            "dutyFreeAmount": {
```

```
                  "unit": "EUR",
                  "value": 29
              },
              "taxIncludedAmount": {
                  "unit": "EUR",
                  "value": 31.9
              }
          },
          "priceAlteration": [
              {
                  "applicationDuration": 3,
                  "description": "Total Discount",
                  "name": "WelcomeDiscount",
                  "priceType": "recurring",
                  "priority": 1,
                  "recurringChargePeriod": "month",
                  "price": {
                      "percentage": 50
                  }
              }
          ]
      }
  ],
  "contactMedium": [
      {
          "mediumType": "email",
          "preferred": true,
          "characteristic": {
              "emailAddress": "JackSmith@mail.com"
          }
      }
  ],
  "validFor": {
      "endDateTime": "2019-05-28T12:02:41.791Z",
      "startDateTime": "2019-08-28T12:02:41.791Z"
  }
}
```

Response

```
201

{
  "id": "19501",
  "href": "https://mycsp.com:8080/tmf-api/shoppingCart/v4/shoppingCart/19501",
  "@type": "ShoppingCart",
  "cartItem": [
      {
          "id": "1203-100",
          "action": "add",
          "quantity": 1,
          "status": "active",
```

```
"itemPrice": [
  {
    "description": "Total Recurring Price.",
    "name": "Monthly Price",
    "priceType": "recurring",
    "recurringChargePeriod": "month",
    "price": {
      "taxRate": 10,
      "dutyFreeAmount": {
        "unit": "EUR",
        "value": 29
      },
      "taxIncludedAmount": {
        "unit": "EUR",
        "value": 31.9
      }
    },
    "priceAlteration": [
      {
        "applicationDuration": 3,
        "description": "First 3 month get 50% off",
        "name": "WelcomeDiscount",
        "priceType": "recurring",
        "priority": 1,
        "recurringChargePeriod": "month",
        "price": {
          "percentage": 50
        }
      }
    ],
    "productOfferingPrice": {
      "id": "1788",
      "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/productOfferingPrice/1788",
      "name": "Recurring Monthly Price for Talk Simple 25"
    }
  }
],
"itemTerm": [
  {
    "description": "Tariff plan 12 Months commitment",
    "name": "12Months",
    "duration": {
      "amount": 12,
      "units": "month"
    }
  }
],
"note": [
  {
    "id": "88",
    "author": "Jack Smith",
    "date": "2019-05-28T12:02:41.791Z",
    "text": "This is a gift"
  }
```

```
        ],
        "product": {
          "isBundle": false,
          "name": "Talk Simple 25",
          "productCharacteristic": [
            {
              "name": "TEL_MSISDN",
              "valueType": "string",
              "value": "415 279 7439"
            }
          ]
        },
        "productOffering": {
          "id": "142456",
          "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/productOffering/142456",
          "name": "Talk Simple 25"
        }
      }
    ],
    "contactMedium": [
      {
        "mediumType": "email",
        "preferred": true,
        "characteristic": {
          "emailAddress": "JackSmith@mail.com"
        }
      }
    ],
    "validFor": {
      "endDateTime": "2019-05-28T12:02:41.791Z",
      "startDateTime": "2019-08-28T12:02:41.791Z"
    }
}
```

Patch shopping cart

PATCH /shoppingCart/{id}

Description

This operation allows partial updates of a shopping cart 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
cartItem	
contactMedium	
relatedParty	

Non Patchable Attributes	Rule
id	
href	
validFor	
cartTotalPrice	

Usage Samples

Here's an example of a request for updating a shoppoing cart - add note to shopping cart item. This example illustrating patch merge. Note that the entire cartItem array is passed in the input with the new note

Request

```
PATCH /tmf-api/shoppingCart/v4/shoppingCart/1203
Content-Type: merge-patch+json

{
    "cartItem": [
        {
            "id": "1203-100",
            "action": "add",
            "quantity": 1,
            "status": "active",
            "ItemTotalPrice": [
                {
                    "description": "Total Recurring Price.",
                    "name": "Monthly Price",
                    "priceType": "recurring",
                    "recurringChargePeriod": "month",
                    "price": {
                        "taxRate": 10,
                        "dutyFreeAmount": {
                            "unit": "EUR",
                            "value": 29
                        },
                        "taxIncludedAmount": {
                            "unit": "EUR",
                            "value": 31.9
                        }
                    },
                    "priceAlteration": [
```

```
                {
                    "applicationDuration": 3,
                    "description": "First 3 month get 50% off",
                    "name": "WelcomeDiscount",
                    "priceType": "recurring",
                    "priority": 1,
                    "recurringChargePeriod": "month",
                    "price": {
                        "percentage": 50
                    }
                }
            ]
        }
    ],
    "itemPrice": [
        {
            "description": "Total Recurring Price.",
            "name": "Monthly Price",
            "priceType": "recurring",
            "recurringChargePeriod": "month",
            "price": {
                "taxRate": 10,
                "dutyFreeAmount": {
                    "unit": "EUR",
                    "value": 29
                },
                "taxIncludedAmount": {
                    "unit": "EUR",
                    "value": 31.9
                }
            },
            "priceAlteration": [
                {
                    "applicationDuration": 3,
                    "description": "First 3 month get 50% off",
                    "name": "WelcomeDiscount",
                    "priceType": "recurring",
                    "priority": 1,
                    "recurringChargePeriod": "month",
                    "price": {
                        "percentage": 50
                    }
                }
            ],
            "productOfferingPrice": {
                "id": "1788",
                "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/productOfferingPrice/1788",
                "name": "Recurring Monthly Price for Talk Simple 25"
            }
        }
    ],
    "itemTerm": [
        {
            "description": "Tariff plan 12 Months commitment",
```

```json
            "name": "12Months",
            "duration": {
              "amount": 12,
              "units": "month"
            }
          }
        ],
        "note": [
          {
            "id": "88",
            "author": "Jack Smith",
            "date": "2019-05-28T12:02:41.791Z",
            "text": "Please wrap with double bag"
          }
        ],
        "product": {
          "isBundle": false,
          "isRef": false,
          "name": "Talk Simple 25",
          "relatedParty": [
            {
              "id": "9866",
              "href": "https://mycsp.com:8080/tmf-api/partyManagement/v4/individual/9866",
              "name": "Sandy Smith",
              "role": "member",
              "@referredType": "Individual"
            }
          ]
        },
        "productOffering": {
          "id": "142456",
          "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/productOffering/142456",
          "name": "Talk Simple 25"
        }
      }
    ],
    "cartTotalPrice": [
      {
        "description": "Total Recurring Price.",
        "name": "Monthly Price",
        "priceType": "recurring",
        "recurringChargePeriod": "month",
        "price": {
          "taxRate": 10,
          "dutyFreeAmount": {
            "unit": "EUR",
            "value": 29
          },
          "taxIncludedAmount": {
            "unit": "EUR",
            "value": 31.9
          }
        },
        "priceAlteration": [
```

```
            {
              "applicationDuration": 3,
              "description": "Total Discount",
              "name": "WelcomeDiscount",
              "priceType": "recurring",
              "priority": 1,
              "recurringChargePeriod": "month",
              "price": {
                "percentage": 50
              }
            }
          ]
        }
    ],
    "relatedParty": [
        {
          "id": "9176",
          "href": "https://mycsp.com:8080/tmf-api/partyManagement/v4/customer/9176",
          "name": "Jack Smith",
          "role": "customer",
          "@referredType": "Customer"
        }
    ],
    "validFor": {
        "endDateTime": "2019-05-28T12:02:41.791Z",
        "startDateTime": "2019-08-28T12:02:41.791Z"
    }
}
```

Response

```
200

{
  "id": "1203",
  "href": "https://host:port/shoppingCart/v4/shoppingCart/1203",
  "cartItem": [
      {
        "id": "1203-100",
        "action": "add",
        "quantity": 1,
        "status": "active",
        "ItemTotalPrice": [
            {
              "description": "Total Recurring Price.",
              "name": "Monthly Price",
              "priceType": "recurring",
              "recurringChargePeriod": "month",
              "price": {
                "taxRate": 10,
                "dutyFreeAmount": {
                    "unit": "EUR",
```

```
              "value": 29
            },
            "taxIncludedAmount": {
              "unit": "EUR",
              "value": 31.9
            }
          },
          "priceAlteration": [
            {
              "applicationDuration": 3,
              "description": "First 3 month get 50% off",
              "name": "WelcomeDiscount",
              "priceType": "recurring",
              "priority": 1,
              "recurringChargePeriod": "month",
              "price": {
                "percentage": 50
              }
            }
          ]
        }
      ],
      "itemPrice": [
        {
          "description": "Total Recurring Price.",
          "name": "Monthly Price",
          "priceType": "recurring",
          "recurringChargePeriod": "month",
          "price": {
            "taxRate": 10,
            "dutyFreeAmount": {
              "unit": "EUR",
              "value": 29
            },
            "taxIncludedAmount": {
              "unit": "EUR",
              "value": 31.9
            }
          },
          "priceAlteration": [
            {
              "applicationDuration": 3,
              "description": "First 3 month get 50% off",
              "name": "WelcomeDiscount",
              "priceType": "recurring",
              "priority": 1,
              "recurringChargePeriod": "month",
              "price": {
                "percentage": 50
              }
            }
          ],
          "productOfferingPrice": {
            "id": "1788",
```

```
                    "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/productOfferingPrice/1788",
                    "name": "Recurring Monthly Price for Talk Simple 25"
                }
            }
        ],
        "itemTerm": [
            {
                "description": "Tariff plan 12 Months commitment",
                "name": "12Months",
                "duration": {
                    "amount": 12,
                    "units": "month"
                }
            }
        ],
        "note": [
            {
                "id": "88",
                "author": "Jack Smith",
                "date": "2019-05-28T12:02:41.791Z",
                "text": "Please wrap with double bag"
            }
        ],
        "product": {
            "isBundle": false,
            "isRef": false,
            "name": "Talk Simple 25",
            "relatedParty": [
                {
                    "id": "9866",
                    "href": "https://mycsp.com:8080/tmf-api/partyManagement/v4/individual/9866",
                    "name": "Sandy Smith",
                    "role": "member",
                    "@referredType": "Individual"
                }
            ]
        },
        "productOffering": {
            "id": "142456",
            "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/productOffering/142456",
            "name": "Talk Simple 25"
        }
    }
],
"cartTotalPrice": [
    {
        "description": "Total Recurring Price.",
        "name": "Monthly Price",
        "priceType": "recurring",
        "recurringChargePeriod": "month",
        "price": {
            "taxRate": 10,
            "dutyFreeAmount": {
                "unit": "EUR",
```

```
                    "value": 29
                },
                "taxIncludedAmount": {
                    "unit": "EUR",
                    "value": 31.9
                }
            },
            "priceAlteration": [
                {
                    "applicationDuration": 3,
                    "description": "Total Discount",
                    "name": "WelcomeDiscount",
                    "priceType": "recurring",
                    "priority": 1,
                    "recurringChargePeriod": "month",
                    "price": {
                        "percentage": 50
                    }
                }
            ]
        }
    ],
    "relatedParty": [
        {
            "id": "9176",
            "href": "https://mycsp.com:8080/tmf-api/partyManagement/v4/customer/9176",
            "name": "Jack Smith",
            "role": "customer",
            "@referredType": "Customer"
        }
    ],
    "validFor": {
        "endDateTime": "2019-05-28T12:02:41.791Z",
        "startDateTime": "2019-08-28T12:02:41.791Z"
    }
}
```

Here's an example of a request for updating a shoppoing cart - add note to shopping cart item. This example illustrating patch json

Request

```
PATCH /tmf-api/shoppingCart/v4/shoppingCart/1203
Content-Type: json-patch+json

[
    {
        "op": "add",
        "path": "/cartItem/1203-100/note",
        "value": {
            "author": "Jack Smith",
```

```
                "text": "Please wrap with double bag"
            }
        }
    ]
```

Response

```
200

{
    "id": "1203",
    "href": "https://host:port/shoppingCart/v4/shoppingCart/1203",
    "cartItem": [
        {
            "id": "1203-100",
            "action": "add",
            "quantity": 1,
            "status": "active",
            "ItemTotalPrice": [
                {
                    "description": "Total Recurring Price.",
                    "name": "Monthly Price",
                    "priceType": "recurring",
                    "recurringChargePeriod": "month",
                    "price": {
                        "taxRate": 10,
                        "dutyFreeAmount": {
                            "unit": "EUR",
                            "value": 29
                        },
                        "taxIncludedAmount": {
                            "unit": "EUR",
                            "value": 31.9
                        }
                    },
                    "priceAlteration": [
                        {
                            "applicationDuration": 3,
                            "description": "First 3 month get 50% off",
                            "name": "WelcomeDiscount",
                            "priceType": "recurring",
                            "priority": 1,
                            "recurringChargePeriod": "month",
                            "price": {
                                "percentage": 50
                            }
                        }
                    ]
                }
            ],
            "itemPrice": [
                {
```

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```
            "description": "Total Recurring Price.",
            "name": "Monthly Price",
            "priceType": "recurring",
            "recurringChargePeriod": "month",
            "price": {
              "taxRate": 10,
              "dutyFreeAmount": {
                "unit": "EUR",
                "value": 29
              },
              "taxIncludedAmount": {
                "unit": "EUR",
                "value": 31.9
              }
            },
            "priceAlteration": [
              {
                "applicationDuration": 3,
                "description": "First 3 month get 50% off",
                "name": "WelcomeDiscount",
                "priceType": "recurring",
                "priority": 1,
                "recurringChargePeriod": "month",
                "price": {
                  "percentage": 50
                }
              }
            ],
            "productOfferingPrice": {
              "id": "1788",
              "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/productOfferingPrice/1788",
              "name": "Recurring Monthly Price for Talk Simple 25"
            }
          }
        ],
        "itemTerm": [
          {
            "description": "Tariff plan 12 Months commitment",
            "name": "12Months",
            "duration": {
              "amount": 12,
              "units": "month"
            }
          }
        ],
        "note": [
          {
            "id": "88",
            "author": "Jack Smith",
            "date": "2019-05-28T12:02:41.791Z",
            "text": "Please wrap with double bag"
          }
        ],
        "product": {
```

```
                    "isBundle": false,
                    "isRef": false,
                    "name": "Talk Simple 25",
                    "relatedParty": [
                        {
                            "id": "9866",
                            "href": "https://mycsp.com:8080/tmf-api/partyManagement/v4/individual/9866",
                            "name": "Sandy Smith",
                            "role": "member",
                            "@referredType": "Individual"
                        }
                    ]
                },
                "productOffering": {
                    "id": "142456",
                    "href": "https://mycsp.com:8080/tmf-api/productCatalogManagement/v4/productOffering/142456",
                    "name": "Talk Simple 25"
                }
            }
        ],
        "cartTotalPrice": [
            {
                "description": "Total Recurring Price.",
                "name": "Monthly Price",
                "priceType": "recurring",
                "recurringChargePeriod": "month",
                "price": {
                    "taxRate": 10,
                    "dutyFreeAmount": {
                        "unit": "EUR",
                        "value": 29
                    },
                    "taxIncludedAmount": {
                        "unit": "EUR",
                        "value": 31.9
                    }
                },
                "priceAlteration": [
                    {
                        "applicationDuration": 3,
                        "description": "Total Discount",
                        "name": "WelcomeDiscount",
                        "priceType": "recurring",
                        "priority": 1,
                        "recurringChargePeriod": "month",
                        "price": {
                            "percentage": 50
                        }
                    }
                ]
            }
        ],
        "relatedParty": [
            {
```

```
            "id": "9176",
            "href": "https://mycsp.com:8080/tmf-api/partyManagement/v4/customer/9176",
            "name": "Jack Smith",
            "role": "customer",
            "@referredType": "Customer"
        }
    ],
    "validFor": {
        "endDateTime": "2019-05-28T12:02:41.791Z",
        "startDateTime": "2019-08-28T12:02:41.791Z"
    }
}
```

Delete shopping cart

DELETE /shoppingCart/{id}

Description

This operation deletes a shopping cart entity.

Usage Samples

Here's an example of a request for deleting a shoppoing cart.

Request
DELETE /tmf-api/shoppingCart/v4/shoppingCart/1203
Response
204

API NOTIFICATIONS

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

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

Register listener

POST /hub

Description

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

Behavior

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

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

Usage Samples

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

Request
POST /api/hub Accept: application/json {"callback": "http://in.listener.com"}
Response
201 Content-Type: application/json Location: /api/hub/42 {"id":"42","callback":"http://in.listener.com","query":null}

Unregister listener

DELETE /hub/{id}

Description

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

Behavior

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

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

Usage Samples

Here's an example of a request for un-registering a listener.

Request
DELETE /api/hub/42 Accept: application/json
Response
204

Publish Event to listener

POST /client/listener

Description

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

Provides to a registered listener the description of the event that was raised. The /client/listener url is the callback url passed when registering the listener.

Behavior

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

Usage Samples

Here's an example of a notification received by the listener. In this example "EVENT TYPE" should be replaced by one of the notification types supported by this API (see Notification resources Models section) and EVENT BODY refers to the data structure of the given notification type.

Request

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

Response
201

For detailed examples on the general TM Forum notification mechanism, see the TMF REST Design Guidelines.

Acknowledgements

Release History

Release Number	Date	Release led by:	Description
Release 1.0	04/15/2017	Pierre Gauthier TM Forum pgauthier@tmforum.org Mariano Belaunde Orange Labs	First Release of the Document.
Release 2.0	11/06/2018	Mariano Belaunde Orange Labs	Alignment with Guidelines 3.0
Release 4.0	12-Aug-2019	Jacob Avraham Amdocs jacoba@amdocs.com	Alginment with new schema of V4

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