

# TM Forum Specification

## Resource Order Management API User Guide

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# Introduction

The following document is the specification of the REST API for Resource Order Management. It includes the model definition as well as all available operations. Possible actions are creating, updating and retrieving Resource Orders (including filtering).

A Resource Order API provides a standard mechanism for placing a Resource Order with all necessary order parameters. A Resource Order is created based on a resource candidate that is defined in the resource catalog. The Resource candidate is an entity that makes a Resource Specification available to a resource catalog.

Resources are physical or non-physical components (or some combination of these) within an enterprise's infrastructure or inventory. They are typically consumed or used by Services (for example a physical port assigned to a service) or contribute to the realization of a Product (for example, a SIM card). They can be drawn from the Application, Computing and Network domains, and include, for example, Network Elements, software, IT systems, content and information, and technology components.

A Resource Specification is an abstract base class for representing a generic means for implementing a particular type of Resource. In essence, a Resource Specification defines the common attributes and relationships of a set of related Resources, while Resource defines a specific instance that is based on a particular Resource Specification.

Resource Order API manages resource order resource:

- A Resource Order is a type of order which can be used to place an order between a service provider and a partner and vice versa
- Main order items attributes are the orders resource candidates and resource characteristics with the related action to be performed (e.g: add or delete resources), state.

Resource Order API performs the following operations on the Resource Order:

- Retrieval of a Resource Order or a collection of Resource Orders depending on filter criteria
- Partial update of a ResourceOrder
- Creation of a Resource order
- Deletion of a resource order (for admin purposes)
- Notifications of events on resource order
  - o Order creation
  - o Order removal
  - o Order state change
  - o Order value change
  - o Order information required

The following Assumptions were considered in the development of this document:

- The Order Management system has access to the catalog system

## SAMPLE USE CASES

### Ordering Optical Cable

There is a use-case through the examples provided:

The operator is buying 7km of optical cable (the Physical Resource) made by FiberOpticsRUs (in the role of *Manufacturer*) on behalf of Acme Inc (in the role of *Customer*). There is a note (of type *Note*) associated with this order, and a link to a previous Site Survey (*Appointment*). The order is known to Acme under its own internal ordering number (passed as an “ExternalReference”). The Account manager (an Individual related party in the role of *Account Manager*) is Gwen Howells.

Once created, later examples show:

- Retrieval of orders under a **Premium** category
- Update this order to change the priority to **2**
- Delete this order using its id: **5130d5131a23**

## 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 LogicalResource and PhysicalResource inheriting properties from the abstract Resource 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 Resource instances some may be instances of LogicalResource where other could be instances of PhysicalResource. 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 a ResourceRef 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 LogicalResourceRef or PhysicalResourceRef, 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.

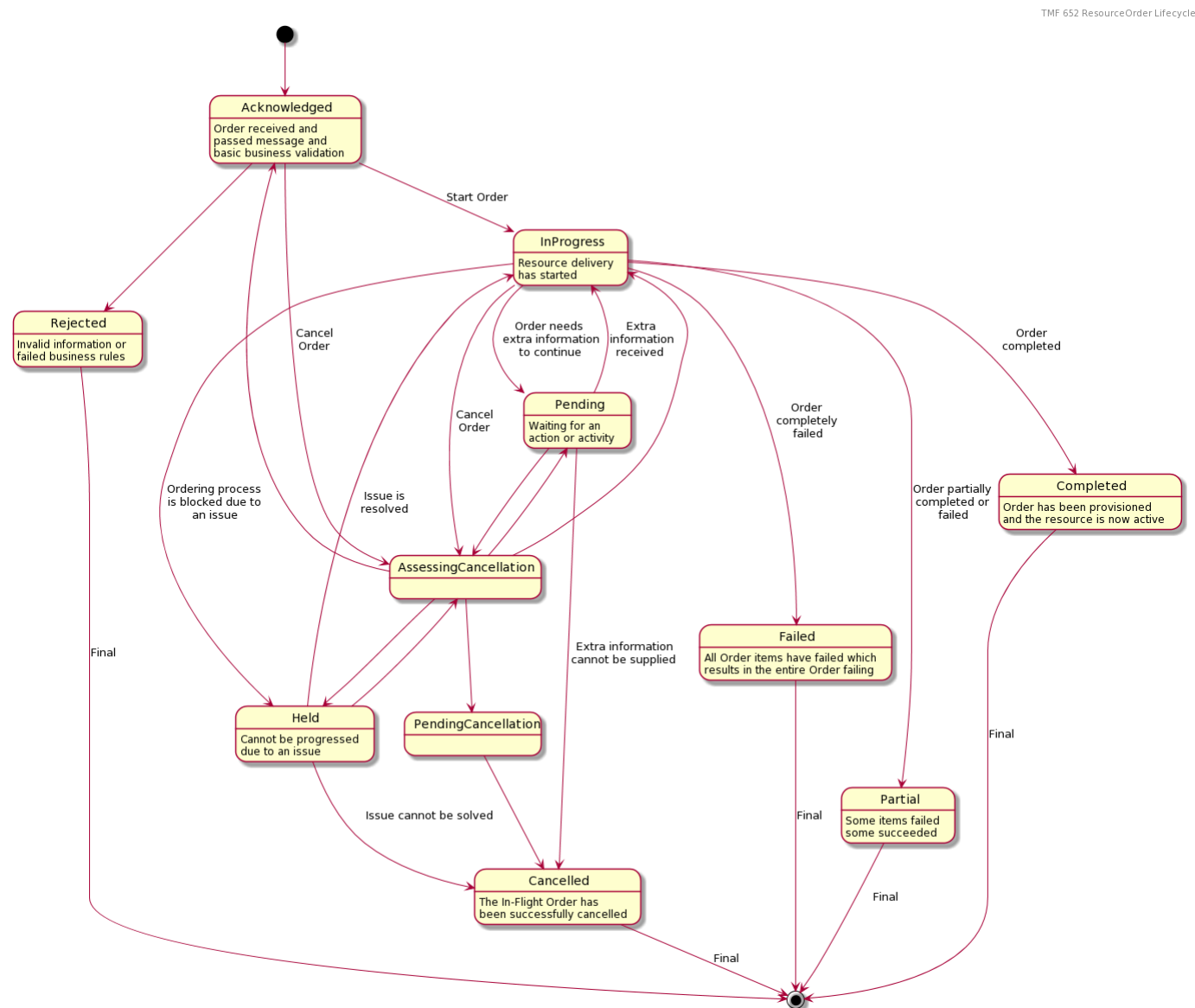
The @baseType attribute gives a way to provide explicitly the base of class of a given resource that has been extended.



# RESOURCE MODEL

## Lifecycle

Below is the state-transition diagram for a ResourceOrder:



## Managed Entity and Task Resource Models

### Resource Order resource

A Resource Order is a request to provision a set of Resources (logical and physical) triggered by the request to provision a Service through a Service Order.

```

classDiagram
    class ExternalReference {
        externalReferenceType : String
        href : Uri
        id : String
        name : String
        @baseType : String
        @schemaLocation : Uri
        @type : String
    }
    class ResourceSpecificationRef {
        href : Uri
        id : String
        name : String
        version : String
        @baseType : String
        @referencedType : String
        @schemaLocation : Uri
        @type : String
    }
    class AppointmentRef {
        description : String
        href : String
        id : String
        @baseType : String
        @referencedType : String
        @schemaLocation : Uri
        @type : String
    }
    class ResourceOrder {
        cancellationDate : DateTime
        cancellationReason : String
        category : String
        completionDate : DateTime
        description : String
        expectedCompletionDate : DateTime
        externalId : String
        href : Uri
        id : String
        name : String
        orderDate : DateTime
        priority : Integer
        requestedCompletionDate : DateTime
        requestedStartDate : DateTime
        startDate : DateTime
        state : ResourceOrderStateType
        @baseType : String
        @schemaLocation : Uri
        @type : String
    }
    class ResourceOrderItem {
        action : OrderItemActionType
        href : Uri
        id : String
        quantity : Integer
        state : ResourceOrderItemStateType
        @baseType : String
        @schemaLocation : Uri
        @type : String
    }
    class ResourceRefOrValue {
        administrativeState : ResourceAdministrativeStateType
        category : String
        description : String
        endDateOperatingDate : DateTime
        href : String
        id : String
        name : String
        operationalState : ResourceOperationalStateType
        resourceStatus : ResourceStatusType
        resourceVersion : String
        startOperatingDate : DateTime
        usageState : ResourceUsageStateType
        @baseType : String
        @referencedType : String
        @schemaLocation : Uri
        @type : String
    }
    class Note {
        author : String
        date : DateTime
        href : Uri
        id : String
        text : String
        @baseType : String
        @schemaLocation : Uri
        @type : String
    }
    class RelatedParty {
        href : Uri
        id : String
        name : String
        role : String
        @baseType : String
        @referencedType : String
        @schemaLocation : Uri
        @type : String
    }
    class ResourceRelationship {
        href : Uri
        id : String
        relationshipType : String
        @baseType : String
        @schemaLocation : Uri
        @type : String
    }
    class Characteristic {
        id : String
        name : String
        value : Any
        valueType : String
        @baseType : String
        @schemaLocation : Uri
        @type : String
    }
    class Feature {
        id : String
        isBundle : Boolean
        isEnabled : Boolean
        name : String
    }
    class AttachmentRefOrValue {
        href : String
        id : String
        name : String
        role : String
        @baseType : String
        @referencedType : String
        @schemaLocation : Uri
        @type : String
    }
    class ResourceOrderItemRef {
        href : Uri
        id : String
        relationshipType : String
        @baseType : String
        @referencedType : String
        @schemaLocation : Uri
        @type : String
    }
    class ExternalReference "0..*" -- "0..1" ResourceOrder : externalReference
    class ResourceSpecificationRef "0..1" -- "0..1" ResourceOrder : resourceSpecification
    class AppointmentRef "0..1" -- "0..1" ResourceOrder : appointment
    class ResourceOrder "0..1" -- "0..1" ResourceOrderItem : resource
    class ResourceOrderItem "0..1" -- "0..1" ResourceRefOrValue : resource
    class ResourceRefOrValue "0..1" -- "0..1" Note : note
    class ResourceRefOrValue "0..1" -- "0..1" RelatedParty : relatedParty
    class ResourceRefOrValue "0..1" -- "0..1" ResourceRelationship : resourceRelationship
    class ResourceRefOrValue "0..1" -- "0..1" Characteristic : resourceCharacteristic
    class ResourceRefOrValue "0..1" -- "0..1" Feature : activationFeature
    class ResourceRefOrValue "0..1" -- "0..1" AttachmentRefOrValue : attachment
    class ResourceRefOrValue "0..1" -- "0..1" ResourceOrderItemRef : orderItemRelationship
    class ResourceRefOrValue "0..1" -- "0..1" CharacteristicRelationship : characteristicRelationship
    class ResourceRefOrValue "0..1" -- "0..1" FeatureRelationship : featureRelationship
    class ResourceRefOrValue "0..1" -- "0..1" ConstraintRef : constraint
    class Note "0..1" -- "0..1" ResourceOrder : note
    class RelatedParty "0..1" -- "0..1" ResourceOrder : relatedParty
    class ResourceRelationship "0..1" -- "0..1" ResourceOrder : resourceRelationship
    class Characteristic "0..1" -- "0..1" ResourceOrder : resourceCharacteristic
    class Feature "0..1" -- "0..1" ResourceOrder : activationFeature
    class AttachmentRefOrValue "0..1" -- "0..1" ResourceOrder : attachment
    class ResourceOrderItemRef "0..1" -- "0..1" ResourceOrder : orderItemRelationship
    class CharacteristicRelationship "0..1" -- "0..1" ResourceOrder : characteristicRelationship
    class FeatureRelationship "0..1" -- "0..1" ResourceOrder : featureRelationship
    class ConstraintRef "0..1" -- "0..1" ResourceOrder : constraint
    class ResourceOrderStateType {
        acknowledged
        rejected
        pending
        held
        inProgress
        cancelled
        completed
        failed
        assessingCancellation
        pendingCancellation
    }
    class OrderItemActionType {
        add
        modify
        delete
        noChange
    }
    class ResourceOperationalStateType {
        idle
        active
        busy
    }
    class ResourceUsageStateType {
        locked
        unlocked
        shutdown
    }
    class ResourceAdministrativeStateType {
        enable
        disable
    }
    class ResourceStatusType {
        standby
        alarm
        available
        reserved
        unknown
        suspended
    }

```

### ResourceOrder fields

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category	A string. Used to categorize the order from a business perspective that can be useful for the order management system.
completionDate	A date time (DateTime). Date when the order was actually completed, in RFC3339 (subset of ISO8601) format.
description	A string. Free-text description of the Resource Order.
expectedCompletionDate	A date time (DateTime). Date when the order is expected to be completed, in RFC3339 (subset of ISO8601) format.
externalId	A string. DEPRECATED: Use externalReference Instead. ID given by the consumer (to facilitate searches afterwards).
externalReference	A list of external references (ExternalReference [*]). External reference of the individual or reference in other system.
href	An uri (Uri). Hyperlink to access the order.
id	A string. Identifier of an instance of the Resource Order. Required to be unique within the resource type.
name	A string. A string used to give a name to the Resource Order.
note	A list of notes (Note [*]). Extra information about a given entity.
orderDate	A date time (DateTime). Date when the order was created, in RFC3339 (subset of ISO8601) format.
orderItem	A list of resource order items (ResourceOrderItem [*]). An identified part of the order. A resource order is decomposed into one or more order items.
orderType	A string. Name of the Resource Order type.
priority	An integer. A way that can be used by consumers to prioritize orders in OM system (such as: 0 is the highest priority, and 4 the lowest).
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, in RFC3339 (subset of ISO8601) format.
requestedStartDate	A date time (DateTime). Order start date wished by the requestor, in RFC3339 (subset of ISO8601) format.
startDate	A date time (DateTime). Date when the order was actually started, in RFC3339 (subset of ISO8601) format.

**state** A resource order state type (ResourceOrderStateType). Possible values for the state of the order.

#### AttachmentRefOrValue sub-resource

An attachment by value or by reference. An attachment complements the description of an element, for example through a document, a video, a picture.

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

**description** A string. A narrative text describing the content of the attachment.

**href** An uri (Uri). URI for this Attachment.

**id** A string. Unique identifier for this particular attachment.

**url** An uri (Uri). Uniform Resource Locator, is a web page address (a subset of URI).

**name** A string. The name of the attachment.

**@baseType** A string. When sub-classing, this defines the super-class.

**@schemaLocation** An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.

**@type** A string. When sub-classing, this defines the sub-class Extensible name.

**attachmentType** A string. Attachment type such as video, picture.

**content** A base 6 4 (Base64). The actual contents of the attachment object, if embedded, encoded as base64.

**contentType** A string. Attachment mime type such as extension file for video, picture and document.

**size** A quantity (Quantity). The size of the attachment.

**validFor** A time period. The period of time for which the attachment is valid.

#### Characteristic sub-resource

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

**@baseType** A string. When sub-classing, this defines the super-class.

**@schemaLocation** An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.

**@type** A string. When sub-classing, this defines the sub-class Extensible name.

characteristicRelationship	A list of characteristic relationships (CharacteristicRelationship [*]). Another Characteristic that is related to the current Characteristic;.
id	A string. Unique identifier of the characteristic.
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.

CharacteristicRelationship sub-resource

Another Characteristic that is related to the current Characteristic;.

href	An uri (Uri). Hyperlink reference.
id	A string. Unique identifier of the characteristic.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
relationshipType	A string. The type of relationship.

ExternalReference sub-resource

External reference of the individual or reference in other system.

href	An uri (Uri). Hyperlink reference.
id	A string. unique identifier.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
externalReferenceType	A string. Type of the external reference.
name	A string. External reference name.

Feature sub-resource

Configuration feature.

constraint	A list of constraint references (ConstraintRef [*]). This is a list of feature constraints.
------------	---

featureCharacteristic	A list of characteristics (Characteristic [1..*]). This is a list of Characteristics for a particular feature.
featureRelationship	A list of feature relationships (FeatureRelationship [*]). Configuration feature.
id	A string. Unique identifier of the feature.
isBundle	A boolean. True if this is a feature group. Default is false.
isEnabled	A boolean. True if this feature is enabled. Default is true.
name	A string. This is the name for the feature.

FeatureRelationship sub-resource

Configuration feature.

id	A string. Unique identifier of the target feature.
name	A string. This is the name of the target feature.
relationshipType	A string. This is the type of the feature relationship.
validFor	A time period. The period for which this feature relationship is valid.

Note sub-resource

Extra information about a given entity.

href	An uri (Uri). Hyperlink reference.
id	A string. Identifier of the note within its containing entity (may or may not be globally unique, depending on provider implementation).
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
author	A string. Author of the note.
date	A date time (DateTime). Date of the note.
text	A string. Text of the note.

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.

name                      A string. Name of the related entity.

href                      An uri (Uri). Hyperlink reference.

id                         A string. unique identifier.

@baseType                A string. When sub-classing, this defines the super-class.

@schemaLocation        An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.

@type                    A string. When sub-classing, this defines the sub-class Extensible name.

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.

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.

@baseType                A string. When sub-classing, this defines the super-class.

@schemaLocation        An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.

@type                    A string. When sub-classing, this defines the sub-class Extensible name.

role                      A string.

#### ResourceOrderItem sub-resource

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

href	An uri (Uri). Hyperlink reference.
id	A string. Identifier of the line item (such as a sequence number 01, 02, 03).
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
action	An order item action type (OrderItemActionType). action to be performed on the product.
appointment	An appointment reference (AppointmentRef). Refers an appointment, such as a Customer presentation or internal meeting or site visit.
orderItemRelationship	A list of resource order item relationships (ResourceOrderItemRelationship [*]).
quantity	An integer. Quantity ordered.
resource	A resource ref or value (ResourceRefOrValue). Resource is an abstract entity that describes the common set of attributes shared by all concrete resources. The polymorphic attributes @type, @schemaLocation & @referredType are related to the Resource entity and not the related ResourceRefOrValue class itself.
resourceSpecification	A resource specification reference (ResourceSpecificationRef). Resources are physical or non-physical components (or some combination of these) within an enterprise's infrastructure or inventory. They are typically consumed or used by services (for example a physical port assigned to a service) or contribute to the realization of a Product (for example, a SIM card). They can be drawn from the Application, Computing and Network domains, and include, for example, Network Elements, software, IT systems, content and information, and technology components. A ResourceSpecification is an abstract base class for representing a generic means for implementing a particular type of Resource. In essence, a ResourceSpecification defines the common attributes and relationships of a set of related Resources, while Resource defines a specific instance that is based on a particular ResourceSpecification.
state	A resource order item state type (ResourceOrderItemStateType). Possible values for the state of the order item.

#### ResourceOrderItemRelationship sub-resource

href	An uri (Uri). Hyperlink reference.
id	A string. unique identifier.



@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
orderItem	A resource order item reference (ResourceOrderItemRef).
relationshipType	A string. Type of the order item relationship.

#### ResourceRefOrValue sub-resource

Resource is an abstract entity that describes the common set of attributes shared by all concrete resources. The polymorphic attributes @type, @schemaLocation & @referredType are related to the Resource entity and not the related ResourceRefOrValue class itself.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
name	A string. A string used to give a name to the resource.
href	A string. The URI for the object itself.
id	A string. Identifier of an instance of the resource. Required to be unique within the resource type. Used in URIs as the identifier for specific instances of a type.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
category	A string. Category of the concrete resource. e.g., Gold, Silver for MSISDN concrete resource.
description	A string. free-text description of the resource.
endOperatingDate	A date time (DateTime). A date time( DateTime). The date till the resource is operating.
resourceVersion	A string. A field that identifies the specific version of an instance of a resource.
startOperatingDate	A date time (DateTime). A date time( DateTime). The date from which the resource is operating.
activationFeature	A list of features (Feature [*]). Configuration features.

administrativeState	A resource administrative state type (ResourceAdministrativeStateType). Tracks the lifecycle status of the resource, such as planning, installing, operating, retiring and so on.
attachment	A list of attachment ref or values (AttachmentRefOrValue [*]). An attachment by value or by reference. An attachment complements the description of an element, for example through a document, a video, a picture.
note	A list of notes (Note [*]). Extra information about a given entity.
operationalState	A resource operational state type (ResourceOperationalStateType). Tracks the lifecycle status of the resource, such as planning, installing, operating, retiring and so on.
place	A related place ref or value (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.
relatedParty	A list of related parties (RelatedParty [*]). Related Entity reference. A related party defines party or party role linked to a specific entity.
resourceCharacteristic	A list of characteristics (Characteristic [*]). Describes a given characteristic of an object or entity through a name/value pair.
resourceRelationship	A list of resource relationships (ResourceRelationship [*]). Linked resources to the one instantiate, such as [bundled] if the resource is a bundle and you want to describe the bundled resources inside this bundle; [reliesOn] if the resource needs another already owned resource to rely on (e.g. an option on an already owned mobile access resource) [targets] or [isTargeted] (depending on the way of expressing the link) for any other kind of links that may be useful.
resourceSpecification	A resource specification reference (ResourceSpecificationRef). Resources are physical or non-physical components (or some combination of these) within an enterprise's infrastructure or inventory. They are typically consumed or used by services (for example a physical port assigned to a service) or contribute to the realization of a Product (for example, a SIM card). They can be drawn from the Application, Computing and Network domains, and include, for example, Network Elements, software, IT systems, content and information, and technology components. A ResourceSpecification is an abstract base class for representing a generic means for implementing a particular type of Resource. In essence, a ResourceSpecification defines the common attributes and relationships of a set of related Resources, while Resource defines a specific instance that is based on a particular ResourceSpecification.

resourceStatus	A resource status type (ResourceStatusType). Tracks the lifecycle status of the resource, such as planning, installing, operating, retiring and so on.
usageState	A resource usage state type (ResourceUsageStateType). Tracks the lifecycle status of the resource, such as planning, installing, operating, retiring and so on.

#### ResourceRelationship sub-resource

Linked resources to the one instantiate, such as [bundled] if the resource is a bundle and you want to describe the bundled resources inside this bundle; [reliesOn] if the resource needs another already owned resource to rely on (e.g. an option on an already owned mobile access resource) [targets] or [isTargeted] (depending on the way of expressing the link) for any other kind of links that may be useful.

href	An uri (Uri). Hyperlink reference.
id	A string. unique identifier.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
relationshipType	A string. Type of the resource relationship, such as [bundled] if the resource is a bundle and you want to describe the bundled resources inside this bundle; [reliesOn] if the resource needs another already owned resource to rely on (eg: an option on an already owned mobile access resource) [targets] or [isTargeted] (depending on the way of expressing the link) for any other kind of links that may be useful.
resource	A resource ref or value (ResourceRefOrValue). Resource is an abstract entity that describes the common set of attributes shared by all concrete resources. The polymorphic attributes @type, @schemaLocation & @referredType are related to the Resource entity and not the related ResourceRefOrValue class itself.

#### AppointmentRef relationship

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

href	A string. The reference of the appointment.
id	A string. The identifier of the referred appointment.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.

@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.

ConstraintRef relationship

Constraint reference. The Constraint resource represents a policy/rule applied to an entity or entity spec.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
name	A string. Name of the related entity.
href	An uri (Uri). Hyperlink reference.
id	A string. unique identifier.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
version	A string. constraint version.

ResourceOrderItemRef relationship

@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
@referredType	A string. The actual type of the target instance when needed for disambiguation.
itemId	A string. Identifier of the line item.
resourceOrderHref	An uri (Uri). Link to the order to which this item belongs to.
resourceOrderId	A string. Identifier of the resource order that this item belongs to.

ResourceSpecificationRef relationship

Resources are physical or non-physical components (or some combination of these) within an enterprise's infrastructure or inventory. They are typically consumed or used by services (for example a physical port assigned to a service) or contribute to the realization of a Product (for example, a SIM card). They can be drawn from the Application, Computing and Network domains, and include, for example, Network Elements, software, IT systems, content and information, and technology components.

A ResourceSpecification is an abstract base class for representing a generic means for implementing a particular type of Resource. In essence, a ResourceSpecification defines the common attributes and relationships of a set of related Resources, while Resource defines a specific instance that is based on a particular ResourceSpecification.

@referredType	A string. The actual type of the target instance when needed for disambiguation.
name	A string. Name of the related entity.
href	An uri (Uri). Hyperlink reference.
id	A string. unique identifier.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
version	A string. Resource Specification version.

### Json representation sample

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

```
{
  "id": "5130d5131a23",
  "href": "http://host/resourceOrder/resourceOrder/5130d5131a23",
  "category": "Premium",
  "description": "7000m of Optical Cable",
  "expectedCompletionDate": "2020-05-31T20:50:27.275Z",
  "name": "7km Optical Cable for Acme Inc",
  "orderDate": "2020-03-31T20:50:27.275Z",
  "priority": 0,
  "requestedCompletionDate": "2020-03-31T19:50:43.214Z",
  "requestedStartDate": "2020-03-31T19:50:43.214Z",
  "startDate": "2020-03-31T19:50:43.214Z",
  "externalReference": [
    {
      "externalReferenceType": "Acme Ordering Number",
      "name": "8b032c8ca734"
    }
  ],
  "note": [
    {
      "id": "9ba1047c38ce",
      "date": "2020-03-31T19:50:43.214Z",
      "text": "Cable must be double jacketed as it may be exposed to water"
    }
  ],
  "orderItem": [
    {
      "id": "049eb3108ed5",
      "quantity": 7000,

```

```

    "action": "add",
    "appointment": {
      "id": "74da513bdc6c",
      "href": "https://host/tmf-api/appointment/v4/appointment/74da513bdc6c",
      "description": "Site Survey"
    },
    "resource": {
      "category": "Premium",
      "description": "LG Series: FAA-Compliant Loose Tube Cable - Double Jacket",
      "name": "LG006-C5111N1",
      "resourceVersion": "6",
      "attachment": [
        {
          "id": "305f2215715f",
          "href": "http://host/Attachment/305f2215715f",
          "attachmentType": "PDF",
          "description": "Fiber Optic Cable Data Sheet",
          "mimeType": "application/pdf",
          "name": "FAA-Compliant_Loose_Tube_Cable_-_Double_Jacket.pdf",
          "url": "http://host/Content/d08d1967b82f"
        }
      ],
      "operationalState": "disable",
      "place": {
        "id": "49c2c42cbd2f",
        "href": "http://host/GeographicAddress/address/49c2c42cbd2f",
        "name": "Acme Inc Headquarters",
        "role": "Customer Site",
        "@baseType": "Place",
        "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Common/GeographicAddress.schema.json",
        "@referredType": "GeographicAddress"
      },
      "relatedParty": [
        {
          "role": "Manufacturer",
          "id": "091b56cc3864",
          "href": "http://host/PartyManagement/organization/091b56cc3864",
          "name": "FiberOpticsRUs Inc",
          "@referredType": "Organization"
        }
      ],
      "resourceSpecification": {
        "id": "e362d12b54f2",
        "href": "http://host/ResourceCatalog/resourceSpecification/e362d12b54f2",
        "name": "LG006-C5111N1",
        "version": "6"
      },
      "@baseType": "Resource",
      "@type": "PhysicalResource"
    },
    "state": "acknowledged"
  }
],
"relatedParty": [
  {
    "role": "Customer",

```

```

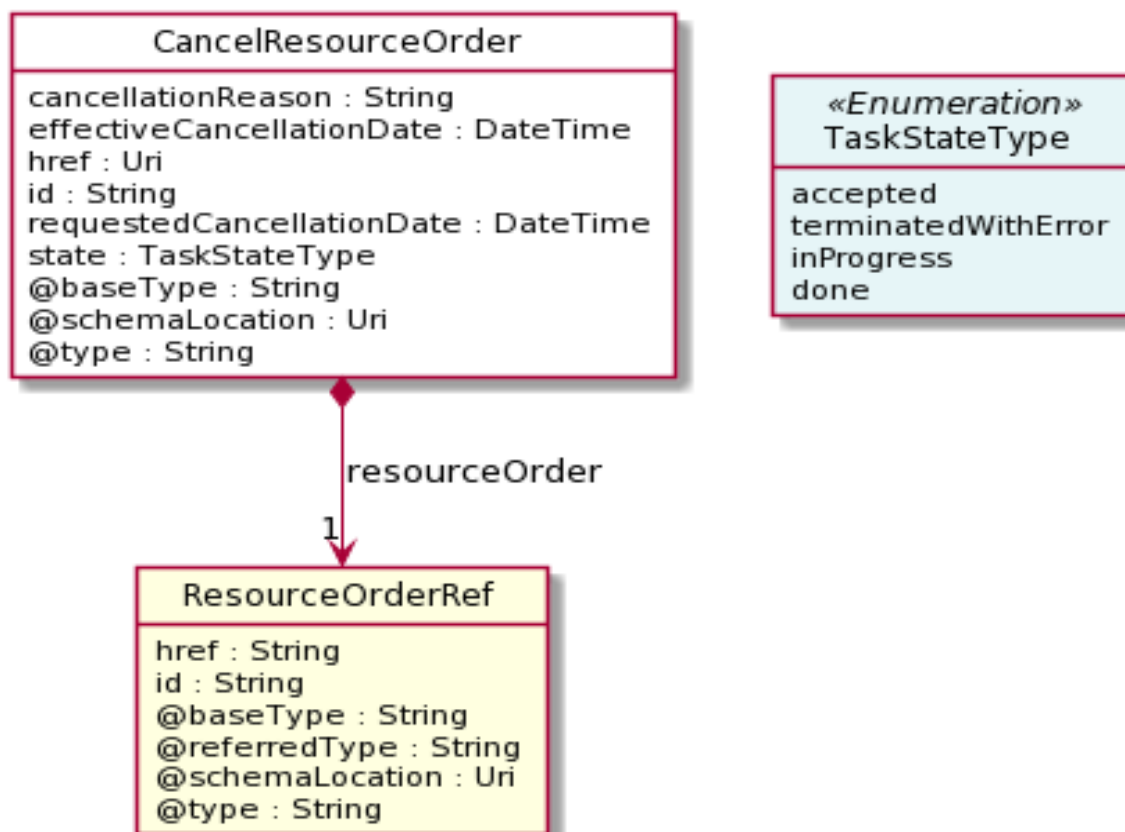
    "id": "b5bd5f0b9f33",
    "href": "http://host/PartyManagement/organization/b5bd5f0b9f33",
    "name": "Acme Inc",
    "@referredType": "Organization"
  },
  {
    "role": "Account Manager",
    "id": "8f0585d639f6",
    "href": "http://host/PartyManagement/organization/8f0585d639f6",
    "name": "Gwen Howells",
    "@referredType": "Individual"
  }
],
"state": "acknowledged"
}

```

## Cancel Resource Order resource

Request for cancellation an existing resource order.

### Resource model



**Field descriptions***CancelResourceOrder* fields

cancellationReason	A string. Reason why the order is cancelled.
effectiveCancellationDate	A date time (DateTime). Date when the order is cancelled.
href	An uri (Uri). Hyperlink reference.
id	A string. unique identifier.
requestedCancellationDate	A date time (DateTime). Date when the submitter wants the order to be cancelled.
href	An uri (Uri). Hyperlink reference.
id	A string. unique identifier.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
resourceOrder	A resource order reference (ResourceOrderRef).
state	A task state type (TaskStateType). Tracks the lifecycle status of the cancellation request, such as Acknowledged, Rejected, InProgress, Pending and so on.

*ResourceOrderRef* relationship

href	A string. Hyperlink to access the related Resource Order.
id	A string. The unique identifier of the related resource order.
@baseType	A string. When sub-classing, this defines the super-class.
@schemaLocation	An uri (Uri). A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A string. When sub-classing, this defines the sub-class Extensible name.
@referredType	A string. The actual type of the target instance when needed for disambiguation.

**Json representation sample**

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



```
{
  "id": "5130d5131a23",
  "href": "https://host/tmf-api/cancelResourceOrder/v4/cancelResourceOrder/5130d5131a23",
  "cancellationReason": "No longer required",
  "effectiveCancellationDate": "2020-07-10T18:00:00.000Z",
  "requestedCancellationDate": "2020-07-10T17:18:14.523Z",
  "resourceOrder": {
    "id": "fde8c6a47450",
    "href": "http://host/resourceOrder/fde8c6a47450"
  },
  "state": "assessingCancellation"
}
```

## Notification Resource Models

8 notifications are defined for this API

Notifications related to ResourceOrder:

- ResourceOrderCreateEvent
- ResourceOrderAttributeValueChangeEvent
- ResourceOrderStateChangeEvent
- ResourceOrderDeleteEvent
- ResourceOrderInformationRequiredEvent

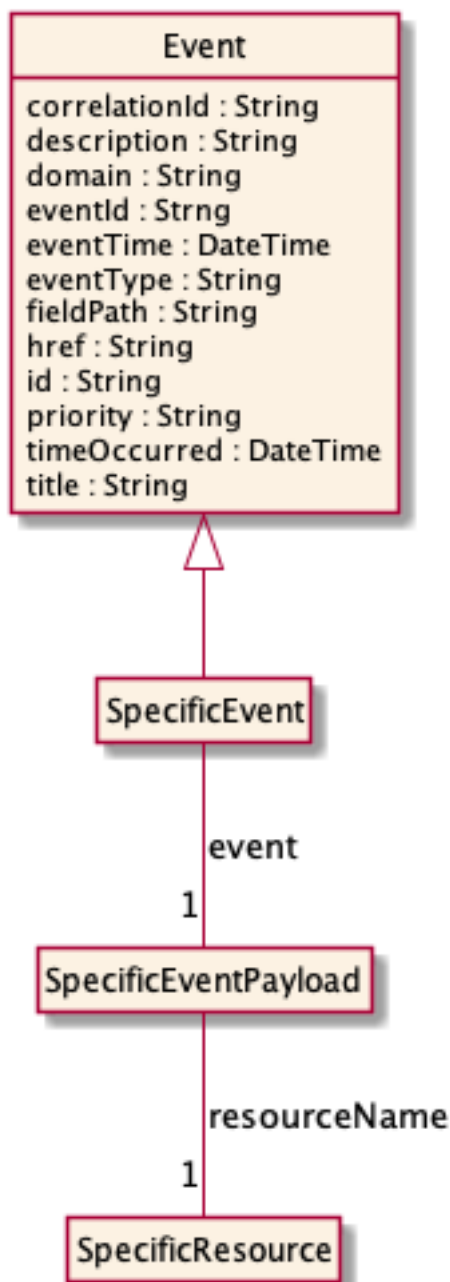
Notifications related to CancelResourceOrder:

- CancelResourceOrderCreateEvent
- CancelResourceOrderStateChangeEvent
- CancelResourceOrderInformationRequiredEvent

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).



## Resource Order Create Event

Notification ResourceOrderCreateEvent case for resource ResourceOrder

### Json representation sample

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

```

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

```
    {-- SEE ResourceOrder RESOURCE SAMPLE --}  
  }  
}
```

## Resource Order Attribute Value Change Event

Notification ResourceOrderAttributeValueChangeEvent case for resource ResourceOrder

### Json representation sample

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

```
{  
  "eventId":"00001",  
  "eventTime":"2015-11-16T16:42:25-04:00",  
  "eventType":"ResourceOrderAttributeValueChangeEvent",  
  "event": {  
    "resourceOrder" :  
      {-- SEE ResourceOrder RESOURCE SAMPLE --}  
  }  
}
```

## Resource Order State Change Event

Notification ResourceOrderStateChangeEvent case for resource ResourceOrder

### Json representation sample

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

```
{  
  "eventId":"00001",  
  "eventTime":"2015-11-16T16:42:25-04:00",  
  "eventType":"ResourceOrderStateChangeEvent",  
  "event": {  
    "resourceOrder" :  
      {-- SEE ResourceOrder RESOURCE SAMPLE --}  
  }  
}
```

## Resource Order Delete Event

Notification ResourceOrderDeleteEvent case for resource ResourceOrder

### Json representation sample

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

```
{
  "eventId": "00001",
  "eventTime": "2015-11-16T16:42:25-04:00",
  "eventType": "ResourceOrderDeleteEvent",
  "event": {
    "resourceOrder":
      {-- SEE ResourceOrder RESOURCE SAMPLE --}
  }
}
```

## Resource Order Information Required Event

Notification ResourceOrderInformationRequiredEvent case for resource ResourceOrder

### Json representation sample

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

```
{
  "eventId": "00001",
  "eventTime": "2015-11-16T16:42:25-04:00",
  "eventType": "ResourceOrderInformationRequiredEvent",
  "event": {
    "resourceOrder":
      {-- SEE ResourceOrder RESOURCE SAMPLE --}
  }
}
```

## Cancel Resource Order Create Event

Notification CancelResourceOrderCreateEvent case for resource CancelResourceOrder

### Json representation sample

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

```
{
  "eventId": "00001",
  "eventTime": "2015-11-16T16:42:25-04:00",
  "eventType": "CancelResourceOrderCreateEvent",
  "event": {
    "cancelResourceOrder":
      {-- SEE CancelResourceOrder RESOURCE SAMPLE --}
  }
}
```

## Cancel Resource Order State Change Event

Notification CancelResourceOrderStateChangeEvent case for resource CancelResourceOrder

### Json representation sample

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

```
{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"CancelResourceOrderStateChangeEvent",
  "event": {
    "cancelResourceOrder" :
      {-- SEE CancelResourceOrder RESOURCE SAMPLE --}
  }
}
```

## Cancel Resource Order Information Required Event

Notification CancelResourceOrderInformationRequiredEvent case for resource CancelResourceOrder

### Json representation sample

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

```
{
  "eventId":"00001",
  "eventTime":"2015-11-16T16:42:25-04:00",
  "eventType":"CancelResourceOrderInformationRequiredEvent",
  "event": {
    "cancelResourceOrder" :
      {-- SEE CancelResourceOrder 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 Resource Order

#### List resource orders

**GET /resourceOrder?fields=...&{filtering}**

#### Description

This operation list resource 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

Retrieving brief details of a previous Resource Order. The request criteria is the category (Premium)

Request
GET /tmf-api/resourceOrdering/v4/resourceOrder?fields=id,href,expectedCompletionDate,state,category&category=Premium Accept: application/json
Response
200  [ { "id": "5130d5131a23", "href": "http://host/resourceOrder/resourceOrder/5130d5131a23", "category": "Premium", "expectedCompletionDate": "2020-03-31T21:05:37.168Z", "state": "InProgress" } ]

### Retrieve resource order

**GET /resourceOrder/{id}?fields=...&{filtering}**

#### Description

This operation retrieves a resource 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

A request for the previous ResourceOrder. The criteria is the Resource id 5130d5131a23

**Request**

GET /tmf-api/resourceOrdering/v4/resourceOrder/5130d5131a23  
 Accept: application/json

**Response**

200

```
{
  "id": "5130d5131a23",
  "href": "http://host/resourceOrder/resourceOrder/5130d5131a23",
  "category": "Premium",
  "description": "7000m of Optical Cable",
  "expectedCompletionDate": "2020-05-31T20:50:27.275Z",
  "name": "7km Optical Cable for Acme Inc",
  "orderDate": "2020-03-31T20:50:27.275Z",
  "priority": 0,
  "requestedCompletionDate": "2020-03-31T19:50:43.214Z",
  "requestedStartDate": "2020-03-31T19:50:43.214Z",
  "startDate": "2020-03-31T19:50:43.214Z",
  "externalReference": [
    {
      "externalReferenceType": "Acme Ordering Number",
      "name": "8b032c8ca734"
    }
  ],
  "note": [
    {
      "id": "9ba1047c38ce",
      "date": "2020-03-31T19:50:43.214Z",
      "text": "Cable must be double jacketed as it may be exposed to water"
    }
  ],
  "orderItem": [
    {
      "id": "049eb3108ed5",
      "quantity": 7000,
      "action": "add",
      "appointment": {
        "id": "74da513bdc6c",
        "href": "https://host/tmf-api/appointment/v4/appointment/74da513bdc6c",
        "description": "Site Survey"
      },
      "resource": {
        "id": "56fcbd0673c3",
        "href": "http://host/resourceCatalog/resource/56fcbd0673c3",
        "category": "Premium",
        "description": "LG Series: FAA-Compliant Loose Tube Cable - Double Jacket",
        "name": "LG006-CS111N1",
        "resourceVersion": "6",
        "attachment": [
```



```

    {
      "id": "305f2215715f",
      "href": "http://host/Attachment/305f2215715f",
      "attachmentType": "PDF",
      "description": "Fiber Optic Cable Data Sheet",
      "mimeType": "application/pdf",
      "name": "FAA-Compliant_Loose_Tube_Cable_-_Double_Jacket.pdf",
      "url": "http://host/Content/d08d1967b82f"
    }
  ],
  "operationalState": "disable",
  "place": {
    "id": "49c2c42cbd2f",
    "href": "http://host/GeographicAddress/address/49c2c42cbd2f",
    "name": "Acme Inc Headquarters",
    "role": "Customer Site",
    "@baseType": "Place",
    "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Common/GeographicAddress.schema.json",
    "@referredType": "GeographicAddress"
  },
  "relatedParty": [
    {
      "role": "Manufacturer",
      "id": "091b56cc3864",
      "href": "http://host/PartyManagement/organization/091b56cc3864",
      "name": "FiberOpticsRUs Inc",
      "@referredType": "Organization"
    }
  ],
  "resourceSpecification": {
    "id": "e362d12b54f2",
    "href": "http://host/ResourceCatalog/resourceSpecification/e362d12b54f2",
    "name": "LG006-C5111N1",
    "version": "6"
  },
  "@baseType": "Resource",
  "@type": "PhysicalResource"
},
"state": "InProgress"
}
],
"relatedParty": [
  {
    "role": "Customer",
    "id": "b5bd5f0b9f33",
    "href": "http://host/PartyManagement/organization/b5bd5f0b9f33",
    "name": "Acme Inc",
    "@referredType": "Organization"
  },
  {
    "role": "Account Manager",
    "id": "8f0585d639f6",
    "href": "http://host/PartyManagement/organization/8f0585d639f6",
    "name": "Gwen Howells",
    "@referredType": "Individual"
  }
]

```

```

},
"state": "InProgress"
}

```

## Create resource order

### POST /resourceOrder

#### Description

This operation creates a resource order entity.

#### Mandatory and Non Mandatory Attributes

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

Non Mandatory Attributes	Rule
@baseType	
@schemaLocation	
@type	
cancellationDate	
cancellationReason	
category	
completionDate	
description	
expectedCompletionDate	
externalId	
externalReference	
name	
note	
orderDate	
orderItem	
orderType	
priority	
relatedParty	
requestedCompletionDate	
requestedStartDate	
startDate	
state	

#### Additional Rules

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

Context	Mandatory Sub-Attributes
resourceOrderItem	id, action
relatedParty	id, @referredType
note	text, id
orderRelationship	id, relationshipType
orderItem.resourceCharacteristic	name
orderItem.orderItemRelationship	orderItem
orderItem.orderItemRelationship.orderItem	itemId
appointment	id
externalReference	name

The following pre-conditions apply for this operation.

Pre-conditions
When creating a resource order (post) an order must not have the state, cancellationDate, cancellationReason, completionDate, orderDate fields
When creating a resource order (post) an order item must not have the state field
In relatedParty, the role is mandatory if the id identifies a party - optional if it is a party role.

## Usage Samples

An example request to create an order for Optical Cable for use case 1 - the resulting resource ID is 5130d5131a23

Request
POST /tmf-api/resourceOrdering/v4/resourceOrder Content-Type: application/json  <pre>{   "category": "Premium",   "description": "7000m of Optical Cable",   "name": "7km Optical Cable for Acme Inc",   "priority": 0,   "requestedCompletionDate": "2020-03-31T19:50:43.214Z",   "requestedStartDate": "2020-03-31T19:50:43.214Z",   "externalReference": [     {       "externalReferenceType": "Acme Ordering Number",       "name": "8b032c8ca734"     }   ],   "note": [     {       "id": "9ba1047c38ce",       "date": "2020-03-31T19:50:43.214Z",       "text": "Cable must be double jacketed as it may be exposed to water"     }   ] }</pre>

```

    }
  ],
  "orderItem": [
    {
      "id": "049eb3108ed5",
      "quantity": 7000,
      "action": "add",
      "appointment": {
        "id": "74da513bdc6c",
        "href": "https://host/tmf-api/appointment/v4/appointment/74da513bdc6c",
        "description": "Site Survey"
      },
      "resource": {
        "category": "Premium",
        "description": "LG Series: FAA-Compliant Loose Tube Cable - Double Jacket",
        "name": "LG006-C5111N1",
        "resourceVersion": "6",
        "attachment": [
          {
            "id": "305f2215715f",
            "href": "http://host/Attachment/305f2215715f",
            "attachmentType": "PDF",
            "description": "Fiber Optic Cable Data Sheet",
            "mimeType": "application/pdf",
            "name": "FAA-Compliant_Loose_Tube_Cable_-_Double_Jacket.pdf",
            "url": "http://host/Content/d08d1967b82f"
          }
        ],
        "operationalState": "disable",
        "place": {
          "id": "49c2c42cbd2f",
          "href": "http://host/GeographicAddress/address/49c2c42cbd2f",
          "name": "Acme Inc Headquarters",
          "role": "Customer Site",
          "@baseType": "Place",
          "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Common/GeographicAddress.schema.json",
          "@referredType": "GeographicAddress"
        },
        "relatedParty": [
          {
            "role": "Manufacturer",
            "id": "091b56cc3864",
            "href": "http://host/PartyManagement/organization/091b56cc3864",
            "name": "FiberOpticsRUs Inc",
            "@referredType": "Organization"
          }
        ],
        "resourceSpecification": {
          "id": "e362d12b54f2",
          "href": "http://host/ResourceCatalog/resourceSpecification/e362d12b54f2",
          "name": "LG006-C5111N1",
          "version": "6"
        },
        "@baseType": "Resource",
        "@type": "PhysicalResource"
      }
    }
  ]
}

```

```

    }
  ],
  "relatedParty": [
    {
      "role": "Customer",
      "id": "b5bd5f0b9f33",
      "href": "http://host/PartyManagement/organization/b5bd5f0b9f33",
      "name": "Acme Inc",
      "@referredType": "Organization"
    },
    {
      "role": "Account Manager",
      "id": "8f0585d639f6",
      "href": "http://host/PartyManagement/organization/8f0585d639f6",
      "name": "Gwen Howells",
      "@referredType": "Individual"
    }
  ]
}

```

## Response

201

```

{
  "id": "5130d5131a23",
  "href": "http://host/resourceOrder/resourceOrder/5130d5131a23",
  "category": "Premium",
  "description": "7000m of Optical Cable",
  "expectedCompletionDate": "2020-05-31T20:50:27.275Z",
  "name": "7km Optical Cable for Acme Inc",
  "orderDate": "2020-03-31T20:50:27.275Z",
  "priority": 0,
  "requestedCompletionDate": "2020-03-31T19:50:43.214Z",
  "requestedStartDate": "2020-03-31T19:50:43.214Z",
  "startDate": "2020-03-31T19:50:43.214Z",
  "externalReference": [
    {
      "externalReferenceType": "Acme Ordering Number",
      "name": "8b032c8ca734"
    }
  ],
  "note": [
    {
      "id": "9ba1047c38ce",
      "date": "2020-03-31T19:50:43.214Z",
      "text": "Cable must be double jacketed as it may be exposed to water"
    }
  ],
  "orderItem": [
    {
      "id": "049eb3108ed5",
      "quantity": 7000,

```

```

    "action": "add",
    "appointment": {
      "id": "74da513bdc6c",
      "href": "https://host/tmf-api/appointment/v4/appointment/74da513bdc6c",
      "description": "Site Survey"
    },
    "resource": {
      "id": "56fcbd0673c3",
      "href": "http://host/resourceOrder/resource/56fcbd0673c3",
      "category": "Premium",
      "description": "LG Series: FAA-Compliant Loose Tube Cable - Double Jacket",
      "name": "LG006-C5111N1",
      "resourceVersion": "6",
      "attachment": [
        {
          "id": "305f2215715f",
          "href": "http://host/Attachment/305f2215715f",
          "attachmentType": "PDF",
          "description": "Fiber Optic Cable Data Sheet",
          "mimeType": "application/pdf",
          "name": "FAA-Compliant_Loose_Tube_Cable_-_Double_Jacket.pdf",
          "url": "http://host/Content/d08d1967b82f"
        }
      ],
      "operationalState": "disable",
      "place": {
        "id": "49c2c42cbd2f",
        "href": "http://host/GeographicAddress/address/49c2c42cbd2f",
        "name": "Acme Inc Headquarters",
        "role": "Customer Site",
        "@baseType": "Place",
        "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Common/GeographicAddress.schema.json",
        "@referredType": "GeographicAddress"
      },
      "relatedParty": [
        {
          "role": "Manufacturer",
          "id": "091b56cc3864",
          "href": "http://host/PartyManagement/organization/091b56cc3864",
          "name": "FiberOpticsRUs Inc",
          "@referredType": "Organization"
        }
      ],
      "resourceSpecification": {
        "id": "e362d12b54f2",
        "href": "http://host/ResourceCatalog/resourceSpecification/e362d12b54f2",
        "name": "LG006-C5111N1",
        "version": "6"
      },
      "@baseType": "Resource",
      "@type": "PhysicalResource"
    },
    "state": "acknowledged"
  },
  "relatedParty": [

```

```

{
  "role": "Customer",
  "id": "b5bd5f0b9f33",
  "href": "http://host/PartyManagement/organization/b5bd5f0b9f33",
  "name": "Acme Inc",
  "@referredType": "Organization"
},
{
  "role": "Account Manager",
  "id": "8f0585d639f6",
  "href": "http://host/PartyManagement/organization/8f0585d639f6",
  "name": "Gwen Howells",
  "@referredType": "Individual"
}
],
"state": "acknowledged"
}

```

## Patch resource order

### PATCH /resourceOrder/{id}

#### Description

This operation allows partial updates of a resource 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
@baseType	
@schemaLocation	
@type	
cancellationDate	
cancellationReason	
category	
description	
expectedCompletionDate	
externalId	
externalReference	
name	
note	

orderItem	
orderType	
priority	
relatedParty	
requestedCompletionDate	
requestedStartDate	
startDate	
state	

Non Patchable Attributes	Rule
id	
href	
orderDate	
completionDate	
correlationId	

### Additional Rules

The following pre-conditions apply for this operation.

Pre-conditions
When creating a resource order (post) an order must not have the state, cancellationDate, cancellationReason, completionDate, orderDate fields
When creating a resource order (post) an order item must not have the state field
In relatedParty, the role is mandatory if the id identifies a party - optional if it is a party role.

### Usage Samples

A request for updating a previous ResourceOrder, changing the priority for ResourceOrder 5130d5131a23

<b>Request</b>
PATCH /tmf-api/resourceOrdering/v4/resourceOrder/5130d5131a23 Content-Type: application/json  <pre>{   "priority": 2 }</pre>
<b>Response</b>
200  <pre>{   "id": "5130d5131a23",</pre>



```

    "href": "http://host/resourceOrder/resourceOrder/5130d5131a23",
    "category": "Premium",
    "description": "7000m of Optical Cable",
    "expectedCompletionDate": "2020-05-31T20:50:27.275Z",
    "name": "7km Optical Cable for Acme Inc",
    "orderDate": "2020-03-31T20:50:27.275Z",
    "priority": 2,
    "requestedCompletionDate": "2020-03-31T19:50:43.214Z",
    "requestedStartDate": "2020-03-31T19:50:43.214Z",
    "startDate": "2020-03-31T19:50:43.214Z",
    "externalReference": [
      {
        "externalReferenceType": "Acme Ordering Number",
        "name": "8b032c8ca734"
      }
    ],
    "note": [
      {
        "id": "9ba1047c38ce",
        "date": "2020-03-31T19:50:43.214Z",
        "text": "Cable must be double jacketed as it may be exposed to water"
      }
    ],
    "orderItem": [
      {
        "id": "049eb3108ed5",
        "quantity": 7000,
        "action": "add",
        "appointment": {
          "id": "74da513bdc6c",
          "href": "https://host/tmf-api/appointment/v4/appointment/74da513bdc6c",
          "description": "Site Survey"
        },
        "resource": {
          "id": "56fcbd0673c3",
          "href": "http://host/resourceCatalog/resource/56fcbd0673c3",
          "category": "Premium",
          "description": "LG Series: FAA-Compliant Loose Tube Cable - Double Jacket",
          "name": "LG006-C5111N1",
          "resourceVersion": "6",
          "attachment": [
            {
              "id": "305f2215715f",
              "href": "http://host/Attachment/305f2215715f",
              "attachmentType": "PDF",
              "description": "Fiber Optic Cable Data Sheet",
              "mimeType": "application/pdf",
              "name": "FAA-Compliant_Loose_Tube_Cable_-_Double_Jacket.pdf",
              "url": "http://host/Content/d08d1967b82f"
            }
          ]
        },
        "operationalState": "disable",
        "place": {
          "id": "49c2c42cbd2f",
          "href": "http://host/GeographicAddress/address/49c2c42cbd2f",
          "name": "Acme Inc Headquarters",

```

```

        "role": "Customer Site",
        "@baseType": "Place",
        "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/Common/GeographicAddress.schema.json",
        "@referredType": "GeographicAddress"
    },
    "relatedParty": [
        {
            "role": "Manufacturer",
            "id": "091b56cc3864",
            "href": "http://host/PartyManagement/organization/091b56cc3864",
            "name": "FiberOpticsRUs Inc",
            "@referredType": "Organization"
        }
    ],
    "resourceSpecification": {
        "id": "e362d12b54f2",
        "href": "http://host/ResourceCatalog/resourceSpecification/e362d12b54f2",
        "name": "LG006-C5111N1",
        "version": "6"
    },
    "@baseType": "Resource",
    "@type": "PhysicalResource"
},
"state": "InProgress"
}
],
"relatedParty": [
    {
        "role": "Customer",
        "id": "b5bd5f0b9f33",
        "href": "http://host/PartyManagement/organization/b5bd5f0b9f33",
        "name": "Acme Inc",
        "@referredType": "Organization"
    },
    {
        "role": "Account Manager",
        "id": "8f0585d639f6",
        "href": "http://host/PartyManagement/organization/8f0585d639f6",
        "name": "Gwen Howells",
        "@referredType": "Individual"
    }
],
"state": "InProgress"
}

```

## Delete resource order

**DELETE** /resourceOrder/{id}

### Description

This operation deletes a resource order entity.

## Usage Samples

A request to delete an existing ResourceOrder

<b>Request</b>
DELETE /tmf-api/resourceOrdering/v4/resourceOrder/5130d5131a23
<b>Response</b>
204

## Operations on Cancel Resource Order

### List cancel resource orders

**GET** /cancelResourceOrder?fields=...&{filtering}

#### Description

This operation list cancel resource 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 CancelResourceOrder resources.

<b>Request</b>
GET /tmf-api/resourceOrdering/v4/cancelResourceOrder Accept: application/json
<b>Response</b>
200  [ { "id": "5130d5131a23", "href": "https://host/tmf-api/cancelResourceOrder/v4/cancelResourceOrder/5130d5131a23", "cancellationReason": "No longer required", }

```

"effectiveCancellationDate": "2020-07-10T18:00:00.000Z",
"requestedCancellationDate": "2020-07-10T17:18:14.523Z",
"resourceOrder": {
  "id": "fde8c6a47450",
  "href": "http://host/resourceOrder/fde8c6a47450"
},
"state": "assessingCancellation"
}
]

```

## Retrieve cancel resource order

**GET /cancelResourceOrder/{id}?fields=...&{filtering}**

### Description

This operation retrieves a cancel resource 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 CancelResourceOrder resource.

Request
GET /tmf-api/resourceOrdering/v4/cancelResourceOrder/5130d5131a23 Accept: application/json
Response
200  {   "id": "5130d5131a23",   "href": "https://host/tmf-api/cancelResourceOrder/v4/cancelResourceOrder/5130d5131a23",   "cancellationReason": "No longer required",   "effectiveCancellationDate": "2020-07-10T18:00:00.000Z",   "requestedCancellationDate": "2020-07-10T17:18:14.523Z",   "resourceOrder": {     "id": "fde8c6a47450",     "href": "http://host/resourceOrder/fde8c6a47450"   },   "state": "assessingCancellation" }

**Create cancel resource order****POST /cancelResourceOrder****Description**

This operation creates a cancel resource order entity.

**Mandatory and Non Mandatory Attributes**

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

Non Mandatory Attributes	Rule
cancellationReason	
effectiveCancellationDate	
requestedCancellationDate	
@baseType	
@schemaLocation	
@type	
state	

**Additional Rules**

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

Context	Mandatory Sub-Attributes
resourceOrder	id

The following pre-conditions apply for this operation.

Pre-conditions
Resource order id must exist
When creating a cancel resource order (post) the id, href, effectiveCancellationDate and state fields must not be present in the request

**Usage Samples**

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

**Request**

POST /tmf-api/resourceOrdering/v4/cancelResourceOrder  
Content-Type: application/json

```
{
  "resourceOrder": {
    "id": "fde8c6a47450",
    "href": "http://host/resourceOrder/fde8c6a47450"
  }
}
```

**Response**

201

```
{
  "id": "5130d5131a23",
  "href": "https://host/tmf-api/cancelResourceOrder/v4/cancelResourceOrder/5130d5131a23",
  "resourceOrder": {
    "id": "fde8c6a47450",
    "href": "http://host/resourceOrder/fde8c6a47450"
  }
}
```

## 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
<pre>POST /client/listener Accept: application/json  {   "event": {     EVENT BODY   },   "eventType": "EVENT_TYPE" }</pre>
Response
201

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

# Acknowledgements

## Version History

Version Number	Date Modified	Modified by:	Description of changes
4.0.0	26-Jul-2020	Alan Pope	Final edits prior to publication

## Release History

Release Status	Date	Release led by:	Description
Release 1.0	15-Apr-2016	Pierre Gauthier TM Forum  Nicoleta Stoica Vodafone Group  Mariano Belaunde Orange Labs	Generated using the API data model
Pre-production	26-Jul-2020	Yasen Pavlov Vodafone Germany  Stephen Harrop Vodafone Group	Updated based on schema-library and Design Guideline v4 patterns