

TM Forum Specification

ServiceOrdering

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Introduction

The following document is the user guide of the REST API for Service Ordering Management. It includes the model definition as well as all available operations. Possible actions are creating, updating and retrieving Service Orders (including filtering). The specification covers also a task-based resource to request Service Order Cancellation.

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

- The Order Management system has access to a catalog system
- A service order will describe a list of service order items
- A service order item references an action on an existing or future service
- The API supports ordering for both Customer-Facing Service (CFS) and Resource Facing Service (RFS)

From a component perspective, a service order should be available

- from a Service Orchestration Component (and it could mix CFS and RFS)
- from an Infrastructure Control & Management component (and it would have only RFS)

Service ordering API performs the following operations:

....on Service Order:
* Retrieval of a service order or a collection of service orders depending on filter criteria
* Partial update of a service order (including updating rules)
* Creation of a service order (including default values and creation rules)
* Deletion of service order (for administration purposes)
* Notification of events on service order:

service order creation

service order deletion

service order state change

service order value change used to notify that any data in an order has just changed
** service order information required used to notify that some data in the order need to be filled / are missing

.....on CancelServiceOrder:
* Retrieval of a service order cancellation request or a collection of service order cancellation requests depending on filter criteria
* Creation of a service order cancellation request
* Notification of events on service order cancellation:
cancel service Order creation cancel service Order state change
** order information required used to notify that some data in the cancel service order need to be filled / are missing

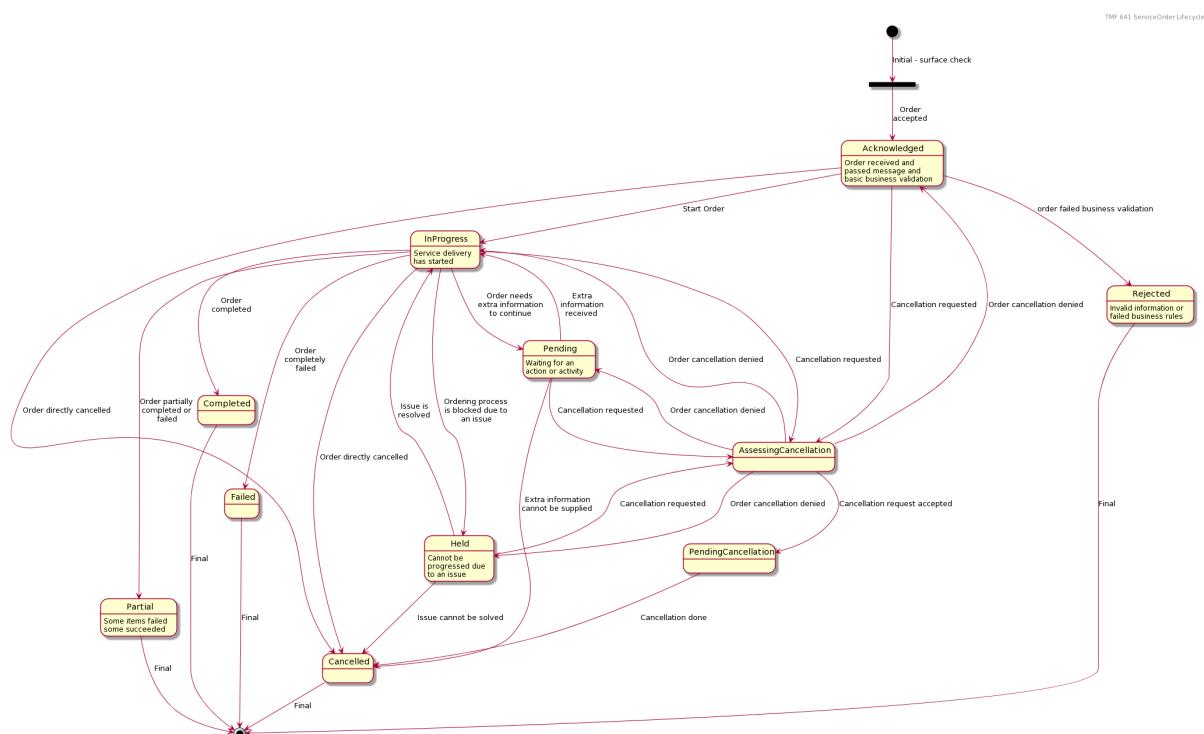
Sample Use Cases

We illustrate in this document a multi-items service order covering use-cases:

1. Creation of a very simplified CPE illustrating an object characteristic
2. Modification of an existing service to change a characteristic value and a supporting resource
3. Creation of a service with feature
4. Modification of a service order item to switch to inactive an existing service

The document also provides an example to a service order cancellation request.

Service Order Life Cycle

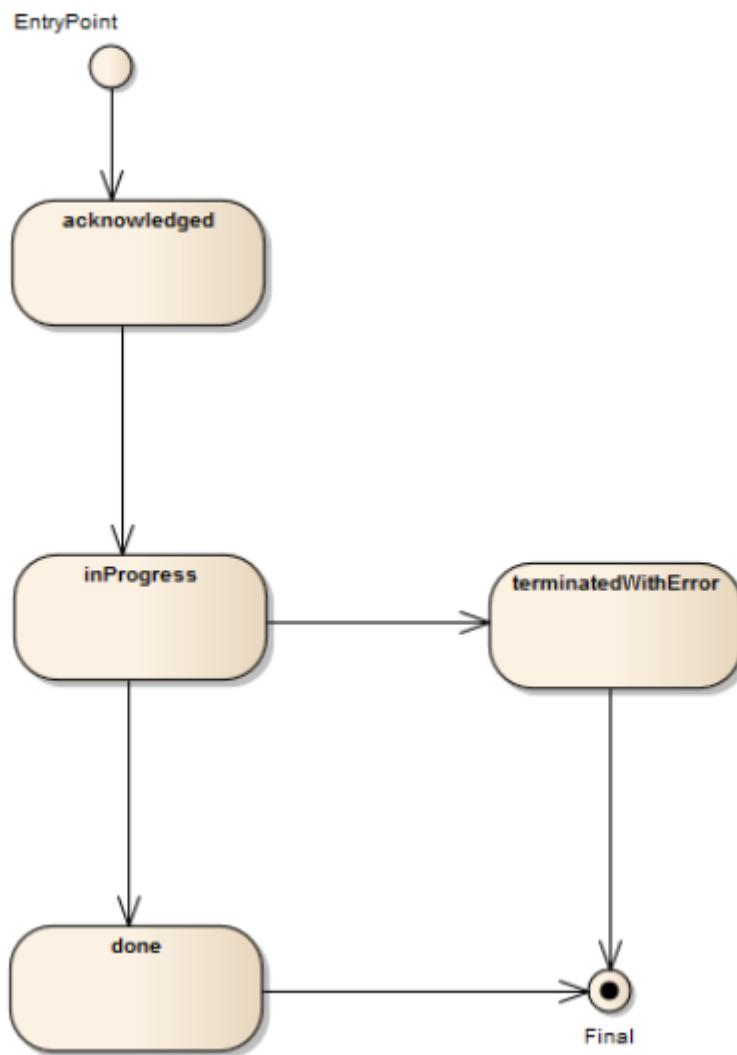


The following table provides service order state and service order item state description:

State	Definition
Acknowledged	The Acknowledged state is when an order/item has been received and has passed surface message validation.
Rejected	The Rejected state is where: • Invalid information is provided through the order request (not checked synchronously – like check that a service id provided exist in the inventory and relation service order item action is valid) • The order request fails to meet business rules for ordering Same rules applied for order item. If an order item is rejected the complete service order is rejected.

State	Definition
Pending	The Pending state is used when an order/item is currently in a waiting stage for an action/activity to be completed before the order/item can progress further, pending order amend or cancel assessment. In situations where Access Seeker action is required, an “information required” notification will be issued on transition into this state. A pending stage can lead into auto cancellation of an order/item, if no action is taken.
InProgress	The In Progress state is where an order Item has passed the Order check successfully and service delivery has started. For the order at least one order item is inProgress
Held	The Held state is used when an order/item cannot be progressed due to an issue. Service provided has temporarily delayed completing an order/item to resolve an infrastructure shortfall to facilitate supply of order. Upon resolution of the issue, the order/item will continue to progress.
AssessingCancellation	Following a cancel request, the SP is assessing if cancel can be done for the order/item (or if the Service Order has reached PONR). If cancellation request is not accepted after assessment the order will return in Held or Pending or InProgress state.
PendingCancellation	Once a cancel order has been accepted by SP, it could in some UC take time to effectively cancel the order/item. During this time when accepted cancellation is effectively processed we use Pending Cancellation.
Cancelled	The Cancelled state is where an In-Flight Order/item has been successfully cancelled.
Completed	The Completed state is where an item has complete provision and the service is now active. For an order if all order items are completed.
Failed	Order item as not a successful delivery completion. The service is not delivered and the order item failed. All Order items have failed which results in the entire Order has Failed.
Partial	Some Order items have failed and some have succeeded so the entire Order is in a Partial state. This provides support for partial Failure of an Order (or a service order item with ‘embedded’ service order item).

Cancel Service Order Life Cycle



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

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 TypeAServiceOrder and TypeBServiceOrder inheriting properties from the abstract Account entity.

Generic support of polymorphism and pattern extensions is described in the TMF API Guidelines v5.0 Part 2 document.

The @type attribute provides a way to represent the actual class type of an entity. For example, within a list of ServiceOrder instances some may be instances of TypeAServiceOrder where other could be instances of TypeBServiceOrder. 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 RelatedParty 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 ServiceOrderItemRef or AppointmentRef, 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

ServiceOrder resource

Resource model

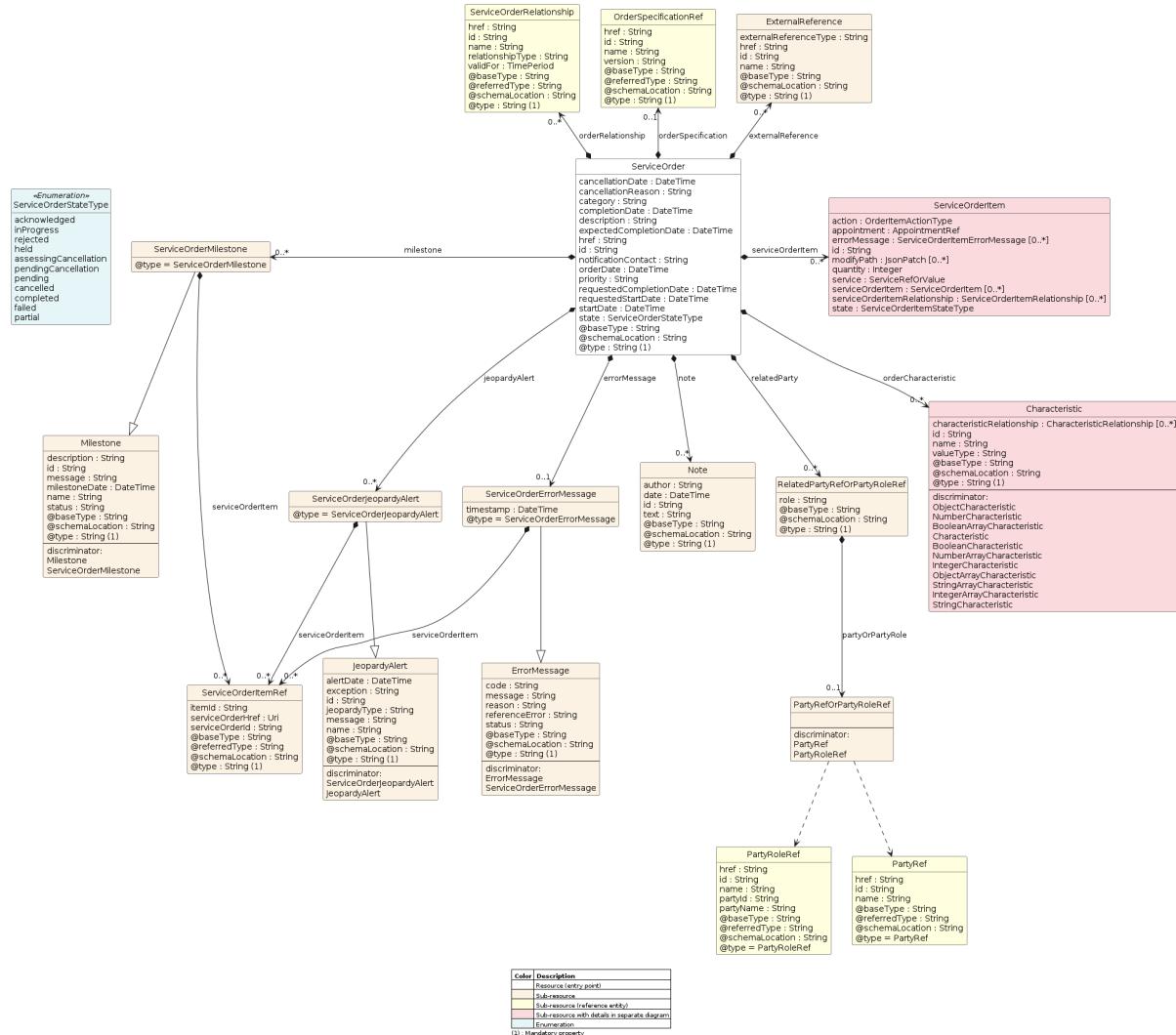
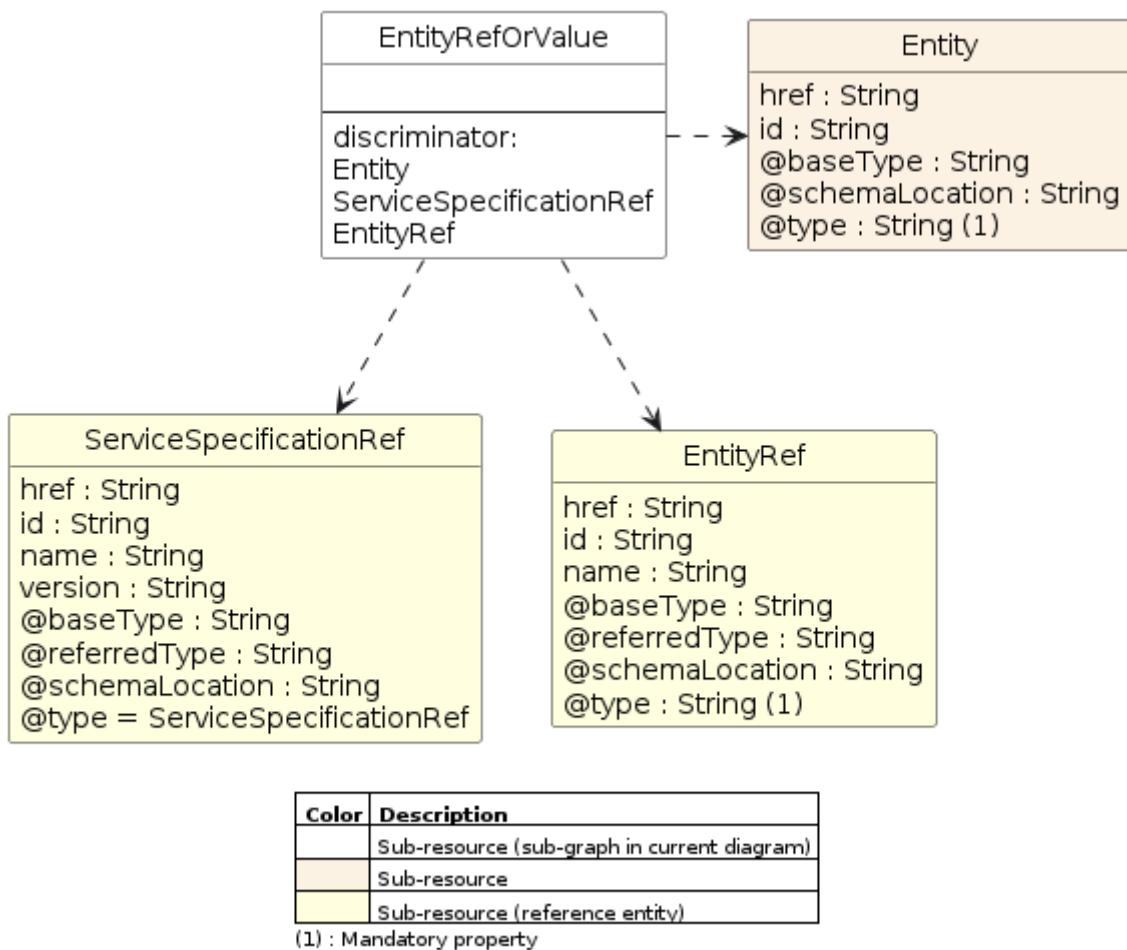
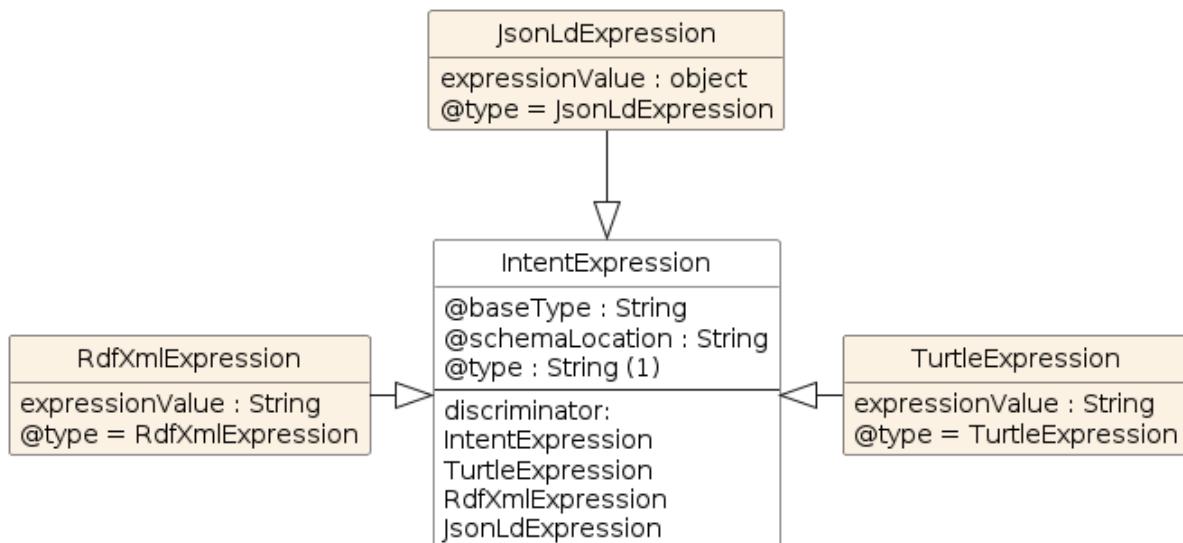


Figure 1 - ServiceOrder

Figure 2 - `EntityRefOrValue`



Color	Description
	Sub-resource (sub-graph in current diagram)
	Sub-resource

(1) : Mandatory property

Figure 3 - IntentExpression

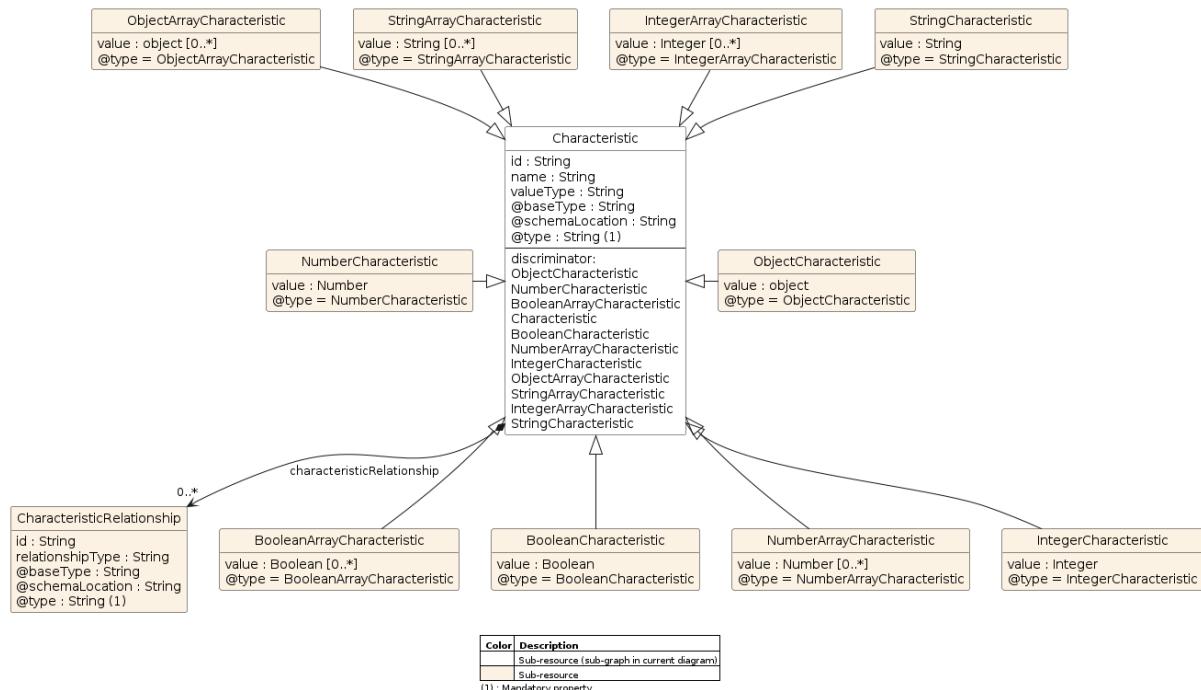


Figure 4 - Characteristic

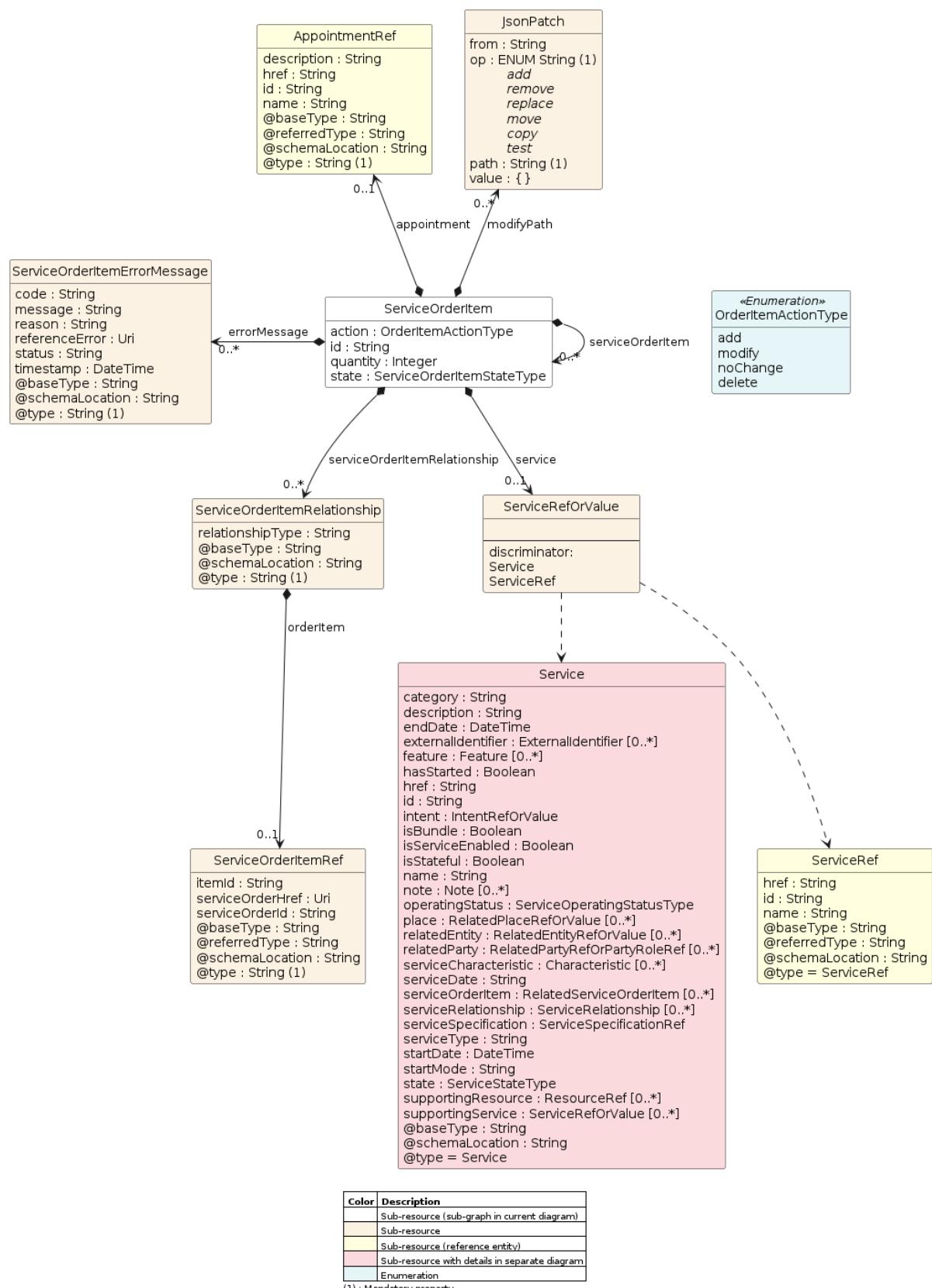


Figure 5 - ServiceOrderItem

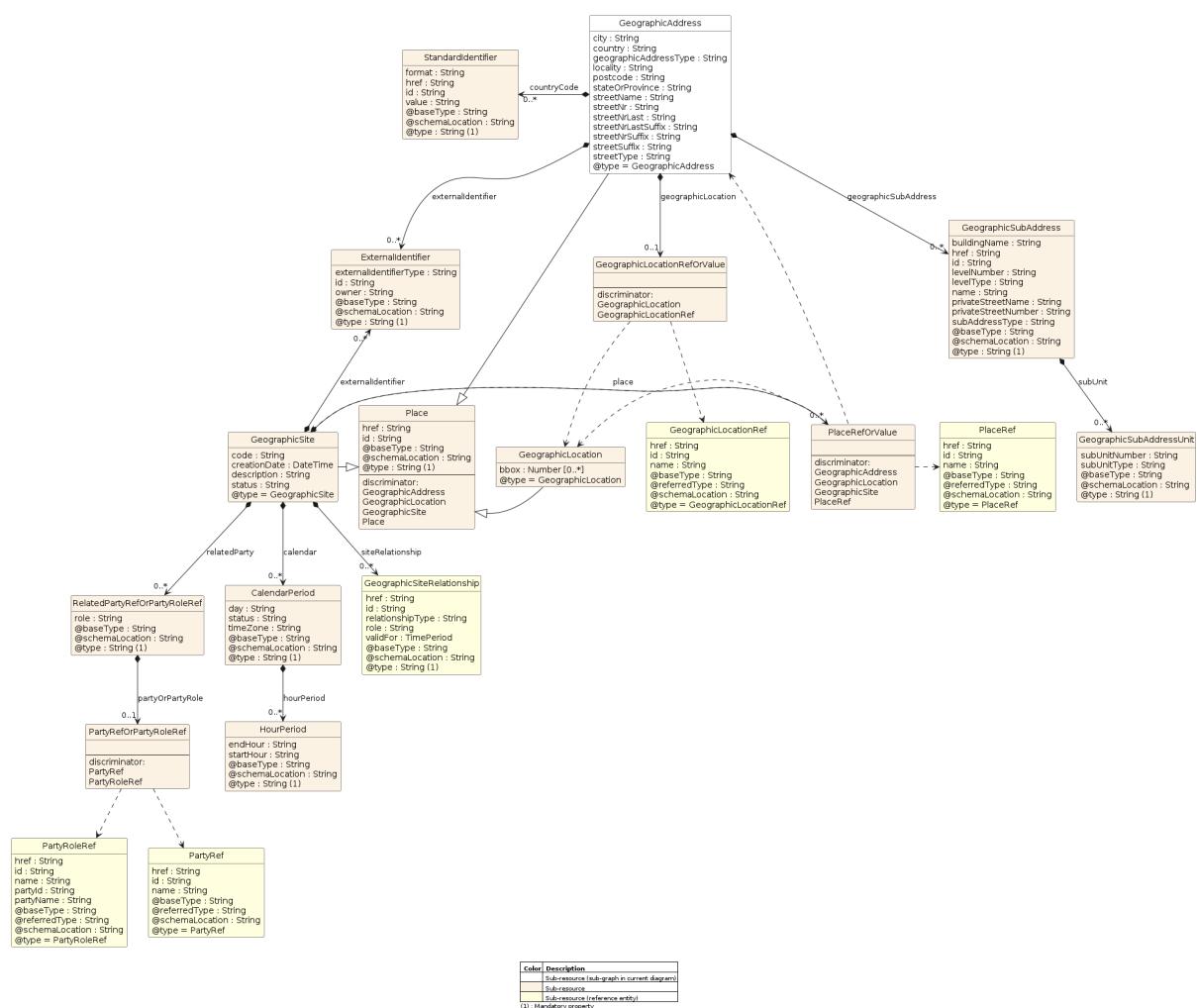


Figure 6 - GeographicAddress

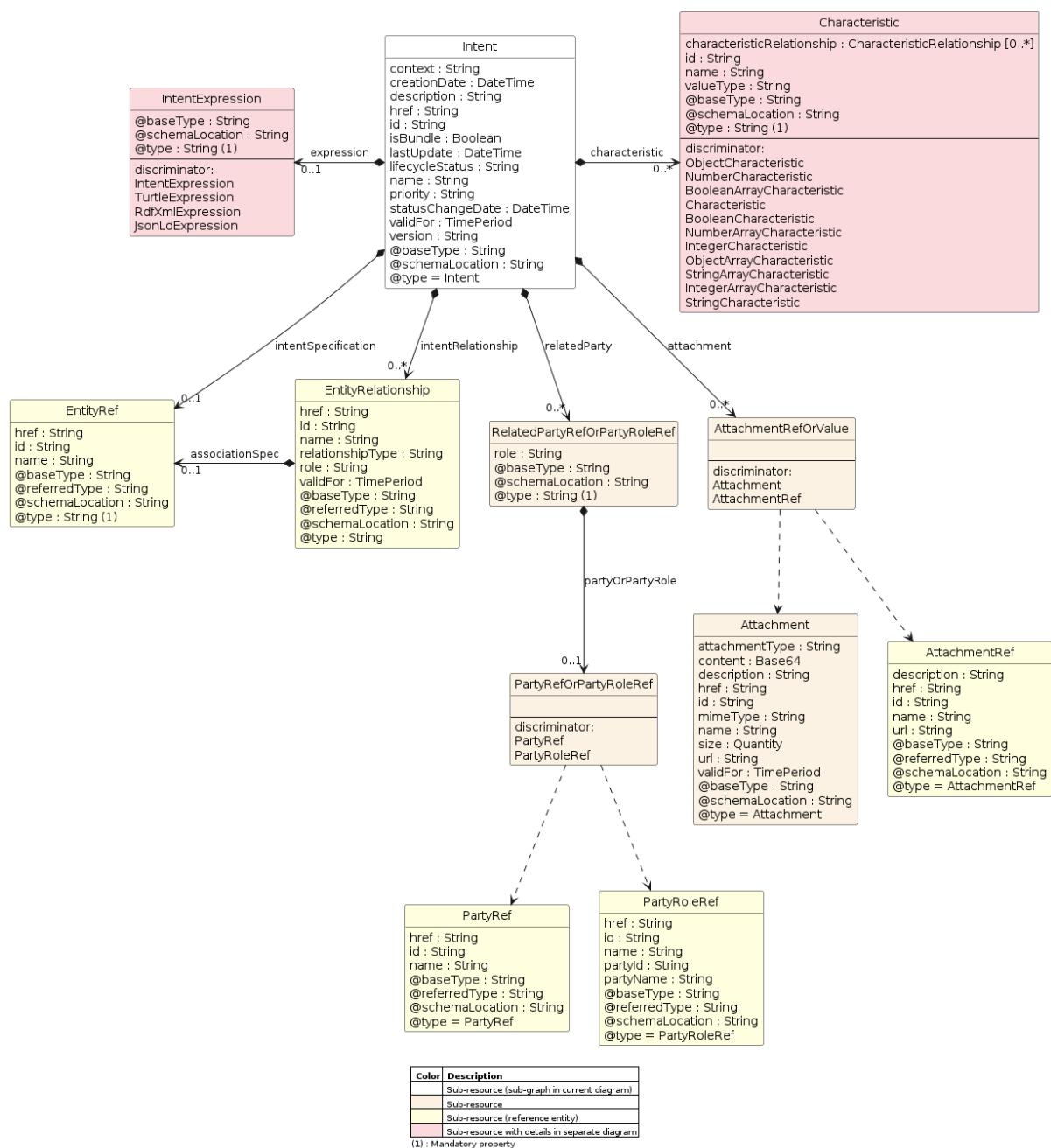


Figure 7 - Intent

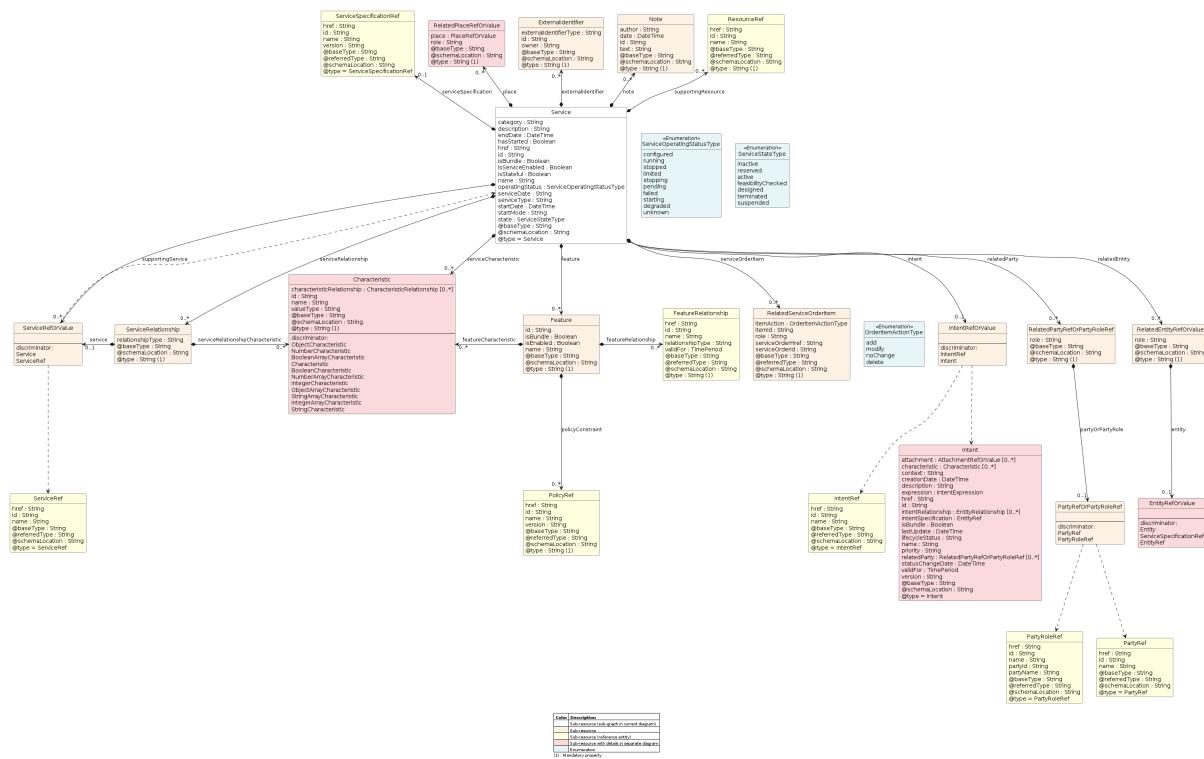


Figure 8 - Service

Field descriptions

ServiceOrder fields

cancellationDate	A DateTime. Date when the order is cancelled. This is used when order is cancelled.
cancellationReason	A String. Reason why the order is cancelled. This is used when order is cancelled.
category	A String. Used to categorize the order, useful for the OM system, such as: Broadband, TVOption.
completionDate	A DateTime. Effective delivery date amended by the provider.
description	A String. A free-text description of the service order.
errorMessage	A ServiceOrderErrorMessage. A ServiceOrderErrorMessage represents an error that causes a status change in a service order.
expectedCompletionDate	A DateTime. Expected delivery date amended by the provider.
externalReference	An ExternalReference. External reference of the individual or reference in other system.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
jeopardyAlert	A ServiceOrderJeopardyAlert. A list of jeopardy alerts related to this order.

milestone	A ServiceOrderMilestone. A list of milestones related to this order.
note	A Note. Extra-information about the order; e.g. useful to add extra delivery information that could be useful for a human process.
notificationContact	A String. Contact attached to the order to send back information regarding this order.
orderCharacteristic	A Characteristic. A list of characteristics that characterize this order.
orderDate	A DateTime.
orderRelationship	A ServiceOrderRelationship. A list of service orders related to this order (e.g. prerequisite, dependent on).
orderSpecification	An OrderSpecificationRef. Order specification reference.
priority	A String. Can be used by consumers to prioritize orders in a Service Order Management system.
relatedParty	A RelatedPartyRefOrPartyRoleRef. A list of parties which are involved in this order and the role they are playing.
requestedCompletionDate	A DateTime. Requested delivery date from the requestors perspective.
requestedStartDate	A DateTime. Order start date wished by the requestor.
serviceOrderItem	A ServiceOrderItem. A list of service order items to be processed by this order.
startDate	A DateTime. Date when the order was started for processing.
state	A ServiceOrderStateType. Possible values for the state of the order.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

AppointmentRef sub-resource fields

description	A String. An explanatory text regarding the appointment made with a party.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.

@schemaLocation	A String. 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.

Attachment sub-resource fields

attachmentType	A String. A business characterization of the purpose of the attachment, for example logo, instructionManual, contractCopy.
content	A Base64. The actual contents of the attachment object, if embedded, encoded as base64.
description	A String. A narrative text describing the content of the attachment.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
MimeType	A String. A technical characterization of the attachment content format using IETF Mime Types.
name	A String. The name of the attachment.
size	A Quantity. An amount in a given unit.
url	A String. Uniform Resource Locator, is a web page address (a subset of URI).
validFor	A TimePeriod. A period of time, either as a deadline (endTime only) a startTime only, or both.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

AttachmentRef sub-resource fields

description	A String. A narrative text describing the content of the attachment.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
url	A String. Link to the attachment media/content.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. 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.
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BooleanArrayCharacteristic sub-resource fields

characteristicRelationship	A 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	A Boolean.
valueType	A String. Data type of the value of the characteristic.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

BooleanCharacteristic sub-resource fields

characteristicRelationship	A 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	A Boolean. Value of the characteristic.
valueType	A String. Data type of the value of the characteristic.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

CalendarPeriod sub-resource fields

day	A String. Day where the calendar status applies (e.g.: monday, mon-to-fri, weekdays, weekend, all week, ...).
hourPeriod	A HourPeriod.
status	A String. Indication of the availability of the caledar period (e.g.: available, booked, etc.).
timeZone	A String. Indication of the timezone applicable to the calendar information (e.g.: Paris, GMT+1).
@baseType	A String. When sub-classing, this defines the super-class.

@schemaLocation	A String. 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.

Characteristic sub-resource fields

characteristicRelationship	A 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.
valueType	A String. Data type of the value of the characteristic.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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 sub-resource fields

id	A String. Unique identifier of the characteristic.
relationshipType	A String. The type of relationship.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

Entity sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

EntityRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.

@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. 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.

EntityRelationship sub-resource fields

associationSpec	An EntityRef. Entity reference schema to be use for all entityRef class.
href	A String.
id	A String.
name	A String.
relationshipType	A String. Type of relationship such as migration, substitution, dependency, exclusivity.
role	A String. The association role for this entity.
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String.
@schemaLocation	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
@type	A String.

ErrorMessage sub-resource fields

code	A String. Error code.
message	A String. More details and corrective actions related to the error.
reason	A String. Explanation of the reason for the error.
referenceError	A String. URI of documentation describing the error.
status	A String. Error code extension like sys-ABC-2001.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

ExternalIdentifier sub-resource fields

externalIdentifierType	A String. Type of the identification, typically would be the type of the entity within the external system.
id	A String. Identification of the entity within the external system.
owner	A String. Name of the external system that owns the entity.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

ExternalReference sub-resource fields

externalReferenceType	A String. Type of the external reference.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name given to the external reference.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

Feature sub-resource fields

featureCharacteristic	A Characteristic. This is a list of Characteristics for a particular feature.
featureRelationship	A FeatureRelationship. Configuration feature.
id	A String. Unique identifier.
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.
policyConstraint	A PolicyRef. Reference to manage a list of feature specification policy constraints.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

FeatureRelationship sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
relationshipType	A String. This is the type of the feature relationship.
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. 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.

GeographicAddress sub-resource fields

city	A String. City that the address is in.
country	A String. Country that the address is in.
countryCode	A StandardIdentifier. Country codes are short alphabetic or numeric geographical codes (geocodes) developed to represent countries and dependent areas, for use in data processing and communications. Several different systems have been developed to do this. The term country code frequently refers to ISO 3166-1 alpha-2 or international dialing codes, the E.164 country calling codes.
externalIdentifier	An ExternalIdentifier. An identification of an entity that is owned by or originates in a software system different from the current system, for example a ProductOrder handed off from a commerce platform into an order handling system. The structure identifies the system itself, the nature of the entity within the system (e.g. class name) and the unique ID of the entity within the system. It is anticipated that multiple external IDs can be held for a single entity, e.g. if the entity passed through multiple systems on the way to the current system. In this case the consumer is expected to sequence the IDs in the array in reverse order of provenance, i.e. most recent system first in the list.
geographicAddressType	A String. Classification of the address, e.g., residential, industrial.
geographicLocation	A GeographicLocationRefOrValue. The polymorphic attributes @type, @schemaLocation & @referredType are related to the GeographicLocation entity and not the GeographicLocationRefOrValue class itself.
geographicSubAddress	A GeographicSubAddress. Representation of a GeographicSubAddress It is used for addressing within a property in an urban area (country properties are often defined differently). It may refer to a building, a building cluster, or a floor of a multistory building.

href	A String. Hyperlink reference.
id	A String. Unique identifier.
locality	A String. An area of defined or undefined boundaries within a local authority or other legislatively defined area, usually rural or semi rural in nature. [ANZLIC-STREET], or a suburb, a bounded locality within a city, town or shire principally of urban character [ANZLICSTREET].
postcode	A String. Descriptor for a postal delivery area, used to speed and simplify the delivery of mail (also known as zipcode).
stateOrProvince	A String. The State or Province that the address is in.
streetName	A String. Name of the street or other street type.
streetNr	A String. Number identifying a specific property on a public street. It may be combined with streetNrLast for ranged addresses.
streetNrLast	A String. Last number in a range of street numbers allocated to a property.
streetNrLastSuffix	A String. Last street number suffix for a ranged address.
streetNrSuffix	A String. The first street number suffix.
streetSuffix	A String. A modifier denoting a relative direction.
streetType	A String. Alley, avenue, boulevard, brae, crescent, drive, highway, lane, terrace, parade, place, tarn, way, wharf.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

GeographicLocation sub-resource fields

bbox	A Number. A bounding box array that contains the geometry. The axes order follows the axes order of the geometry.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

GeographicLocationRef sub-resource fields

href	A String. Hyperlink reference.
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<code>id</code>	A String. Unique identifier.
<code>name</code>	A String. Name of the referred entity.
<code>@baseType</code>	A String. When sub-classing, this defines the super-class.
<code>@referredType</code>	A String. The actual type of the target instance when needed for disambiguation.
<code>@schemaLocation</code>	A String. A URI to a JSON-Schema file that defines additional attributes and relationships.
<code>@type</code>	A String. When sub-classing, this defines the sub-class Extensible name.

GeographicSite sub-resource fields

<code>calendar</code>	A CalendarPeriod.
<code>code</code>	A String. A code that may be used for some addressing schemes eg: [ANSI T1.253-1999].
<code>creationDate</code>	A DateTime. Date and time when the GeographicSite was created.
<code>description</code>	A String. Text describing additional information regarding the site.
<code>externalIdentifier</code>	An ExternalIdentifier. An identification of an entity that is owned by or originates in a software system different from the current system, for example a ProductOrder handed off from a commerce platform into an order handling system. The structure identifies the system itself, the nature of the entity within the system (e.g. class name) and the unique ID of the entity within the system. It is anticipated that multiple external IDs can be held for a single entity, e.g. if the entity passed through multiple systems on the way to the current system. In this case the consumer is expected to sequence the IDs in the array in reverse order of provenance, i.e. most recent system first in the list.
<code>href</code>	A String. Hyperlink reference.
<code>id</code>	A String. Unique identifier.
<code>place</code>	A PlaceRefOrValue. The polymorphic attributes <code>@type</code> , <code>@schemaLocation</code> & <code>@referredType</code> are related to the Place entity and not the PlaceRefOrValue class itself.
<code>relatedParty</code>	A RelatedPartyRefOrPartyRoleRef. RelatedParty reference. A related party defines party or party role or its reference, linked to a specific entity.
<code>siteRelationship</code>	A GeographicSiteRelationship.
<code>status</code>	A String. The condition of the GeographicSite, such as planned, underConstruction, cancelled, active, inactive, former.
<code>@baseType</code>	A String. When sub-classing, this defines the super-class.
<code>@schemaLocation</code>	A String. 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.
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GeographicSiteRelationship sub-resource fields

href	A String. Reference of the related geographic site.
id	A String. Unique identifier of the related site entity within the server.
relationshipType	A String. Type of relationship.
role	A String. Role of the related site in the relationship.
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

GeographicSubAddress sub-resource fields

buildingName	A String. Allows for buildings that have well-known names.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
levelNumber	A String. Used where a level type may be repeated e.g. BASEMENT 1, BASEMENT 2.
levelType	A String. Describes level types within a building.
name	A String. Name of the subAddress to identify it with a meaningful identification.
privateStreetName	A String. Private streets internal to a property (e.g. a university) may have internal names that are not recorded by the land title office.
privateStreetNumber	A String. Private streets numbers internal to a private street.
subAddressType	A String. Type of subAddress : it can be a subunit or a private street.
subUnit	A GeographicSubAddressUnit. Representation of a SubUnit. It is used for describing subunit within a subAddress e.g. BERTH, FLAT, PIER, SUITE, SHOP, TOWER, UNIT, WHARF.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

GeographicSubAddressUnit sub-resource fields

subUnitNumber	A String. The discriminator used for the subunit, often just a simple number but may also be a range.
subUnitType	A String. The type of subunit e.g.BERTH, FLAT, PIER, SUITE, SHOP, TOWER, UNIT, WHARF, RACK.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

HourPeriod sub-resource fields

endHour	A String. The time when the status ends applying.
startHour	A String. The time when the status starts applying.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

IntegerArrayCharacteristic sub-resource fields

characteristicRelationship	A 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 Integer.
valueType	A String. Data type of the value of the characteristic.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

IntegerCharacteristic sub-resource fields

characteristicRelationship	A 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 Integer. Value of the characteristic.

valueType	A String. Data type of the value of the characteristic.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

Intent sub-resource fields

attachment	An AttachmentRefOrValue. Attachments that may be of relevance to this intent, such as picture, document, media.
characteristic	A Characteristic. Describes a given characteristic of an object or entity through a name/value pair.
context	A String. A string used to give a context to the intent.
creationDate	A DateTime. Date and time of the creation of this REST resource.
description	A String. The description of the intent.
expression	An IntentExpression. An Intent expression.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
intentRelationship	An EntityRelationship. A list of intents related to this intent.
intentSpecification	An EntityRef. Entity reference schema to be use for all entityRef class.
isBundle	A Boolean. IsBundle determines whether an intent represents a single intent (false), or a bundle of intents(true).
lastUpdate	A DateTime. Date and time of the last update of this REST resource.
lifecycleStatus	A String. Used to indicate the current lifecycle status of this intent.
name	A String. The name of the intent.
priority	A String. Can be used by intent owner to prioritize intents in an intent management system.
relatedParty	A RelatedPartyRefOrPartyRoleRef. RelatedParty reference. A related party defines party or party role or its reference, linked to a specific entity.
statusChangeDate	A DateTime. A date time(DateTime). The date that the entity status changed to the current one.
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
version	A String. A field that identifies the specific version of an instance of an intent.
@baseType	A String. When sub-classing, this defines the super-class.

@schemaLocation	A String. 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.

IntentExpression sub-resource fields

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

IntentRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. 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.

JeopardyAlert sub-resource fields

alertDate	A DateTime. A date time(DateTime). The date that the alert issued.
exception	A String. The exception associated with this jeopardy alert.
id	A String. Identifier of the JeopardyAlert.
jeopardyType	A String. A string represents the type of jeopardy/risk like Normal, Hazard, Critical, ...
message	A String. A string represents the message of the alert.
name	A String. A string used to give a name to the jeopardy alert.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

JsonLdExpression sub-resource fields

expressionValue	An object. JsonLdExpression is the ontology-encoded form of the Intent as JSON-LD as defined in https://www.w3.org/TR/json-ld/ should be validated against https://raw.githubusercontent.com/json-ld/json-ld.org/main/schemas/jsonld-schema.json .
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

JsonPatch sub-resource fields

from	A String. A string containing a JSON Pointer value.
op	A String. The operation to be performed.
path	A String. A JSON-Pointer.
value	A {}. The value to be used within the operations.

Milestone sub-resource fields

description	A String. Free-text description of the Milestone.
id	A String. Identifier of the Milestone.
message	A String. A string represents the message of the milestone.
milestoneDate	A DateTime. A date time(DateTime). The date that the milestone happens.
name	A String. A string used to give a name to the milestone.
status	A String. The milestone status.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

Note sub-resource fields

author	A String. Author of the note.
date	A DateTime. Date of the note.
id	A String. Identifier of the note within its containing entity.
text	A String. Text of the note.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.
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NumberArrayCharacteristic sub-resource fields

characteristicRelationship	A 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	A Number.
valueType	A String. Data type of the value of the characteristic.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

NumberCharacteristic sub-resource fields

characteristicRelationship	A 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	A Number. Value of the characteristic.
valueType	A String. Data type of the value of the characteristic.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

ObjectArrayCharacteristic sub-resource fields

characteristicRelationship	A 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 object.
valueType	A String. Data type of the value of the characteristic.
@baseType	A String. When sub-classing, this defines the super-class.

@schemaLocation	A String. 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.

ObjectCharacteristic sub-resource fields

characteristicRelationship	A 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 object. Value of the characteristic.
valueType	A String. Data type of the value of the characteristic.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

OrderSpecificationRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
version	A String. Order specification version.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. 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.

PartyRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.

@schemaLocation	A String. 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.

PartyRoleRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
partyId	A String. The identifier of the engaged party that is linked to the PartyRole object.
partyName	A String. The name of the engaged party that is linked to the PartyRole object.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. 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.

Place sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

PlaceRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. 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.
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PolicyRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
version	A String.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. 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.

RdfXmlExpression sub-resource fields

expressionValue	A String. RDF XML Expression value encoded object.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

RelatedEntityRefOrValue sub-resource fields

entity	An EntityRefOrValue.
role	A String.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

RelatedPartyRefOrPartyRoleRef sub-resource fields

partyOrPartyRole	A PartyRefOrPartyRoleRef.
role	A String. Role played by the related party or party role in the context of the specific entity it is linked to. Such as 'initiator', 'customer', 'salesAgent', 'user'.
@baseType	A String. When sub-classing, this defines the super-class.

@schemaLocation	A String. 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.

RelatedPlaceRefOrValue sub-resource fields

place	A PlaceRefOrValue. The polymorphic attributes @type, @schemaLocation & @referredType are related to the Place entity and not the PlaceRefOrValue class itself.
role	A String.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

RelatedServiceOrderItem sub-resource fields

itemAction	An OrderItemActionType. Action to be performed on the entity managed by the item.
itemId	A String. Identifier of the order item where the service was managed.
role	A String. Role of the service order item for this service.
serviceOrderHref	A String. Reference of the related entity.
serviceOrderId	A String. Unique identifier of a related entity.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. 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.

ResourceRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.

@schemaLocation	A String. 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.

Service sub-resource fields

category	A String. Is it a customer facing or resource facing service.
description	A String. Free-text description of the service.
endDate	A DateTime. Date when the service ends.
externalIdentifier	An ExternalIdentifier. A list of external identifiers associated with this service.
feature	A Feature. A list of feature associated with this service.
hasStarted	A Boolean. If TRUE, this Service has already been started.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
intent	An IntentRefOrValue. Intent Ref (if Intent already exists) or Value (if Intent be created or its details be presented).
isBundle	A Boolean. If true, the service is a ServiceBundle which regroup a service hierarchy. If false, the service is a 'atomic' service (hierarchy leaf).
isServiceEnabled	A Boolean. If FALSE and hasStarted is FALSE, this particular Service has NOT been enabled for use - if FALSE and hasStarted is TRUE then the service has failed.
isStateful	A Boolean. If TRUE, this Service can be changed without affecting any other services.
name	A String. Name of the service.
note	A Note. A list of notes made on this service.
operatingStatus	A ServiceOperatingStatusType. Valid values for the Operating status of the service.
place	A RelatedPlaceRefOrValue. A list of places (Place [*]). Used to define a place useful for the service (for example a geographical place where the service is installed).
relatedEntity	A RelatedEntityRefOrValue. A list of related entities in relationship with this service.
relatedParty	A RelatedPartyRefOrPartyRoleRef. A list of related party references (RelatedParty [*]). A related party defines party or party role linked to a specific entity.
serviceCharacteristic	A Characteristic. A list of characteristics that characterize this service (ServiceCharacteristic [*]).
serviceDate	A String. Date when the service was created (whatever its status).

serviceOrderItem	A RelatedServiceOrderItem. A list of service order items related to this service.
serviceRelationship	A ServiceRelationship. A list of service relationships (ServiceRelationship [*]). Describes links with other service(s) in the inventory.
serviceSpecification	A ServiceSpecificationRef. Service specification reference: ServiceSpecification(s) required to realize a ProductSpecification.
serviceType	A String. Business type of the service.
startDate	A DateTime. Date when the service starts.
startMode	A String. This attribute is an enumerated integer that indicates how the Service is started, such as: 0: Unknown; 1: Automatically by the managed environment; 2: Automatically by the owning device; 3: Manually by the Provider of the Service; 4: Manually by a Customer of the Provider; 5: Any of the above.
state	A ServiceStateType. Valid values for the lifecycle state of the service.
supportingResource	A ResourceRef. A list of supporting resources (SupportingResource [*]). Note: only Service of type RFS can be associated with Resources.
supportingService	A ServiceRefOrValue. A list of supporting services (SupportingService [*]). A collection of services that support this service (bundling, link CFS to RFS).
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

ServiceOrderErrorMessage sub-resource fields

code	A String. Error code.
message	A String. More details and corrective actions related to the error.
reason	A String. Explanation of the reason for the error.
referenceError	A String. URI of documentation describing the error.
serviceOrderItem	A ServiceOrderItemRef. A list of order item references corresponded to this error.
status	A String. Error code extension like sys-ABC-2001.
timestamp	A DateTime. Date when the error happened.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.
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ServiceOrderItem sub-resource fields

action	An OrderItemActionType. Action to be performed on the entity managed by the item.
appointment	An AppointmentRef. Refers an appointment, such as a Customer presentation or internal meeting or site visit.
errorMessage	A ServiceOrderItemErrorMessage. The error(s) cause an order item status change.
id	A String. Identifier of the individual line item.
modifyPath	A JsonPatch. A list of modification items provided for the service update when serviceOrderItem action is modify.
quantity	An Integer. Quantity ordered.
service	A ServiceRefOrValue. The polymorphic attributes @type, @schemaLocation & @referredType are related to the Service entity and not the ServiceRefOrValue class itself.
serviceOrderItem	A ServiceOrderItem. A list of order items embedded to this order item.
serviceOrderItemRelationship	A ServiceOrderItemRelationship. A list of order items related to this order item.
state	A ServiceOrderItemStateType. Possible values for the state of the order item.

ServiceOrderItemErrorMessage sub-resource fields

code	A String. Error code.
message	A String. More details and corrective actions related to the error.
reason	A String. Explanation of the reason for the error.
referenceError	A Uri. URI of documentation describing the error.
status	A String. Error code extension like sys-ABC-2001.
timestamp	A DateTime. Date when the error happened.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

ServiceOrderItemRef sub-resource fields

itemId	A String. Identifier of the line item.
serviceOrderHref	A Uri. Link to the order to which this item belongs to.

serviceOrderId	A String. Identifier of the order that this item belongs to.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. 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.

ServiceOrderItemRelationship sub-resource fields

orderItem	A ServiceOrderItemRef.
relationshipType	A String. The type of related order item, can be: dependency if the order item needs to be not started until another order item is complete.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

ServiceOrderJeopardyAlert sub-resource fields

alertDate	A DateTime. A date time(DateTime). The date that the alert issued.
exception	A String. The exception associated with this jeopardy alert.
id	A String. Identifier of the JeopardyAlert.
jeopardyType	A String. A string represents the type of jeopardy/risk like Normal, Hazard, Critical, ...
message	A String. A string represents the message of the alert.
name	A String. A string used to give a name to the jeopardy alert.
serviceOrderItem	A ServiceOrderItemRef. A list of order item references corresponded to this alert.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

ServiceOrderMilestone sub-resource fields

description	A String. Free-text description of the Milestone.
id	A String. Identifier of the Milestone.

message	A String. A string represents the message of the milestone.
milestoneDate	A DateTime. A date time(DateTime). The date that the milestone happens.
name	A String. A string used to give a name to the milestone.
serviceOrderItem	A ServiceOrderItemRef. A list of order item references corresponded to this milestone.
status	A String. The milestone status.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

ServiceOrderRelationship sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
relationshipType	A String. The type of related order, such as: [dependency] if the order needs to be [not started] until another order item is complete (a service order in this case) or [cross-ref] to keep track of the source order (a productOrder).
validFor	A TimePeriod. A period of time, either as a deadline (endDateTime only) a startDateTime only, or both.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. 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.

ServiceRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. 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.
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ServiceRelationship sub-resource fields

relationshipType	A String.
service	A ServiceRefOrValue. The polymorphic attributes @type, @schemaLocation & @referredType are related to the Service entity and not the ServiceRefOrValue class itself.
serviceRelationshipCharacteristic	A Characteristic. 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	A String. 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.

ServiceSpecificationRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
version	A String. Service specification version.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. 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.

StandardIdentifier sub-resource fields

format	A String. Standard/Regulatory definition identifier. e.g., ISO 3166-1.
href	A String. Hyperlink reference.
id	A String. Unique identifier.
value	A String. The value of the resource in the corresponding standard.e.g., a country code value.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.
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StringArrayCharacteristic sub-resource fields

characteristicRelationship	A 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	A String.
valueType	A String. Data type of the value of the characteristic.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

StringCharacteristic sub-resource fields

characteristicRelationship	A 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	A String. Value of the characteristic.
valueType	A String. Data type of the value of the characteristic.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

TurtleExpression sub-resource fields

expressionValue	A String. Turtle Expression value is the ontology-encoded form of the Intent as Turtle RDF as defined in https://www.w3.org/TR/turtle/ .
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

Json representation sample(s)

We provide below a JSON representation as example of the 'ServiceOrder' resource object.

```
{  
    "note": [ {  
        "date": "2020-08-27T09:37:40.508Z",  
        "author": "Harvey Poupon",  
        "@type": "Note",  
        "id": "1",  
        "text": "Some text"  
    } ],  
    "@type": "ServiceOrder",  
    "description": "Service order description",  
    "priority": "1",  
    "relatedParty": [ {  
        "partyOrPartyRole": {  
            "@referredType": "Individual",  
            "@type": "PartyRef",  
            "name": "Jean Pontus",  
            "href": "https://mycsp.com:8080/tmf-api/partyManagement/v5/individual/456",  
            "id": "456"  
        },  
        "role": "requester",  
        "@type": "RelatedPartyRefOrPartyRoleRef"  
    } ],  
    "requestedStartDate": "2020-08-31T09:37:40.508Z",  
    "serviceOrderItem": [  
        {  
            "service": {  
                "@type": "Service",  
                "serviceSpecification": {  
                    "@referredType": "ServiceSpecification",  
                    "@type": "ServiceSpecificationRef",  
                    "name": "vCPE",  
                    "id": "1212",  
                    "href": "https://mycsp.com:8080/tmf-  
api/serviceCatalogManagement/v5/serviceSpecification/1212",  
                    "version": "1.0.0"  
                },  
                "state": "active",  
                "serviceCharacteristic": [ {  
                    "@type": "ObjectCharacteristic",  
                    "valueType": "object",  
                    "name": "vCPE",  
                    "id": "452-gh6",  
                    "value": {  
                        "MaxTxRate": 300,  
                        "@type": "VCPE",  
                        "vCPE_IP": "193.218.236.21",  
                        "maxTream": "OFF",  
                        "@schemaLocation": "https://mycsp.com:8080/tmf-  
api/schema/VCPE.schema.json",  
                        "TransmitPower": "11 dBm"  
                    }  
                } ]  
            },  
            "@type": "ServiceOrderItem",  
            "action": "add",  
            "id": "1",  
            "state": "InProgress"  
        },  
        {  
            "service": {  
                "@type": "Service",  
                "serviceSpecification": {  
                    "@referredType": "ServiceSpecification",  
                    "@type": "ServiceSpecificationRef",  
                    "name": "vCPE",  
                    "id": "1212",  
                    "href": "https://mycsp.com:8080/tmf-  
api/serviceCatalogManagement/v5/serviceSpecification/1212",  
                    "version": "1.0.0"  
                },  
                "state": "active",  
                "serviceCharacteristic": [ {  
                    "@type": "ObjectCharacteristic",  
                    "valueType": "object",  
                    "name": "vCPE",  
                    "id": "452-gh6",  
                    "value": {  
                        "MaxTxRate": 300,  
                        "@type": "VCPE",  
                        "vCPE_IP": "193.218.236.21",  
                        "maxTream": "OFF",  
                        "@schemaLocation": "https://mycsp.com:8080/tmf-  
api/schema/VCPE.schema.json",  
                        "TransmitPower": "11 dBm"  
                    }  
                } ]  
            },  
            "@type": "ServiceOrderItem",  
            "action": "add",  
            "id": "1",  
            "state": "InProgress"  
        }  
    ]  
}
```

```
    "service": {
        "serviceRelationship": [
            {
                "relationshipType": "reliesOn",
                "service": {
                    "@referredType": "Service",
                    "@type": "ServiceRef",
                    "href": "https://mycsp.com:8080/tmf-
api/serviceInventory/v5/service/5645",
                    "id": "5645"
                },
                "@type": "ServiceRelationship"
            }
        ],
        "feature": [
            {
                "featureCharacteristic": [
                    {
                        "@type": "BooleanCharacteristic",
                        "valueType": "boolean",
                        "name": "VolumeCapped",
                        "id": "444",
                        "value": true
                    }
                ],
                "@type": "Feature",
                "isEnabled": true,
                "name": "DataDownload",
                "id": "Feat1"
            }
        ],
        "@type": "Service",
        "serviceSpecification": {
            "@referredType": "ServiceSpecification",
            "@type": "ServiceSpecificationRef",
            "name": "genericDataService48",
            "id": "48",
            "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/48",
            "version": "2.0.0"
        },
        "state": "active"
    },
    "@type": "ServiceOrderItem",
    "action": "add",
    "id": "2",
    "state": "acknowledged"
}
],
"milestone": [
    {
        "serviceOrderItem": [
            {
                "itemId": "2",
                "@type": "ServiceOrderItemRef",
                "serviceOrderHref":
                "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",
                "serviceOrderId": "42"
            }
        ],
        "milestoneDate": "2020-08-27T23:17:45.450Z",
        "@type": "ServiceOrderMilestone",
        "name": "Port Allocation",
        "description": "Port Allocation",
        "id": "143",
        "message": "Port Allocation",
        "status": "Completed"
    }
],
"expectedCompletionDate": "2020-08-31T09:37:40.508Z",
"id": "42",
"href": "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",
"state": "InProgress",
```

```

    "category": "TMF resource illustration",
    "orderDate": "2020-08-27T09:37:40.508Z",
    "startDate": "2020-08-31T09:37:40.508Z",
    "requestedCompletionDate": "2020-08-31T09:37:40.508Z"
}

```

CancelServiceOrder resource

Request for cancellation an existing Service order.

Resource model

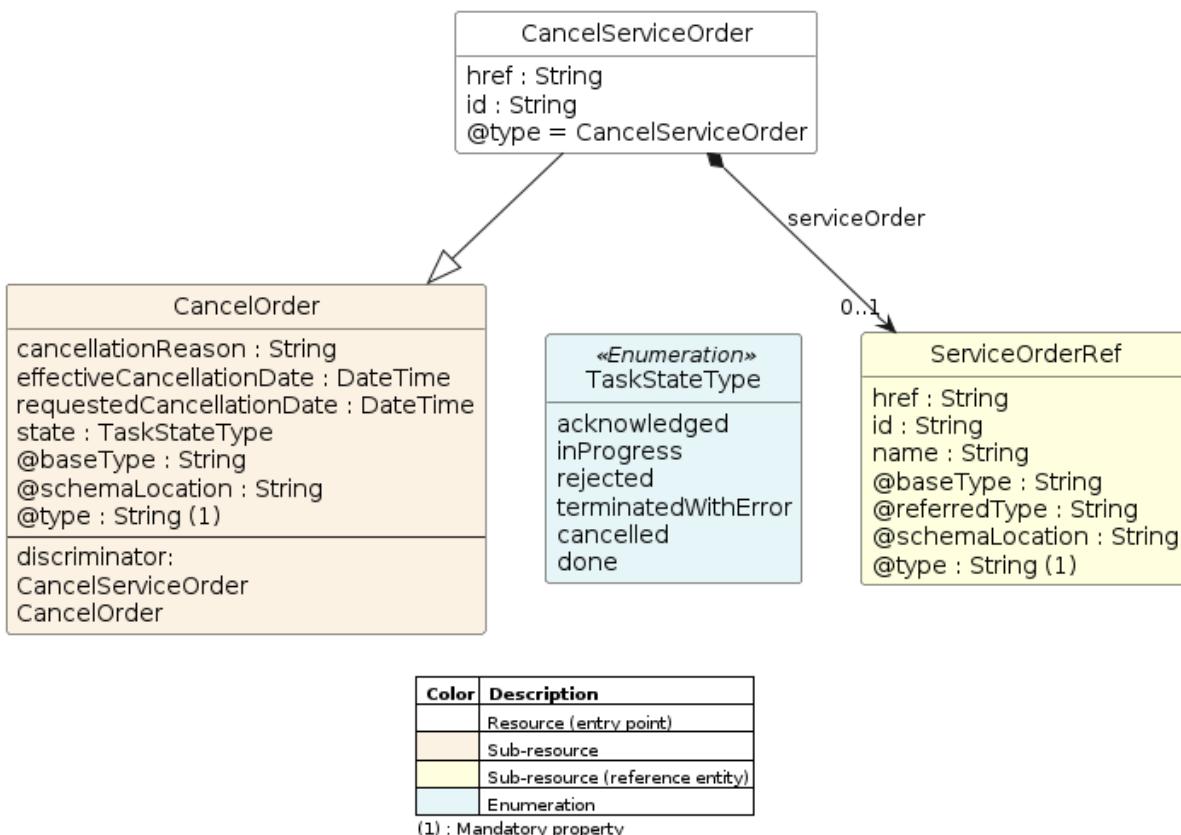


Figure 9 - CancelServiceOrder

Field descriptions

CancelServiceOrder fields

<code>cancellationReason</code>	A String. Reason why the order is cancelled.
<code>effectiveCancellationDate</code>	A DateTime. Date when the order is cancelled.
<code>href</code>	A String. Hyperlink reference.
<code>id</code>	A String. Unique identifier.
<code>requestedCancellationDate</code>	A DateTime. Date when the submitter wants the order to be cancelled.

serviceOrder	A ServiceOrderRef. Service Order reference. Useful to understand the which was the Service order through which the service was instantiated in the service inventory.
state	A TaskStateType. Possible values for the state of a task.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

CancelOrder sub-resource fields

cancellationReason	A String. Reason why the order is cancelled.
effectiveCancellationDate	A DateTime. Date when the order is cancelled.
requestedCancellationDate	A DateTime. Date when the submitter wants the order to be cancelled.
state	A TaskStateType. Possible values for the state of a task.
@baseType	A String. When sub-classing, this defines the super-class.
@schemaLocation	A String. 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.

ServiceOrderRef sub-resource fields

href	A String. Hyperlink reference.
id	A String. Unique identifier.
name	A String. Name of the referred entity.
@baseType	A String. When sub-classing, this defines the super-class.
@referredType	A String. The actual type of the target instance when needed for disambiguation.
@schemaLocation	A String. 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.

Json representation sample(s)

We provide below a JSON representation as example of the 'CancelServiceOrder' resource object.

```
{
  "requestedCancellationDate": "2020-08-27T12:56:21.931Z",
  "cancellationReason": "Duplicate service order",
```

```

"@type": "CancelServiceOrder",
"serviceOrder": {
    "@referredType": "ServiceOrder",
    "@type": "ServiceOrderRef",
    "id": "45f-98f-ss45",
    "href": "https://host:port/serviceOrdering/v5/serviceOrder/45f-98f-ss45"
},
"id": "789-fsds5-kjp",
"href": "https://host:port/serviceOrdering/v5/cancelServiceOrder/789-fsds5-kjp",
"state": "done",
"effectiveCancellationDate": "2020-08-27T12:58:35.489Z"
}

```

A Service Order is a type of order which can be used to describe a group of operations on service one service order item per service. An action at the level of the service order item describe the operation to be done on a service (add, change, terminate for example). The service order is triggered from the BSS system in charge of the product order management to the SOM (Service order Management) system that will manage the service fulfillment.

Here is the state machine diagram for a Service order. Each order state is described in the following table.

Note: Consistency rules are defined between order state & order item state.

[Lifecycle ServiceOrder] | *Lifecycle_ServiceOrder.png*

[LifeCycle CancelServiceOrder] | *LifeCycle_CancelServiceOrder.png*

Notification Resource Models

10 notifications are defined for this API.

Notifications related to ServiceOrder:

- Service Order Delete Event
- Service Order Milestone Event
- Service Order Attribute Value Change Event
- Service Order State Change Event
- Service Order Jeopardy Event
- Service Order Information Required Event
- Service Order Create Event

Notifications related to CancelServiceOrder:

- Cancel Service Order Information Required Event
- Cancel Service Order Create Event
- Cancel Service Order State Change Event

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).

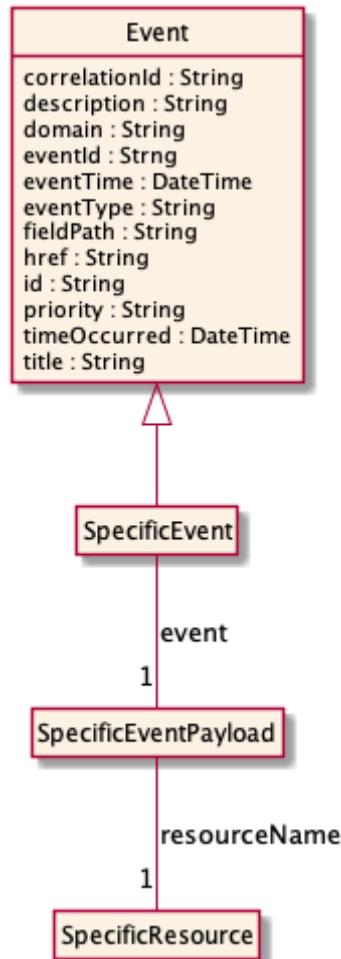


Figure 10 Notification Pattern

Service Order Delete Event

Message example for ServiceOrderDeleteEvent event

```

Content-Type: application/json

{
  "correlationId": "SOM-20011",
  "description": "ServiceOrderDeleteEvent illustration",
  "domain": "Commercial",
  "eventId": "10039",
  "eventTime": "2021-12-27T01:06:59.059Z",
  "eventType": "ServiceOrderDeleteEvent",
  "priority": "1",
  "timeOccurred": "2021-12-27T01:06:59.059Z",
  "title": "ServiceOrderDeleteEvent",
  "event": {
    "serviceOrder": {
      ...
    }
  }
}
  
```

```

        "id": "5351",
        "href": "https://host:port/serviceOrdering/v5/serviceOrder/5351",
        "@type": "ServiceOrder"
    },
},
"relatedParty": [
{
    "id": "56d",
    "role": "Issuer",
    "@type": "RelatedParty",
    "@referredType": "Organization"
}
],
"reportingSystem": {
    "id": "20011",
    "name": "Service Order Management Component",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"source": {
    "id": "20011",
    "name": "Service Order Management Component",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"@baseType": "Event",
"@type": "ServiceOrderDeleteEvent"
}
}
```

Service Order Milestone Event

Message example for ServiceOrderMilestoneEvent event

```

Content-Type: application/json

{
    "correlationId": "SOM-20011",
    "description": "ServiceOrderMilestoneEvent illustration",
    "domain": "Commercial",
    "eventId": "10069",
    "eventTime": "2021-12-27T01:06:59.059Z",
    "eventType": "ServiceOrderMilestoneEvent",
    "priority": "1",
    "timeOccurred": "2021-12-27T01:06:59.059Z",
    "title": "ServiceOrderMilestoneEvent",
    "event": {
        "serviceOrder": {
            "id": "42",
            "href": "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",
            "priority": "1",
            "description": "Service order description",
            "category": "TMF resource illustration",
            "state": "InProgress",
            "orderDate": "2020-08-27T09:37:40.508Z",
            "requestedStartDate": "2020-08-31T09:37:40.508Z",
            "requestedCompletionDate": "2020-08-31T09:37:40.508Z",
            "expectedCompletionDate": "2020-08-31T09:37:40.508Z",
            "startDate": "2020-08-31T09:37:40.508Z",
            "@type": "ServiceOrder",
            "note": [

```

```
{  
    "date": "2020-08-27T09:37:40.508Z",  
    "id": "1",  
    "author": "Harvey Poupon",  
    "text": "Some text",  
    "@type": "Note"  
}  
,  
"relatedParty": [  
    {  
        "role": "requester",  
        "@type": "RelatedPartyRefOrPartyRoleRef",  
        "partyOrPartyRole": {  
            "href": "https://mycsp.com:8080/tmf-  
api/partyManagement/v5/individual/456",  
            "id": "456",  
            "name": "Jean Pontus",  
            "@type": "PartyRef",  
            "@referredType": "Individual"  
        }  
    }  
,  
    {  
        "id": "143",  
        "description": "Port Allocation",  
        "message": "Port Allocation",  
        "milestoneDate": "2020-08-27T23:17:45.450Z",  
        "name": "Port Allocation",  
        "status": "Completed",  
        "serviceOrderItem": [  
            {  
                "itemId": "1",  
                "serviceOrderHref":  
"http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",  
                "serviceOrderId": "42",  
                "@type": "ServiceOrderItemRef"  
            }  
,  
            "@type": "ServiceOrderMilestone"  
        }  
,  
        "serviceOrderItem": [  
            {  
                "id": "1",  
                "action": "add",  
                "state": "InProgress",  
                "service": {  
                    "@type": "Service",  
                    "state": "active",  
                    "serviceCharacteristic": [  
                        {  
                            "id": "452-gh6",  
                            "name": "vCPE",  
                            "valueType": "object",  
                            "value": {  
                                "@type": "VCPE",  
                                "@schemaLocation": "https://mycsp.com:8080/tmf-  
api/schema/VCPE.schema.json",  
                                "vCPE_IP": "193.218.236.21",  
                                "MaxTxRate": 300,  
                                "TransmitPower": "11 dBm",  
                                "maxTream": "OFF"  
                            }  
                        }  
                    ]  
                }  
            }  
        ]  
    }  
]
```

```

        },
        "@type": "ObjectCharacteristic"
    }
],
"serviceSpecification": {
    "@type": "ServiceSpecificationRef",
    "@referredType": "ServiceSpecification",
    "id": "1212",
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/1212",
        "name": "vCPE",
        "version": "1.0.0"
    }
},
"@type": "ServiceOrderItem"
}
]
}
},
"reportingSystem": {
    "id": "20011",
    "name": "Service Order Management Component",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"source": {
    "id": "20011",
    "name": "Service Order Management Component",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"@baseType": "Event",
"@type": "ServiceOrderMilestoneEvent"
}
}
```

Service Order Attribute Value Change Event

Message example for ServiceOrderAttributeValueChangeEvent event

```

Content-Type: application/json

{
    "correlationId": "SOM-20011",
    "description": "ServiceOrderAttributeValueChangeEvent illustration",
    "domain": "Commercial",
    "eventId": "10037",
    "eventTime": "2021-12-27T01:06:59.059Z",
    "eventType": "ServiceOrderAttributeValueChangeEvent",
    "priority": "1",
    "timeOccurred": "2021-12-27T01:06:59.059Z",
    "title": "ServiceOrderAttributeValueChangeEvent",
    "event": {
        "serviceOrder": {
            "id": "5351",
            "href": "https://host:port/serviceOrdering/v5/serviceOrder/5351",
            "expectedCompletionDate": "2022-02-27T01:06:59.059Z",
            "@type": "ServiceOrder"
        }
    },
    "relatedParty": [

```

```
{
  "id": "56d",
  "role": "Issuer",
  "@type": "RelatedParty",
  "@referredType": "Organization"
}
],
"reportingSystem": {
  "id": "20011",
  "name": "Service Order Management Component",
  "@type": "ReportingResource",
  "@referredType": "LogicalResource"
},
"source": {
  "id": "20011",
  "name": "Service Order Management Component",
  "@type": "ReportingResource",
  "@referredType": "LogicalResource"
},
"@baseType": "Event",
"@type": "ServiceOrderAttributeValueChangeEvent"
}
```

Service Order State Change Event

Message example for ServiceOrderStateChangeEvent event

```
Content-Type: application/json

{
  "correlationId": "SOM-20011",
  "description": "ServiceOrderStateChangeEvent illustration",
  "domain": "Commercial",
  "eventId": "10091",
  "eventTime": "2021-12-27T01:06:59.059Z",
  "eventType": "ServiceOrderStateChangeEvent",
  "priority": "1",
  "timeOcurred": "2021-12-27T01:06:59.059Z",
  "title": "ServiceOrderStateChangeEvent",
  "event": {
    "serviceOrder": {
      "id": "5351",
      "href": "https://host:port/serviceOrder/v5/serviceOrder/5351",
      "state": "inProgress",
      "@type": "ServiceOrder"
    }
  },
  "relatedParty": [
    {
      "id": "56d",
      "role": "Issuer",
      "@type": "RelatedParty",
      "@referredType": "Organization"
    }
  ],
  "reportingSystem": {
    "id": "20011",
    "name": "Service Order Management Component",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
  }
}
```

```

    },
    "source": {
        "id": "20011",
        "name": "Service Order Management Component",
        "@type": "ReportingResource",
        "@referredType": "LogicalResource"
    },
    "@baseType": "Event",
    "@type": "ServiceOrderStateChangeEvent"
}

```

Service Order Jeopardy Event

Message example for ServiceOrderJeopardyEvent event

```

Content-Type: application/json

{
    "correlationId": "SOM-20011",
    "description": "ServiceOrderJeopardyEvent illustration",
    "domain": "Commercial",
    "eventId": "10079",
    "eventTime": "2021-12-27T01:06:59.059Z",
    "eventType": "ServiceOrderJeopardyEvent",
    "priority": "1",
    "timeOccurred": "2021-12-27T01:06:59.059Z",
    "title": "ServiceOrderJeopardyEvent",
    "event": {
        "serviceOrder": {
            "id": "42",
            "href": "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",
            "priority": "1",
            "description": "Service order description",
            "category": "TMF resource illustration",
            "state": "InProgress",
            "orderDate": "2020-08-27T09:37:40.508Z",
            "requestedStartDate": "2020-08-31T09:37:40.508Z",
            "requestedCompletionDate": "2020-08-31T09:37:40.508Z",
            "expectedCompletionDate": "2020-08-31T09:37:40.508Z",
            "startDate": "2020-08-31T09:37:40.508Z",
            "@type": "ServiceOrder",
            "note": [
                {
                    "date": "2020-08-27T09:37:40.508Z",
                    "id": "1",
                    "author": "Harvey Poupon",
                    "text": "Some text",
                    "@type": "Note"
                }
            ],
            "relatedParty": [
                {
                    "role": "requester",
                    "@type": "RelatedPartyRefOrPartyRoleRef",
                    "partyOrPartyRole": {
                        "href": "https://mycsp.com:8080/tmf-api/partyManagement/v5/individual/456",
                        "id": "456",
                        "name": "Jean Pontus",
                        "@type": "PartyRef",

```

```
        "@referredType": "Individual"
    }
}
],
"jeopardyAlert": [
{
    "id": "144",
    "alertDate": "2020-08-27T23:17:45.450Z",
    "exception": "Order Item Completion is in Jeopardy",
    "jeopardyType": "Normal",
    "message": "Order Item Completion is in Jeopardy",
    "name": "Order Item Completion",
    "serviceOrderItem": [
        {
            "itemId": "1",
            "serviceOrderHref": "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",
            "serviceOrderId": "42",
            "@type": "ServiceOrderItemRef"
        }
    ],
    "@type": "ServiceOrderJeopardyAlert"
}
],
"serviceOrderItem": [
{
    "id": "1",
    "action": "add",
    "state": "InProgress",
    "service": {
        "@type": "Service",
        "state": "active",
        "serviceCharacteristic": [
            {
                "id": "452-gh6",
                "name": "vCPE",
                "valueType": "object",
                "value": {
                    "@type": "VCPE",
                    "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/VCPE.schema.json",
                    "vCPE_IP": "193.218.236.21",
                    "MaxTxRate": 300,
                    "TransmitPower": "11 dBm",
                    "maxTream": "OFF"
                },
                "@type": "ObjectCharacteristic"
            }
        ],
        "serviceSpecification": {
            "@type": "ServiceSpecificationRef",
            "@referredType": "ServiceSpecification",
            "id": "1212",
            "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v5/serviceSpecification/1212",
            "name": "vCPE",
            "version": "1.0.0"
        }
    },
    "@type": "ServiceOrderItem"
}
]
}
```

```

} ,
"reportingSystem": {
  "id": "20011",
  "name": "Service Order Management Component",
  "@type": "ReportingResource",
  "@referredType": "LogicalResource"
},
"source": {
  "id": "20011",
  "name": "Service Order Management Component",
  "@type": "ReportingResource",
  "@referredType": "LogicalResource"
},
"@baseType": "Event",
"@type": "ServiceOrderJeopardyEvent"
}

```

Service Order Information Required Event

Message example for ServiceOrderInformationRequiredEvent event

```

Content-Type: application/json

{
  "correlationId": "SOM-20011",
  "description": "ServiceOrderInformationRequiredEvent illustration",
  "domain": "Commercial",
  "eventId": "10061",
  "eventTime": "2021-12-27T01:06:59.059Z",
  "eventType": "ServiceOrderInformationRequiredEvent",
  "priority": "1",
  "timeOccurred": "2021-12-27T01:06:59.059Z",
  "title": "ServiceOrderInformationRequiredEvent",
  "event": {
    "serviceOrder": {
      "id": "5351",
      "href": "https://host:port/serviceOrder/v5/serviceOrder/5351",
      "@type": "ServiceOrderRef"
    },
    "informationRequired": [
      {
        "op": "add",
        "path": "requestedCompletionDate"
      },
      {
        "op": "add",
        "path": "requestedStartDate"
      }
    ]
  },
  "relatedParty": [
    {
      "id": "56d",
      "role": "Issuer",
      "@type": "RelatedParty",
      "@referredType": "Organization"
    }
  ],
  "reportingSystem": {
    "id": "20011",
    "name": "Service Order Management Component",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
  }
}

```

```

    "name": "Service Order Management Component",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"source": {
    "id": "20011",
    "name": "Service Order Management Component",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"@baseType": "Event",
"@type": "ServiceOrderInformationRequiredEvent"
}

```

Service Order Create Event

Message example for ServiceOrderCreateEvent event

```

Content-Type: application/json

{
  "correlationId": "SOM-20011",
  "description": "ServiceOrderCreateEvent illustration",
  "domain": "Commercial",
  "eventId": "10007",
  "eventTime": "2021-12-27T01:06:59.059Z",
  "eventType": "ServiceOrderCreateEvent",
  "priority": "1",
  "timeOccurred": "2021-12-27T01:06:59.059Z",
  "title": "ServiceOrderCreateEvent",
  "event": {
    "serviceOrder": {
      "id": "42",
      "href": "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",
      "priority": "1",
      "description": "Service order description",
      "category": "TMF resource illustration",
      "state": "acknowledged",
      "orderDate": "2020-08-27T09:37:40.508Z",
      "requestedStartDate": "2020-08-31T09:37:40.508Z",
      "requestedCompletionDate": "2020-08-31T09:37:40.508Z",
      "expectedCompletionDate": "2020-08-31T09:37:40.508Z",
      "startDate": "2020-08-31T09:37:40.508Z",
      "@type": "ServiceOrder",
      "note": [
        {
          "date": "2020-08-27T09:37:40.508Z",
          "id": "1",
          "author": "Harvey Poupon",
          "text": "Some text",
          "@type": "Note"
        }
      ],
      "relatedParty": [
        {
          "role": "requester",
          "@type": "RelatedPartyRefOrPartyRoleRef",
          "partyOrPartyRole": {
            "href": "https://mycsp.com:8080/tmf-api/partyManagement/v5/individual/456",
            ...
          }
        }
      ]
    }
  }
}

```

```
        "id": "456",
        "name": "Jean Pontus",
        "@type": "PartyRef",
        "@referredType": "Individual"
    }
}
],
"serviceOrderItem": [
{
    "id": "1",
    "action": "add",
    "state": "acknowledged",
    "service": {
        "@type": "Service",
        "state": "active",
        "serviceCharacteristic": [
            {
                "id": "452-gh6",
                "name": "vCPE",
                "valueType": "object",
                "value": {
                    "@type": "VCPE",
                    "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/VCPE.schema.json",
                    "vCPE_IP": "193.218.236.21",
                    "MaxTxRate": 300,
                    "TransmitPower": "11 dBm",
                    "maxTream": "OFF"
                },
                "@type": "ObjectCharacteristic"
            }
        ],
        "serviceSpecification": {
            "@type": "ServiceSpecificationRef",
            "@referredType": "ServiceSpecification",
            "id": "1212",
            "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/1212",
            "name": "vCPE",
            "version": "1.0.0"
        }
    },
    "@type": "ServiceOrderItem"
},
{
    "id": "2",
    "action": "modify",
    "state": "InProgress",
    "service": {
        "id": "456",
        "@type": "Service",
        "href":
"http://serverlocation:port/serviceInventoryManagement/v5/service/456",
        "state": "active",
        "serviceCharacteristic": [
            {
                "id": "452-gh6",
                "valueType": "string",
                "name": "InputPort",
                "value": "456/7",
                "@type": "StringCharacteristic"
            }
        ]
    }
}
```

```
        },
        "@type": "ServiceOrderItem"
    },
    {
        "id": "3",
        "action": "add",
        "state": "acknowledged",
        "service": {
            "state": "active",
            "@type": "Service",
            "serviceRelationship": [
                {
                    "relationshipType": "reliesOn",
                    "service": {
                        "href": "https://mycsp.com:8080/tmf-
api/serviceInventory/v5/service/5645",
                        "id": "5645",
                        "@type": "ServiceRef",
                        "@referredType": "Service"
                    },
                    "@type": "ServiceRelationship"
                }
            ],
            "serviceSpecification": {
                "@type": "ServiceSpecificationRef",
                "@referredType": "ServiceSpecification",
                "id": "48",
                "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/48",
                "name": "genericDataService48",
                "version": "2.0.0"
            },
            "feature": [
                {
                    "id": "Feat1",
                    "isEnabled": true,
                    "name": "DataDownload",
                    "@type": "Feature",
                    "featureCharacteristic": [
                        {
                            "name": "VolumeCapped",
                            "id": "444",
                            "value": true,
                            "valueType": "boolean",
                            "@type": "BooleanCharacteristic"
                        }
                    ]
                }
            ],
            "@type": "ServiceOrderItem"
        }
    }
},
"relatedParty": [
{
    "id": "56d",
    "role": "Issuer",
    "@type": "RelatedParty",
    "@referredType": "Organization"
}
],
```

```

"reportingSystem": {
  "id": "20011",
  "name": "Service Order Management Component",
  "@type": "ReportingResource",
  "@referredType": "LogicalResource"
},
"source": {
  "id": "20011",
  "name": "Service Order Management Component",
  "@type": "ReportingResource",
  "@referredType": "LogicalResource"
},
"@baseType": "Event",
"@type": "ServiceOrderCreateEvent"
}

```

Cancel Service Order Information Required Event

Message example for CancelServiceOrderInformationRequiredEvent event

```

Content-Type: application/json

{
  "correlationId": "SOM-20021",
  "description": "CancelServiceOrderInformationRequiredEvent illustration",
  "eventId": "10103",
  "eventTime": "2021-12-28T01:09:57.059Z",
  "eventType": "CancelServiceOrderInformationRequiredEvent",
  "priority": "1",
  "timeOccurred": "2021-12-28T01:09:57.059Z",
  "title": "CancelServiceOrderInformationRequiredEvent",
  "event": {
    "cancelServiceOrder": {
      "id": "20021",
      "href": "https://host:port/serviceOrdering/v5/cancelServiceOrder/20021",
      "@type": "CancelServiceOrder"
    },
    "informationRequired": [
      {
        "op": "add",
        "path": "requestedCancellationDate"
      }
    ]
  },
  "reportingSystem": {
    "id": "20011",
    "name": "Service Order Management Component",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
  },
  "source": {
    "id": "20011",
    "name": "Service Order Management Component",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
  },
  "@baseType": "Event",
  "@type": "CancelServiceOrderInformationRequiredEvent"
}

```

Cancel Service Order Create Event

Message example for CancelServiceOrderCreateEvent event

```
Content-Type: application/json

{
  "correlationId": "SOM-20021",
  "description": "CancelServiceOrderCreateEvent illustration",
  "eventId": "10009",
  "eventTime": "2021-12-28T01:09:57.059Z",
  "eventType": "CancelServiceOrderCreateEvent",
  "priority": "1",
  "timeOccurred": "2021-12-28T01:09:57.059Z",
  "title": "CancelServiceOrderCreateEvent",
  "event": {
    "cancelServiceOrder": {
      "id": "789-fsds5-kjp",
      "href": "https://host:port/serviceOrdering/v5/cancelServiceOrder/789-fsds5-kjp",
      "cancellationReason": "Duplicate service order",
      "requestedCancellationDate": "2020-08-27T12:56:21.931Z",
      "serviceOrder": {
        "id": "45f-98f-ss45",
        "href": "https://host:port/serviceOrdering/v5/serviceOrder/45f-98f-ss45",
        "@referredType": "ServiceOrder",
        "@type": "ServiceOrderRef"
      },
      "state": "acknowledged",
      "@type": "CancelServiceOrder"
    }
  },
  "reportingSystem": {
    "id": "20011",
    "name": "Service Order Management Component",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
  },
  "source": {
    "id": "20011",
    "name": "Service Order Management Component",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
  },
  "@type": "CancelServiceOrderCreateEvent"
}
```

Cancel Service Order State Change Event

Message example for CancelServiceOrderStateChangeEvent event

```
Content-Type: application/json

{
  "correlationId": "SOM-20021",
  "description": "CancelServiceOrderStateChangeEvent illustration",
  "domain": "Commercial",
  "eventId": "10099",
```

```
"eventTime": "2021-12-28T01:09:57.059Z",
"eventType": "CancelServiceOrderStateChangeEvent",
"priority": "1",
"timeOccurred": "2021-12-28T01:09:57.059Z",
"title": "CancelServiceOrderStateChangeEvent",
"event": {
    "cancelServiceOrder": {
        "id": "789-fsds5-kjp",
        "href": "https://host:port/serviceOrdering/v5/cancelServiceOrder/789-fsds5-kjp",
        "serviceOrder": {
            "id": "45f-98f-ss45",
            "href": "https://host:port/serviceOrdering/v5/serviceOrder/45f-98f-ss45",
            "@referredType": "ServiceOrder",
            "@type": "ServiceOrderRef"
        },
        "state": "done",
        "@type": "CancelServiceOrder"
    }
},
"reportingSystem": {
    "id": "20011",
    "name": "Service Order Management Component",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"source": {
    "id": "20011",
    "name": "Service Order Management Component",
    "@type": "ReportingResource",
    "@referredType": "LogicalResource"
},
"@baseType": "Event",
"@type": "CancelServiceOrderStateChangeEvent"
}
```

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 ServiceOrder

List or find ServiceOrder objects

`GET /serviceOrder?fields=...`

Description

This operation list ServiceOrder 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 multiple service orders.

Request

```
GET /serviceOrder
Content-Type: application/json
```

Response

```
200
```

```
[  
  {  
    "id": "42",  
    "href": "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",  
    "priority": "1",  
    "description": "Service order description",  
    "category": "TMF resource illustration",  
    "state": "InProgress",  
    "orderDate": "2020-08-27T09:37:40.508Z",  
    "requestedStartDate": "2020-08-31T09:37:40.508Z",  
    "requestedCompletionDate": "2020-08-31T09:37:40.508Z",  
    "expectedCompletionDate": "2020-08-31T09:37:40.508Z",  
    "startDate": "2020-08-31T09:37:40.508Z",  
    "@type": "ServiceOrder",  
    "note": [  
      {  
        "date": "2020-08-27T09:37:40.508Z",  
        "id": "1",  
        "author": "Harvey Poupon",  
        "text": "Some text",  
        "@type": "Note"  
      }  
    ],  
    "relatedParty": [  
      {  
        "role": "requester",  
        "@type": "RelatedPartyRefOrPartyRoleRef",  
        "partyOrPartyRole": {  
          "href": "https://mycsp.com:8080/tmf-api/partyManagement/v5/individual/456",  
          "id": "456",  
          "name": "Jean Pontus",  
          "@type": "PartyRef",  
          "@referredType": "Individual"  
        }  
      }  
    ],  
    "jeopardyAlert": [  
      {  
        "id": "144",  
        "alertDate": "2020-08-27T23:17:45.450Z",  
        "exception": "Order Item Completion is in Jeopardy",  
        "jeopardyType": "Normal",  
        "message": "Order Item Completion is in Jeopardy",  
        "name": "Order Item Completion",  
        "serviceOrderItem": [  
          {  
            "itemId": "1",  
            "serviceOrderHref":  
              "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",  
              "serviceOrderId": "42",  
              "@type": "ServiceOrderItemRef"  
            }  
          ],  
          "@type": "ServiceOrderJeopardyAlert"  
        }  
      ],  
      "milestone": [  
        {  
          "id": "143",  
          "description": "Port Allocation",  
          "message": "Port Allocation",  
          "milestoneDate": "2020-08-27T23:17:45.450Z",  
        }  
      ]  
    ]  
]
```

```
        "name": "Port Allocation",
        "status": "Completed",
        "serviceOrderItem": [
            {
                "itemRef": "2",
                "serviceOrderRef": "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",
                "serviceOrderId": "42",
                "@type": "ServiceOrderItemRef"
            }
        ],
        "@type": "ServiceOrderMilestone"
    },
    "serviceOrderItem": [
        {
            "id": "1",
            "action": "add",
            "state": "InProgress",
            "service": {
                "@type": "Service",
                "state": "active",
                "serviceCharacteristic": [
                    {
                        "id": "452-gh6",
                        "name": "vCPE",
                        "valueType": "object",
                        "value": {
                            "@type": "VCPE",
                            "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/VCPE.schema.json",
                            "vCPE_IP": "193.218.236.21",
                            "MaxTxRate": 300,
                            "TransmitPower": "11 dBm",
                            "maxTream": "OFF"
                        },
                        "@type": "ObjectCharacteristic"
                    }
                ],
                "serviceSpecification": {
                    "@type": "ServiceSpecificationRef",
                    "@referredType": "ServiceSpecification",
                    "id": "1212",
                    "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v5/serviceSpecification/1212",
                    "name": "vCPE",
                    "version": "1.0.0"
                }
            },
            "errorMessage": [
                {
                    "code": "500",
                    "message": "Resource Fallout",
                    "reason": "IP address not available",
                    "referenceError": "http://serverlocation:port/serviceOrdering/v5/errorMessage/500",
                    "status": "ERROR-003",
                    "timestamp": "2020-08-27T23:17:45.450Z",
                    "@type": "ServiceOrderItemErrorMessage"
                }
            ],
            "@type": "ServiceOrderItem"
        }
    ]
}
```

```
{  
    "id": "2",  
    "action": "add",  
    "state": "acknowledged",  
    "service": {  
        "state": "active",  
        "@type": "Service",  
        "serviceRelationship": [  
            {  
                "relationshipType": "reliesOn",  
                "service": {  
                    "href": "https://mycsp.com:8080/tmf-  
api/serviceInventory/v5/service/5645",  
                    "id": "5645",  
                    "@type": "ServiceRef",  
                    "@referredType": "Service"  
                },  
                "@type": "ServiceRelationship"  
            },  
            ],  
        "serviceSpecification": {  
            "@type": "ServiceSpecificationRef",  
            "@referredType": "ServiceSpecification",  
            "id": "48",  
            "href": "https://mycsp.com:8080/tmf-  
api/serviceCatalogManagement/v5/serviceSpecification/48",  
            "name": "genericDataService48",  
            "version": "2.0.0"  
        },  
        "feature": [  
            {  
                "id": "Feat1",  
                "isEnabled": true,  
                "name": "DataDownload",  
                "@type": "Feature",  
                "featureCharacteristic": [  
                    {  
                        "name": "VolumeCapped",  
                        "id": "444",  
                        "value": true,  
                        "valueType": "boolean",  
                        "@type": "BooleanCharacteristic"  
                    }  
                ]  
            }  
        ],  
        "@type": "ServiceOrderItem"  
    },  
    ],  
},  
{  
    "id": "51",  
    "href": "http://serverlocation:port/serviceOrdering/v5/serviceOrder/51",  
    "priority": "1",  
    "description": "Service order description",  
    "category": "TMF resource illustration",  
    "state": "completed",  
    "orderDate": "2019-07-01T09:56:03.222Z",  
    "requestedStartDate": "2019-07-01T09:56:03.222Z",  
    "requestedCompletionDate": "2020-05-01T09:56:03.222Z",  
    "expectedCompletionDate": "2020-05-01T09:56:03.222Z",  
    "startDate": "2019-07-01T09:56:03.222Z",  
}
```

```

"@type": "ServiceOrder",
"relatedParty": [
  {
    "role": "member",
    "@type": "RelatedPartyRefOrPartyRoleRef",
    "partyOrPartyRole": {
      "href": "https://mycsp.com:8080/tmf-
api/partyManagement/v5/individual/420",
      "id": "420",
      "name": "Mark",
      "@type": "PartyRef",
      "@referredType": "Individual"
    }
  }
],
"serviceOrderItem": [
  {
    "id": "1",
    "action": "add",
    "state": "completed",
    "service": {
      "@type": "Service",
      "id": "123-456",
      "href": "http://serverlocation:port/tmf-
api/serviceInventory/v5/service/123-456",
      "state": "active",
      "serviceCharacteristic": [
        {
          "id": "654",
          "name": "MSISDN",
          "valueType": "string",
          "value": "415-275-7439",
          "@type": "StringCharacteristic"
        }
      ],
      "serviceSpecification": {
        "@type": "ServiceSpecificationRef",
        "@referredType": "ServiceSpecification",
        "id": "1515",
        "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/1515",
        "name": "c_Mobile",
        "version": "1.0.0"
      }
    },
    "@type": "ServiceOrderItem"
  }
]
}
]

```

Retrieves a ServiceOrder by ID

GET /serviceOrder/{id}?fields=...

Description

This operation retrieves a ServiceOrder entity. 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 service order by ID.

Request

```
GET /serviceOrder/42
Content-Type: application/json
```

Response

```
200

{
  "id": "42",
  "href": "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",
  "priority": "1",
  "description": "Service order description",
  "category": "TMF resource illustration",
  "state": "InProgress",
  "orderDate": "2020-08-27T09:37:40.508Z",
  "requestedStartDate": "2020-08-31T09:37:40.508Z",
  "requestedCompletionDate": "2020-08-31T09:37:40.508Z",
  "expectedCompletionDate": "2020-08-31T09:37:40.508Z",
  "startDate": "2020-08-31T09:37:40.508Z",
  "@type": "ServiceOrder",
  "note": [
    {
      "date": "2020-08-27T09:37:40.508Z",
      "id": "1",
      "author": "Harvey Poupon",
      "text": "Some text",
      "@type": "Note"
    }
  ],
  "relatedParty": [
    {
      "role": "requester",
      "@type": "RelatedPartyRefOrPartyRoleRef",
      "partyOrPartyRole": {
        "href": "https://mycsp.com:8080/tmf-api/partyManagement/v5/individual/456",
        "id": "456",
        "name": "Jean Pontus",
        "@type": "PartyRef",
        "@referredType": "Individual"
      }
    }
  ],
  "jeopardyAlert": [
    {
      "id": "144",
      "alertDate": "2020-08-27T23:17:45.450Z",
      "exception": "Order Item Completion is in Jeopardy",
      "jeopardyType": "Normal",
      "message": "Order Item Completion is in Jeopardy",
      "name": "Order Item Completion",
      "serviceOrderItem": [
        ...
      ]
    }
  ]
}
```

```
{  
    "itemId": "1",  
    "serviceOrderHref":  
        "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",  
        "serviceOrderId": "42",  
        "@type": "ServiceOrderItemRef"  
    }  
],  
"@type": "ServiceOrderJeopardyAlert"  
},  
"milestone": [  
    {  
        "id": "143",  
        "description": "Port Allocation",  
        "message": "Port Allocation",  
        "milestoneDate": "2020-08-27T23:17:45.450Z",  
        "name": "Port Allocation",  
        "status": "Completed",  
        "serviceOrderItem": [  
            {  
                "itemId": "2",  
                "serviceOrderHref":  
                    "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",  
                    "serviceOrderId": "42",  
                    "@type": "ServiceOrderItemRef"  
                }  
            ],  
            "@type": "ServiceOrderMilestone"  
        }  
    ],  
    "serviceOrderItem": [  
        {  
            "id": "1",  
            "action": "add",  
            "state": "InProgress",  
            "service": {  
                "@type": "Service",  
                "state": "active",  
                "serviceCharacteristic": [  
                    {  
                        "id": "452-gh6",  
                        "name": "vCPE",  
                        "valueType": "object",  
                        "value": {  
                            "@type": "VCPE",  
                            "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/VCPE.schema.json",  
                            "vCPE_IP": "193.218.236.21",  
                            "MaxTxRate": 300,  
                            "TransmitPower": "11 dBm",  
                            "maxTream": "OFF"  
                        },  
                        "@type": "ObjectCharacteristic"  
                    }  
                ],  
                "serviceSpecification": {  
                    "@type": "ServiceSpecificationRef",  
                    "@referredType": "ServiceSpecification",  
                    "id": "1212",  
                    "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v5/serviceSpecification/1212",  
                    "name": "vCPE",  
                }  
            }  
        ]  
    ]  
}
```

```
        "version": "1.0.0"
    }
},
"@type": "ServiceOrderItem"
},
{
"id": "2",
"action": "add",
"state": "acknowledged",
"service": {
    "state": "active",
    "@type": "Service",
    "serviceRelationship": [
        {
            "relationshipType": "reliesOn",
            "service": {
                "href": "https://mycsp.com:8080/tmf-
api/serviceInventory/v5/service/5645",
                "id": "5645",
                "@type": "ServiceRef",
                "@referredType": "Service"
            },
            "@type": "ServiceRelationship"
        }
    ],
    "serviceSpecification": {
        "@type": "ServiceSpecificationRef",
        "@referredType": "ServiceSpecification",
        "id": "48",
        "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/48",
        "name": "genericDataService48",
        "version": "2.0.0"
    },
    "feature": [
        {
            "id": "Feat1",
            "isEnabled": true,
            "name": "DataDownload",
            "@type": "Feature",
            "featureCharacteristic": [
                {
                    "name": "VolumeCapped",
                    "id": "444",
                    "value": true,
                    "valueType": "boolean",
                    "@type": "BooleanCharacteristic"
                }
            ]
        }
    ],
    "@type": "ServiceOrderItem"
}
]
```

Creates a ServiceOrder

POST /serviceOrder?fields=...

Description

This operation creates a ServiceOrder entity.

Mandatory Attributes

Mandatory Attributes	Rule
serviceOrderItem	
serviceOrderItem.action	
serviceOrderItem.id	
serviceOrderItem.service	
serviceOrderItem.service.@type	
serviceOrderItem.service.id	
serviceOrderItem.service.serviceDate	
serviceOrderItem.service.serviceSpecification	
serviceOrderItem.service.serviceSpecification.@type	
serviceOrderItem.service.serviceSpecification.id	
serviceOrderItem.service.state	
@type	

Usage samples

Creation of a new service order with POST operation

Request

```
POST /serviceOrder
Content-Type: application/json

{
    "priority": "1",
    "description": "Service order description",
    "category": "TMF resource illustration",
    "requestedStartDate": "2020-08-27T09:37:40.508Z",
    "requestedCompletionDate": "2020-08-27T09:37:40.508Z",
    "@type": "ServiceOrder",
    "serviceOrderItem": [
        {
            "id": "1",
            "action": "add",
            "@type": "ServiceOrderItem",
            "service": {
                "@type": "Service",
                "state": "active",
                "serviceCharacteristic": [
                    ...
                ]
            }
        }
    ]
}
```

```
{
    "name": "vCPE",
    "id": "452-gh6",
    "valueType": "object",
    "value": {
        "@type": "VCPE",
        "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/VCPE.schema.json",
        "vCPE_IP": "193.218.236.21",
        "MaxTxRate": 300,
        "TransmitPower": "11 dBm",
        "maxTream": "OFF"
    },
    "@type": "ObjectCharacteristic"
},
],
"serviceSpecification": {
    "id": "1212",
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/1212",
    "name": "vCPE",
    "version": "1.0.0",
    "@type": "ServiceSpecificationRef",
    "@referredType": "ServiceSpecification"
}
}
}
]
}
```

Response

```
201
{
    "id": "5351",
    "href": "http://serverlocation:port/serviceOrdering/v5/serviceOrder/5351",
    "state": "acknowledged",
    "description": "Service order description",
    "category": "TMF resource illustration",
    "orderDate": "2020-08-27T09:37:40.508Z",
    "requestedStartDate": "2020-08-31T09:37:40.508Z",
    "requestedCompletionDate": "2020-08-31T09:37:40.508Z",
    "expectedCompletionDate": "2020-10-31T09:37:40.508Z",
    "startDate": "2020-08-31T09:37:40.508Z",
    "serviceOrderItem": [
        {
            "id": "1",
            "action": "add",
            "state": "acknowledged",
            "service": {
                "@type": "Service",
                "state": "active",
                "serviceCharacteristic": [
                    {
                        "id": "452-gh6",
                        "name": "vCPE",
                        "valueType": "object",
                        "value": {
                            "@type": "VCPE",
                            "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/VCPE.schema.json",
                            "vCPE_IP": "193.218.236.21",
                            "MaxTxRate": 300,
                            "TransmitPower": "11 dBm",
                            "maxTream": "OFF"
                        }
                    }
                ]
            }
        }
    ]
}
```

```

        "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/VCPE.schema.json",
        "vCPE_IP": "193.218.236.21",
        "MaxTxRate": 300,
        "TransmitPower": "11 dBm",
        "maxTream": "OFF"
    },
    "@type": "ObjectCharacteristic"
}
],
"serviceSpecification": {
    "@type": "ServiceSpecificationRef",
    "@REFERREDTYPE": "ServiceSpecification",
    "id": "1212",
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/1212",
    "name": "vCPE",
    "version": "1.0.0"
}
},
"@type": "ServiceOrderItem"
}
],
"@type": "ServiceOrder"
}

```

Creation of a new service order with POST operation with serviceOrderItem action modify. The use of modifyPath is optional and is only applicable in the context of a "ServiceOrderItem" with the action set to "modify". The modifyPath.path can only point to a service inside the ServiceOrderItem and it can't reference anything outside of the ServiceOrderItem.service. In case an implementation receive a JSON Pointer as part of the modifyPath.path referencing anything outside of the ServiceOrderItem.service, then the implementation must return 400 Bad Request.

Request

```

POST /serviceOrder
Content-Type: application/json

{
    "priority": "1",
    "description": "Service order description",
    "category": "TMF resource illustration",
    "requestedStartDate": "2020-08-27T09:37:40.508Z",
    "requestedCompletionDate": "2020-08-27T09:37:40.508Z",
    "@type": "ServiceOrder",
    "serviceOrderItem": [
        {
            "id": "1",
            "action": "modify",
            "service": {
                "id": "456",
                "@type": "ServiceRef",
                "href":
"http://serverlocation:port/serviceInventoryManagement/v5/service/456"
            },
            "modifyPath": [
                {
                    "op": "add",

```

```
        "path": "/serviceCharacteristic",
        "value":
        [
            {
                "id": "452-gh6",
                "valueType": "string",
                "name": "InputPort",
                "value": "456/7",
                "@type": "StringCharacteristic"
            }
        ],
        "@type": "ServiceOrderItem"
    }
]
}
```

Response

```
201

{
    "id": "5351",
    "href": "http://serverlocation:port/serviceOrdering/v5/serviceOrder/5351",
    "state": "acknowledged",
    "priority": "1",
    "description": "Service order description",
    "category": "TMF resource illustration",
    "requestedStartDate": "2020-08-27T09:37:40.508Z",
    "requestedCompletionDate": "2020-08-27T09:37:40.508Z",
    "expectedCompletionDate": "2020-10-31T09:37:40.508Z",
    "serviceOrderItem": [
        {
            "id": "1",
            "action": "modify",
            "state": "acknowledged",
            "service": {
                "id": "456",
                "@type": "ServiceRef",
                "href": "http://serverlocation:port/serviceInventoryManagement/v5/service/456"
            },
            "modifyPath": [
                {
                    "op": "add",
                    "path": "/serviceCharacteristic",
                    "value": {
                        "id": "452-gh6",
                        "valueType": "string",
                        "name": "InputPort",
                        "value": "456/7",
                        "@type": "StringCharacteristic"
                    }
                }
            ],
            "@type": "ServiceOrderItem"
        }
    ],
    "@type": "ServiceOrder"
}
```

Creation of a new service order with intent, with POST operation

Request

```

POST /serviceOrder
Content-Type: application/json

{
    "priority": "1",
    "description": "Service order description",
    "category": "TMF resource illustration",
    "requestedStartDate": "2020-08-27T09:37:40.508Z",
    "requestedCompletionDate": "2020-08-27T09:37:40.508Z",
    "@type": "ServiceOrder",
    "serviceOrderItem": [
        {
            "id": "1",
            "action": "add",
            "@type": "ServiceOrderItem",
            "service": {
                "id": "455",
                "@type": "Service",
                "href": "http://serverlocation:port/serviceInventoryManagement/v5/service/455",
                "state": "active",
                "serviceSpecification": {
                    "@type": "ServiceSpecificationRef",
                    "@referredType": "ServiceSpecification",
                    "id": "1212",
                    "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v5/serviceSpecification/1212",
                    "name": "vCPE",
                    "version": "1.0.0"
                },
                "intent": {
                    "@type": "Intent",
                    "id": "42",
                    "description": "Intent for ordering live broadcast service for an event",
                    "validFor": {
                        "startDateTime": "2022-10-23T00:30:00.00Z",
                        "endDateTime": "2022-10-19T23:30:00.00Z"
                    },
                    "isBundle": true,
                    "version": "1.0.0",
                    "intentSpecification": {
                        "@type": "IntentSpecificationRef",
                        "id": "EventLiveBroadcast_IntentSpec",
                        "name": "EventLiveBroadcastIntentSpec",
                        "@referredType": "IntentSpecification",
                        "@href": "/intent/v5/IntentSpecification/EventLiveBroadcast_IntentSpec"
                    },
                    "name": "EventLiveBroadcast",
                    "expression": {
                        "@type": "JsonLdExpression",
                        "expressionValue": {
                            "@context": {
                                "icm": "http://www.models.tmforum.org/tio/v1.0.0/IntentCommonModel#",
                                "cat": "http://www.operator.com/Catalog#",
                                "idan": "http://www.idan-tmforum-catalyst.org/IntentDrivenAutonomousNetworks#",
                                "icn": "http://www.idan-tmforum-catalyst.org/IntentDrivenNetworks#"
                            }
                        }
                    }
                }
            }
        }
    ]
}

```

```
"xsd": "http://www.w3.org/2001/XMLSchema#",
"t": "http://www.w3.org/2006/time#",
"elb": "http://www.operator.com/Catalog/EventWirelessAccess#",
"app": "http://www.operator.com/Catalog/StreamingApplication#",
"geo": "https://tmforum.org/2020/07/geographicPoint#"
},
"idan:EventLiveBroadcast000001": {
    "@type": "icm:Intent",
    "icm:intentOwner": "idan:Salesforce",
    "icm:hasExpectation": {
        "idan:Delivery_service": {
            "@type": "icm:DeliveryExpectation",
            "icm:target": "_:service",
            "icm:params": {
                "icm:targetDescription": "cat:EventWirelessAccess"
            }
        },
        "idan:Delivery_app": {
            "@type": "icm:DeliveryExpectation",
            "icm:target": "_:application",
            "icm:params": {
                "icm:targetDescription": "cat:StreamingApplication"
            }
        },
        "idan:Property_service": {
            "@type": "icm:PropertyExpectation",
            "icm:target": "_:service",
            "icm:params": {
                "elb:serviceQuality": [
                    {
                        "icm:value": "4KUHD"
                    }
                ],
                "elb:numberOfParticipants": [
                    {
                        "icm:atMost": "200"
                    }
                ],
                "elb:areaOfService": [
                    {
                        "geo:geographicPoints": [
                            {
                                "geo:longitude": 90,
                                "geo:latitude": 44,
                                "geo:altitude": 84
                            },
                            {
                                "geo:longitude": 84,
                                "geo:latitude": -12,
                                "geo:altitude": 24
                            },
                            {
                                "geo:longitude": 131,
                                "geo:latitude": -36,
                                "geo:altitude": 29
                            },
                            {
                                "geo:longitude": 7,
                                "geo:latitude": 81,
                                "geo:altitude": -42
                            }
                        ]
                    }
                ]
            }
        }
    }
}
```

```
        ]
    }
},
"idan:Property_app": {
    "@type": "icm:PropertyExpectation",
    "icm:target": "_:application",
    "icm:params": {
        "app:appType": [
            {
                "icm:value": "AWS MediaLive"
            },
            {
                "icm:value": "Facebook Live"
            },
            {
                "icm:value": "YouTube"
            }
        ]
    }
},
"idan:Reporting": {
    "@type": "icm:ReportingExpectation",
    "icm:target": "idan:EventLiveBroadcast",
    "icm:params": {
        "icm:reportingInterval": [
            {
                "t:Duration": [
                    {
                        "t:numbericDuration": 10,
                        "t:temporalUnit": "unitMinute"
                    }
                ]
            }
        ],
        "icm:reportingEvent": [
            "icm:StateComplies",
            "icm:StateDegrades"
        ]
    }
}
},
"lastUpdate": "2023-03-09T08:42:33.044Z"
}
]
}
```

Response

```
201
{
  "id": "5351",
  "href": "http://serverlocation:port/serviceOrdering/v5/serviceOrder/5351",
  "state": "acknowledged",
  "priority": "1",
```

```

"description": "Service order description",
"category": "TMF resource illustration",
"orderDate": "2020-08-27T09:37:40.508Z",
"requestedStartDate": "2020-08-27T09:37:40.508Z",
"requestedCompletionDate": "2020-08-27T09:37:40.508Z",
"expectedCompletionDate": "2020-10-31T09:37:40.508Z",
"startDate": "2020-08-31T09:37:40.508Z",
"@type": "ServiceOrder",
"serviceOrderItem": [
  {
    "id": "1",
    "action": "add",
    "state": "acknowledged",
    "service": {
      "id": "455",
      "@type": "Service",
      "href": "http://serverlocation:port/serviceInventoryManagement/v5/service/455",
      "state": "active",
      "serviceSpecification": {
        "@type": "ServiceSpecificationRef",
        "@referredType": "ServiceSpecification",
        "id": "1212",
        "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v5/serviceSpecification/1212",
        "name": "vCPE",
        "version": "1.0.0"
      },
      "intent": {
        "@type": "Intent",
        "id": "42",
        "description": "Intent for ordering live broadcast service for an event",
        "validFor": {
          "startDateTime": "2022-10-23T00:30:00.00Z",
          "endDateTime": "2022-10-19T23:30:00.00Z"
        },
        "isBundle": true,
        "version": "1.0.0",
        "intentSpecification": {
          "@type": "IntentSpecificationRef",
          "id": "EventLiveBroadcast_IntentSpec",
          "name": "EventLiveBroadcastIntentSpec",
          "@referredType": "IntentSpecification",
          "@href": "/intent/v5/IntentSpecification/EventLiveBroadcast_IntentSpec"
        },
        "name": "EventLiveBroadcast",
        "expression": {
          "@type": "JsonLdExpression",
          "expressionValue": {
            "@context": {
              "icm": "http://www.models.tmforum.org/tio/v1.0.0/IntentCommonModel#",
              "cat": "http://www.operator.com/Catalog#",
              "idan": "http://www.idan-tmforum-catalyst.org/IntentDrivenAutonomousNetworks#",
              "xsd": "http://www.w3.org/2001/XMLSchema#",
              "t": "http://www.w3.org/2006/time#",
              "elb": "http://www.operator.com/Catalog/EventWirelessAccess#",
              "app": "http://www.operator.com/Catalog/StreamingApplication#",
              "geo": "https://tmforum.org/2020/07/geographicPoint#"
            }
          }
        }
      }
    }
  }
]
}

```

```
"idan:EventLiveBroadcast000001": {
    "@type": "icm:Intent",
    "icm:intentOwner": "idan:Salesforce",
    "icm:hasExpectation": {
        "idan:Delivery_service": {
            "@type": "icm:DeliveryExpectation",
            "icm:target": "_:service",
            "icm:params": {
                "icm:targetDescription": "cat:EventWirelessAccess"
            }
        },
        "idan:Delivery_app": {
            "@type": "icm:DeliveryExpectation",
            "icm:target": "_:application",
            "icm:params": {
                "icm:targetDescription": "cat:StreamingApplication"
            }
        },
        "idan:Property_service": {
            "@type": "icm:PropertyExpectation",
            "icm:target": "_:service",
            "icm:params": {
                "elb:serviceQuality": [
                    {
                        "icm:value": "4KUHD"
                    }
                ],
                "elb:numberOfParticipants": [
                    {
                        "icm:atMost": "200"
                    }
                ],
                "elb:areaOfService": [
                    {
                        "geo:geographicPoints": [
                            {
                                "geo:longitude": 90,
                                "geo:latitude": 44,
                                "geo:altitude": 84
                            },
                            {
                                "geo:longitude": 84,
                                "geo:latitude": -12,
                                "geo:altitude": 24
                            },
                            {
                                "geo:longitude": 131,
                                "geo:latitude": -36,
                                "geo:altitude": 29
                            },
                            {
                                "geo:longitude": 7,
                                "geo:latitude": 81,
                                "geo:altitude": -42
                            }
                        ]
                    }
                ]
            }
        },
        "idan:Property_app": {
            "@type": "icm:PropertyExpectation",
            "icm:target": "_:application",
            "icm:params": {
                "icm:targetDescription": "cat:StreamingApplication"
            }
        }
    }
}
```

```

        "icm:params": [
            "app:appType": [
                {
                    "icm:value": "AWS MediaLive"
                },
                {
                    "icm:value": "Facebook Live"
                },
                {
                    "icm:value": "YouTube"
                }
            ]
        },
        "idan:Reporting": {
            "@type": "icm:ReportingExpectation",
            "icm:target": "idan:EventLiveBroadcast",
            "icm:params": {
                "icm:reportingInterval": [
                    {
                        "t:Duration": [
                            {
                                "t:numbericDuration": 10,
                                "t:temporalUnit": "unitMinute"
                            }
                        ]
                    }
                ],
                "icm:reportingEvent": [
                    "icm:StateComplies",
                    "icm:StateDegrades"
                ]
            }
        }
    },
    "lastUpdate": "2023-03-09T08:42:33.044Z"
},
"@type": "ServiceOrderItem"
]
}
}

```

Updates partially a ServiceOrder

PATCH /serviceOrder/{id}?fields=...

Description

This operation allows partial updates of a ServiceOrder 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

Non Patchable Attributes	Rule
errorMessage	
href	
id	
jeopardyAlert	
milestone	
orderDate	
@baseType	@baseType is immutable
@schemaLocation	@schemaLocation is immutable
@type	@type is immutable

Patchable Attributes	Rule
cancellationDate	
cancellationReason	
category	
completionDate	
description	
expectedCompletionDate	
externalReference	
note	
notificationContact	
orderCharacteristic	
orderRelationship	
orderSpecification	
priority	
relatedParty	
requestedCompletionDate	
requestedStartDate	
serviceOrderItem	
startDate	
state	

Usage samples

Here's an example of a request for patching a service order using merge-patch+json for requestedStartDate and requestedCompletionDate.

Request

```
PATCH /serviceOrder/42
Content-Type: application/merge-patch+json

{
    "requestedStartDate": "2020-08-27T09:37:40.508Z",
    "requestedCompletionDate": "2020-08-27T09:37:40.508Z",
    "@type": "ServiceOrder"
}
```

Response

```
200

{
    "id": "42",
    "href": "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",
    "priority": "1",
    "description": "Service order description",
    "category": "TMF resource illustration",
    "state": "InProgress",
    "orderDate": "2020-08-27T09:37:40.508Z",
    "requestedStartDate": "2020-08-31T09:37:40.508Z",
    "requestedCompletionDate": "2020-08-31T09:37:40.508Z",
    "expectedCompletionDate": "2020-08-31T09:37:40.508Z",
    "startDate": "2020-08-31T09:37:40.508Z",
    "@type": "ServiceOrder",
    "note": [
        {
            "date": "2020-08-27T09:37:40.508Z",
            "id": "1",
            "author": "Harvey Poupon",
            "text": "Some text",
            "@type": "Note"
        }
    ],
    "relatedParty": [
        {
            "role": "requester",
            "@type": "RelatedPartyRefOrPartyRoleRef",
            "partyOrPartyRole": {
                "href": "https://mycsp.com:8080/tmf-api/partyManagement/v5/individual/456",
                "id": "456",
                "name": "Jean Pontus",
                "@type": "PartyRef",
                "@referredType": "Individual"
            }
        }
    ],
    "jeopardyAlert": [
        {
            "id": "144",
            "alertDate": "2020-08-27T23:17:45.450Z",
            "exception": "Order Item Completion is in Jeopardy",
            "jeopardyType": "Normal",
            "message": "Order Item Completion is in Jeopardy",
            "name": "Order Item Completion",
            "serviceOrderItem": [

```

```
{  
    "itemId": "1",  
    "serviceOrderHref":  
        "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",  
        "serviceOrderId": "42",  
        "@type": "ServiceOrderItemRef"  
    }  
,  
    "@type": "ServiceOrderJeopardyAlert"  
}  
,  
"milestone": [  
    {  
        "id": "143",  
        "description": "Port Allocation",  
        "message": "Port Allocation",  
        "milestoneDate": "2020-08-27T23:17:45.450Z",  
        "name": "Port Allocation",  
        "status": "Completed",  
        "serviceOrderItem": [  
            {  
                "itemId": "2",  
                "serviceOrderHref":  
                    "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",  
                    "serviceOrderId": "42",  
                    "@type": "ServiceOrderItemRef"  
                }  
,  
                "@type": "ServiceOrderMilestone"  
            }  
,  
            "serviceOrderItem": [  
                {  
                    "id": "1",  
                    "action": "add",  
                    "state": "InProgress",  
                    "service": {  
                        "@type": "Service",  
                        "state": "active",  
                        "serviceCharacteristic": [  
                            {  
                                "id": "452-gh6",  
                                "name": "vCPE",  
                                "valueType": "object",  
                                "value": {  
                                    "@type": "VCPE",  
                                    "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/VCPE.schema.json",  
                                    "vCPE_IP": "193.218.236.21",  
                                    "MaxTxRate": 300,  
                                    "TransmitPower": "11 dBm",  
                                    "maxTream": "OFF"  
                                },  
                                "@type": "ObjectCharacteristic"  
                            }  
,  
                            "serviceSpecification": {  
                                "@type": "ServiceSpecificationRef",  
                                "@referredType": "ServiceSpecification",  
                                "id": "1212",  
                                "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v5/serviceSpecification/1212",  
                                "name": "vCPE",  
                            }  
                        ]  
                    }  
                }  
            ]  
        ]  
    }  
]
```

```
        "version": "1.0.0"
    }
},
"errorMessage": [
{
    "code": "500",
    "message": "Resource Fallout",
    "reason": "IP address not available",
    "referenceError": null
},
{
    "http://serverlocation:port/serviceOrdering/v5/errorMessage/500": {
        "status": "ERROR-003",
        "timestamp": "2020-08-27T23:17:45.450Z",
        "@type": "ServiceOrderItemErrorMessage"
    }
},
{
    "@type": "ServiceOrderItem"
},
{
    "id": "2",
    "action": "modify",
    "state": "InProgress",
    "service": {
        "id": "456",
        "@type": "Service",
        "href": null
    }
},
{
    "http://serverlocation:port/serviceInventoryManagement/v5/service/456": {
        "state": "active",
        "serviceCharacteristic": [
            {
                "id": "452-gh6",
                "valueType": "string",
                "name": "InputPort",
                "value": "456/7",
                "@type": "StringCharacteristic"
            }
        ]
    },
    "@type": "ServiceOrderItem"
},
{
    "id": "3",
    "action": "add",
    "state": "acknowledged",
    "service": {
        "state": "active",
        "@type": "Service",
        "serviceRelationship": [
            {
                "relationshipType": "reliesOn",
                "service": {
                    "href": "https://mycsp.com:8080/tmf-api/serviceInventory/v5/service/5645",
                    "id": "5645",
                    "@type": "ServiceRef",
                    "@referredType": "Service"
                },
                "@type": "ServiceRelationship"
            }
        ],
        "serviceSpecification": {
            "@type": "ServiceSpecificationRef",
            "@referredType": "ServiceSpecification",
            "id": "48"
        }
    }
}
```

```

    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/48",
    "name": "genericDataService48",
    "version": "2.0.0"
},
"feature": [
{
    "id": "Feat1",
    "isEnabled": true,
    "name": "DataDownload",
    "@type": "Feature",
    "featureCharacteritic": [
        {
            "name": "VolumeCapped",
            "id": "444",
            "value": true,
            "valueType": "boolean",
            "@type": "BooleanCharacteristic"
        }
    ]
}
],
"@type": "ServiceOrderItem"
}
]
}

```

Here's an example of a request for updating a service order using json-patch-query+json for relatedParty.

Request

```

PATCH /serviceOrder/42
Content-Type: application/json-patch-query+json

[
{
    "op": "replace",
    "path": "/relatedParty/partyOrPartyRole/name?relatedParty.role=requester",
    "value": "Mr. N. Bene"
}
]

```

Response

```

200

{
    "id": "42",
    "href": "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",
    "priority": "1",
    "description": "Service order description",
    "category": "TMF resource illustration",
    "state": "InProgress",
    "orderDate": "2020-08-27T09:37:40.508Z",
    "requestedStartDate": "2020-08-31T09:37:40.508Z",
}

```

```
"requestedCompletionDate": "2020-08-31T09:37:40.508Z",
"expectedCompletionDate": "2020-08-31T09:37:40.508Z",
"startDate": "2020-08-31T09:37:40.508Z",
"@type": "ServiceOrder",
"note": [
  {
    "date": "2020-08-27T09:37:40.508Z",
    "id": "1",
    "author": "Harvey Poupon",
    "text": "Some text",
    "@type": "Note"
  }
],
"relatedParty": [
  {
    "role": "requester",
    "@type": "RelatedPartyRefOrPartyRoleRef",
    "partyOrPartyRole": {
      "href": "https://mycsp.com:8080/tmf-api/partyManagement/v5/individual/456",
      "id": "456",
      "name": "Mr. N. Bene",
      "@type": "PartyRef",
      "@referredType": "Individual"
    }
  }
],
"jeopardyAlert": [
  {
    "id": "144",
    "alertDate": "2020-08-27T23:17:45.450Z",
    "exception": "Order Item Completion is in Jeopardy",
    "jeopardyType": "Normal",
    "message": "Order Item Completion is in Jeopardy",
    "name": "Order Item Completion",
    "serviceOrderItem": [
      {
        "itemId": "1",
        "serviceOrderHref": "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",
        "serviceOrderId": "42",
        "@type": "ServiceOrderItemRef"
      }
    ],
    "@type": "ServiceOrderJeopardyAlert"
  }
],
"milestone": [
  {
    "id": "143",
    "description": "Port Allocation",
    "message": "Port Allocation",
    "milestoneDate": "2020-08-27T23:17:45.450Z",
    "name": "Port Allocation",
    "status": "Completed",
    "serviceOrderItem": [
      {
        "itemId": "2",
        "serviceOrderHref": "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",
        "serviceOrderId": "42",
        "@type": "ServiceOrderItemRef"
      }
    ]
  }
]
```

```
        "@type": "ServiceOrderMilestone"
    }
],
"serviceOrderItem": [
{
    "id": "1",
    "action": "add",
    "state": "InProgress",
    "service": {
        "@type": "Service",
        "state": "active",
        "serviceCharacteristic": [
            {
                "id": "452-gh6",
                "name": "vCPE",
                "valueType": "object",
                "value": {
                    "@type": "VCPE",
                    "@schemaLocation": "https://mycsp.com:8080/tmf-
api/schema/VCPE.schema.json",
                    "vCPE_IP": "193.218.236.21",
                    "MaxTxRate": 300,
                    "TransmitPower": "11 dBm",
                    "maxTream": "OFF"
                },
                "@type": "ObjectCharacteristic"
            }
        ],
        "serviceSpecification": {
            "@type": "ServiceSpecificationRef",
            "@referredType": "ServiceSpecification",
            "id": "1212",
            "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/1212",
            "name": "vCPE",
            "version": "1.0.0"
        }
    },
    "errorMessage": [
{
        "code": "500",
        "message": "Resource Fallout",
        "reason": "IP address not available",
        "referenceError":
"http://serverlocation:port/serviceOrdering/v5/errorMessage/500",
        "status": "ERROR-003",
        "timestamp": "2020-08-27T23:17:45.450Z",
        "@type": "ServiceOrderItemErrorMessage"
    }
],
"@type": "ServiceOrderItem"
},
{
    "id": "2",
    "action": "modify",
    "state": "InProgress",
    "service": {
        "id": "456",
        "@type": "Service",
        "href":
"http://serverlocation:port/serviceInventoryManagement/v5/service/456",
        "state": "active",
        "serviceCharacteristic": [

```

```
{  
    "id": "452-gh6",  
    "valueType": "string",  
    "name": "InputPort",  
    "value": "456/7",  
    "@type": "StringCharacteristic"  
}  
]  
]  
},  
"@type": "ServiceOrderItem"  
},  
{  
    "id": "3",  
    "action": "add",  
    "state": "acknowledged",  
    "service": {  
        "state": "active",  
        "@type": "Service",  
        "serviceRelationship": [  
            {  
                "relationshipType": "reliesOn",  
                "service": {  
                    "href": "https://mycsp.com:8080/tmf-  
api/serviceInventory/v5/service/5645",  
                    "id": "5645",  
                    "@type": "ServiceRef",  
                    "@referredType": "Service"  
                },  
                "@type": "ServiceRelationship"  
            }  
        ],  
        "serviceSpecification": {  
            "@type": "ServiceSpecificationRef",  
            "@referredType": "ServiceSpecification",  
            "id": "48",  
            "href": "https://mycsp.com:8080/tmf-  
api/serviceCatalogManagement/v5/serviceSpecification/48",  
            "name": "genericDataService48",  
            "version": "2.0.0"  
        },  
        "feature": [  
            {  
                "id": "Feat1",  
                "isEnabled": true,  
                "name": "DataDownload",  
                "@type": "Feature",  
                "featureCharacteristic": [  
                    {  
                        "name": "VolumeCapped",  
                        "id": "444",  
                        "value": true,  
                        "valueType": "boolean",  
                        "@type": "BooleanCharacteristic"  
                    }  
                ]  
            }  
        ]  
    },  
    "@type": "ServiceOrderItem"  
}  
]  
}
```

Here's an example of a request for updating a service using json-patch+json for requestedStartDate and requestedCompletionDate.

Request

```
PATCH /serviceOrder/42
Content-Type: application/json-patch+json

[
  {
    "op": "replace",
    "path": "/requestedStartDate",
    "value": "2020-08-31T09:37:40.508Z"
  },
  {
    "op": "replace",
    "path": "/requestedCompletionDate",
    "value": "2020-08-31T09:37:40.508Z"
  }
]
```

Response

```
200

{
  "id": "42",
  "href": "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",
  "priority": "1",
  "description": "Service order description",
  "category": "TMF resource illustration",
  "state": "InProgress",
  "orderDate": "2020-08-27T09:37:40.508Z",
  "requestedStartDate": "2020-08-31T09:37:40.508Z",
  "requestedCompletionDate": "2020-08-31T09:37:40.508Z",
  "expectedCompletionDate": "2020-08-31T09:37:40.508Z",
  "startDate": "2020-08-31T09:37:40.508Z",
  "@type": "ServiceOrder",
  "note": [
    {
      "date": "2020-08-27T09:37:40.508Z",
      "id": "1",
      "author": "Harvey Poupon",
      "text": "Some text",
      "@type": "Note"
    }
  ],
  "relatedParty": [
    {
      "role": "requester",
      "@type": "RelatedPartyRefOrPartyRoleRef",
      "partyOrPartyRole": {
        "href": "https://mycsp.com:8080/tmf-api/partyManagement/v5/individual/456",
        "id": "456",
        "name": "Jean Pontus",
        "@type": "PartyRef",
        "@referredType": "Individual"
      }
    }
  ]
}
```

```
        }
    ],
    "jeopardyAlert": [
        {
            "id": "144",
            "alertDate": "2020-08-27T23:17:45.450Z",
            "exception": "Order Item Completion is in Jeopardy",
            "jeopardyType": "Normal",
            "message": "Order Item Completion is in Jeopardy",
            "name": "Order Item Completion",
            "serviceOrderItem": [
                {
                    "itemId": "1",
                    "serviceOrderHref":
"http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",
                        "serviceOrderId": "42",
                        "@type": "ServiceOrderItemRef"
                }
            ],
            "@type": "ServiceOrderJeopardyAlert"
        }
    ],
    "milestone": [
        {
            "id": "143",
            "description": "Port Allocation",
            "message": "Port Allocation",
            "milestoneDate": "2020-08-27T23:17:45.450Z",
            "name": "Port Allocation",
            "status": "Completed",
            "serviceOrderItem": [
                {
                    "itemId": "2",
                    "serviceOrderHref":
"http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",
                        "serviceOrderId": "42",
                        "@type": "ServiceOrderItemRef"
                }
            ],
            "@type": "ServiceOrderMilestone"
        }
    ],
    "serviceOrderItem": [
        {
            "id": "1",
            "action": "add",
            "state": "InProgress",
            "service": {
                "@type": "Service",
                "state": "active",
                "serviceCharacteristic": [
                    {
                        "id": "452-gh6",
                        "name": "vCPE",
                        "valueType": "object",
                        "value": {
                            "@type": "VCPE",
                            "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/VCPE.schema.json",
                            "vCPE_IP": "193.218.236.21",
                            "MaxTxRate": 300,
                            "TransmitPower": "11 dBm",
                            "maxTream": "OFF"
                        }
                    }
                ]
            }
        }
    ]
}
```

```
        },
        "@type": "ObjectCharacteristic"
    }
],
"serviceSpecification": {
    "@type": "ServiceSpecificationRef",
    "@referredType": "ServiceSpecification",
    "id": "1212",
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/1212",
    "name": "vCPE",
    "version": "1.0.0"
}
},
"errorMessage": [
{
    "code": "500",
    "message": "Resource Fallout",
    "reason": "IP address not available",
    "referenceError":
"http://serverlocation:port/serviceOrdering/v5/errorMessage/500",
    "status": "ERROR-003",
    "timestamp": "2020-08-27T23:17:45.450Z",
    "@type": "ServiceOrderItemErrorMessage"
}
],
"@type": "ServiceOrderItem"
},
{
    "id": "2",
    "action": "modify",
    "state": "InProgress",
    "service": {
        "id": "456",
        "@type": "Service",
        "href":
"http://serverlocation:port/serviceInventoryManagement/v5/service/456",
        "state": "active",
        "serviceCharacteristic": [
            {
                "id": "452-gh6",
                "valueType": "string",
                "name": "InputPort",
                "value": "456/7",
                "@type": "StringCharacteristic"
            }
        ]
    },
    "@type": "ServiceOrderItem"
},
{
    "id": "3",
    "action": "add",
    "state": "acknowledged",
    "service": {
        "state": "active",
        "@type": "Service",
        "serviceRelationship": [
            {
                "relationshipType": "reliesOn",
                "service": {
                    "href": "https://mycsp.com:8080/tmf-
api/serviceInventory/v5/service/5645",

```

```

        "id": "5645",
        "@type": "ServiceRef",
        "@referredType": "Service"
    },
    "@type": "ServiceRelationship"
}
],
"serviceSpecification": {
    "@type": "ServiceSpecificationRef",
    "@referredType": "ServiceSpecification",
    "id": "48",
    "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/48",
    "name": "genericDataService48",
    "version": "2.0.0"
},
"feature": [
{
    "id": "Feat1",
    "isEnabled": true,
    "name": "DataDownload",
    "@type": "Feature",
    "featureCharacteristic": [
        {
            "name": "VolumeCapped",
            "id": "444",
            "value": true,
            "valueType": "boolean",
            "@type": "BooleanCharacteristic"
        }
    ]
}
],
"@type": "ServiceOrderItem"
}
]
}
}

```

Here's an example of a request for patching a service order using application/json for requestedStartDate and requestedCompletionDate.

Request

```

PATCH /serviceOrder/42
Content-Type: application/json

{
    "requestedStartDate": "2020-08-27T09:37:40.508Z",
    "requestedCompletionDate": "2020-08-27T09:37:40.508Z",
    "@type": "ServiceOrder"
}

```

Response

```
200
```

```
{  
    "id": "42",  
    "href": "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",  
    "priority": "1",  
    "description": "Service order description",  
    "category": "TMF resource illustration",  
    "state": "InProgress",  
    "orderDate": "2020-08-27T09:37:40.508Z",  
    "requestedStartDate": "2020-08-31T09:37:40.508Z",  
    "requestedCompletionDate": "2020-08-31T09:37:40.508Z",  
    "expectedCompletionDate": "2020-08-31T09:37:40.508Z",  
    "startDate": "2020-08-31T09:37:40.508Z",  
    "@type": "ServiceOrder",  
    "note": [  
        {  
            "date": "2020-08-27T09:37:40.508Z",  
            "id": "1",  
            "author": "Harvey Poupon",  
            "text": "Some text",  
            "@type": "Note"  
        }  
    ],  
    "relatedParty": [  
        {  
            "role": "requester",  
            "@type": "RelatedPartyRefOrPartyRoleRef",  
            "partyOrPartyRole": {  
                "href": "https://mycsp.com:8080/tmf-api/partyManagement/v5/individual/456",  
                "id": "456",  
                "name": "Jean Pontus",  
                "@type": "PartyRef",  
                "@referredType": "Individual"  
            }  
        }  
    ],  
    "jeopardyAlert": [  
        {  
            "id": "144",  
            "alertDate": "2020-08-27T23:17:45.450Z",  
            "exception": "Order Item Completion is in Jeopardy",  
            "jeopardyType": "Normal",  
            "message": "Order Item Completion is in Jeopardy",  
            "name": "Order Item Completion",  
            "serviceOrderItem": [  
                {  
                    "itemId": "1",  
                    "serviceOrderHref":  
                        "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",  
                        "serviceOrderId": "42",  
                        "@type": "ServiceOrderItemRef"  
                }  
            ],  
            "@type": "ServiceOrderJeopardyAlert"  
        }  
    ],  
    "milestone": [  
        {  
            "id": "143",  
            "description": "Port Allocation",  
            "message": "Port Allocation",  
            "milestoneDate": "2020-08-27T23:17:45.450Z",  
            "name": "Port Allocation",  
            "status": "Completed",  
        }  
    ]  
}
```

```
"serviceOrderItem": [
    {
        "itemId": "2",
        "serviceOrderHref": "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",
        "serviceOrderId": "42",
        "@type": "ServiceOrderItemRef"
    }
],
"@type": "ServiceOrderMilestone"
},
"serviceOrderItem": [
{
    "id": "1",
    "action": "add",
    "state": "InProgress",
    "service": {
        "@type": "Service",
        "state": "active",
        "serviceCharacteristic": [
            {
                "id": "452-gh6",
                "name": "vCPE",
                "valueType": "object",
                "value": {
                    "@type": "VCPE",
                    "@schemaLocation": "https://mycsp.com:8080/tmf-api/schema/VCPE.schema.json",
                    "vCPE_IP": "193.218.236.21",
                    "MaxTxRate": 300,
                    "TransmitPower": "11 dBm",
                    "maxTream": "OFF"
                },
                "@type": "ObjectCharacteristic"
            }
        ],
        "serviceSpecification": {
            "@type": "ServiceSpecificationRef",
            "@referredType": "ServiceSpecification",
            "id": "1212",
            "href": "https://mycsp.com:8080/tmf-api/serviceCatalogManagement/v5/serviceSpecification/1212",
            "name": "vCPE",
            "version": "1.0.0"
        }
    },
    "errorMessage": [
        {
            "code": "500",
            "message": "Resource Fallout",
            "reason": "IP address not available",
            "referenceError": "http://serverlocation:port/serviceOrdering/v5/errorMessage/500",
            "status": "ERROR-003",
            "timestamp": "2020-08-27T23:17:45.450Z",
            "@type": "ServiceOrderItemErrorMessage"
        }
    ],
    "@type": "ServiceOrderItem"
},
{
    "id": "2",

```

```
"action": "modify",
"state": "InProgress",
"service": {
    "id": "456",
    "@type": "Service",
    "href": "http://serverlocation:port/serviceInventoryManagement/v5/service/456",
    "state": "active",
    "serviceCharacteristic": [
        {
            "id": "452-gh6",
            "valueType": "string",
            "name": "InputPort",
            "value": "456/7",
            "@type": "StringCharacteristic"
        }
    ],
    "@type": "ServiceOrderItem"
},
{
    "id": "3",
    "action": "add",
    "state": "acknowledged",
    "service": {
        "state": "active",
        "@type": "Service",
        "serviceRelationship": [
            {
                "relationshipType": "reliesOn",
                "service": {
                    "href": "https://mycsp.com:8080/tmf-
api/serviceInventory/v5/service/5645",
                    "id": "5645",
                    "@type": "ServiceRef",
                    "@referredType": "Service"
                },
                "@type": "ServiceRelationship"
            }
        ],
        "serviceSpecification": {
            "@type": "ServiceSpecificationRef",
            "@referredType": "ServiceSpecification",
            "id": "48",
            "href": "https://mycsp.com:8080/tmf-
api/serviceCatalogManagement/v5/serviceSpecification/48",
            "name": "genericDataService48",
            "version": "2.0.0"
        },
        "feature": [
            {
                "id": "Feat1",
                "isEnabled": true,
                "name": "DataDownload",
                "@type": "Feature",
                "featureCharacteristic": [
                    {
                        "name": "VolumeCapped",
                        "id": "444",
                        "value": true,
                        "valueType": "boolean",
                        "@type": "BooleanCharacteristic"
                    }
                ]
            }
        ]
    }
}
```

```
        ]
      ]
    ],
  "@type": "ServiceOrderItem"
]
}
```

Deletes a ServiceOrder

DELETE /serviceOrder/{id}

Description

This operation deletes a ServiceOrder entity.

Usage samples

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

Request

```
DELETE /serviceOrder/42
Content-Type: application/json
```

Response

```
204
{
  "id": "42",
  "href": "http://serverlocation:port/serviceOrdering/v5/serviceOrder/42",
  "@type": "ServiceOrder"
}
```

Operations on CancelServiceOrder

Retrieves a CancelServiceOrder by ID

GET /cancelServiceOrder/{id}?fields=...

Description

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

Usage samples

Retrieve a CanceServiceOrder from its identifier

Request

```
GET /cancelServiceOrder/789-fsds5-kjp
Content-Type: application/json
```

Response

```
200

{
  "id": "789-fsds5-kjp",
  "href": "https://host:port/serviceOrdering/v5/cancelServiceOrder/789-fsds5-kjp",
  "cancellationReason": "Duplicate service order",
  "effectiveCancellationDate": "2020-08-27T09:37:40.508Z",
  "requestedCancellationDate": "2020-08-27T09:37:40.508Z",
  "serviceOrder": {
    "id": "45f-98f-ss45",
    "href": "https://host:port/serviceOrdering/v5/serviceOrder/45f-98f-ss45",
    "@referredType": "ServiceOrder",
    "@type": "ServiceOrderRef"
  },
  "state": "done",
  "@type": "CancelServiceOrder"
}
```

List or find CancelServiceOrder objects

GET /cancelServiceOrder?fields=...

Description

This operation list CancelServiceOrder 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

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

Request

```
GET /cancelServiceOrder?state=done
Content-Type: application/json
```

Response

```
200
[
  {
    "id": "789-fsds5-kjp",
    "state": "done"
  }
]
```

```

    "href": "https://host:port/serviceOrdering/v5/cancelServiceOrder/789-fsds5-
kjp",
    "cancellationReason": "Duplicate service order",
    "effectiveCancellationDate": "2020-08-27T09:37:40.508Z",
    "requestedCancellationDate": "2020-08-27T09:37:40.508Z",
    "serviceOrder": {
        "id": "45f-98f-ss45",
        "href": "https://host:port/serviceOrdering/v5/serviceOrder/45f-98f-ss45",
        "@referredType": "ServiceOrder",
        "@type": "ServiceOrderRef"
    },
    "state": "done",
    "@type": "CancelServiceOrder"
}
]

```

Retrieve a list of CancelServiceOrder(s) with field selection id and serviceOrder

Request

```

GET /cancelServiceOrder?fields=id,serviceOrder
Content-Type: application/json

```

Response

```

200
[
    {
        "id": "6987",
        "serviceOrder": {
            "id": "45f-98f-ss45",
            "href": "https://host:port/serviceOrdering/v5/serviceOrder/45f-98f-ss45",
            "@type": "ServiceOrderRef",
            "@referredType": "ServiceOrder"
        },
        "@type": "CancelServiceOrder"
    },
    {
        "id": "7412",
        "serviceOrder": {
            "id": "45f-789-sdre",
            "href": "https://host:port/serviceOrdering/v5/serviceOrder/45f-789-sdre",
            "@type": "ServiceOrderRef",
            "@referredType": "ServiceOrder"
        },
        "@type": "CancelServiceOrder"
    },
    {
        "id": "3214",
        "serviceOrder": {
            "id": "45f-as4-os3f",
            "href": "https://host:port/serviceOrdering/v5/serviceOrder/45f-as4-os3f",
            "@type": "ServiceOrderRef",
            "@referredType": "ServiceOrder"
        },
        "@type": "CancelServiceOrder"
    }
]
```

```

    }
]
```

Creates a CancelServiceOrder

POST /cancelServiceOrder?fields=...

Description

This operation creates a CancelServiceOrder entity.

Mandatory Attributes

Mandatory Attributes	Rule
serviceOrder	
serviceOrder.@type	
serviceOrder.id	
@type	

Usage samples

Creation of a new CancelServiceOrder with POST operation

Request

```

POST /cancelServiceOrder
Content-Type: application/json

{
  "cancellationReason": "Duplicate service order",
  "requestedCancellationDate": "2020-08-27T09:37:40.508Z",
  "serviceOrder": {
    "id": "45f-98f-ss45",
    "href": "https://host:port/serviceOrdering/v5/serviceOrder/45f-98f-ss45",
    "@referredType": "ServiceOrder",
    "@type": "ServiceOrderRef"
  },
  "@type": "CancelServiceOrder"
}
```

Response

```

201

{
  "id": "789-fsds5-kjp",
  "href": "https://host:port/serviceOrdering/v5/cancelServiceOrder/789-fsds5-kjp",
  "cancellationReason": "Duplicate service order",
  "effectiveCancellationDate": "2020-08-27T09:37:41.331Z",
  "requestedCancellationDate": "2020-08-27T09:37:40.508Z",
  "serviceOrder": {
    "id": "45f-98f-ss45",
  }
}
```

```
    "href": "https://host:port/serviceOrdering/v5/serviceOrder/45f-98f-ss45",
    "@referredType": "ServiceOrder",
    "@type": "ServiceOrderRef"
},
"state": "acknowledged",
"@type": "CancelServiceOrder"
}
```

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": ""
}
```

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
1.0 / 15.5.1	Nov 2015	Pierre Gauthier/TM Forum, Andrew Forth/Amdocs, August-Wilhelm Jagau/Ericsson	
2.0 /16.5.1	Oct 2016	Pierre Gauthier/TM Forum, Ludovic Robert/Orange, Nicoleta Stoica/Vodafone, Jean-Luc Tymen/Orange	
3.0 /18.5	Dec 2018	Pierre Gauthier/TM Forum, Ludovic Robert/Orange, Mariano Belaunde/Orange	Alignment with Guidelines 3.0
4.0.0	March 2020	Pierre Gauthier/TM Forum, Ludovic Robert/Orange	
4.1.0	Aug 2020	Kamal Maghsoudlou/Ericsson	Added support for order milestone, jeopardy alert, error messages
5.0	Jan 2022	Kamal Maghsoudlou/Ericsson	Migrated to OASv3
5.1.0	July 2023	Tamal Kanti Panja	Fix Issues Related to TMF v5 & CaaS
5.1.0	July 2023	Tamal Kanti Panja	Fix Issues Related to TMF v5 & CaaS
5.1.0	Oct 2023	Amita Giriya	Updates Related to v5 version upgrade

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