

## **Data exchange for sales**

*This IRS is to be published only in English*

**International Railway Solution to be classified in volumes of UIC 9**

- Information, Technology, Miscellaneous

**Application:**

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### **The International Railway Solution**

The International Railway Solutions (IRS) are structured in a General Part and in some eventual Application Parts.

The General Part is valid worldwide, while the Application Parts are valid for a specific railway application, based on a geographical or on a service implementation.

The eventual Application Parts may thus be added according to the current needs of the Railway Community.

Structure of the International Railway Solution:

#### **IRS 90918-10: Data exchange for sales and fares**

<h2>General Part</h2>
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# Foreword

## Current Situation

This specification addresses the following difficulties in the fare data exchange and sales with the current data exchange formats specified in UIC leaflet 108.1 and 2.

- Missing access to yield managed fares
- Current data exchange is partially non-structured (word, excel, text, ...)
- Fare data are not in line with time table data (different station codes)
- Missing solution in case of two carriers on the same line
- Data exchange once a year only
- Mapping of fares to travelers is difficult

## Objectives

The main objectives guiding this specification were:

- Create a new tariff model to enable the NRT-carriers/operators to offer customer-friendly and competitive prices for international travel, preferably based on timetables.
- Enable the allocating carrier/operator to offer through-tickets based on different conditions-ranges (e.g. fullflex, semiflex, non-flex, others).
- The portfolio to be offered to the customer shall be set at the decision of the issuing undertaking.
- Focus on easy possibly online-solutions to be implemented within the next two years taking into account upcoming requirements, i.e. new RICS-codes etc.

- The reservation should be fully integrated in the new technology
- Provide a service specification for the online services that integrates FSM so it can be used by allocators and ticket vendors

## Summary

The specification covers the data exchange and sales services for rail products either to provide fare details to combine fares into offers and to provide entire offers for tickets as well.

It defines the data structures to define the fares in detail and the combination rules for fares.

The specification covers static fares that can be exchanged as bulk data as well as dynamic fares and offers that need to be requested and booked online.

Reservation of places is included to have a harmonized solution for the complete sales service.

A migration is supported by additional data items to cover conversion into the existing data formats 108.1 and to support existing reservation service IRS 90918-1 and accounting data formats IRS 30301.

## Normative References

### **UIC Leaflets**

#### **International Union of Railway (UIC)**

*UIC Leaflet 912: Principles governing standard messages for data exchange at international level*

*UIC Leaflet 920-1: Standard numerical coding for railway undertakings, infrastructure managers and other companies involved in rail-transport chains*

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*UIC Leaflet 920-2: Standard numerical coding of locations*

*UIC Leaflet 920-14: Standard numerical country coding for use in railway traffic*

### International Rail Standards

#### International Union of Railway (UIC)

*IRS 30301: Accountancy regulations for international "Passenger" traffic*

*IRS 90918-0: Electronic seat/berth reservation and electronic production of travel documents*

*IRS 90918-1: Electronic reservation of seats/berths and electronic production of travel documents - Exchange of messages*

*IRS 90918-4: e-Ticket Exchange for Control*

*IRS 90918-9: Digital Security Elements for Rail Passenger Ticketing*

#### CIT Manual for International Rail Tickets (MIRT)

#### CIT Guidelines on Protection of Privacy and Processing of Personal Data used in International Passenger Traffic by Rail (GDP CIT)

#### International Union of Railway (UIC)/PSS

*Implementation guide reservation systems*

### International Standards

#### International Organization for Standardization (ISO)

*ISO 3166:2006: Codes for the representation of names of countries and their subdivisions, 2006*

*ISO 4217:2001: Codes for the representation of currencies and funds, 08-2001*

#### European Union Agency for Railways (ERA)

*ERA TAP TSI Technical Document B.6: Electronic seat/berth reservation and electronic production of transport documents - Transport documents (RCT2 Standard)*

*ERA TAP TSI Technical Document B.7: International Rail Ticket for Home Printing*

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*ERA TAP TSI Technical Document B.8: Standard numerical coding for railway undertakings, infrastructure managers and other companies involved in rail-transport chains*

*ERA TAP TSI Technical Document B.9: Standard numerical coding of locations*

### **European Union (EU)**

*Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)*

### **International Civil Aviation Organization (ICAO)**

*Doc 9303 Machine Readable Travel Documents - Part 3: Specifications Common to all*

*MRTDs, 7th edition, 2015*

## Terms and Definitions

<b>New</b>	<p>already existing but seen, experienced, or acquired recently or now for the first time.</p> <p>(Oxford dictionary)</p>
<b>Tariff</b>	<p>a schedule of <a href="#">prices</a> for the sale or rental of a product or service.</p> <p>(Wikipedia)</p> <p>In UIC context the term “tariff” is used for fare structure.</p>
<b>Model</b>	<p>a representation of a system using general rules and concepts</p> <p>(Wikipedia)</p>
<b>Fare structure</b>	<p>A <b>fare</b> is the <a href="#">fee</a> paid by a <a href="#">passenger</a> for use of a <a href="#">public transport</a> system: <a href="#">rail</a>, <a href="#">bus</a>, <a href="#">taxi</a>, etc. In the case of <a href="#">air</a> transport, the term <i>airfare</i> is often used.</p> <p>Fare structure is the system set up to determine how much is to be paid by various passengers using a <a href="#">transit vehicle</a> at any given time.</p> <p>(Wikipedia)</p>
<b>e-Ticket</b>	<p>The electronic representation of the travel contract on a data base.</p> <p>The home print ticket (A4RT or FST) where the contract of travel is represented in a printed or displayed bar code is not an e-ticket according to this definition.</p> <p>Synonym: dematerialized ticket</p>
<b>Integrated Reservation Ticket (IRT)</b>	<p>Ticket for a specific train on a travel day usually including the seats.</p> <p>All tickets for a train are managed in one central system of the <b>allocator</b>.</p> <p>The ticket is valid on that train on a certain day only.</p>

<b>Non-integrated Reservation Ticket (NRT)</b>	<p>A ticket not including an integrated reservation.</p> <p>Multiple <b>allocators</b> can create tickets for the same route independently.</p> <p>The <b>allocator</b> of the ticket is usually the same company that issues the ticket.</p> <p>The ticket might be applicable to a route with many trains or a zone or a list of trains or combinations of these. The validity might be more than one day.</p> <p>Some conditions allow a partial refund on unused parts of the ticket route. Refund can be done via the ticket vendor. These conditions depend on the carriers and the allocator (i.e. providing the option of reducing the number of passengers or to interrupt the journey).</p> <p>NRTs not linked to a train might be reused in case the use is not tracked.</p>
<b>Ticket</b>	<p>Medium to carry the travel contract or a reference to the travel contract. The ticket might provide proof of the travel contract via its security features.</p> <p>The tickets are sold by <b>ticket vendors</b><sup>1</sup>.</p> <p>The assembling of the ticket is done by the <b>allocator(s)</b><sup>1</sup>. The allocator holds the master ticket data/contract of the sold ticket.</p> <p>A ticket can include multiple <b>carriers</b> in the travel contract.</p> <p>The control of one ticket is done by one or many <b>Ticket Controlling Organizations (TCO)</b><sup>1</sup>. Other means of ticket checking (e.g. gates) will also be named TCOs.</p>
<b>Conditions</b>	<p>Conditions that limit the use of a travel contract or the changes of a travel contract.</p>
<b>Fare</b>	<p>Proposal to purchase a transport service for specific passenger subject to specific conditions for a specific price.</p> <p>Handling fees by the allocator or ticket vendor are not included.</p>
<b>Sales fees</b>	<p>Sales fees are fees added by the allocator or a ticket vendor to the price provided by the carrier. Sales fees are not part of the carrier offers defined in the scope of this document.</p>
<b>Station fee</b>	<p>A station fee is a fee for the use of a station by a traveller. It might be included in the carrier offer.</p>

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<sup>1</sup> See chapter **Actors**

<b>Station</b>	A station is a location where trains or busses regularly stop to load or unload travellers
<b>Individual ticketing</b>	A separate ticket is created per traveller.
<b>Individual contracts</b>	A separate ticket is created per traveller and these tickets can be treated as individual contracts of carriage. After sales transactions can be applied independently per traveller and ticket.

## Acronyms

<b>EWT</b>	<p>East West tariff</p> <p>Tariff used for Non-Integrated-Reservation-Tickets. The fare data model follows UIC IRS 10108.1.</p>
<b>FCB</b>	<p>Flexible Content Bar Code</p> <p>Barcode specification that contains ticket data for control as structured data and is therefore machine interpretable. The Specification provides a data model of a ticket for control. FCB covers various ticket type (IRT, NRT, RPT,...).</p> <p>(UIC 90918-9)</p>
<b>JWT</b>	<p>JSON Web Token</p> <p>Specification to transport authentication information used by the OAUTH2 authorization protocol.</p> <p><a href="#">JSON Web Token</a> - RFC 7519</p>
<b>NRT</b>	<p>Non-Integrated Reservation Tariff</p> <p>Tariff used for Non-Integrated-Reservation-Tickets. The fare data model follows UIC IRS 10108.1.</p>
<b>NRT</b>	<p>Non-Integrated Reservation Ticket</p> <p>Ticket not including an integrated reservation.</p>
<b>SiP</b>	<p>Security in Paper</p> <p>A ticket (representing the contract of carriage) is unique and printed on secured paper to avoid modification or creation by other than a railway company. The security is provided by the quality of the security elements included in the paper and the quality of the stock control process that controls the access to blank secure paper.</p> <p>(UIC IRS 90918-0)</p>



<b>SiD</b>	<p>Security in Data</p> <p>A ticket contains security elements. These are created/calculated based on the content of the ticket, resulting in a non-compliant security element in case of falsification or modification. SiD tickets are usually easy to regenerate or to copy. As SiD does not provide copy protection additional measures must be taken to avoid double use. The tickets are personalized, and the validity of the ticket is limited.</p> <p>(UIC IRS 90918-0)</p>
<b>Sis</b>	<p>Security in System</p> <p>The contract is on a server. Every operation (creation, check, modification, ...) on the ticket is conducted on the record(s) on the server or a synchronized replica. The access to the contract requires an authentication of the traveller. The ticket control id (key to the ticket) or personal data of the traveller (name, date of birth,) are used to retrieve the ticket.</p> <p>(UIC IRS 90918-0)</p>
<b>SiV</b>	<p>Security by Visual elements.</p> <p>The ticket is controlled by a visual element printed with the ticket data on blank paper or displayed on a device. To use an image as a security feature the costs to create the complex image must be higher than the price of the ticket.</p> <p>(UIC IRS 90918-0)</p>
<b>TCO</b>	Ticket Controlling Organization
<b>TLT</b>	<p>Train linked ticket</p> <p>Ticket not including a reservation but restricted to a train run (or multiple train runs along the route)</p>
<b>TLB</b>	<p>Ticket Layout Barcode</p> <p>Barcode specification describing the “printed” layout of a ticket. It is not machine interpretable and does not provide ticket data, only a ticket display.</p>
<b>UML</b>	<p>Unified Modelling Language</p> <p>A specification defining a graphical language for visualizing, specifying, constructing, and documenting the artifacts of distributed object systems.</p> <p>OMG Unifier Modelling Language Superstructure v 2.1.2</p>

## IRS 90918-10

UUID	Universally Unique Identifier  Standard to create a unique id. The specification is published as ISO/IEC 9834-8:2005.
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## Requirements

### Functional Requirements

The requirements covered by this specification are listed here with references to the implementation. Changes in the requirements during the lifecycle of this specification might lead to changes in the corresponding implementations.

#### Requirements on regional validity

Users of the data:

- The allocator to link a journey from the time table to the valid offers based on the fare data (automated)
- The traveler in a readable form to know which transport connections he can use (manual)
- A controller to validate the ticket on a train or station or station (manual and/or automated (e.g. gates))

Non-functional:

- The fares depend on the time table. The station data are not part of the fare structure. Stations will always be referenced by the station code used in the time table. Station codes used are those in the time table according to EU TAP-TSI B.1.

Functional concepts:

#### Station

A station which could be used in time table data to embark and/or disembark travelers.

#### Fare reference station set (virtual pricing point)

A fare reference station is a list of stations where the fare is valid with a common name.

**Implementation:** → [FareReferenceStationSetDefinition](#)

#### Routes

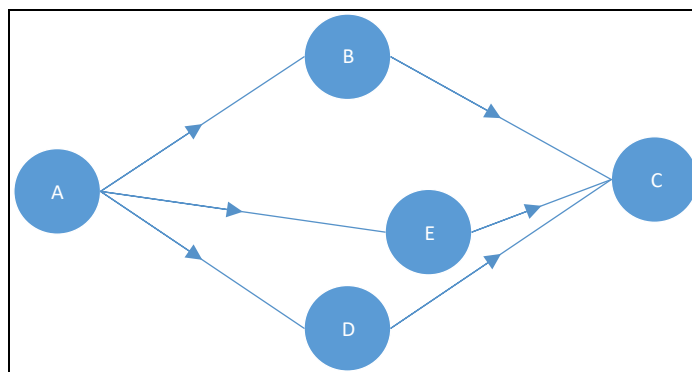
## IRS 90918-10

Routes are defined as an ordered list of stations or “fare reference stations” along a possible travel route. In the human readable form, the stations are separated by “\*”.

A route can split into optional routes indicated in the human readable route by “/”.

The end of a route of one carrier when combined to another route of another carrier is indicated with an additional “(FR)” in the human readable form if it is not at a “real” station.

Are routes used as line routes or as bubble routes?



A\*B/D\*C as line routes: A-E-C is not allowed

A\*B/D\*C as bubble route: A-E-C is allowed

➔ Decision: only the line routes will be supported, “bubbles” must be defined as areas

More than two alternative routes must be possible in the route description.

### Areas

Areas for the regional validity are needed. The areas defined in IRS 90918-4 (control) and IRS 90918-9 (bard codes) will be available for the fares as well:

- Zones
- Countries
- geographical polygons

What would be the route for dynamic fares?

- train bound ticket only
  - No route

- List of: train number, travel date and time, service brand (optional), from/to station
- Route based only
  - Route same as for non-yielded NRT
  - Optionally depending on service brand(s)
- Train bound (long distance) + route (regional)
  - Yield management can be on both parts combined, so the complete part must be requested online
- Train bound (carrier 1) + Train bound (carrier 2)
  - Train bound offer until the border point on both sides
  - Train bound can be combined into one
- Train bound (carrier 1) + route (carrier 2)
  - Train bound offer until the border point
  - Route description from the border point onwards

### Connecting routes:

Regions (routes) of different carriers can be connected at defined connection points. The old concept of a central predefined list of border points (as part of TAP-TSI) is replaced by the concept of “connection points” which can be defined by each carrier independently using the station codes.

Connection points will include a border point code to support existing implementations where the border point code is compared with the time table data. As in principle every station can become a connection point (e.g. all stops from Aachen to Brussels are connection points from DB to SNCB) implementations based on border point codes cannot cover all connections.

As on both sides of a connection multiple small stations could be connected and not all of them might be in the time table of a train the connections point should allow to connect sets of stations.

**Implementation:** → [ConnectionPoint](#)

## **Requirements on allowed service**

### Allowed services

Open tickets - not linked to a train - might be valid for some carriers or services on the route only.

As the offers should be created based on the time table the allowed services in an offer should be defined based on the service brand code in the time table data.

# IRS 90918-10

Carriers and service brands can be included or excluded.

Implementation: → [CarrierConstraint](#)

Implementation: → [ServiceConstraint](#)

## Class of Service

List of classes allowed in the ticket.

There needs to be a marketing name for the class.

Implementation: → [ServiceConstraint](#), [ServiceClass](#)

IRT fares don't use classes but service levels (defined in IRS 90918-1) to cover the more detailed products available via reservation.

In case NRT and Reservation needs to be combined, rules are needed which service levels of the reservation are allowed in combination with a fare.

Implementation: → [SalesAvailability](#)

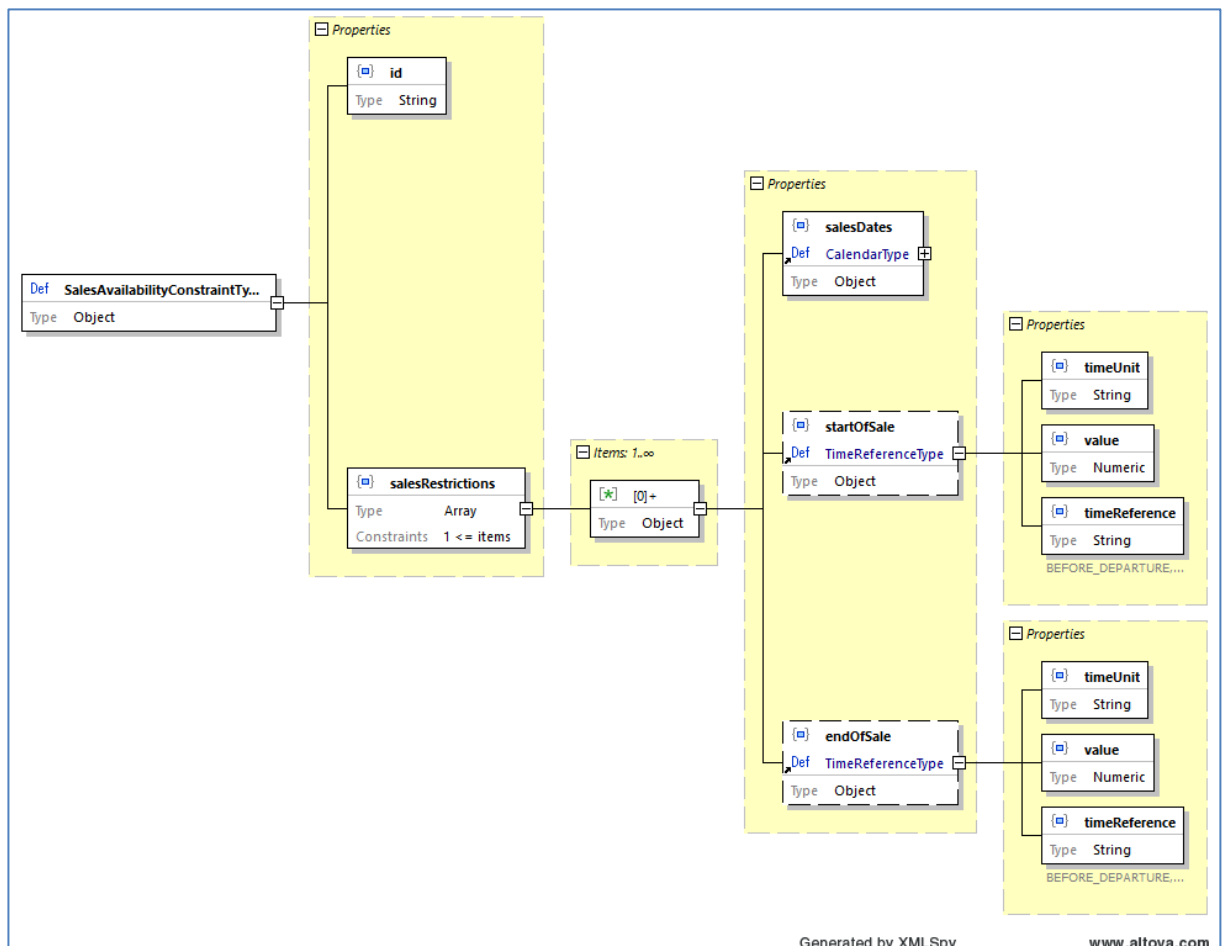


Figure 39 SalesAvailability data structure

Data constraints	
startOfSale, endOfSale	startOfSale < endOfSale

ServiceClass

## Ancillary Service

Ancillary services will be treated as “passengers”

- Bicycle
- Dog (might depend on the class of the ticket)
- Luggage (might depend on the class of the ticket)
- Oversize Luggage (might depend on the class of the ticket)

Class is optional for ancillary services

## **Requirements on availability for purchase**

An offer is available a specific time range before the start of travel at the first departure station in the time zone of the departure station.

An offer might become unavailable a specific time range before the start of travel at the first departure station in the time zone of the departure station.

An offer might be available from a specific time onwards or in a time range or time ranges (either in UTC or alternatively in the time zone of the ticket vendor).

Example: Offer A is available from 3 months before departure until 2 days before departure and can be purchased in June and July on Thursdays only.

Real examples

- Available for purchase 180 to 3 days before departure day
- Available for purchase 01 JUN – 30 JUN for travels 01 JUL – 31 AUG for 30 consecutive days of validity
  - purchase 01 JUN – 30 JUN
  - travels in 01 JUL – 31 AUG → validity for usage
  - 30 days of validity → validity for usage
- Available for purchase 180 to 0 days before departure day, valid for 2 consecutive days

The following rules can be defined (and combined):

- Sales start hours or days prior to the departure in the time zone of the departure station
- Sales ends minutes, hours or days prior to the departure in the time zone of the departure station
- Sales start hours or days prior to the start of validity in the time zone of the departure station



## IRS 90918-10

- Sales ends minutes, hours or days prior to the start of validity in the time zone of the departure station
- Sales ends minutes, hours after the start of validity in the time zone of the departure station
  - A specific range of days in UTC
- A specific range of days in the time zone of the sales location

### Implementation: SalesAvailability

## Requirements on validity for usage

The validity of usage defines the time when the traveler is allowed to use a fare. To define this time there is a need for:

- Simple duration (number of days starting from the first day of validity 00:00 in the time zone of the departure station until the number of days and hours later at a specified time in the time zone of the arrival station:

Example:

Start of Validity: 1.1.2020 00:00 CET

Validity data: 4 days 5 hours

End of Validity: 5.1.2020 05:00 GMT

Printed text on the ticket: 1.1.2020 – 4.1.2020

- Duration as number of days and hours + number of days of the journey according to the time table
- Exclusions (e.g. not valid during peak hours 8:00 – 10:00)
  - Peak hours in case the journey starts in the peak hours (e.g. at NS)
  - Peak hours in general
- Restrictions to specific days
  - Mondays
  - Tuesdays
  - ...
  - Sundays
  - Specific dates or date ranges
- Restriction on return tickets
  - return ticket of the same carrier must be sold
  - the number of nights in between the inbound and outbound part of a return ticket
  - a specific weekday in between the inbound and outbound part of a return ticket is not allowed

- **Decision: no return tickets on one “paper” but return fares should be possible**
- Validity for passes
  - Indication that the ticket is a pass
  - Start and end of validity in UTC
  - Number of allowed trips or days
- Examples:
  - Valid Monday – Friday when work day from 09:00 until 03:00 the following day
    - → Mo – Fr without holidays
  - Valid Saturday – Sunday and public holidays from 00:00 until 03:00 the following day

**Implementation: [TravelValidityConstraint](#)**

### Requirements on validity for transportables (passengers / ancillary services)

Transportables can be different types of travelers, animals or other items carried by a traveler.

- A passenger might have an upper and / or lower age limit.
- A passenger might have an additional age limit for travelling alone.
- There might be a limit on the number of accompanying passengers of one type a passenger of another type can accompany. (e.g. not more than 8 children with one adult)
- A passenger might have an additional age limit for being entitled for reservation.
- A number of travelers might be entitled to carry a number of passengers of another type for free (1 Adult + 1 accompanying person for PRM).

**Implementation → [TravelerTypes](#)**

A fare might be available with a specific number of travelers only (group fares):

- Minimum number of travelers (adults + seniors + children + youths + Accompanying Person for PRM)
- Minimum number of adults + seniors + (children + youths) / 2

**Implementation: → [PassengerConstraint](#)**

## Requirements on validity for reductions

Reductions are price reduction due to a reduction "card" an existing ticket or a pass which the traveler already holds. It might be that the physical card does not correspond to a specific reduction but provides the option to carry different reductions.

Different prices due to the age of the traveler are separate fares, not reductions to a fare.

- A card might be valid only for combined tickets only (special NS card)
- Multiple cards might apply to the same route segment, but only one of them would be applied.
- A reduction might grant a 100% price reduction → In this case an NRT is created up to the final station the customer goes with the price to the border of the area. The ticket indicates that the ticket has a reduction of 100% within the area and an indication that it is valid only together with the card. Pricing data are needed for the free travel area to get the route description.

Implementation: → [ReductionCard](#)

## Requirements on prices

### Price:

Prices might be needed in more than one currency.

- Currency (local currency might be required additionally due to local legislation for two carriers in one country)
- Amount

### Value Added Tax:

VAT details must be given to the customer to enable a business customer to claim a refund. The VAT details include:

- Country
- VAT-Company-Id
- Percentage
- Amount

The VAT given is the VAT the carrier pays for this fare to the countries where he is providing his service.

## IRS 90918-10

- The VAT might depend additionally on whether the fare is issued as national ticket or integrated in an international ticket
- The VAT might depend on whether the fare is used for short distance or integrated in a long-distance ticket

Note: There are national rules on where and when to display the VAT on a ticket or receipt when a ticket is sold in that country. These are not considered here.

### Price calculation:

- Fixed prices attached to a route (and fare) including VAT details (country, percentage, amount, VAT id)
- Prices depending on an intermediate distance ("fare kilometer")? Why is this needed?
- Price calculation depending of other prices. Is this needed or only used to reduce the data volume?

**Decision: The price will be delivered also in case of reductions or kilometers. No calculation is needed at the receiver side of the data.**

Implementation: → Price

## Requirements on the basic fare structure

The basic fare element links the constraints and the price.

A name of the fare needs to be provided.

Implementation: → Fare

## Requirements on the after sales conditions

After sales conditions define fees to be taken in case of an after sales transaction on behalf of a customer. The after sales transactions considered are:

- Cancellation (Refund)
- Exchange with a new fare of the same carrier
- Exchange with a new fare of another carrier
- Exchange for the same travel day
- Upgrade

After sales transactions due to service violations of the carrier are governed by PRR rules and are not considered here.

Some railways make refunds using other “means of payment” like bonus points, vouchers. These are not considered here and thus will not apply to the fares defined here.

Some railways apply different refund rules depending on the type of payment. These restrictions will not be considered here. It is assumed that the refund will be processed by the allocator who manages the combined fare. He needs to consider payment restrictions in order to avoid fraud (e.g. no cash refund on electronically paid tickets, no refund unless ticket control data have been received, ...).

The refund fee can be claimed by the carrier.

Implementation: → AfterSalesRules

## Requirements on conditions on fulfilment

The fulfilment defines the required types of creating a ticket for the traveler and therefore especially the required types of security to be applied.

The fulfilment might be restricted depending on:

- Allowed types of fulfilment
- Accepted / required bar codes
- Required control data exchange
- Individual ticketing

**Implementation:** → **FulfilmentConstraint**

The Required personal data might depend on the fulfilment:

- Required personal data to be provided from the allocator to the carrier depending on type of fulfilment
- Depending on border crossing and train types (Belgium border crossing of high-speed trains requires personal data)
- Data might be required for ticket holder(s) only or for all travelers

**Implementation:** →

**PersonalDataConstraint**

## Requirements on dynamic fares and train linked tickets

### *Indication of dynamic fares available online*

The allocator needs to find where he can request offers online.

- Solution 1: add the carrier(s) providing offers in their systems to the trains in the time table
- Solution 2: publish station or ODs (optionally also by country) and/or train types (service brands) and/or the carrier(s) mentioned in the time table where fares can be requested
- Solution 3: publish for which carriers and service brands (and optionally trains) offers can be requested

**Decision: The solution should be independent from the time table.**

**Implementation:** **FareResourceLocation**

## *Indication of train links on the ticket*

Ticket might be linked to the use of specific trains even in case there is no reservation. There are different options on how to indicate this restriction:

- DB solution: The train information replaces the corresponding route part
- ÖBB solution: The route description is identical to the ticket without train link and the trains are added in the condition description

**Decision: in case of a train bound ticket the route of the train should replace the route description for the part of the train bound**

Train link should include:

- Train number
- Service Brand Abbreviation (RJ, ICE,) (can be retrieved from time table data)
- Date and departure time
- Departure Station (short name)
- Arrival Station (short name)

## *Request for online fares*

- The complete connection must be sent
  - To check whether it is international
  - To check that it is not inside some regional tariff area
  - To calculate the correct VAT
  - To check for supplements applicable only at the start of end of the journey
- The part where the offer should be built must be provided
  - the station/connection point from and to where the offer is needed

### **Implementation: Offer**

## **Requirements on combining fares**

Multiple models are defined for combining fares. The carrier defines in the fare data which model(s) the allocator can apply.

Combining the fares tries to achieve:

- Apply the conditions set by the carrier for the service he provides to secure the business model and financial interests of the carrier
- Create a simple combined fare for the customer

It is not possible to achieve both target at the same time. The different models of combining fares implement different priorities given to these targets.

In general, the basic parameters defining the price must be listed separately on the combined offer:



## IRS 90918-10

- route description / train link
- class of service
- passenger types

The combined price is always the sum of the prices of the parts. The allocator might add a handling fee.

### ***Models of combination:***

#### SEPARATE CONTRACTS:

This is the model for not combining the fares in one ticket and not allowing the integration in one contract. The rules applied for this ticket are exactly the rules defined by the carrier in the fare data.

The allocator must ensure that it is clear for the customer that no common contract was established.

#### SEPARATE TICKETS:

This is the model for not combining the fares in one ticket, so the rules applied for this ticket are exactly the rules defined by the carrier in the fare data. The allocator can form a common contract for the whole journey.

Optionally this might be restricted by a list of carriers where this combination is allowed.

#### CLUSTERING:

The CLUSTERING model tries to simplify conditions and fares for the customer but sacrifices a part of the control of the carrier on his fares.

Similar types of fares are defined to belong to the same “cluster”. The after sales conditions for a cluster are defined by the allocator. However, the after sales conditions must basic rules on after sales for that cluster.

The clusters correspond to the flexibility a traveler receives to change the booked train. This corresponds directly to the after sales conditions. Hereby the fees to be paid for such an exchange are essential for the definition of clusters and not the complexity of the process to change. Thus, a train bound ticket and an open ticket belong to the same cluster in case the fees to change to different trains / times are comparable.

The after sales fees can be demanded by the carrier.

The other conditions might either be listed per carrier or combined by rules.

The customer buying products from one allocator has a simple unique view on after sales conditions.

## IRS 90918-10

Optionally this might be restricted by a list of carriers and/or allocators where this combination is allowed.

### COMBINING:

The COMBINING model tries to be close to the fare conditions defined by the carrier but sacrifices the simplicity of the fare towards the customer.

The after sales conditions of the different fares will be combined into one condition to best reflect the conditions of all included carriers.

The after sales conditions will thus depend on the combinations of carriers.

Optionally this might be restricted by a list of carriers where this combination is allowed.

### ***CLUSTERING model:***

The validity for usage is combined to be:

The minimal validity of all included fares but at least the time needed for the combined journey according to a time table information.

The combined fare is available for sale only in case all parts are available for sale.

The following clusters are defined (with the order from high to low flexibility):

Any of the clusters can contain train linked or non train-linked offers.

Offers of a less restrictive cluster can be included in a more restrictive cluster using the more restrictive rules for the combined offer:

BUSINES → FULL-FLEX → SEMI-FLEX → NON-FLEX

e.g.: BUSINESS + FULL-FLEX → FULL-FLEX

#### BUSINESS

- Refundable after the departure or last day of validity
- Exchangeable after the departure or last day of validity

#### FULL-FLEX

- Refundable before the departure or last day of validity
- Exchangeable before the departure or last day of validity

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## SEMI-FLEX

- Refundable with fee depending on conditions of the allocator
- Exchangeable with fee depending on conditions of the allocator
- Minimum validity applies

## NON-FLEX

- Non refundable
- Non exchangeable
- Minimum validity applies

## PROMO

- Non refundable
- Non exchangeable
- Minimum validity applies
- Restricted combination with another cluster offers

### ***COMBINATION model:***

The combination model tries to apply all rules of the involved carriers but sacrifices simplicity of rules.

The validity is combined to be:

The minimal validity of all included fares but at least the time needed for the combined journey according to a time table information.

The combined fare is available for sale only in case all parts are available for sale.

The after sales fees are combined according:

At any time, the fees defined by the carriers are applied on the price part of these carriers only. The result is a list of times with increasing fees.

Carrier 1:        10%    20 days before departure    price: 100€

Carrier 2:        90%    2 days before departure    price: 200 €

Result:            10€ fee            20 days before departure

                      190€ fee            2 days before departure

### **Implementation: FareCombinationConstraint**

# IRS 90918-10

## Requirements on reservation

It should be possible to book reservations within the same technology.

The existing reservation services in IRS 90918-1 should also be supported.

## Requirements not in the scope

- Payment procedures including payment procedures via private currencies alike bonus points

Information whether such payments are allowed can be included in the fare data, but the required service to handle such payments are not specified here.

- Validation of customer cards

## Legal Requirements

The following legal regulations provide requirements that affect the solution:

### Regulations

- **Rail PRR:** Regulation (EC) 1371/2007 on Rail Passengers' Rights and Obligations
- **GDPR:** Regulation (EU) 2016/679 on data protection
  - The traveller must be informed on the use of his data and on passing his data to the carrier and TCO
  - The traveller must be informed which data are stored including data passed to the carrier and TCO
  - The traveller has the right to ask to delete the data in case the data are not required to fulfil the contract of carriage
  - The traveller has the right to ask for data correction in case the data are wrong
  - Legal basis for processing of personal data with a view of black-listing

Although the exchange of blacklists is not in the scope of the specification the data exchanged can be used by the allocator for a local blacklist. He has therefore to obey the regulations when using the data.

Two processing actions (automated profiling) are concerned:

- (i) Collection and analysis of personal data on regular basis for trigger points: consent of passengers or legitimate interests of the rail carrier is needed
  - (ii) Storage of information in the blacklists: legitimate interest of the rail carrier is needed
- General black list for use by multiple companies is allowed
  - (i) No access to the full list is provided
  - (ii) No automatic checking in all cases
- Pre-cautions to be pursued by the railway undertaking
  - (i) Ensure right of access and objection
  - (ii) Information preceding such processing and notification of inclusion into the blacklist
  - (iii) Safeguards to prevent confusion
  - (iv) Additional organizational and technical safeguards for processing
- **art. 101§1 TFEU (competition law)**
  - **all agreements between undertakings, decisions by associations of undertakings and concerted practices which are restrictive of competition are prohibited and void**
  - Sensitive activities
    - Information sharing
    - Joint purchasing/selling
    - **Technical standards**
    - Standard terms and conditions
  - Guideline:
    - Technical specifications for data formats should be ok
    - Technical specifications for data exchange scenarios should be ok, but excessive error handling scenarios should be optional and agreed bilaterally as unnecessarily high requirements would be a restriction for small companies

- Service Level Requirements should be in bilateral agreements, not in the specification as unnecessarily high requirements would be a restriction for small companies
- Data content should be defined bilaterally for all content that is not necessarily required as unnecessarily high requirements would be a restriction for small companies
- Information exchange is allowed between the carriers within one contract of carriage as they are all involved in the contract. This does not apply in case of separate contracts.

## Actors / Business capabilities

Actors are defined according to the UML specification:

An Actor models a type of role played by an entity that interacts with the subject (e.g., by exchanging signals and data), but which is external to the subject.

Actors may represent roles played by human users, external hardware, or other subjects.

**Note that an actor does not necessarily represent a specific physical entity but merely a facet (i.e., “role”) of some entity** that is relevant to the specification of its associated use cases. Thus, a single physical instance may play the role of several different actors and, conversely, a given actor may be played by multiple different instances.

Source: OMG Unified Modelling Language Superstructure v 2.1.2

The following diagram shows the actors and principal use cases involved in rail distribution and control. The principal use case relevant for this specification is marked in yellow.

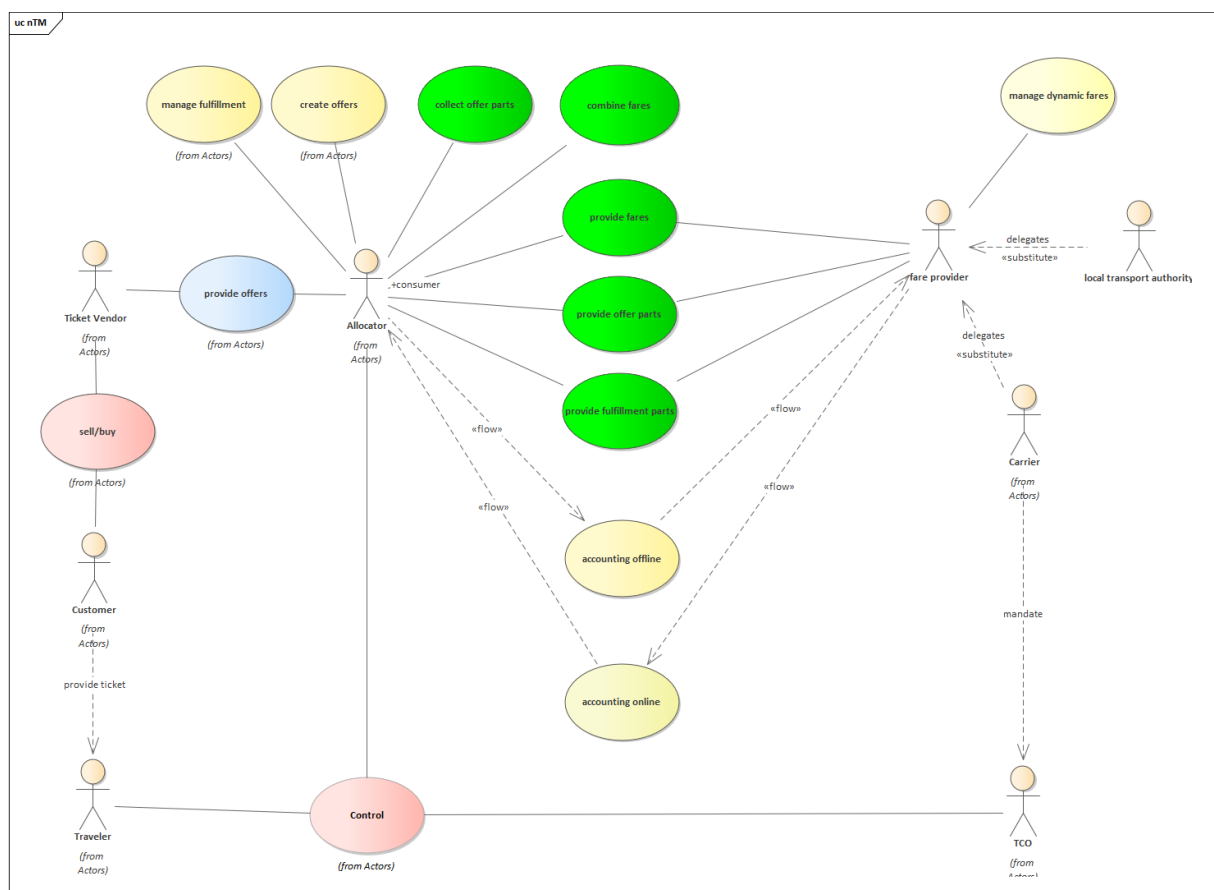


Figure 1 Actor model

The fare data exchanged might already be the result of an allocation process between different local carriers and local transport administrations.

## Actors description

Ticket Vendor	
Definition	<p>The <b>ticket vendor</b> is the company selling the ticket provided and managed by the <b>allocator</b> to the customer.</p> <p><b>The ticket vendor does not combine fare into one ticket.</b></p>
Motivation / Distinction to other roles	Alias: Ticket vendor

Allocator	
Definition	<p>The <b>allocator</b> manages the lifecycle of a product sold (the travel contract). He therefore needs to establish information exchange with the <b>ticket vendor</b>, <b>carriers</b> and <b>TCOs</b> involved.</p> <p>The <b>allocator</b> makes products available to the <b>ticket vendor</b>.</p> <p>The allocator could provide direct services to the <b>passenger</b> to modify the ticket status (e.g. activate / check in on a ticket).</p> <p>The allocator combines fares defined by the carriers according to their rules.</p> <p>Note: To avoid confusion due to usage differences (see the CIT term bank as well as the European TAP-TSI regulation), the terms “Issuer” and “Attributor” have been avoided in this IRS.</p> <p>The allocator creates the ticket fulfilment data (e.g. pdf, pkpass, ...).</p>
Motivation / Distinction to other roles	The allocator is introduced to separate the role of just selling tickets along a route (Ticket Vendor) from the role of creating the ticket content and providing it to vendors for sale.



FareProvider	
Definition	The fare provider manages fares on behalf of a carrier or a local transport authority.
Motivation / Distinction to other roles	

Carrier	
Definition	<p>The <b>carrier</b> is the owner of the fare- He provides the transport of the <b>traveller himself or via a substitute carrier</b>.</p> <p>The travel contract provided to the customer establishes a contract between the traveller and each carrier participating in the product.</p> <p>Carriers include Railway undertaking, Bus companies, Maritime companies.</p>
Motivation / Distinction to other roles	

Customer	
Definition	<p>Purchaser of a travel contract for one or more traveller.</p> <p><b>Note:</b> The <b>customer</b> is entitled to receive refund payments.</p>
Motivation / Distinction to other roles	The <b>customer</b> buys the ticket which represents the travel contract between one or more <b>travellers</b> and one or more <b>carriers</b> .

<b>Traveller</b>	
<b>Definition</b>	Person who travels using a travel contract.
<b>Motivation / Distinction to other roles</b>	s. Customer

<b>Local Transport Authority</b>	
<b>Definition</b>	<p>The local transport authority organizes the local traffic within an area a behalf of the government or is itself a governmental organisation.</p> <p>It defines a fare structure for the local transport which all carriers included must apply.</p>

## Business Capabilities / Use Cases

### Combine fares

The allocator combines fares from different carriers into one offer. The rules on how to combine fares are part of the fare data.

### Collect offer parts

Offer parts are collected by an allocator for the complete offer for the ticket vendor. Offer parts can only be collected, they cannot be modified.

### Service resource location / locate dynamic fares

Dynamic fares must be requested online. The allocator needs to find the online resource where to request the offer and book. The fare data provide information on how to find the online service.

### Provide bulk fare data

The carrier provides bulk data on his static fares and additional data for locating online services to the allocators.

### Provide dynamic fare

The carrier provides an online service to retrieve dynamic fares.

### Book offer

The carrier provides online services to book fares and cancel or exchange fares. These can be either as defined in the specification herein or via the interface defined in IRS 90918-1.

### Reservation

Reservation has been included in the online services and the supporting data for reservation are included in the bulk data.

Option/Step 1: using 90918-1 messages for reservation

1. offer (90918-10 REST service) → parameters for 90918-1 soap services are delivered
2. reservation as-if (90918-1 soap service) / graphical place display (90918-1 soap service)
3. reservation (90918-1 soap service) / specific place reservation (90918-1 soap service)
4. prebooking NRT (90918-10 REST service)
5. confirm booking NRT (90918-10 REST service)

## IRS 90918-10

+ reusing existing interfaces (less costs)

- complex implementation using different technologies

Option/Step 2: using REST services 90918-10 for all services

1. offer (90918-10 REST service)
2. checkPreferences (90918-10 REST service) / graphical place display (90918-10 REST service)
3. prebooking NRT / reservation (90918-10 REST service)
4. confirmbooking reservation / NRT (90918-10 REST service)

+ same technology for all services (less costs in case the entire interface is rebuild)

- more interfaces to be implemented

## Accounting

The specification of the accounting data is not part of this document, however some on the fare content defined in this specification must be included in the accounting data.

The accounting data of a booking should include:

- The identification of the entire ticket sold (unique id within the context of the allocator for at least 2 years)
- The booking id provided by the carriers in case of online fares (unique id within the context of the carrier for at least 2 years)
- The identification of each fare included in the ticket (unique id e.g. UUID)
- The identification of individual tickets of the allocator (unique id within the context of the allocator for at least 2 years)
- The identification of individual tickets of the carriers (unique id within the context of the carrier for at least 2 years)
- The price for each fare and carrier included in the ticket
- The VAT does not need to be included in the accounting data (to be verified in RCF-1)

When using the existing 301 data file structure the ids cannot be included. Until the accounting data structures have not been extended the following intermediate solution is included:

For NRT fares distributed in the bulk data exchange:

A legacy accounting identifier is included in the fare element:

- **seriesId**: the last five digits of the index of a regionalValidity within the list of regional validities

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- addId: the remaining digits of the index of a regionalValidity within the list of regional validities (max. 2 digits)
- tariffId: the index of the fare Element in a list of all fare elements referencing the same regionalValidity

Thereby it is possible to identify the fare element uniquely in the context of a fare data delivery.

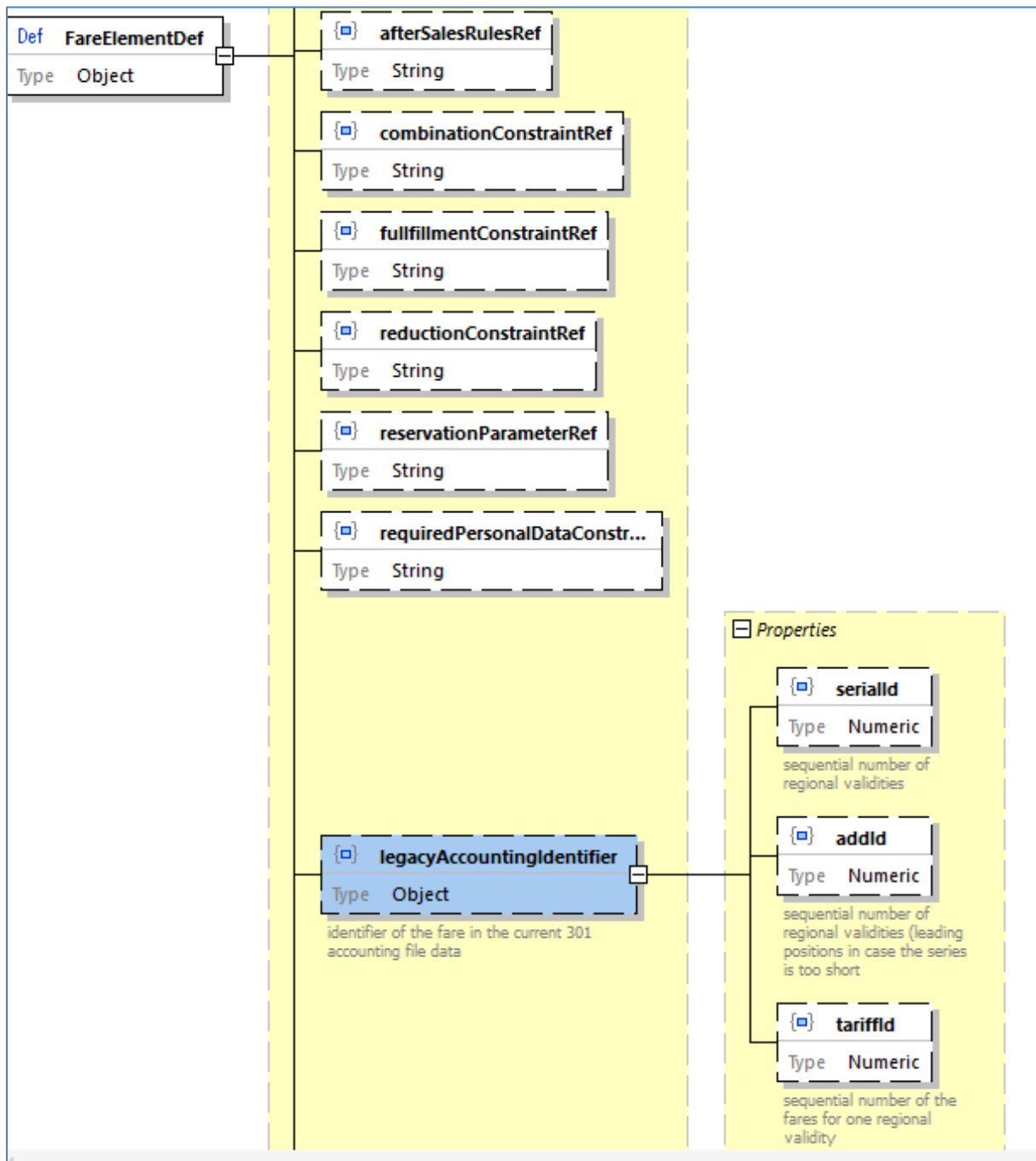


Figure 2 legacy accounting id in the fare element

## IRS 90918-10

Accounting data flow:

- In case of NRT fares used from a bulk data exchange:

The allocator is responsible for the accounting. The data structure for NRT is used.

- In case of fares (IRT or NRT) used with an online booking service:

The carrier is responsible for the accounting. The data structure for IRT is used.

- In case of fares (IRT or NRT) used with an online booking service but with carrier fees defined by the allocator:

The carrier is responsible for the accounting. The data structure for IRT is used. The allocator will inform the carrier on the applied fees in the cancellation confirmation.

# Technical Design

## Data structures

The following chapters contain the detailed description of data structures used to describe fares.

The data structure definitions are used in the bulk data exchange and the online services. The requirements listed in chapter “Requirements” reference the data structures that implement the requirement.

## General

DateTime Formats:

Date time values must be encoded according to [RFC 3339, section 5.6](#).

Station Codes:

Station codes must be taken from the MERITS code list.

Station Names:

Station names should not include “/”, “\*”. These characters are used to define routes and alternative routes in route descriptions.

## AfterSalesRules

After sales conditions define fees to be taken in case of an after sales transaction on behalf of a customer. The after sales transactions considered are:

- Cancellation (= Refund)
- Exchange with a new fare of the same carrier
- Exchange with a new fare of another carrier
- Upgrade

**See code list: Reason for after sale**

The after sales rules might include rules for a delayed payment to avoid fraud. This might depend in the type of fulfilment. (e.g. no cash refund on electronically payed tickets, no refund unless ticket control data have been received, ...).

The refund fee can be claimed by the carrier.

The after sales rules bundle a set of after sales conditions under an id that can be referenced by a fare.

An after sales condition applies for a set of after sales transactions and specified:

- the fee to be applied
- the time when the fee needs to be applied
- whether the fee needs to be given to the carrier or can be kept by the allocator

The data include the amount to be refunded. The amount is given to avoid any calculations with complex rules (percentage + minimum / maximum value) at the allocator side.:

- The value and currency to be applied
- A percentage for customer information. Due to rounding errors a calculated percentage could result in strange numbers (e.g. 9.99% instead of 10%)
- The unit on which the value is calculated (travellers or bookings)

The time when the fee needs to be applied is defined by:

- The time unit (hours, minutes, ...)
- The time difference value
- The time reference (before departure...)

**See code lists: TimeReference , TimeUnit**



An after sales fee is applied from a time before departure, after sale,..)

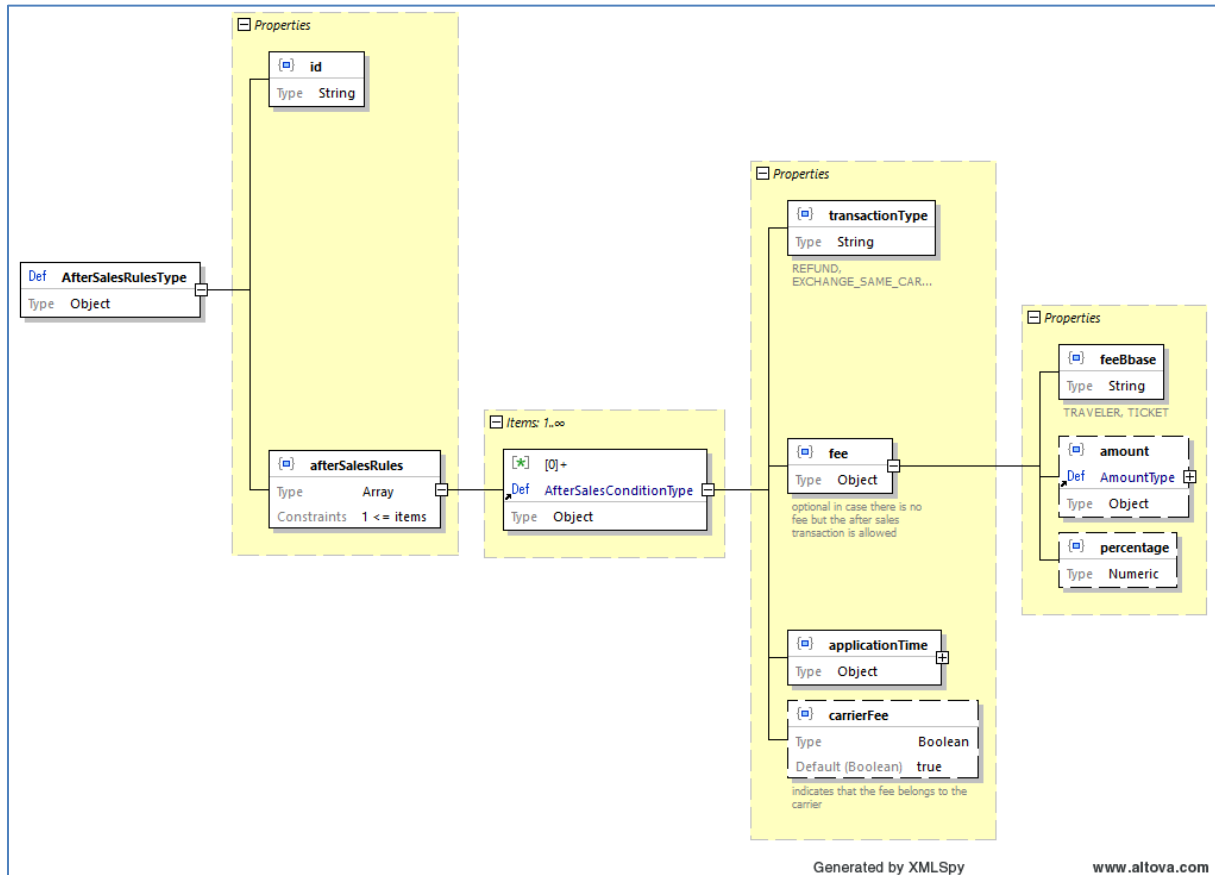


Figure 3 after sales rules data structure

In case multiple rules apply to the same after sales transaction the rule with the closest time in the future must be applied.

Data constraints	
fee/feeRef	<p>In online services a fee is included directly, in bulk data exchange a fee must be included in the list of prices and referenced by an id.</p> <p>The fee provided must include the currency EUR if not agreed bilaterally otherwise.</p>
applicationTime/applicationTimeStamp	<p>An application time stamp can be used in online services only.</p>

	If an application time stamp is provided the allocation Time as relative time must not be included.
--	---

## Calendar

A calendar is referenced by a unique id which can be referenced from other data structures linked to the fare.

A Calendar defines a list of days between two dates. If the dates are not provided in UTC the offset to UTC must be provided additionally.

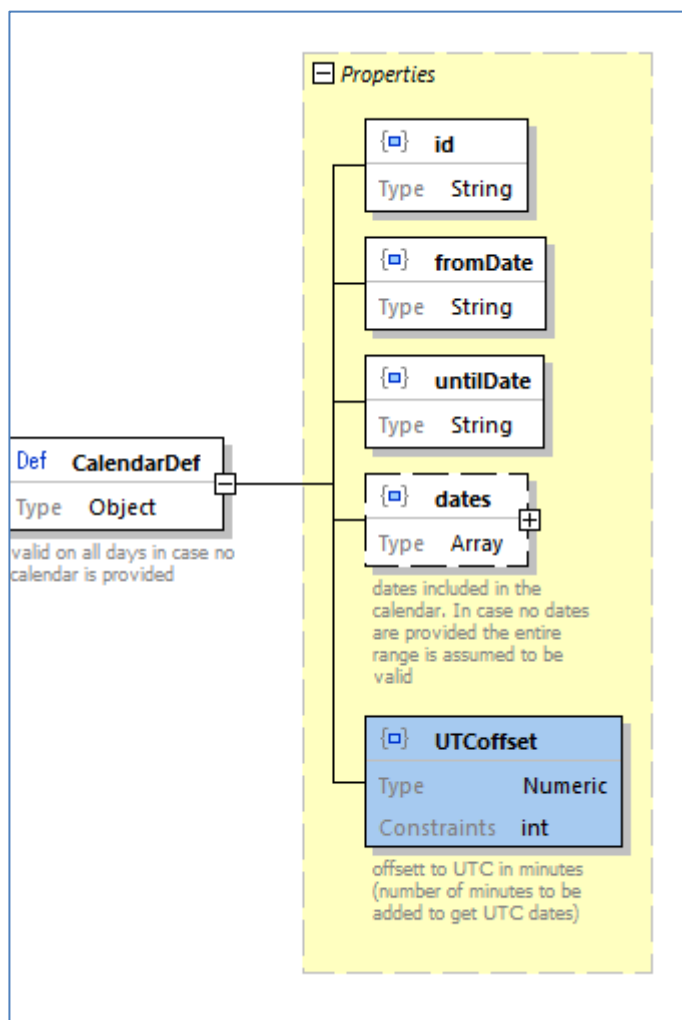


Figure 4 Calendar data structure

Data constraints	
fromDate/untilDate	fromDate and untilDate must be provided.  fromDate <= untilDate
dates	fromDate <= date <= untilDate

## CarrierConstraint

The carrier constraint can be referenced by a fare via the id.

Carrier constraint limits an open fare - not linked to a train - to some carriers. The carriers can be specified either as exclusion list or alternatively as inclusion list.

Carriers are specified by their Company code (RICS code).

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The included / excluded carriers are also part of the FCB barcode (IRS 90918-4) content and the ticket control data (IRS 90918-9).

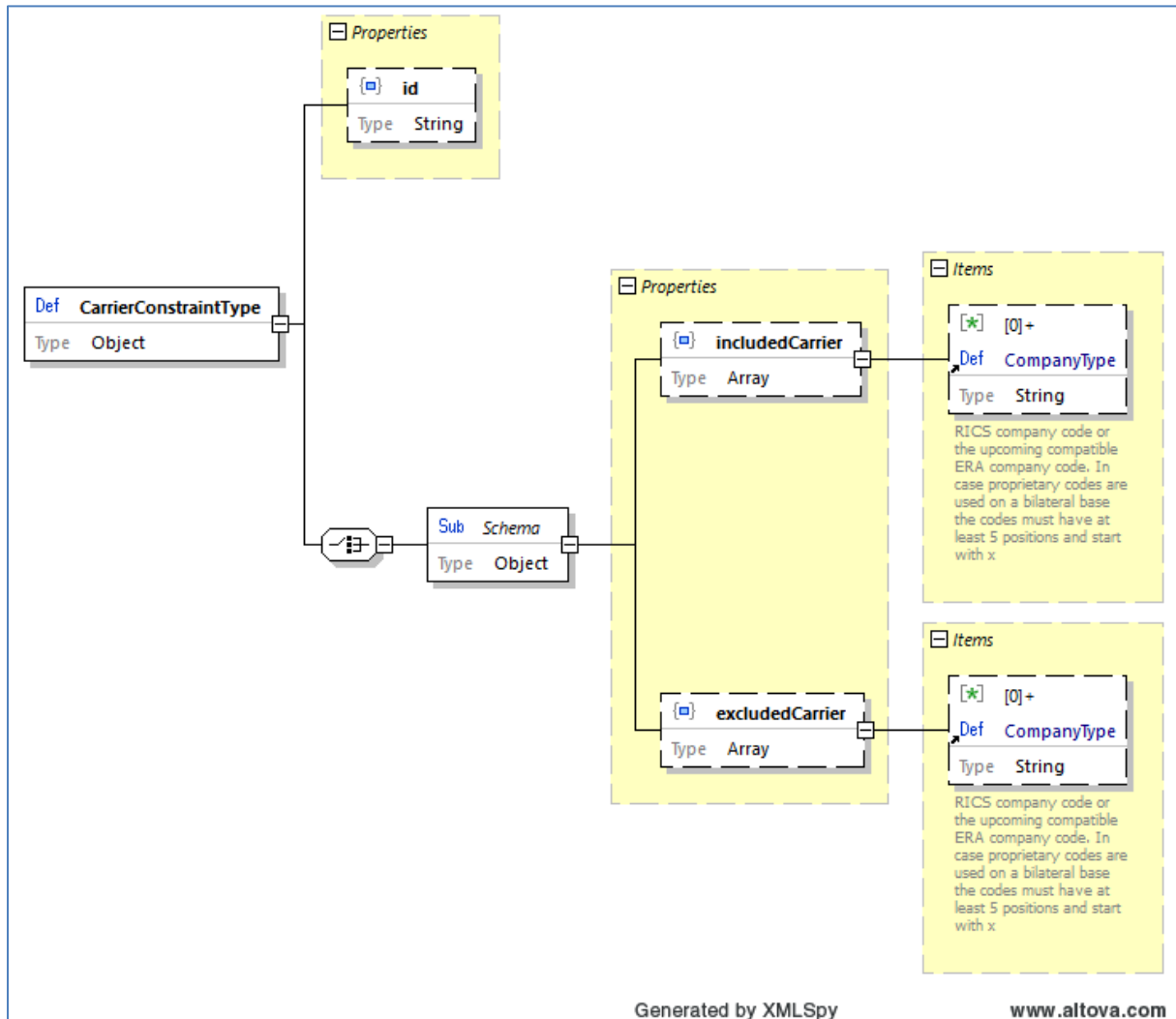


Figure 5 carrier constraint data structure

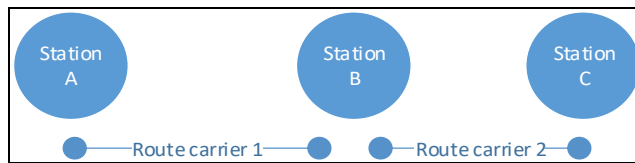
Data constraints	
includedCarriers/excludedCarriers	Either a list of included or a list of excluded carriers must be provided. It is not allowed to provide both lists.

## ConnectionPoint

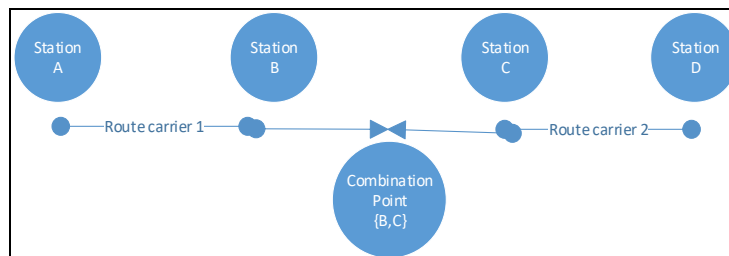
A connection point defines a point where two regional validities of different carriers can be connected. A connection point is implemented as the list of stations which hit connects.

## IRS 90918-10

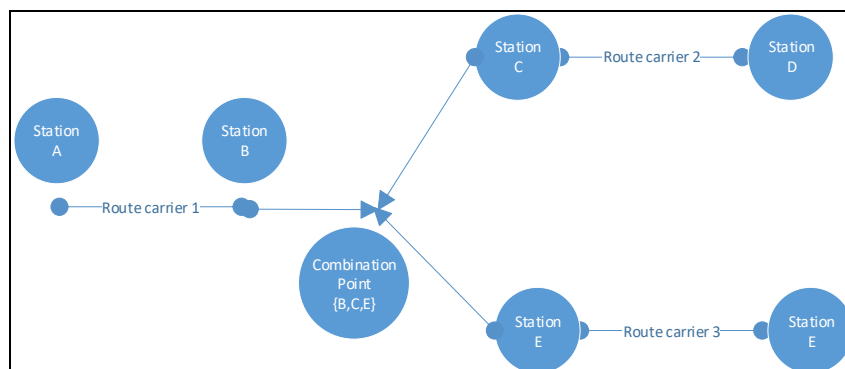
In case a route ends at a real station the connection point includes the real station.



In case the combination is not at a real station an indication is needed to define the allowed combinations. This could be done by listing the next stations of other carriers which would allow a combination. Combinations would be allowed if the combination points of two routes share two common stations.



This would also work with multiple stations.



Connection points will include a border point code to support existing implementations where the border point code is compared with the time table data. As in principle every station can become a connection point (e.g. all stops from Aachen to Brussels are connection points from DB to SNCB) implementations based on border point codes cannot cover all connections.

As on both sides of a connection multiple small stations could be connected and not all of them might be in the time table of a train the connections point should allow to connect sets of stations.

1. Two fares can be connected in case their connection points share a common station in the provided station sets if only one set is provided by a connection point.
2. Two fares can be connected in case their connection points share a common station in two of the provided station sets of each connection point.

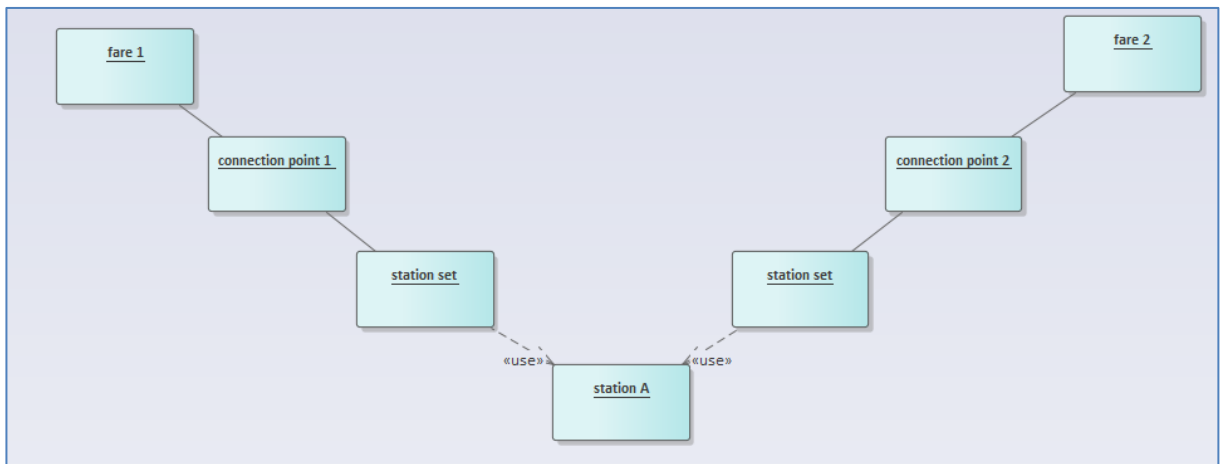


Figure 6 connection points - simple case 1

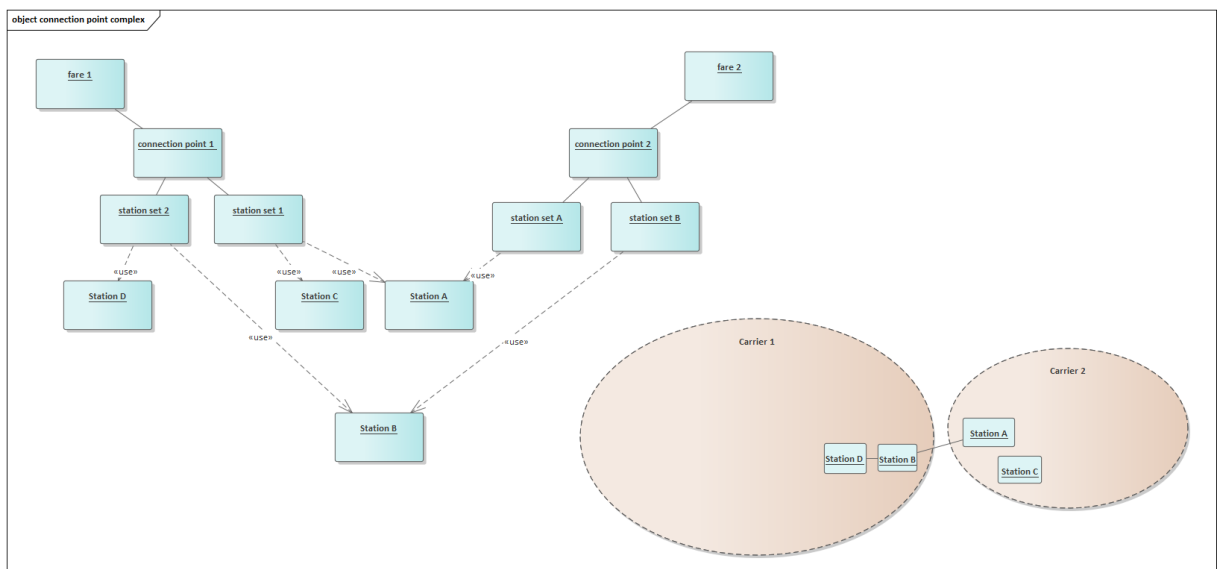


Figure 7 connection points - complex case 2

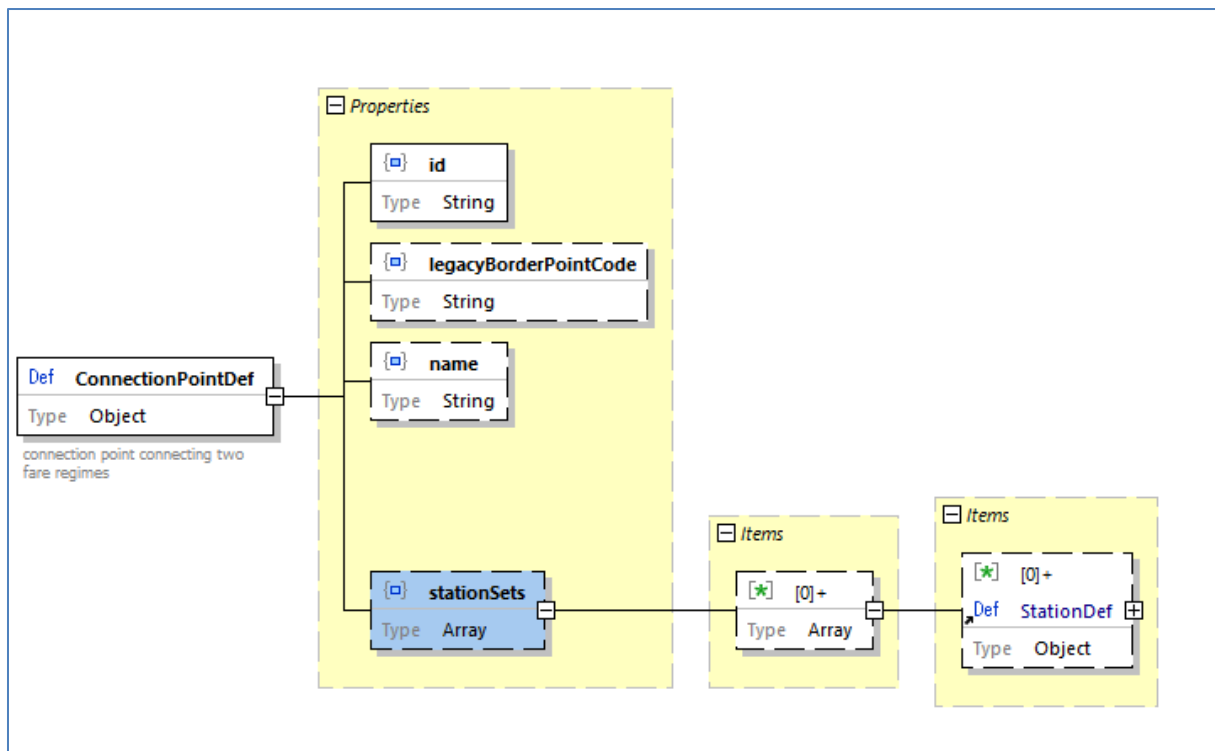


Figure 8 ConnectionPoint data structure

Data constraints	
stationSets	<p>At least one set with one station must be provided in case the fare border is a real station.</p> <p>Two station sets must be provided in case the fare border is inbetween two real stations.</p>
legacyBorderPointCode	The legacy border point code must be provided for the time being. New implementations should not use the border point code.

## Fare

An elementary fare to create an offer linking all constraints to one price.

Data elements	
fareType	NRT, IRT, Anxilliaris , Reservations
name	Name of the fare
fareDetailDescription	Additional explanation on the fare (e.g. on included fees like Diabolo or Venice fee)

## IRS 90918-10

price	Price with currency EUR must be provided if not otherwise agreed bilaterally.
regionalConstraint	Definition of the regional validity of the fare and the geographical combination rules (connection points)
serviceConstraint	Restrictions of the service allowed to be used
carrierConstraint	Restriction on the carriers that can be used with the fare.
serviceClass	Class the traveler can use
serviceLevel	Mode detailed category of places the traveler can use.
passengerConstraint	Rules and restrictions on the passenger types allowed to use the fare and rules on combining passengers.
afterSalesRules	After sales rules for the fare. In case the allocator is responsible for the aftersales rules this is almost empty.
combinationConstraint	Rules on the model of combination of this fare with fares of other carriers.
fulfilmentConstraint	Restrictions and requirements on the fulfilment and security to be applied by the allocator.
reductionConstraint	Rules on reduction cards necessary to apply the fare.
reservationParameter	Information on parameters for reservation via the 90918-1 interface and reservation options.
personalDataConstraint	Rules on the personal data to be provided in a booking
legacyAccountingIdentifier	Data to be included in the current IRS 30301 accounting data format.
salesAvailabilityConstraint	Rules on the allowed sales dates for the fare.
travelValidityConstraint	Rules on the validity for travel of this fare.
legacyConversion	<p>Defines whether this fare is allowed to be converted to the old 108.1 data structure and used according to the old rules.</p> <ul style="list-style-type: none"> <li>• YES</li> <li>• NO</li> <li>• ONLY – this fare is provided for conversion only</li> </ul>



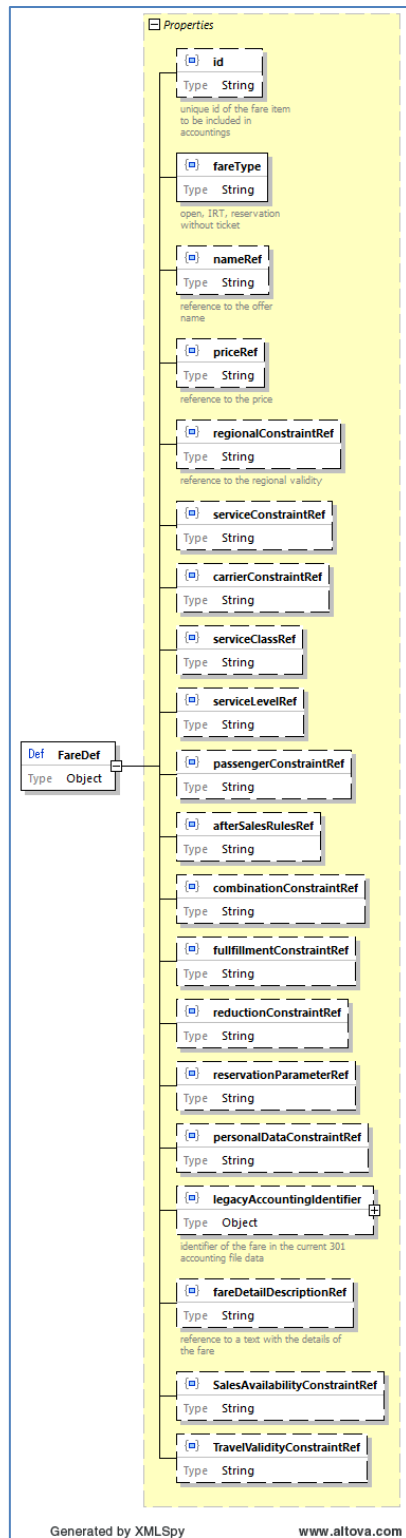


Figure 9 Fare element data structure

Data constraints	
price	A price must be provided for all offline fares including those where the price is zero.
legacyAccountingIdentifier	In case 30301 in the current version is used to accounting these data must be provided for offline fares
serviceClass	Must be provided for offline fares
combinationConstraint	Must be provided for offline fares
travelValidityConstraint	Must be provided for offline fares
SalesAvailabilityConstraint	Must be provided for offline fares

## FareOnline

An elementary fare used in online services.

The data elements which are referenced in bulk data fare are here included as objects.

An elementary fare to create an offer linking all constraints to one price.

Data elements	
fareType	NRT, IRT, Anxillaries , Reservations
name	Name of the fare
fareDetailDescription	Additional explanation on the fare (e.g. on included fees like Diabolo or Venice fee)
price	Price with currency EUR must be provided if not otherwise agreed bilaterally.
regionalConstraint	Definition of the regional validity of the fare and the geographical combination rules (connection points)
serviceConstraint	Restrictions of the service allowed to be used
carrierConstraint	Restriction on the carriers that can be used with the fare.
serviceClass	Class the traveler can use
serviceLevel	Mode detailed category of places the traveler can use.
passengerConstraint	Rules and restrictions on the passenger types allowed to use the fare and rules on combining passengers.
afterSalesRules	After sales rules for the fare. In case the allocator is responsible for the aftersales rules this is almost empty.
combinationConstraint	Rules on the model of combination of this fare with fares of other carriers.
fulfilmentConstraint	Restrictions and requirements on the fulfilment and security to be applied by the allocator.
reductionConstraint	Applied reduction cards only
reservationParameter	Information on parameters for reservation via the 90918-1 interface and reservation options.
personalDataConstraint	Rules on the personal data to be provided in a booking
legacyAccountingIdentifier	Data to be included in the current IRS 30301 accounting data format.
travelValidityConstraint	Rules on the validity for travel of this fare.

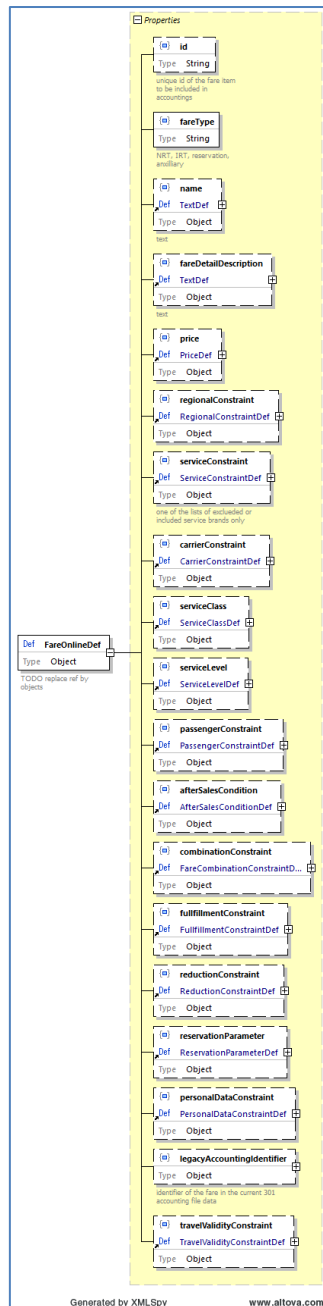


Figure 10 FareOnline data structure

Data constraints	
price	A price must be provided for all offline fares including those where the price is zero.
legacyAccountingIdentifier	In case 30301 in the current version is used for accounting
serviceClass	Must be provided
combinationConstraint	Must be provided
travelValidityConstraint	Must be provided

## FareCombinationConstraint

The fare combination constraint defines the rules of combining fares from different carriers. It provides a list of combination models the allocator can choose of.

Content	Description
model	Code of the combination model applied
combinableCarriers	List of carriers that can be combined with this fare. <b>If empty, there is no restriction in combining different carriers.</b> Carriers are listed by their RICS company codes.
onlyWhenCombined	Indicates that this fare can be used only if it is combined with another fare of another carrier.
referenceCluster	Cluster within the clustering model to which this fare belongs
allowedClusters	List of clusters with which this fare can be combined
allowedAllocators	List of allocators which can combine this fare. . . <b>If empty, there is no restriction in combining different carriers.</b> Carriers are listed by their RICS company codes.
allowedCommonContracts	List of Carriers with which the allocator can for a common contract. <b>If empty, there is no restriction in indicating common contracts to the traveler except for the SEPARATE_CONTRACT model.</b> Carriers are listed by their RICS company codes.

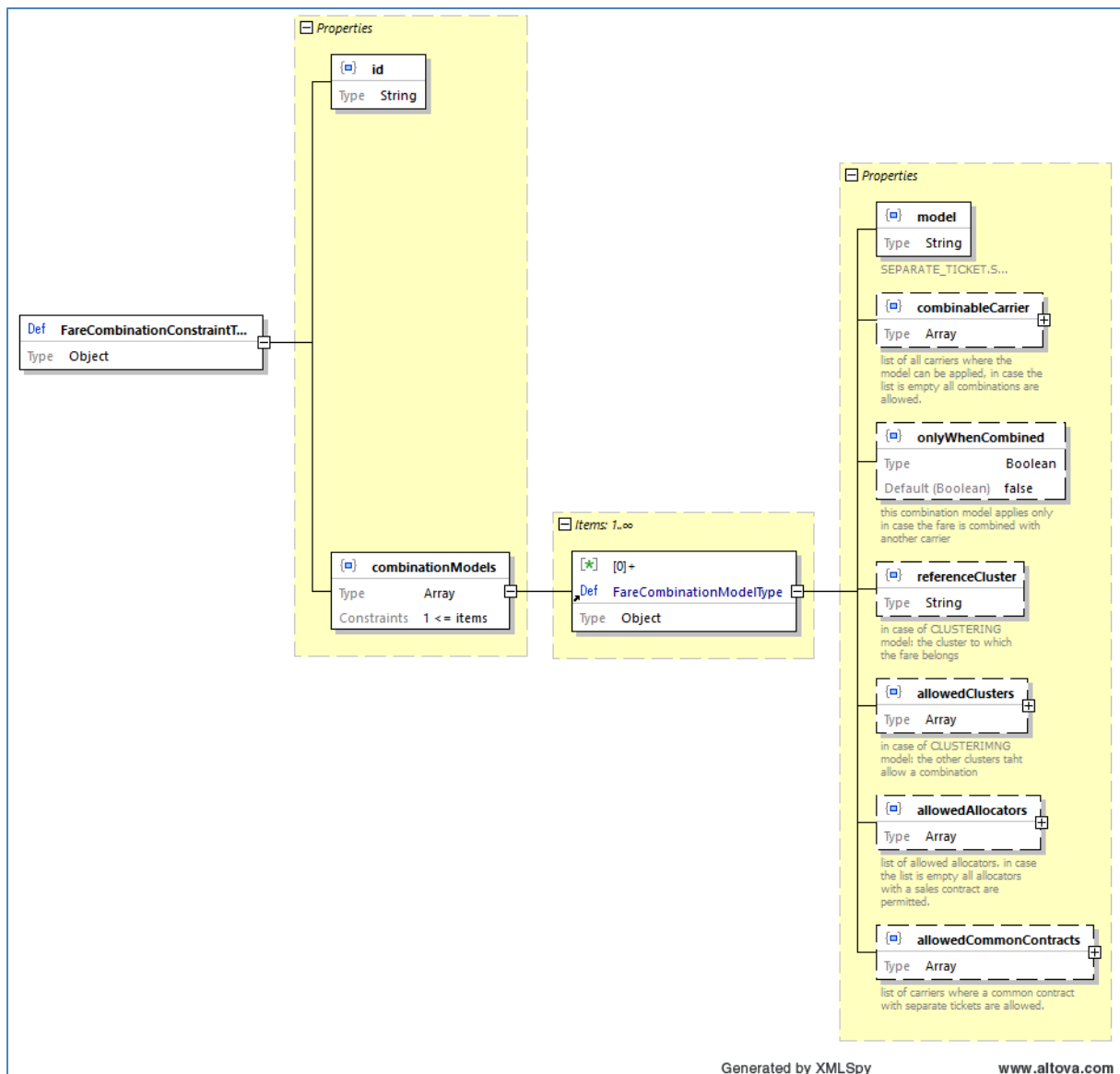


Figure 11 fare combination constraint data structure

Combination model code	Description
SEPARATE_CONTRACT	This is the model for not combining the fares in one ticket and not allowing the integration in one contract. The rules applied for this ticket are exactly the rules defined by the carrier in the fare data. The allocator must ensure that it is clear for the customer that no common contract was established.
SEPARATE_TICKET	This is the model for not combining the fares in one ticket, so the rules applied for this ticket are exactly the rules defined by the carrier in the fare data. The allocator can form a common contract for the whole journey.
CLUSTER	The CLUSTERING model tries to simplify conditions and fares for the customer but sacrifices a part of the control of the carrier on his fares.

	<p>Similar types of fares are defined to belong to the same “cluster”. The after sales conditions for a cluster are defined by the allocator. However, the after sales conditions must basic rules on after sales for that cluster. The clusters correspond to the flexibility a traveler receives to change the booked train. This corresponds directly to the after sales conditions. Hereby the fees to be paid for such an exchange are essential for the definition of clusters and not the complexity of the process to change. Thus, a train bound ticket and an open ticket belong to the same cluster in case the fees to change to different trains / times are comparable. The after sales fees can be demanded by the carrier. The other conditions might either be listed per carrier or combined by rules. The customer buying products from one allocator has a simple unique view on after salles conditions.</p> <p>The basic parameters defining the price must be obeyed individually within separately on the combined fare/offer:</p> <ul style="list-style-type: none"><li>○ route description / train link</li><li>○ class of service</li><li>○ passenger types</li></ul>																
COMBINE	<p>The COMBINING model tries to be close to the fare conditions defined by the carrier but sacrifices the simplicity of the fare towards the customer. The after sales conditions of the different fares will be combined into one condition to reflect the conditions of all included carriers. The after sales conditions will thus depend on the combinations of carriers.</p> <p>At any time, the after sales fees defined by the carriers are applied on the price part of these carriers only. The result is a list of times with increasing fees.</p> <p>E.g.:</p> <table><tr><td>Carrier 1:</td><td>10%</td><td>20 days before departure</td><td>price: 100€</td></tr><tr><td>Carrier 2:</td><td>90%</td><td>2 days before departure</td><td>price: 200 €</td></tr><tr><td>Result:</td><td>10€ fee</td><td>20 days before departure</td><td></td></tr><tr><td></td><td>190€ fee</td><td>2 days before departure</td><td></td></tr></table>	Carrier 1:	10%	20 days before departure	price: 100€	Carrier 2:	90%	2 days before departure	price: 200 €	Result:	10€ fee	20 days before departure			190€ fee	2 days before departure	
Carrier 1:	10%	20 days before departure	price: 100€														
Carrier 2:	90%	2 days before departure	price: 200 €														
Result:	10€ fee	20 days before departure															
	190€ fee	2 days before departure															

Additional clustering model data:

Fare clusters reflect the flexibility a fare provides to the customer. Flexibility is defined by the after sales conditions that apply when a traveler wants to change his ticket.

Fare cluster code	description
BUSINESS	Refundable after the departure or last day of validity Exchangeable after the departure or last day of validity
FULL_FLEX	Refundable before the departure or last day of validity

## IRS 90918-10

	Exchangeable before the departure or last day of validity
SEMI_FLEX	Refundable with fee depending on conditions of the allocator Exchangeable with fee depending on conditions of the allocator Minimum validity applies
NON_FLEX	Non refundable Non exchangeable Minimum validity applies
PROMO	Used on a bilateral basis only.  Non refundable Non exchangeable Minimum validity applies

Combinations of fares of different clusters is allowed with the fare clusters listed in allowedClusters. However not all combinations would be provided to the customer. A fare will be combined with a fare of the same cluster and in case this is not available with one of the higher clusters.

E.g.:

Carrier 1: BUSINESS → CombinableClusters: BUSINESS,FULL\_FLEX,SEMI\_FLEX, NON\_FLEX  
SEMI\_FLEX → CombinableClusters: SEMI\_FLEX, NON\_FLEX

Carrier 2: BUSINESS → CombinableClusters: BUSINESS,FULL\_FLEX,SEMI\_FLEX, NON\_FLEX  
FULL\_FLEX → CombinableClusters: FULL\_FLEX,SEMI\_FLEX, NON\_FLEX

Possible combined offers are:

BUSINESS (Carrier 1 BUSINESS + Carrier 2 BUSINESS)  
FULL\_FLEX (Carrier 1 BUSINESS + Carrier 2 FULL\_FLEX)  
SEMI\_FLEX (Carrier 1 SEMI\_FLEX + Carrier 2 FULL\_FLEX)

A NON\_FLEX would be formally allowed, but with the same price as the SEMI\_FLEX so it should not be shown to the customer:

NON\_FLEX (Carrier 1 SEMI\_FLEX + Carrier 2 FULL\_FLEX)

Other combinations would also be formally allowed by the data but suppressed as they would only offer a higher price. These should be suppressed by the allocator. E.g.:

FULL\_FLEX (Carrier 1 BUSINESS + Carrier 2 BUSINESS)

...



Data constraints	
combinationModel	At least one model must be provided

## FareResourceLocation

Fare resource location provides data on where to find online services for fares.

The fare location provides three options:

- Link a resource to a carrier – the carrier must be known from the time table
- Link a resource to the train – the data must be updated in case of new trains
- Link a resource to stations:
  - The link can be made for stations and for connection points
  - The link is valid if start and end station (or connection points) provide the link

The online link provides information on:

- The type of resource either for a whole train or an area. In case of a train the request must be for the train route between stations (e.g. IRT), whereas for areas there might be multiple splits in-between a train run (e.g. NRT).

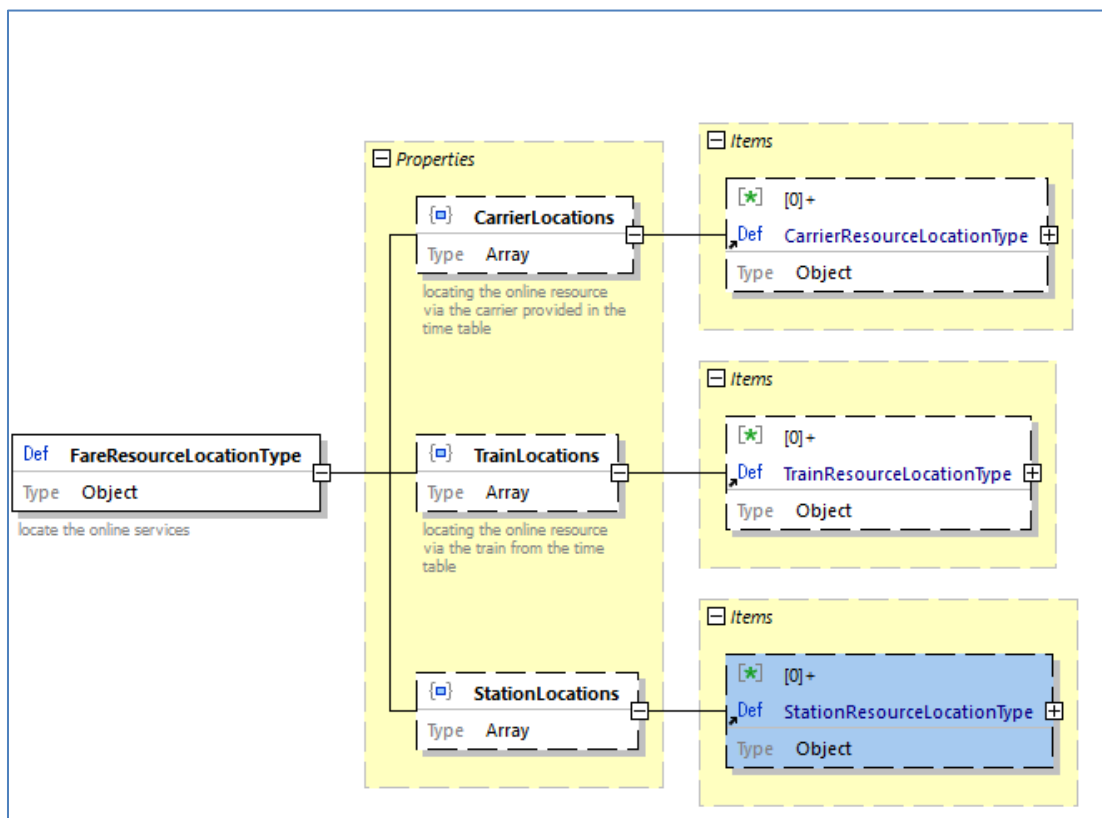


Figure 12 FareResourceLocation data structure

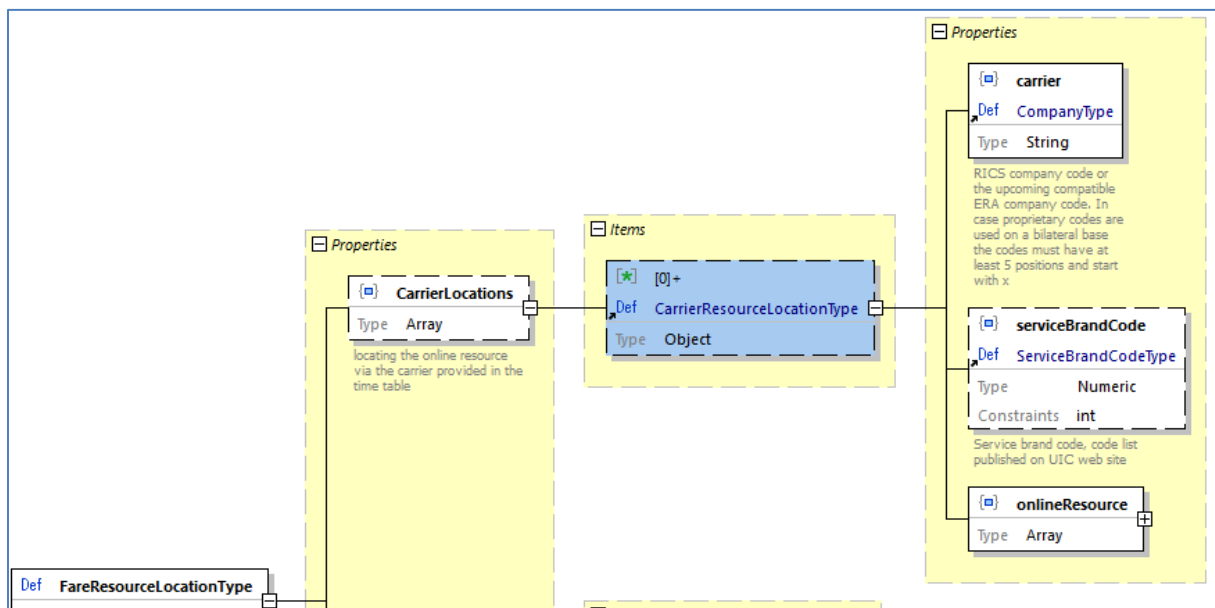


Figure 13 FareResourceLocation data structure - carrier link

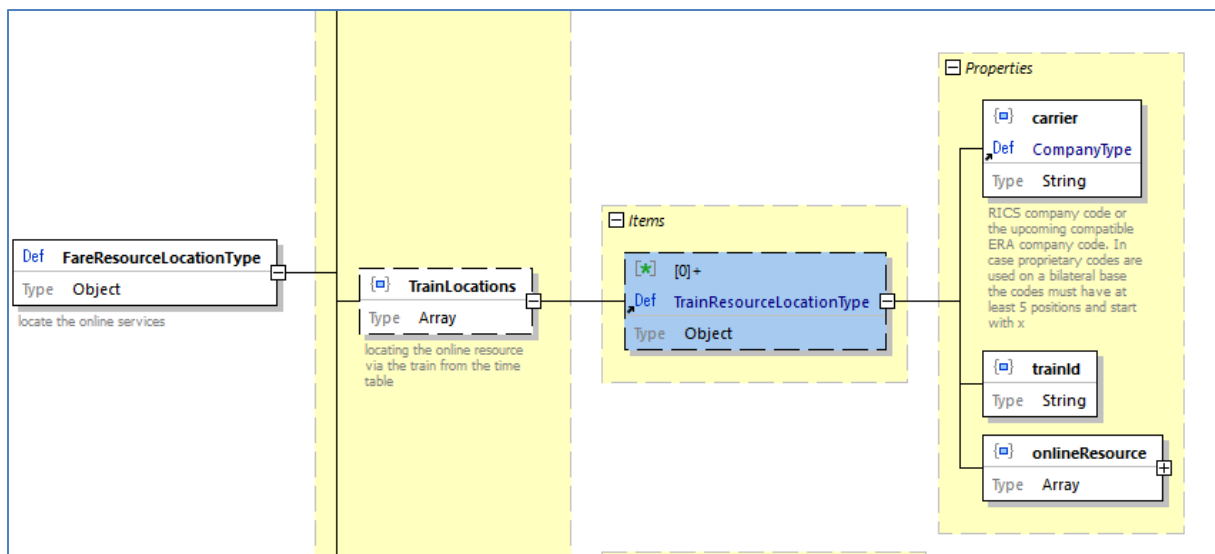


Figure 14 FareResourceLocation data structure - train link

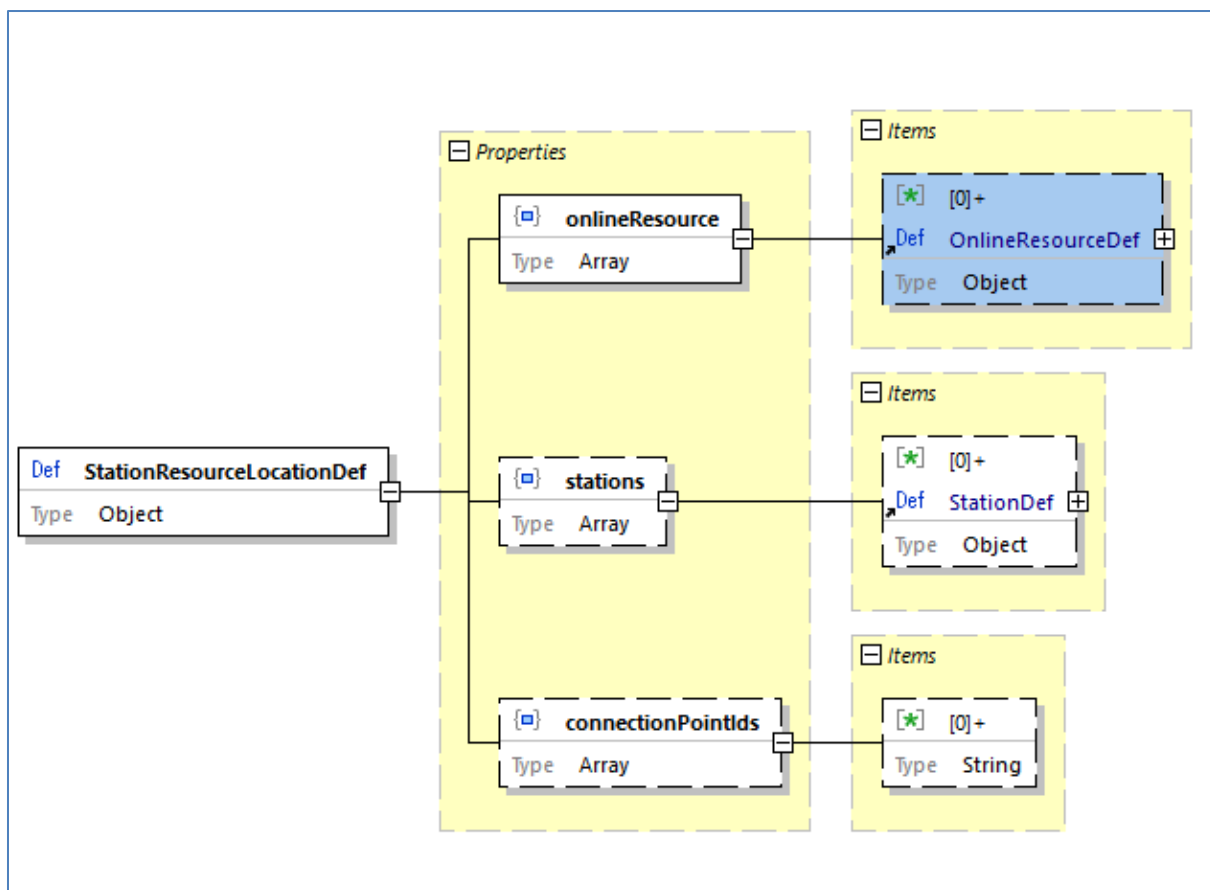


Figure 15 FareResourceLocation data structure - station link

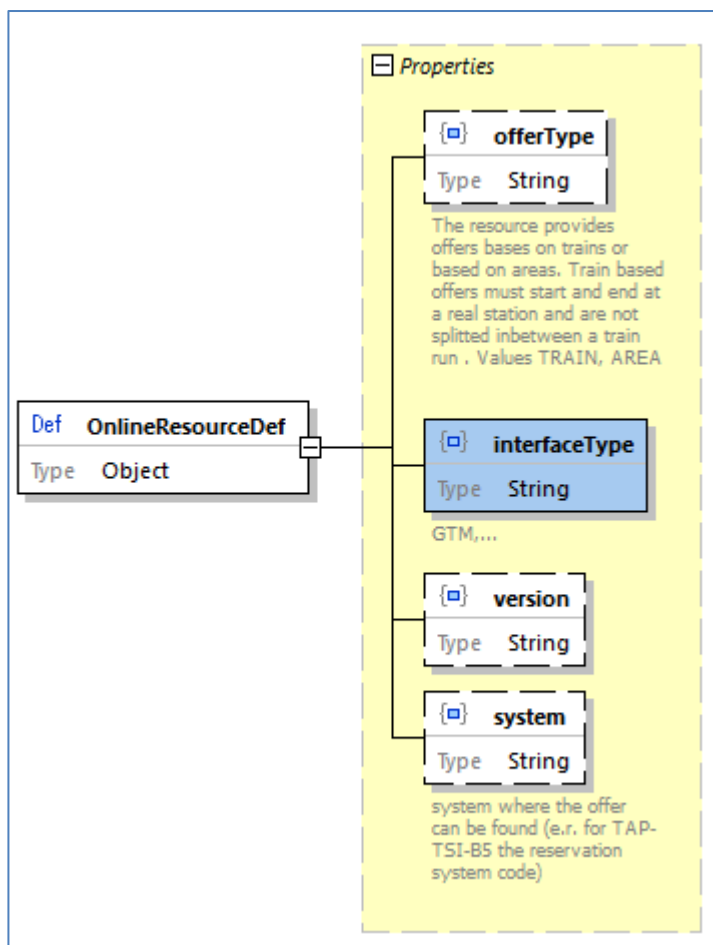


Figure 16 FareResourceLocation data structure - online resource

Code lists:

**Interface Type**  
**Offer request Type**

Data constraints	
System	For reservation interface 90810-1 the reservation system code is used.

### FareReferenceStationSetDefinition

The fare reference station set defines a set of stations where the fare is valid for all included stations. This set can be used in the regionalValidity description.

## IRS 90918-10

The corresponding bar code ab ticket control data will only contain the code of the station set, but the allocator needs the complete list of station to link the fare to the train routes.

A name can be provided.

The station set is referenced by the company code of the fare provider and a code unique within the fare provider.

A legacyCode can be provided to include the current code in the 108.1 data.

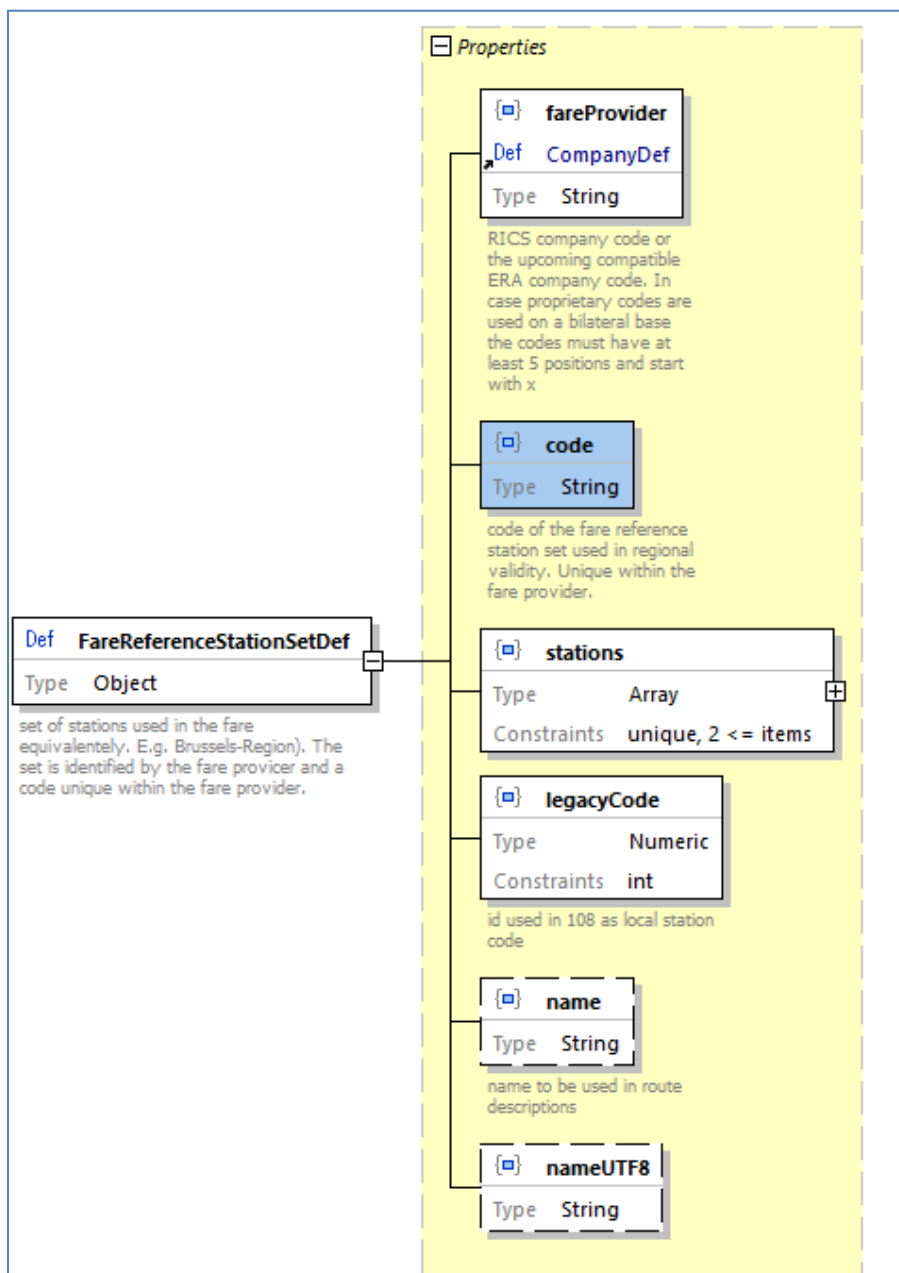


Figure 17 FareReferenceStationSet Definition data structure

Data constraints	
legacyCode	A legacyCode must be provided for the time being. New implementations should not rely on that code.
Name	The name should not include "/"."*".

### FulfilmentConstraint

The fulfilment constraint limits the applicable types of fulfilment and defined whether control data need to be transferred via a standard interface (IRS 90918-4).

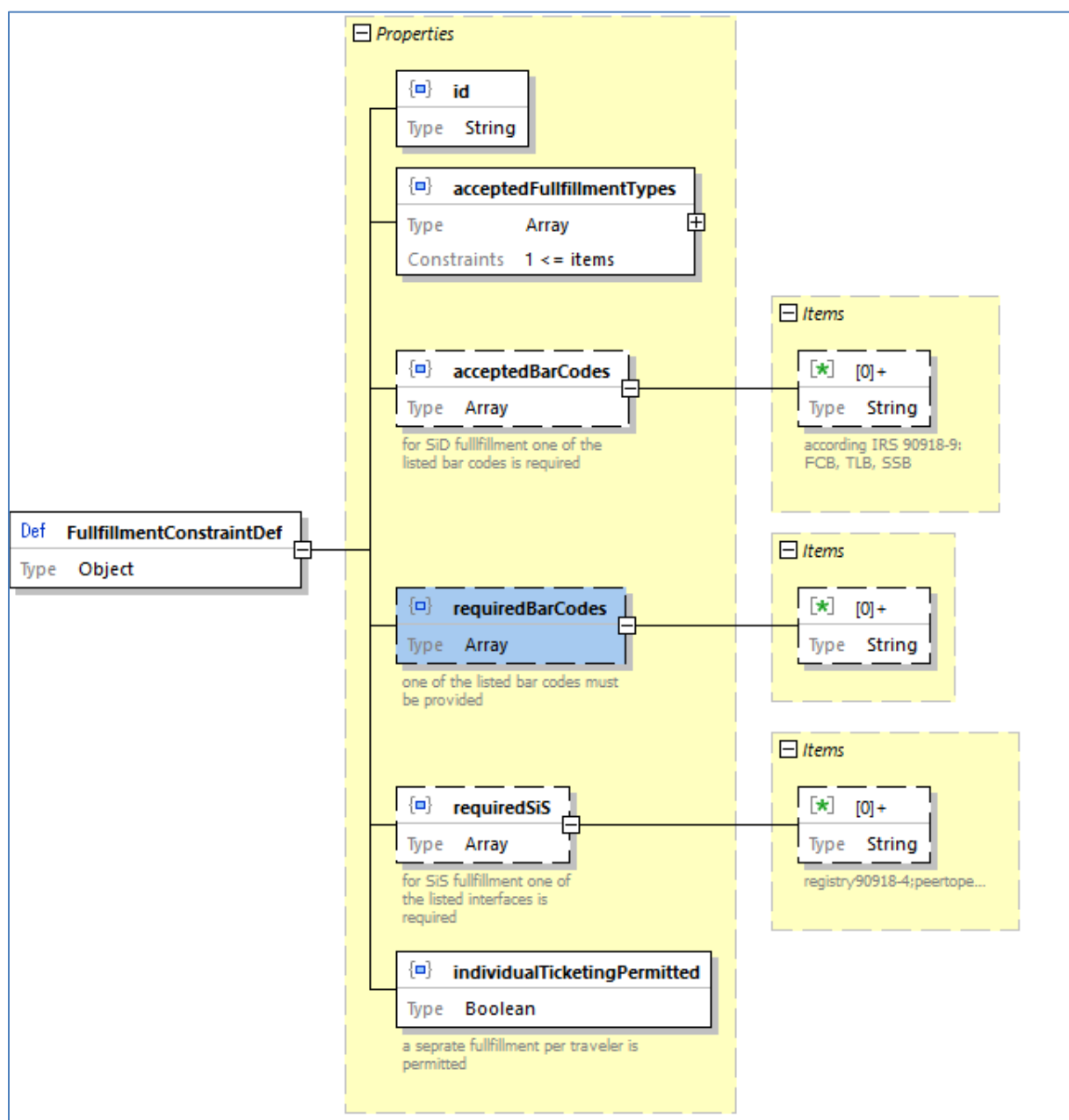


Figure 18 Fulfilmentconstraint data structure

# IRS 90918-10

Code lists:

for required SiS: **ControlDataExchangeType**  
for barcodes: **BarcodeType**  
for fulfilment: **FulfilmentType**

Data constraints	
acceptedFulfilmentType	At least one accepted fulfilment type must be provided

## Offer

The offer lists all fares and offer parts for the requested passengers and links them to the passengers.

Fares are delivered to allocators only, whereas ticket vendors will receive offerParts only.

fares	List of fare items and the link to the travelers to which they apply. One fare item can apply to multiple passengers (e.g. 2 adult fares).
validityTimePrice	The carrier might guarantee the price provided with the fares for a specific time.  This is optional, some carriers will not guarantee the price.
offerContext	Data provided by the carrier which need to be returned in preliminary booking requests.  This allows a carrier to implement the offer service context free. It is recommended to use signed content (e.g. json signatures) in the content.  In case a system implements offers referenced by an id it will place the id in the context. If the offer is transient the context might include all data required to create the prebooking
processType	DIRECT_SALE indicates an offer which does not require further booking and confirmations but can be used directly in a ticket.  This might be used to request static fares online to avoid implementing fare calculations.

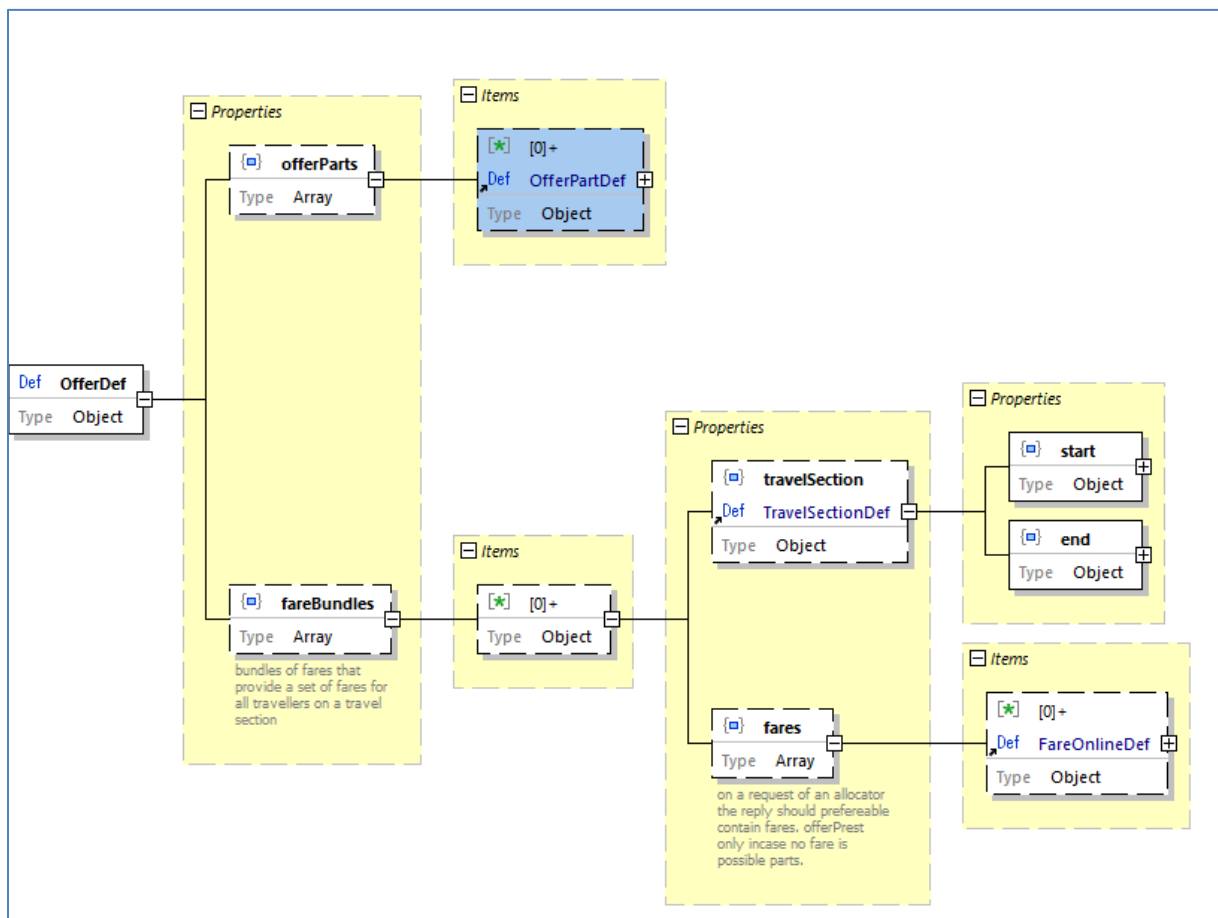


Figure 19 Offer data structure



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### OfferPart

The offer part is an immutable part of an offer provided for a ticket vendor. It does not include any detailed information needed to combine fares or to support the creation of bar codes or control data or to create complex textual descriptions from regional validity data.

Where details must be displayed to the customer these are included as textual descriptions.

The polygon (defined in UIC 90918-4) has been added for the option of graphical displays of regional validity, usually for local traffic zones.

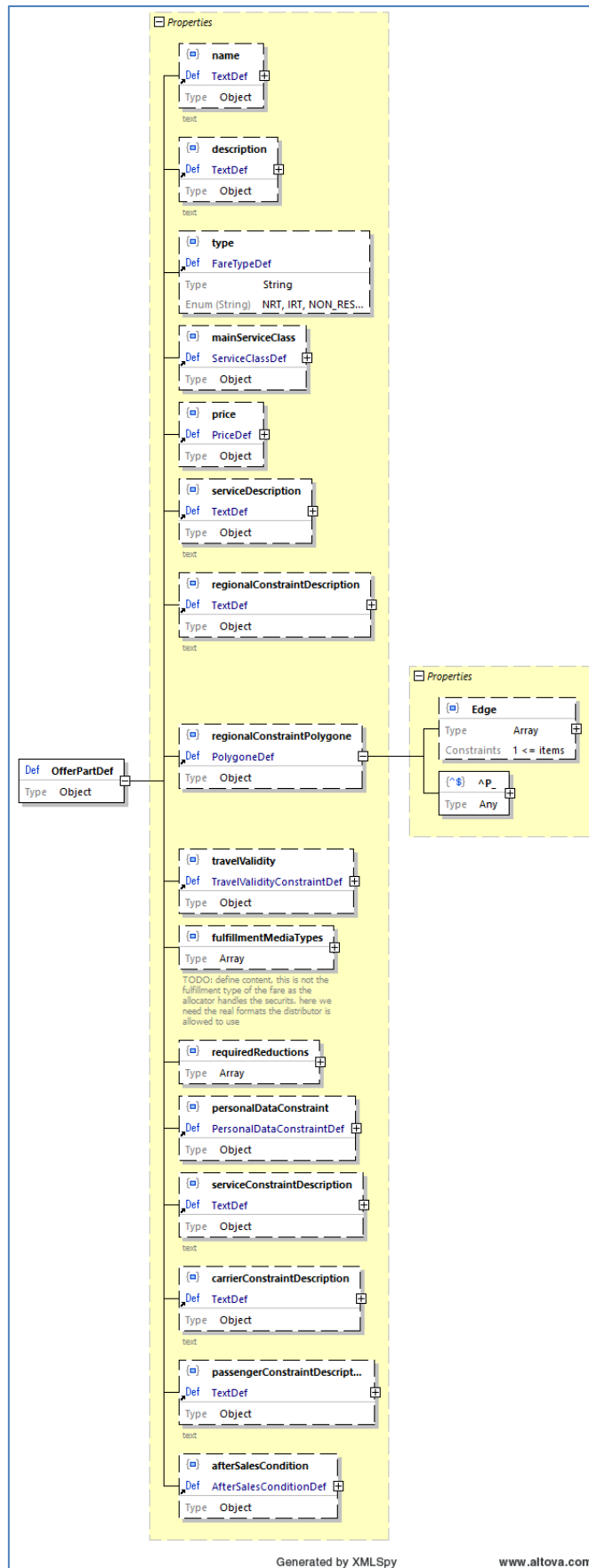


Figure 20 OfferPart data structure

## PassengerConstraint

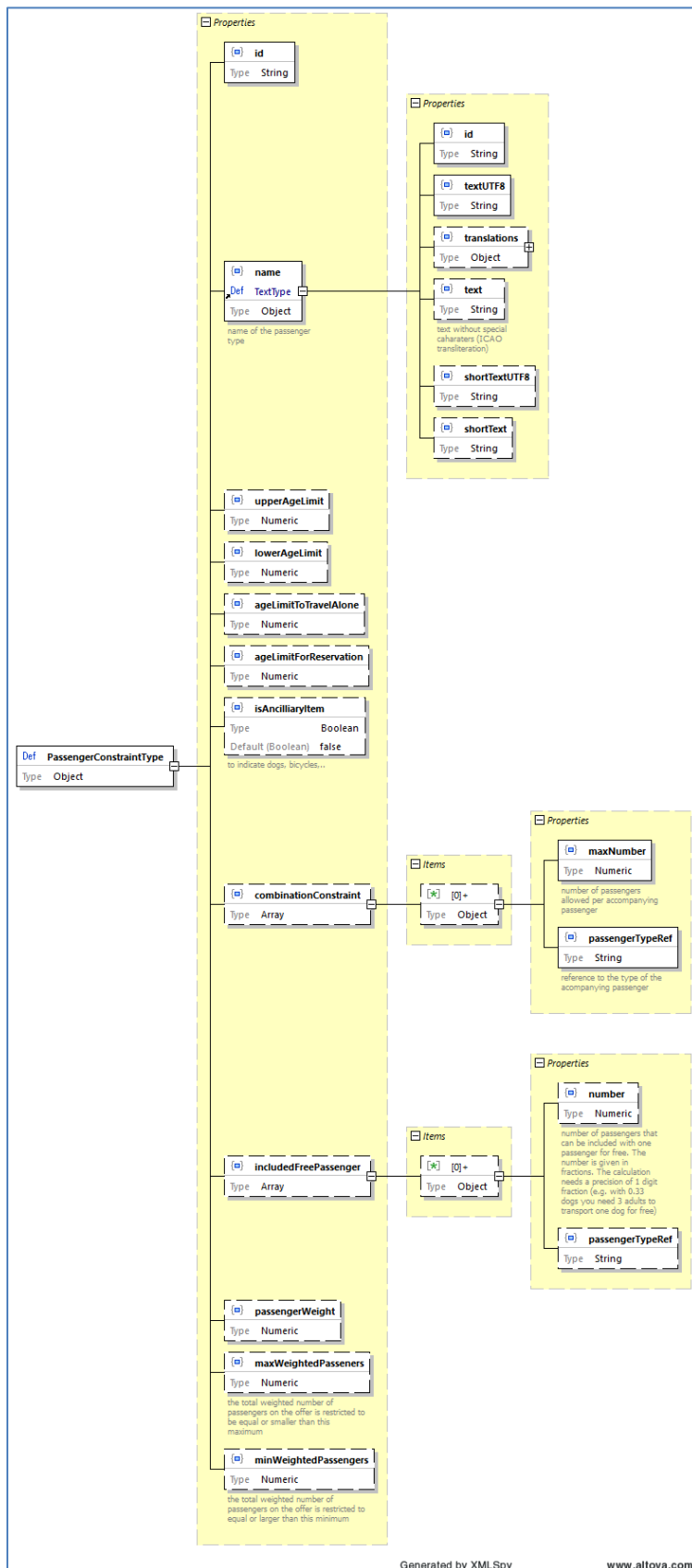


Figure 21 PassengerConstraint data structure

## IRS 90918-10

Data constraints	
upperAgeLimit, lowerAgeLimit	upperAgeLimit >= lowerAgeLimit

### PersonalDataConstraint

Specification of personal data to be delivered to the carrier. Personal data might be included in:

- Booking service (nTM and/or IRS 90918-1)
- Control data (bar code and/or control data delivery IRS 90918-4)

The requirement for personal data might depend on the type of fulfilment or on specific border crossings.

acceptedReason	Accepted reason to change personal data after booking confirmation  See code list: Personal data change reasons
transfer	The way the personal data are transferred.  See code list: Personal data transfer types
ticketHolderOnly	Personal data are required for the ticket holder only
dataItem	Code of the data item required  See code list: Personal data items

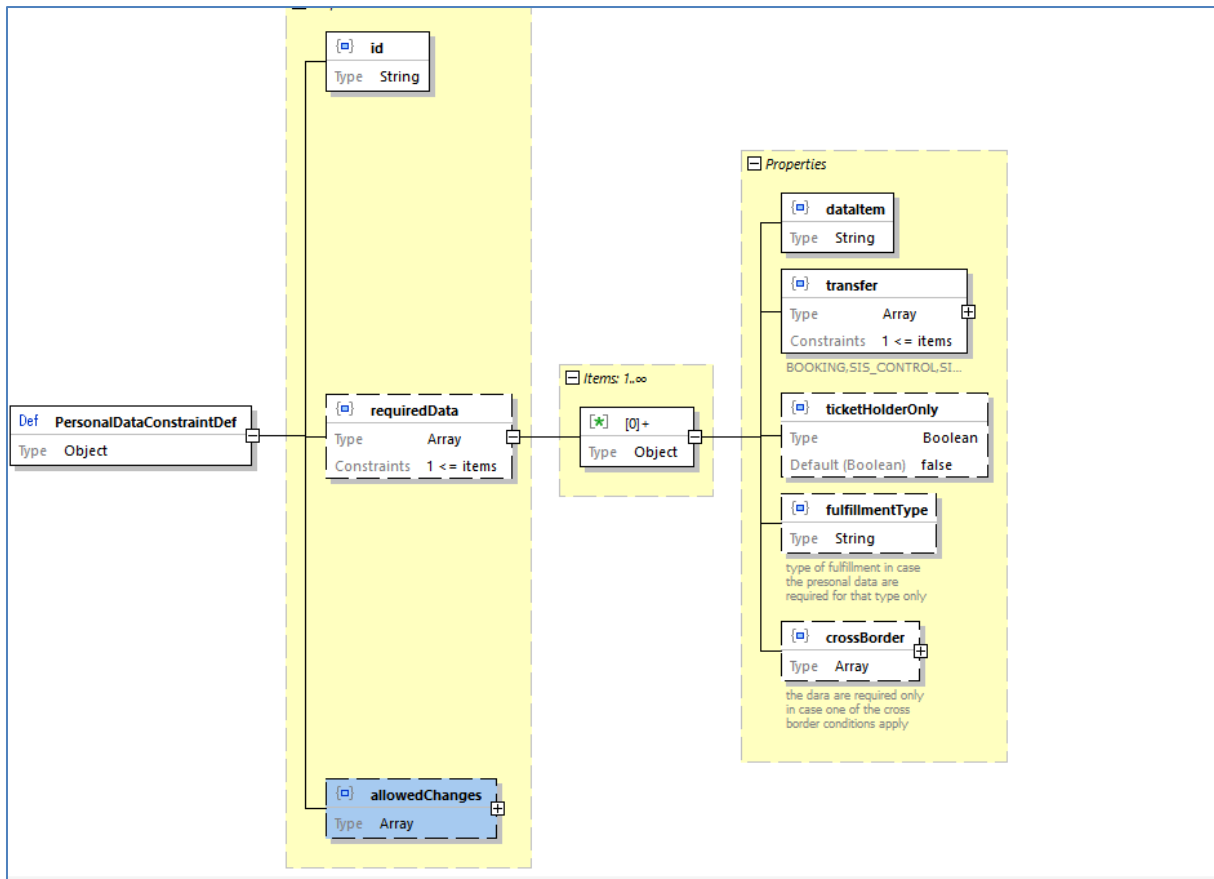


Figure 22 Required Personal data structure

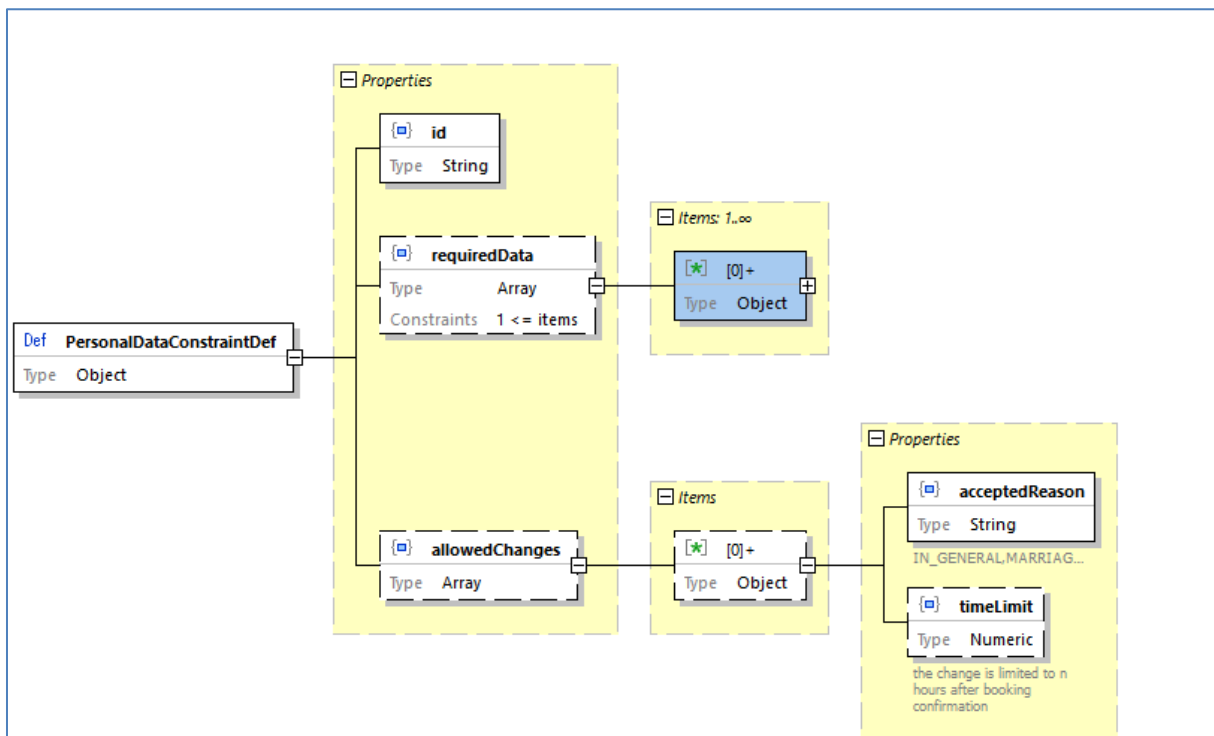


Figure 23 allowed changes on personal data

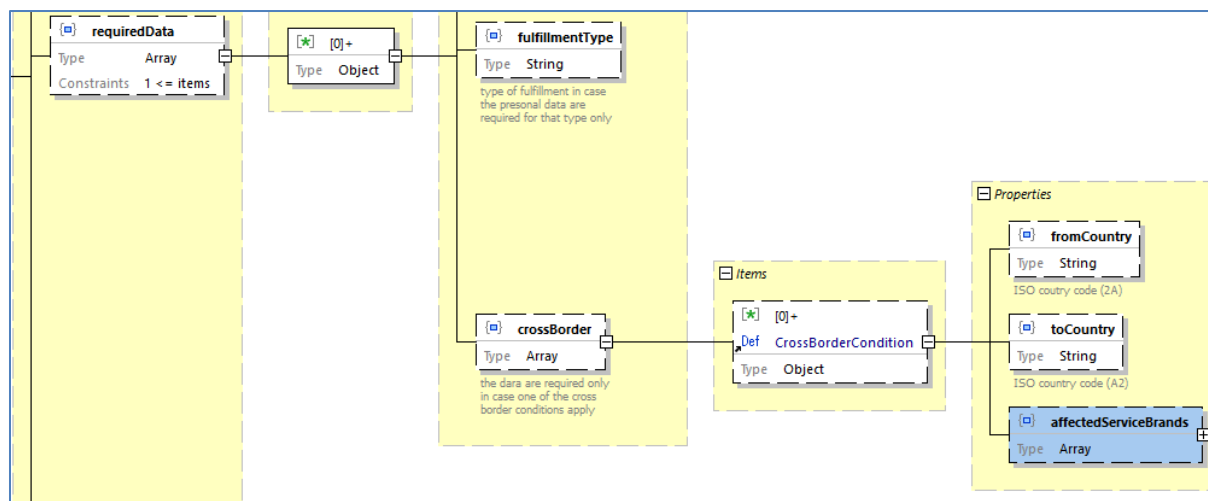


Figure 24 cross border conditions for personal data

## Price

The price data structure provides the price or a fee including the VAT details optionally in different currencies.

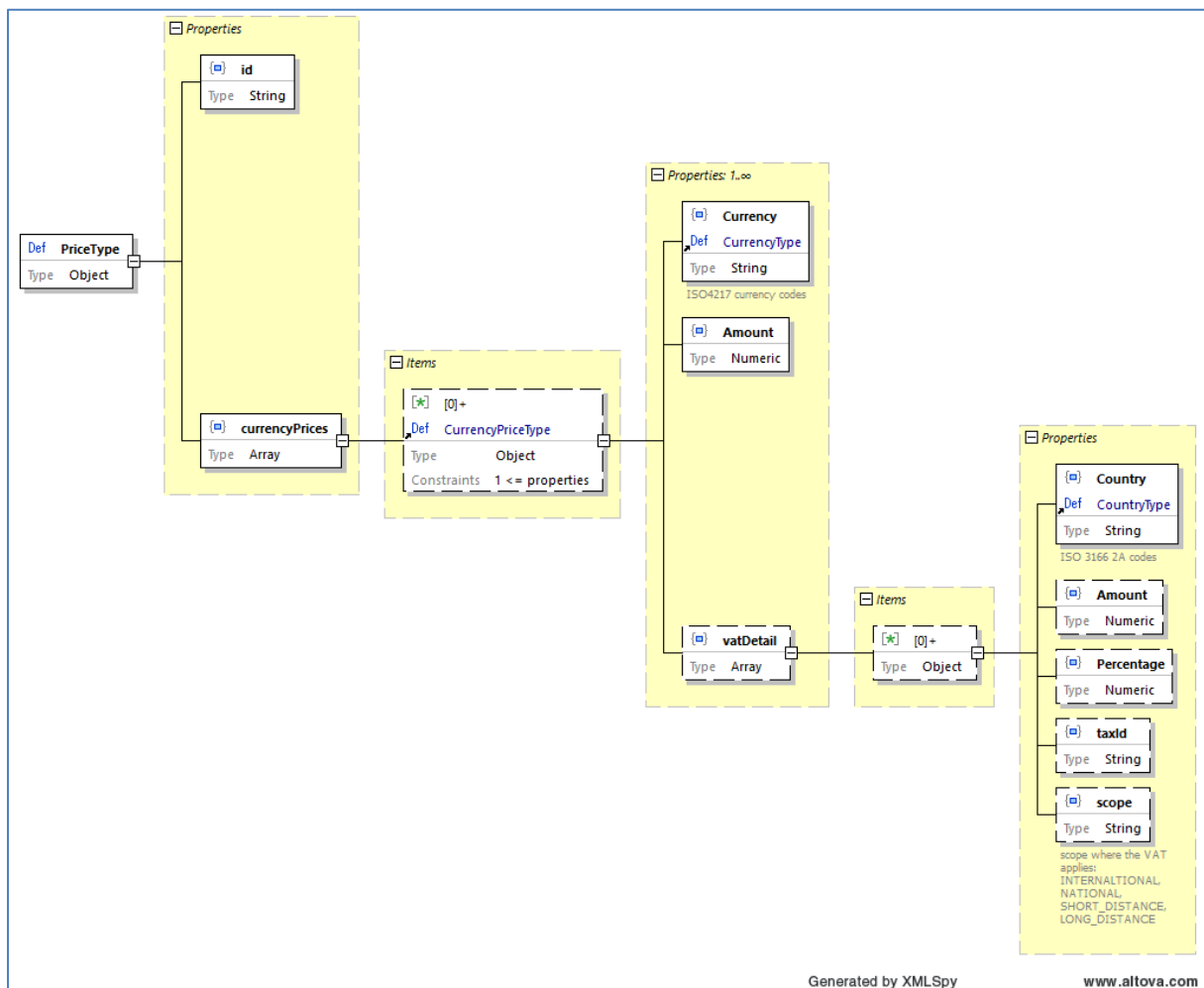


Figure 25 Price data structure

Scope: see code list TaxScope

Data constraints	
amount	Amount >= sum of VAT-amounts

## Requestor

Requestor indicating its role and the sales channel. Used in offer requests.

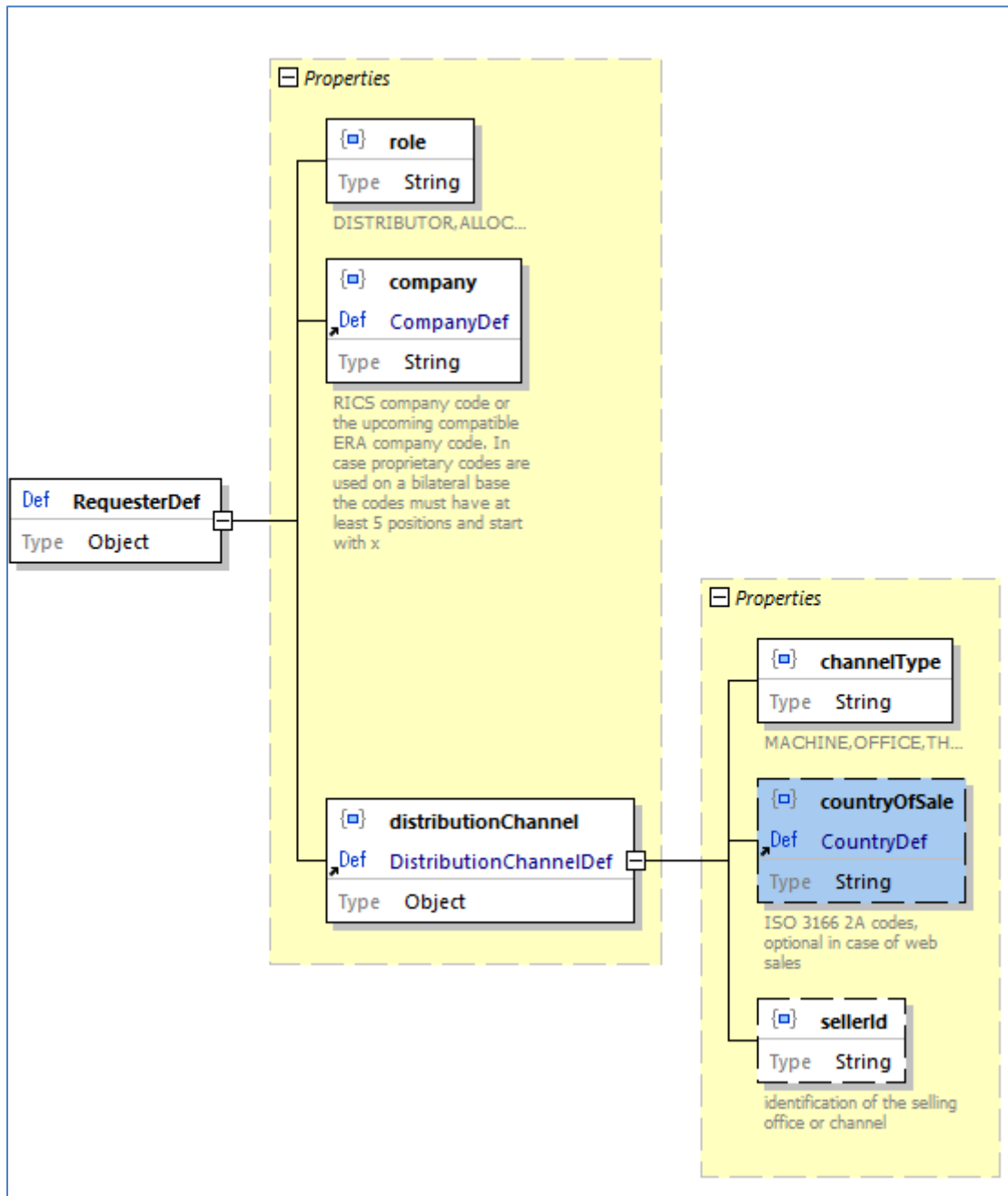


Figure 26 requester data structure



## IRS 90918-10

### ReductionCard

The reduction cards of a carrier are listed in the bulk data.

List of cards of the carrier:

Id	Unique id of the card. The id must start with the RICS code of the carrier
name	Name and short name of the card. The name should be used for the card selection by the customer, the short name should be used for barcodes. Usually the card name is not translated, but the card name might be provided in different languages by carriers in multilingual countries.
serviceClass	Service class indicated for the class
issuer	Issuer of the card. Usually the carrier providing the fare data.
type	Type of the cards to separate between loyalty cards, cards that are tickets (passes), and reduction cards.  LOYALTY_CARD,REDUCTION_CARD,PASS
cardIdRequired	Indicates that the card id must be provided in the prebooking request to validate the card. This card cannot be used without the online services for booking

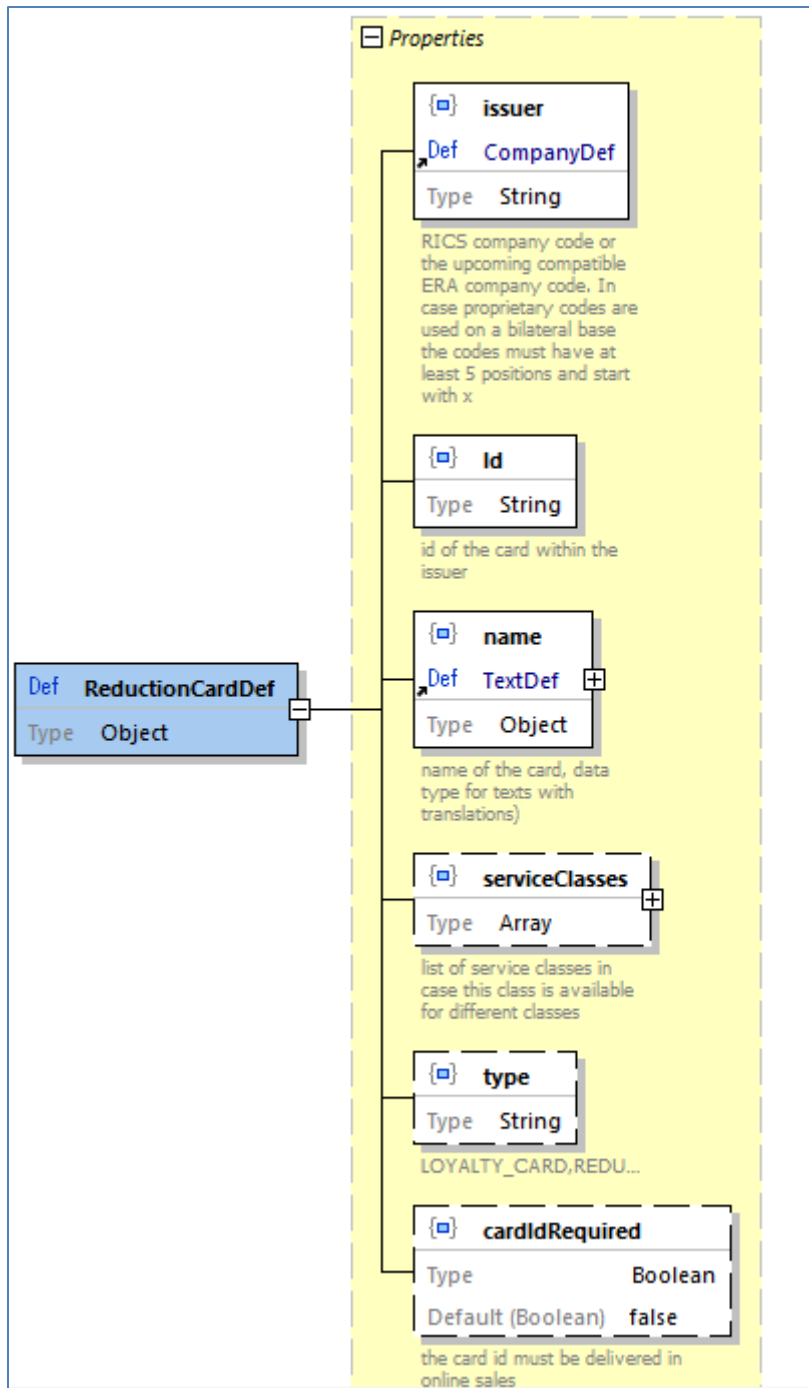


Figure 27 reduction cards

## ReductionCardConstraint

A fare associated with this constraint requires one of the listed cards to be presented by the traveler on the trip. Card Ids can be taken from the listed cards provided within the fare data delivery or from the common code list in **Reduction “cards”**.

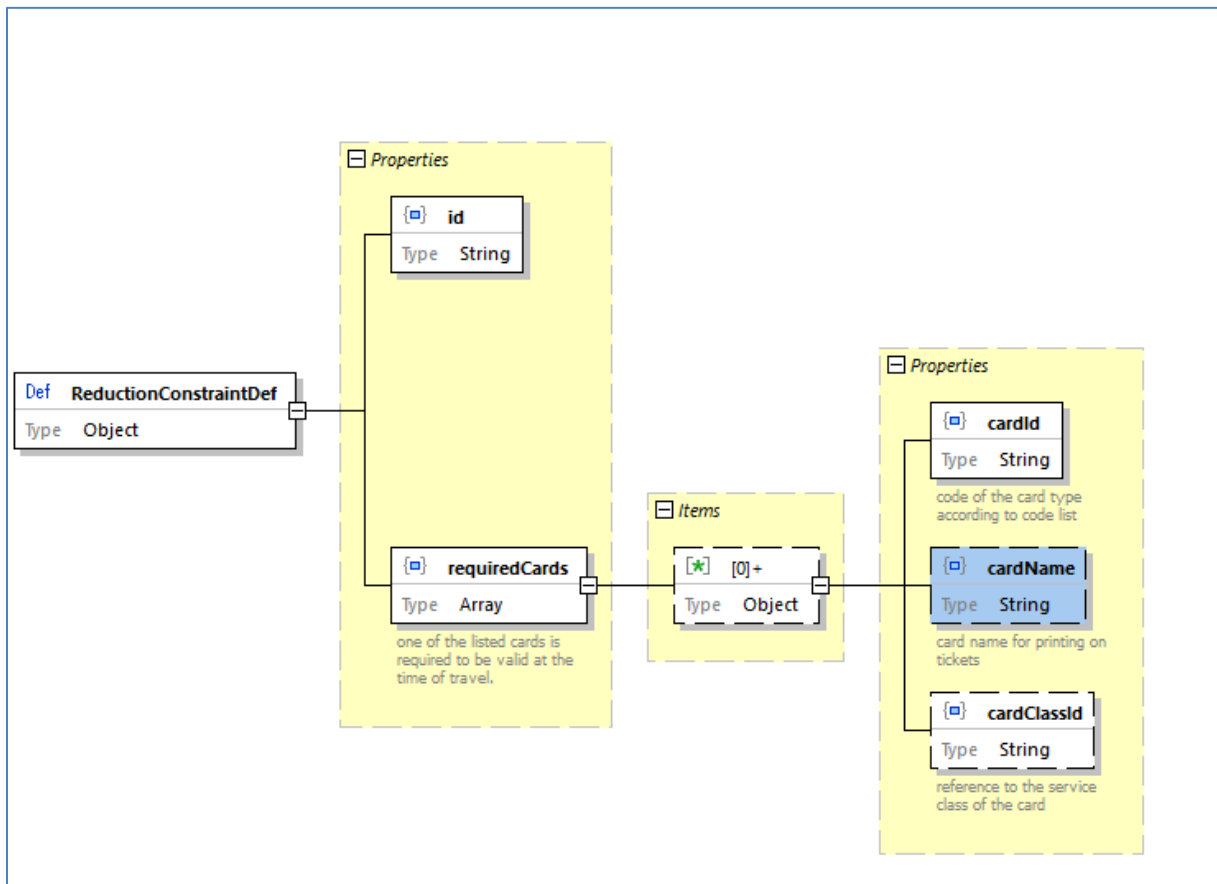


Figure 28 ReductionCardConstraint data structure

# IRS 90918-10

## RegionalConstraint

Definition of a regional validity of a fare. The regional validity constraint is defined by an entry connection point and an exit connection point to combine this regional validity with other regional validities of other carriers and the specification of the regional validity that is sued and described in IRS 90918-4 for ticket control. The entry or exit connection point might be missing in case the fare cannot be combined or can be combined on one side only.

Content	description
entryConnectionPoint	Defines the connection point for connecting this fare at the start of regional validity (see ConnectionPoint)
exitConnectionPoint	Defines the connection point for connecting this fare at the start of regional validity (see ConnectionPoint)
regionalValidity	Definition of the regional validity as defined in IRS 90918-4. I provide data structures for zones, Lines, train links, geographical polygons and routes.

The connection points are included for combining regions. When combining two regional validities from two carriers the connection points will disappear in the combined data structure for bar codes and ticket control and from the textual description for the traveler.

E.g.:

Carrier 1: RegionalConstraint {Exit (A,B), RegionalValidity X – Y/Z- A}

Carrier 2: RegionalConstraint {Entry (A,B), RegionalValidity B – C/D – E}

→ X\*Y/Z\*A\*B\*C/D\*E

The allocator might need to remove doubled stations in routes in case the connection point is a real station used in both regional validity descriptions in case it is displayed as one combined text:

Carrier 1: RegionalConstraint {Exit (A), RegionalValidity X – Y/Z- A}

Carrier 2: RegionalConstraint {Entry (A), RegionalValidity A – C/D – E}

→ X\*Y/Z\*A\*A\*C/D\*E → X\*Y/Z\*A\*C/D\*E

## IRS 90918-10

### Connecting Regional Validity to trips:

The regional constraint is connected to the time table via the regional validity, the connection points are used to combine regional constraints.

To support legacy implementations the connection points can provide a border point code linked with the time table.

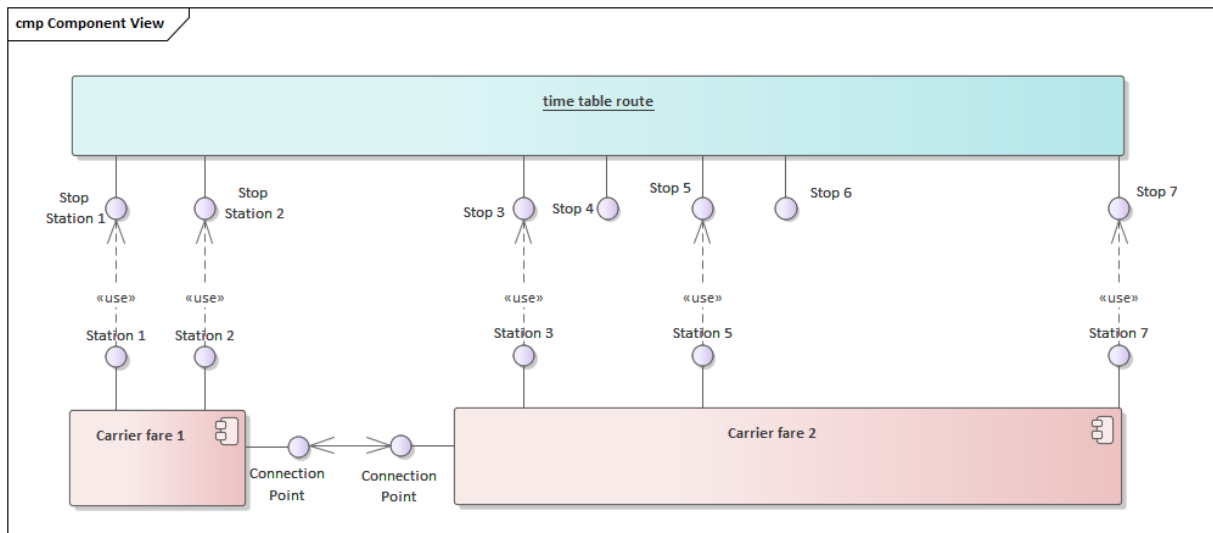


Figure 29 Connection points and time table routes

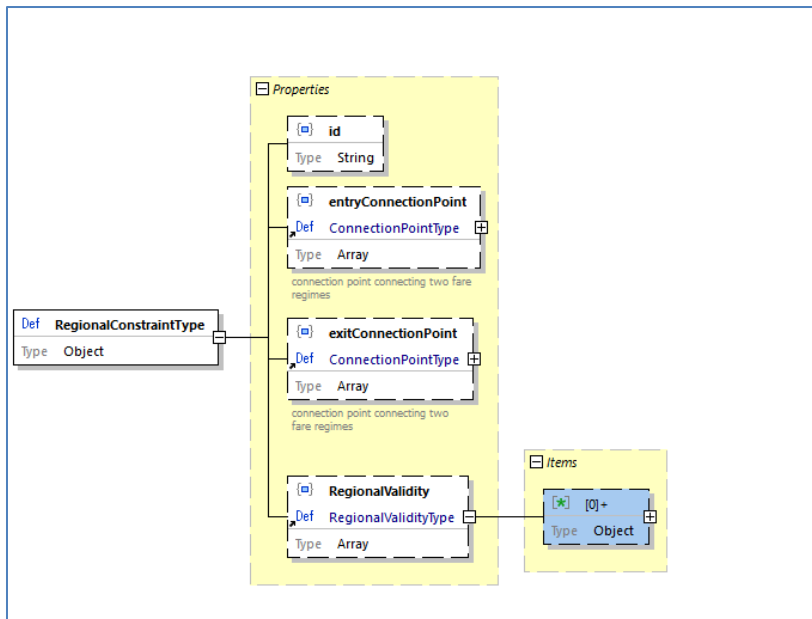


Figure 30 regional validity constraint data structure

The regional validity contains also content that is applicable to synchronous data transfer only (e.g. train links for train bound offers).

The data structure “RegionalValidity” is defined in UIC IRS 90918-4 and included by reference only. It provides a sequential list of region definitions that can be defined as zones, lines, train links (online version only) geographical areas (polygons) and route descriptions (via-stations). The route description is extended to include fare reference station sets within the route.

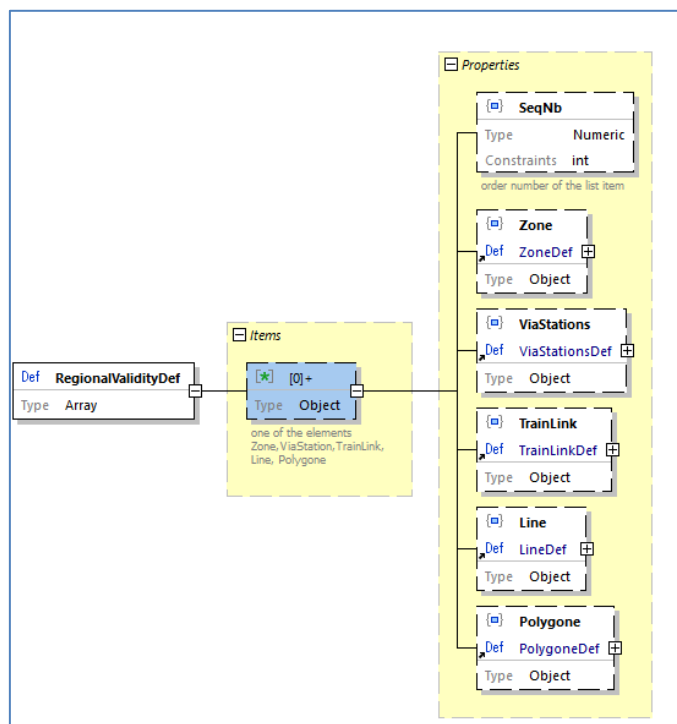


Figure 31 regional validity data structure

## IRS 90918-10

Extended route data structure including fare reference station sets.

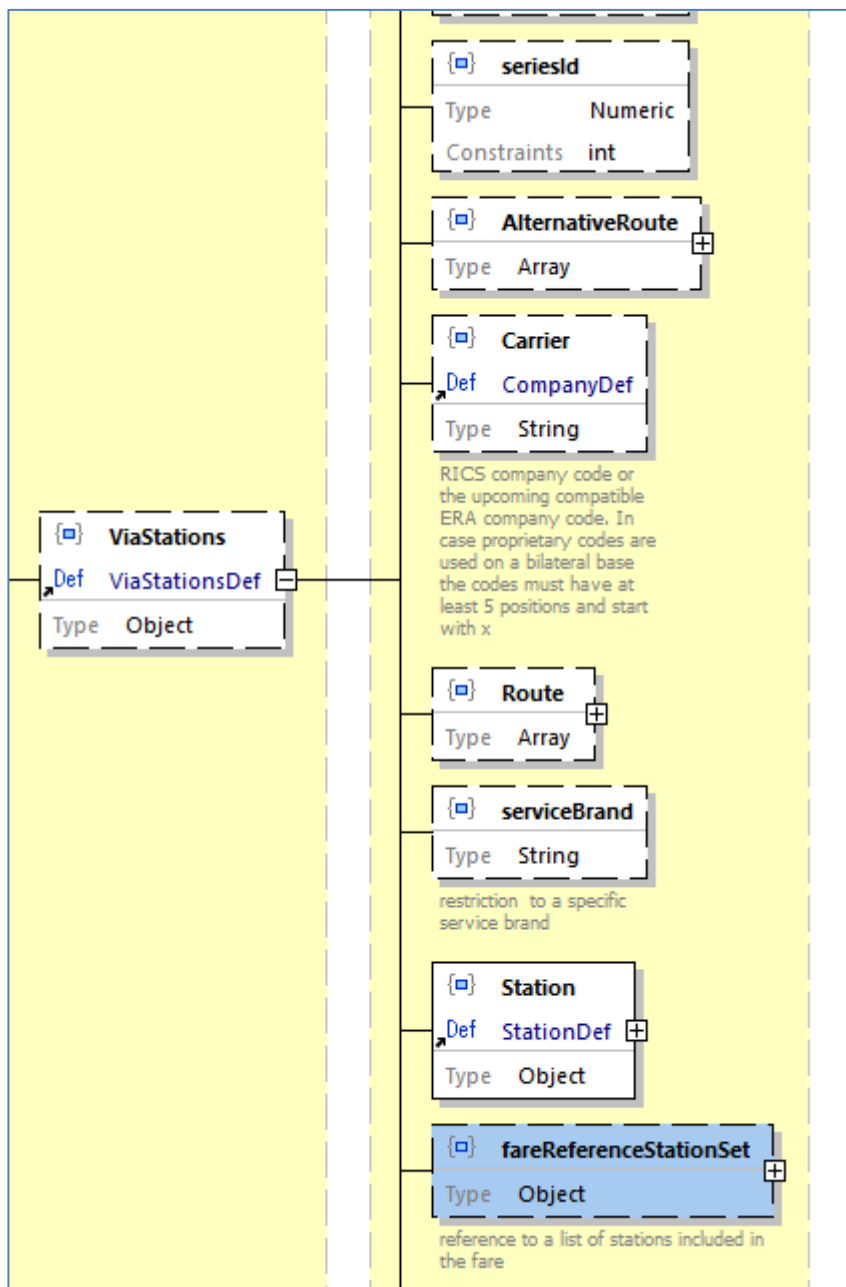


Figure 32 route description (ViaStation) data structure

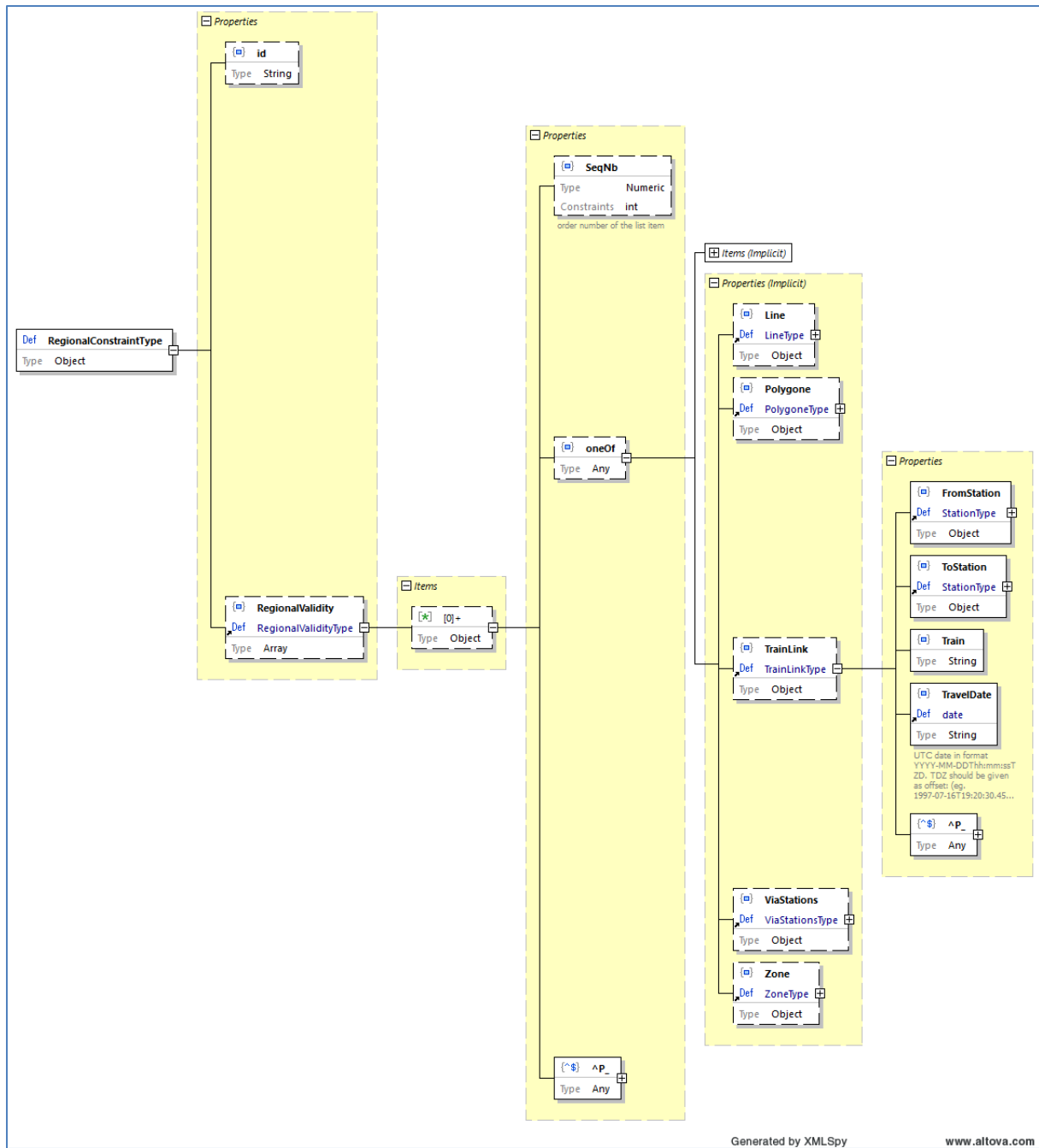


Figure 33 RegionalValidity data structure - copy of 90918-4



## IRS 90918-10

### ReservationParameter

ReservationParameter provide data on how to combine reservations with NRT fares, how to book reservations via the 90918-1 interface and which options a traveler has for reservation.

reservationRequired	A reservation must be made accompanying an NRT ticket.
reservationParameters981-1	Parameters to request the correct reservation using the interface according to IRS 90918-1
reservationOptions	<p>Reservation options available that would not change the offer (same price and conditions) (e.g. Aisle or Window). The information is static and does not mean that such an option is still available.</p> <p>The preferences are grouped in case a selection is required (Aisle or Window).</p>

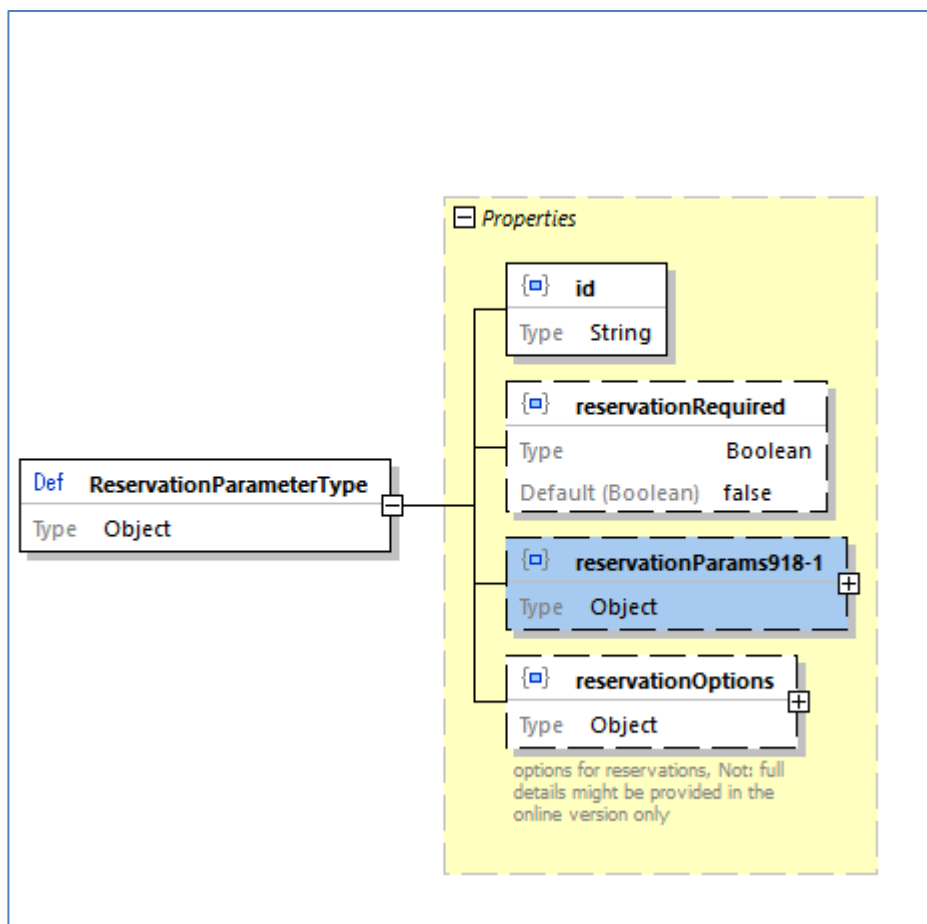


Figure 34 ReservationParameter data structure

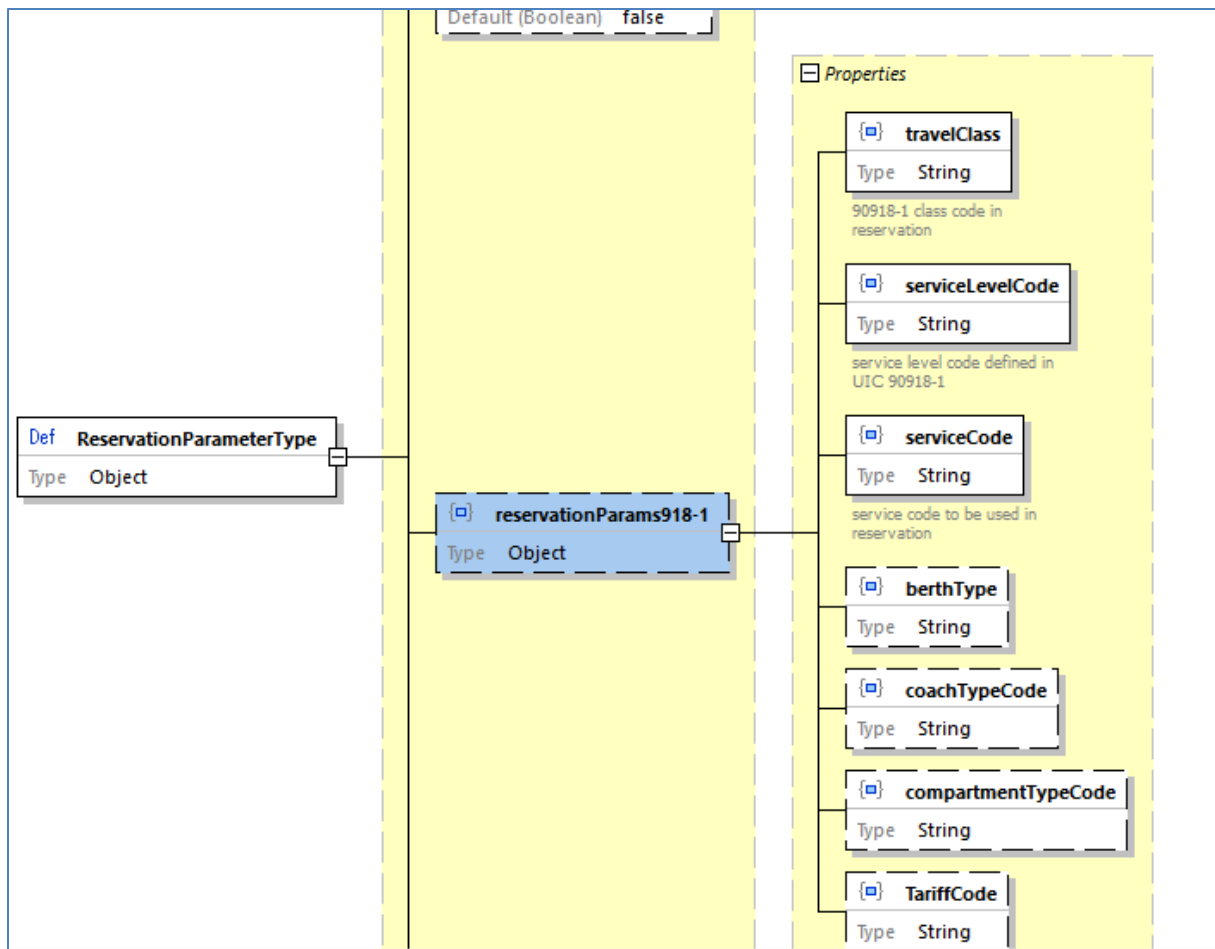


Figure 35 Reservation Parameter - support for 90918-1 reservation interface

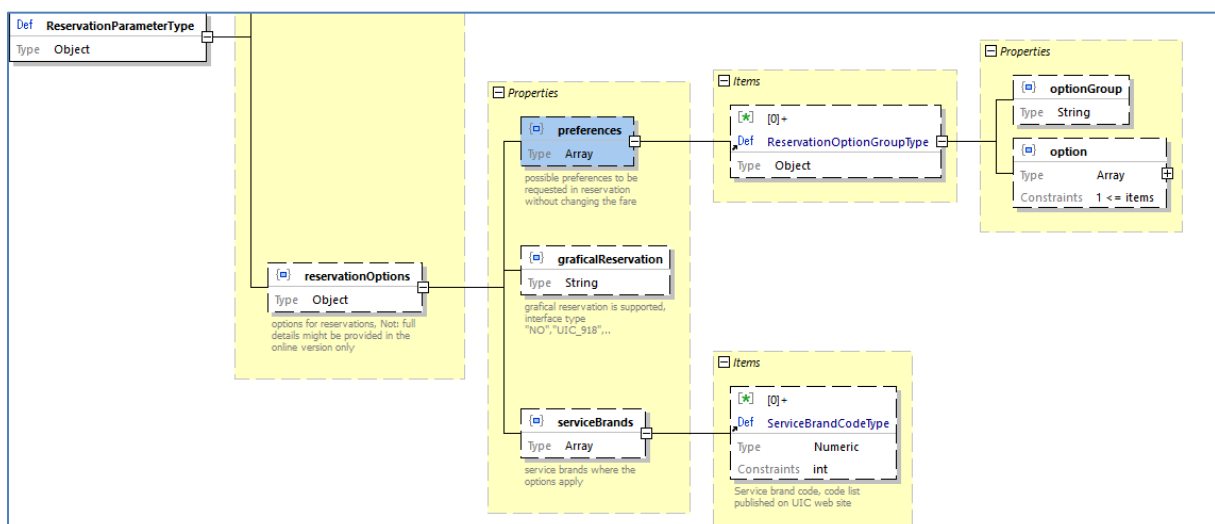


Figure 36 ReservationParameter data structure - reservation options

- Code list Preference Groups: see Preference groups
- Code list Preferences: see Preferences of places

## StationDetail

StationDetail is used to provide station names in local character sets and in more readable Upper/lower case letters as long as MERITS is not able to deliver these.

The station codes must be included in the MERITS station code list.

Station names should not include "/" , "\*" .

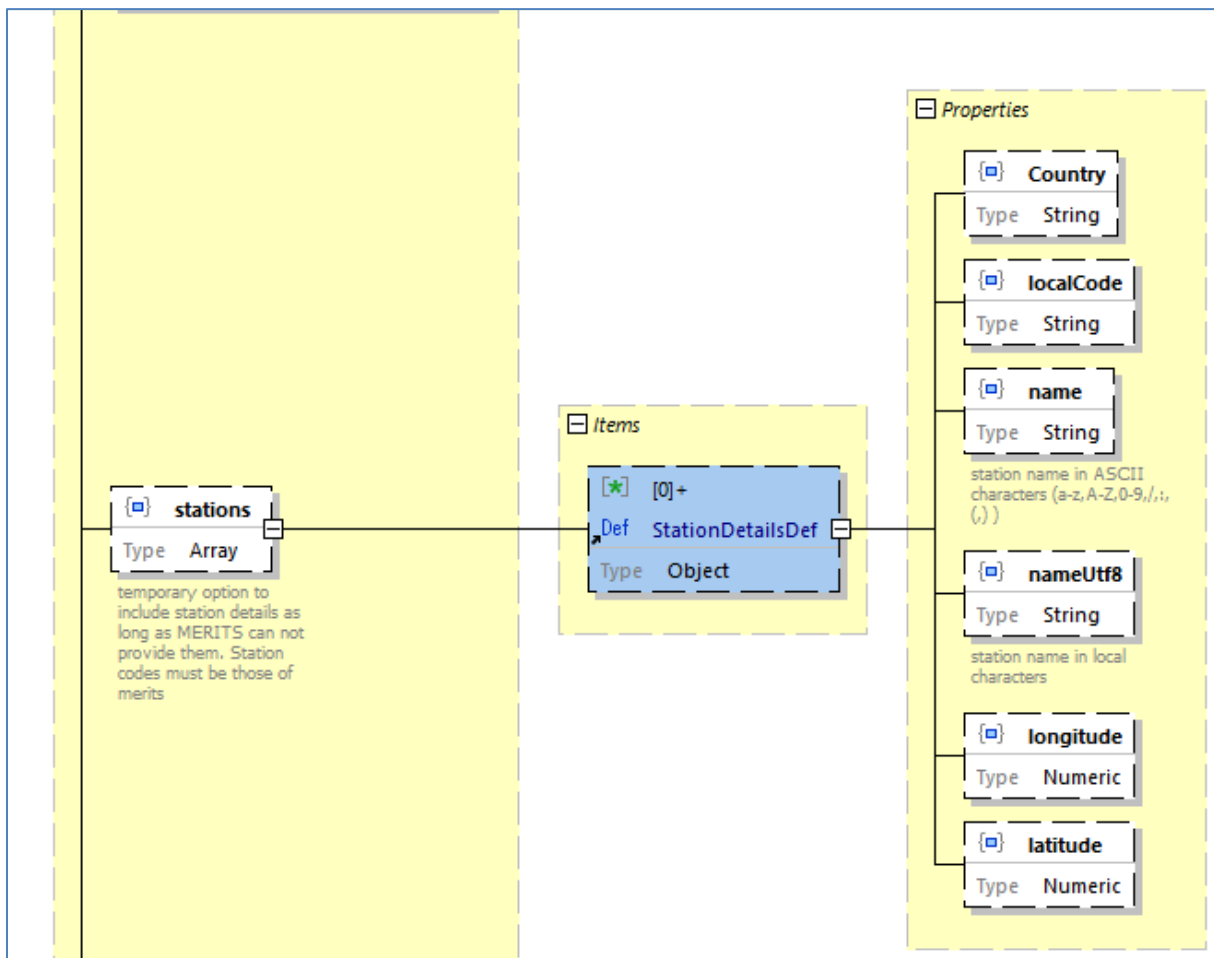


Figure 37 structure Station detail data

## Text

Used for all textual descriptions where translations might be needed.

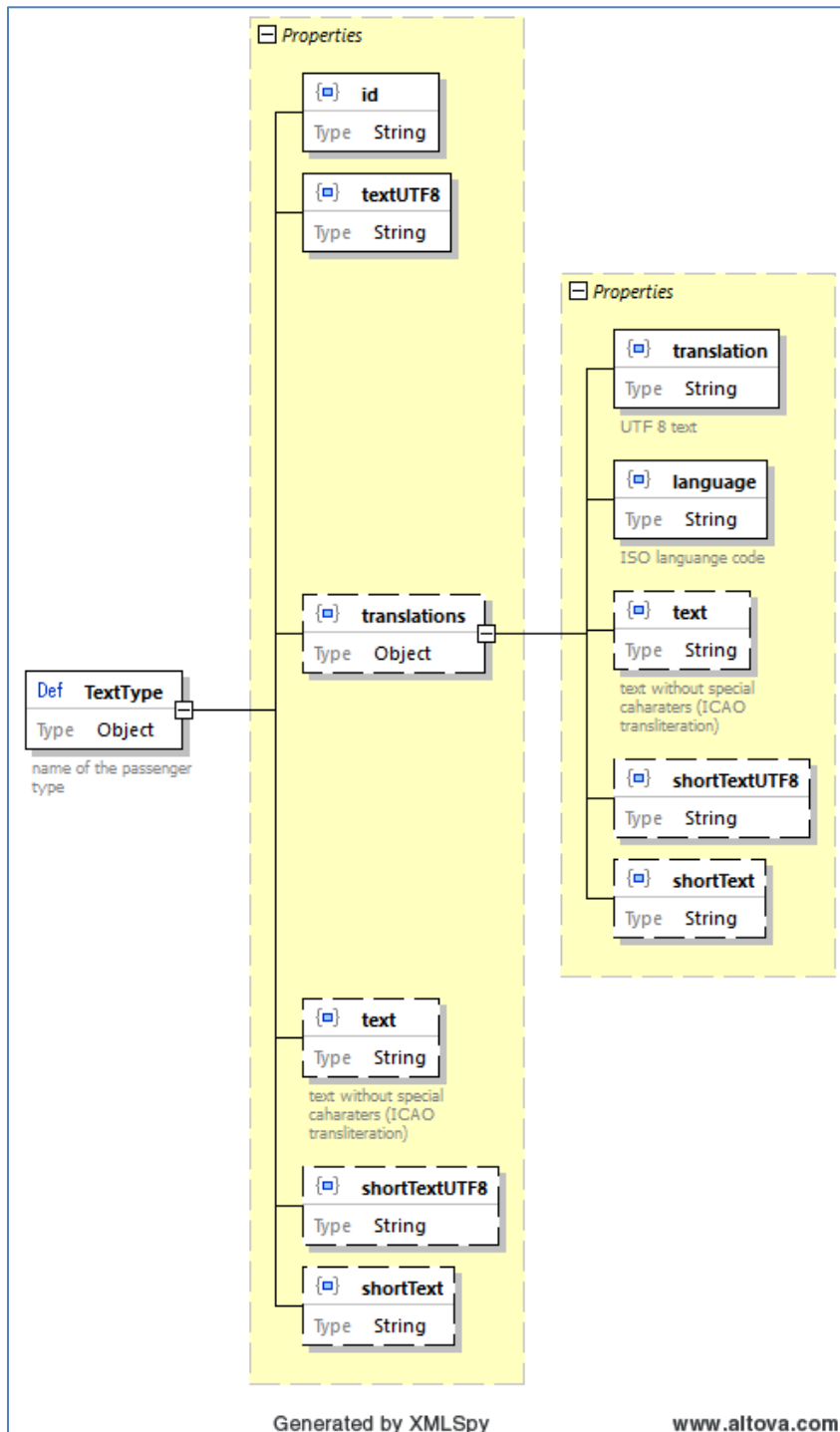


Figure 38 Text data structure

## SalesAvailability

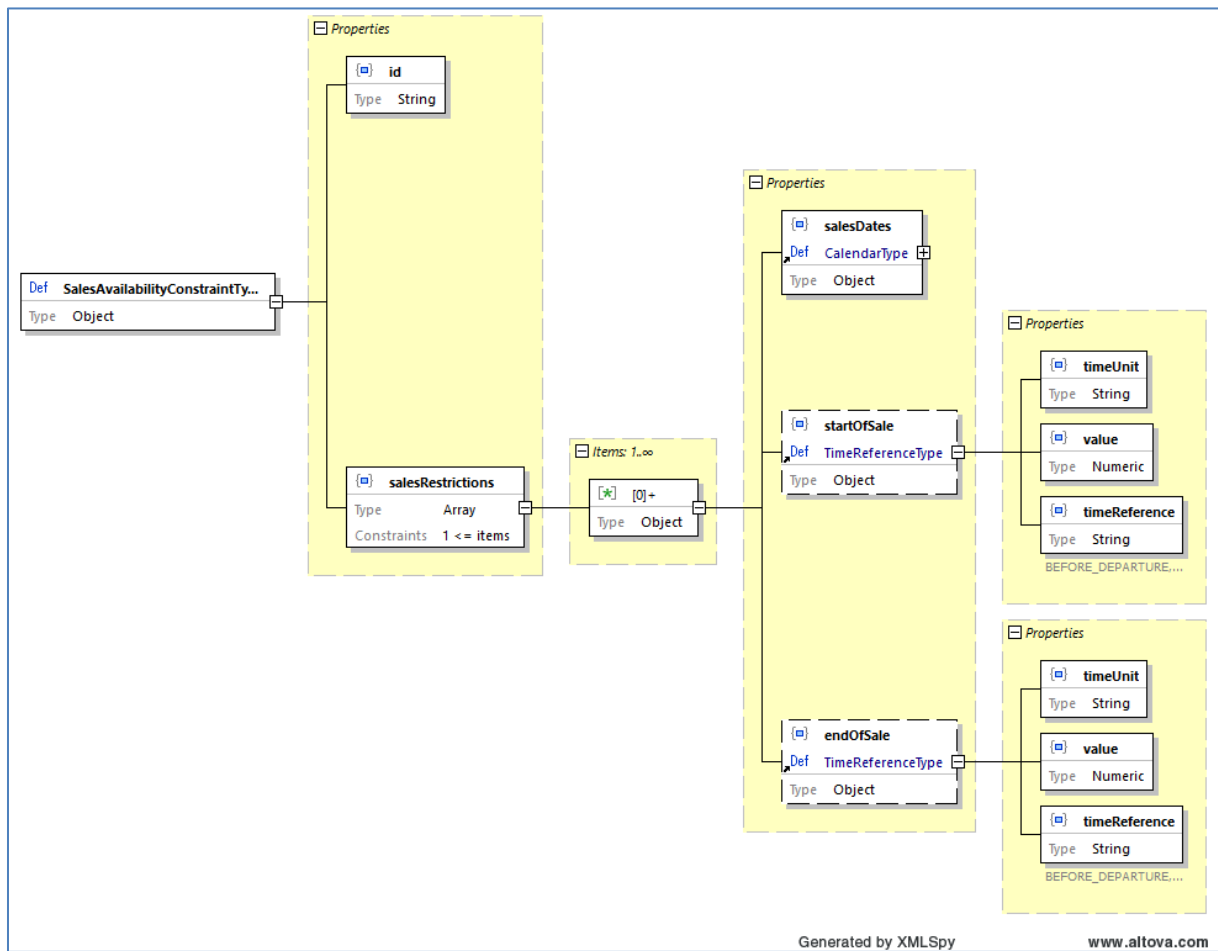
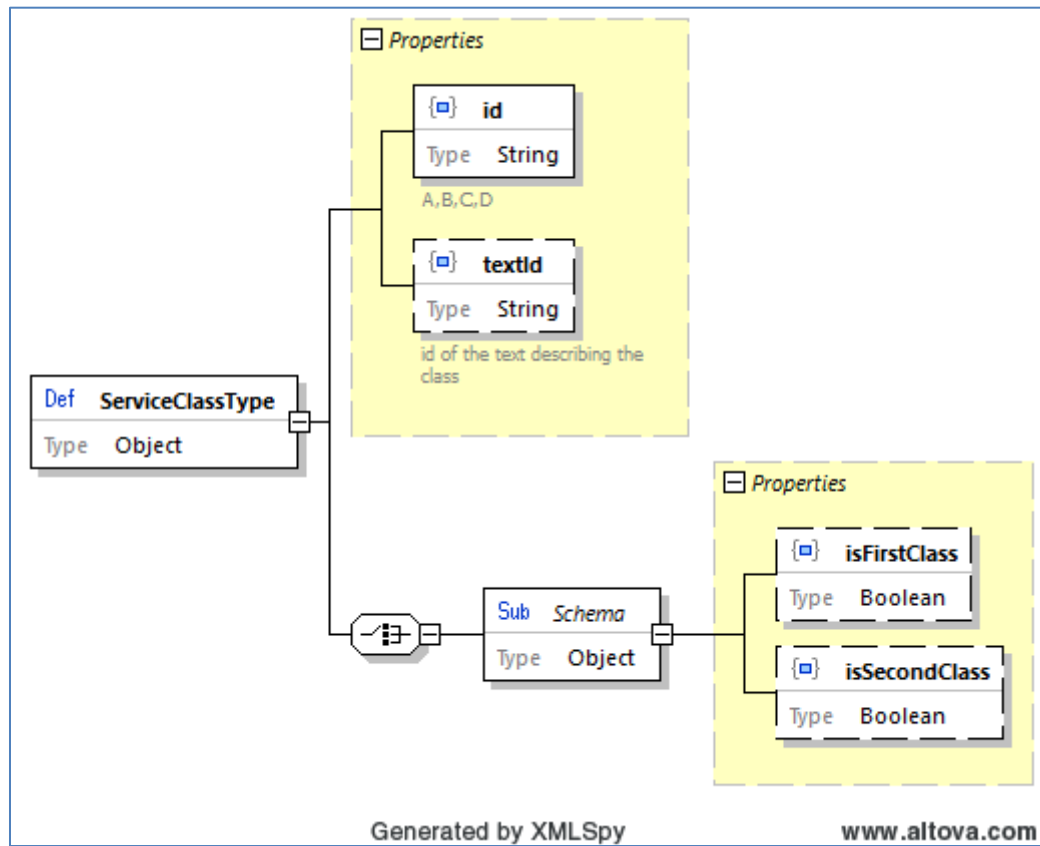


Figure 39 SalesAvailability data structure

Data constraints	
startOfSale, endOfSale	startOfSale < endOfSale

## ServiceClass



## ServiceConstraint

The service constraint limits a fare to specific service brands (train types). The constraint can either be defined as a list of service brands included or as a list of service brands excluded for the fare.

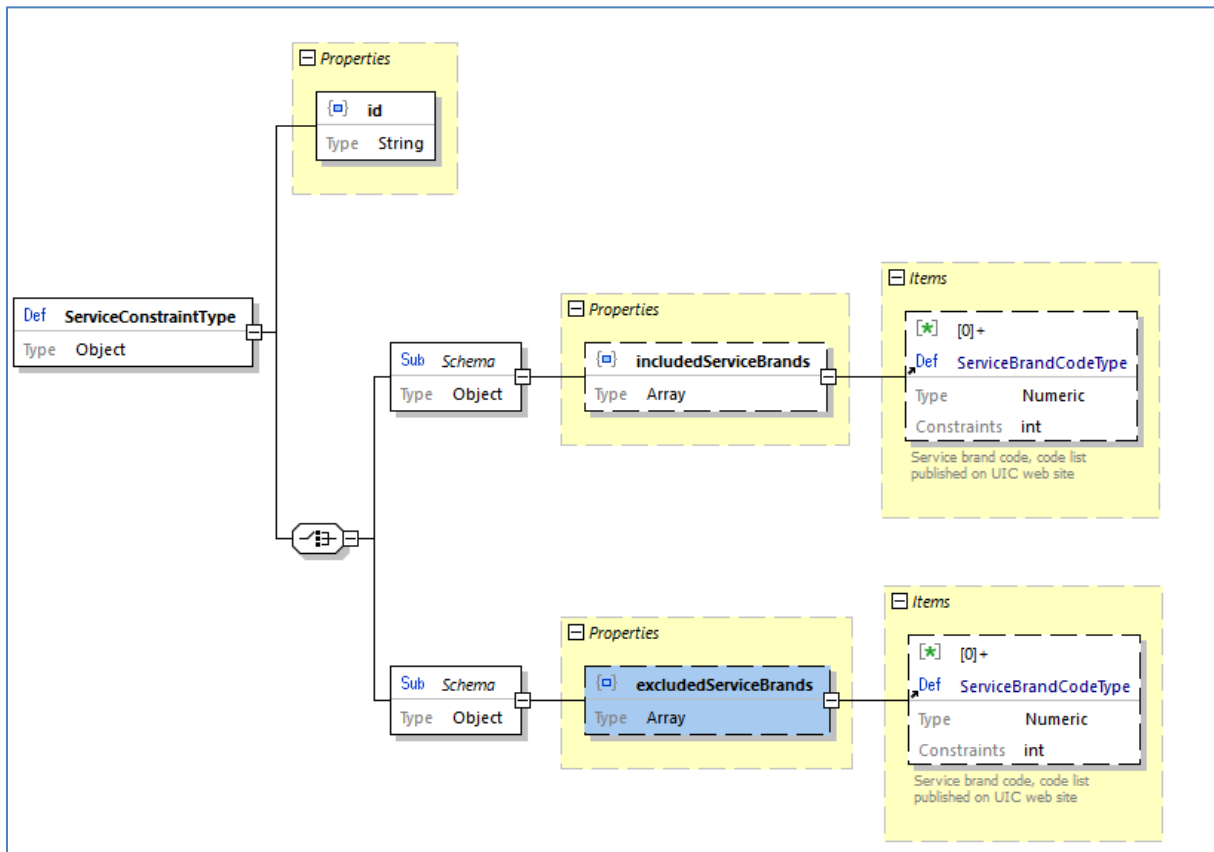


Figure 40 service constraints

Data constraints	
includedServiceBrands, excludedServiceBrands	Only one of the lists can be used. Using both lists is forbidden.



# IRS 90918-10

## ServiceLevel

Description of a service level. The service level defines a specific product on a train which can have a price (e.g. Double places with shower, ...). It is more specific than just the classic travel class.

The available service levels are defined in IRS 90918-1 element 308 (Service level code). The data indicate the service class that needs to be booked in case the reservation is not an IRT and parameters needed for reservation via the 90918-1 interface.

Some service levels might require a mandatory reservation.

Additional to a service level there might be reservation options that do not affect the price. There are listed in reservation options. (e.g. Upper or lower berth in the service level for double Sleeper compartment).

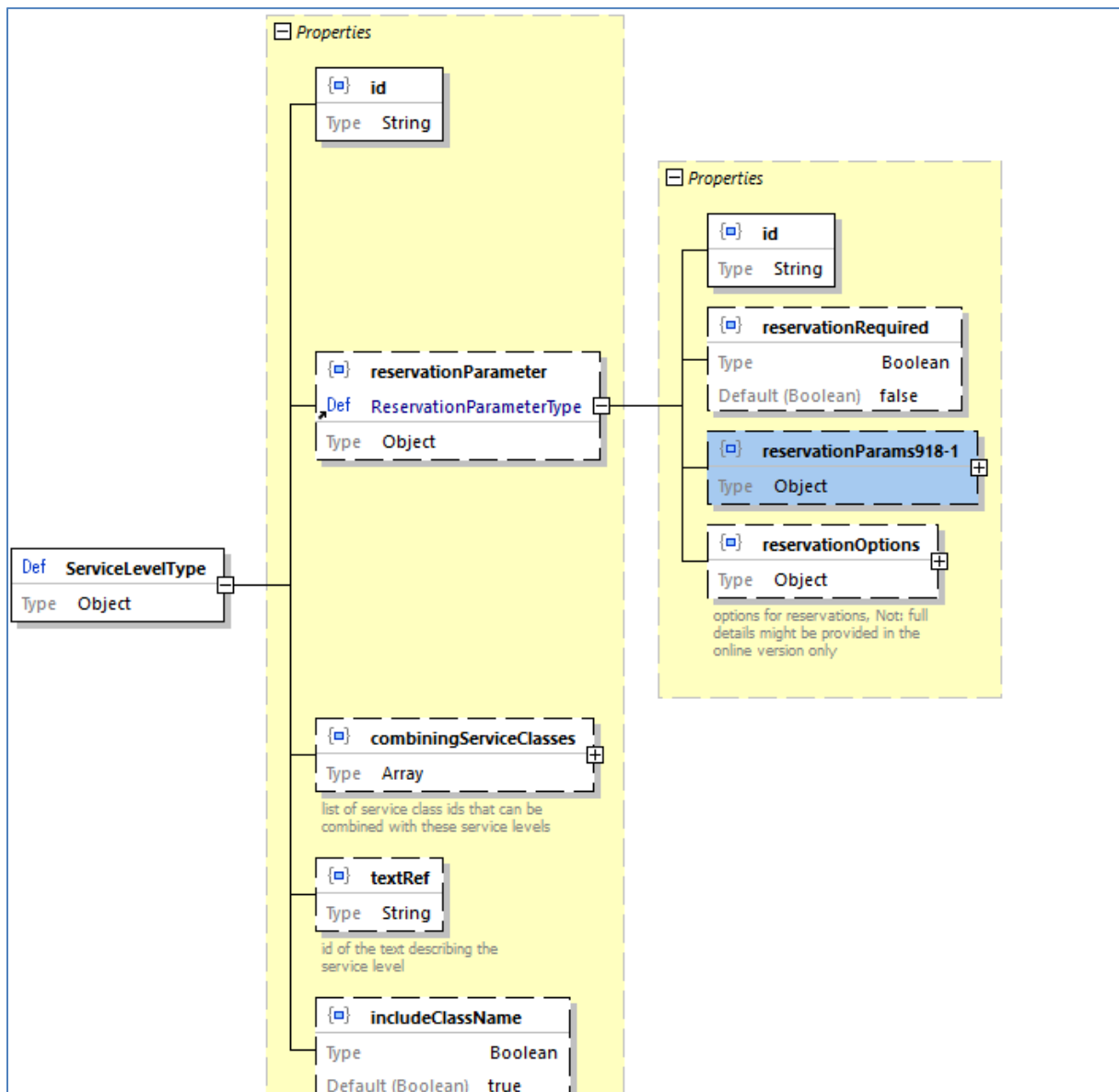


Figure 41 Service level description

## Trip

The trip describes the travel solution the customer has chosen from a time table system. The trip is an ordered list of segments where each segment contains a vehicle for the transport, a list of stops which must include departure and arrival of the vehicle and optionally a transfer to the next vehicle in the list. The transfer will not be part of the offer.

Note: The allocator is responsible to create the trip data and to obey the minimal connection times provided by the carriers and station managers as part of the time table data. Providing an offer does not imply that the connection time in the transfer has been validated by the carrier. However the carrier is allowed to reject an offer due to a violation of the minimal connection time.

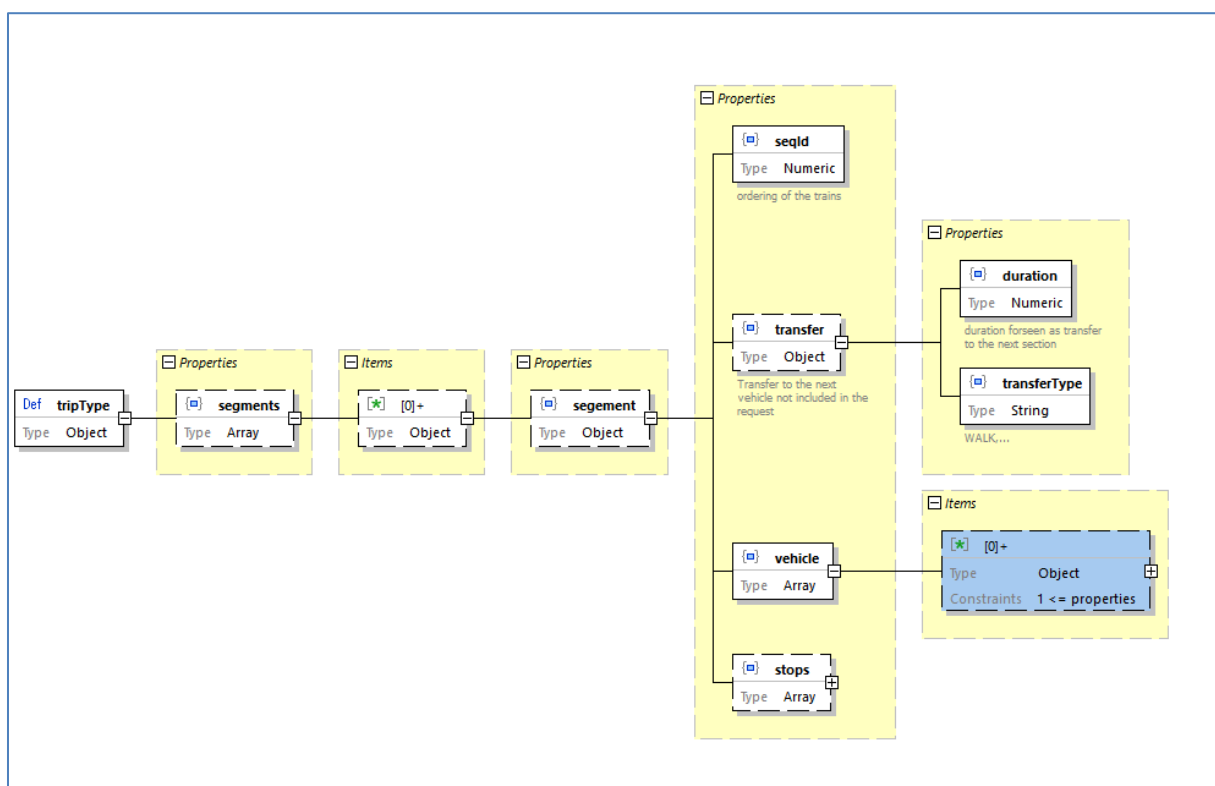


Figure 42 Trip data structure

Codelist: TransverTypes

## IRS 90918-10

The vehicle is identified via an array of numbers or a line number (in case of local transport there might not be dedicated number for the vehicle). Multiple numbers can be included in case of coupled trains running together but with different train numbers.

Note: The number is the train number **not** combined with the service brand abbreviation (e.g. TGV 4711 has number 4711).

The service brand code contains valid codes from the service brand code list (UIC/ TAP-TSI) only.

The transport mode has been added to align the content with FSM. The valid codes must comply with the service brand code list (UIC MERITS/TAP-TSI).

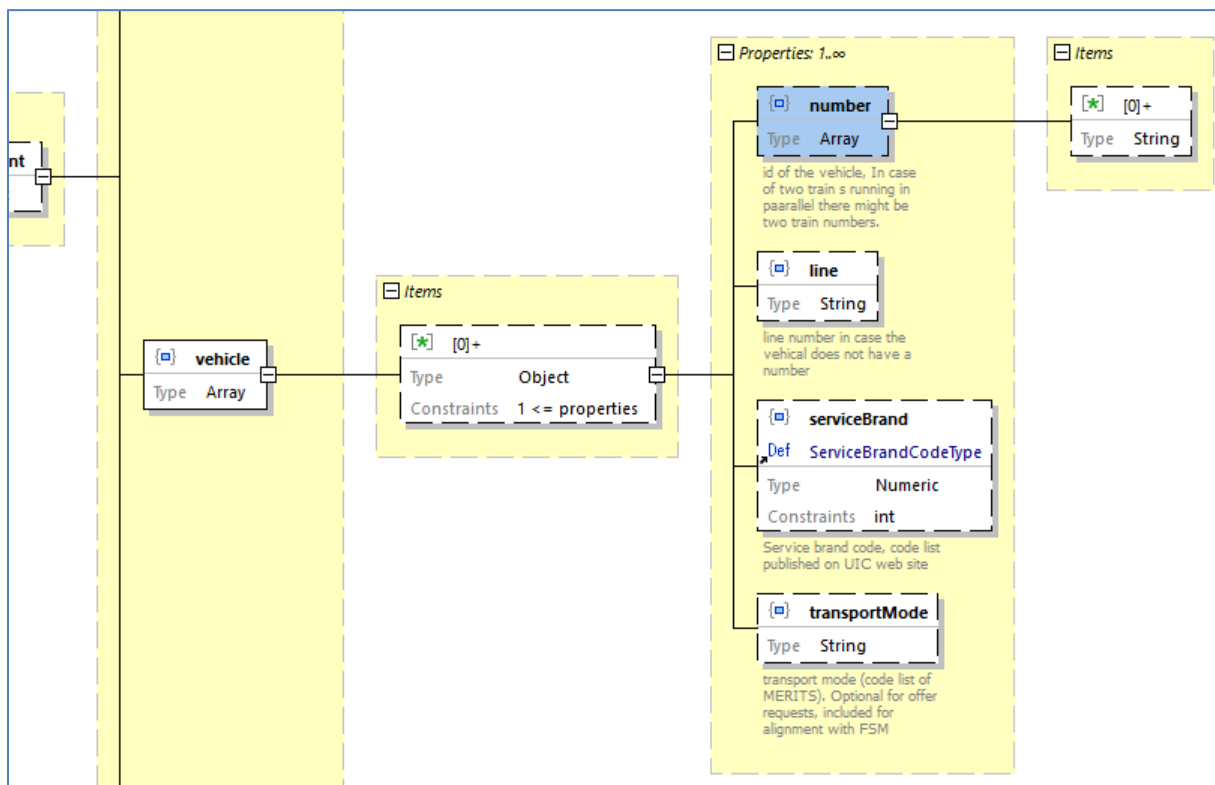


Figure 43 trip data structure - vehicle

## IRS 90918-10

The stops include the station and the arrival and departure time. Intermediate stops can be added as well.

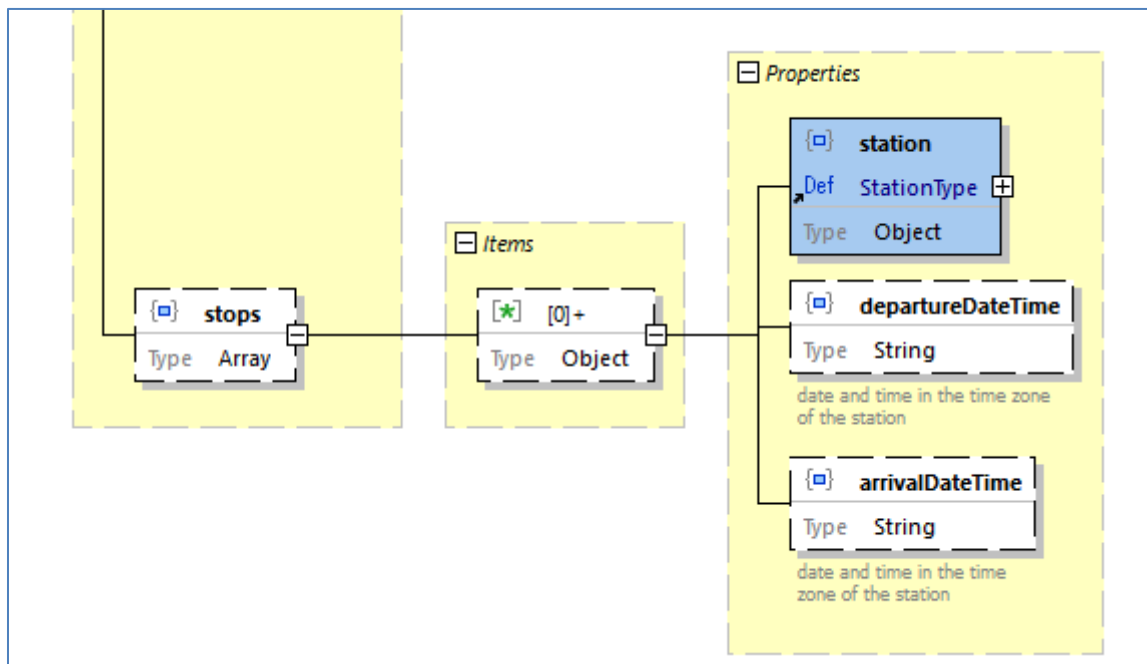


Figure 44 Trip description - stops

**TravelValidityConstraint**

The travel validity constraint defines at which times the traveler is permitted to travel.

Data	
travelValidity	Calendar defining the days on which travelling is allowed
validityRange	Duration of validity for a travel contract including extensions for some hours after midnight.
ExcludedTimeRange	Time range(s) excluded from travelling
numberOfTravelDays	Number of allowed travel days
returnConstraint	Restrictions on the time between the trip and the return trip.

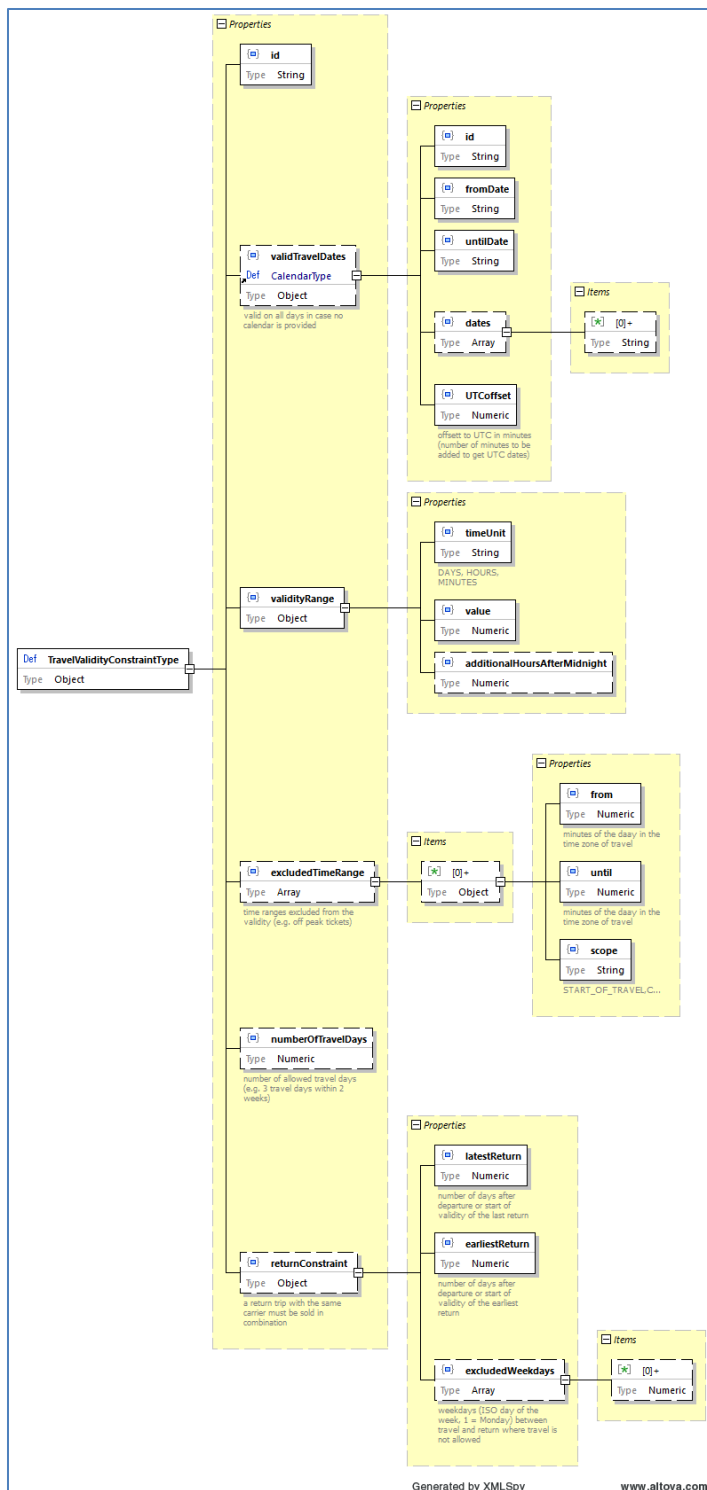


Figure 45 travel validity data structure

Data constraints	
ExcludedTimeRange	from time < to time
numberOfTravelDays	A duration must be provided
returnConstraint	earliestReturn < latestReturn

## ZoneDefinition

Definition of Zones used in regional validity.

The area of a zone can be defined by either a list of stations, geographical polygon of a list of NUTS codes. Multiple definitions are allowed in case they define the same area.

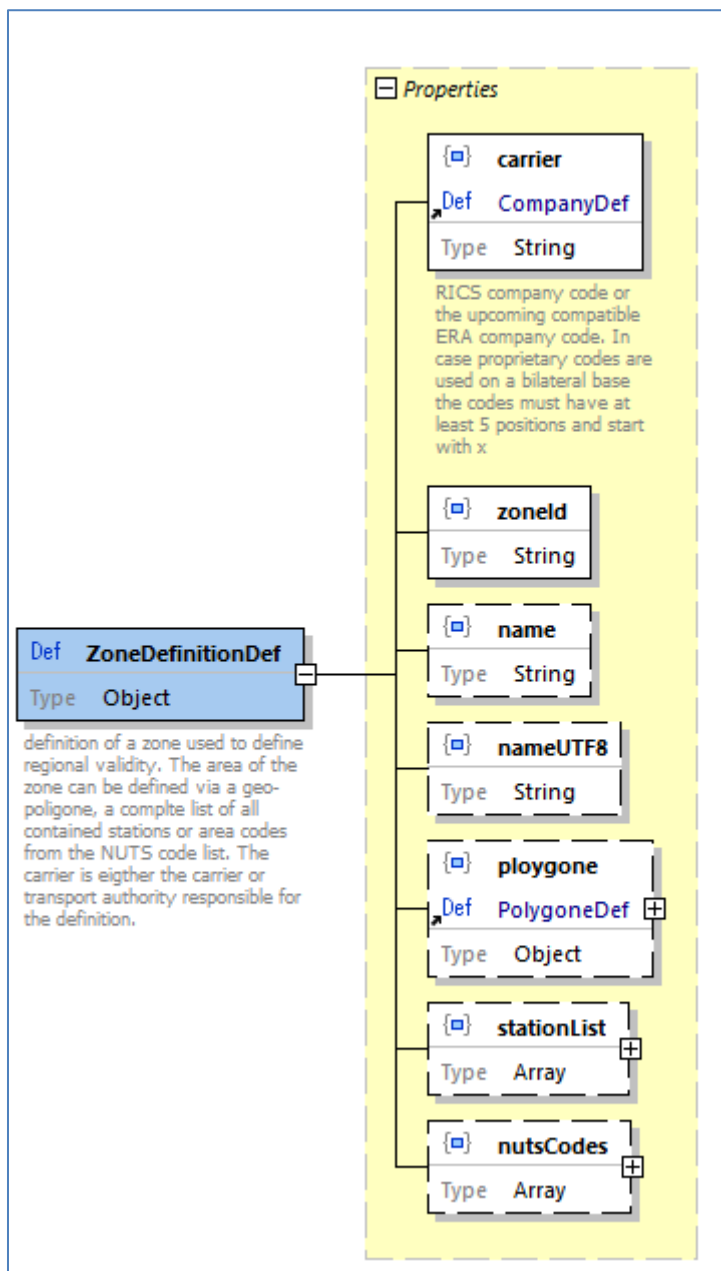


Figure 46 Zon definition structure

## Versioning

## IRS 90918-10

The data definition is versioned with a mayor and minor version number (e.g. 1.1). The mayor version number will be updated when a breaking change occurs so that the data according to different versions of the schema cannot be read with a reader expecting a different version.

Minor version will be introduced in case of changes that include additional data elements.

A minor minor version (1.1.1) might be introduce with changes on documentation only.

A mayor version must be expected every two years and minor versions in-between unless otherwise decided by the responsible UIC groups.

## Asynchronous data transfer

### Versioning

The data delivery will contain the version number and the version number which is required to process the data. Also, a change in a minor version might restrict the usage of older version in case a carrier used a new optional feature which is mandatory to his fares.

### Automated bulk data exchange

Automated asynchronous bulk data transfer is implemented by queues. The queues must implement the AMQP 1.0 specification (<https://www.amqp.org/about/what> ).

On bilateral agreement other queue technologies might be used between two systems.

Queue authentication and encryption must use TLS version 1.2.

AMPQ Header Parameter:

Parameter	Usage
message-id	Technical id of the data transfer, not the data delivery id in the data.
user-id	
to	
subject	„fare-data-delivery_“<version>
reply-to	N/A



correlation-id	N/A
content-type	application/json
absolute-expiry-time	1 year ahead
creation-time	Time stamp when the data are put to the queue
group-id	
group-sequence	
reply-to-group-id	

## Asynchronous fare data delivery

The fare structure delivery is the bulk data object collecting the fare data (“FareStructure”) of a delivery and the delivery meta data (“Delivery”).

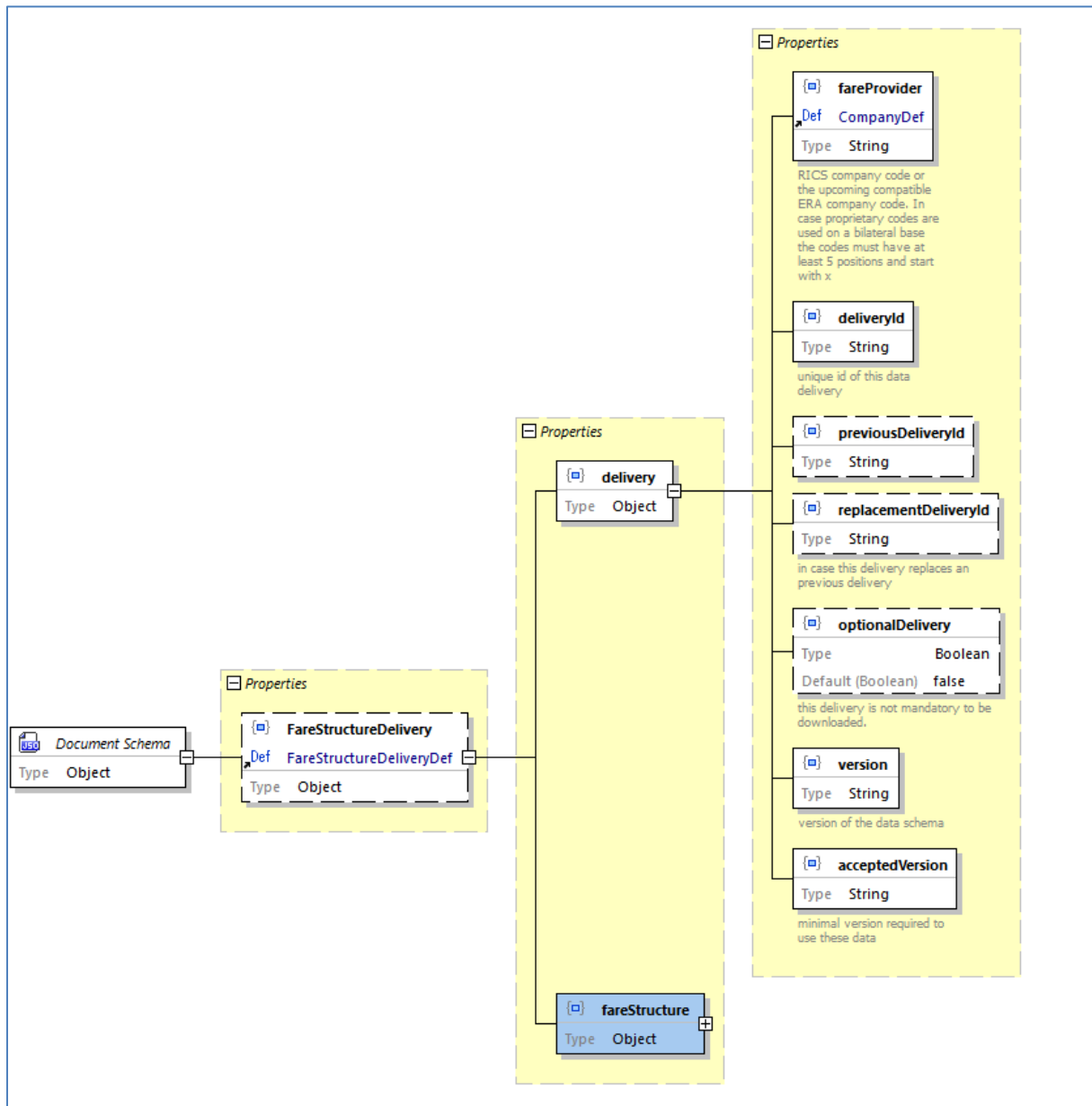


Figure 47 Data structure for bulk data

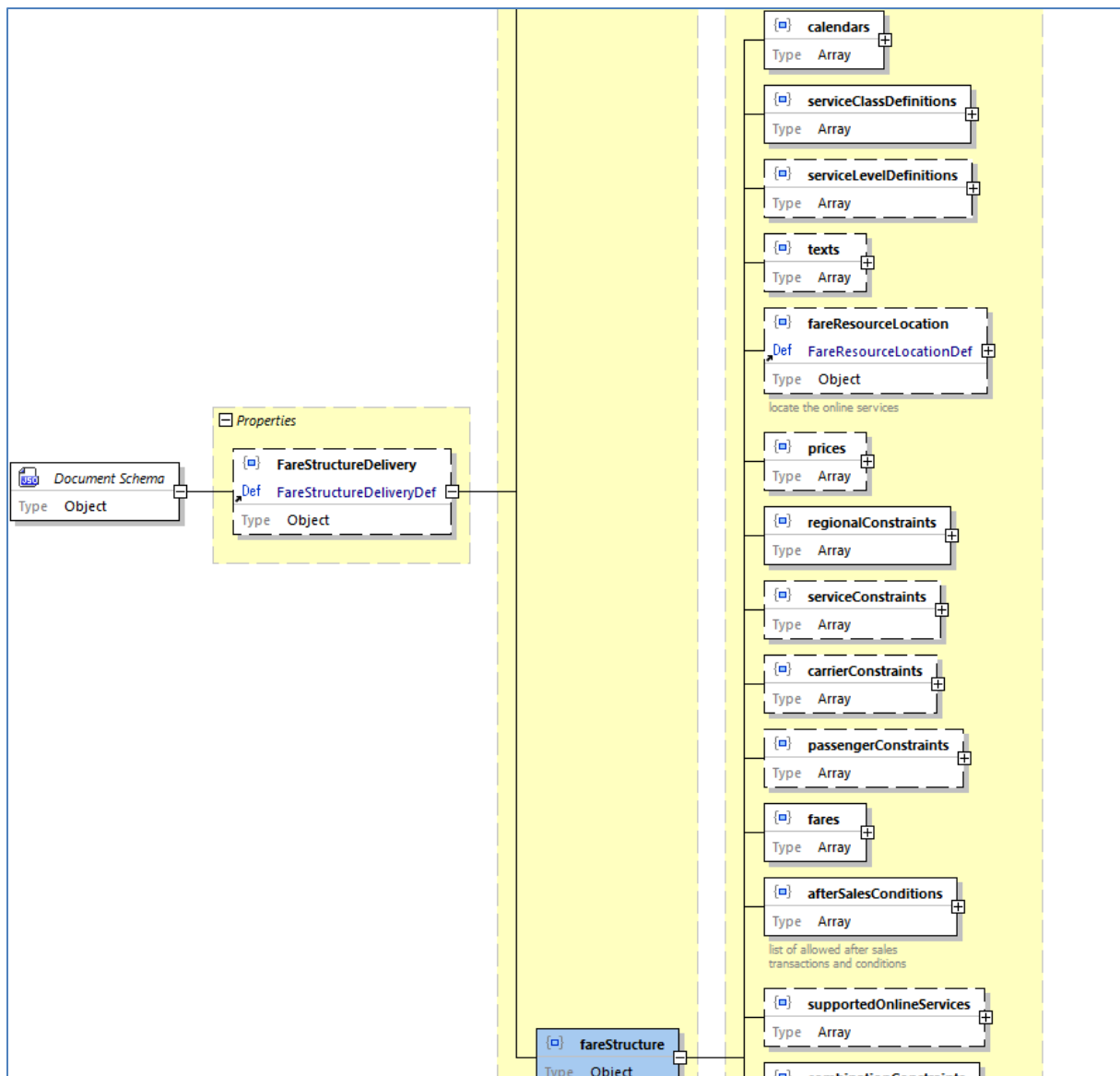


Figure 48 fare structure part 1

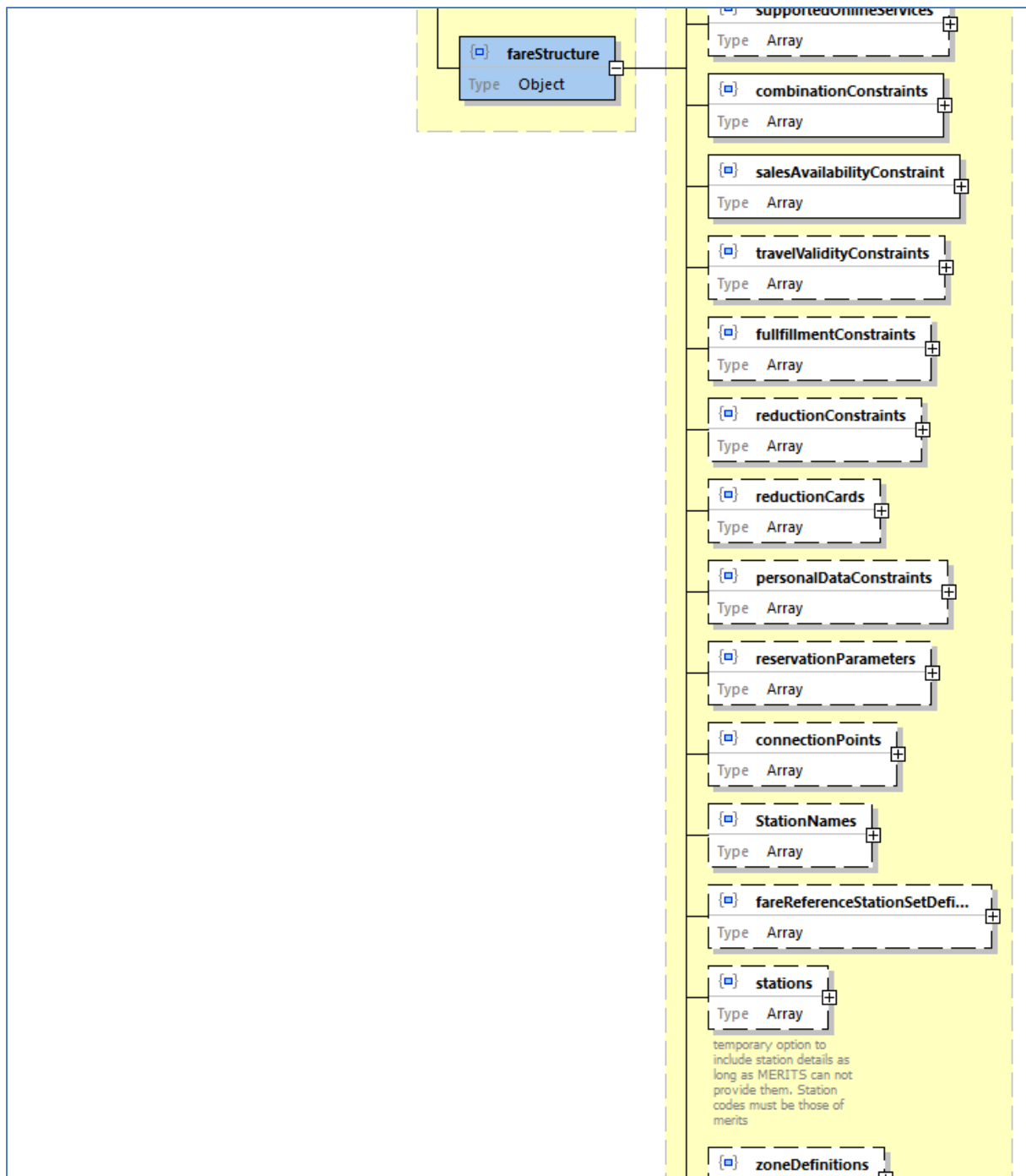


Figure 49 fare structure part 2

## Synchronous services

### General scenarios

The services defined to exchange fares online are designed to support general sales and after sales scenarios.

Here the general flow is listed, and the supporting services of the fare exchange are indicated as well as other services of UIC specifications.

### *Sales scenario*

#### Time table search

Time table data are not in the scope of this specification. It is assumed, that the issuer has retrieved a valid travel solution from a time table search engine before requesting fares.

#### Offer

Requesting fares of a carrier or train for a specified set of travelers. Splitting of the entire travel solution into appropriate parts is the task of the allocator. Data supporting the selection of the carriers to be requested are part of this specification and can be transferred beforehand (see **FareResourceLocation**).

The carrier should deliver all applicable fares for the requested offer and the rules for combining them.

The prices provided within the offer might be fixed for a specific time range depending on the fare, but this is not mandatory. Some carriers don't guarantee prices at all.

In case of offers with reservation the offer reply will contain the availability of the different fares and services, but no availability on other place features (e.g. window, aisle, ...) if they don't affect the price.

In case a trip description needs to be change as the carrier/ fare provider has more accurate data on the trip the reply contains a new trip and an indication of change.

# IRS 90918-10

## Place selection

Place selection is not in the scope of this specification.

Place selection is supported by the services defined in IRS 90918-1 (coach graphics, availability per place for graphical displays, as-if reservation of requests with preferences).

Place selection does not allocate places.

The current 90918-1 service require a detailed specification of fares and place features. The fare data of the offer defined in this specification will provide these data to allow an integration with the existing services of reservation systems. (see Reservation Parameter).

## Preliminary Booking

The preliminary booking allocates the fare for a period defined by the carrier.

In case of reservations the currently defined flow in IRS 90918-1 is different, as the preliminary booking must be implemented by the allocator receiving the reservation by cancelling the allocated fare and places in due time and with a specific reason for cancellation.

The current 90918-1 service require a detailed specification of fares and place features. The fare data of the offer defined in this specification will provide these data to allow an integration with the existing services of reservation systems.

## Payment

Payment is not in the scope of this specification. The carrier is not involved in this step.

## Confirm Booking

The booking is confirmed by the allocator to the carrier. This is the trigger for the accounting processes between the allocator and the carrier.

## Fulfilment

For combined tickets the allocator creates the ticket and is responsible to for the fulfilment.

The fulfilment is not in the scope of this specification.

## IRS 90918-10

IRS 90918-1 provides services to support the fulfilment to:

- Request an entire ticket (only in case the fare is not combined with other fares)
- Request security features to be added to a ticket (additional barcodes, visual elements, ...)

The allocator is responsible to provide the ticket data for the control by the carriers. This is not in the scope of this specification but defined in IRS 90918-4.

### *After sales scenario – cancellation*

#### Cancellation Offer

The fare description obtained with the original offer includes all information on cancellation fees in case the fees are not calculated by the allocator.

A cancellation offer from the carrier is therefore not required for the process.

A cancellation offer request can indicate a special reason for cancellation without fees due to an error of the allocator or unavailability of the service. The reason might not be accepted by the carrier.

The cancellation offer might indicate that the payment of the refund needs to be delayed checking whether the ticket has been used.

#### Confirm Cancellation Offer

A confirmed booking is cancelled.

#### Return Payment

In case of a delayed payment of refunds the allocator needs to validate the ticket control data (IRS 90918-4).

### *After sales scenario - exchange*

A cancellation offer is requested using special exchange reasons.

## IRS 90918-10

An offer for the new booking is requested with a reference to the old booking(s).

These covers:

- Exchange
- Upgrade
- Increase of travelers
- Decrease of travelers

[See Offer](#)

[See ConfirmBooking](#)

### Return Payment

No data exchange is foreseen in this step between allocator and carrier.

In case of a delayed payment of refunds the allocator needs to validate the ticket control data (IRS 90918-4) before the payment to the customer.

### *Change of personal data*

#### Change personal data

The change of personal data is not in the scope of this specification.

IRS 90918-1 provides services to change personal data for a booking.

### Reticket

The reticketing is not in the scope of this specification.

IRS 90918-1 provides services to support the fulfilment to:

- Request an entire ticket (only in case the fare is not combined with other fares)
- Request security features to be added to a ticket (additional barcodes, visual elements, ...)

The allocator is responsible to provide the ticket data for the control by the carriers. This is not in the scope of this specification but defined in IRS 90918-4.



### *Information on personal data*

In order to fulfill GDPR requirements information on stored personal data of the customer or traveler must be provided. As personal data are transferred from the allocator to the carrier the customer can ask at the issuer or allocator for information on the still stored personal data. The allocator then needs a possibility to request this information from the carrier.

The information on personal data is not in the scope of this specification.

IRS 90918-1 provides services to request the stored personal data for a booking.

### *Reservation support*

A complete set of online services is provided which would also include place allocation and fulfilment services which are currently specified in IRS 90918-1 as independent services.

## Service specification

- The services are specified as REST services with JSON.
  - Additional principles:
    - Personal data are not allowed within the service URL
    - GET is only allowed without request body
- The authentication is made according to the OAUTH 2.0 protocol.
- All services must use https at least TLS (Transport Layer Security) version 1.2.

The following features must be specified per service:

Feature	Options
Idempotency	Yes/No The same request might be resent and will provide the same answer. E.g.: <ul style="list-style-type: none"> <li>• a cancellation will reply with an ok if the previous one was ok.</li> </ul>
Compensation	Yes / No A service is available to undo or correct the result of the service.
Compensation Retry	Not available / optional / mandatory A compensation or correction needs to be repeated until it was successful.
Expected Look-to-Book Rate	Expected number of service requests per final used booking that the service must provide. Higher rates must be agreed bilaterally. If the rate is exceeded the receiver might reject requests.
Expected Response time	Expected average response time in milliseconds that a service must provide. The time includes the infrastructure of the receiver (firewalls, load balance, circuit breaker and application) but not the network in-between the sender and receiver.

## Offer

Feature	Options
Idempotency	No
Compensation	No
Compensation Retry	Not available
Expected Look-to-Book Rate	1000:1
Expected Response time	400 msec.

## Request Content:

tag	content
trip	See Trip
requestedSection	Begin and end of the requested part of the travel description. Starting an ending at a station or fare connection point
requestor requestor.distributionChannel	Requestor: Allocator or Ticket Vendor indicating its role sales office, country of sale and type of channel (in line with IRS 90918-1).
passengers	List of passenger details required for the offer.  Traveler types are required for special passengers only (e.g. PRM). For generic types (child, adult, ...) the date of birth is used.  The gender is required for night trains. In case the gender is missing offers will include mixed gender compartments or complete compartments only.

Request:

**POST /getOffer/<version>/{..}**

Reply:

HTTP reply codes

http code	http meaning	usage
200	ok	Used in case the request could be processed. The reply could contain offers of indications on functional errors.
201	created	Not used
202	accepted	Not used
204	Reply intentionally empty	Not used
400	Bad request	Used in case of syntactical errors <ul style="list-style-type: none"> <li>• schema violation</li> <li>• undefined codes</li> </ul>
401	unauthorized	Authorization error on a technical level (OAUTH 2.0 authentication)
404	Not found	No offer found
408	Request timeout	Request was not received completely
409	Conflict	Not used
424	Dependency conflict	Not used
429	Too many requests	In case a load limiter or circuit breaker rejects the request
500	Internal server error	In case of technical errors within the server (internal time out, unavailable resources, ...)

Payload error descriptions:

Code	Type	Description
	Type of error to address the internal staff to monitor and analyze errors	<p>Description of the error to be used in logging for error analysis.</p> <p>The description is not passed to a customer.</p> <p>English language must be used.</p>
DEPARTURE_PASSED	FUNCTIONAL	Departure of the requested section in the past

## IRS 90918-10

FULLFILLMENT_NOT_SUPPORTED	FUNCTIONAL	No offer for available fulfilment options
BOOKING_STILL_CLOSED	FUNCTIONAL	Booking is not yet possible
SOLD_OUT	FUNCTIONAL	Offers were available in the past but are sold out
CLOSED_DUE_TO_CONSTRUCTION	FUNCTIONAL	Offers cannot be provided due to construction work.
CONTENT_ERROR	CONTENT	The wrong code and an indication of the element affected should be in the description.

Request body:

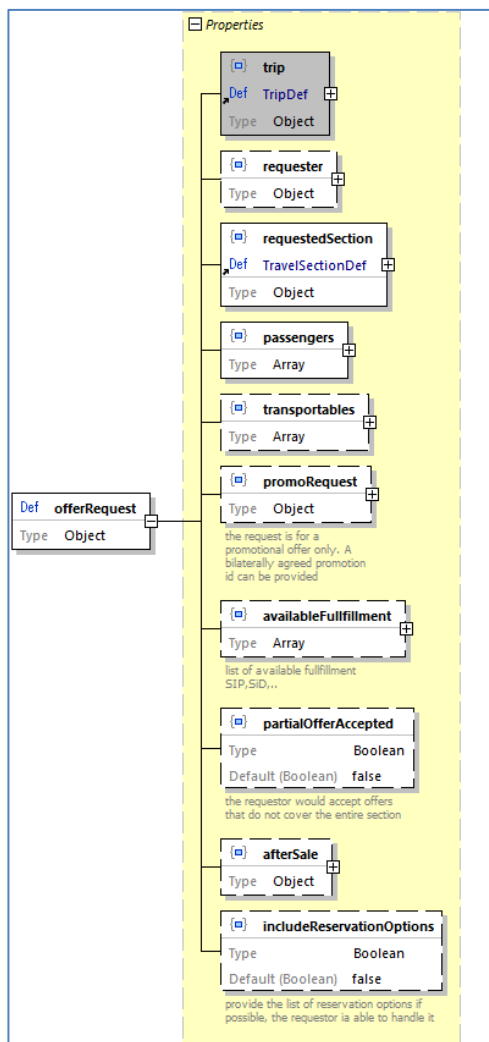


Figure 50 offer request data structure

The requested section data define the part of the trip where an offer is requested. The sections do not necessarily correspond to a vehicle in the trip, the requested section can include multiple trip sections or parts of a trip section (in case the carrier of a vehicle changes in-between).

The section is defined by a start and end point which can either be stations or connections points in-between stations.

For offerParts the requested section must start and end at a real station.

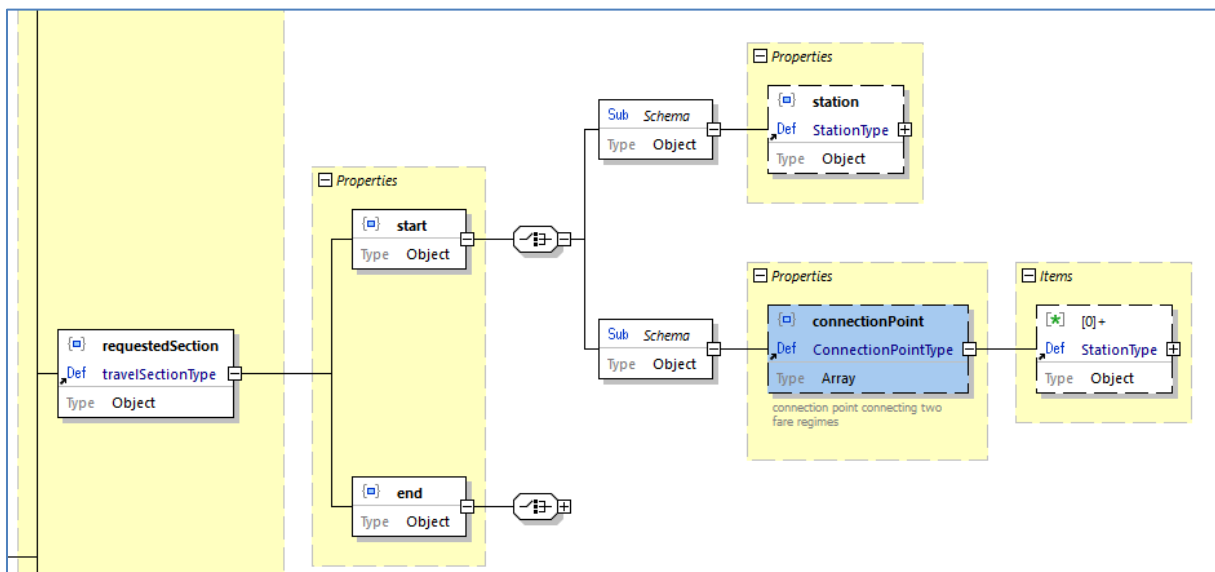


Figure 51 offer request - requested section

## IRS 90918-10

The sales channel provides information on the requesting organization in line with the data used in IRS 90918-1.

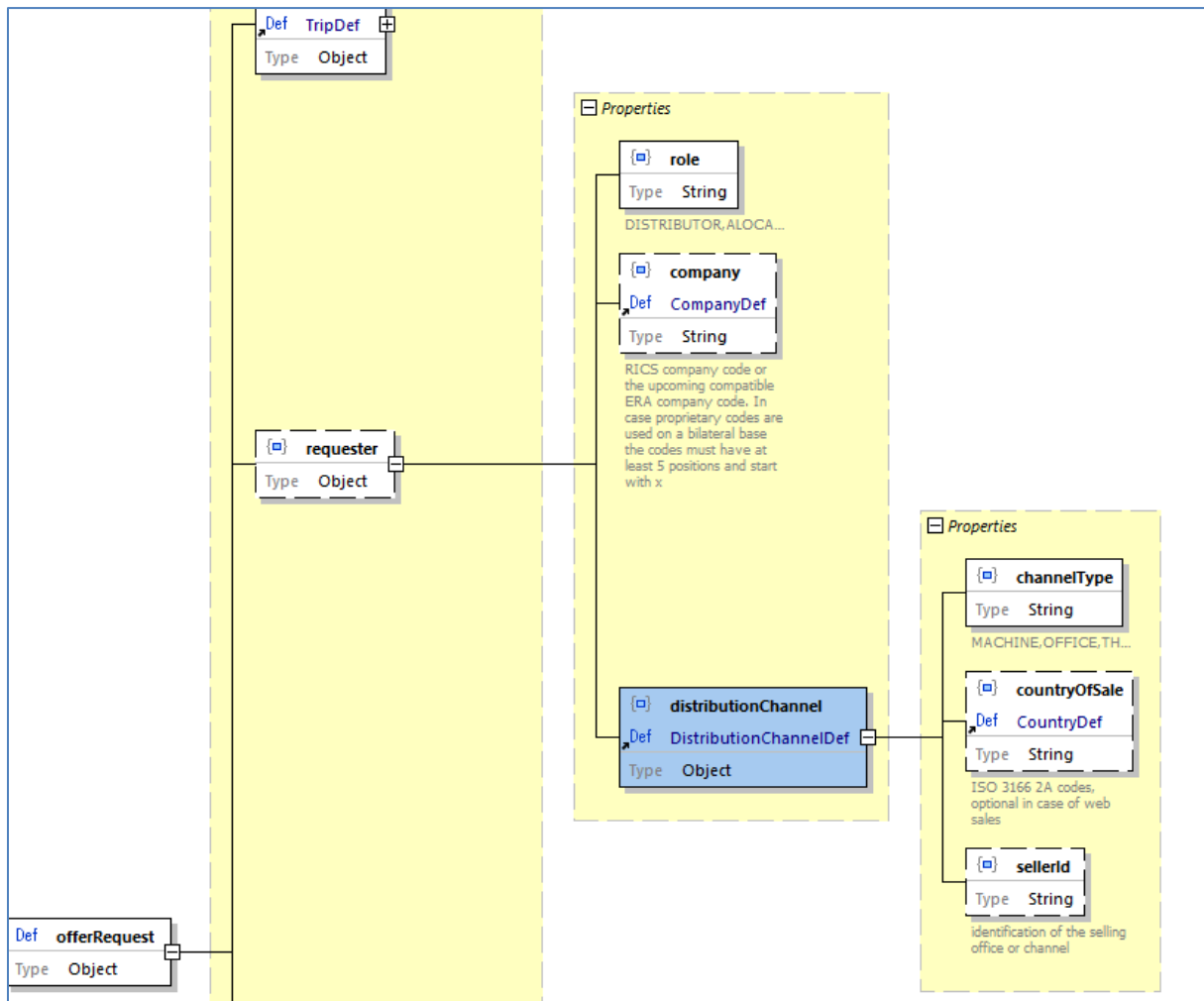


Figure 52 sales channel data structure



## IRS 90918-10

The passenger data provide the basic information on the included passengers needed to provide an offer. The data do not include personal data to identify a passenger.

Traveler Id	to identify the passenger within the context of the offer. It is not allowed to use identifiers that allow an identification of the individual passenger beyond the offer context.
Date of birth	used to select the appropriate reductions based on the age
gender	used to provide offers in partially used sleeper compartments
traveler type	used to identify special traveler types not related to an age
reductions	Reductions the traveler holds.

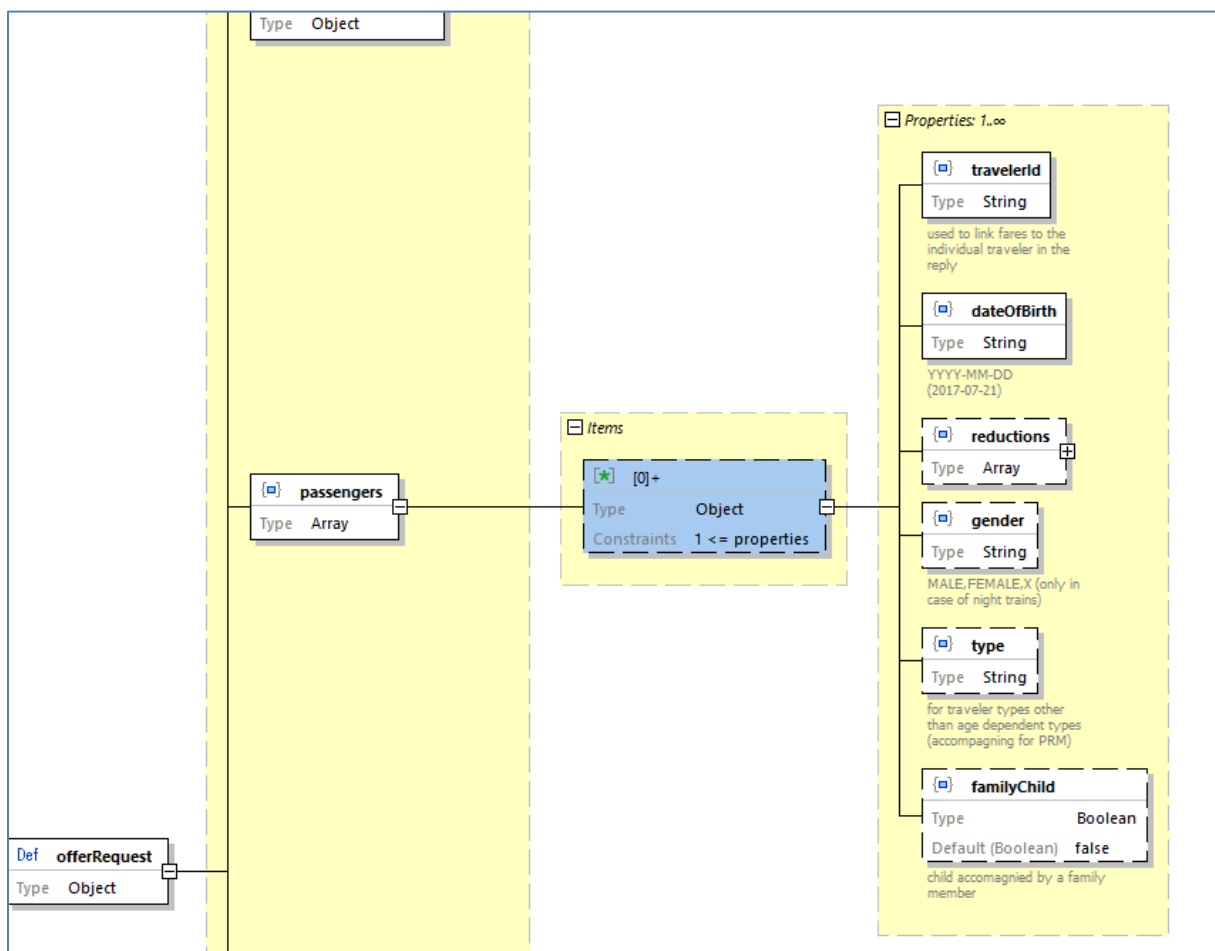


Figure 53 offer request - passenger data structure

## IRS 90918-10

A bilaterally agreed identifier for promotional offers can be supplied to request offers for this promotion.

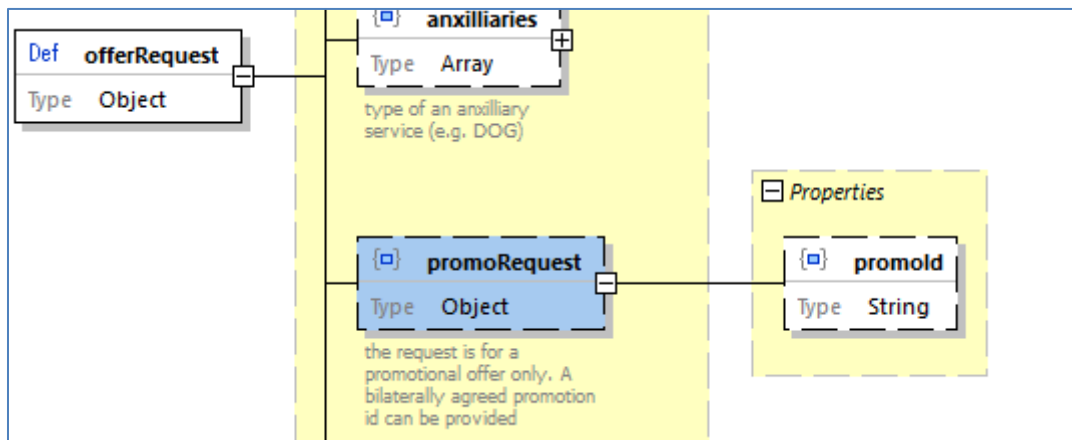


Figure 54 offer request - promo data structure

The reductions are based on cards, tickets or passes the traveler owns. All possible reductions can be provided, it is up to the carrier to select the reductions that can be applied for the offers.

It is possible that one card can hold different reductions, the traveler must select the appropriate reduction before making the request.

The reduction card id is not transferred in the offer request as it would allow an identification of the passenger and belongs to the personal data.

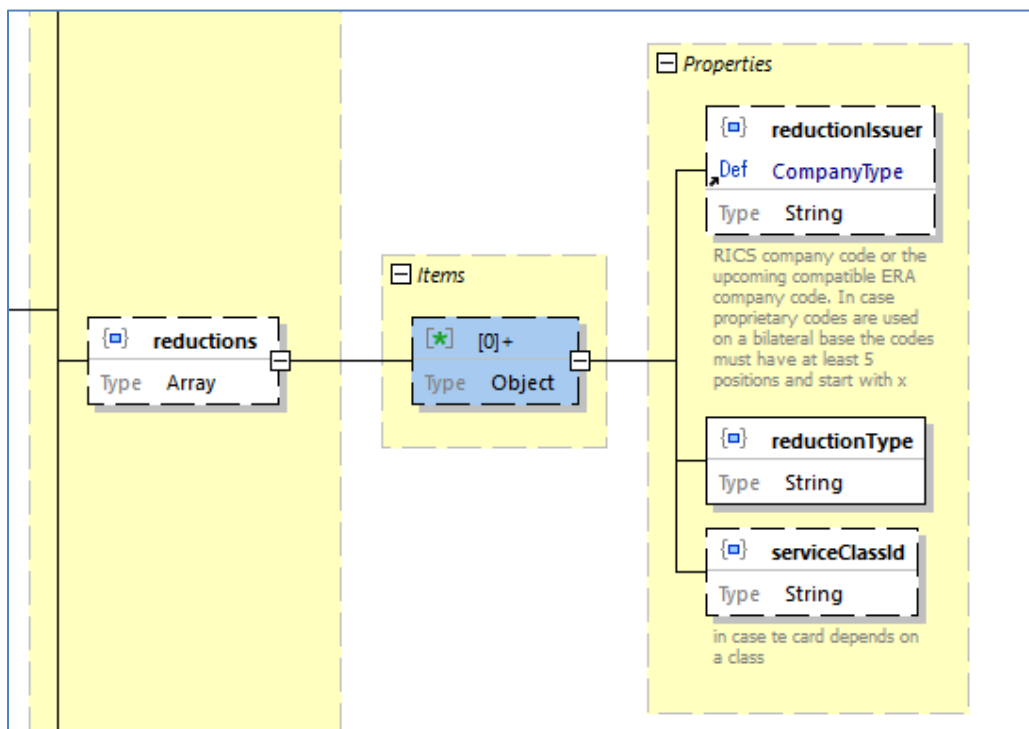
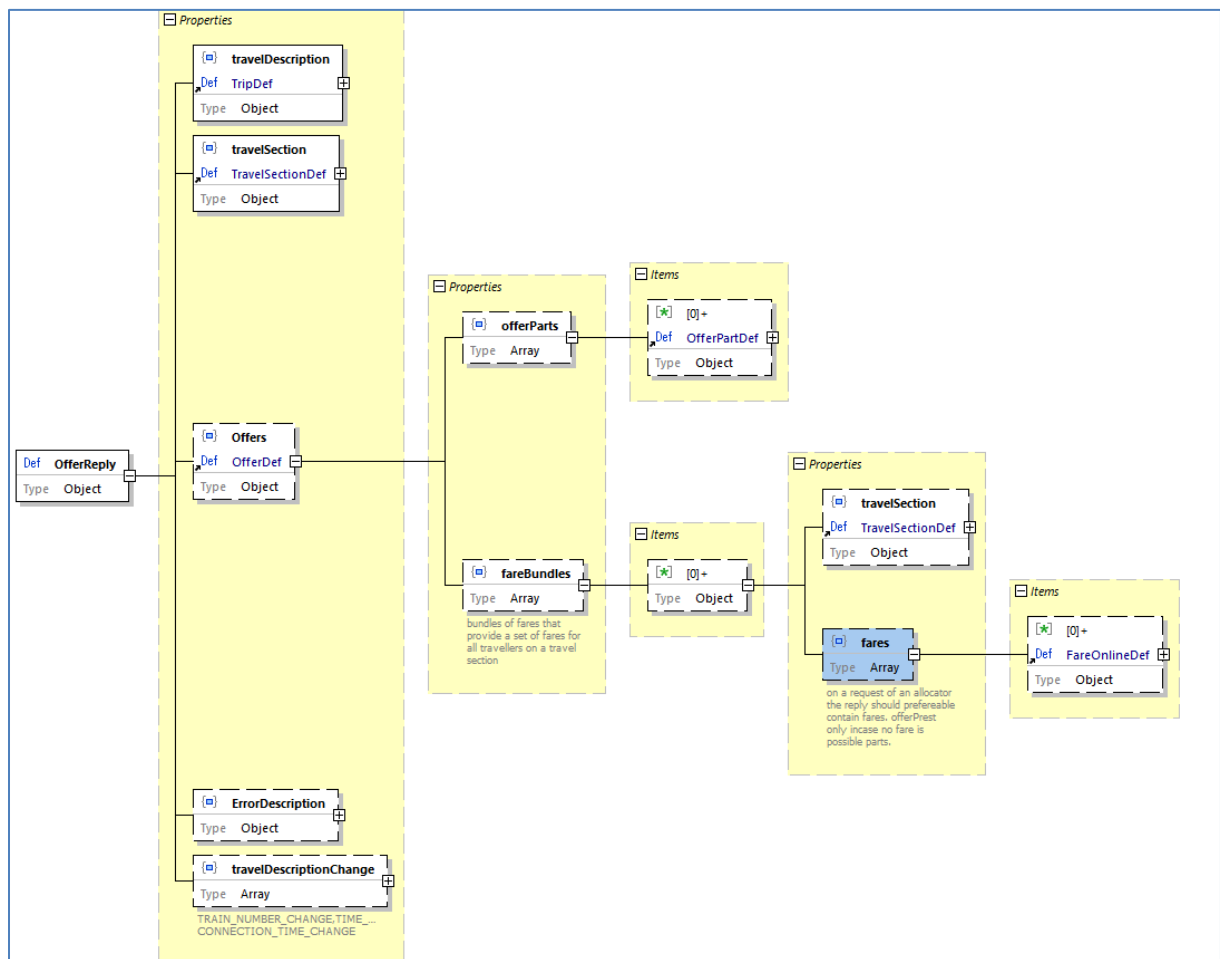


Figure 55 offer request - reduction data structure

# IRS 90918-10

Reply:



- Scope of offers

Offers for all available classes / service levels that fit to the passengers are provided.

- Double trains

Double trains (two train numbers for two train parts running together) in train linked tickets (in case your railway has train linked tickets)

The behavior of carriers might be different:

- The train link is for both trains and the customer can choose
- The carrier selects one of the trains and the train link is for one train only

The reply might contain two train links for the trains in parallel or only one. In case only one is contained subsequent reservations and bookings must use this number.

- Rerouted trains

## IRS 90918-10

In case a train is routed via a different route due to construction work this might result in different prices. E.g. ICE from Frankfurt to Amsterdam has a price based on the route via Emmerich border. With constructions, the train is re-routed via Venlo border, for which there is a different price (based on the local train connections). But it is still an ICE train connection.

The service brand is required in the travel description to allow the carrier to calculate an ICE price for a route usually only prices for regional trains. By this it can be avoided that the carrier must search for the train in his data.

### Optional features:

- Time table mismatch

The carrier is not obliged to validate the travel description but could do so.

In case the carrier detects a time table mismatch between the requested travel solution and his time table data he might return a change travel solution and base the offers on the changed solution. The change must be indicated in the offer reply.

- TRAIN\_NUMBER\_CHANGE
- TIME\_CHANGE
- CONNECTION\_TIME\_CHANGE

- Partial Offers

The allocator can indicate that he would accept offers that don't cover the entire requested section.

In this case the carrier is allowed return an offer for a part of the section. If the offer covers a part of the requested section only this must be indicated explicitly in the offer data.

### *OfferSearch*

Service to search for offers not related to a trip.

The search parameters may include:

- Tags to search by key words
- NUTS codes to indicate regions or cities for passes
- A regionalConstraint object in case of seasonal fares based on a previous offer for a trip.

Feature	Options
Idempotency	No

## IRS 90918-10

Compensation	No
Compensation Retry	Not available
Expected Look-to-Book Rate	100:1
Expected Response time	400 msec.

### Request Content:

tag	content
requestor requestor.distributionChannel	Requestor: Allocator or Ticket Vendor indicating its role sales office, country of sale and type of channel (in line with IRS 90918-1).
passengers	List of passenger details required for the offer.  Traveler types are required for special passengers only (e.g. PRM). For generic types (child, adult, ...) the date of birth is used.  The gender is required for night trains. In case the gender is missing offers will include mixed gender compartments or complete compartments only.
SearchParams	Search parameters to indicate the scope of the required offers. <ul style="list-style-type: none"> <li>• Tags</li> <li>• NUTS codes for regions</li> <li>• A regional validity object retrieved from an offer for a trip to ask for sessional fares</li> </ul>
travelPeriod	A calendar to indicate the requested duration of a pass or seasonal ticket must be provided.

Request:

**POST /searchOffer/<version>/{..}**

Reply:

HTTP reply codes

http code	http meaning	usage
200	ok	Used in case the request could be processed. The reply could contain offers of indications on functional errors.
201	created	Not used
202	accepted	Not used
204	Reply intentionally empty	Not used
400	Bad request	Used in case of syntactical errors <ul style="list-style-type: none"> <li>• schema violation</li> <li>• undefined codes</li> </ul>
401	unauthorized	Authorization error on a technical level (OAUTH 2.0 authentication)
404	Not found	No offer found
408	Request timeout	Request was not received completely
409	Conflict	Not used
424	Dependency conflict	Not used
429	Too many requests	In case a load limiter or circuit breaker rejects the request
500	Internal server error	In case of technical errors within the server (internal time out, unavailable resources, ...)

Payload error descriptions:

Code	Type	Description
	Type of error to address the internal staff to monitor and analyze errors	Description of the error to be used in logging for error analysis.  The description is not passed to a customer.  English language must be used.
FULLFILLMENT_NOT_SUPPORTED	FUNCTIONAL	No offer for available fulfilment options
BOOKING_STILL_CLOSED	FUNCTIONAL	Booking is not yet possible

## IRS 90918-10

SOLD_OUT	FUNCTIONAL	Offers were available in the past but are sold out
CONTENT_ERROR	CONTENT	The wrong code and an indication of the element affected should be in the description.

Request body:

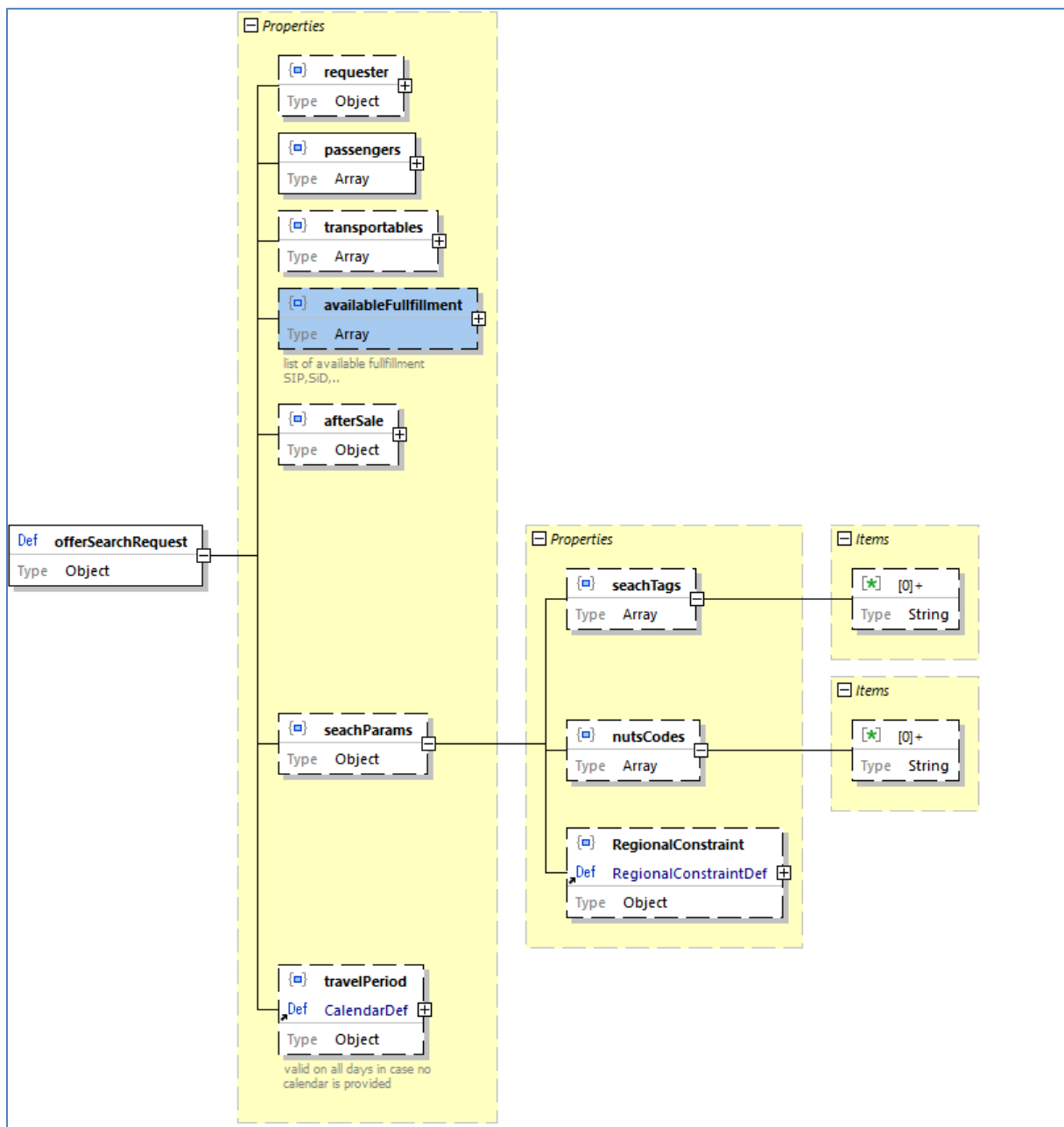
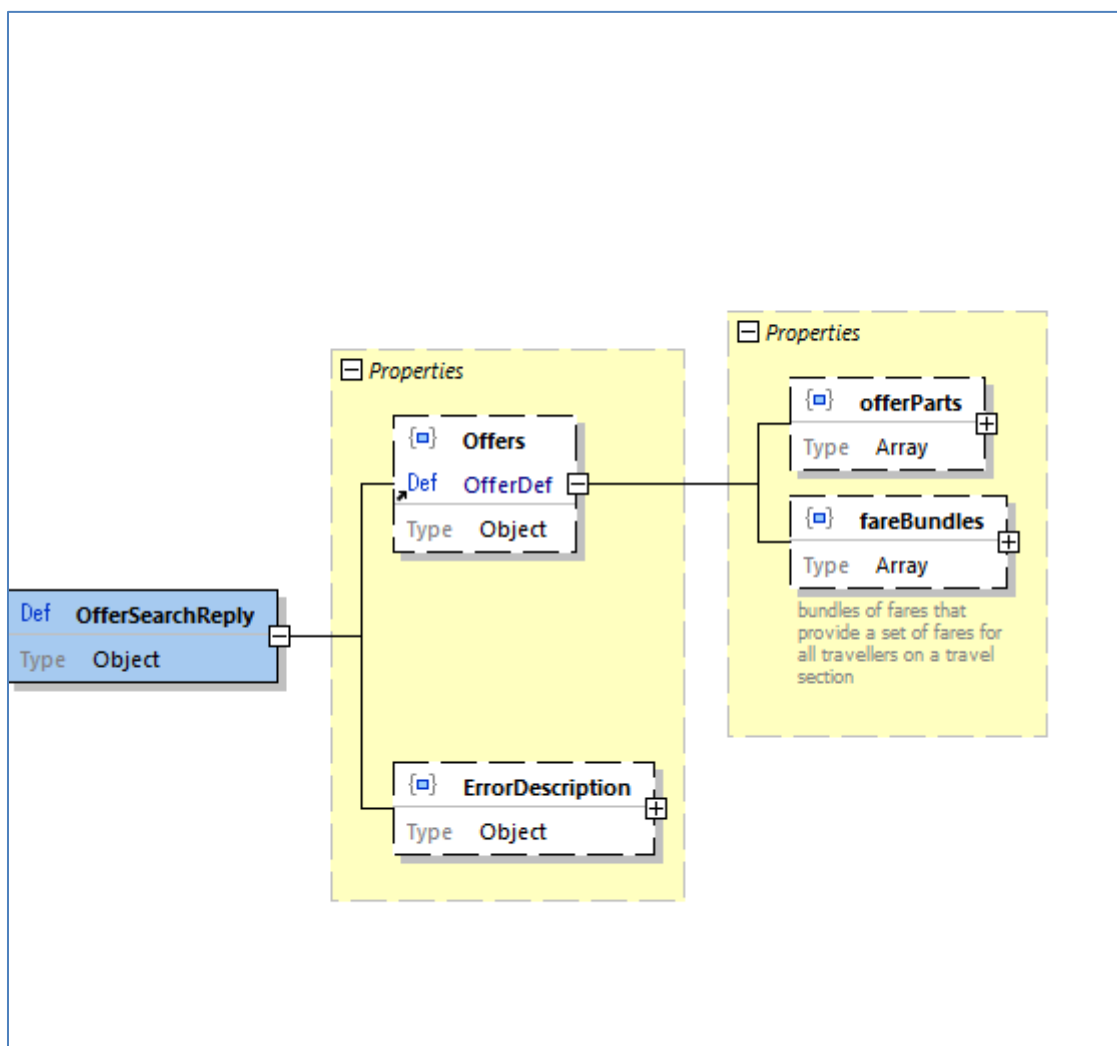


Figure 56 offer search without trip



## IRS 90918-10

### Response Body



### Prebooking

A preliminary booking supports the implementation of a business transaction covering the different bookings with carriers and payment (or payment confirmation) by the allocator and ticket vendor.

- defined in UIC IRS 90918-1 for IRT only (to be transferred to JSON?)
  - the offer contains reservation parameter for reservation

Feature	Options
Idempotency	Yes
Compensation	→CompensatePrebooking →DeletePrebooking

## IRS 90918-10

Compensation Retry	Not available
Expected Look-to-Book Rate	5:1
Expected Response time	300 msec.

### Request Content:

tag	content
requestid	<p><b>Mandatory</b></p> <p>Id of the request message. This id is used to implement the idempotency only. The use of a uuid is recommended.</p> <p>Request with the same request id must provide the same content.</p>
offerId	<p><b>Mandatory</b></p> <p>The id of the offer</p>
price	The price of the offer in order to check whether there was a price change.
offerContext	<p><b>Conditional</b></p> <p>The offerContext provided by the carrier. The offer context must be provided in case the carrier included it in the offer.</p>
reservationContext	<p><b>Conditional – for future use</b></p> <p>The reservationContext provided by the carrier. The reservationContext must be provided in case the carrier included it in place selections.</p>
requestedTimeToLive	<p><b>Optional</b></p> <p>The time to live in seconds of the preliminary booking which the allocator wants to obtain to complete the transaction.</p> <p><b>The carrier is not obliged to grant the requestedTimeToLive.</b></p>
passengers	<p>Personal data of the passengers in case the carrier has requested them for the offer.</p> <p>Note: personal data must not be included in case they have not been requested. (GDPR)</p>
Passenger.reference	<p><b>Mandatory</b></p> <p>Reference of the passenger provided in the offer to link fares and passengers.</p>

## IRS 90918-10

	Note: The reference is valid in the context of this offer/booking only. It is not allowed to use permanent passenger references.
Passengers.ticketholder	Conditional  Indication of the ticket older in case of a ticket for multiple persons.
Passenger.personalData	Conditional  Personal data of the passengers. Data structure defined in IRS 90918-4 compliant with the FCB barcode in IRS 90918-9 and personal data in 90918-1 for reservation.
Passenger.documentData	Conditional  document data of the passengers (passport, id card). Data structure defined in IRS 90918-4 compliant with the FCB barcode in IRS 90918-9 and personal data in 90918-1 for reservation.  Used to fulfill legal regulations at border crossings.
Passenger.cardIdentification	Conditional  Card data including card numbers.

Reservation support:

Using the existing IRS 90918-1 services is possible as the offer could provide supporting information for the existing services. (see

ReservationParameter).

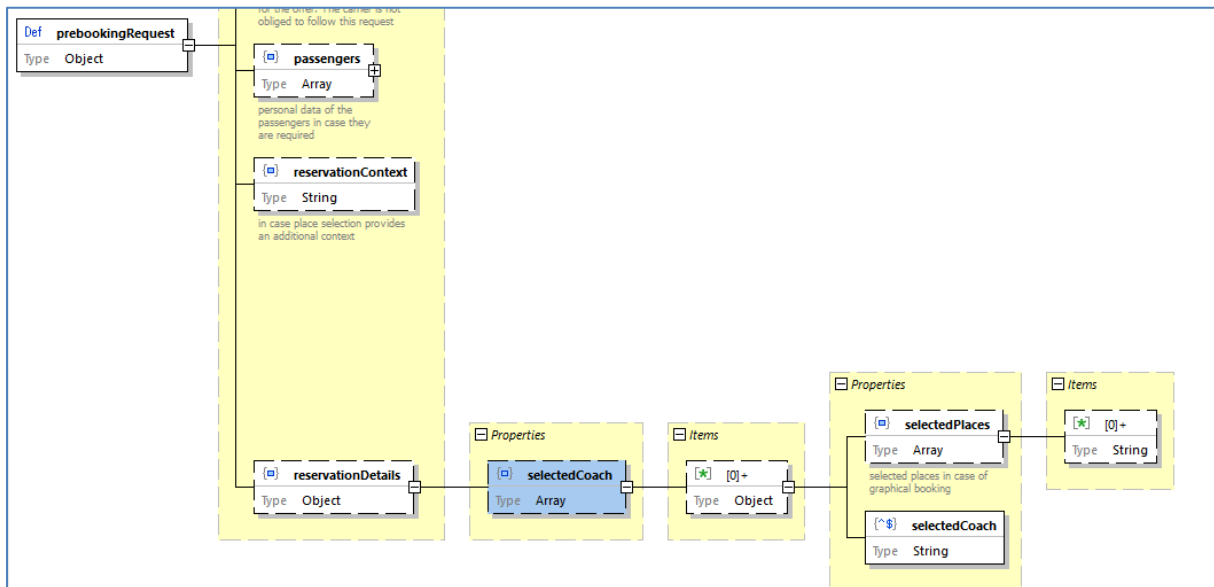


Figure 57 reservation specific information in prebooking request for graphical reservation

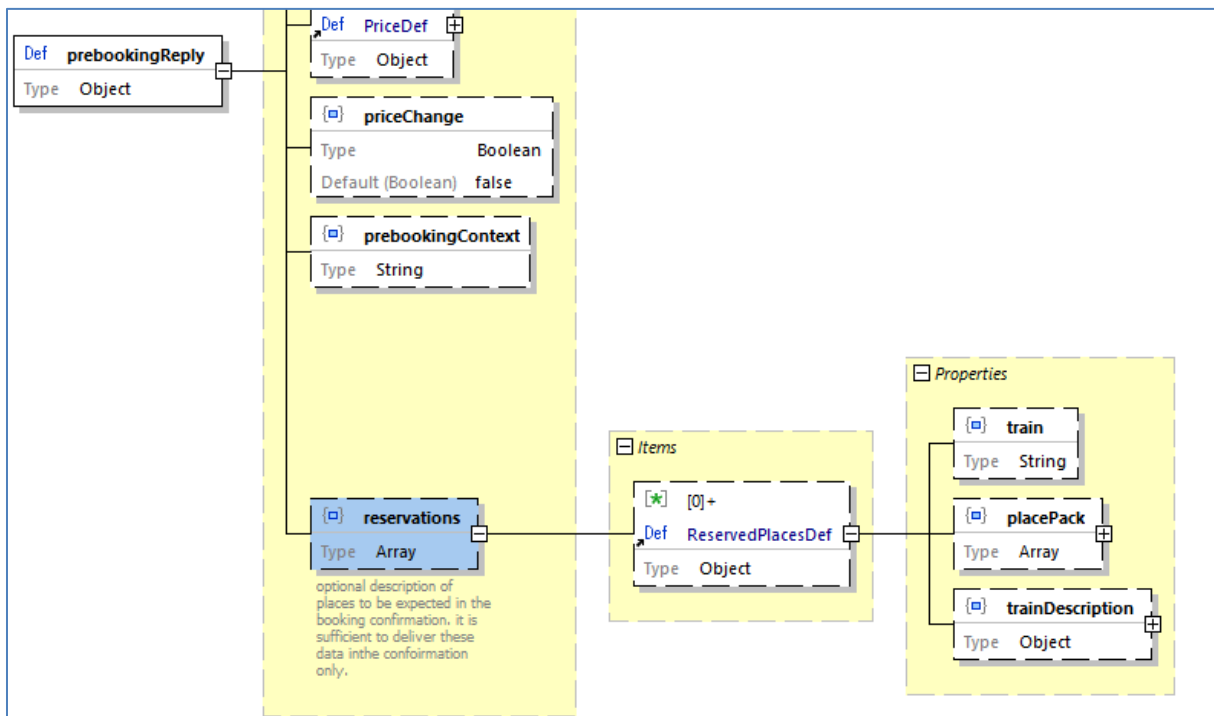


Figure 58 Optional information on booked places

Reply Content:

tag	content
prebookingId	Id of the prebooking to be used for booking requests.
expiryTime	Expiry time in UTC until which the prebooking is guaranteed. The expiryTime might be already passed in case the carrier does not guarantee the prebooking
priceChanged	Indication that the price has changed
newPrice	New price that replaces the old price
prebookingContext	Data the carrier wants to be returned in the booking confirmation

## IRS 90918-10

### Optional Features:

- In case of a price change the new price can be provided to allow a faster sales process without starting the offer request again.

### Service description:

Request:

**PUSH /Prebooking/<requestid>/<version>/{..}**

Reply:

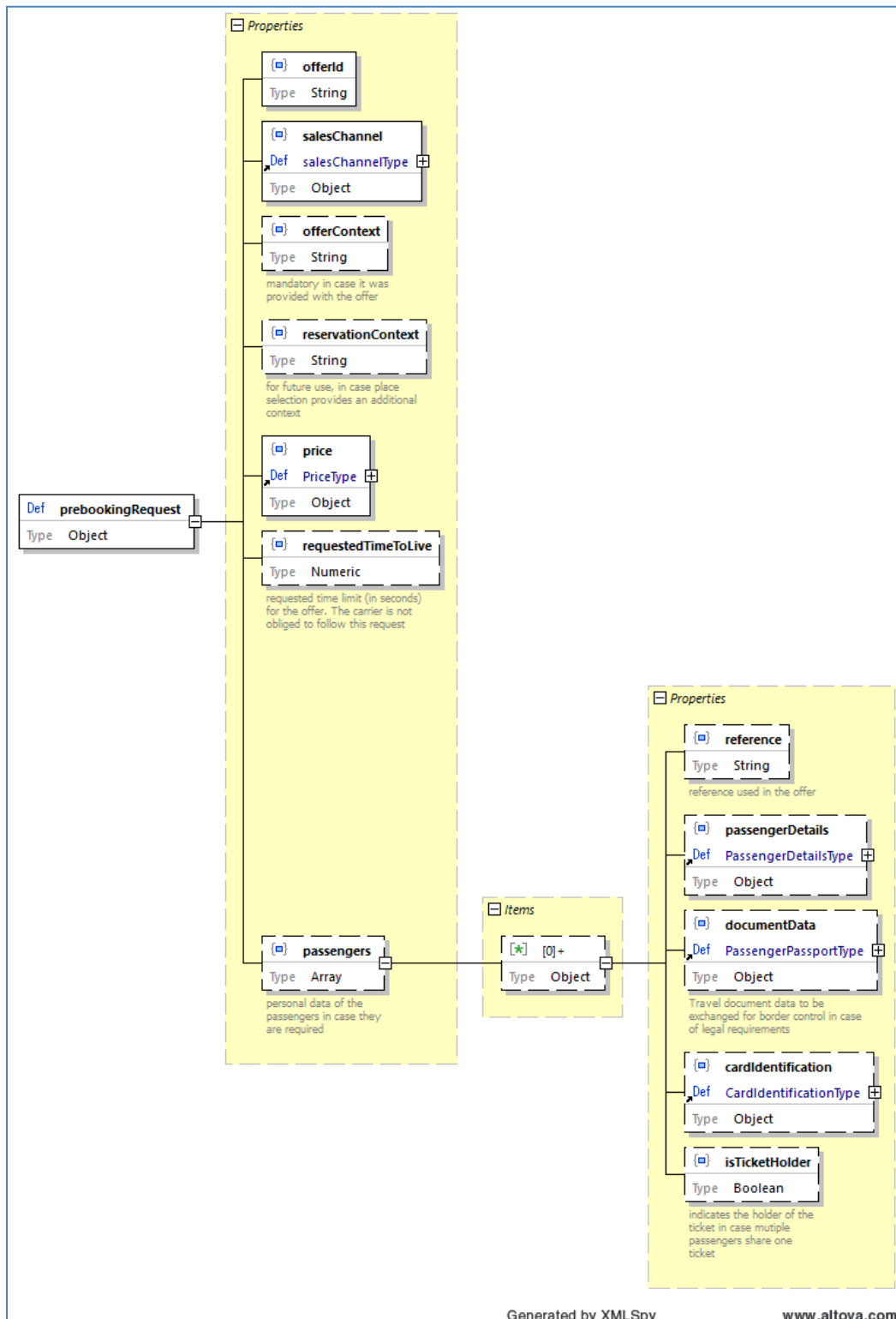
### HTTP reply codes

http code	http meaning	usage
200	ok	Used in case the prebooking was created
201	created	Not used
202	accepted	Not used
204	Reply intentionally empty	Not used
400	Bad request	Used in case of syntactical errors <ul style="list-style-type: none"><li>• schema violation</li><li>• undefined codes</li></ul>
401	unauthorized	Authorization error on a technical level (OAUTH 2.0 authentication)
404	Not found	Not used
408	Request timeout	Request was not received completely
409	Conflict	The offer context or the reservation context was corrupted
424	Dependency conflict	The offer is expired, or the offer is not any more available
429	Too many requests	In case a load limiter or circuit breaker rejects the request
500	Internal server error	In case of technical errors within the server (internal time out, unavailable resources, ...)

Payload error descriptions:

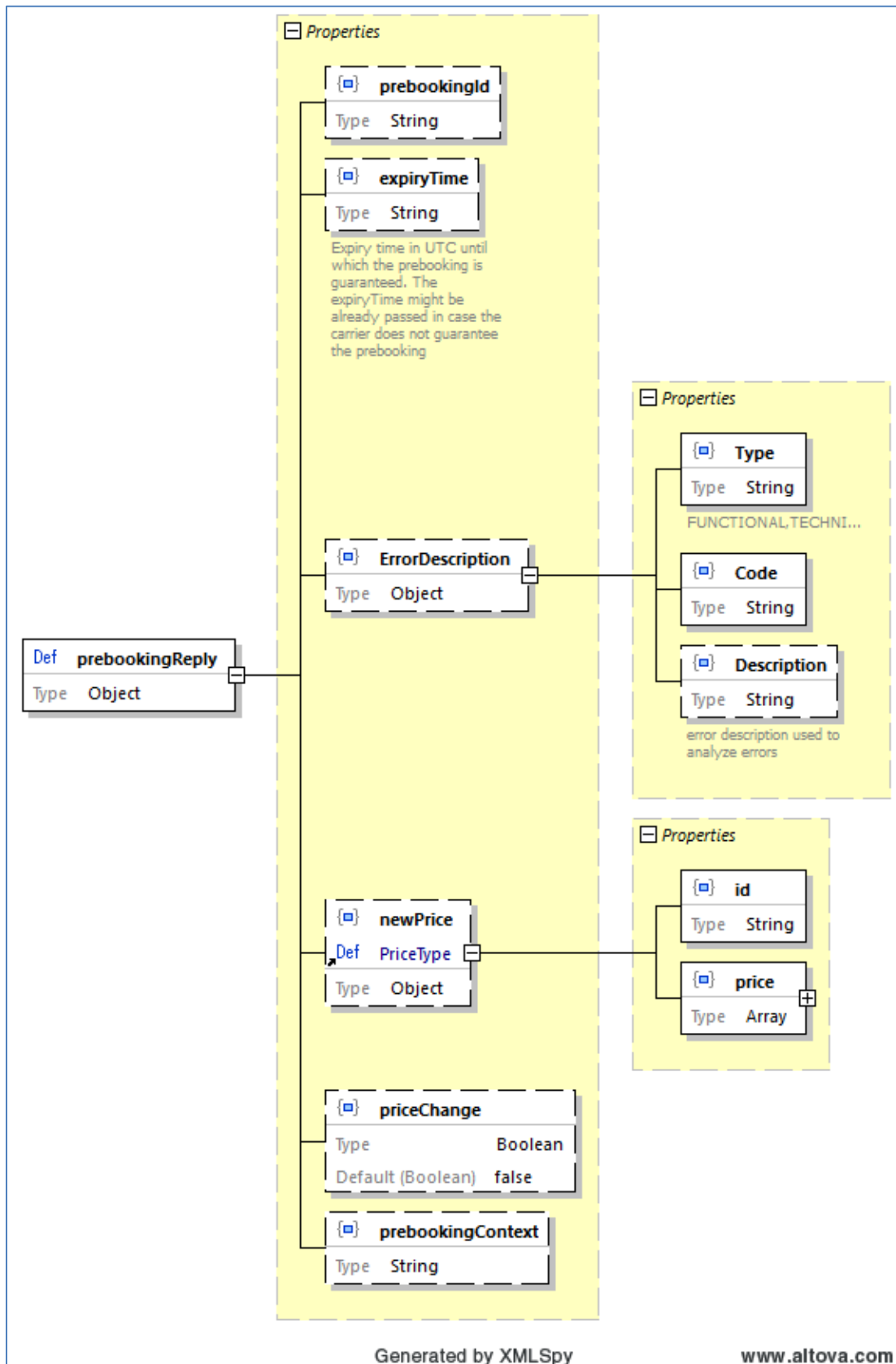
Code	Type	Description
	Type of error to address the internal staff to monitor and analyze errors	<p>Description of the error to be used in logging for error analysis.</p> <p>The description is not passed to a customer.</p> <p>English language must be used.</p>
DEPARTURE_PASSED	FUNCTIONAL	Departure of the requested section in the past
SOLD_OUT	FUNCTIONAL	Offers were available in the past but are sold out
CLOSED_DUE_TO_CONSTRUCTION	FUNCTIONAL	Offers cannot be provided due to construction work.
CONTENT_ERROR	CONTENT	The wrong code and an indication of the element affected should be in the description.
MISSING_PERSONAL_DATA	FUNCTIONAL	Personal data have not been provided as requested
WRONG_PERSONAL_DATA	FUNCTIONAL	Personal data contain errors (e.g. e-mail without @)

Request:





Reply:



## *CompensatePrebooking*

Feature	Options
Idempotency	Yes
Compensation	N/A
Compensation Retry	Not available
Expected Look-to-Book Rate	0,1:1
Expected Response time	300 msec.

A preliminary booking is removed. This method can be used in case the reply for the prebooking request was never received.

Request:

**DELETE /CompensatePrebooking/<version>/<requestid>/{..}**

Reply:

HTTP reply codes

http code	http meaning	usage
200	ok	Used in case the compensation was ok or the prebooking was never created or was already compensated.
201	created	Not used
202	accepted	Not used
204	Reply intentionally empty	Not used
400	Bad request	Used in case of syntactical errors <ul style="list-style-type: none"> <li>• schema violation</li> <li>• undefined codes</li> </ul>
401	unauthorized	Authorization error on a technical level (OAUTH 2.0 authentication)
404	Not found	Not used
408	Request timeout	Request was not received completely
409	Conflict	The preliminary booking is already confirmed
424	Dependency conflict	Not used
429	Too many requests	In case a load limiter or circuit breaker rejects the request
500	Internal server error	In case of technical errors within the server (internal time out, unavailable resources, ...)

Payload error descriptions:

Code	Type	Description
	Type of error to address the internal staff to monitor and analyze errors	Description of the error to be used in logging for error analysis.  The description is not passed to a customer.  English language must be used.

Request:

- no payload

Reply:

- no payload

## *DeletePrebooking*

Feature	Options
Idempotency	Yes
Compensation	N/A
Compensation Retry	Not available
Expected Look-to-Book Rate	4:1
Expected Response time	300 msec.

A preliminary booking is removed. This method can be used in case the prebooking reply was received but the prebooking is not needed any more.

Request:

**DELETE /Prebooking/<version>/<prebookingid>/Services HTTPS/1.1 {..}**

Reply:

HTTP reply codes

http code	http meaning	usage
200	ok	Used in case the compensation was ok or the prebooking was never created or was already compensated.
201	created	Not used
202	accepted	Not used
204	Reply intentionally empty	Not used
400	Bad request	Used in case of syntactical errors <ul style="list-style-type: none"> <li>• schema violation</li> <li>• undefined codes</li> </ul>
401	unauthorized	Authorization error on a technical level (OAUTH 2.0 authentication)
404	Not found	Not used
408	Request timeout	Request was not received completely
409	Conflict	The preliminary booking is already confirmed
424	Dependency conflict	Not used
429	Too many requests	In case a load limiter or circuit breaker rejects the request
500	Internal server error	In case of technical errors within the server (internal time out, unavailable resources, ...)

## Payload error descriptions:

Code	Type	Description
	Type of error to address the internal staff to monitor and analyze errors	<p>Description of the error to be used in logging for error analysis.</p> <p>The description is not passed to a customer.</p> <p>English language must be used.</p>
DEPARTURE_PASSED	FUNCTIONAL	Departure of the requested section in the past
SOLD_OUT	FUNCTIONAL	Offers were available in the past but are sold out
CLOSED_DUE_TO_CONSTRUCTION	FUNCTIONAL	Offers cannot be provided due to construction work.
CONTENT_ERROR	CONTENT	The wrong code and an indication of the element affected should be in the description.
MISSING_PERSONAL_DATA	FUNCTIONAL	Personal data have not been provided as requested
WRONG_PERSONAL_DATA	FUNCTIONAL	Personal data contain errors (e.g. e-mail without @)

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Request:

- no payload

Reply:

- no payload

### *ConfirmBooking*

Payment is guaranteed from the allocator to the carrier. Accounting processes can start with this timestamp.

Feature	Options
Idempotency	Yes
Compensation	Yes →CompensateConfirmBooking →DeleteBooking  In case retries are used a compensation is not allowed until 2 minutes after the last retry request.
Compensation Retry	Mandatory until compensation was successful or train departure of the last train has passed.
Expected Look-to-Book Rate	1:1
Expected Response time	200 msec.

Request Content:

tag	content
requestid	Mandatory  Id of the request message. This id is used to implement the idempotency only. The use of a uuid is recommended.  Request with the same request id must provide the same content.
prebookingId	Mandatory  The id of the prebooking
prebookingContext	Conditional

	<p>The prebookingContext provided by the carrier. The prebooking context must be provided in case the carrier included it in the offer.</p>
individualTicketing	<p>true/false</p> <p>indicates that individual booking ids for individual ticketing are required. (only in case the fare allows individual ticketing)</p>

Reply Content:

tag	content
bookingId	Id of the booking to be used for booking requests.
individualTicketing.reference	Conditional  Passenger reference
individualTicketing.bookingId	Conditional  Passenger Booking Ids in case of individual ticketing

The booking confirmation is extended with the information specific to reservations:

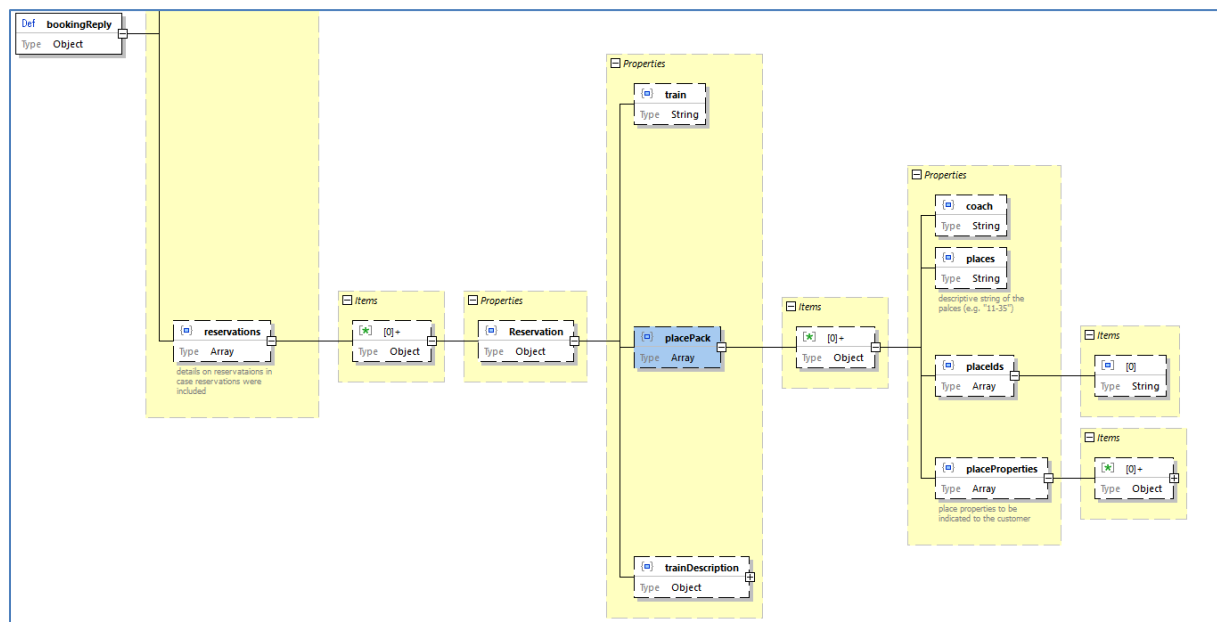


Figure 59 reservation specific booking confirmation

## IRS 90918-10

Service description:

Request:

**PUSH /confirmBooking/<version>/<requestid>/{...}**

Reply:

HTTP reply codes

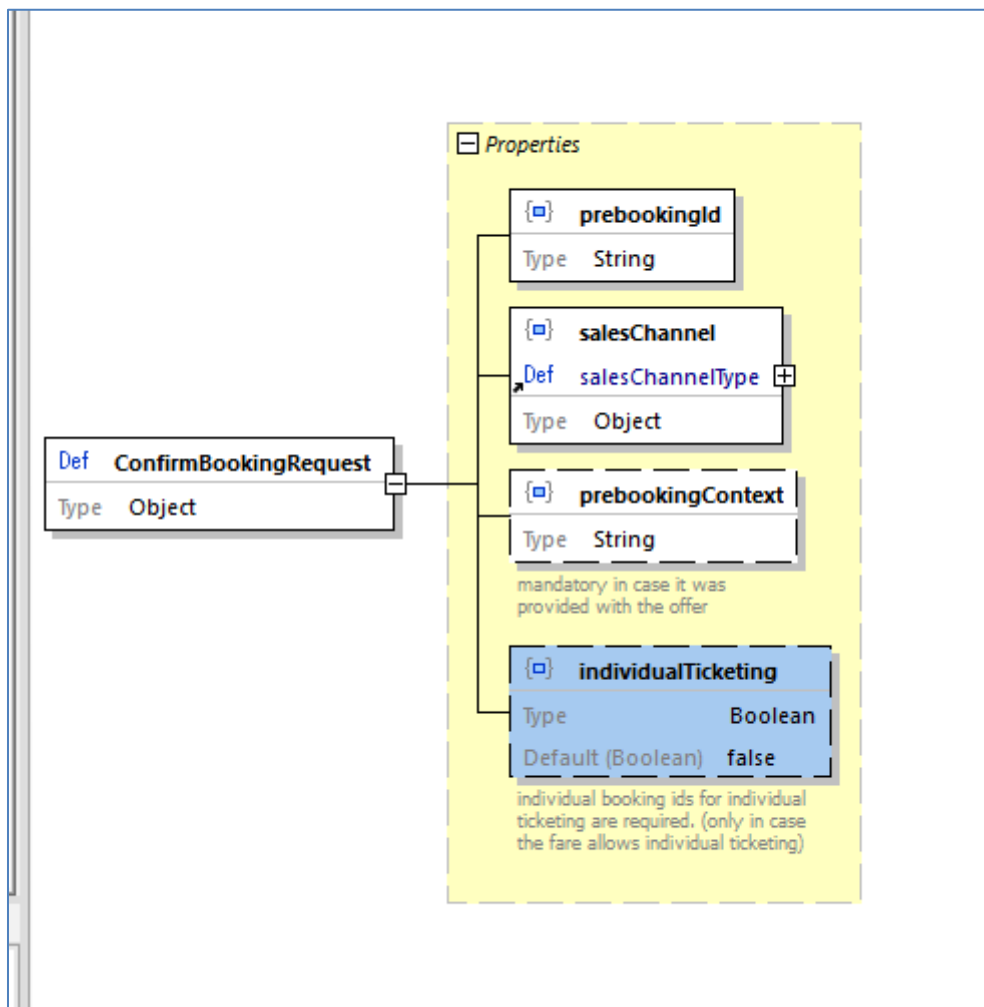
http code	http meaning	usage
200	ok	Booking is confirmed
201	created	Not used
202	accepted	Not used
204	Reply intentionally empty	Not used
400	Bad request	Used in case of syntactical errors <ul style="list-style-type: none"><li>• schema violation</li><li>• undefined codes</li></ul>
401	unauthorized	Authorization error on a technical level (OAUTH 2.0 authentication)
404	Not found	The preliminary booking was not found
408	Request timeout	Request was not received completely
409	Conflict	The prebooking context was corrupted
424	Dependency conflict	The prebooking is expired (optional, only possible in case the expired prebooking was not deleted entirely)
429	Too many requests	In case a load limiter or circuit breaker rejects the request
500	Internal server error	In case of technical errors within the server (internal time out, unavailable resources, ...)

Payload error descriptions:

Code	Type	Description
	Type of error to address the internal staff to monitor and analyze errors	Description of the error to be used in logging for error analysis.  The description is not passed to a customer.  English language must be used.
CONTENT_ERROR	CONTENT	The wrong code and an indication of the element affected should be in the description.
NO_INDIVIDUAL_TICKETING	CONTENT	Individual ticketing was requested although the fare does not permit this.
EXPIRED	FUNCTIONAL	The prebooking has expired



Request:



Reply:

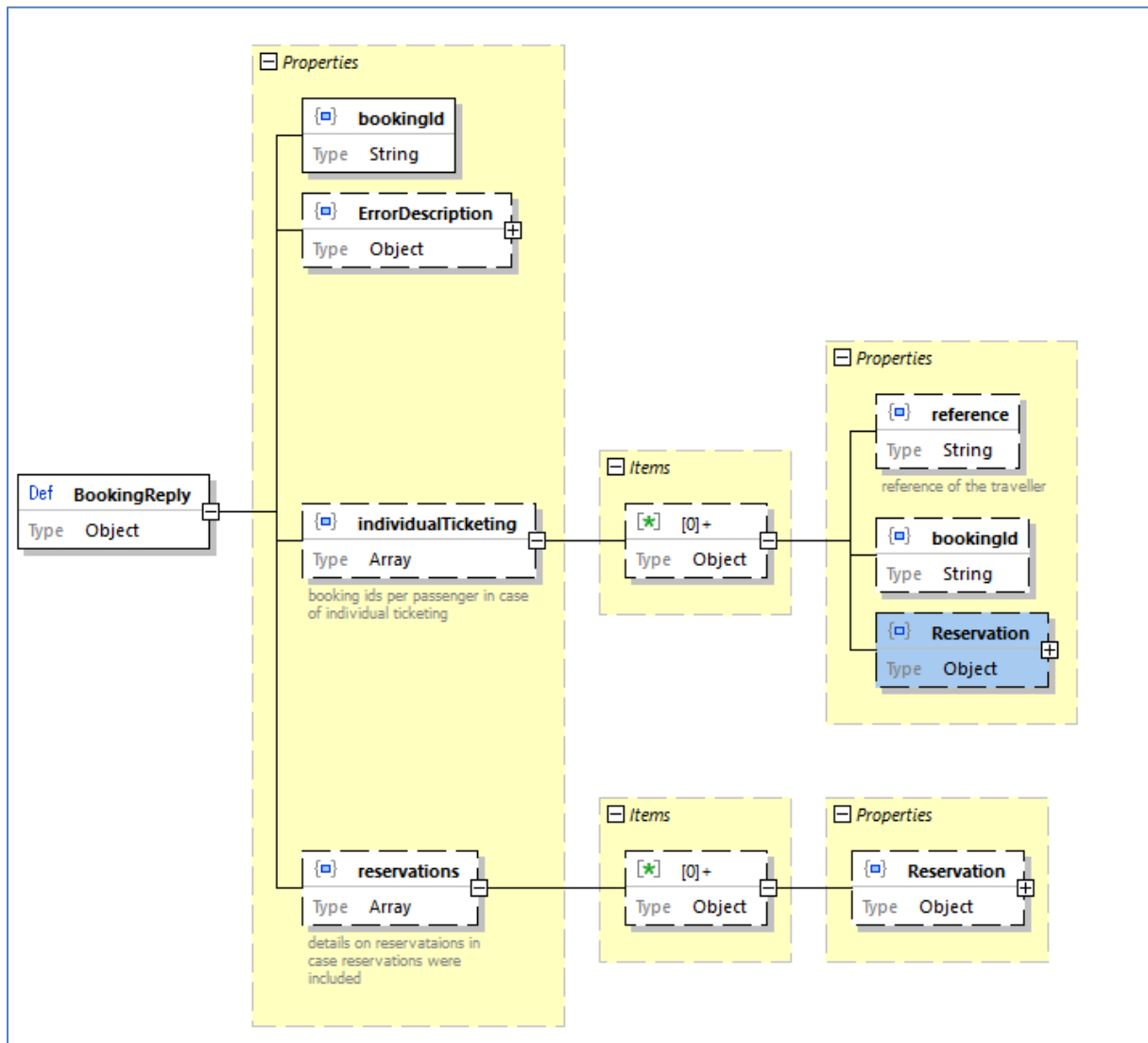


Figure 60 confirm booking reply data

In case of a reservation the confirmBooking reply includes the details of the booked places and optionally a link to the travelers.

Details for car carriage reservations are not included. As car carriage is usually not integrated within a travel chain it is recommended to use the carrier bases fulfilment with a complete ticket (see Fehler! Verweisquelle konnte nicht gefunden werden.).

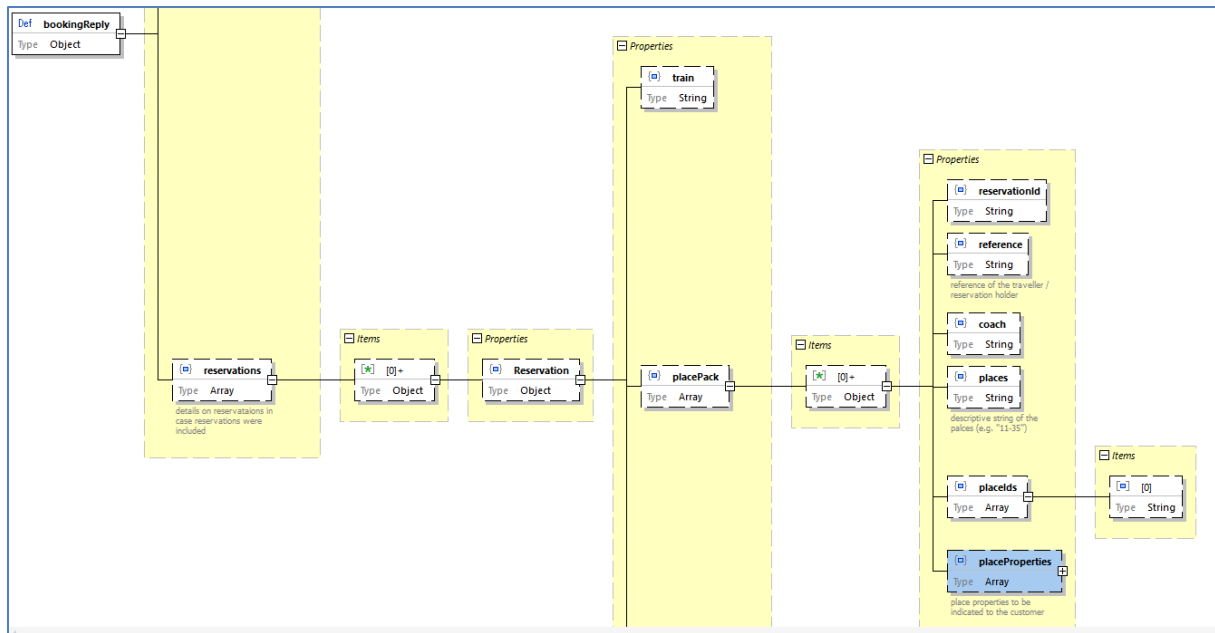


Figure 61 confirm booking reservation details

Code lists:

- **Properties of places**

## CompensateBooking

Feature	Options
Idempotency	Yes
Compensation	N/A
Compensation Retry	
Expected Look-to-Book Rate	0,1:1
Expected Response time	200 msec.

A booking is removed. This method can be used in case the reply for the confirmbooking request was never received.

Request:

**DELETE /Booking/<requestid>/Services HTTPS/1.1 {..}**

Reply:

## HTTP reply codes

http code	http meaning	usage
200	ok	Used in case the compensation was ok or the booking was never created or was already compensated.
201	created	Not used
202	accepted	Not used
204	Reply intentionally empty	Not used
400	Bad request	Used in case of syntactical errors <ul style="list-style-type: none"> <li>• schema violation</li> <li>• undefined codes</li> </ul>
401	unauthorized	Authorization error on a technical level (OAUTH 2.0 authentication)
404	Not found	Not used
408	Request timeout	Request was not received completely
409	Conflict	The preliminary booking is already confirmed
424	Dependency conflict	Not used
429	Too many requests	In case a load limiter or circuit breaker rejects the request
500	Internal server error	In case of technical errors within the server (internal time out, unavailable resources, ...)

## IRS 90918-10

Payload error descriptions:

Code	Type	Description
	Type of error to address the internal staff to monitor and analyze errors	Description of the error to be used in logging for error analysis.  The description is not passed to a customer.  English language must be used.

Request:

- no payload

Reply:

- no payload

### *DeleteBooking*

Feature	Options
Idempotency	Yes
Compensation	N/A
Compensation Retry	
Expected Look-to-Book Rate	0,1:1
Expected Response time	200 msec.

A booking is removed. This method can be used in case the booking reply was received but the booking cannot be processed due to technical errors.

On request details on the case must be provided to the carrier.

## IRS 90918-10

Request:

**PUSH /DeleteBooking/<version>/{..}**

Reply:

HTTP reply codes

http code	http meaning	usage
200	ok	Used in case the compensation was ok or the booking was never created or was already compensated.
201	created	Not used
202	accepted	Not used
204	Reply intentionally empty	Not used
400	Bad request	Used in case of syntactical errors <ul style="list-style-type: none"><li>• schema violation</li><li>• undefined codes</li></ul>
401	unauthorized	Authorization error on a technical level (OAUTH 2.0 authentication)
404	Not found	Not used
408	Request timeout	Request was not received completely
409	Conflict	The preliminary booking is already confirmed
424	Dependency conflict	Not used
429	Too many requests	In case a load limiter or circuit breaker rejects the request
500	Internal server error	In case of technical errors within the server (internal time out, unavailable resources, ...)

Payload error descriptions:

Code	Type	Description
	Type of error to address the internal staff to monitor and analyze errors	Description of the error to be used in logging for error analysis.  The description is not passed to a customer.  English language must be used.

Request:

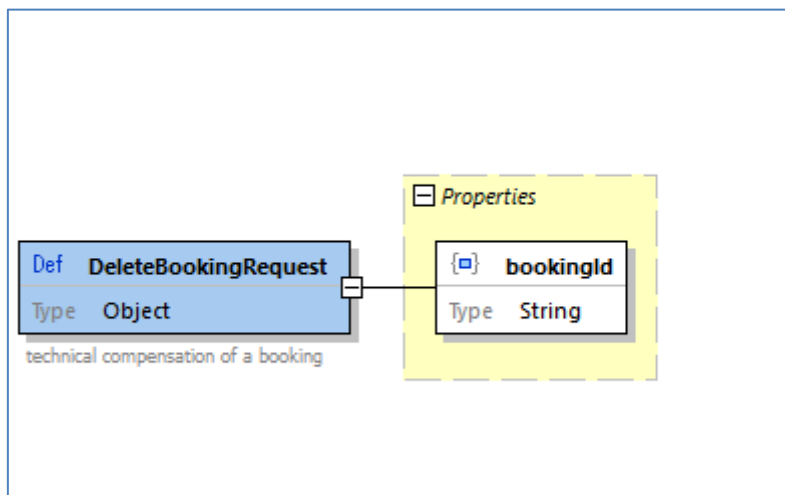


Figure 62 DeleteBookingRequest structure

Reply:

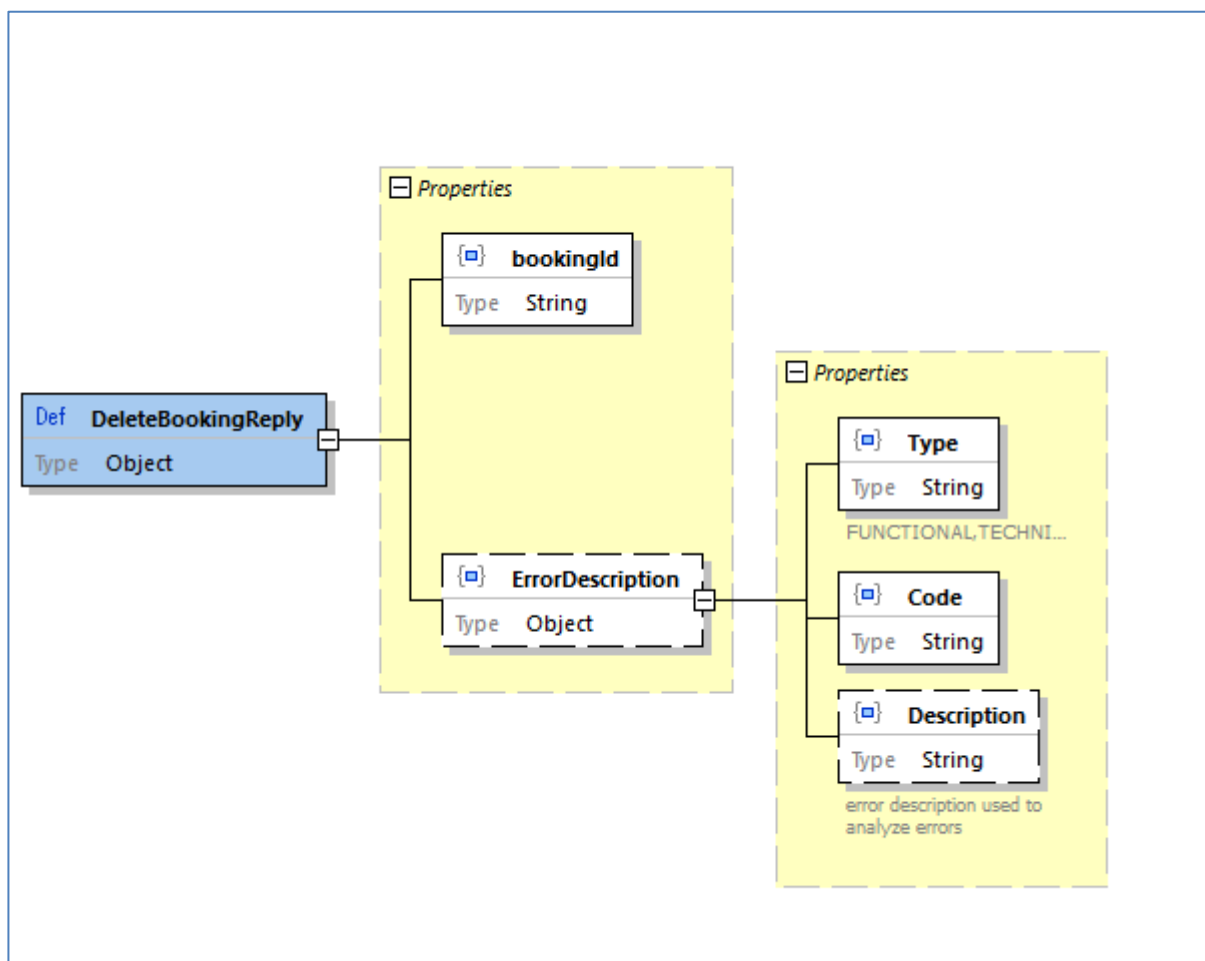


Figure 63 DeleteBookingReply structure

## *CancellationOffer*

An offer for cancellation is requested.

Feature	Options
Idempotency	Yes
Compensation	N/A
Compensation Retry	
Expected Look-to-Book Rate	0,5:1
Expected Response time	400 msec.

Request Content:

tag	content
bookingId	bookingId of the entire booking
reasonForCancellation	Reason for cancellation <ul style="list-style-type: none"> <li>• Error of an agent</li> <li>• Schedule change</li> <li>• Missed connection during the trip</li> <li>• Strike</li> <li>• Exchange</li> <li>• Customer refund (refund on request on the customer)</li> </ul>

Reply Content:

tag	content
paymentDelay	When cancelling the booking the payment will be delayed checking for a possible usage of the ticket.
reasonAccepted	The reason was accepted, and a full refund is granted. The allocator needs to provide evidence on the reason on request.



## IRS 90918-10

expiryTime	expiryTime of the offer in seconds.  The carrier might not grant an expiry time.
offerContext	Data the carrier wants to pass to the confirmation of the cancellation.

Request:

**PUSH /CancellationOffer/<version>/{..}**

Reply:

HTTP reply codes

http code	http meaning	usage
200	ok	Used in case the request could be processed. The reply could contain offers of indications on functional errors.
201	created	Not used
202	accepted	Not used
204	Reply intentionally empty	Not used
400	Bad request	Used in case of syntactical errors <ul style="list-style-type: none"> <li>• schema violation</li> <li>• undefined codes</li> </ul>
401	unauthorized	Authorization error on a technical level (OAUTH 2.0 authentication)
404	Not found	Booking not found
408	Request timeout	Request was not received completely
409	Conflict	Not used
424	Dependency conflict	Not used
429	Too many requests	In case a load limiter or circuit breaker rejects the request
500	Internal server error	In case of technical errors within the server (internal time out, unavailable resources, ...)

Payload error descriptions:

Code	Type	Description
	Type of error to address the internal staff to monitor and analyze errors	Description of the error to be used in logging for error analysis.  The description is not passed to a customer.

## IRS 90918-10

		English language must be used.
ALREADY_CANCELLED	FUNCTIONAL	The booking was already cancelled.
BOOKING_USED	FUNCTIONAL	The booking was used
CANCELLATION_NOT_PERMITTED	FUNCTIONAL	The cancellation is not permitted according to the fare conditions.
MANUAL_REFUND	FUNCTIONAL	<p>The refund for the reason of cancellation is not done directly, the refund must be requested manually.</p> <p>Manual refunds should be avoided, and refunds should be approved if possible.</p>

Request body:

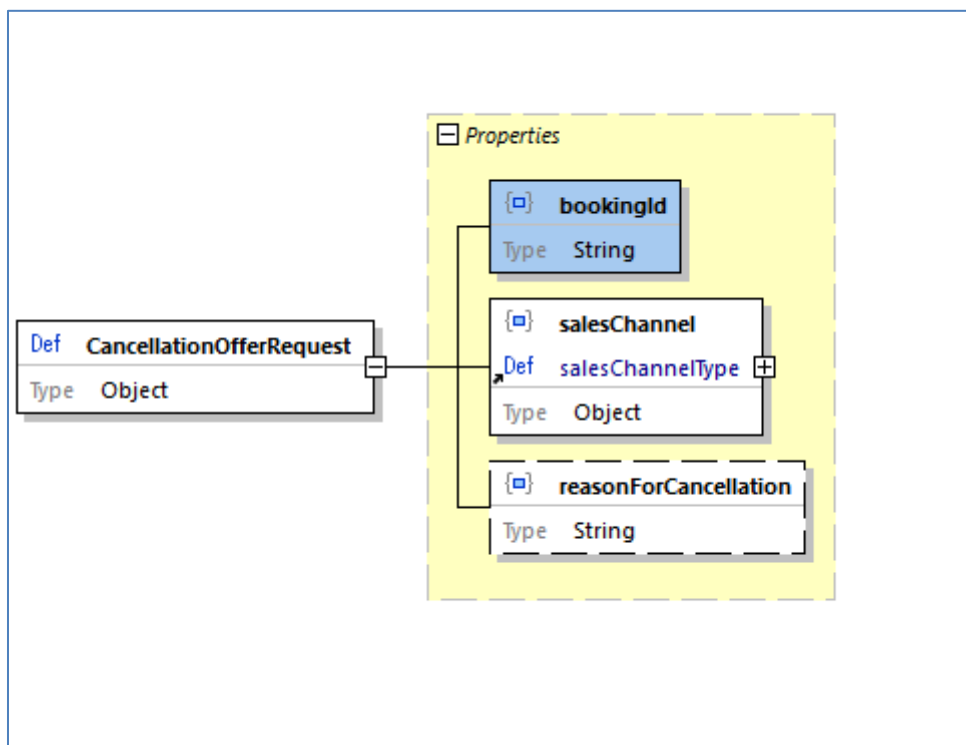


Figure 64 cancellation offer request

Reply:

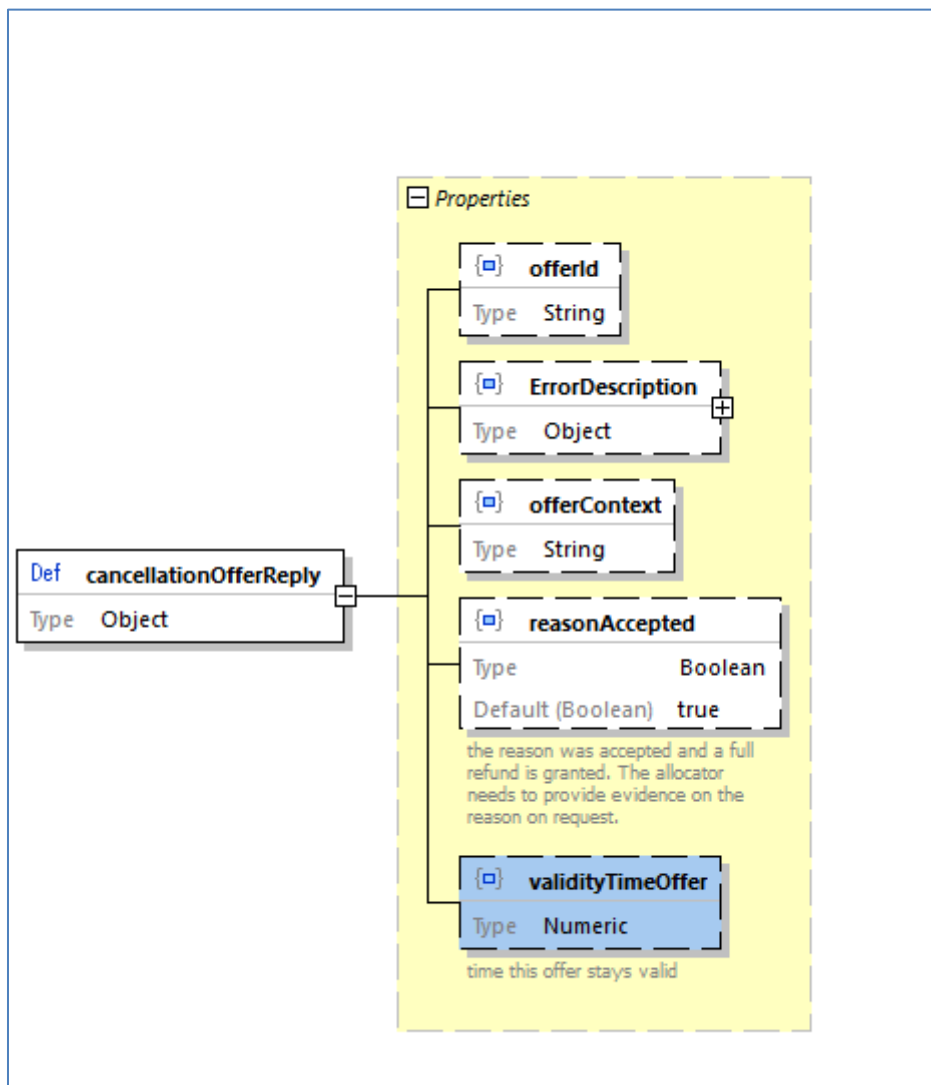


Figure 65 cancellation offer reply

### *ConfirmCancellation*

Feature	Options
Idempotency	Yes
Compensation	N/A
Compensation Retry	
Expected Look-to-Book Rate	0,5:1
Expected Response time	400 msec.

A booking is cancelled by accepting the cancellation offer.

Request:

**PUSH /ConfirmCancellationOffer/<version>/<offerid>/{..}**

Reply:

HTTP reply codes

http code	http meaning	usage
200	ok	Used in case the compensation was ok or the booking was never created or was already compensated.
201	created	Not used
202	accepted	Not used
204	Reply intentionally empty	Not used
400	Bad request	Used in case of syntactical errors <ul style="list-style-type: none"> <li>• schema violation</li> <li>• undefined codes</li> </ul>
401	unauthorized	Authorization error on a technical level (OAUTH 2.0 authentication)
404	Not found	Offer was not found
408	Request timeout	Request was not received completely
409	Conflict	The preliminary booking is already confirmed
424	Dependency conflict	Not used
429	Too many requests	In case a load limiter or circuit breaker rejects the request

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500	Internal server error	In case of technical errors within the server (internal time out, unavailable resources, ...)
-----	-----------------------	---

Payload error descriptions:

Code	Type	Description
	Type of error to address the internal staff to monitor and analyze errors	Description of the error to be used in logging for error analysis.  The description is not passed to a customer.  English language must be used.
CONTENT_ERROR	CONTENT	The wrong code and an indication of the element affected should be in the description.
EXPIRED	FUNCTIONAL	The cancellation offer has expired.

Request:

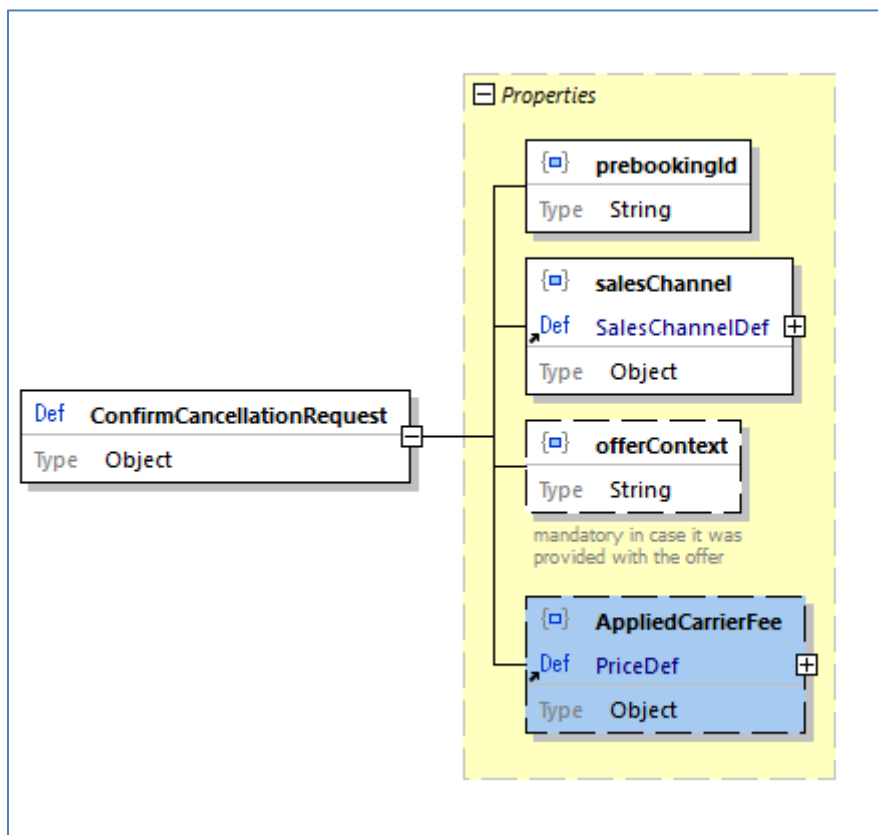


Figure 66 confirm cancellation request

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AppliedCarrierFee: cancellation carrier fee according to the definition of the allocator. In this case the allocator can define the cancellation fee (in accordance with the fare combination rules) but the fee needs to be given to the carrier. The accounting of the fee (and the refund of the fare) will be managed by the carrier.

Reply:

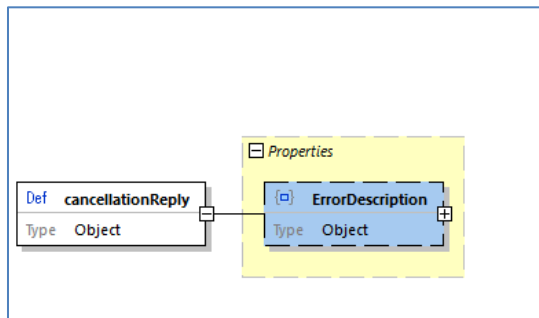


Figure 67 confirm cancellation reply

## Exchange booking

In an exchange an old booking is replaced by a new booking of the same carrier. The exchange will be implemented as a cancellation with a special reason EXCHANGE. Thus, no separate message is required.

At some Carriers exchange is not possible. The implementation of this feature is up to the allocator.

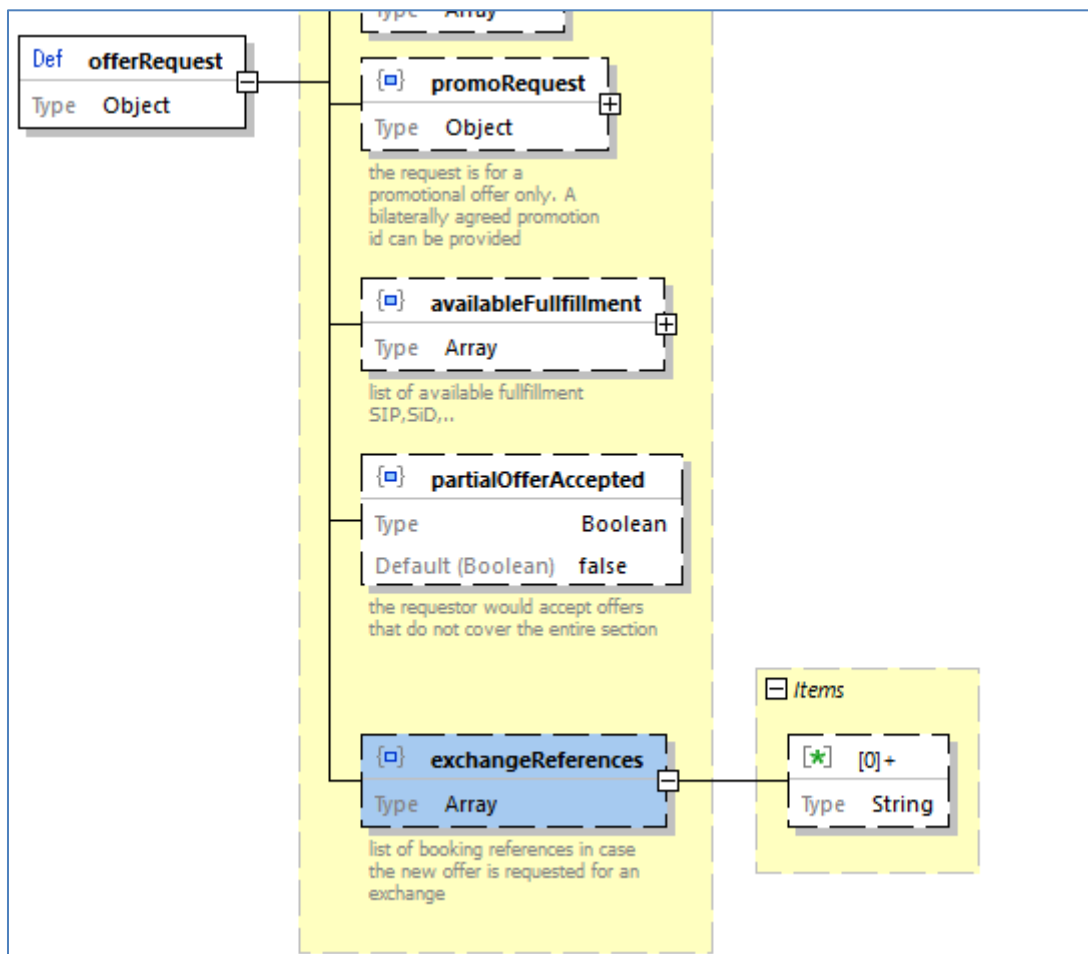


Figure 68 exchange offer references

## Upgrade

The upgrade is implemented as a new offer with a special after sale reason “UPGRADE”. (see **Reason for after sale**).

- The travel solution needs to be the same for an upgrade.
- The reference to the original ticket needs to be provided.
- Not all carriers might support this feature: (see **SupportedOnlineServices**).
- The old ticket is kept by the traveler and must be shown together with the upgrade at control.

## Increase / Decrease of the number of Travelers

Increase and decrease of the number of travelers are handled as an exchange. The old booking(s) will be cancelled within the confirm booking transaction for the new booking!

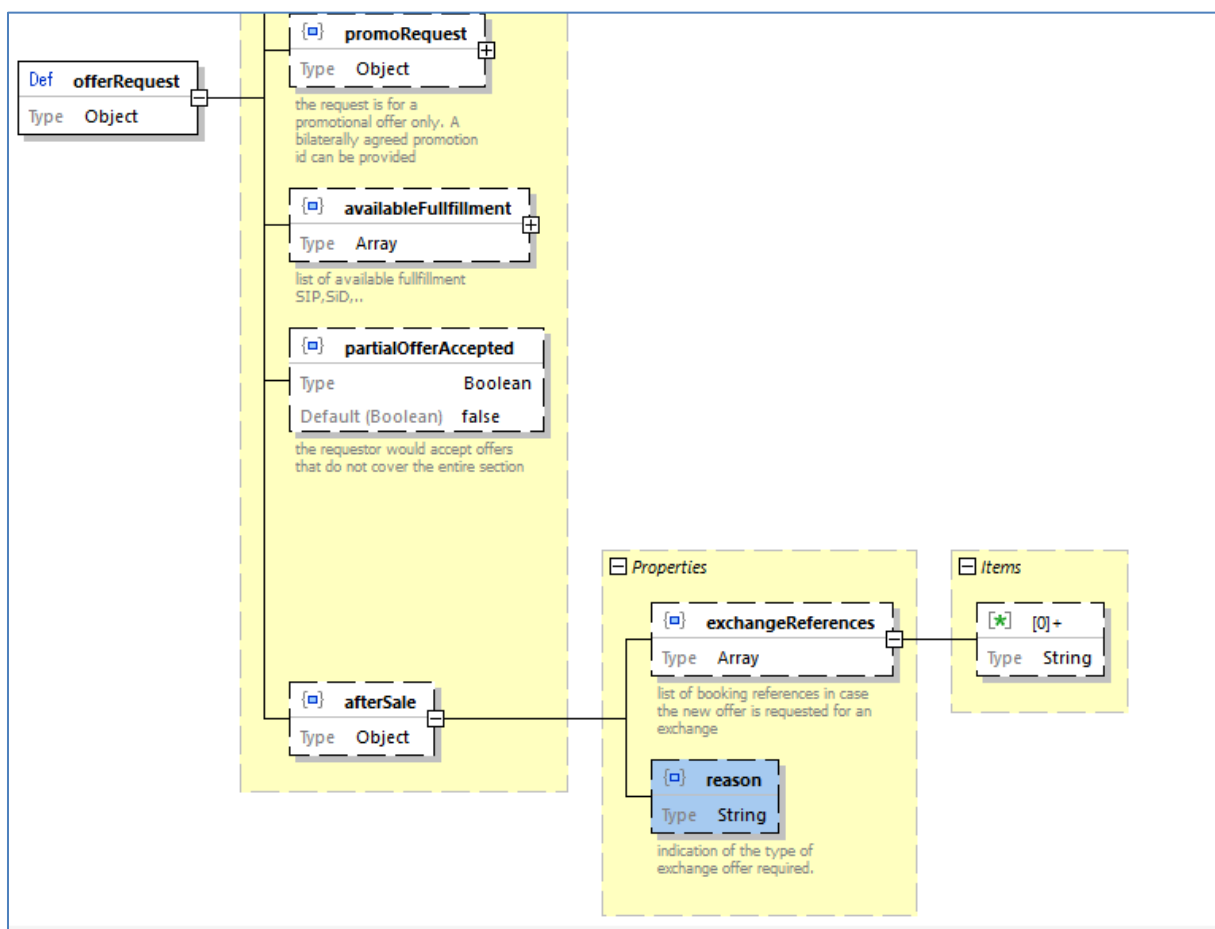


Figure 69 indication of after sales type in additional offer



Special reasons for these exchanges must be provided along with the references to the old booking(s) (see **Reason for after sale**, **SupportedOnlineServices**).

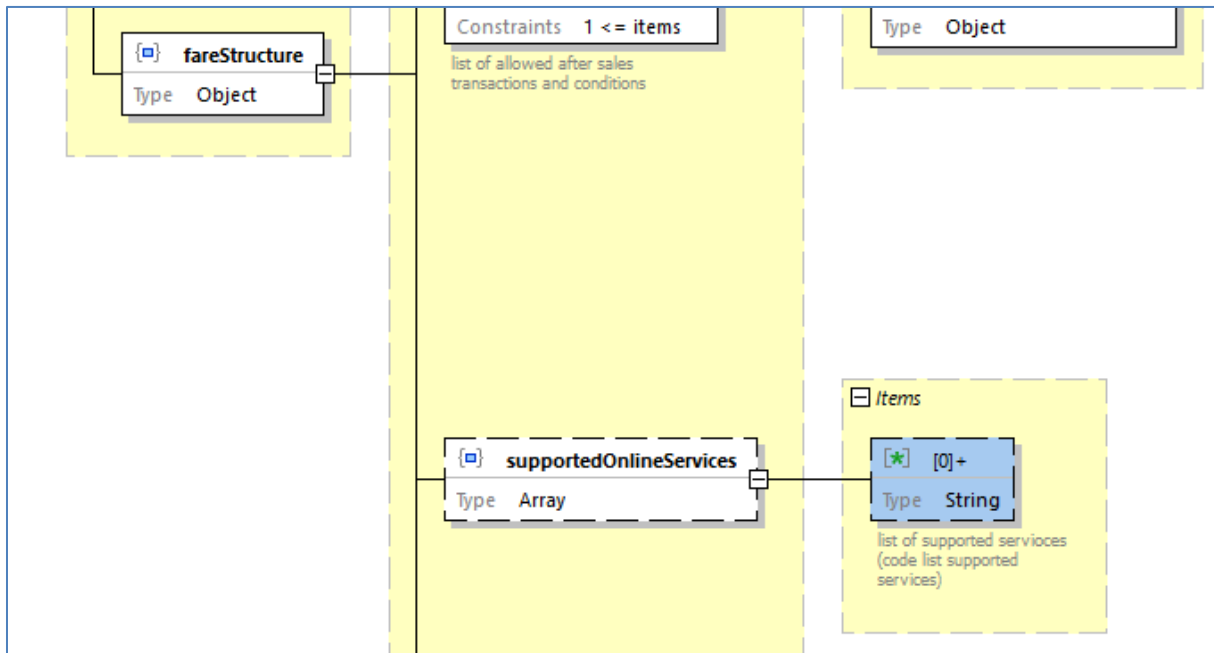


Figure 70 supported online services

In individual ticketing each traveler receives his own ticket (e.g. to pass a gate). However even with individual ticketing the tickets are still part of one booking and the after sales conditions apply to the whole booking and require an exchange of all individual bookings.

In some cases (e.g. full fares) the individual tickets can be treated as individual contracts and can be cancelled individually. This can be indicated in the after sales conditions attached to the fare.

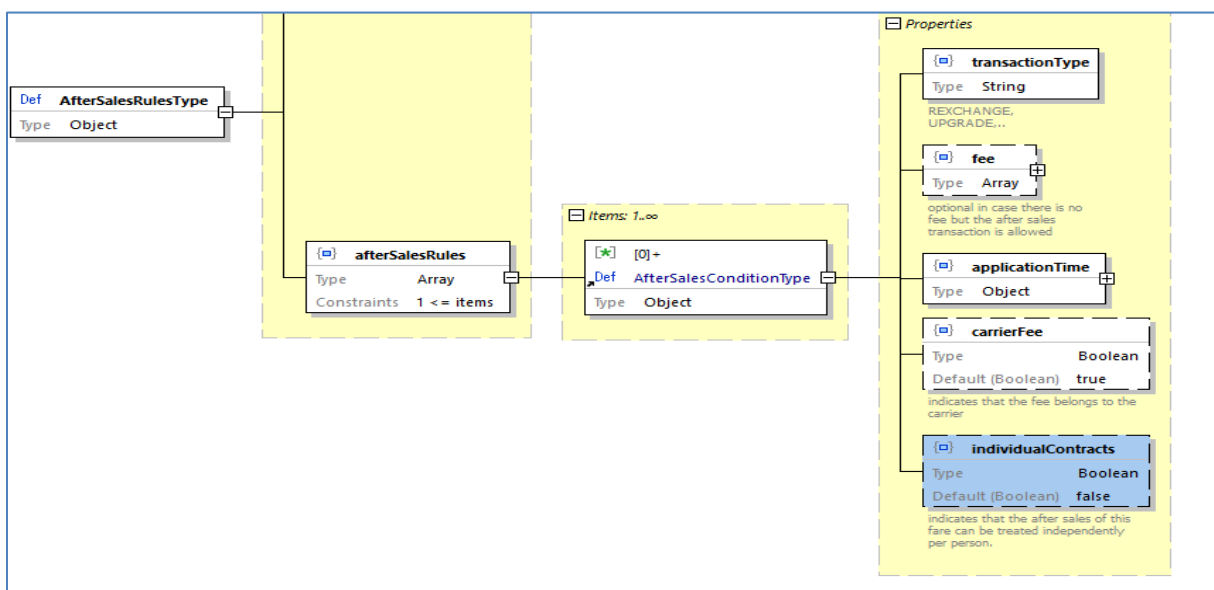


Figure 71 indication of individual contracts in the after sales conditions

## IRS 90918-10

### *Place selection by preferences*

Feature	Options
Idempotency	Yes
Compensation	N/A
Compensation Retry	Not available
Expected Look-to-Book Rate	5:1
Expected Response time	300 msec.

#### Request Content:

tag	content
offerId	Mandatory The id of the offer
train	Train number
offerContext	Conditional The offerContext provided by the carrier. The offer context must be provided in case the carrier included it in the offer.
preferences	List of preferences Code List: Preferences of places

#### Reply Content:

tag	content
available preferences	List of preferences available in combination if the booking would have been confirmed now. Code List: Preferences of places
reservationContext	Data to be used in prebooking. The data must not be changed by the allocator.

## IRS 90918-10

Service description:

Request:

**PUSH /CheckPlacePreferences/<version>/{..}**

Reply:

HTTP reply codes

http code	http meaning	usage
200	ok	
201	created	Not used
202	accepted	Not used
204	Reply intentionally empty	Not used
400	Bad request	Used in case of syntactical errors <ul style="list-style-type: none"><li>• schema violation</li><li>• undefined codes</li></ul>
401	unauthorized	Authorization error on a technical level (OAUTH 2.0 authentication)
404	Not found	The references offer was not found
408	Request timeout	Request was not received completely
409	Conflict	The offer context or the reservation context was corrupted
424	Dependency conflict	The offer is expired, or the offer is not any more available
429	Too many requests	In case a load limiter or circuit breaker rejects the request
500	Internal server error	In case of technical errors within the server (internal time out, unavailable resources, ...)

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Request payload:

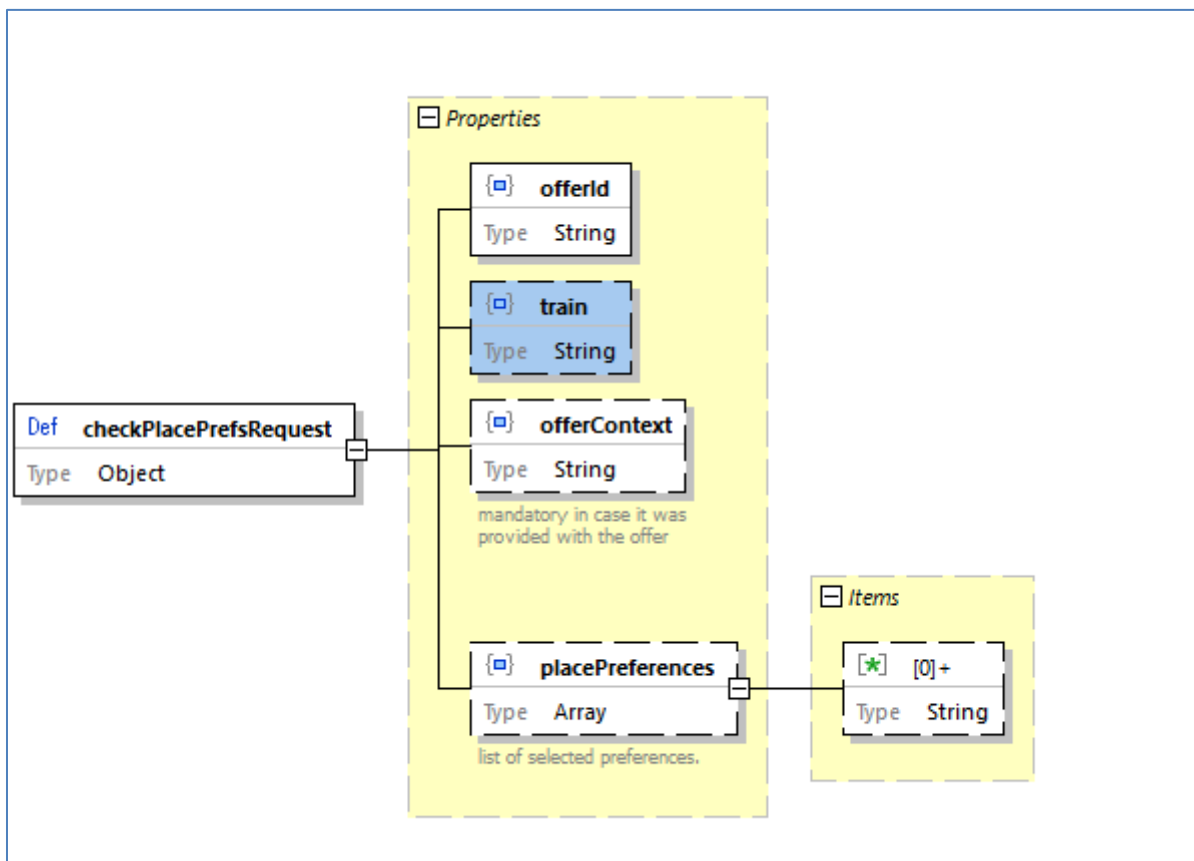


Figure 72 check place preferences request

Reply payload:

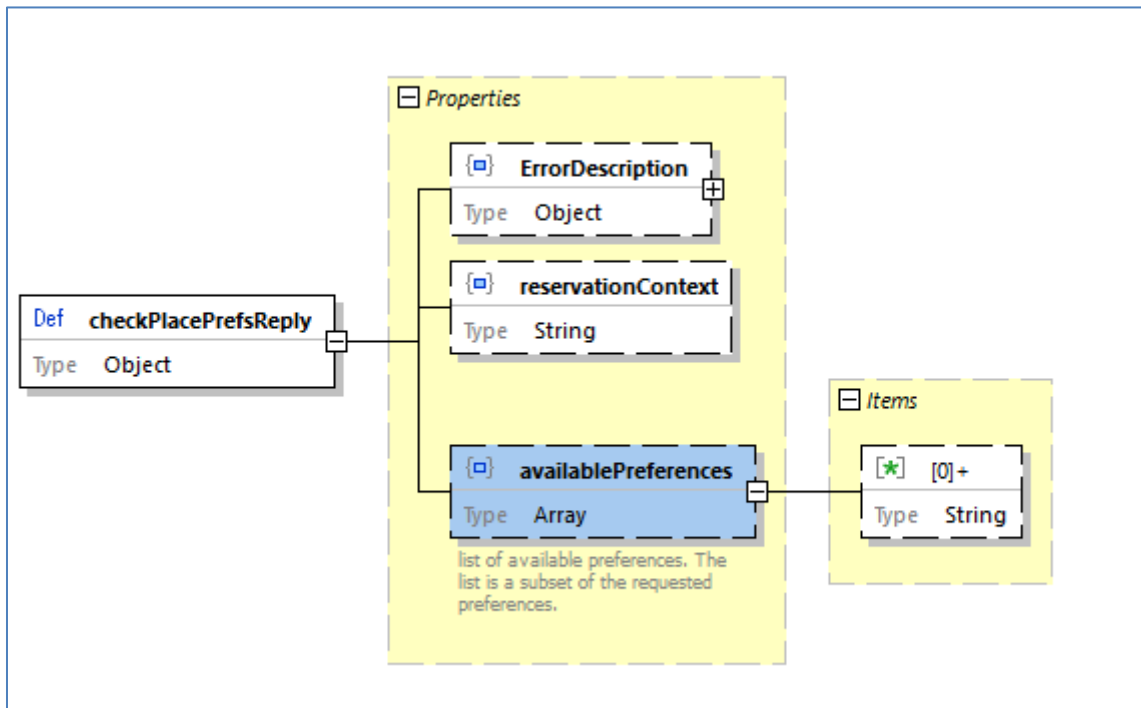


Figure 73 check place preferences reply

Payload error descriptions:

Code	Type	Description
	Type of error to address the internal staff to monitor and analyze errors	Description of the error to be used in logging for error analysis.  The description is not passed to a customer.  English language must be used.
SOLD_OUT	FUNCTIONAL	Offers were available in the past but are sold out
CLOSED_DUE_TO_CONSTRUCTION	FUNCTIONAL	Offers cannot be provided due to construction work.
CONTENT_ERROR	CONTENT	The wrong code and an indication of the element affected should be in the description.

## *Place selection by graphical selection*

Place selection by graphical displays is split in two services, one to retrieve the layout data and one to retrieve the available places for an offer.

This allows the allocator to reformat the layout according to his layout styles beforehand and to reduce the data volume per sales transaction significantly.

## *GetLayouts*

The layout information for graphical reservation is requested.

Feature	Options
Idempotency	Yes
Compensation	N/A
Compensation Retry	Not available
Expected Look-to-Book Rate	N/A request to be used one time per day
Expected Response time	10000 msec.

Request:

**GET /CoachLayouts/<version>/{..}**

## IRS 90918-10

Reply:

HTTP reply codes

http code	http meaning	usage
200	ok	
201	created	Not used
202	accepted	Not used
204	Reply intentionally empty	Not used
400	Bad request	Used in case of syntactical errors <ul style="list-style-type: none"><li>• schema violation</li><li>• undefined codes</li></ul>
401	unauthorized	Authorization error on a technical level (OAUTH 2.0 authentication)
404	Not found	Not used
408	Request timeout	Not used
409	Conflict	Not used
424	Dependency conflict	Not used
429	Too many requests	In case a load limiter or circuit breaker rejects the request
500	Internal server error	In case of technical errors within the server (internal time out, unavailable resources, ...)

Request:

- no payload

Reply payload:

The content of the layout data follows the definition of IRS 90918-1. Content and code lists are defined there.

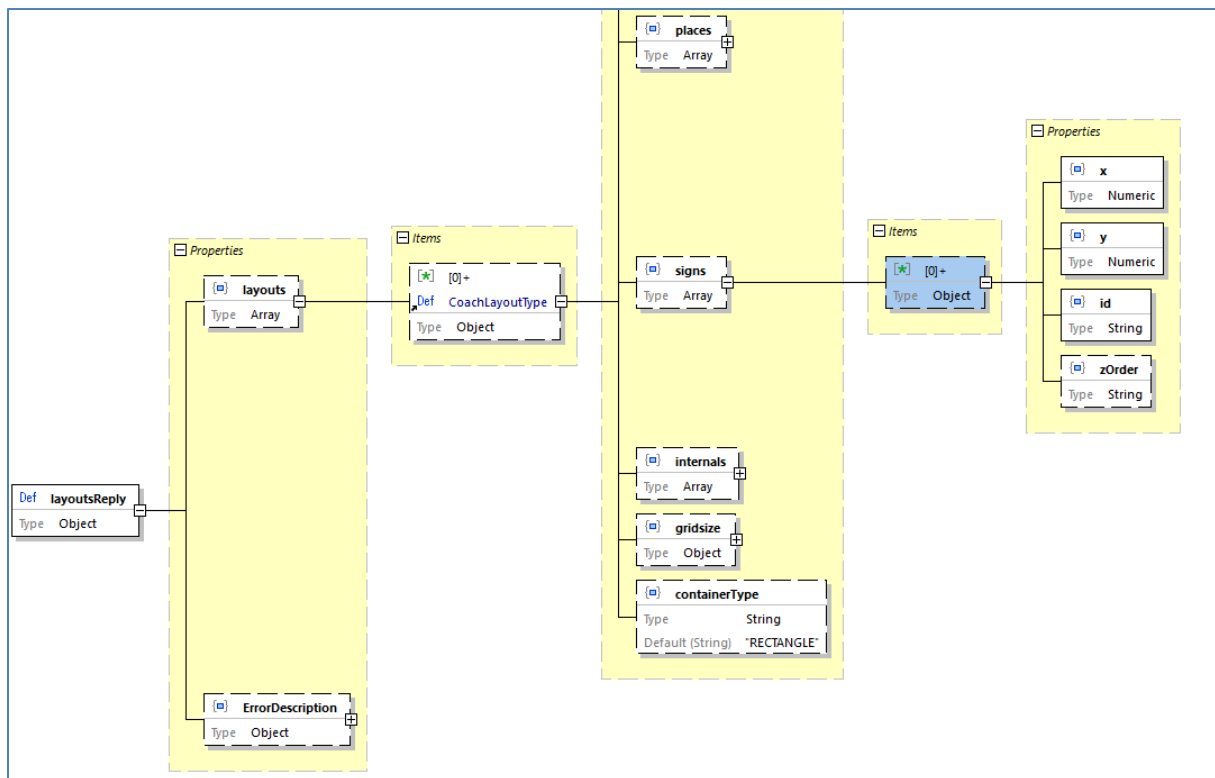


Figure 74 coach layouts reply data structure

### GetPlaceAvailability

Feature	Options
Idempotency	Yes
Compensation	N/A
Compensation Retry	Not available
Expected Look-to-Book Rate	5:1
Expected Response time	300 msec.

Request Content:

tag	content
offerId	Mandatory The id of the offer
train	Train number
offerContext	Conditional

## IRS 90918-10

	The offerContext provided by the carrier. The offer context must be provided in case the carrier included it in the offer.
preferences	List of preferences used for a preselection of places  Code List: Preferences of places

### Reply Content:

tag	content
reservationContext	Data to be used in prebooking. The data must not be changed by the allocator.



## IRS 90918-10

Service description:

Request:

**PUSH /GetPlaceAvailability/<version>/{..}**

Reply:

HTTP reply codes

http code	http meaning	usage
200	ok	
201	created	Not used
202	accepted	Not used
204	Reply intentionally empty	Not used
400	Bad request	Used in case of syntactical errors <ul style="list-style-type: none"><li>• schema violation</li><li>• undefined codes</li></ul>
401	unauthorized	Authorization error on a technical level (OAUTH 2.0 authentication)
404	Not found	The references offer was not found
408	Request timeout	Request was not received completely
409	Conflict	The offer context or the reservation context was corrupted
424	Dependency conflict	The offer is expired, or the offer is not any more available
429	Too many requests	In case a load limiter or circuit breaker rejects the request
500	Internal server error	In case of technical errors within the server (internal time out, unavailable resources, ...)

## IRS 90918-10

### Request payload

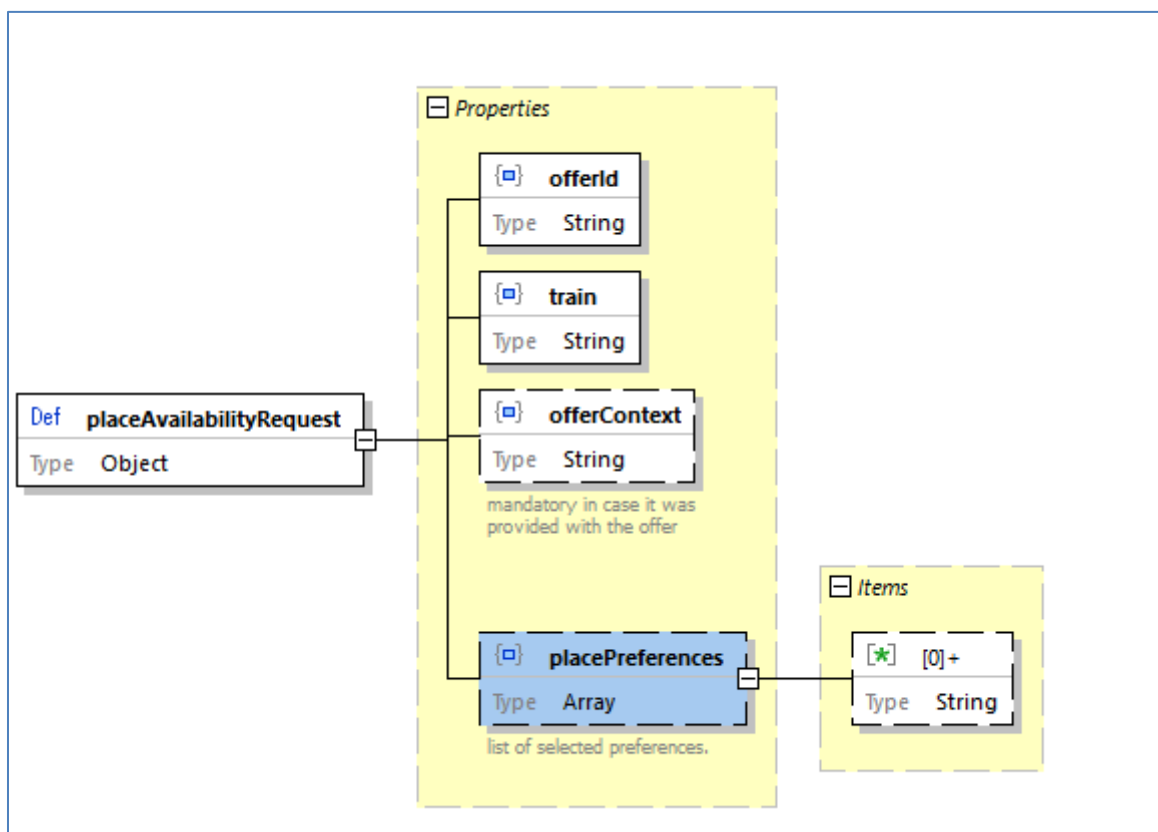


Figure 75 place availability request

### Reply payload:

The content corresponds to the content defined in IRS 90918-1. Code lists are defined there.

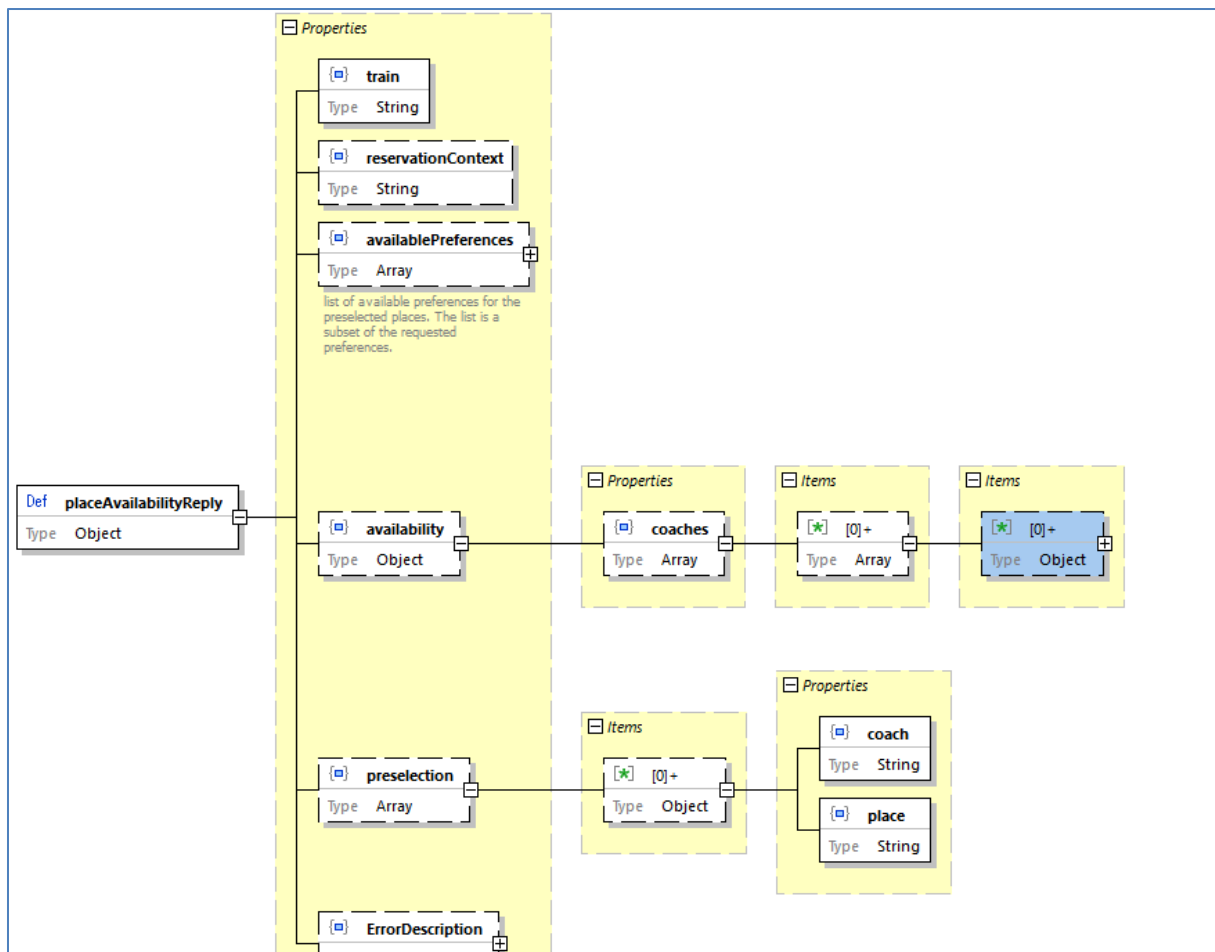


Figure 76 place availability reply data

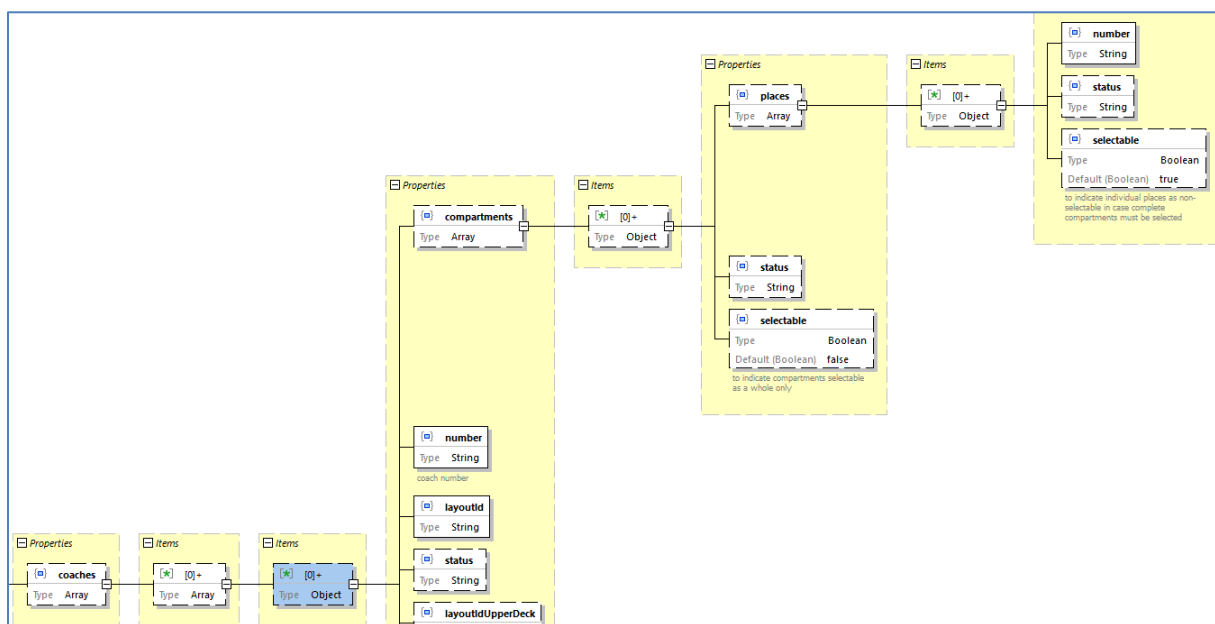


Figure 77 place availability data

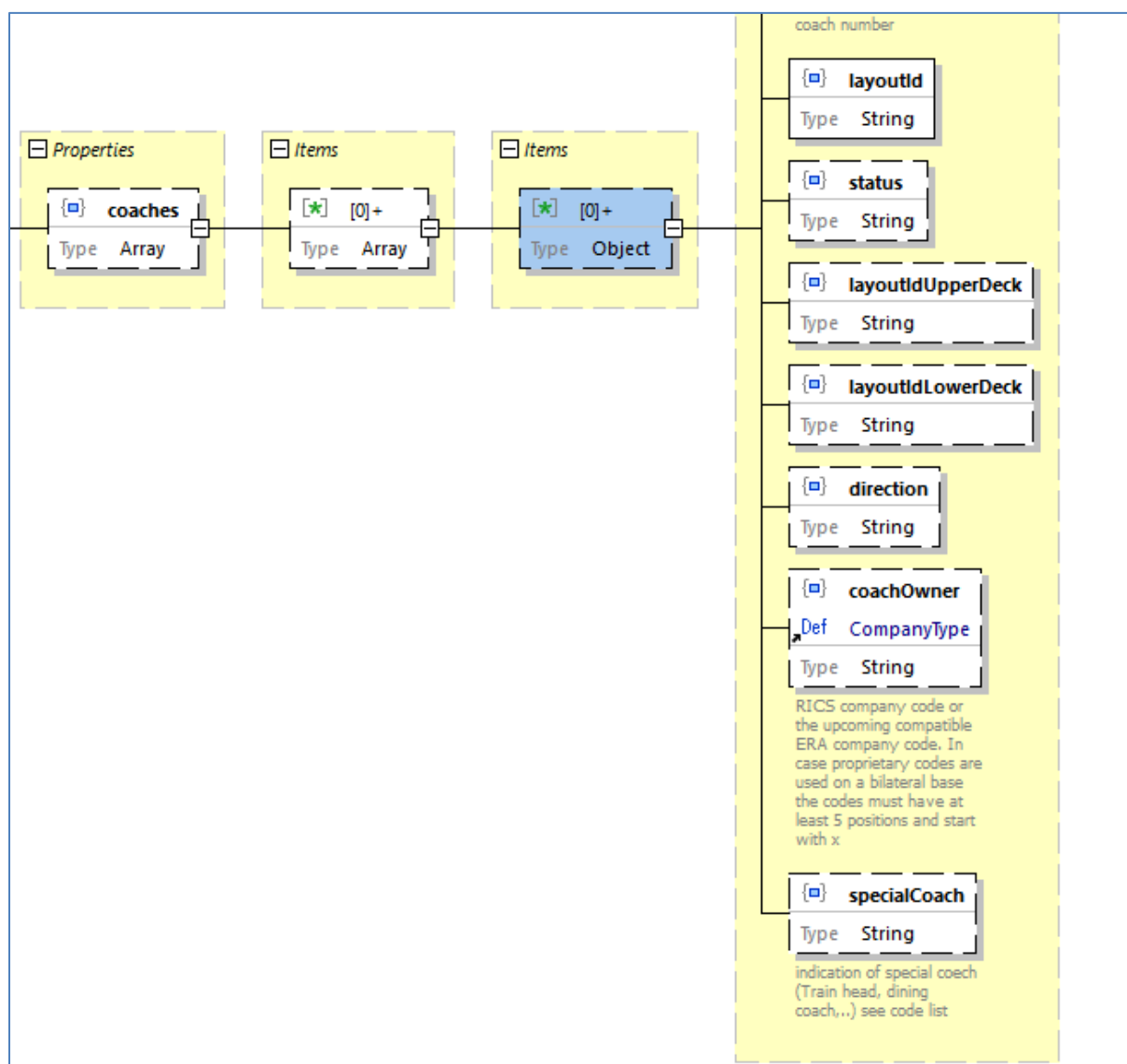


Figure 78 place availability - coach data

*Place selection near existing booking*

Feature	Options
Idempotency	N/A
Compensation	N/A
Compensation Retry	Not available
Expected Look-to-Book Rate	0,01:1
Expected Response time	300 msec.

Request Content:

tag	content
offerId	Mandatory The id of the offer
train	Train number
offerContext	Conditional The offerContext provided by the carrier. The offer context must be provided in case the carrier included it in the offer.
bookingId	Id of the booking which should be near by

Reply Content:

tag	content
available preferences	List of preferences available in combination if the booking would have been confirmed now. Code List: Preferences of places
reservationContext	Data to be used in prebooking. The data must not be changed by the allocator.

## IRS 90918-10

Service description:

Request:

**PUSH /CheckPlaceNearby/<version>/{..}**

Reply:

HTTP reply codes

http code	http meaning	usage
200	ok	
201	created	Not used
202	accepted	Not used
204	Reply intentionally empty	Not used
400	Bad request	Used in case of syntactical errors <ul style="list-style-type: none"><li>• schema violation</li><li>• undefined codes</li></ul>
401	unauthorized	Authorization error on a technical level (OAUTH 2.0 authentication)
404	Not found	The references offer was not found
408	Request timeout	Request was not received completely
409	Conflict	The offer context or the reservation context was corrupted
424	Dependency conflict	The offer is expired, or the offer is not any more available
429	Too many requests	In case a load limiter or circuit breaker rejects the request
500	Internal server error	In case of technical errors within the server (internal time out, unavailable resources, ...)

# IRS 90918-10

Request payload:

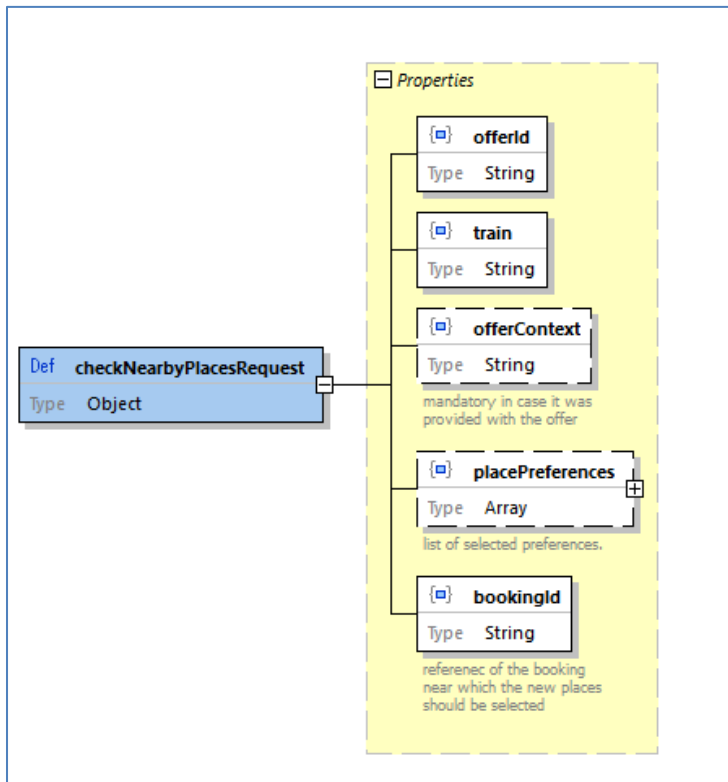


Figure 79 nearby place selection request

Reply payload

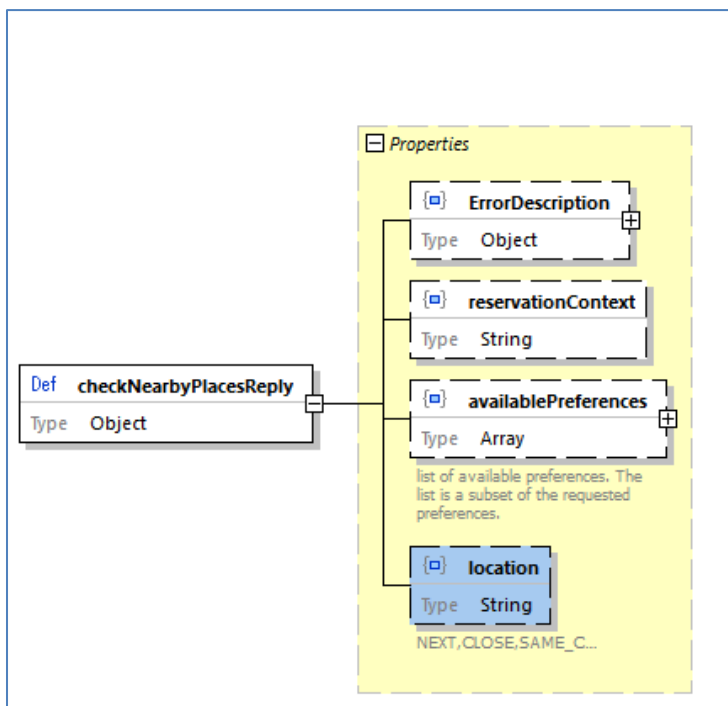


Figure 80 nearby place selection reply data

## IRS 90918-10

### *Fulfilment*

Request is based on the bookingId. The content of 90918-1 is transferred to JSON.

The service provides security features or entire tickets (only in case separate tickets are required).

Feature	Options
Idempotency	Yes
Compensation	No
Compensation Retry	No
Expected Look-to-Book Rate	1:1
Expected Response time	200 msec.

Request Content:

tag	content
requestid	<p>Mandatory</p> <p>Id of the request message. This id is used to implement the idempotency only. The use of a uuid is recommended.</p> <p>Request with the same request id must provide the same content.</p>
bookingId	<p>Mandatory</p> <p>The id of the booking</p>
Fulfilment medium	Fulfilment medium (code list in 90918-1)

Reply Content:

tag	content
bookingId	Id of the booking to be used for booking requests.



## IRS 90918-10

Service description:

Request:

**PUSH /GetSecurityFeatures/<version>/<requestid>/{..}**

Reply:

HTTP reply codes

http code	http meaning	usage
200	ok	Booking is confirmed
201	created	Not used
202	accepted	Not used
204	Reply intentionally empty	Not used
400	Bad request	Used in case of syntactical errors <ul style="list-style-type: none"><li>• schema violation</li><li>• undefined codes</li></ul>
401	unauthorized	Authorization error on a technical level (OAUTH 2.0 authentication)
404	Not found	The booking was not found
408	Request timeout	Request was not received completely
409	Conflict	The prebooking context was corrupted
424	Dependency conflict	The prebooking is expired (optional, only possible in case the expired prebooking was not deleted entirely)
429	Too many requests	In case a load limiter or circuit breaker rejects the request
500	Internal server error	In case of technical errors within the server (internal time out, unavailable resources, ...)

## Payload error descriptions:

Code	Type	Description
	Type of error to address the internal staff to monitor and analyze errors	<p>Description of the error to be used in logging for error analysis.</p> <p>The description is not passed to a customer.</p> <p>English language must be used.</p>
CONTENT_ERROR	CONTENT	The wrong code and an indication of the element affected should be in the description.
NO_INDIVIDUAL_TICKETING	CONTENT	Individual ticketing was requested although the fare does not permit this.
PERSONAL_DATA_MISSING	CONTENT	Personal data are not complete or references to passengers do not fit.

## Request payload:

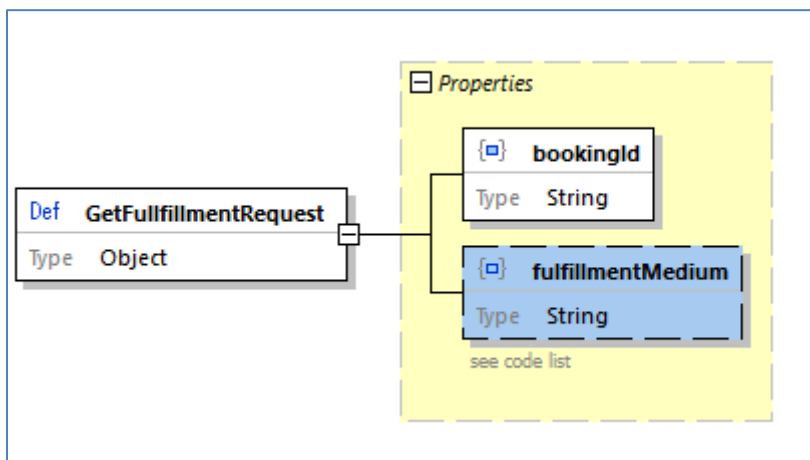


Figure 81 get fulfilment request

Reply payload:

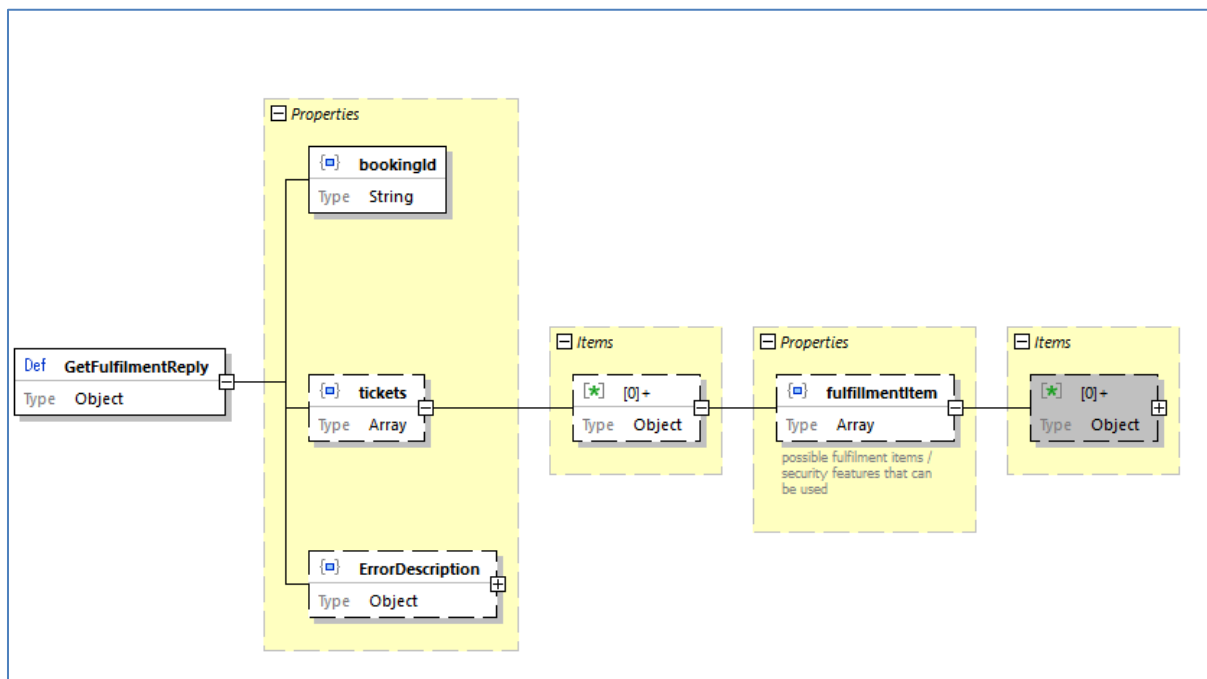


Figure 82 fulfilment items reply data

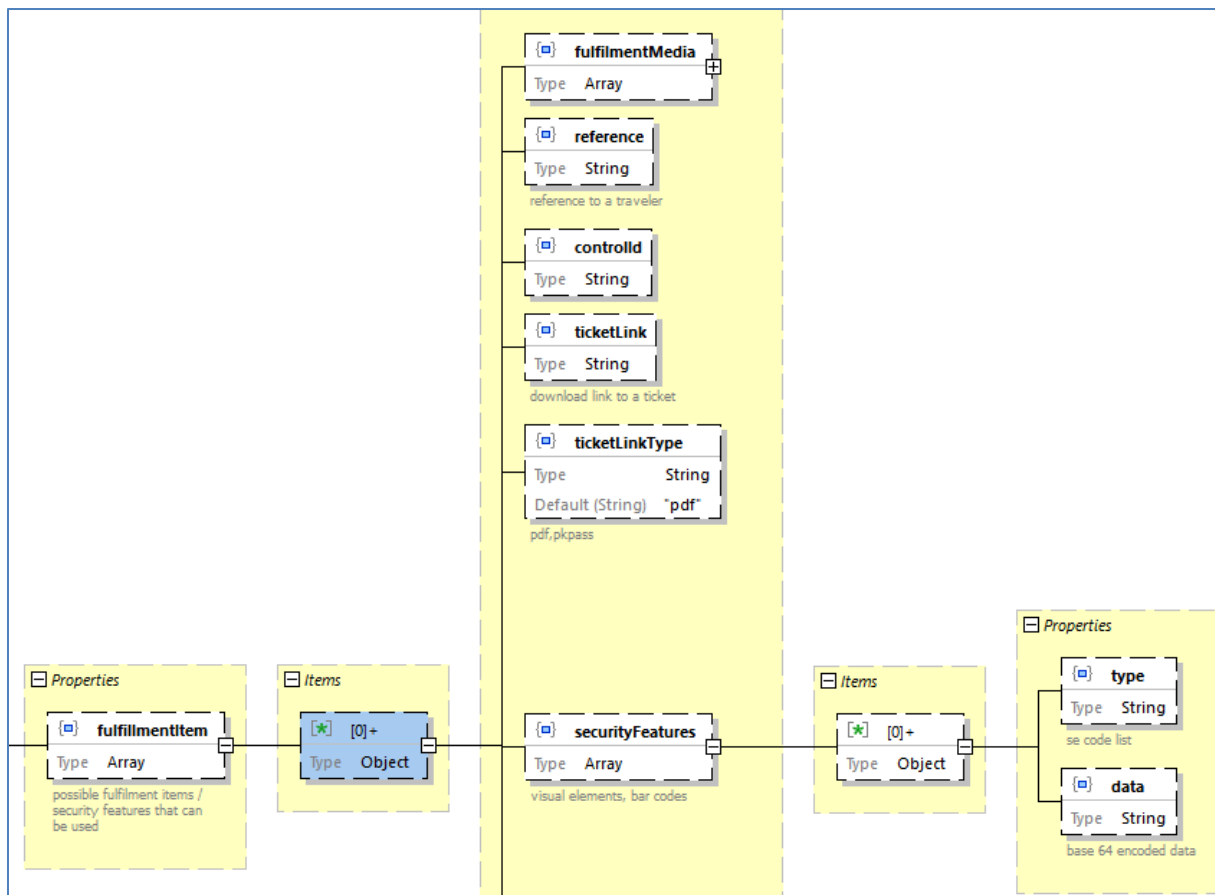


Figure 83fulfilment items data

### Add personal data

Request is based on the bookingId. The content of 90918-1 is transferred to JSON

The adding of personal data is required especially in case that document data are needed to be transferred for border crossings. To service allows to proceed with the booking in case the traveler has not his document data not (yet) ready. The data must be complete before fulfilment.

Feature	Options
Idempotency	Yes
Compensation	No
Compensation Retry	No
Expected Look-to-Book Rate	0,01:1
Expected Response time	200 msec.

## IRS 90918-10

### Request Content:

tag	content
requestid	<p>Mandatory</p> <p>Id of the request message. This id is used to implement the idempotency only. The use of a uuid is recommended.</p> <p>Request with the same request id must provide the same content.</p>
bookingId	<p>Mandatory</p> <p>The id of the booking</p>
Personal data	see 90918-4 (JSON-content specification) / 90918-1 (XML content specification)
Traveler reference	

### Reply Content:

tag	content
ErrorDescription	Error description

## IRS 90918-10

Service description:

Request:

**PUT /PersonalData/<version>/<requestid>{..}**

Reply:

HTTP reply codes

http code	http meaning	usage
200	ok	Booking is confirmed
201	created	Not used
202	accepted	Not used
204	Reply intentionally empty	Not used
400	Bad request	Used in case of syntactical errors <ul style="list-style-type: none"><li>• schema violation</li><li>• undefined codes</li></ul>
401	unauthorized	Authorization error on a technical level (OAUTH 2.0 authentication)
404	Not found	The booking was not found
408	Request timeout	Request was not received completely
409	Conflict	The prebooking context was corrupted
424	Dependency conflict	The prebooking is expired (optional, only possible in case the expired prebooking was not deleted entirely)
429	Too many requests	In case a load limiter or circuit breaker rejects the request
500	Internal server error	In case of technical errors within the server (internal time out, unavailable resources, ...)

Payload error descriptions:

Code	Type	Description
	Type of error to address the internal staff to monitor and analyze errors	Description of the error to be used in logging for error analysis.  The description is not passed to a customer.  English language must be used.
CONTENT_ERROR	CONTENT	The wrong code and an indication of the element affected should be in the description.
PERSONAL_DATA_MISSING	CONTENT	Personal data are not complete or references to passengers do not fit.

Request payload:

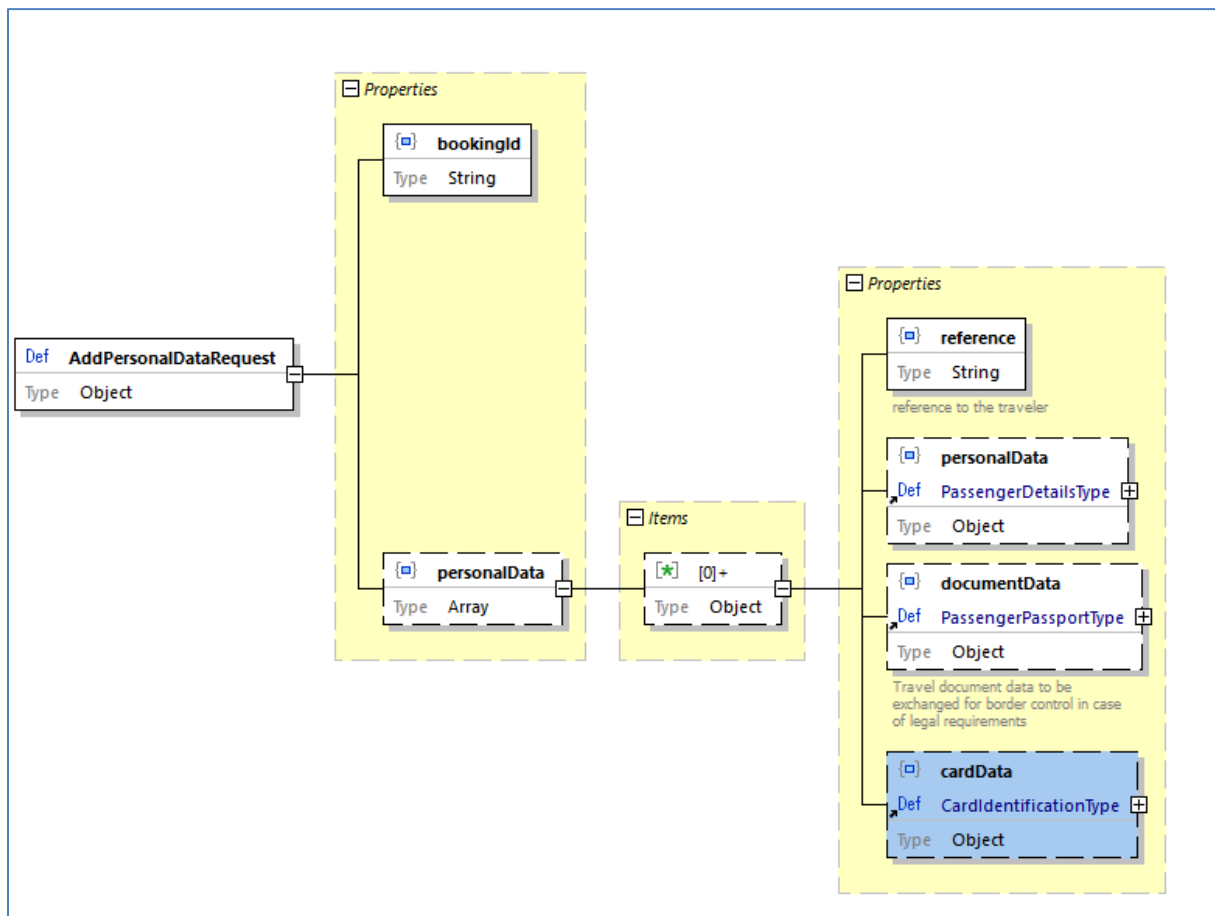


Figure 84 add personal data request

Reply payload:

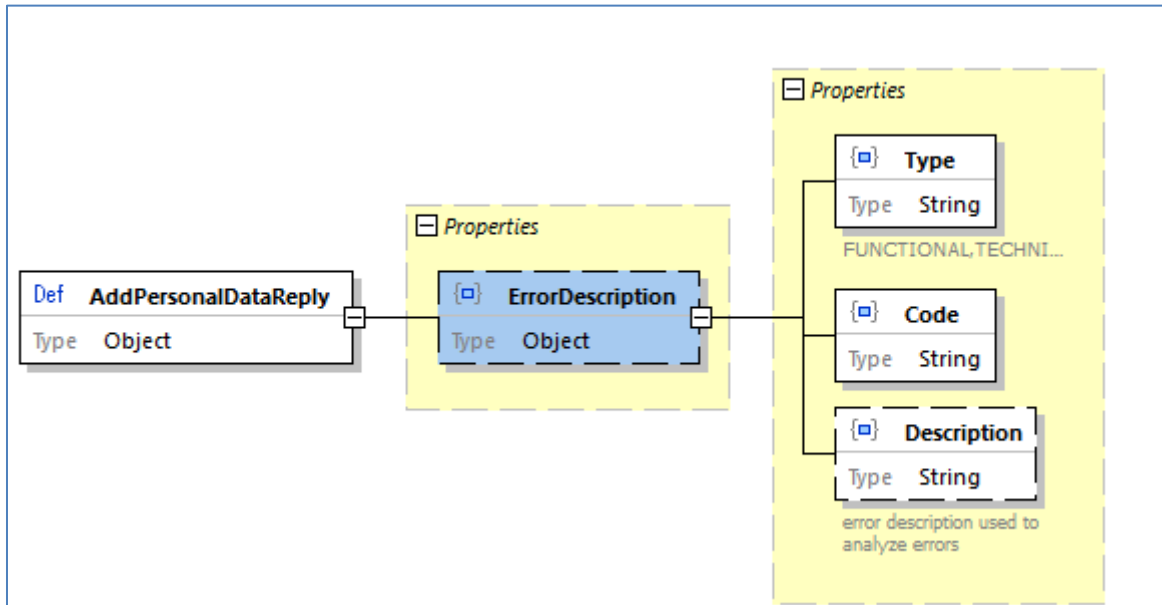


Figure 85 add personal data reply

## Correction of personal data

The correction of personal data is required by GDPR and especially needed in case that document data need to be transferred for border crossings.

Request is based on the bookingId. Content of 90918-1 is transferred to JSON

There is no special service to correct personal data. The service to add personal data will replace old data.

## Information on stored personal data

Request is based on the bookingId. Content of 90918-1 is transferred to JSON

This service allows the allocator to provide information on stored personal data to the traveler as required by GDPR.



## IRS 90918-10

Feature	Options
Idempotency	Yes
Compensation	No
Compensation Retry	No
Expected Look-to-Book Rate	0,01:1
Expected Response time	200 msec.

### Request Content:

tag	content
bookingId	Mandatory The id of the booking

### Reply Content:

tag	content
Personal data	Using the same data structure as in add personal data

## IRS 90918-10

Service description:

Request:

**PUSH /GetPersonalData/<version>/{..}**

Reply:

HTTP reply codes

http code	http meaning	usage
200	ok	Booking is confirmed
201	created	Not used
202	accepted	Not used
204	Reply intentionally empty	Not used
400	Bad request	Used in case of syntactical errors <ul style="list-style-type: none"><li>• schema violation</li><li>• undefined codes</li></ul>
401	unauthorized	Authorization error on a technical level (OAUTH 2.0 authentication)
404	Not found	The booking was not found
408	Request timeout	Request was not received completely
409	Conflict	Not used
424	Dependency conflict	Not used
429	Too many requests	In case a load limiter or circuit breaker rejects the request
500	Internal server error	In case of technical errors within the server (internal time out, unavailable resources, ...)

Payload error descriptions:

Code	Type	Description
	Type of error to address the internal staff to monitor and analyze errors	Description of the error to be used in logging for error analysis.  The description is not passed to a customer.  English language must be used.
CONTENT_ERROR	CONTENT	The wrong code and an indication of the element affected should be in the description.
PERSONAL_DATA_MISSING	CONTENT	Personal data are not complete or references to passengers do not fit.

Request payload:

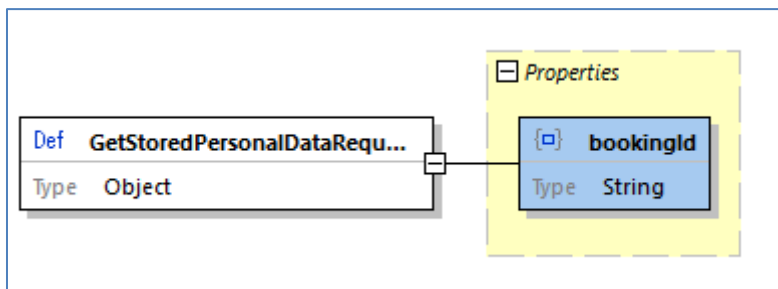


Figure 86 get stored personal data request

Reply payload:

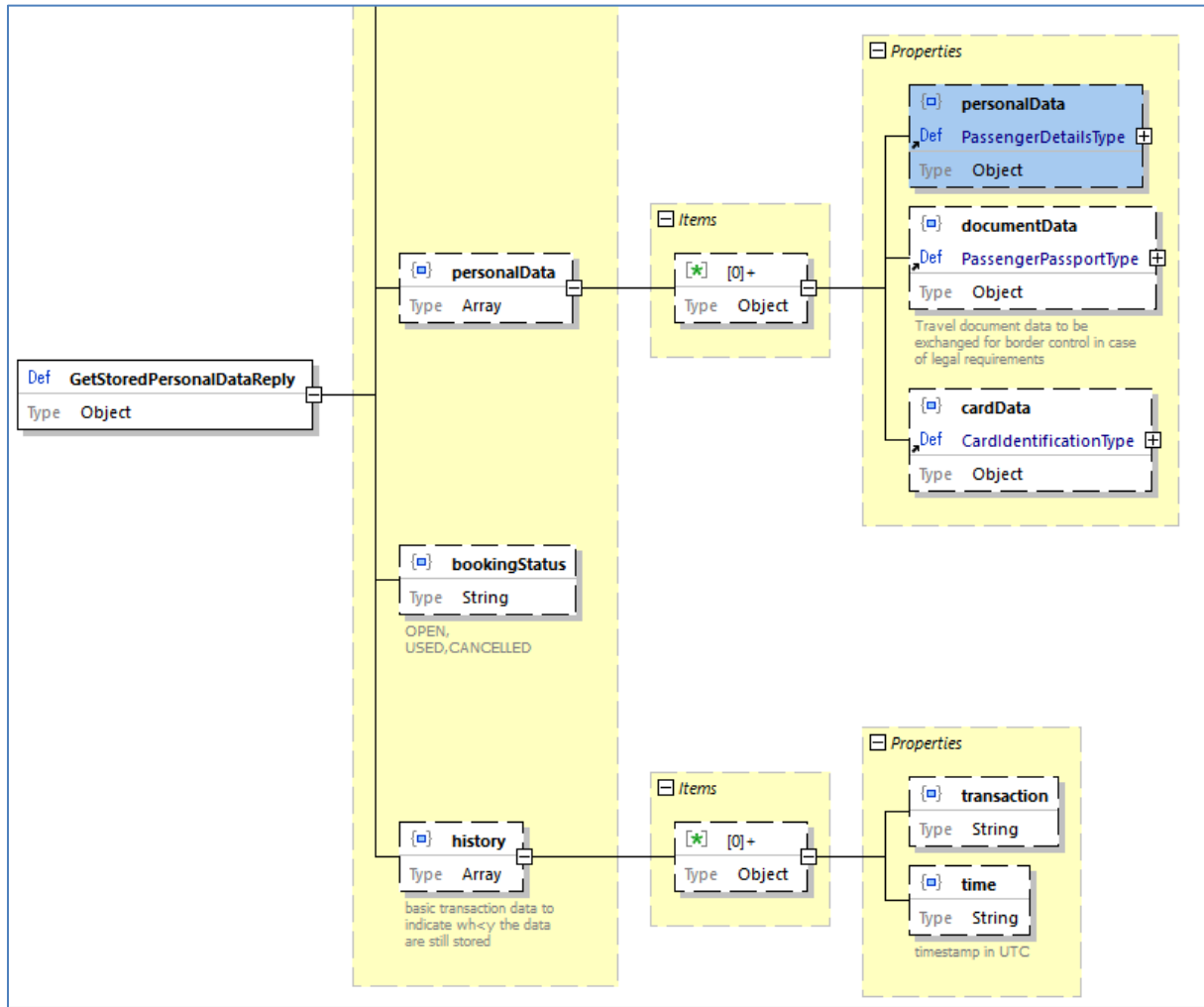


Figure 87 get stored personal data reply

## Code lists

### *BarcodeType*

Code	Description
FCB	See IRS 90918-9
TLB	See IRS 90918-9
SBB	See IRS 90918-9

### *ControlDataExchangeType*

Code	Description
IRS90918_4_REGISTRY	See IRS 90918-4, data are deliverd to the UIC registry
IRS90918_4_PEER2PEER	See IRS 90918-4, adata are exchange peer 2 peer
PROPRIETARY	

### *FareType*

Code	Description
NRT	NRT
IRT	IRT
RES	RES (with or without supplement)
ANC	Ancilliary

### *FulfilmentType*

Code	Description
SIP	See IRS 90918-9
SID	See IRS 90918-9
SIS	See IRS 90918-9

### *Gender*

Gender code	Description
MALE	Male
FEMALE	Female
X	Diverse

## IRS 90918-10

### *Interface Type*

Code	Description
IRS90918_1_BINARY	Reservation interface according to IRS90918-1 binary message format
IRS90918_1_XML	Reservation interface according to IRS90918-1 XML message format
IRS90918_1_BINARY	Reservation interface according to IRS90918-1 binary message format

### *Offer request Type*

Code	Description
DATE_OF_BIRTH	Date of birth
E_MAIL	e-mail

### *Personal data items*

Codes for personal data items that might be transferred to the carrier if required.

Code	Description
DATE_OF_BIRTH	Date of birth
E_MAIL	e-mail
PHONE	Phone number
FULL_NAME	Full name (first and last name)
LAST_NAME	Last name
SOCIAL_MEDIA_ACCOUNT	A social media account
LANGUAGE	Languages of the traveler
TITLE	Title of the traveler
DOC_TYPE	Type of the document if passport or id card are possible
DOC_ID	ID of the document
DOC_NAME	Name of the traveler as written on the document
DOC_CITY_OF_RESIDENCE	City of residence as written in the document
DOC_COUNTRY_OF_BIRTH	
DOC_COUNTRY_OF_ISSUE	
DOC_COUNTRY_OF_RESIDENCE	
DOC_DATE_OF_ISSUE	
DOC_GENDER	Gender as written in the document
GENDER	Gender to be used for special bookings
DOC_NATIONALITY	Nationality as given in the document
DOC_LIMIT_OF_VALIDITY	Limit of validity as written on the document
DOC_CITY_OF_ISSUE	
DOC_CITY_OF_BIRTH	
DOC_TYPE_PASSPORT	Document provided must be a passport
CARD_ISSUER	Card issuer
CARD_NUMBER	Card identifier

## *Personal data transfer types*

Code	Description
BOOKING	The data will be transfered via the booking services
SIS_CONTROL	The data will be transfered via ssecurity in system control data exchange (IRS 90918-4)
SID	The data will be transfered via a barcode

## *Personal data change reasons*

Code	Description
IN_GENERAL	No specific reason
MARRIAGE	
DOCUMENT_EXCHANGE	E.g. passport was lost and replaced
AGENT_ERROR	Personal data were entered wrongly by the sales agent

## *Preferences of places*

Code	Group	Description
AILE	PLACE_LOCATION	
WINDOW	PLACE_LOCATION	
UPPER_BED	BED_LOCATION	
LOWER_BED	BED_LOCATION	
MIDDLE_BED	BED_LOCATION	
UPPER_COUCHETTE	BED_LOCATION	
MIDDLE_COUCHETTE	BED_LOCATION	
LOWER_COUCHETTE	BED_LOCATION	
UPPER_DECK	LEVEL	
LOWER_DECK	LEVEL	
COMPARTMENT	PLACE_GROUPING	
OPEN_SPACE	PLACE_GROUPING	
TABLE		Places at a table
BICYCLE	VEHICLE	Bicycle
TANDEM	VEHICLE	Tandem bicycle
PRAM	VEHICLE	Space for a pram
AIR-CONDITIONED		
PANORAMA		Panorama coach
MANAGER		Manager compartment / business
VIDEO		Place with video entertainment
CABIN8	PLACE_GROUPING	
DUO_F2F	PLACE_GROUPING	Duo face to face (2 seats facing)

DUO_SBS	PLACE_GROUPING	Duo side by side (2 seats side by side)
CLUB_2	PLACE_GROUPING	Club Duo (2 seats facing in a separate compartment)
CLUB_4	PLACE_GROUPING	Club 4 (4 seats facing)
CARRE	PLACE_GROUPING	Carré (4 seats facing normally 2nd Class)
SALON	PLACE_GROUPING	Salon (6 seats facing in separate compartment)
KIOSQUE	PLACE_GROUPING	Kiosque (special seats in edge area)
SOLO	PLACE_GROUPING	Separate place
SILENCE	USAGE	
OFFICE	USAGE	
ACC_BICYCLE	ACC_VEHICLE	Place with bicycle
ACC_TANDEM	ACC_VEHICLE	Place with tandem bicycle
BISTRO		Places in a coach with self-service bistro
CLASSIC		Classic coach
RESTAURANT	USAGE	Places in the restaurant coach
FRONT_VIEW		Places with view to the front
PRM	PRM	Places for passenger needing assistance / disabled
EASY_ACCESS	PRM	Place with easy access for PRMs
WHEELCHAIR	PRM	Wheelchair place with additional seat
WHEELCHAIR_WS	PRM	Wheelchair place without additional seat
PHONE		Places in an area with mobile phone amplifier
NEAR_ANIMALS	ANIMALS	Places close to place with animals
SILENCE		Places in silence area
NEAR_DINING		Places near the dining car
WIFI		Places with WiFi access point
POWER		Place with power socket
WITH_ANIMALS	ANIMALS	Place with animals (animals allowed)
WITHOUT_ANIMALS	ANIMALS	Place in an area where animals are not allowed
WITH_SMALL_CHILDREN	FAMILY	Places for passengers with small children
ACC_PRAM	FAMILY	Place with space for a pram
FAMILY	FAMILY	Places in family area
NEAR_PLAY_AREA	FAMILY	Places near a child play area
FEMALE	USAGE	Female compartment
DOUBLE_BED		Sleeper with double bed
CONNECTING_DOOR		Compartments with connecting Door (in Sleepers)
CONFERENCE	USAGE	Conference compartment



*Preference groups*

Code	description
PLACE_LOCATION	Place location (Aisle, Window)
BERTH_LOCATION	Location of a berth or couchette
LEVEL	Upper or lower deck
PLACE_GROUPING	Compartment / Open Space
VEHICLE	Different types of vehicles
USAGE	Different usage types for different coach areas
ACC_VEHICLE	Different types of accompanying vehicles
FAMILY	Different types of places for families

*Properties of places*

Code	Description
AILE	
WINDOW	
UPPER_BED	
LOWER_BED	
MIDDLE_BED	
UPPER_COUCHETTE	
MIDDLE_COUCHETTE	
LOWER_COUCHETTE	
UPPER_DECK	
LOWER_DECK	
COMPARTMENT	
OPEN_SPACE	
TABLE	Places at a table
BICYCLE	Bicycle
TANDEM	Tandem bicycle
PRAM	Space for a pram
AIR-CONDITIONED	
PANORAMA	Panorama coach
MANAGER	Manager compartment / business
VIDEO	Place with video entertainment
CABIN8	
DUO_F2F	Duo face to face (2 seats facing)
DUO_SBS	Duo side by side (2 seats side by side)
CLUB_2	Club Duo (2 seats facing in a separate compartment)
CLUB_4	Club 4 (4 seats facing)

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CARRE	Carré (4 seats facing normally 2nd Class)
SALON	Salon (6 seats facing in separate compartment)
KIOSQUE	Kiosque (special seats in edge area)
SOLO	Separate place
SILENCE	
OFFICE	
ACC_BICYCLE	Place with bicycle
ACC_TANDEM	Place with tandem bicycle
BISTRO	Places in a coach with self-service bistro
CLASSIC	Classic coach
RESTAURANT	Places in the restaurant coach
FRONT_VIEW	Places with view to the front
PRM	Places for passenger needing assistance / disabled
EASY_ACCESS	Place with easy access for PRMs
WHEELCHAIR	Wheelchair place with additional seat
WHEELCHAIR_WS	Wheelchair place without additional seat
PHONE	Places in an area with mobile phone amplifier
NEAR_ANIMALS	Places close to place with animals
SILENCE	Places in silence area
NEAR_DINING	Places near the dining car
WIFI	Places with WiFi access point
POWER	Place with power socket
WITH_ANIMALS	Place with animals (animals allowed)
WITHOUT_ANIMALS	Place in an area where animals are not allowed
WITH_SMALL_CHILDREN	Places for passengers with small children
ACC_PRAM	Place with space for a pram
FAMILY	Places in family area
NEAR_PLAY_AREA	Places near a child play area
FEMALE	Female compartment
DOUBLE_BED	Sleeper with double bed
CONNECTING_DOOR	Compartments with connecting Door (in Sleepers)
CONFERENCE	Conference compartment
COMPARTMENT_SHOWER_WC	Compartment with shower and WC
COMPARTMENT_WC	Compartment with shower
SLEEPERETTE	Sleeperette (reclining seat)
BUSINESS	Manager compartment/business
CONFERENCE_ROOM	Conference room
BICYCLE_INCL_SEAT	Bicycle including seat
CLUB	Club (RENFE)
PREFERENTE	Preferente (RENFE)
TOURIST	Tourist (RENFE)
COUCHETTE_4	Four-berth couchette compartment
COUCHETTE_EMPTY	Couchette coach without equipment
WITH_DRINK	with drink
WITH_MEAL	with meal
PREMIUM	PREMIUM
WITH_BREAKFAST	Breakfast included
COUCHETTE_5	Five-bed couchette compartment
DOUBLE_BED	Double bed (Suite DeLuxe)
EXCELLENCE	Excellence Class

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RESTAURANT	Restaurant (places in a dining car)
COUCHETTE_2	Two-bed couchette compartment
COUCHETTE_6	Six-bed couchette compartment
BED_SINGLE	Single sleeper compartment
BED_SPECIAL	Special (small) one bed sleeper compartment
BED_DOULBE	Double sleeper compartment
BED_T2	Small double sleeper compartment
BED_T3	Three bed sleeper compartment
BED_T4	Four bed sleeper compartment

### *Reason for after sale*

Code	Description
REFUND_STRIKE	
REFUND_SALES_STAFF_ERROR	
REFUND	Cancellation on request of a traveler
REFUND_PAYMENT_FAILURE	Cancellation made by the allocator due to a failed payment
EXCHANGE	The indicated previous bookings will be cancelled after the confirmation of the new booking.
UPGRADE	The original booking(s) stay valid. The new booking is an upgrade depending on the old bookings.
INCREASE_TRAVELLERS	The number of passengers is increased. The new booking replaces the old booking after confirmation
DECREASE_TRAVELLERS	The number of passengers is decreased. The new booking replaces the old booking after confirmation.
EXCHANGE_KEEP_CARRIER	Exchange with a new fare of the same carrier
EXCHANGE_CHANGE_CARRIER	Exchange with a new fare of another carrier

### *Reduction "cards"*

The following code lists defines the commonly used cards which are not provided by a specific carrier:

Predefined Card-Ids	Issuer	Description	type
UIC_EURAIL	Eurail	Eurail Pass	PASS
UIC_INTERRAIL	Eurail	Interrail Pass	PASS
UIC_FIP_LEASURE_RED	FIP	FIP reduction (50%)	REDUCTION_CARD
UIC_FIP_DUTY	FIP	FIP duty	PASS
UIC_FIP_LEASURE_FREE	FIP	FIP free personal use	PASS
UIC_RAILPLUS	*	A pure rail plus card	REDUCTION_CARD
UIC_RIT_1	*	RIT reduction for RIT 1 members	REDUCTION_CARD
UIC_RIT_2	*	RIT reduction for RIT 2 members	REDUCTION_CARD
UIC_RIT_3	*	RIT reduction for RIT 3 members	REDUCTION_CARD

## *CardType*

The following code list defines the card types for cards used

Predefined Card-Ids	Description
LOYALTY_CARD	Loyalty card
REDUCTION_CARD	Card providing reduction
PASS	Pass for travelling

## *Sales Channel Type*

Channel type code	description
STATION_OFFICE	
VENDING_MACHINE	
WEB_MOBILE_SALE	
ON_BOARD_SALE	
AGENCY_SALE	

## *Service Brand Codes*

Codes from the official UIC/TAP-TSI code list must be used.

## *Service Class / Classic Class*

Code	Description	Classic Class
A	1st class A (highest service level)	FIRST
B	1st class B - todays standard 1st class	FIRST
C	2nd class C	SECOND
D	2nd class D (lowest service level) - todays standard 2nd class	SECOND

Examples:

ÖBB: A = Business, B = 1<sup>st</sup> class, D = 2<sup>nd</sup> class

DB: B = 1<sup>st</sup> class, D = 2<sup>nd</sup> class

RHB: A = Excellence Class, B = 1<sup>st</sup>. class, D = 2<sup>nd</sup> class

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## Station codes

The station codes are the station codes defined in the time table data according to TAP-TSI. A valid source for the code list is MERITS.

## SupportedOnlineServices

Online services supported by the carrier.

Supported online services	Description
OFFER	Offer service (without after sales offers)
BOOKING	Preliminary booking, confirm booking and cancellation
RESERVATION_LEGACY_918_1	Services according to the 90918-1 XML or binary specification
RESERVATION_PREF	Place allocation using preferences
RESERVATION_GRAPH	Place allocation using graphical place display
UPGRADE	Upgrade to an existing booking
INCREASE	Exchange with an increase of the number of travelers
DECREASE	Exchange with an decrease of the number of travelers
EXCHANGE	Exchange with the same number of travelers
FULFILLMENT	Only in case of separate ticket! – providing an entire tickets
FULFILLMENT_ITEMS	Providing security items for a ticket (e.g. additional bar codes)

## TaxScope

Code	description
INTERNATIONAL	VAT applies in international tickets only This needs to be applied in case the fare is integrated into an international ticket
NATIONAL	VAT applies in national tickets only
SHORT_DISTANCE	VAT applies in short distance tickets only
LONG_DISTANCE	VAT applies in long distance tickets only This needs to be applied in case the fare is integrated in a longer journey.

## TimeReference

Code	Description
BEFORE_DEPARTURE	Time value calculated relative to the departure (subtract from departure) The time zone of the departure station applies.
AFTER_DEPARTURE	Time value calculated relative to the departure (add to departure) The time zone of the departure station applies.
AFTER_SALE	Time value calculated relative to the sales time (add to sales time). The time zone of the sale applies.
BEFORE_START_VALIDITY	before the start of the validity. The time zone of the departure station applies.

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AFTER_END_VALIDITY	after the start of the validity. The time zone of the departure station applies.
--------------------	--

### *TimeUnit*

Code	Description
DAY	Time value calculated relative to the departure (subtracted from departure)
MONTH	Time value calculated relative to the departure (added to departure)
HOURE	Time value calculated relative to the sales time (added to sales time)

### *TransferTypes*

Code	Description
WALK	A walk
OTHER	Other types of transfer (e.g. taxi, local city transport not included in the offer,...)

### *TravelerTypes*

Traveler type provides generic codes for the usual types of passengers.

FareItems:

- TravelerTypes
- Anxillaries

TravelerType/Anxillary	Description	Anxillary service	bulk	Online request	Online reply
YOUNG_CHILD	Young child - defined by the carrier depending on the age		X		X
CHILD	Child - defined by the carrier depending on the age		X		X
YOUTH	Youth - defined by the carrier depending on the age		X		X
ADULT	Adult - defined by the carrier depending on the age		X		X
SENIOR	Senior - defined by the carrier depending on the age		X		X
ACCOMP_PRM	Accompanying Person for PRM		X		X
PRM_CHILD	Handicapped young child accompanied by one person where the usual child according to the age price would be zero and the accompanying person would also be free		X		X
WHEELCHAIR	Passenger with wheelchair			X	
PERSON	Used in requests together with date of birth			X	

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PRM	Person with reduced mobility – to be used in case of accompanying person or dog, date of birth must be provided additionally			X	
DOG	A dog	X	X	X	X
LUGGAGE	Oversize luggage	X	X	X	X
BICYCLE	A bicycle	X	X	X	X
ACCOMP_DOG	An accompanying dog for a PRM	X	X	X	X
CAR	A car for car carriage trains	X	X	X	X
MOTOCYCLE	A motorcycle for car carriage trains	X	X	X	X
TRAILER	A trailer for car carriage trains	X	X	X	X

## Compliance with the specification

An implementation of the bulk data exchange or the online services is compliant with the specification if:

- A feature specified in the data structure is implemented  
Or
- A fare providing using the feature in its data is excluded from sale

A system receiving data for a fare must be able to understand all features and rules of the fare defined in the data and obey these features and rules or must not sell such a fare.

If an online interface is provided the following services/features are required:

Service	Obligation
Offer	Mandatory
OfferSearch	Optional
Prebooking	Mandatory in case ConfirmBooking is provided
CompensatePrebooking	Mandatory in case Prebooking is provided
DeletePrebooking	Mandatory in case Prebooking is provided
ConfirmBooking	Mandatory in case Prebooking is provided
CompensateBooking	Mandatory in case ConfirmBooking is provided
DeleteBooking	Mandatory in case ConfirmBooking is provided
CancellationOffer	Mandatory in case ConfirmBooking is provided
ExchangeBooking	Optional
Upgrade	Optional
IncreaseNumberOfPassengers	Optional
DecreaseNumberOfPassengers	Optional
Place selection by preferences	Mandatory in case reservations are offered
GetLayouts	Mandatory in case graphical place selection is offered
GetPlaceAvailability	Mandatory in case graphical place selection is offered
Place selection for nearby booking	Optional
Fulfilment	Optional
Add personal data	Optional
Correction of personal data	Optional
Information on stored personal data	Optional, only in the case of personal data exchange

All non-functional requirements defined in the services must be fulfilled.



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